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UNRAVELING SOUTHERN CALIFORNIA'S WATER/GROWTH NEXUS: METROPOLITAN WATER DISTRICT POLICIES AND SUBSIDIES FOR SUBURBAN DEVELOPMENT, 1928-1996

STEVEN P. ERIE AND PASCALE JOASSART-MARCELLI*

INTRODUCTION

This article examines how regional water policies have shaped growth patterns in Southern California, particularly postwar suburban development. Nationwide, the dynamics of suburbanization are complex and multifaceted. Transportation technology (e.g., the streetcar and automobile), cultural values, and federal highway and housing policies have been major contributory factors.¹ Local and state policies have furthered processes of suburbanization. These include zoning and land-use controls, municipal incorporation and taxation policies, and, in the case of Southern California, the provision of county services to newly-incorporated suburbs.²

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1. *See generally* KENNETH T. JACKSON, *CRABGRASS FRONTIER: THE SUBURBANIZATION OF THE UNITED STATES* (1985); ROBERT FISHMAN, *BOURGEOIS UTOPIAS: THE RISE AND FALL OF SUBURBIA* (1987); JOEL GARREAU, *EDGE CITY: LIFE ON THE NEW FRONTIER* (1991).

2. *See generally* JON C. TEAFORD, *CITY AND SUBURB: THE POLITICAL FRAGMENTATION OF METROPOLITAN AMERICA, 1850-1970* (1976); MICHAEL N. DANIELSON, *THE POLITICS OF EXCLUSION* (1976); MARK GOTTDIENER, *PLANNED SPRAWL: PRIVATE AND PUBLIC INTERESTS IN SUBURBIA* (1977); GARY J. MILLER, *CITIES BY CONTRACT: THE POLITICS OF MUNICIPAL INCORPORATION* (1981); JOHN R. LOGAN & HARVEY L. MOLOTCH, *URBAN FORTUNES: THE POLITICAL ECONOMY OF PLACE* (1987); WILLIAM FULTON, *SPRAWL HITS THE WALL: RECENT RESEARCH ON LAND USE POLICY AND REGIONAL GROWTH PATTERNS IN METROPOLITAN LOS ANGELES* (1999).

I. WATER AND GROWTH: CURRENT POLICY DEBATES

In the semi-arid West, there is widespread recognition that water has played a crucial role in development.³ Yet, there are few studies of how water policy may be an important contributory factor to suburban development *within* regions such as Southern California. In one of the few intra-regional analyses, Robert Gottlieb argues that the founders of the Metropolitan Water District of Southern California (MWD or Metropolitan), “. . . immediately established policies that were favorable to newly developing areas rather than the city [of Los Angeles] itself These policies were designed to draw on the tax base of the developed areas while creating pricing incentives for water use and development of the new areas.”⁴

Have water policies in Southern California favored the suburbanizing periphery at the expense of the central city? This study seeks to test this hypothesis. It examines the growth and equity effects of capital financing and water rate policies of the Metropolitan Water District, the mammoth twenty-seven member agency⁵ water wholesaler serving over sixteen million customers in 250 communities. The lengthy time period examined, 1928 to 1996, spans the life of the agency and permits evaluation of policy changes and their effects. A guiding question is the extent to which the City of Los Angeles, owing to its large early investments in the Colorado River Aqueduct and limited use of MWD water, subsidized water provision to fast-growing outlying areas such as San Diego and Orange Counties.

The Metropolitan Water District was created by state legislation in 1927 and incorporated the following year.⁶ In terms of customers served and territory, it is the largest water district in the United States. MWD's 5139 square-mile service area includes six counties or portions thereof: Ventura, Los Angeles, Orange, San Diego, San Bernardino and Riverside Counties. The gross regional product of MWD's service territory exceeds \$500 billion—the eleventh largest economy in the world.

3. *See generally* PETER WILEY & ROBERT GOTTLIEB, *EMPIRES IN THE SUN: THE RISE OF THE NEW AMERICAN WEST* (1982); DONALD WORSTER, *RIVERS OF EMPIRE: WATER, ARIDITY, AND THE GROWTH OF THE AMERICAN WEST* (1985); MARC REISNER, *CADILLAC DESERT: THE AMERICAN WEST AND ITS DISAPPEARING WATER* (1986); NORRIS HUNDLEY, JR., *THE GREAT THIRST: CALIFORNIANS AND WATER, 1770s-1990s* (1992).

4. ROBERT GOTTLIEB, *A LIFE OF ITS OWN: THE POLITICS AND POWER OF WATER* 126 (1988).

5. MWD member agencies (and date of entry) are: Anaheim (1928), Beverly Hills (1928), Burbank (1928), Glendale (1928), Los Angeles (1928), Pasadena (1928), San Marino (1928), Santa Ana (1928), Santa Monica (1928), Fullerton (1931), Long Beach (1931), Torrance (1931), Compton (1931), Coastal MWD (1942), San Diego County Water Authority (1946), West Basin MWD (1948), Pomona Valley MWD (1950), Eastern MWD (1951), Chino Basin MWD (1951), MWD of Orange County (1951), Foothill MWD (1953), Central Basin MWD (1954), Western MWD of Riverside County (1954), Las Virgines MWD (1960), Calleguas MWD (1960), Upper San Gabriel Valley MWD (1963), and San Fernando (1971).

6. *See* Metropolitan Water District Act, Ch. 429, California Statutes 1927, 694 (cited in METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA: HISTORY AND FIRST ANNUAL REPORT 313 (Charles A. Bissell ed. 1939) [hereinafter MWD HISTORY]).

Given current policy debates, this is an appropriate time to examine the region's water/growth relationship, cost-of-service equity between MWD member agencies, and possible suburban subsidies. Today, Southern California faces a growing gap between its water requirements and assured supplies. At the same time, "smart growth" or sustainable development has become the leitmotif of policy discussions in California and the region.⁷ These concerns have encouraged the development of new water policies, particularly agriculture-to-urban water transfers. Approved in 1998, the landmark transfer agreement of 200,000 acre/feet a year from the Imperial Irrigation District (IID) to the San Diego County Water Authority (SDCWA) has been hailed as a promising solution to the looming water shortage in urban Southern California.⁸ In 1999, MWD outlined its own plans to buy water on the open market.⁹ Transfers are supported by many environmentalists who believe that, as a result, fewer dams and aqueducts will be constructed.

Yet, in terms of considering water transfers as a smart growth policy, very little is known about their actual effects upon growth. Nor is much known about their impact upon capital facility needs and financing, or upon cost-of-service equity among the region's water agencies. An analysis of past and current MWD policies, assessing their growth and equity effects, can provide a valuable baseline for the debate over transfers.¹⁰

Such a study also can inform policy and governance debates now occurring within Metropolitan and its member agencies. MWD is under new leadership, with both a newly installed chairperson and general manager, and is considering new policy directions. Under the smart growth rubric, there is interest in complementing conservation, reclamation and transfer measures with rate restructuring involving new growth-based charges. The MWD Strategic Visioning Project represents a comprehensive internal review of the agency's mission, policies and governance; the State Legislature also is examining these issues.¹¹

Within the San Diego County Water Authority, MWD's largest customer, there is a movement to unbundle the uniform or so-called "postage-

7. See CENTER FOR CONTINUING STUDY OF THE CALIFORNIA ECONOMY, LAND USE AND THE CALIFORNIA ECONOMY: PRINCIPLES FOR PROSPERITY AND QUALITY OF LIFE (1998), available in <<http://www.calutures.org>>.

8. See San Diego County Water Authority, *Landmark Water Conservation and Transfer Agreement Ratified*, April 29, 1998 (press release); Steve LaRue, 'Historic' Imperial Water Deal Approved, *SAN DIEGO UNION TRIB.*, Apr. 30, 1998, at A1.

9. See Tony Perry, *MWD to Buy Water on Open Market*, *L.A. TIMES*, Aug. 10, 1999, at A3.

10. See Steven P. Erie, *A San Diego/Imperial Valley Water Deal: Who Stands to Gain? Who to Lose?*, *METRO INVESTMENT REP.*, June 1997, at 19-20; Harold Brackman & Steven P. Erie, *Managing California's New Water Wars*, in *CALIFORNIA POLICY OPTIONS 1999*, 45-50 (Daniel J.B. Mitchell & Patricia Nomura eds., 1999).

11. See LLOYD DIXON ET AL, *IDENTIFYING AND EXPLORING THE POLICY ISSUES THAT UNDERPIN A VISION FOR THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA* (1998); DENNIS O'CONNOR, *GOVERNANCE OF THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA: OPTIONS FOR CHANGE* (1998).

stamp” water rate—long a staple of MWD and its member agencies—and substitute a more equitable rate based upon the relationship between financial contributions and benefits among SDCWA’s twenty-three member agencies.¹² SDCWA officials also have begun quietly exploring whether to secede from Metropolitan.¹³ These debates too can profit from an understanding of MWD’s record.

II. MWD AND REGIONAL GROWTH: A PARADIGMATIC CASE

Since MWD’s creation, the pattern of growth in Southern California has been one of massive and unrelenting suburban development. Between 1928 and 1996, the population of metropolitan Southern California has increased ten-fold, from less than two million to over 18 million residents. The City of Los Angeles, the original urban core, has grown from one million to 3.7 million residents—a 270% increase. The rest of Southern California has experienced far more prodigious growth—1300%, from one million to 14.3 million in population. While the City of Los Angeles was the region’s pre-Depression era growth leader, in the immediate post-World War Two era the rest of Los Angeles County witnessed fast-paced suburbanization. By the 1960s, the fastest growing areas were San Diego and Orange Counties. More recently, the Inland Empire (San Bernardino and Riverside Counties) has emerged as the region’s growth leader.

Population growth estimates for the region, 1996-2020, suggest little slackening in the fervid pace of growth. In the next twenty years, Southern California is forecast to grow by 40%—adding 8.7 million new residents, the equivalent of two and one-half Chicagos.¹⁴ The fastest growing areas are predicted to be the exurban periphery: western Riverside County, San Bernardino County, northern Los Angeles County, southern Orange County, and northern and southern San Diego County. Unless smart growth policies encouraging sustainable development are devised and implemented, the pattern of suburban sprawl will continue, posing massive costs for the region’s already-overburdened environment, quality-of-life, public services and infrastructure.

Very little of Southern California’s staggering population growth to date could have occurred without an adequate supply of affordable imported water. The region’s climate is semi-arid, and local water supplies only can support a population of one million. In the early twentieth century, the City of Los Angeles pioneered the development of imported water supplies, com-

12. See ECONOMIC STUDY GROUP, DRAFT REPORT: ANALYSIS OF SAN DIEGO COUNTY WATER AUTHORITY’S RATES, CHARGES, AND FEES WITH RESPECT TO COST OF SERVICE EQUITY AMONG MEMBER AGENCIES (Brookman-Edmonston Engineering, Inc. ed. 1999). The County of San Diego is an *ex officio* member of SDCWA.

13. See Michael Gardner, *S.D. Thirsts for Independence*, SAN DIEGO UNION TRIB., Aug. 11, 1999, at A1.

14. Population growth estimates prepared by the Southern California Association of Governments (SCAG) and the San Diego Association of Governments (SANDAG).

pleting its aqueduct from the Owens Valley in 1913.¹⁵ This allowed L.A. to grow from one-half million to two million residents.

In 1928, Los Angeles and its suburbs joined in creating the Metropolitan Water District in order to finance, construct and operate the Colorado River Aqueduct to bring fresh supplies of imported water from the Colorado River.¹⁶ In effect, MWD created a "water wall" around Los Angeles, breaking up the city's water monopoly, which had been used as a potent force for territorial expansion.¹⁷ Los Angeles' boundaries today are roughly the same as they were in 1928. In this fashion, MWD helped underwrite the postwar suburbanization of Los Angeles County, as over fifty new cities were incorporated. They formed municipal water districts and were annexed to MWD.

From the 1940s onward, as Colorado River water became available, outlying areas such as San Diego annexed themselves to MWD. As a result, Metropolitan's service area has grown through annexation to encompass most of urban Southern California. In the early 1950s, MWD established a new policy, known as the Laguna Declaration, which pledged the agency to find a permanent water supply for the region, and to provide water to anyone who requested it in its service territory.¹⁸ In 1960, California voters approved the MWD- supported State Water Project, bringing a fresh supply of imported water (albeit representing only one-half of the California Aqueduct's full capacity) from Northern California for distribution by Metropolitan and its member agencies.¹⁹

Given that Southern California is arguably the nation's paradigmatic case for the water/growth nexus, this study focuses upon MWD capital financing and water rates and their growth and equity effects under two different policy regimes: (a) 1928-1970, when capital financing, such as for the

15. See generally VINCENT OSTROM, *WATER AND POLITICS: A STUDY OF WATER POLICIES AND ADMINISTRATION IN THE DEVELOPMENT OF LOS ANGELES* (1953); ABRAHAM HOFFMAN, *VISION OR VILLAINY: ORIGINS OF THE OWENS VALLEY-LOS ANGELES WATER CONTROVERSY* (1981); WILLIAM KAHRL, *WATER AND POWER* (1982).

16. See MWD HISTORY, *supra* note 6.

17. Interview with Robert V. Phillips, former General Manager and Chief Engineer, Los Angeles Department of Water and Power (June 1, 1995).

18. The Laguna Declaration states:

The Metropolitan Water District of Southern California is prepared, with its existing governmental powers and its present and projected distribution facilities, to provide its service area with adequate supplies of water to meet expanding and increasing needs in the years ahead. The District now is providing its service area with a supplemental water supply from the Colorado River. When and as additional water resources are required to meet increasing needs for domestic, industrial and municipal water, The Metropolitan Water District of Southern California will be prepared to deliver such supplies.

Id. See also Statement of Policy Approved by the Board of Directors of the Metropolitan Water District of Southern California, Dec. 16, 1952, in SOURCE MATERIALS ON METROPOLITAN WATER DISTRICT ACT § 135; PREFERENTIAL RIGHTS, Item 44 of supporting documents (1996).

19. See JOEL SCHWARZ, *A WATER ODYSSEY: THE STORY OF THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA* 103-18 (1991).

Colorado River Aqueduct, was property-tax based, and water rates were kept below actual cost (requiring further tax subsidies) to encourage water sales via annexation of outlying areas to MWD; and (b) 1970-1996, when water rates were raised substantially to include both capital financing and cost recovery.

The analysis is organized into four sections. The first part examines MWD capital financing and water rates in the pre- and post-1970 periods. The second section analyzes fiscal subsidies between MWD's twenty-seven member agencies in the two eras, focusing upon possible central city/suburban transfers. A subsidy index is constructed for each member agency, which compares its share of MWD water deliveries relative to its share of financial contributions. A guiding assumption here is that inter-agency subsidies should be minimized. This study argues that tax-based water provision is an inequitable system. More equitable policies feature postage-stamp or uniform commodity charges with cost recovery or, as now is being proposed, rates which reflect the actual cost of service. The third section examines possible growth-inducing effects of MWD water policies. For Metropolitan's twenty-seven member agencies, correlations between subsidies and average annual population growth rates for the pre- and post-1970 periods are examined. The concluding section addresses normative concerns: the fairness of past MWD policies, and the equity and growth issues raised by water transfers.

In addition to MWD member agencies, counties are treated as primary units of analysis since counties and their political subdivisions, not water agencies, make land-use decisions and thus shape patterns of growth. Here, member agencies' water deliveries, financial contributions and population growth are aggregated to the county level.²⁰ Much of the analysis employs constant (1996) dollars to more accurately reflect member agency tax assessments and debt burdens for early large-scale projects such as the Colorado River Aqueduct. The data collected and analyzed include MWD member agency annual water sales and deliveries, revenue and taxes collected, capital contributions, annexation fees and other charges. Member agency population figures are from Metropolitan's annual reports.

20. Los Angeles County MWD member agencies include Beverly Hills, Burbank, Central Basin, Compton, Foothill MWD, Glendale, Las Virgines, Long Beach, Los Angeles, Pasadena, San Fernando, San Marino, Santa Monica, Three Valleys, Torrance, Upper San Gabriel Valley and West Basin. Orange County agencies include Anaheim, Coastal, Fullerton, MWD of Orange County and Santa Ana. Riverside County agencies are Eastern MWD and Western MWD. San Bernardino County's member agency is Chino Basin MWD. San Diego County's agency is the San Diego County Water Authority. Ventura County's agency is Calleguas MWD.

III. MWD POLICIES: PRE- AND POST-1970

A. *Capital Financing*

Although Colorado River water did not make its way to Southern California until 1941, when the aqueduct finally was completed, MWD began collecting property taxes in 1929 to finance the \$220 million project. Property taxes remained the principal means of MWD financing through the 1960s because capital projects could not generate revenue until they were completed, and early water sales were inadequate for project financing. By the mid-1940s, MWD was awash in water but not customers, forcing the agency to sell water below cost in order to encourage greater purchases by member agencies as well as possible annexations to Metropolitan. In 1947, MWD only charged \$15 per acre-foot for treated domestic water, a price that slowly rose to \$49 by 1970; by 1996, however, this rate had increased to \$426.²¹

Los Angeles, whose taxpayers paid 75% of the costs of the Colorado River Aqueduct, drew little MWD water—only 8% of total deliveries—because the city continued to develop its own water supplies. In the 1930s, Los Angeles extended its system to the Mono Lake Basin. Later, in 1970, the city completed a second aqueduct to the Owens Valley. Owens Valley water was far cheaper because it featured a gravity-flow system while MWD needed costly pumping plants to move its Colorado River water over desert mountains.

Starting in the 1960s, MWD began shifting its capital financing from taxes to water sales. By then nearly all of the urban coastal plain had been annexed to Metropolitan. Now it was easier for MWD to raise water prices to recover costs. The State Water Project (SWP), begun in 1960 and completed in 1972-73, served as major catalyst for capital restructuring. Los Angeles demanded that the State Water Project, with its more expensive water, be financed by water sales rather than taxes. San Diego, however, resisted. The San Diego County Water Authority, MWD's largest customer, drew one-quarter of its water but only had paid 10-13% in annexation charges (representing back taxes plus interest) and property taxes since joining MWD in 1946.

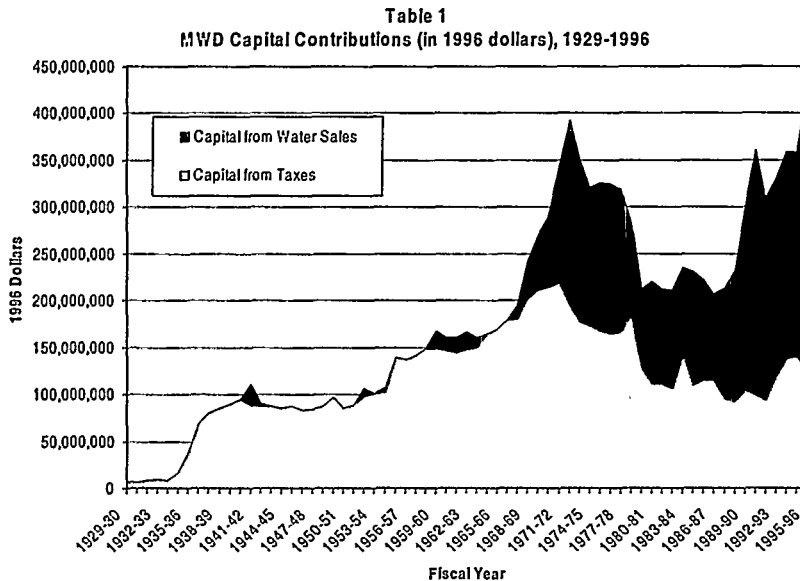
The Los Angeles/San Diego conflict resulted in MWD shifting much of its capital financing from property taxes to water rates. In 1960, the MWD Board of Directors adopted a new policy which required that at least one-half of all capital expenses plus all operating and maintenance costs be borne by water sales revenues.²² This partially allayed Los Angeles' concern that

21. See METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA, THIRTY-FOURTH ANNUAL REPORT 1972, at 147 [hereinafter MWD THIRTY-FOURTH]; METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA, ANNUAL REPORT 1997, at 128 (1997).

22. See Board of Directors of the Metropolitan Water District of Southern California, Resolution 5821 (1960) [hereinafter MWD Resolution 5821].

MWD would continue to rely heavily upon tax revenues. A subsequent Los Angeles lawsuit and, in 1978, the passage of Proposition 13 furthered the shift in capital financing to water sales.²³

As a result, there are two distinct MWD fiscal regimes: pre- and post-1970. Table 1 shows the sharp shift in Metropolitan capital financing circa 1970.



23. In 1960, SDCWA's MWD directors resisted raising MWD water rates to include payments of principal and interest on bonded debt. Later, Metropolitan's Board of Directors considered setting a higher price for State Water Project supplies (to include capital costs) relative to Colorado River water. According to an unofficial history of Metropolitan Water District Act provisions:

SDCWA and other heavy water users resisted the concept of any such difference [in water price based upon] source amendment to the Act [to Section 133, derived from the original Act's Section 5(10) and Section 6(8) (Stats. 1961, Ch. 862)]. A majority of the board, though, approved . . . a legislative draft containing this concept. However, the [Los Angeles] City's Department of Water and Power then entered into a Memorandum of Understanding with SDCWA (in order to dissuade the Authority from lobbying for defeat of the bill). The Memorandum contained these points: . . . [t]he legislation is permissive only . . .

GEORGE FLEWELLING, DERIVATION AND HISTORY OF VARIOUS METROPOLITAN WATER DISTRICT ACT PROVISIONS 93 (1985). Finally, starting in 1979 with the settlement of a lawsuit brought by the City of Los Angeles regarding MWD water and tax rate setting policies, MWD began to fully implement a water charge-based system of capital financing. *See id.* at 92-107. *See also* MWD Resolution 5821, *supra* note 22; Board of Directors of the Metropolitan Water District of Southern California, Resolution 7446 (1972); Board of Directors of the Metropolitan Water District of Southern California, Minutes, November 13, 1979, at 9.

The table displays annual capital contributions from taxes (and annexation fees paid by new member agencies) and water sales, 1929-1996, in constant 1996 dollars. Before 1970, virtually all MWD capital projects were paid for by property taxes. After the early 1970s, as State Project water flowed into Southern California, water sales became a major source of capital financing. Metropolitan's uniform or postage-stamp water rates (in which all member agencies paid the same amount for similar kinds of water) now were raised to include most capital, operating and maintenance charges.

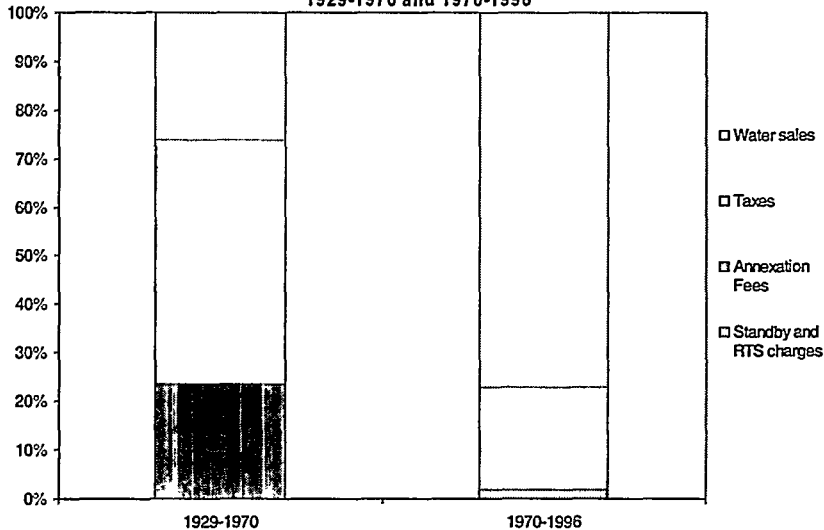
By 1995, however, new capital financing policies were being created. In response to reduced water deliveries, sales and revenues produced by a lengthy drought coupled with the financing needs of an ambitious capital improvement program, MWD adopted a new rate structure designed to shift capital costs away from water rates and toward new, more stable charges. These included a readiness-to-serve (RTS) charge to meet debt service needs by guaranteeing water reliability and quality under normal demand; a standby charge for unimproved land benefiting from legal access to MWD water; and a new demand charge (since suspended) to recover capital costs associated with meeting new demands on Metropolitan's system.²⁴

B. Changes in Revenue Sources

The shift in capital financing circa 1970, coupled with an increase in water rates to reflect the actual cost of service, dramatically altered MWD's revenue sources. Table 2 shows the changing components of total MWD revenue (in current dollars) 1929-1970, and 1970-1996.

24. See Board of Directors of the Metropolitan Water District of Southern California, Resolutions 8464-65 (1995).

Table 2
Components of Total Revenue Collected by MWD (in current dollars),
1929-1970 and 1970-1996



In the pre-1970 period, taxes and annexation fees accounted for 75% of agency revenue while water sales only amounted to one-quarter of MWD revenue. Property taxes not only were the principal source of early capital financing, they also were used to pay a significant share of operating costs. By 1960, one-third of MWD's ad valorem tax rate was devoted to general purposes rather than bond service.²⁵ Metropolitan had been forced to keep water prices artificially low to make its water financially attractive to member agencies relative to groundwater usage, and to encourage annexations to MWD. This strategy of giving water away, forcing further reliance upon property taxes as the agency's principal revenue source, appeared to work. The original thirteen member agencies, which had joined MWD between 1928 and 1931, later were joined by thirteen additional agencies annexed to Metropolitan between 1942 and 1963. San Fernando, the twenty-seventh member agency, joined in 1971.

For the post-1970 period, the relative magnitude of the two revenue streams was reversed. Water sales now accounted for 75% of total agency revenue. In contrast, taxes, fees and other charges only generated one-quarter of MWD revenue. Increased water sales revenues reflected both the shift in capital financing and MWD's willingness to raise water rates as annexation was completed.

25. See MWD THIRTY-FOURTH, *supra* note 21, at 146.

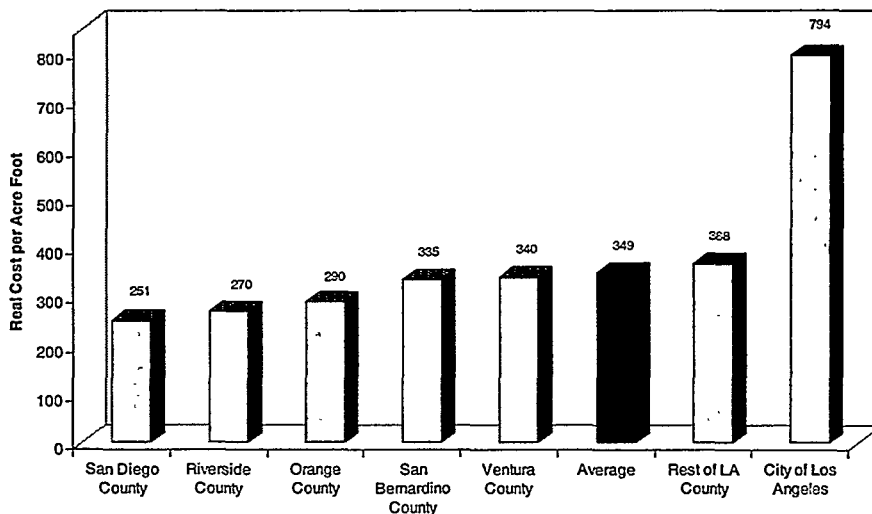
IV. SUBSIDIES BETWEEN MEMBER AGENCIES

A. Comparing Agency Water Deliveries and Financial Contributions

One of the main findings of this research is that the City of Los Angeles, and to a lesser extent the other founding member agencies of Metropolitan, heavily subsidized later joining agencies by underwriting most of MWD's early capital costs, particularly for the Colorado River Aqueduct. In general, water deliveries to the original members have not matched their financial contributions.

Table 3 shows water delivery/financial contribution ratios for the City of Los Angeles, the rest of Los Angeles County, and the other counties served by Metropolitan, 1929-1996.

Table 3
 Unit Cost (in 1996 dollars) per Acre Foot of MWD Water Delivered,
 by County and the City of Los Angeles, 1929-1996

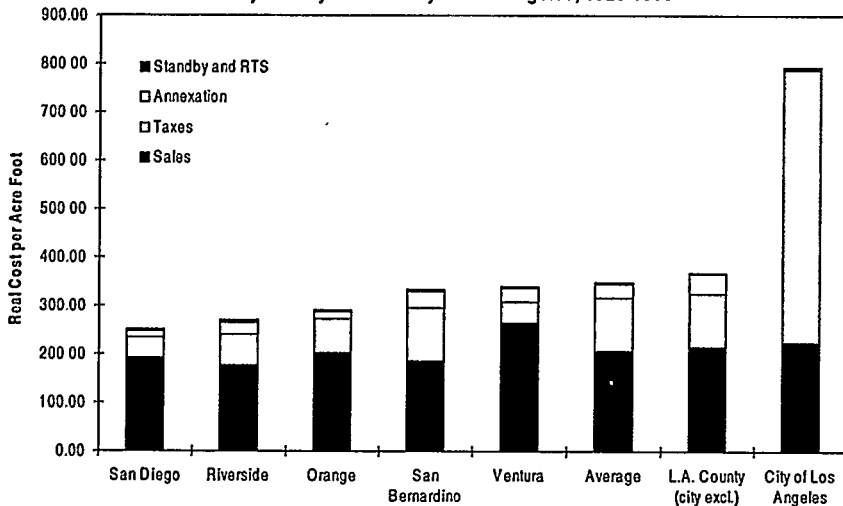


(Note: Financial contributions include MWD proceeds from water sales, taxes, annexation fees, standby and readiness-to-serve charges.)

The ratios represent the total real contribution to MWD (in 1996 dollars) per acre-foot of water delivered to each jurisdiction. Note the substantial differences in unit water costs for the City of Los Angeles relative to the rest of Southern California. Los Angeles paid \$794 per acre-foot of water, more than double the \$349 average. In contrast, San Diego, Riverside and Orange Counties paid only \$251, \$270 and \$290 per acre-foot, respectively.

What explains these substantial unit cost disparities? Table 4 disaggregates MWD financial contributions (in 1996 dollars) for these jurisdictions into four components: water sales, property taxes, annexation fees, and other charges.

Table 4
Types of MWD Financial Contributions (in 1996 dollars)
per Acre Foot of MWD Water Delivered,
by County and the City of Los Angeles, 1929-1996



Thus, 74% of Los Angeles' financial contribution to Metropolitan has come from taxes compared to less than 24% from water sales. In sharp contrast, only 28% of the San Diego County Water Authority's total contribution has come from taxes and annexation fees compared to 70% from water sales. Similarly, two-thirds of Orange and Riverside Counties' member agency contributions to Metropolitan have come from water sales and only one-third from taxes and annexation charges.

As both tables reveal, the greatest disparities between MWD water deliveries and financial contributions are between the City of Los Angeles and San Diego, Riverside and Orange Counties. Between 1929 and 1996, Los Angeles only drew 8% of total MWD water deliveries, but paid (in 1996 dollars) 25% of total property taxes, 23% of capital charges, and 17% of total MWD financial contributions. In contrast, the San Diego County Water Authority, whose member agencies provide for the county's water needs, has received 26% of MWD's total water delivered, but in real terms, only has paid 13% of MWD's taxes, 15% of the capital budget and 18% of overall MWD's financial contributions. Similarly, Orange County's five member agencies have drawn 21% of MWD water deliveries, and only have paid

16% of MWD taxes, 17% of capital costs, and 18% of revenue.²⁶

Most of Orange County's disparity is produced by one agency, the Municipal Water District of Orange County (MWDOC). The county's three smallest agencies, Anaheim, Santa Ana and Fullerton, were MWD founders, joining between 1928 and 1931. A fourth agency, Coastal MWD, annexed in 1942. However, MWDOC, the county's largest agency which draws 70% of its Metropolitan water deliveries, only joined MWD in 1951. Riverside County's member agencies with low unit costs are Eastern and Western MWD, having joined Metropolitan in 1951 and 1954, respectively.

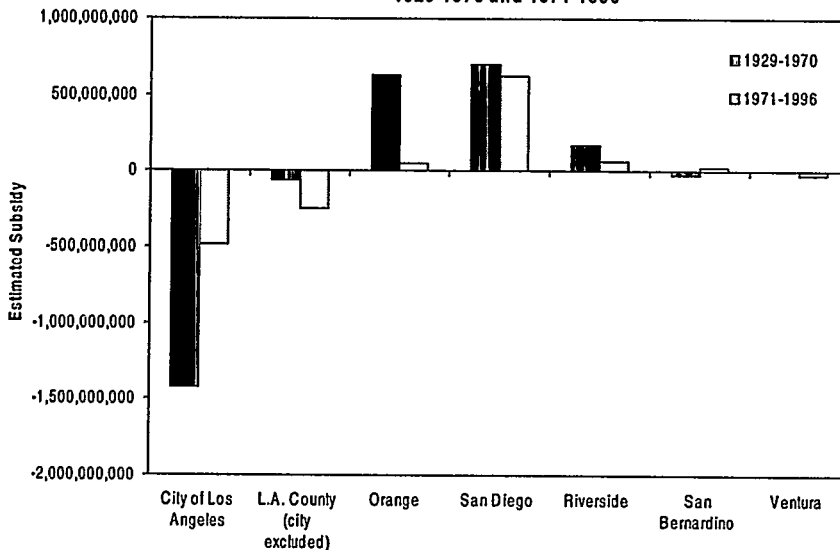
The reasons for the large unit cost disparities between Los Angeles and San Diego, Riverside and Orange Counties are complex. They have to do with the City of Los Angeles' heavy initial tax payments for the Colorado River Aqueduct; SDCWA's, MWDOC's, and Eastern and Western MWD's small assessed valuations (and thus few back taxes paid via annexation charges) when joining Metropolitan in the postwar era; L.A.'s limited use of MWD water as a supplemental source versus SDCWA's reliance as a primary source; San Diego, Riverside and Orange Counties' heavy utilization of lower-cost MWD water for agricultural purposes; and MWD's use of property taxes rather than water sales to finance capital projects prior to 1970.

B. Changing Subsidy Patterns: Pre- and Post-1970

The pronounced shift in MWD capital financing and revenue sources circa 1970 suggests that there may be different subsidy patterns in the pre- and post-1970 eras. Table 5 shows this to be the case.

26. See METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA, WATER DELIVERY IN ACRE FEET BY MEMBER AGENCY THROUGH MARCH 31, 1996; TAXES BY MEMBER AGENCIES THROUGH MARCH 31, 1996; TOTAL CAPITAL COSTS [BY MEMBER AGENCIES], NOMINAL VALUE AND PRESENT VALUE [THROUGH FISCAL YEAR 1995-96]; TOTAL REVENUE COLLECTED BY MWDSC FROM THE MEMBER AGENCIES THROUGH MARCH 31, 1996.

Table 5
Estimated Subsidies (in 1996 dollars), by County and the City of Los Angeles,
1929-1970 and 1971-1996



(Note: The subsidy is computed by calculating the difference between total MWD financial contributions and actual water sales.)

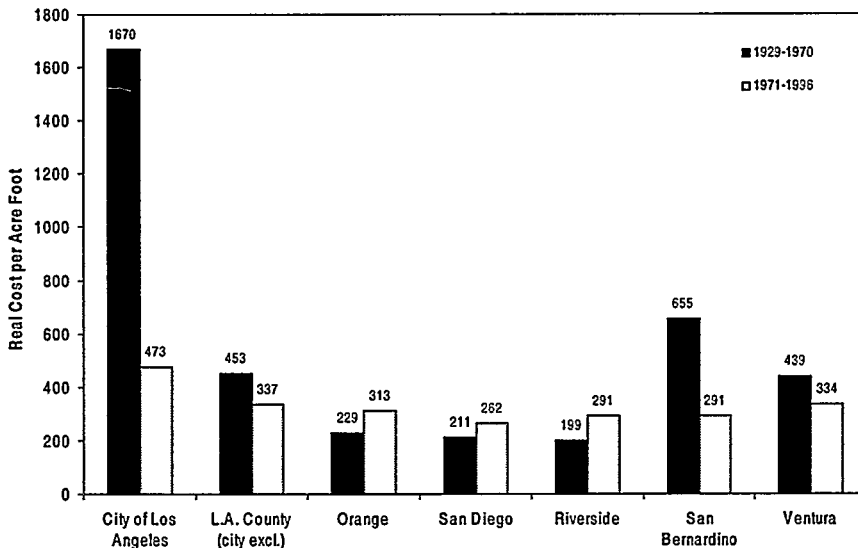
Here we measure the magnitude of the financial overpayment or underpayment to Metropolitan (in 1996 dollars) relative to actual water deliveries for the City of Los Angeles, the rest of L.A. County and the other counties served by MWD, for 1929-1970 and 1971-1996. The table graphically shows that most of the inter-agency subsidies occurred in the pre-1970 period. In the 1929-1970 period, the City of Los Angeles overpaid \$1.42 billion and the rest of L.A. County \$59 million in MWD contributions relative to water deliveries. In contrast, the San Diego County Water Authority underpaid \$701 million relative to MWD deliveries while Orange County member agencies underpaid \$631 million. MWDOC, with a \$531 million underpayment, generated most of Orange County's subsidy. Riverside County's pre-1970 subsidy was much smaller (\$173 million), reflecting its limited MWD purchases given ample groundwater supplies. In essence, Riverside's member agencies joined MWD to provide for future growth. However, there is little early subsidy pattern evident for MWD member agencies in San Bernardino and Ventura Counties.

Table 5 demonstrates that after 1970, with the postage-stamp water rate rising to reflect most MWD expenses, suburban subsidies were significantly reduced, but not eliminated. Los Angeles continued to overpay—the City by \$487 million and the County by \$250 million—and San Diego to underpay (by \$621 million) while Orange and Riverside Counties' subsidies largely were eliminated.

Table 6 highlights a different way of estimating subsidies between sub-

regions for the two time periods. Here, to control for differences in member agency size, water deliveries and financial contributions, we calculate the real cost per acre foot of water delivered.

Table 6
Unit Cost (in 1996 dollars) per Acre Foot of MWD Water Delivered,
by County and the City of Los Angeles, 1929-1970 and 1971-1996



(Note: Costs estimates are computed by dividing total financial contributions by total water delivered (in acre feet) to each member agency.)

The unit cost is obtained by dividing the total financial contribution of each member agency by the quantity of water delivered. As with the previous table, Table 6 shows that there were significant early cost disparities. For 1929-1970, the City of Los Angeles paid \$1670 per acre foot of MWD water while member agencies in Ventura (Calleguas MWD) and San Bernardino (Chino Basin MWD) Counties paid \$439 and \$655, respectively. Given that Ventura and San Bernardino unit costs, 1929-1996, closely approximate the overall regional average, these pre-1970 figures are anomalous. Calleguas only joined MWD in 1960 to receive State Water Project deliveries and, through 1970, had paid annexation charges but had received little MWD water. Chino Basin, which had joined in 1951, chose to draw little MWD water in the pre-1970 period relative to its payment of annexation fees.

The high pre-1970 unit costs make the City of Los Angeles appear a fiscal profligate. Yet, as noted, L.A. early on heavily relied upon its own water supplies, taking few MWD deliveries before the advent of the State Water Project. Hence, the retail cost of water to Los Angeles customers remained relatively low and did not represent an inhibitor to development. Also of note is the high early unit cost for the remainder of Los Angeles County—\$453. From 1928 to 1931, ten of L.A.'s suburbs had joined MWD, fully con-

tributing to the financing of the Colorado River Aqueduct while generally drawing Metropolitan water as a supplemental source.

In dramatic contrast, in the pre-1970 era San Diego, Riverside and Orange County water agencies only paid \$211, \$229 and \$199 per acre foot, respectively. As noted, their low unit costs were driven by small assessed valuations (and thus low annexation fees and early property taxes) coupled with large water deliveries, particularly for agricultural use. For example, SDCWA and MWDOC paid \$34 million and \$32 million in annexation charges, respectively, which represent 10% shares of total MWD annexation charges.²⁷ After 1970, though, as MWD's water rates were raised substantially, unit cost disparities among member agencies were reduced.

Why did the City of Los Angeles so heavily contribute to early MWD capital financing, in effect subsidizing water provision to suburbanizing San Diego and Orange Counties? Robert Gottlieb argues that L.A.'s MWD directors were acting in their capacity as developers and investors:

Though the city of Los Angeles's representatives dominated the new MET [MWD] board and management, they immediately established policies that were favorable to newly developing areas rather than the city itself. They did so in part as developers in their own right, and as participants and leaders in the urban-development complex that transcended the boundaries of particular municipalities. These policies were designed to draw on the tax base of the developed areas while creating pricing incentives for water use and development of the new areas.²⁸

In actuality, this explanation appears overdrawn. MWD's original policies, as found in the Metropolitan Water District Act, were written by lawyers, not developers. The key bill drafters were William Burgess Mathews, former L.A. City Attorney and Department of Water and Power (DWP) Attorney and first MWD General Counsel, and James Howard, Pasadena City Attorney and Mathews' successor as MWD's General Counsel. For capital financing, they turned to existing models. In that era, capital improvements were financed by general obligation bonds, approved by voters, and paid for by property taxes. In the early twentieth century, Los Angeles was one of the nation's leaders in securing voter-approved, taxed-based financing for its ambitious water, power and harbor projects.²⁹ Only later would the city shift to a revenue-bond strategy to finance new infrastructure projects.

The drafters also assumed that Los Angeles would draw a substantial portion of MWD water deliveries. This would have substantially lessened

27. See METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA, ANNEXATION CHARGES BY MEMBER AGENCY THROUGH MARCH 31, 1996.

28. GOTTLIEB, *supra* note 4, at 126.

29. See Steven P. Erie, *How the Urban West Was Won: The Local State and Economic Growth in Los Angeles, 1880-1932*, 27 URBAN AFFAIRS Q. 519-551 (1992); Steven P. Erie, *From Regional Imperium to Pacific Rim Gateway: Los Angeles as a Developmental City-State*, in FROM CHICAGO TO L.A.: RECONSIDERING URBAN THEORY (Michael Dear & Philip Ethington eds., forthcoming 2000).

the city's delivery/contribution disparity. Yet, in the 1930s, as Arizona sought Congressional redress and began filing federal lawsuits against California to re-allocate Colorado River allotments, L.A.'s water officials realized that their Colorado River priority rights were less secure than originally thought. Thus they began developing more secure supplies in the Owens Valley and Mono Basin.

The Metropolitan Water District Act also conferred substantial benefit, as well as cost, to Los Angeles. Although the city would bear the brunt of financing the Colorado River Aqueduct and had bestowed its substantial Colorado River water entitlement upon MWD³⁰, it was offered substantial inducements. The Metropolitan Act conferred preferential rights to water, such as during times of scarcity, on the basis of property taxes and other financial contributions for MWD capital and operating costs, exclusive of water sales.³¹ In 1996, Los Angeles had a preferential claim to 24% of MWD water relative to SDCWA's 13% claim and MWDOC's 11% share.³² In effect, Los Angeles bought an expensive drought insurance policy should its Owens Valley supplies prove insufficient. Los Angeles also was assured a major role in MWD policymaking when assessed valuation, the basis for property taxes levied, became the basis of board representation and voting. To protect smaller member agencies, though, Los Angeles only was given 50% of the initial weighted vote—in effect guaranteeing it a veto—even though, on the basis of assessed valuation, the city was entitled to 75%.

As MWD board directors were installed, they primarily acted as guardians of Metropolitan's fiduciary interests. As Gottlieb admits, "[a]fter Colorado River water arrived in the Basin in 1941, so much surplus water was available at first that MET practically offered to give it away for free in order to establish a more substantial revenue base."³³ By encouraging water sales, low annexation charges and price incentives would enhance MWD's long-term revenue stream and thus allow for subsequent readjustments in the relative financial burdens of older and newer member agencies.

30. On June 28, 1924, the City of Los Angeles filed with the state authorities for a flow of 1500 cubic feet per second—equivalent to 1.1 million acre feet annually—from the Colorado River. Los Angeles' original filing, which was transferred to Metropolitan, represents 90% of MWD's Colorado River priority rights. MWD's other Colorado River entitlement consists of the City of San Diego's filing for 112,000 annual acre feet. San Diego granted its filing to MWD upon annexation in 1946. See MWD HISTORY, *supra* note 6, at 36; SCHWARZ, *supra* note 19, at 84-86.

31. See Metropolitan Water District Act, § 5 1/2, Ch. 323, California Statutes 1931. Preferential rights now appear in section 135 of the Metropolitan Water District Act, Chapter 209, California Statutes 1969, as amended. See METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA, SOURCE MATERIALS ON METROPOLITAN WATER DISTRICT ACT § 135 PREFERENTIAL RIGHTS (1996).

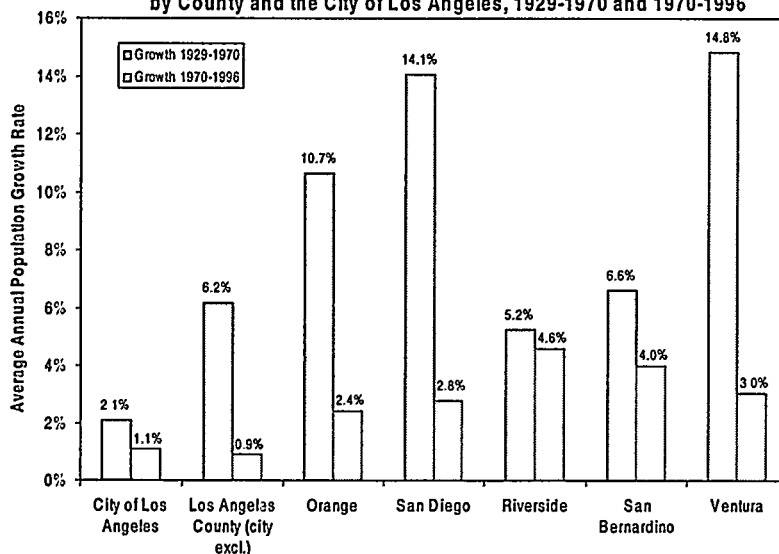
32. See METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA, MWD ACT § 135 PREFERENTIAL RIGHTS TO PURCHASE WATER (June 1996).

33. GOTTLIEB, *supra* note 4, at 126.

V. TESTING THE SUBSIDY/GROWTH RELATIONSHIP

To what extent have MWD capital financing and water rate policies, and resulting inter-agency subsidies, been growth-inducing, contributing to the region's suburban sprawl? To answer this question, we have performed a correlation analysis between the subsidy scores for the twenty-seven member agencies, expressed as their real cost per acre foot of MWD water delivered, and their average annual population growth rates since joining Metropolitan. As Table 7 shows, there are wide variations in average annual growth rates for the City of Los Angeles, the remainder of Los Angeles County, and the other counties served by Metropolitan, 1929-1970 and 1970-1996.

Table 7
Average Annual Population Growth Rate,
by County and the City of Los Angeles, 1929-1970 and 1970-1996



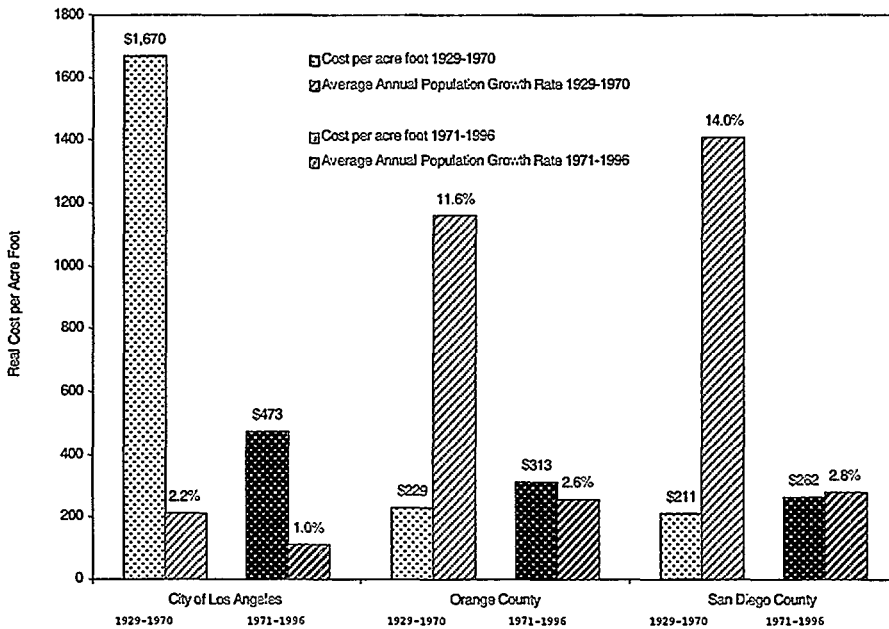
(Note: The average annual population growth rate between 1929 and 1970 is calculated from the year member agencies joined MWD.)

Because of the smaller population base in the pre-1970 period, early growth rates are much higher and show greater variation. Los Angeles City and County, because they already were settled, experienced lower annual growth rates than sparsely settled Orange, San Diego and Ventura Counties. Sub-regional differences persisted after 1970, with annual population increases in Riverside and San Bernardino Counties four times as great as the City and County of Los Angeles.

Table 8 compares unit water costs per acre foot and average annual population growth rates for the three leading cases of central city/suburban fiscal transfers: the City of Los Angeles, San Diego and Orange Counties, 1929-1970 and 1971-1996.

Table 8

Unit Cost (in 1996 dollars) per Acre Foot and Population Growth Rate, Orange and San Diego Counties and the City of Los Angeles 1929-1970 and 1971-1996

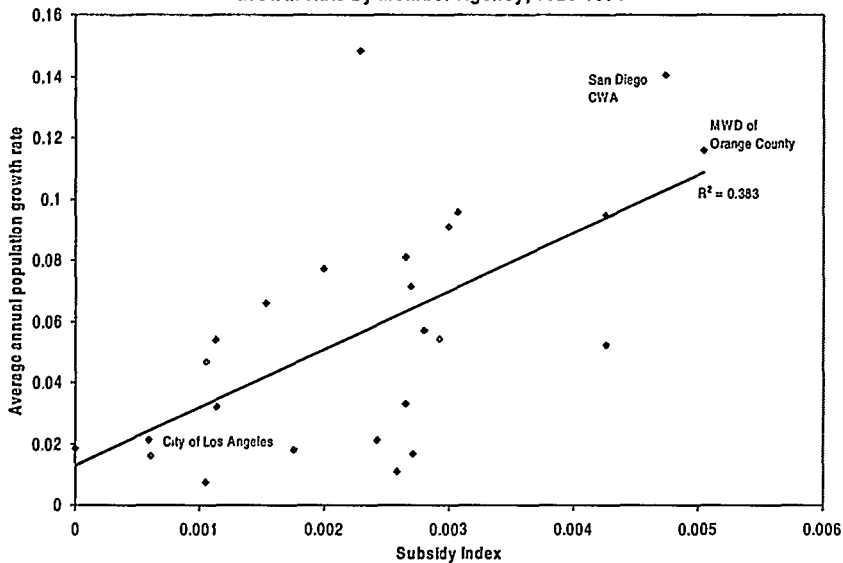


The table graphically illustrates the early subsidy/growth relationship for these three key jurisdictions. Prior to 1970, Los Angeles paid dearly for its MWD hookup but only grew at a moderate 2.2% annual growth rate. In contrast, San Diego and Orange Counties paid little for MWD infrastructure and water provision in the earlier period but experienced double-digit annual growth rates. For all three jurisdictions, however, the water/growth relationship substantially weakens after 1970.

The early subsidy/growth relationship also appears to hold for all twenty-seven MWD member agencies. Table 9 displays the correlation between member agency real (inflated-adjusted) cost per acre-foot of water de-

livered and average annual population growth rate, 1929-1970.

Table 9
Correlation between Water Subsidy Index and Population
Growth Rate by Member Agency, 1929-1970

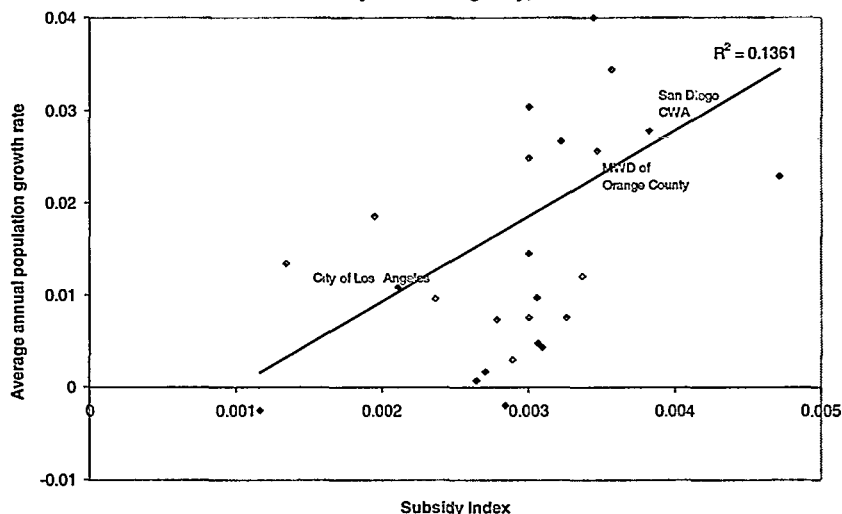


(Note: The subsidy index is computed by dividing the amount of water delivered (in acre feet) by the contribution paid (in 1996 dollars) for each member agency. The average annual population growth rate is calculated from the year member agencies joined MWD.)

The relationship is quite robust, with $R^2 = .383$. The coefficient fundamentally is driven by two key agencies—the San Diego County Water Authority and the Municipal Water District of Orange County.

Finally, Table 10 displays the correlation for the member agency subsidy/growth relationship, 1971-1996.

Table 10
 Correlation between Water Subsidy Index and Population
 Growth Rate by Member Agency, 1971-1996



(Note: The subsidy index is computed by dividing the amount of water delivered (in acre feet) by the contribution paid (in 1996 dollars) for each member agency.)

As expected, for the later period the correlation is sharply reduced but not eliminated, with an $R^2 = .136$. Thus, MWD capital financing and water pricing after 1970 appear much less growth inducing.

As noted, these bivariate correlations should be treated as exploratory and suggestive. Regional growth is a complex, multi-faceted phenomenon, and is not driven solely by any single variable. Key growth determinants include land availability and price, zoning and land-use controls, local taxes, and infrastructure (such as transportation), education and amenities. Yet, the subsidy/growth relationship for the pre-1970 period is surprisingly strong, and suggests the need for further research. However, the ready availability of inexpensive water may be a necessary, but not sufficient, condition for growth in a semi-arid region such as Southern California. If the cost of water were a sufficient condition, lowering Los Angeles' MWD unit costs from nearly \$1700/acre foot, 1929-1970, to less than \$500/acre foot, 1971-1996, should have sparked a greater growth surge than actually occurred.

In this case a multivariate analysis is complicated by the fact that while many demographic, economic and policy variables are available at the county and city levels, they are not available for member agencies which are not coterminous with county or city boundaries. Such agencies include both incorporated and unincorporated areas, making data comparability and analysis difficult.

VI. WATER POLICY, EQUITY AND GROWTH

This analysis suggests that MWD's pre-1970 policy of relying upon ad valorem property taxes for capital financing and many operating expenses produced substantial cost-of-service disparities between member agencies and favored new suburban development at the expense of the central city and older suburbs. MWD's founding member agencies, such as the City of Los Angeles, paid their full complement of property taxes but, in general, used the system as a supplemental water source. In contrast, agencies such as the SDCWA joined MWD in the postwar era, paid relatively small annexation fees and relied upon MWD as a primary water source. The result was a substantial early water provision subsidy of over \$1.3 billion from Los Angeles City and County to suburbanizing San Diego and Orange Counties.

How fair was this early tax-based financing system? Should new suburban areas have been subsidized by established urban centers like Los Angeles in the same way a nation might protect infant industries or parents might indulge a child until maturity? According to Gottlieb, an argument can be made that MWD's founders and early directors were pursuing a policy of enlightened self-interest, creating a suburban hinterland and thus greater economic opportunities for the core urban center. As noted, a case also can be made that when faced with a possible stranded asset such as the Colorado River Aqueduct, MWD officials pursued a rational long-term strategy of encouraging annexations and water sales so that rates could be raised at a later date. One wonders what the thirteen original cities' MWD costs would have been if outlying areas had not been encouraged with financial incentives to join the Met family.

Yet, there is growing evidence that subsidies have unwanted consequences. Because beneficiaries fight ferociously to maintain their privileged status, subsidies have a tendency to become self-perpetuating. The protracted battle over shifting MWD capital financing from property taxes to water rates offers vivid testimony in this regard.

In recent years, with central city decline and rampant suburban sprawl, it has become clear that urban centers can no longer be called upon to subsidize the suburban periphery. Indeed, there is growing realization that the fate of metropolitan areas fundamentally depends upon the prosperity of the central city.³⁴ Smart growth advocates now call for the elimination of subsidies encouraging sprawl. Because newly developed areas require greater capital investments, a cost-of-service logic suggests they should pay additional, not reduced, charges for services such as water provision.

MWD's post-1970 shift from tax-based financing to a rate structure featuring substantial cost recovery has resulted in a more equitable and less growth-inducing water policy. The new rate system reduced many cost-of-service disparities among member agencies and resulting subsidies. Yet, Los

34. See generally DAVID RUSK, *CITIES WITHOUT SUBURBS* (2d ed. 1995).

Angeles' subsidy of water provision to other member agencies, particularly San Diego, continued—although at one-half the level as previously. As noted, since 1970 Los Angeles City and County have overpaid \$737 million and San Diego has underpaid \$621 million relative to their respective water deliveries. While a portion of San Diego's lower water costs are due to agricultural discounts (which come with lessened water reliability), MWD's continued reliance upon property taxes for up to one-third of its capital financing (designed to generate a stable dedicated revenue stream and thus lower borrowing costs) saddles Los Angeles, with its large tax base, with a disproportionate share of MWD costs.

Overall, between 1929 and 1996 the taxpayers and ratepayers of the City of Los Angeles have overpaid \$1.9 billion and L.A. County residents \$309 million relative to their MWD water usage. In contrast, San Diego County residents have underpaid \$1.3 billion, Orange County residents nearly \$700 million, and those living in Riverside County \$225 million relative to their MWD water usage. As a result, the metropolitan core has subsidized water provision to the suburbanizing periphery by over \$2.2 billion.

But MWD's strategy of piggybacking much of its costs onto water charges has not been without risks. It has made the majority of capital financing dependent upon water sales and revenues. In the early 1990s, as MWD embarked upon an ambitious capital program while suffering drought-induced declines in water sales and revenues, the limitations of this rate structure became evident. Hence, MWD adopted new charges—readiness-to-serve, standby, and new demand rates—to firm up capital financing and create greater equity between established and rapidly growing areas for financing the capital projects needed to accommodate new growth. Yet, the postage-stamp rate and new growth charges created incentives for major customers such as the San Diego County Water Authority to reduce their large and growing MWD capital financing burdens by purchasing non-MWD water through transfers.

With the advent of water transfers, the postage-stamp rate has been under sharp attack. To date, the California courts have rejected Metropolitan's validation lawsuit seeking a postage-stamp rate (including system-wide costs) for short-term conveyance—or wheeling—of transferred water through the Colorado River Aqueduct.³⁵ Instead, the courts have embraced the concept of incremental or point-to-point wheeling costs. Given MWD's current financing system—roughly 80% of its costs are fixed; 75% of its revenue comes from water sales—any reduction in water revenues, such as when member agencies substitute transfers for MWD purchases, could portend significant cost shifting to other member agencies.

The question needs to be raised whether transfers such as the IID/SDCWA agreement are more about guaranteeing water reliability or re-

35. *See* Metropolitan Water Dist. of S. Cal. v. All Persons Interested in the Matter of the Validity of the Fourth Supplemental Resolution for Commercial Paper and Revolving Notes, Los Angeles Superior Court, Case No. 164076, January 30, 1998.

ducing capital financing burdens. While SDCWA claims it is buying reliability given its limited preferential rights to MWD water, the state Water Code governing water shortage emergencies appears to make preferential rights unenforceable.³⁶ Instead, critics have argued that San Diego is seeking to insulate itself from a fair share of MWD capital project financing, such as for the \$2.2 billion Eastside Reservoir, by positioning itself to purchase less water from (and furnish less revenue to) Metropolitan in the future.

The IID transfer also could help insulate San Diego from proposed growth-based fees, such as Metropolitan's now-suspended new demand charge, designed to recover system development costs to meet the needs of fast-growing areas. Also of concern is whether transfers, by reducing supply pressures, might lessen the incentive for sustainable-development policies such as conservation and reclamation.³⁷ In back-to-the-future fashion, transfers may herald a return to regional water policies that are growth inducing and result in significant cost-of-service inequities.

This study suggests a complex relationship between water policy and suburban development, and between the City of Los Angeles, its older suburbs and the rest of suburban Southern California. The Metropolitan Water District, ostensibly the creature of "imperial Los Angeles," for forty years subsidized suburban sprawl and the regional periphery, particularly San Diego and Orange Counties, at the expense of the taxpayers and ratepayers of the metropolitan center. A post-1970 policy shift reduced L.A.'s suburban subsidization to one-half of its previous level, but did not end the intra-regional conflicts over who benefits and pays for water policy.

San Diego, Metropolitan's most heavily subsidized customer, likes to portray itself as a David fighting for water independence against the so-called dictatorial MWD Goliath headquartered in Los Angeles. However, the SDCWA's demand that MWD charge only nominal wheeling rates for water purchased from the Imperial Valley could further institutionalize this long-term pattern of subsidization by other MWD member agencies.³⁸ San Diego's preferential status, which in the past was paid for by Los Angeles city and county residents, now could come disproportionately at the expense of the region's fastest growing areas—Riverside and San Bernardino Counties. Thus, the future friction point in regional water policy may not be between Los Angeles and San Diego but between the "old" (San Diego and Orange) and "new" (Riverside and San Bernardino) growth peripheries.

Ultimately, the question of the region's water policies and its subsidized beneficiaries recalls a Thomas Nast cartoon about the Tweed Ring, which ran New York City in the Civil War era. Nast portrays the most notorious grafters standing in a circle, each pointing his finger at the culprit next to him. So too, with the politics of water subsidies in Southern California. The region's "usual suspects" are eager to point the finger at each other rather than pay their fair share for water provision and sustainable development.

36. See CAL. WATER CODE § 350 (West 1953).

37. See sources cited *supra* note 10.

38. See *id.*