Reallocating Property Tax Revenue According to Needs and Preferences

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Chapter 1: Introduction

Over twenty years ago California voters approved Proposition 13, limiting the rate at which property is taxed to one percent, limiting increases in assessments, and giving state government the authority to allocate local property tax revenues. Prior to the passage of Proposition 13, local governments were able to adjust their property tax rate annually, to accommodate changes in needs and demands for services. Under Proposition 13, the state determines the allocation of the property tax collected in each county among the various local entities. Implementing legislation passed in 1979, known as Assembly Bill 8 (AB 8), set the share of the revenues allocated to each local jurisdiction based on the proportion of countywide property tax revenues they received before Proposition 13. Although this allocation scheme was designed to reflect local jurisdiction obligations and priorities at the time, much has changed since then and the constraints of local governments have led to many unintended consequences. Both local government officials and state legislators agree that the current system is unfair, outdated, inflexible, and has led to inefficient land use decisions.

California property owners pay about $20 billion in property taxes each year, which is roughly the same amount that is raised by the state's income tax or the state and local sales tax. Property tax revenues are allocated to local governments within the county in which the property is located. Specifically, K-12 schools and community colleges received, on average, 52 percent of all property taxes collected statewide in 1997-98. Counties received 19 percent, cities received 11 percent, and other districts received 18 percent. However, there is considerable variation among jurisdictions in the share of property taxes received, the amount of property taxes received per capita, and the amount of property taxes received per dollar of assessed valuation. For example, individual counties received between 64 percent (Alpine) and 6 percent (Orange) of property taxes collected within their borders in 1997-98. On a per capita basis, Stanislaus County received $65 per resident while Mono County received $749 per resident, and on a per-thousand-dollars-of-assessed-value basis, Orange County received $1.57 while Sierra County received $6.75. There is just as much variation in the amount of property taxes received by cities. For example, within Los Angeles County alone, Baldwin Park received $2.89 per resident while Beverly Hills received $397.

Much of the variation in local government property tax receipts can be explained by AB 8, the state's property tax allocation law. While other factors contribute to these variations including differences in the assessed value of property, differences in service responsibilities, and differences in the extent of redevelopment areas, two local governments that are identical today with respect to these other factors could still receive very different amounts of property taxes because of the static AB 8 formulas established in the 1970s. Thus AB 8 has led to inequities in property tax allocations.

Local governments' loss of property tax revenues and control over their primary revenue source are said to have led to inefficient resource allocation decisions resulting in the depletion of open space, growth in low paying retail jobs at the expense of other industry, and a shortage of housing due to increased local reliance on the sales tax which has encouraged retail growth and development as opposed to other land uses such as residential or manufacturing. If changes in the needs or preferences of a local community increase the demand for locally provided services, local governments have few financing options available. Since 1978, they have been unable to increase the property tax rate; and since passage of Proposition 218 in 1996, they cannot increase property related fees and exactions without the approval of property owners. This has led to increased competition for sales tax revenues and the consequent expansion of retail development.

The Legislature responded to growing criticism of the property tax allocation system in 1999 by passing AB 676 (Brewer), which declared that California's system for allocating property taxes is "seriously flawed." The legislative intent of AB 676 was to facilitate revision of the property tax system that would increase taxpayer knowledge of the allocation of property taxes, provide greater local control over property tax allocation, and give local governments greater fiscal incentives to approve other than retail developments. The statute directed the Legislative Analyst's Office (LAO) to develop alternatives for restructuring the property tax allocation system. Their February 2000 report[1] highlights five alternative reforms ranging from property tax allocations based on set but uniform property tax shares for all jurisdictions statewide to a shift in authority to allocate property taxes from the state to counties. The LAO had earlier supported a decentralized approach due to the difficulties in ascertaining the needs and priorities of each California community: "Decentralization would allow the debate regarding the appropriate distribution of local revenues to be carried out locally, rather than in Sacramento, and offers Californians the best chance of aligning tax revenues with local needs and preferences."[2]

The current study explores alternative strategies for allocating property tax revenues among the local governments in a county. Our objective is to identify allocation rules that are sensitive to and flexible with respect to local responsibilities, needs, and preferences and yet are not overly complex.

This study, accepts Proposition 13 as a given feature of California's fiscal landscape; it assumes that Proposition 13 will remain in place. Proposition 13 is controversial, to say the least, with many strong supporters and strong opponents. We do not enter this debate. Our assumption that Proposition 13 will remain in place should not be taken as advocacy of it. Rather, we focus on

[1] California Legislative Analyst's Office (2000).
[2] California Legislative Analyst's Office (1996), p. 9.

reform that could be undertaken by the legislature. The legislature does not have the power to revoke Proposition 13, but it does have the power to alter the manner in which it is implemented. The legislature could change the way in which tax revenues are allocated among jurisdictions.

In Chapter 2, we examine closely the current system for allocating property tax revenues among local governments. Pre- and post-Proposition 13 situations are compared using simple examples that illustrate the redistributive nature and complexity of existing rules. The resulting variations in property tax shares are presented and the need for reform is discussed.

We begin to develop our revenue allocation proposals by deriving measures of community needs and preferences in Chapter 3. Our approach assumes that the needs and preferences of a community are reflected in actual spending patterns of the jurisdictions that serve them. Reduced form per capita spending models are estimated for both cities and counties using annual data covering the period 1992-98. Factors found to be significant determinants of local government spending include population size and composition, extent of urbanization, growth, income, wealth, crime rate, and unemployment rate. These estimated relationships are then used to predict spending levels for each city and county in California based on its individual characteristics.

Two different approaches to allocating property tax revenues are developed and compared in Chapter 4. Both approaches use the predicted expenditures from our econometric model. Our first approach, the "countywide approach," assigns revenue to each jurisdiction in proportion to its predicted expenditure. This approach pools all non-school property tax revenues countywide and divides it among the cities and the county. The second, or "situs approach," allocates all revenue paid by a particular property owner among the city and county governments that have jurisdiction over that property.

The property tax shares we derive in Chapter 4 are used as a benchmark because they are based on estimates of local government needs and preferences. In Chapter 5 we show that much simpler formulas can generate shares that are very similar to our benchmark. According to these simple rules a city's or county's share of property tax revenues is determined by its share of assessed value, population, or both. These rules, while simple to understand and implement, still allow for responsiveness to changes in needs and preferences. We conclude, in Chapter 6, that a simple rule that determines a local government's share of property tax revenues based on both its share of assessed value and population, as opposed to one or the other, is preferred.

Chapter 2: Background

In order to formulate and evaluate proposals for changing the allocation of property tax revenue among local jurisdictions, we must understand how the

property tax is administered in California. This chapter discusses aspects of the history of the property tax in California necessary for such an understanding. Additional background information concerning the role of the property tax, other reform proposals, and allocation methods in other states can be found in Appendix 1.

The current revenue allocation system was put into place following the passage in 1978 of Proposition 13, California's constitutional amendment to limit property taxes. Revenue allocation is governed by two pieces of legislation, Senate Bill 154 (SB 154) and AB 8, which were passed to implement Proposition 13.

A close examination of SB 154 and AB 8 shows that the current system redistributes revenue from jurisdictions that had relatively low tax revenue to ones that had relatively high tax revenue prior to Proposition 13. Our discussion will also explain how the revenue patterns of the late 1970s have been built inflexibly into current revenue allocations. There is no mechanism for changing the division of revenue among the different governments that serve a particular area.

Property Taxation in California Prior to Proposition 13

California began its long history of taxing property when the first state legislature passed the Property Tax Law of 1850. For the next 60 years, from 1850 to 1910, the property tax was the major source of revenue for both state and local governments. By 1900-1901, the property tax accounted for over 85 percent of state revenue and taxpayers began to complain about the unfair and excessive tax burden on property. The 1910 California State Legislature, under the guise of property tax relief, eliminated the statewide property tax. However, the expected relief never materialized for many taxpayers as local taxing jurisdictions increased local tax rates to capture the revenue that was previously collected by the state.

Between 1910 and 1960 property tax reform efforts focused on issues concerning non-uniform assessment practices and several attempts were made to equalize assessments across and within counties. The struggle for property tax relief began again in earnest in 1962. The inability of the state legislature to pass relief measures over the next 15 years led ultimately to California voters passing Proposition 13 in June 1978 by an overwhelming majority.

Proposition 13

Proposition 13 amended the state constitution, sharply limited property taxes and fundamentally altered the state and local government fiscal relationship. The key provisions of Proposition 13 included:

1. The maximum property tax rate was limited to one percent of assessed value except as necessary to cover preexisting voter-approved indebtedness.

2. The assessed value of all property was "rolled back" to its "full cash value" as of March 1, 1975, or as of the date the property changes ownership or is newly constructed after March 1, 1975.

3. Subsequent annual adjustments in assessed value were limited to the rate of inflation, not to exceed two percent per year.

4. State and local governments were prohibited from imposing any other property taxes, sales taxes, or transactions taxes on real property.

5. New or increased state taxes required a two-thirds approval vote in each house of the legislature and new or increased local "special" taxes required a two-thirds vote of the qualified electorate.

Between June 6 and July 1 of 1978, there was much work to be done by the legislature to implement Proposition 13. Among the key issues to be resolved was how to divide up the revenues from the one percent property tax rate among all local jurisdictions because Proposition 13 only required that those revenues be "apportioned according to law." The legislature had to develop a system to share or apportion total property tax revenues within each county to all of its cities, school districts, and special districts. Understandably, the legislature tried to minimize the reduction in revenue for all jurisdictions. However, in doing so, little, if any, provision was made to allow flexibility in revenue allocation following demographic change. Consequently, jurisdictions with high tax revenue in the late 1970s still receive relatively large allocations, at the expense of jurisdictions whose revenue was relatively low at that time.

Legislation implementing Proposition 13 came in two steps: SB 154, which was passed shortly after voters approved Proposition 13, followed by AB 8 a year later. In combination, they present us with a remarkably complex revenue allocation system.

SB 154

The emergency "bailout" legislation, SB 154 (Petris), provided a temporary solution. SB 154 specified the rules for allocating the one percent property tax for the fiscal year immediately following the passage of Proposition 13, fiscal 1978-79. In addition, it provided state assistance in the form of block grants to local governments to replace lost property tax revenues, and provided for state assumption of the costs of several state-mandated health and welfare programs.

County property tax revenues for 1978-79 were allocated to local agencies (cities, special districts, school districts, and the county) on the basis of their average share of countywide taxes (exclusive of taxes collected for debt retirement) over the previous three fiscal years. Specifically, 1978-79 property tax revenues were first apportioned into two categories: local agency (cities, special districts, county) revenues and school (school districts, county superintendent of schools, community college districts) revenues. The local agency share and school share were determined by their respective shares of total countywide property tax revenues collected in 1977-78. Then each local agency's share of the total property tax revenues allocated to all local agencies was the average amount of property tax revenue the local agency collected in the three previous fiscal years divided by the average amount of property tax revenues collected by all local agencies during those three years.

The State minimized the immediate impact on local governments by using an existing state surplus to replace lost property taxes. State assistance in the form of block grants was also tied to historical collections of property tax revenues. Counties were further assisted by state assumption of just over $1 billion of mandated health and welfare program costs. The state relieved the counties of their previous obligations to share in the costs of Medi-Cal, Supplemental Security Income/State Supplemental Program (SSI/SSP), AFDC, Boarding Homes and Institutions (BHI), food-stamp administration, mental-health programs, and alcohol and drug-abuse programs.

Ignoring the "bailout", the allocation formula of SB 154 resulted in a redistribution of property tax revenues among local governments, from what had previously been low-tax areas to high-tax areas. For example, consider two cities A and B located in the same county. Suppose both cities have the same market value of taxable property equal to $1 million. Before Proposition 13, all residents of the county paid property taxes of 1.5 percent of market value to the county. However, property taxes paid to cities differed, with residents of city A (the low-tax city) paying city taxes of 0.5 percent and residents of city B (the high-tax city) paying 1.5 percent. Table 2.1 shows that City A therefore collected $5,000 of revenue and City B collected $15,000 of revenue prior to Proposition 13. Total property tax collections in the county prior to Proposition 13 were $50,000: $30,000 collected by the county and $20,000 collected by the two cities in combination.

Table 2.1: Revenue Received by Cities Before and After Proposition 13

	City A			City B		
	Tax Rate	**Amount Paid**	**Revenue Received**	**Tax Rate**	**Amount Paid**	**Revenue Received**
Before Proposition 13:						
County	1.5%	$15,000	$15,000	1.5%	$15,000	$15,000
City	0.5%	5,000	5,000	1.5%	15,000	15,000
Total	2.0%	$20,000	$20,000	3.0%	$30,000	$30,000
Post-Proposition 13:						
County			$6,000			$6,000
City			2,000			6,000
Total	1.0%	$10,000	$8,000	1.0%	$10,000	$12,000

Following the implementation of Proposition 13, property taxes in the county were limited to 1 percent or $20,000.[3] In city A, tax collections fell from a total of $20,000 for the city and county to $10,000 (1% of the city's $1,000,000 of assessed value). In city B, tax collections fell from a total of $30,000 for the city and county to $10,000.

SB 154 would allocate the total $20,000 in taxes paid in the county among the county government and the two city governments on the basis of each local government's average share of total county revenues from the previous three years. To keep the example as simple as possible, assume that the pre-Proposition 13 taxes shown in Table 2.1 also represent the average of the previous three fiscal years. Recall that the county government had $30,000 of revenue, City A had $5000, and City B had $15,000. Total revenue for these three governments prior to Proposition 13 was $50,000. The county share of the post-Proposition 13 revenues was 60 percent ($30,000/$50,000), City A's share was 10 percent ($5000/$50,000), and City B's share was 30% ($15,000/$50,000). The revenue received by each jurisdiction under SB 154 is determined by these shares. Recall that the total county tax revenue under Proposition 13 is 1% of assessed value, or $20,000. The county will receive 60% of this, or 12,000. City A will receive $2000 (10% of $20,000) and City B will receive $6000 (30% of $20,000)

Now, consider the revenue benefiting residents of each city. The residents of both cities share equally in the benefits of county government revenue; in effect receiving $6000 of revenue benefits each from the $12,000 county revenue. Residents of City A, therefore, receive a total of $8000 of revenue benefits, $2000 through their city government and $6000 through the county government. Residents of City B, however, receive a total of $12,000 of revenue benefits. Tax revenues were redistributed from the previously lower-

[3] This ignores any rollback in assessed valuations after Proposition 13, and assumes that the county tax base consists only of the property in these two cities. Note that some examples in the literature on Proposition 13 use a tax rate of 4%, which was then applied to 25 percent of market value which is equivalent to levying a 1 percent tax on full market value.

tax city A to the higher-tax city B. Residents in city A pay a total of $10,000, yet the county and their city receive only $8,000; city B residents pay the same total, but the county and their city receive $12,000. An amount equal to $2,000 has been redistributed from city A to city B. In general, an effect of SB 154 was that residents of low-tax areas subsidized residents of high-tax areas. This is a consequence of the legislature's objective of minimizing the percentage by which revenue was reduced in any jurisdiction. To prevent high-tax jurisdictions from losing high percentages of revenue, they were given relatively large fractions of the revenue available under Proposition 13.

AB 8

Redistribution was not the only unpopular feature of the property tax apportionment formula. Because SB 154 pooled all property tax revenue at the county level, revenues from new construction were distributed countywide. As a result, fast growing jurisdictions were short changed and it was feared that local governments would be reluctant to approve new development, thus creating a "no-growth" atmosphere. It was also obvious by early 1979 that the "bailout" was not a viable permanent solution. There was no guarantee that state budget surpluses would be available indefinitely for purposes of relieving local governments and such reliance involved too much uncertainty in the local government budgetary process.

In 1979 the legislature passed AB 8 (Greene), which revised the allocation of property taxes and made permanent the "bailout," or the vast majority of it, by shifting property tax revenues from school districts to cities, counties, and special districts. The state, in turn increased assistance to school districts to make up the loss in property tax revenues. In addition, the growth in property tax revenues due to growth in assessed valuations was allocated to local governments on a situs basis; that is, it was given to the jurisdiction(s) in which the property was located. Under AB 8 each local jurisdiction receives a "base" allocation equal to the property tax revenues it received in the prior year plus an "increment" equal to its share of any growth in property tax within its boundaries.

The 1979-80 base allocation for each local agency was equal to its 1978-79 share of property taxes plus an amount determined by its 1978-79 SB 154 block grant (bailout).[4] The base revenue figures for each jurisdiction made

[4] Each school district's property tax share was reduced to fund the permanent bailout, with state funds replacing lost property tax revenue. Specifically, school districts received their 1978-79 property taxes minus a prorated share of the total amount of state assistance received by local jurisdictions in the county in which they were situated. Cities received 82.9 percent of their 1978-79 block grant plus one-half of any outstanding debt as of June 30, 1978 for museums, whereas special districts received 95.2 percent of their 1978-79 grant. The base for counties was somewhat more complicated. They received

permanent the redistribution of revenue created by SB 154. This redistribution is not apparent to many government officials or taxpayers today, however, because the base was computed back in 1978, and because the mechanism by which the base was computed at that time is not widely remembered today.

Incremental allocations (allocation of revenue generated by incremental or additional assessed value above the base level) were determined by the growth in assessed valuations within each jurisdiction's boundaries, regardless of whether the growth was due to the annual 2 percent increase in assessment, new construction, or reassessment triggered by changes in ownership. These incremental revenues were allocated first to tax rate areas[5] based on the location of the growth, and then among the local jurisdictions that serve the area. These funds were distributed among the tax rate area's jurisdictions in proportion to the amount of revenue each jurisdiction raised from that tax rate area in the prior fiscal year. These proportions are known as AB 8 factors and are constant over time. Since AB 8 factors are based on 1970s revenue patterns, they perpetuate the 1970's status quo. The lack of flexibility in these factors has led to calls for revenue allocation reform.

Because SB 154 had allocated property tax revenues and block grants in 1978-79 without any reference to tax rate areas, the legislature had to define the amounts of revenue each jurisdiction raised from different tax rate areas in 1978-79. The solution was to attribute each jurisdiction's 1978-79 revenues among tax rate areas in which it was situated in proportion to the taxable assessed valuation located in those tax rate areas. For example, if a tax rate area contained 10 percent of a city's taxable assessed valuation, then 10 percent of the city's 1978-79 property tax revenues were attributed to that tax rate area.

In subsequent years, 1980-81 and thereafter, each city, county, special district, and school district received a base allocation equal to the amount it received in the prior year plus its AB 8 share of additional revenues generated by assessed-value growth within its boundaries.

An example that illustrates the implementation of the AB 8 apportionment rule and compares the allocation of revenue before Proposition 13 to those under SB 154 and AB 8, is presented in Appendix 2. Aside from providing greater detail for the interested reader, the example illustrates the complexity of the current allocation formula. This complexity was

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their 1978-79 share of property taxes plus 100 percent of their 1978-79 block grant, less the state grant for county health services. An addition was made in the amount of reduced state funding of AFDC.

[5] A tax rate area is a specific geographic area all of which is within the jurisdiction of the same combination of local agencies (city, county, special district) and school entities (school district, county superintendent of schools, community college district).

compounded by AB 8's use of SB 154 base revenue. An understanding of the current formula therefore requires an understanding of SB 154 as well as of AB 8.

To recap, the revenue redistribution among local governments created by SB 154 persists under AB 8 because SB 154 generated the 1978-79 base revenue that has been carried forward in each subsequent year as part of base revenue. In addition, the incremental allocations were determined, as in SB 154, on the basis of historical shares of property tax revenues. Thus, as was true under SB 154, residents in jurisdictions that had low tax rates prior to Proposition 13 have subsidized residents in jurisdictions that had high tax rates. The extent of redistribution decreases over time as growth in assessed valuations increases the importance of the incremental share of revenues relative to 1978-79 base revenues. However, the division of revenue among jurisdictions governing a particular property or tax rate area will still be in proportion to those jurisdictions' spending patterns in the 1970s unless reform is undertaken. These fixed shares are what makes the current system inflexible and unable to respond to changes in demographic conditions and to changes in demand for and cost of government services.

SB 154 and AB 8 still form the foundation for the allocation of property tax revenues today; however, subsequent decisions by the legislature and voters have altered the rules somewhat. In particular, since 1979 there have been two changes to the original property tax allocation system. First, the legislature has gradually increased the share of property taxes going to certain cities that levied a low, or no property tax, or were not incorporated as cities, prior to Proposition 13. Secondly, in response to budget deficits in the midst of the 1992-94 recession, the state shifted property tax revenues from counties, cities, and special districts to schools.

No/Low Tax Cities

Since property tax allocations under AB 8 depend upon historical shares, cities which didn't exist in 1979, had never levied a property tax, or levied a low rate property tax received no share or a very small share of the property taxes generated within their boundaries. There were 31 no-tax cities and roughly 60 low-tax cities that received less than 10 percent of the property tax paid by their residents. Some of these cities had no or low taxes because they provided few municipal services and thus their costs were low at the time. However, it soon became obvious that some flexibility (in the form of deviations from historical shares) was needed to accommodate boundary changes, new incorporations, and shifts in service responsibilities.

The first adjustment in AB 8 allocations was made by the legislature in 1984 (SB 794, Marks) when the city of Yorba Linda was statutorily granted a special share of the property taxes generated within its limits. Property tax allocation is a zero-sum game; that is, the revenues allocated to Yorba Linda

had to come from some other local government's share, and so funds were shifted from Orange County to Yorba Linda.

This precedent-setting shift was followed by more general legislation in 1987 (SB 709, Lockyer) that directed counties to transfer some of their property tax revenues to the no/low share cities. No/low tax cities were guaranteed a minimum 10 percent of the property tax revenue generated within their boundaries. This shift from counties to the no/low tax cities was modified in 1988 (AB 1197, W. Brown) by phasing-in a 7 percent shift over seven years and by allowing the no/low tax cities to benefit from the growth in their property tax base. Special provisions still exist for the no/low tax cities in Los Angeles, Orange, San Mateo, Santa Clara, and Ventura counties.[6]

Education Revenue Augmentation Fund (ERAF)

The state faced a serious budget crisis in 1992-93 as the recession continued to depress state revenues. Tax increases were politically infeasible since taxes had been increased $7.3 billion the previous year and legislators were unable or unwilling to agree on sufficient spending cuts. On September 2, 1992, the legislature finally passed a "compromise" budget, a record 64 days after the beginning of the fiscal year. The compromise solution shifted $1.4 billion of property tax revenues from counties, cities, special districts and redevelopment agencies to schools via the Education Revenue Augmentation Fund (SB 617, SB 844). Lawmakers viewed this move as a reversal of the property tax shift of 1979 (AB 8) that had allocated part of the school's share of the property tax to other local governments and used state funds to backfill the loss of property tax to schools. Increasing local revenues to schools eased the pressure on the State General Fund since every new dollar of property tax revenue for schools freed up a dollar for other state spending priorities.

The shift continued the next year as state tax revenues again were insufficient to cover budgetary needs. In 1993-94 counties, cities, and special districts lost an additional $2.6 billion to schools (SB 1135, Senate Budget & Fiscal Revenue committee). Despite local governments' ongoing efforts to overturn these property tax shifts, they remain in force today. Table 2.2 indicates the actual shifts that took place in 1992-93, 1993-94, and 1998-99 by level of local government.

[6] See California Revenue and Taxation Code §98-§98.4.

Table 2.2: Property Tax Shifts

	1992-93 Shift (Millions)	1993-94 Shift (Millions)	1998-99 Value of Ongoing Shifts
Counties	$585	$2,023	$2,798
Cities	240	313	537
Special Districts	375	244	285
Redevelopment Districts	200	65	
Total	$1,400	$2,645	$3,620

Source: California Legislative Analyst's Office, *Shifting Gears: Rethinking Property Tax Shift Relief*, Sacramento, California, 1999.

A wide variety of methodologies were used to allocate the property tax shifts among the various levels of local government but most of the formulas reflect an attempt to reverse the SB 154 "bailout" (which was perpetuated by AB 8), and thus the amount of property tax shifted from a particular entity is largely proportionate to its share of the permanent bailout under AB 8.[7] However, some local governments have persuaded legislators to grant exceptions and exemptions to the formula determined shift amounts for such things as relief for revenues lost because of natural disasters, Oakland's museum, newly-incorporated cities, special districts' debt service, countywide water agencies, small rural fire districts, multi-county special districts, hospital districts, resource conservation district donations, police protection districts, transit districts, veterans' memorial districts, and others.

Special Districts and Redevelopment Districts

A significant portion of property tax revenue goes to local agencies other than county and city governments. Special districts received 16% and redevelopment districts received 17% of non-school property tax allocations respectively in 1998. Any property tax allocation plan must include these districts. This section gives background on the nature of these districts to facilitate informed decisions about how to incorporate them into revenue allocation proposals.

Special Districts

Special districts are legally constituted governmental entities that are granted substantially the same powers as other local governments under the State Constitution and state statutes to provide specified services and facilities to a community. A special district may be limited to a single function or may perform multiple functions. It may be geographically small, covering a portion of a city or county, or be multi-city or multi-county in scope. Its territory may be contiguous or non-contiguous. There are nearly 4,800 special districts in California whose overall expenditures totaled $16.5 billion in 1996-97.

[7] Legislative Analyst's Office (1999).

After passage of Proposition 13, special district property tax revenues fell from $954 million in 1977-78 to $532 million in 1978-79. Special districts, like other local government entities also lost the flexibility to raise the property tax rate in response to changes in priorities or needs. In 1978-79, special districts received $162 million of "bailout" funds under SB 154 and SB 2212, which were given to counties to distribute, based on a criteria of maintaining 1977-78 levels of police and fire protection. Each county board of supervisors received a share of these funds based on its county's special districts' property tax losses in relation to statewide special district property tax losses. For 1979-80 and after, AB 8 shifted property taxes from schools to cover 95.24 percent of the special district bailout. These funds were placed in a Special District Augmentation Fund (SDAF) controlled by counties for distribution to special districts.

In subsequent years, each special district made an annual contribution of property tax revenues to the SDAF based on its 1978 bailout in relation to the growth in its assessed valuation since then.[8] The county board of supervisors then allocated the SDAF to districts usually based on priorities, needs, or the district's contribution. While some county supervisors returned each district's contribution, it was not uncommon for contributions to be redistributed between districts. Consequently, controversies were common and continued up until 1992-93 when the property tax shift (ERAF) eliminated the SDAF.

Redevelopment Districts

Local officials have constitutional and statutory authority to establish redevelopment agencies that are allowed to issue bonds to finance redevelopment in "blighted" areas, or redevelopment districts, under the premise that the redevelopment will generate enough additional property tax revenue to service the bonds. A redevelopment agency receives the property tax revenues generated by incremental increases in property values within the redevelopment district. While AB 8 requires property tax revenues to be allocated among local agencies in proportion to their historical shares, the creation of a redevelopment agency allows a city to keep all or most of the incremental revenue in the community.[9]

Redevelopment tax-increment financing has grown considerably since the passage of Proposition 13 as has redevelopment agencies' shares of property tax revenues. Table 2.3 shows the statewide average shares of property tax revenues for local governments in 1982-83 and 1997-98. In 1982-83, redevelopment agencies received 3.6 percent of total property tax revenues but by 1997-98, their share had grown to 7.9 percent. Because of the

[8] O'Brien (1985).

[9] For a close look at the purposes of redevelopment agencies, their incentives, and how they operate see Dardia (1998).

zero-sum nature of property tax allocation, this growth in redevelopment's share necessitated a decrease in the shares of other local governments.

Table 2.3: Allocation of Property Tax Revenues[10]

	1982-83	1997-98[11]
Cities	13.6%	10.7%
Counties	35.2%	18.3%
Schools	36.1%	53.1%
Less than countywide[12]	1.9%	1.2%
Special districts	9.6%	8.8%
Redevelopment districts	3.6%	7.9%

Source: California Legislature, *Property Tax Allocation: The Summary Report from the Interim Hearing of the Senate Local Government Committee*, September, 1999.

There is considerable variation across counties in the extent to which local officials have implemented tax-increment financing. Table 2.4 indicates the share of property tax revenue siphoned off by redevelopment agencies in the top 12 counties. Nearly a fifth of all property tax revenue goes to redevelopment agencies in Riverside, San Bernardino, and Solano counties. Redevelopment districts had been established in 30 counties by 1982-83 and in 43 counties by 1997-98.

Table 2.4: Redevelopment's Share of Property Tax Revenue: Top 12 Counties

County	1982-83	1997-98
Riverside	4.0%	19.9%
San Bernardino	4.6%	17.8%
Solano	3.0%	17.4%
San Benito	0.0%	14.4%
Yolo	0.0%	11.1%
Santa Clara	5.1%	11.1%
Butte	1.9%	10.0%
Los Angeles	6.7%	9.2%
Imperial	1.7%	9.1%
Santa Cruz	0.5%	8.7%
Contra Costa	5.9%	8.4%
Orange	3.7%	7.8%
Statewide	3.6%	7.9%

Source: California Legislature, *Property Tax Allocation: The Summary Report from the Interim Hearing of the Senate Local Government Committee*, September, 1999.

[10] Data were supplied by the California State Board of Equalization and assembled by the California Research Bureau.
[11] The 1997-98 shares include the shifts to ERAF.
[12] "Less than countywide" includes county fire departments and county free libraries that received property taxes as if they were special districts.

Property Tax Shares

According to data from the California State Board of Equalization, schools and cities currently receive about the same share of property taxes, on average, as they received prior to Proposition 13 (see Table 2.5). In 1977-78 cities received an average 10 percent and schools 53 percent of total property tax revenues. The county share of property tax revenues has declined from an average of 30 percent in 1977-78 to 19 percent in 1998-99 while other districts' share has risen from 7 percent to 18 percent. However, as Table 2.6 illustrates there is wide variation across counties in the shares received by different levels of government. For example, Sierra County received 52 percent of property taxes collected in the county in 1998-99, while its one city received 1 percent. In contrast, Orange County received only 7 percent of countywide property taxes and its cities received 11 percent. There is also variation within each county in the share of property taxes allocated to each city. These shares reflect the revenue patterns that existed prior to 1978.

Table 2.5: Local Government Shares of Property Tax

Fiscal Year	Cities	Counties	Schools	Other
1970-71	.10	.32	.52	.06
1971-72	.10	.32	.52	.06
1972-73	.10	.31	.52	.06
1973-74	.11	.30	.53	.06
1974-75	.10	.31	.53	.06
1975-76	.10	.31	.53	.06
1976-77	.10	.31	.53	.06
1977-78	.10	.30	.53	.07
1978-79	.09	.26	.54	.11
1979-80	.13	.31	.39	.16
1980-81	.13	.33	.39	.15
1981-82	.13	.33	.38	.16
1982-83	.13	.33	.38	.16
1983-84	.13	.33	.38	.17
1984-85	.13	.33	.37	.17
1985-86	.13	.33	.37	.17
1986-87	.13	.33	.37	.18
1987-88	.13	.33	.36	.18
1988-89	.13	.33	.36	.18
1989-90	.13	.33	.36	.18
1990-91	.13	.33	.36	.19
1991-92	.13	.33	.35	.19
1992-93	.12	.30	.41	.17
1993-94	.11	.21	.51	.17
1994-95	.11	.19	.52	.18
1995-96	.11	.19	.52	.18
1996-97	.11	.19	.52	.18
1997-98	.11	.19	.52	.18
1998-99	.11	.19	.52	.18

Source: California State Board of Equalization, *Annual Report*, various years.

Table 2.6: 1998-99 General Property Tax Dollars

County	Cities' Share	County Share	Schools Share	Other Districts Share
Alameda	$0.20	$0.15	$0.45	$0.20
Alpine		0.64	0.26	0.1
Amador	0.04	0.32	0.62	0.02
Butte	0.05	0.13	0.65	0.17
Calaveras	0.01	0.19	0.67	0.13
Colusa	0.05	0.28	0.59	0.08
Contra Costa	0.09	0.13	0.48	0.3
Del Norte	0.01	0.19	0.64	0.16
El Dorado	0.03	0.23	0.49	0.25
Fresno	0.12	0.12	0.64	0.12
Glenn	0.06	0.21	0.68	0.05
Humboldt	0.03	0.2	0.62	0.15
Imperial	0.08	0.17	0.63	0.12
Inyo	0.01	0.3	0.62	0.07
Kern	0.05	0.26	0.57	0.12
Kings	0.06	0.24	0.57	0.13
Lake	0.03	0.24	0.57	0.16
Lassen	0.04	0.2	0.71	0.05
Los Angeles	0.16	0.24	0.42	0.18
Madera	0.03	0.15	0.73	0.09
Marin	0.12	0.18	0.56	0.14
Mariposa		0.25	0.7	0.05
Mendocino	0.02	0.26	0.6	0.12
Merced	0.06	0.23	0.62	0.09
Modoc	0.03	0.27	0.64	0.06
Mono	0.03	0.31	0.42	0.24
Monterey	0.07	0.16	0.62	0.15
Napa	0.1	0.22	0.65	0.03
Nevada.	0.06	0.15	0.6	0.19
Orange	0.11	0.07	0.61	0.21
Placer	0.06	0.19	0.63	0.12
Plumas	0.01	0.22	0.66	0.11
Riverside	0.06	0.13	0.49	0.32
Sacramento	0.1	0.19	0.5	0.21
San Benito	0.02	0.12	0.59	0.27
San Bernardino	0.07	0.12	0.46	0.35
San Diego	0.13	0.14	0.63	0.1
San Francisco		0.65	0.28	0.07
San Joaquin	0.11	0.22	0.57	0.1
San Luis Obispo	0.06	0.23	0.66	0.05
San Mateo	0.11	0.15	0.62	0.12
Santa Barbara	0.05	0.19	0.61	0.15
Santa Clara	0.08	0.15	0.6	0.17
Santa Cruz	0.06	0.15	0.6	0.19
Shasta	0.06	0.14	0.68	0.12
Sierra	0.01	0.52	0.34	0.13
Siskiyou	0.06	0.23	0.67	0.04
Solano	0.14	0.16	0.45	0.25
Sonoma	0.07	0.21	0.61	0.11
Stanislaus	0.06	0.12	0.76	0.06
Sutter	0.07	0.19	0.63	0.11

County	Cities' Share	County Share	Schools Share	Other Districts Share
Tehama	0.04	0.26	0.67	0.03
Trinity		0.31	0.64	0.05
Tulare	0.06	0.21	0.61	0.12
Tuolumne	0.01	0.29	0.63	0.07
Ventura	0.08	0.16	0.53	0.23
Yolo	0.18	0.1	0.57	0.15
Yuba	0.03	0.21	0.65	0.11
Total	$0.11	$0.19	$0.52	$0.18

Source: California State Board of Equalization, 1997-98 Annual Report.

The Need for Reform

Variations across local governments in the amount and share of property tax revenues existed before Proposition 13 and are not necessarily bad. In fact they are desirable to the extent that they reflect differences in responsibilities, needs, or preferences. Some California cities and counties provide a full array of government services, including fire protection, water service, parks and recreation programs, and libraries, while others rely upon special districts to provide some or all of these services. Counties must provide municipal services to residents of unincorporated areas, and there is a wide variation across counties in the proportion of residents living in such areas. Local governments that provide more services require more tax revenues, and the pre-Proposition 13 property tax system reflected these differences. Problems have arisen however, because AB 8 perpetuates tax revenue patterns in effect in the 1970's while local government needs and responsibilities have changed. According to Marianne O'Malley of the Legislative Analyst's Office, "We've flash-frozen the property tax preferences of the 1970s, and like anything that's been left in the freezer too long, it's not particularly palatable."[13]

Proposition 13 and subsequent legislation have resulted in many unintended consequences as local governments have reacted to the loss in property tax revenues and the loss of control over this important revenue source. In the wake of Proposition 13, local governments turned to creative financing mechanisms, such as fees and exactions, to pay for local services but these too are now subject to restrictions since passage of Proposition 218 in 1996.[14] Local governments have turned to competing with one another over the only revenue source that is left: sales taxes. Increased local reliance on sales taxes has influenced land-use decisions by encouraging retail growth and development as opposed to other land uses such as residential or

[13] California Legislature, Senate committee on Local Government (1999).
[14] Proposition 218 limits the authority of local governments to impose taxes and property-related assessments, fees, and charges; requires that a majority of voters approve increases in general taxes; and requires that a two-thirds majority of voters approve special taxes.

manufacturing. This phenomenon is commonly referred to in California as the "fiscalization of land use." Among the alleged results of fiscalization is the depletion of open space, growth in low paying retail jobs at the expense of other industry, and a shortage of housing.

After twenty years of voter initiatives, legislative reactions, and local adjustments, government leaders, community advocates, and academics have come to realize that the state's system of local government finance is in need of reform. During the past few years several political and civic groups have gathered to formulate proposals for improving California's state/local fiscal system. Although no consensus has been reached regarding solutions, there is general agreement and recognition of the problems that need to be addressed. These include the following:

1. Local governments lack a stable and predictable revenue source over which they can exercise control. They relinquished control over the property tax with the passage of Proposition 13 and the State has since further reduced the local government share of property tax revenues.

2. Increased local reliance on the sales tax has created undesirable land-use incentives that have led to increased retail and reduced housing and manufacturing development.

3. Taxpayers find the state/local fiscal relationship incomprehensible. The current property tax allocation system is far too complex. Citizens are unable to see the connection between the taxes they pay and the services they receive and hence are unable to hold government officials accountable.

4. The state/local fiscal system, as it has evolved, is inequitable. Local jurisdictions with similar populations and service needs receive vastly different revenues because of different property tax shares and differing amounts of retail development.

In the following chapters, we propose a mechanism for allocating revenue among governments within counties that takes into account the needs and preferences of those governments relative to each other. Our proposal is based on an econometric model, but ultimately is presented in the form of a simple allocation rule based on assessed value and population. This simple approach accommodates jurisdictional needs and preferences much better than current revenue allocation does.

Chapter 3: Measuring "Needs and Preferences"

A system of state and local governments should allow for flexibility and variation with respect to the type and amount of government services provided

to residents. Variations in service priorities across local jurisdictions can improve the efficiency of resource allocation by offering residents a choice and allowing them to "vote with their feet."[15] Similarly, flexibility allows local governments to respond to changes in preferences of residents and costs of providing services. The current property tax allocation system is not responsive to such changes and has forced local governments to increase reliance on sources of revenue over which they do have some control, such as the sales tax.

One of the objectives of this study is to design new property tax allocation rules is to restore flexibility so that property tax revenues will respond to changes in needs and preferences of local communities. In this chapter we develop an econometric model that identifies the characteristics of a community that reflect or measure its preferences for and costs of providing services. Separate results are obtained for city and county governments since they provide different types of services and since the characteristics of the population served by each of the cities and unincorporated area of the county may be quite different, giving rise to differences in the demand for and costs of providing the same service.

Variations across local jurisdictions in preferences for and costs of providing services are reflected in local government spending decisions. Our approach assumes that actual spending patterns reflect such differences even in the presence of Proposition 13. It is well established in the literature that demand and cost factors influence government spending strongly.[16] With a property tax limitation, it is possible that spending is limited in such a way that the usual effect of demand and cost factors on spending is altered. Some studies have shown that property tax limitations do in fact reduce spending.[17] However, it is worth pointing out that property tax revenue has fallen to 6.5% of total revenue for cities and 12.4% of total revenue for counties, as of 1998. Local governments have increasingly turned to other sources of revenue, including sales tax and charges, to finance their services.

We estimate standard reduced-form models of per capita operating expenditure that incorporate both cost and demand variables,[18] taking into consideration a standard array of factors that have been found to influence spending, as well as some that reflect particular features of California's

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[15] See Tiebout (1956).
[16] See, for example, Ladd and Yinger (1989), Chapter 10.
[17] See McGuire (1999), p.137.
[18] Pack (1998) defends the use of reduced form spending equations, "The mixed findings of the economics literature that has tried to estimate structural relationships and the complexity and ambiguity of the sociological literature on this subject suggests that for now this is the most productive approach." (p. 2006).

governmental structure. Cutler et al. (1993) summarize approximately fifteen studies of determinants of public spending (many of these studies focus on education spending, but some study municipal spending). They find that the effect of demographic variables varies widely across studies. One pattern that they discern is that the magnitude and direction of demographic effects often depend on the level of government observed in a study. This further supports the estimation of separate city and county relationships.

Our dependent variable is real per capita operating expenditure.[19] We use annual data for 1992-1998. Descriptive statistics are provided in Table 3.1 (for counties) and Table 3.2 (for cities). The independent variables or factors related to spending levels can be grouped into the following categories:

- Population size and composition (population size, percent of the population that is minority, percent of the population over age 65)
- Urbanization (population density, percentage of a county's population in unincorporated areas, percent of jobs that are agricultural)
- Growth (population growth, value of new housing permits per capita)
- Resources (personal income, assessed value, and intergovernmental aid)
- Costs (crime rate, unemployment rate, percent of assessed value in redevelopment districts)
- City characteristics (central city, charter city)

Table 3.1: County Summary Statistics

Variable	Mean	Std Dev	Min	Max
Per capita operating expenditure	1,036	323	582	2,700
By county government	907	314	508	2615
By special district governments	129	85	11	470
Population	557,505	1,324,452	3,300	9,587,300
Population density	329	627	2	3,463
Population growth rate	1.36	1.30	-2.44	10.63
Per capita personal income	20,437	5,422	13,666	47,036
Per capita assessed valuation	57,481	22,337	27,211	168,840
Per capita new housing	932	461	326	4,092
Per capita redevelopment value	264	965	0	6,997
Pct population unincorporated area	46.3	2.6	5.3	100
Pct of employees in agriculture	5.6	5.7	0.1	34.2
Pct population minority	30.8	16.6	6.6	78.0

[19] Special district operating expenditure is included with county expenditure, as discussed in Chapter 4.

Variable	Mean	Std Dev	Min	Max
Pct population seniors	12.8	3.3	6.6	21.5
California crime index	2.22	0.86	0.86	5.41
Unemployment rate	10.4	4.6	2.5	29.5
Per capita federal aid	196	90	68	810
To county government	192	91	68	810
To special district governments	4	15	0	184
Per capita state aid	403	142	213	1177
To county government	397	141	212	1172
To special district governments	5	8	0	54

Sources: See Appendix 3

Notes:

- Operating expenditure does not include capital outlays and debt service.
- Redevelopment values are only for county redevelopment agencies, not all redevelopment agencies in the county.
- For years 1992 – 1998.
- 392 total observations (56 counties for 7 years).
- Alpine and San Francisco are excluded (Alpine has no cities and hence no redistribution issue; San Francisco County is a joint city-county).
- Dollar values are deflated to 1992 using CPI for California.

Table 3.2: City Summary Statistics

Variable	Obs	Mean	Std Dev	Min	Max
Per capita operating expenditure	3255	2,505	37,241	54	918,645
Population	3273	53,326	186,560	80	3,716,000
Population density	3273	3,912	3,358	16	26,009
Population growth rate	3264	1.76	4.20	-25.10	129.52
Per capita personal income*	3273	22,803	5,851	13,666	47,036
Per capita assessed valuation	3272	126,745	1,254,536	4,983	27,808,976
Per capita new housing	3180	1,416	8,136	0	249,291
Per capita redevelopment value	3253	56,154	758,481	0	17,527,934
Pct population unincorp area*	3273	25.3	18.7	5.3	92.4
Pct of employees in agriculture*	3273	3.1	4.1	0.1	34.2
Pct population minority*	3273	42.4	16.3	6.6	78.0
Pct population seniors*	3273	11.4	2.3	6.5	21.5
California crime index	2953	4.11	29.56	0.22	730.00
Unemployment rate	2751	9.1	6.6	1.1	40.4
Per capita federal aid	3255	37	196	0	9,336
Per capita state aid	3255	74	54	32	1156
Charter city dummy	3273	0.19	0.39	0	1
Central city dummy	3273	0.12	0.33	0	1

Sources: See Appendix 3

Notes:

- For years 1992 – 1998
- 3273 total observations (470 cities, 460 cities for all 7 years)

- San Francisco is excluded because it is a joint city and county.
- Dollar values are deflated to 1992 using CPI for California
- Summary statistics for observations included in the regression can be found in Appendix 3.

Because of our specific policy context, we omit a few variables that one might otherwise expect to find in a government spending model. For example, we do not include a tax price variable. Proposition 13's limit on the growth of assessed value and the current mechanism for allocating revenue among governments make observation of a conventional tax price variable difficult if not impossible. Our model does not include variables that explicitly account for each of the seven years in our study period.[20] Such variables are likely to be significant, for example, in recession years, as budgetary pressure forces lower spending. However, if resource constraints lead to lower spending, we would like that to be reflected in our resource-variable coefficients so that those coefficients fully capture the government response to changes in resources that occur over time.[21]

Table 3.3 presents our Ordinary Least Squares (OLS) regression results for both counties and cities.[22] Our estimated coefficients are commonly referred to as elasticities, which measure the responsiveness of per capita spending to changes in specified factors.[23] The resource variables have positive and statistically significant effects on spending for both city and county governments. Income elasticity is about 0.1 in counties and 0.5 in cities, while Federal aid elasticity is low in cities (.02), but a little higher in

[20] These are commonly referred to as dummy variables. A seven-year sample would require six dummy variables each of which would be defined to be 1.0 for observations from a specific year and zero otherwise.

[21] Results that explicitly include the year effects are in Appendix 3.

[22] We use a logarithmic functional form, which is the norm in the literature on state and local spending. We report panel-corrected standard errors. A standard approach to analyzing panel data is a fixed-effects model, which allows each city or county to have a different intercept that reflects particular circumstances of that locale, some of which may be unobservable. If so, OLS parameter estimates may be biased. However, in this policy context we argue that OLS is preferable, as fixed effects do not provide a practical basis for allocating property tax revenue. However, we do include county dummy variables in the city model to capture unobservable differences across counties. In Appendix 3 we present the county dummy coefficient estimates, the results of fixed-effects estimation, and other variations of the model for readers interested in econometric modeling issues.

[23] One of the advantages of a log-linear specification is that the estimated coefficient on a variable measured in logs tells us the percentage change in per capita spending we should expect, holding all else constant, from a 1 percent change in the value of the variable.

counties (.13). This difference is not surprising as counties and cities receive Federal aid directed at different functions; counties receive welfare aid and cities do not. The elasticity of assessed value is 0.3 in counties and 0.7 in cities. Higher assessed value constitutes a larger base for the property tax and hence contributes to ability to pay. It also may contribute to demand for public services: higher property values may increase demand for police and fire protection, for example.

Table 3.3: Dependent Variable: Log of Real per Capita Operating Expenditures

Model:	City	County
Log population	-0.976***	0.0173
	(0.179)	(0.0205)
Log population squared	0.0419***	
	(0.0082)	
Log population density	0.0958***	-0.0136
	(0.0324)	(0.0176)
Pct increase population	-0.0011	-0.0048
	(0.0023)	(0.0042)
Log per capita Income	0.531***	0.142
	(0.172)	(0.099)
Log per capita assessed value	0.678***	0.255***
	(0.062)	(0.054)
Log per capita new housing	0.0049	0.0087
	(0.0192)	(0.0311)
Log per capita AV in redev	0.0167***	0.0046
	(0.0053)	(0.0050)
Pct pop'n unincorp area	0.0097*	0.0038***
	(0.0058)	(0.0007)
Pct workers agriculture	-0.0057	-0.0018
	(0.0114)	(0.0029)
Pct population minority	0.0192***	-0.0004
	(0.0062)	(0.0016)
Pct population Seniors	0.0016	-0.0110***
	(0.0246)	(0.0040)
Crime rate	0.2271***	0.0131
	(0.0475)	(0.0145)
Crime rate squared	-0.0199***	
	(0.0062)	
Unemployment rate	0.0160**	0.0062
	(0.0074)	(0.0054)
Log per capita federal aid	0.0187***	0.128***
	(0.0034)	(0.045)
Log per capita state aid	0.219***	0.515***
	(0.049)	(0.093)
Charter city Dummy	0.289***	
	(0.050)	
Central city Dummy	0.0871	
	(0.0735)	
Constant	-4.31*	-1.32
	(2.40)	(0.99)
R-squared	0.56	0.88
# places / # obs	366 / 2493	56 / 392

Notes:

- The City model also includes a full set of county dummies, which are reported in Appendix 3.

- * denotes 10% signficance; ** denotes 5% significance; *** denotes 1% significance.

Population and population growth have negative and significant coefficients in the city equation. Recall that our dependent variable is per capita spending. Larger population is associated with higher total spending, but with slightly lower per capita spending. This may reflect economies of scale in service provision or time lags (as the population grows, city governments may not be able to fully expand services quickly).

Measures of urban cost have an important influence on city spending. The crime rate and unemployment rate, as well as the percentage of assessed value in redevelopment districts, have a positive and significant effect on spending. Three other cost measures, manufacturing wages, service wages and fair market rent, were considered. All had insignificant or negative coefficients, so did not serve effectively as cost measures. The redevelopment variable and the unemployment rate are also significant in the counties equation, but the crime rate is not.

The central city and charter government variables are both positive and significant in the city equation.[24] Having a charter may affect spending directly, but just as likely, it may be a proxy for differences in the array of service provision or in costs. Similarly, the central city coefficient is likely to reflect "full" service provision typical of central cities as well as higher costs of provision in those cities.

We use operating expenditure rather than total expenditure to avoid difficulty that might arise from lumpy capital projects. However, switching the dependent variable to total expenditure has little effect on the results. The total expenditure results are included in Appendix 3.

The estimated coefficients from both our county and city models are very much in line with theoretical expectations and with findings of other empirical studies. They provide a good foundation for predicting expenditure that reflects jurisdictions' "needs and preferences."

In the next chapter, we base our revenue allocation proposals on the expenditure levels predicted by our econometric models of city and county spending.[25] In other words, we consider the spending level that one would

[24] These variables are entered as dummy variables. If the city is a charter city or a central city (as defined by the U.S. Census bureau) then these variables have a value of 1.0. If not, their value is zero.

[25] Some cities are excluded from our regression because of missing data. Also, we exclude cities with population under 1500 because anomalous data in some small cities could obscure otherwise observable patterns across cities. To compute predicted expenditure for cities excluded from the regression, we use

expect given a city or county government's needs and preferences (as reflected in our model's variables), if that government made choices typical of others similarly situated. Actual expenditure may be unusually high or low for reasons peculiar to individual jurisdictions. For example, an inefficient government might have abnormally high spending levels. Predicted expenditure provides a standard based on average governmental behavior for governments with similar needs and preferences.

Chapter 4: Alternative allocation methods

In the previous chapter, we computed "predicted expenditure" for each city and county in the state, providing us with a measure of those jurisdictions' "needs and preferences" for public services and hence for tax revenue. We now discuss how to use those predicted expenditures as the basis for allocating property tax revenue. We consider two possible ways of doing so that reflect the two very different approaches to the allocation seen in SB 154 and AB 8. Recall that SB 154 divided countywide revenue up in proportion to property tax revenue in the late 1970s, while AB 8 allocates the tax increment on a situs basis, again in proportion to late 1970s revenue patterns. Rather than choosing between these approaches, we investigate the consequences of both, substituting "needs and preferences" as measured by predicted expenditure in Chapter 3 for 1970s revenue.

We consider a "countywide" approach, which allocates revenue in proportion to each jurisdiction's needs and preferences, as well as a "situs" approach, which divides revenue raised within a city's boundaries between the city and its county in proportion to their needs and preferences. The countywide approach is similar to SB 154. It divides total county revenue among all local agencies, but in proportion to needs and preferences rather than in proportion to late-1970s revenue. The situs approach is similar to AB 8's treatment of revenue from incremental assessed value. It divides the revenue raised from a jurisdiction's tax base among the governments that serve that area, but again in proportion to those governments needs and preferences rather than in proportion to their revenue in the late 1970s.

Our primary focus is on allocation among city and county governments.[26] Any allocation plan certainly must include schools. In this chapter, we assume that school districts continue to receive the percentage of county revenue that they actually received in each year. Since we can observe school share of tax

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weighted averages of available data for other years or averages of data for other cities in the same county.

[26] The state and the courts govern school finance. School expenditure is equalized across the state, so local school expenditure does not reflect needs and preferences in the way that municipal expenditures do. Our approach of using an expenditure model to predict needs and preferences would therefore not apply to California schools.

revenue only at the county level, we must assume that all taxpayers contribute the county average to schools and that all school districts receive the county average. In the next chapter, which discusses issues of policy implementation, we consider other possible allocations of revenue to school districts.

Our first approach, the "countywide approach," assigns revenue to each jurisdiction in proportion to its predicted expenditure from our econometric model. This approach divides all county revenue, less the school districts' share, among the cities and the county. If a city's predicted expenditure equals ten percent of the total predicted expenditure of all city governments in the county plus that of the county government, then it will receive ten percent of the county revenue pool. This approach is similar to SB 154 in that it treats revenue from all jurisdictions as being in one countywide pool. As illustrated by the discussion of SB 154 in Chapter 2, it is therefore possible for revenue raised in one jurisdiction to be allocated to another. Our "countywide approach" differs from SB 154 in that it allocates according to current needs and preferences rather than according to revenue patterns from the 1970s. It therefore is responsive to demographic change that alters needs and preferences. Table 4.1 shows the predicted expenditure and countywide shares for the three governments in a hypothetical county with two small cities. The "countywide" shares are simply each government's share of the total predicted expenditure in the county (e.g. $5000/$8000 for the county government).

The second approach, the "situs approach," allocates all revenue paid by a particular property owner among governments that have jurisdiction over that property. The revenue raised from property in a city, therefore, will be divided between that city's government and the county government. Predicted expenditure from the city and county models will be used to determine the division of revenue between cities and counties in each case. For this purpose, predicted county expenditure is divided among cities and the unincorporated area in proportion to the assessed value of each.[27]

For each city, we have the predicted city expenditure and a share of the predicted county expenditure. The situs approach divides revenue from each city between the city and the county in proportion to the city's expenditure and its county share. All revenue generated in unincorporated areas of a county, other than school share, goes to the county government. Table 4.1 provides a numerical example. The example indicates that 61.5 cents of every tax dollar paid in Albion go to Albion's city government, while 38.5 cents go to the county government. These shares differ from AB 8 shares in that they allocate all property tax revenue from the jurisdiction, not just the revenue

[27] We allocate predicted county expenditure among cities in proportion to assessed value rather than according to another factor, such as population, to preserve the situs-based aspect of this approach.

from the tax increment since AB 8 was implemented, and these shares are based on the relationship between needs and preferences (as measured by predicted expenditure) in the city and in the county rather than on revenue patterns from the 1970s.

Table 4.1 also shows that the same predicted expenditure figures produce somewhat different shares of total county revenue when computed using the situs approach. For example, Albion would receive 15.4% of county revenue using the situs approach and 25% of county revenue using the countywide approach. The situs share computation is straightforward conceptually, but is more complicated computationally than the countywide approach. In Chapter 5, we develop simple allocation rules based on assessed value and population that produce revenue allocations that are quite similar to those that result from the situs approach.

Table 4.1: Computing Countywide and Situs Revenue Shares

	Predicted Expenditure	Share of Assessed Value
	[1A]	[1B]
County	$5,000	60%
Albion	2,000	25%
Berry	1,000	15%
Total	$8,000	100%

Computing City vs. County Shares Under Situs Approach

	[2A]=
	[1A]/$8,000
County	$5,000/$8,000=62.5%
Albion	$2,000/$8,000=25.0%
Berry	$1,000/$8,000=12.5%

Computing City vs. County Shares under the Situs Approach

	Share of County's Predicted Expenditure	Cities Own Predicted Expenditure	Share to County Government	Share for City to Keep**
	[3A]	[3B]	[3C]	[3D]
	[1A] times [1B]	[1A]	[3A]/([3A]+[3B])	[3B]/([3A]+[3B])
UA*	$3,000		100.0%	0.0%
Albion	1,250	$2,000	38.5%	61.5%
Berry	750	1,000	42.9%	57.1%
Total	$5,000			
* UA = Unincorporated area				
** These shares are comparable to AB8 shares.				

Computing City vs. County Revenue Under the Situs Approach

	Revenue from Tax Base	Revenue to County Government	Revenue to City Government	Situs Approach Shares of Total County Revenue
	[4A]	[4B]	[4C]	[4D]
		[4A] times [3C]	[4A] times [3D]	For Cities: [4C]/$100,000*** For County: [4B]/$100,000
UA*	$60,000	$60,000		
Albion	25,000	9,625	$15,375	15.4%
Berry	15,000	6,435	8,565	8.6%
Total		$70,060		76.0%
* UA = Unincorporated area				
** Revenue from tax base = 1% of assessed value less school share.				
*** $100,000 is the countywide non-school tax revenue, the sum of entries in Column [4A].				

Special districts and redevelopment districts also receive property tax allocations. These allocations are quite large, accounting for 16% and 17% respectively of non-school property tax revenue statewide in 1998. Any allocation reform must include a plan for allocating revenue to these districts.

Most special districts serve either the unincorporated areas of counties or the entire county. Relatively few special districts are associated with cities. We therefore include special district expenditure with county expenditure.[28] We view special districts as an alternative to direct provision of services by the county government. All allocation plans that we consider distribute revenue destined for special districts to their county government. Subsequent allocation to special districts is then left to negotiation between those districts and their county government. This conforms to SB 154 and AB 8, which distributed special district bailout funds to county governments, giving counties the responsibility of allocating this revenue to the special districts.

Redevelopment districts receive property tax revenue generated by the incremental assessed value within their boundaries. In some cases, "pass-through" agreements reimburse city or county governments that have lost revenue as a result of the formation of redevelopment districts. Redevelopment districts have legal status as lending agencies. As such, they must have a secure revenue source that supports their obligations as issuers of bonds. The allocation of a redevelopment district's property tax revenue is divided evenly between the city government that formed the district and the county government. Therefore, cities and counties are obligated to allocate

[28] California classifies special districts as enterprise or non-enterprise. Enterprise districts rely primarily on user-fees for funding, while non-enterprise districts generally do not. Also, enterprise districts receive only small allocations of property tax revenue. We have excluded enterprise districts from our study.

revenue to their redevelopment districts out of their own revenue allocations. This obligation should be qualified by the possibility of case-by-case negotiation to adjust responsibility for redevelopment districts. Currently, county governments provide substantial support to city redevelopment districts as they forego revenue from the tax increment. It seems reasonable, therefore, to expect that counties will continue to contribute to the financing of redevelopment districts. Statewide, counties (including special districts) receive roughly half of city and county revenue. This lends support to our approximation that counties and cities each contribute half of the revenue to a city's redevelopment district. All revenue figures presented below divide redevelopment revenue evenly between the relevant city and county, and include special district revenue with county revenue.

Table 4.2 compares the revenue allocation implied by the countywide and situs approaches with actual revenue allocation for cities with population over 150,000 in 1998 and for two sample counties, San Diego and Stanislaus. [29] The table shows both revenue in dollars and revenue as a share of total county revenue. These data are based on averages of real (inflation-adjusted) revenue data over the seven years in our sample. Equal shares of revenue do not imply comparable revenue figures across counties (1 percent of county revenue is a very different amount in Los Angeles and Modoc counties).

[29] We chose Stanislaus as one of our sample counties because it is close to the state average in how closely our models match actual property tax revenue. We chose San Diego County as the other because it has a major city, it is in a different region than Stanislaus, and has a manageable number of cities to list individually in a table.

Table 4.2: Revenue and Revenue Sharing Under the Countywide and Situs Approaches

City	Actual shares	Countywide approach shares	Situs approach shares	Actual revenue	Countywide approach revenue	Situs approach revenue
Anaheim	0.045	0.063	0.049	$22,800,000	$31,800,000	$24,800,000
Bakersfield	0.117	0.207	0.131	15,600,000	27,600,000	17,400,000
Chula Vista	0.021	0.024	0.022	9,855,844	11,600,000	10,500,000
Fremont	0.058	0.054	0.069	24,300,000	22,500,000	28,800,000
Fresno	0.274	0.318	0.253	29,700,000	34,500,000	27,400,000
Garden Grove	0.017	0.017	0.015	8,850,734	8,503,683	7,617,940
Glendale	0.006	0.007	0.009	15,300,000	17,900,000	21,200,000
Huntington Beach	0.036	0.037	0.033	18,600,000	18,600,000	16,800,000
Long Beach	0.018	0.024	0.022	43,500,000	58,700,000	53,500,000
Los Angeles	0.179	0.316	0.233	429,000,000	759,000,000	560,000,000
Modesto	0.165	0.193	0.161	6,469,032	7,592,881	6,346,077
Oakland	0.125	0.206	0.138	52,200,000	85,800,000	57,600,000
Oceanside	0.025	0.017	0.018	12,000,000	8,212,021	8,633,837
Oxnard	0.057	0.073	0.062	10,700,000	13,600,000	11,400,000
Riverside	0.051	0.086	0.067	13,400,000	22,400,000	17,400,000
Sacramento	0.192	0.214	0.154	44,900,000	49,900,000	35,900,000
San Bernardino	0.040	0.056	0.038	12,400,000	17,200,000	11,900,000
San Diego	0.244	0.291	0.243	117,000,000	139,000,000	116,000,000
San Jose	0.202	0.311	0.248	94,300,000	145,000,000	116,000,000
Santa Ana	0.045	0.050	0.034	23,100,000	25,600,000	17,400,000
Stockton	0.140	0.251	0.187	13,300,000	23,800,000	17,700,000
Stanislaus County						
County	0.692	0.699	0.739	27,200,000	27,500,000	29,100,000
Cares	0.030	0.020	0.019	1,161,029	799,770	752,587
Hughson	0.002	0.003	0.002	72,054	100,126	86,878
Modesto	0.165	0.193	0.161	6,469,032	7,592,881	6,346,077
Newman	0.010	0.006	0.005	402,810	217,578	182,219
Oakdale	0.026	0.016	0.015	1,027,474	624,761	575,051
Patterson	0.007	0.008	0.007	257,477	318,212	267,305
Riverbank	0.014	0.010	0.009	532,684	375,934	359,303
Turlock	0.051	0.042	0.039	2,008,443	1,664,335	1,550,575
Waterford	0.004	0.003	0.003	171,517	130,035	123,637
San Diego County						
County	0.549	0.571	0.613	262,000,000	273,000,000	293,000,000
Carlsbad	0.023	0.013	0.016	11,000,000	6,400,018	7,452,551
Chula Vista	0.021	0.024	0.022	9,855,844	11,600,000	10,500,000
Coronado	0.016	0.004	0.005	7,674,481	2,139,029	2,552,058
Del Mar	0.002	0.002	0.002	1,118,592	1,176,404	1,186,177
El Cajon	0.010	0.010	0.010	4,689,093	4,992,397	4,928,682
Encinitas	0.020	0.007	0.008	9,677,865	3,115,874	3,948,627

City	Actual shares	Countywide approach shares	Situs approach shares	Actual revenue	Countywide approach revenue	Situs approach revenue
Escondido	0.015	0.015	0.015	7,280,462	6,942,086	7,168,365
Imperial Beach	0.003	0.002	0.002	1,308,836	1,128,263	1,034,337
La Mesa	0.006	0.006	0.006	3,087,561	2,803,613	3,013,510
Lemon Grove	0.003	0.003	0.002	1,311,532	1,199,407	1,160,256
National City	0.007	0.005	0.005	3,321,129	2,592,344	2,278,673
Oceanside	0.025	0.017	0.018	12,000,000	8,212,021	8,633,837
Poway	0.019	0.005	0.006	8,882,740	2,422,659	3,027,023
San Diego	0.244	0.291	0.243	117,000,000	139,000,000	116,000,000
San Marcos	0.010	0.007	0.007	4,709,283	3,355,415	3,444,957
Santee	0.011	0.004	0.005	5,046,603	2,119,782	2,380,082
Solana Beach	0.004	0.003	0.003	2,052,028	1,435,723	1,654,508
Vista	0.012	0.009	0.010	5,694,979	4,492,926	4,732,827

For example, the city of Anaheim received $22,800,000 of tax revenue, which is 4.5 percent of countywide revenue (recall that this includes city revenue and half of any redevelopment district revenue). According to our countywide approach, Anaheim should receive substantially more: $31,800,000, or 6.3 percent of county revenue. According to our situs approach, Anaheim should receive $24,800,000, or 4.9 percent of county revenue. Given Anaheim's values for the factors included in our model (population, population growth, assessed value, etc.), it should receive more revenue than it currently does according to both the countywide and the situs approaches. Our model suggests that Anaheim's current revenue falls short of being in line with its needs and preferences, relative to other jurisdictions in Orange County.

Are the results for Anaheim typical of other large cities? Anaheim is representative of other large cities in that it would experience an increase in revenue under our countywide needs-and-preferences approach. Furthermore, the percentage increase in revenue it would receive under a change to the countywide approach, 30percent, is close to the average increase of 39 percent that these 21 cities would receive. Statewide, 66 percent of cities and 6 percent of county governments would gain if revenue were distributed in accordance with our countywide approach. Thus, cities would fare well relative to counties under this approach.[30] Under our situs approach, cities and counties as groups have roughly the same experience: 56 percent of cities and 50 percent of counties would experience an increase in revenue. It is not surprising that counties fare better as a group under the situs approach, as counties would receive all revenue from unincorporated areas as well as a substantial portion of revenue from cities.

[30] Recall that special district revenue and half of redevelopment district revenue is included in our measure of current county revenue. Fewer counties would lose revenue if more city redevelopment district revenue were assigned to cities.

If the current allocation system favored cities with particular characteristics, such as large population or high income, then cities with those characteristics might be expected to lose under reform. To investigate this possibility, we examine the correlation between percentage increases in revenue under both the situs and countywide approaches and several city characteristics. Revenue increases projected by our needs-and-preferences model for cities are not correlated with characteristics such as population, per capita personal income, per capita assessed value, or being a central city, under either the countywide or the situs approach. In no case is the correlation between percentage revenue increase and any of these factors greater than 0.1 in absolute value. Furthermore, none of the independent variables has a correlation with the percentage revenue increase greater than 0.2 in absolute value, and most have correlation less than 0.1. Therefore, the current system does not put broad categories of cities, such as large cities or low-income cities at a disadvantage. Rather, cities that would gain under our model are as likely to be large as small, or high-income as low-income. For county governments, there is some correlation between projected revenue increase and these factors.

Percentage revenue increase for county governments under the countywide and situs approaches has correlation in the range of -.25 to -.37 with per capita income and per capita assessed value. Thus, county governments in lower-income and in lower-assessed-value counties should have somewhat larger percentage revenue increases on average according to our model. Correlation between percentage revenue increases and population is in the range of –0.10 to -0.15, so county governments in smaller counties should have slightly larger revenue increases according to our needs and preferences model.

Results for the two sample counties shown in Table 4.2 give a more detailed view of the implications of our model for jurisdictions within a county. Table 4.2 indicates that the county government in San Diego would receive an increase in revenue under either the countywide or the situs approach, rising from 55% of county revenue to 57% under the countywide approach or to 61% under the situs approach. This additional revenue for the county would come at the expense of several of the cities in San Diego county. Some would lose a much larger percentage of revenue than others, and some would actually gain revenue. In particular, the City of San Diego would enjoy a substantial increase under the countywide approach, although its revenue would stay roughly the same under the situs approach. In Stanislaus County, the county government's revenue stays roughly the same under the countywide approach and would rise by 4 percentage points under the situs approach. Some cities in the county would gain revenue and some would lose.

Two county-based measures indicate how closely our projected model revenue matches actual revenue. These measures represent different ways of

assessing how much redistribution there would be within counties if our models were implemented as allocation mechanisms. Current revenue patterns match projections from our needs-and-preferences model much more closely in some counties than in others, indicating that reform would be both more important and more disruptive of the status quo in some counties.

These measures of within-county redistribution are defined in detail in Appendix 4. Values of the measures by county are presented in Table 4.3. Our first measure is the root mean-squared error of the difference between proposed model revenue and actual revenue for each jurisdiction, normalized by total county revenue. This measure has a mean of .03 with a maximum value of .16 for the countywide approach and a mean of .02 with a maximum value of .13 for the situs approach. The situs-approach allocations are therefore a bit closer to actual allocations than are the countywide-approach allocations. Table 4.3 presents rankings of the counties according to their value of this measure of closeness between proposed and actual revenue. A rank of 1 indicates the closest match between the model and reality. Some counties receive similar rankings under the countywide and situs approaches. For example, Los Angeles County ranks 20th under both approaches. Some counties, on the other hand, fare quite differently under the two approaches. For example, Lassen County ranks first under the countywide approach and 45th under the situs approach. A high ranking under either approach indicates that reform has the potential to improve the fairness and efficiency of fiscal arrangements within the county.

The two right hand columns of Table 4.3 take a different look at the relationship between actual and proposed revenue allocations by county. They show the percentage of total county revenue (excluding school revenue) that would be redistributed if a particular allocation approach were undertaken. The situs approach would reallocate 5% of county revenue on average, while the countywide approach would reallocate 7% on average. Again, we see that the situs approach is a bit closer to current allocations. Even so, some jurisdictions would see very large changes in revenue, as demonstrated in Table 4.3.

Table 4.3: Comparison of Proposed and Actual Revenue

	County Rank for Match between Proposed and Actual Revenue		Percentage of County Revenue to be Redistributed	
County	**Countywide Approach**	**Situs Approach**	**Countywide Approach**	**Situs Approach**
Alameda	32	25	0.13	0.06
Amador	28	2	0.07	0.01
Butte	34	50	0.08	0.12
Calaveras	21	4	0.02	0.01
Colusa	45	13	0.07	0.01
Contra Costa	8	7	0.06	0.05
Del Norte	51	27	0.08	0.02
El Dorado	36	17	0.06	0.01
Fresno	7	14	0.05	0.03
Glenn	27	51	0.04	0.09
Humboldt	4	23	0.03	0.04
Imperial	15	41	0.05	0.08
Inyo	50	33	0.07	0.02
Kern	41	5	0.13	0.02
Kings	33	15	0.07	0.02
Lake	26	12	0.04	0.01
Lassen	1	45	0.01	0.03
Los Angeles	20	20	0.19	0.12
Madera	18	42	0.03	0.04
Marin	24	26	0.10	0.07
Mendocino	44	21	0.10	0.03
Merced	6	30	0.03	0.04
Modoc	11	37	0.01	0.03
Mono	54	54	0.20	0.16
Monterey	22	11	0.08	0.04
Napa	52	28	0.15	0.03
Nevada	25	46	0.04	0.06
Orange	3	16	0.09	0.08
Placer	48	38	0.15	0.06
Plumas	31	1	0.04	0.00
Riverside	10	9	0.09	0.06
Sacramento	17	36	0.04	0.04
San Benito	43	53	0.06	0.11
San Bernardino	2	8	0.06	0.06
San Diego	19	22	0.09	0.06
San Joaquin	42	35	0.11	0.05
San Luis Obispo	40	32	0.11	0.05
San Mateo	16	19	0.10	0.07
Santa Barbara	49	39	0.16	0.07
Santa Clara	39	40	0.16	0.12
Santa Cruz	37	10	0.08	0.02

County	Countywide Approach	Situs Approach	Countywide Approach	Situs Approach
Shasta	53	44	0.16	0.05
Sierra	30	29	0.03	0.02
Siskiyou	13	18	0.05	0.03
Solano	29	34	0.08	0.06
Sonoma	46	47	0.17	0.10
Stanislaus	14	31	0.05	0.05
Sutter	12	48	0.02	0.05
Tehama	23	24	0.04	0.02
Tulare	9	6	0.04	0.02
Tuolumne	5	3	0.01	0.01
Ventura	38	43	0.13	0.10
Yolo	47	52	0.11	0.14
Yuba	35	49	0.05	0.07

Chapter 5: Implementation Issues

Reform is most likely to be feasible and effective if it involves a revenue allocation method that is readily understandable and that causes relatively few jurisdictions to lose revenue. In this chapter, we develop simple, straightforward allocation rules based on assessed value and population. Unlike SB 154 and AB 8, these rules would automatically adjust revenue allocations as jurisdictions' shares of assessed value and population in a county change, providing flexibility over time. The rules are derived from our needs-and-preferences model, as described below, so they reflect needs and preferences.

Simplicity facilitates citizen understanding of the distribution of property taxes. The current system is not well understood. Revenue allocations are based on several complex factors, including SB 154 base revenue, AB 8 factors, ERAF, and redevelopment districts. Revenue allocation is not reported on individual tax bills, presumably because doing so is prohibitively complicated and difficult. If AB 8 factors governed the allocation of all revenue rather than just the tax increment, then they could be reported fairly easily, making tax allocation visible to taxpayers. But they are not accurate indicators of total revenue allocation. There is no practical way to explain the current allocation to taxpayers. The simple rules presented here would represent a significant improvement in the State's ability to explain tax allocation to taxpayers.

We choose assessed value and population as allocation factors for these simple rules for several reasons. Assessed value is the traditional situs-based allocation factor used for property taxes in most places. Population has been proposed as an allocation factor for sales taxes, and may be of interest in this context. Assessed value and population are observable for all jurisdictions in the state. As factors in a revenue allocation formula, they would not create

incentives with undesirable consequences compared with other possible factors. Although they distribute more revenue to jurisdictions that grow fast relative to other jurisdictions in the same county, they reward all types of assessed value similarly, rather than favoring any category such as retail property. Perhaps our most important reason for choosing assessed value and population as allocation factors is that they are able to explain most of the variation in the needs-and-preferences shares estimated in Chapter 3. Thus, they are likely to produce simple rules that closely reflect our needs-and-preferences model. We experimented with many other variables as possible factors, but none came close to working as well as these.

In each of the simple rules presented here, we first determine the share of revenue that goes to the county. The remainder is then allocated among cities on the basis of assessed value, population, or both.[31] A formula based only on assessed value is compatible with situs-based revenue allocation. Population, however, may serve as an effective measure of the needs and preferences of large cities.

In Chapter 4, we derived county and city government shares using predicted expenditure from our econometric model. We did this using both a "countywide" approach and a "situs" approach. We develop this chapter's simple formulas by regressing those shares on the share of assessed value, the share of population, or both. We do this separately for cities and for counties. Results of these regressions are presented in Appendix 5. Our simple formulas have parameters that are as close as possible to the estimated parameters in those regressions, given several constraints. The revenue shares received by all jurisdictions within a county must add to one. Therefore, the coefficient for assessed value must be equal in the county and city share equations. Similarly, the coefficient for population must be equal in both equations. The coefficients in the county equations must sum to one so that a county with no cities gets 100% of county revenue. Finally, we constrained the city constant to be zero so that no jurisdictions would receive negative shares. As demonstrated in Appendix 5, this constraint has a negligible effect on the coefficients.

1. Using assessed value (AV) and population as allocation factors, based on countywide shares

   County share = .50 + .25 * Unincorporated area's Share of County AV

   + .25 * Unincorporated area's Share of County Population

   City share = .25* City's share of County AV

   + .25 * City's share of County population

[31] Smith (1991, p.91) advocates a very similar two-step approach, using only assessed value in the second step, on the grounds that it would avoid non-situs-based allocation, which he views as unconstitutional.

2. Using assessed value as the only allocation factor, based on countywide shares

   County share = .50 + .50 * Unincorporated area's Share of County AV

   City share = .50 * City's share of County AV

3. Using population as the only allocation factor, based on countywide shares

   County share = .50 + .50 * Unincorporated area's Share of County population

   City share = .50 * City's share of County population

4. Using assessed value as the only allocation factor, based on situs shares

   County share = .55 + .45 * Unincorporated area's Share of County AV

   City share = .45 * City's share of County AV

Note that the constant term for counties is the same in the first three rules, all of which are based on countywide shares. This facilitates analysis of the effects of changing allocation factors (assessed value only, population only, or both assessed value and population). The situs-based rule (number 4), allocates more revenue to county governments, in line with the discussion of the differences between the countywide and situs approaches in Chapter 4. We do not include population as an allocation factor in a rule based on situs shares since population is not compatible with a situs-based allocation mechanism.

Table 5.1 shows the county revenue shares generated by each formula for cities with population greater than 150,000 and for cities and county governments in our sample counties. Table 5.2 shows the revenue figures generated by the shares in Table 5.1. These tables also include the countywide and situs shares shown in the Chapter 4 tables for ease of comparison. Table 5.1 indicates that Anaheim would receive 5.1% of county revenue under the assessed value-and-population formula, 4.6% under the countywide-shares assessed-value formula, 5.5% under the population formula, and 4.1% under the situs-shares assessed value formula. The corresponding revenue figures in Table 5.2 are $25,800,000 for assessed-value-and-population, $23,400,000 for countywide-shares assessed-value, $28,100,000 for population, and $21,100,000 for situs-shares assessed-value. Not surprisingly, large cities generally receive more revenue under the population formula, and receive less when assessed value is included as a factor, and receive even less when population is excluded as a factor. San Diego is a notable exception. The situs-shares assessed value rule has a very adverse effect on the large cities, allocating less revenue to them in almost every case than either the countywide or the situs approach to implementing our needs-and-preferences model.

Table 5.1: Property Tax Revenue Shares

City	Actual	CW Model	AV & POP	AV (CW)	POP	Situs Model	AV (Situs)
Anaheim	0.045	0.063	0.051	0.046	0.055	0.049	0.041
Bakersfield	0.117	0.207	0.146	0.119	0.173	0.131	0.107
Chula Vista	0.021	0.024	0.026	0.023	0.029	0.022	0.020
Fremont	0.058	0.054	0.083	0.096	0.071	0.069	0.086
Fresno	0.274	0.318	0.252	0.243	0.262	0.253	0.219
Garden Grove	0.017	0.017	0.022	0.016	0.028	0.015	0.015
Glendale	0.006	0.007	0.011	0.011	0.010	0.009	0.010
Huntington Beach	0.036	0.037	0.036	0.036	0.035	0.033	0.033
Long Beach	0.018	0.024	0.022	0.021	0.023	0.022	0.019
Los Angeles	0.179	0.316	0.190	0.187	0.194	0.233	0.168
Modesto	0.165	0.193	0.204	0.194	0.214	0.161	0.175
Oakland	0.125	0.206	0.122	0.104	0.141	0.138	0.094
Oceanside	0.025	0.017	0.025	0.023	0.028	0.018	0.020
Oxnard	0.057	0.073	0.088	0.068	0.107	0.062	0.062
Riverside	0.051	0.086	0.079	0.070	0.087	0.067	0.063
Sacramento	0.192	0.214	0.166	0.162	0.169	0.154	0.146
San Bernardino	0.040	0.056	0.047	0.038	0.056	0.038	0.034
San Diego	0.244	0.291	0.225	0.232	0.219	0.243	0.208
San Jose	0.202	0.311	0.232	0.200	0.264	0.248	0.180
Santa Ana	0.045	0.050	0.043	0.029	0.057	0.034	0.026
Stockton	0.140	0.251	0.199	0.176	0.221	0.187	0.159
Stanislaus county							
County	0.692	0.699	0.645	0.666	0.625	0.739	0.699
Ceres	0.030	0.020	0.033	0.028	0.038	0.019	0.025
Hughson	0.002	0.003	0.004	0.003	0.004	0.002	0.003
Modesto	0.165	0.193	0.204	0.194	0.214	0.161	0.175
Newman	0.010	0.006	0.006	0.006	0.007	0.005	0.005
Oakdale	0.026	0.016	0.019	0.021	0.017	0.015	0.018
Patterson	0.007	0.008	0.010	0.008	0.012	0.007	0.007
Riverbank	0.014	0.010	0.015	0.014	0.017	0.009	0.012
Turlock	0.051	0.042	0.058	0.057	0.060	0.039	0.051
Waterford	0.004	0.003	0.006	0.005	0.008	0.003	0.004
San Diego County							
County	0.549	0.571	0.581	0.582	0.581	0.613	0.623
Carlsbad	0.023	0.013	0.018	0.023	0.013	0.016	0.021
Chula Vista	0.021	0.024	0.026	0.023	0.029	0.022	0.020
Coronado	0.016	0.004	0.007	0.008	0.005	0.005	0.008
Del Mar	0.002	0.002	0.002	0.003	0.001	0.002	0.003
El Cajon	0.010	0.010	0.014	0.012	0.017	0.010	0.011
Encinitas	0.020	0.007	0.013	0.015	0.011	0.008	0.013
Escondido	0.015	0.015	0.020	0.018	0.022	0.015	0.016
Imperial Beach	0.003	0.002	0.004	0.002	0.005	0.002	0.002
La Mesa	0.006	0.006	0.009	0.008	0.010	0.006	0.007
Lemon Grove	0.003	0.003	0.004	0.003	0.005	0.002	0.002
National City	0.007	0.005	0.007	0.005	0.010	0.005	0.004
Oceanside	0.025	0.017	0.025	0.023	0.028	0.018	0.020

City	Actual	CW Model	AV & POP	AV (CW)	POP	Situs Model	AV (Situs)
Poway	0.019	0.005	0.010	0.011	0.008	0.006	0.010
San Diego	0.244	0.291	0.225	0.232	0.219	0.243	0.208
San Marcos	0.010	0.007	0.009	0.009	0.009	0.007	0.008
Santee	0.011	0.004	0.009	0.007	0.010	0.005	0.006
Solana Beach	0.004	0.003	0.004	0.005	0.002	0.003	0.005
Vista	0.012	0.009	0.014	0.012	0.015	0.010	0.011

Table 5.2: Property Tax Revenue

City	Actual	CW Model	Situs Model	AV & POP	AV-CW	POP	AV (Situs)
Anaheim	$22,800,000	$31,800,000	$24,800,000	$25,800,000	$23,400,000	$28,100,000	$21,100,000
Bakersfield	15,600,000	27,600,000	17,400,000	19,400,000	15,800,000	23,000,000	14,300,000
Chula Vista	9,855,844	11,600,000	10,500,000	12,300,000	10,800,000	13,800,000	9,730,281
Fremont	24,300,000	22,500,000	28,800,000	34,700,000	40,000,000	29,400,000	36,000,000
Fresno	29,700,000	34,500,000	27,400,000	27,400,000	26,400,000	28,400,000	23,700,000
Garden Grove	8,850,734	8,503,683	7,617,940	11,300,000	8,257,733	14,400,000	7,431,959
Glendale	15,300,000	17,900,000	21,200,000	25,700,000	26,600,000	24,800,000	23,900,000
Huntington Beach	18,600,000	18,600,000	16,800,000	18,300,000	18,500,000	18,000,000	16,700,000
Long Beach	43,500,000	58,700,000	53,500,000	52,900,000	49,900,000	55,800,000	45,000,000
Los Angeles	429,000,000	759,000,000	560,000,000	457,000,000	448,000,000	465,000,000	403,000,000
Modesto	6,469,032	7,592,881	6,346,077	8,013,406	7,634,301	8,392,510	6,870,871
Oakland	52,200,000	85,800,000	57,600,000	51,000,000	43,300,000	58,600,000	39,000,000
Oceanside	12,000,000	8,212,021	8,633,837	12,000,000	10,800,000	13,100,000	9,710,296
Oxnard	10,700,000	13,600,000	11,400,000	16,200,000	12,700,000	19,800,000	11,400,000
Riverside	13,400,000	22,400,000	17,400,000	20,500,000	18,300,000	22,700,000	16,400,000
Sacramento	44,900,000	49,900,000	35,900,000	38,700,000	37,800,000	39,600,000	34,000,000
San Bernardino	12,400,000	17,200,000	11,900,000	14,600,000	11,700,000	17,500,000	10,500,000
San Diego	117,000,000	139,000,000	116,000,000	108,000,000	111,000,000	105,000,000	99,500,000
San Jose	94,300,000	145,000,000	116,000,000	109,000,000	93,400,000	124,000,000	84,100,000
Santa Ana	23,100,000	25,600,000	17,400,000	21,900,000	14,800,000	29,100,000	13,300,000
Stockton	13,300,000	23,800,000	17,700,000	18,800,000	16,700,000	20,900,000	15,000,000
Stanislaus County							
County	27,200,000	27,500,000	29,100,000	25,400,000	26,200,000	24,600,000	27,500,000
Cares	1,161,029	799,770	752,587	1,291,084	1,100,057	1,482,111	990,052
Hughson	72,054	100,126	86,878	137,585	110,440	164,730	99,396
Modesto	6,469,032	7,592,881	6,346,077	8,013,406	7,634,301	8,392,510	6,870,871
Newman	402,810	217,578	182,219	244,133	219,834	268,432	197,851
Oakdale	1,027,474	624,761	575,051	739,431	806,635	672,227	725,971
Patterson	257,477	318,212	267,305	390,217	323,869	456,564	291,483
Riverbank	532,684	375,934	359,303	598,847	541,527	656,167	487,374
Turlock	2,008,443	1,664,335	1,550,575	2,282,061	2,223,947	2,340,175	2,001,552
Waterford	171,517	130,035	123,637	242,482	184,413	300,552	165,972

City	Actual	CW Model	Situs Model	AV & POP	AV-CW	POP	AV (Situs)
San Diego County							
County	262,000,000	273,000,000	293,000,000	278,000,000	278,000,000	278,000,000	298,000,000
Carlsbad	11,000,000	6,400,018	7,452,551	8,700,278	11,100,000	6,296,780	9,993,399
Chula Vista	9,855,844	11,600,000	10,500,000	12,300,000	10,800,000	13,800,000	$ 9,730,281
Coronado	7,674,481	2,139,029	2,552,058	3,143,358	3,996,977	2,289,738	3,597,279
Del Mar	1,118,592	1,176,404	1,186,177	922,549	1,396,548	448,550	1,256,893
El Cajon	4,689,093	4,992,397	4,928,682	6,858,467	5,643,043	8,073,891	5,078,739
Encinitas	9,677,865	3,115,874	3,948,627	6,080,807	7,129,317	5,032,298	6,416,385
Escondido	7,280,462	6,942,086	7,168,365	9,625,165	8,724,369	10,500,000	7,851,931
Imperial Beach	1,308,836	1,128,263	1,034,337	1,761,821	1,084,387	2,439,255	975,948
La Mesa	3,087,561	2,803,613	3,013,510	4,425,898	3,896,393	4,965,404	3,506,754
Lemon Grove	1,311,532	1,199,407	1,160,256	1,730,324	1,294,794	2,165,853	1,165,315
National City	3,321,129	2,592,344	2,278,673	3,466,767	2,285,706	4,647,827	2,057,135
Oceanside	12,000,000	8,212,021	8,633,837	12,000,000	10,800,000	13,100,000	9,710,295
Poway	8,882,740	2,422,659	3,027,023	4,648,070	5,272,010	4,024,130	4,744,809
San Diego	117,000,000	139,000,000	116,000,000	108,000,000	111,000,000	105,000,000	99,500,000
San Marcos	4,709,283	3,355,415	3,444,957	4,249,429	4,158,608	4,340,250	3,742,747
Santee	5,046,603	2,119,782	2,380,082	4,073,683	3,311,576	4,835,791	2,980,418
Solana Beach	2,052,028	1,435,723	1,654,508	1,803,691	2,415,523	1,191,860	2,173,970
Vista	5,694,979	4,492,926	4,732,827	6,507,161	5,931,513	7,082,810	5,338,361

Chapter 4 presented two county-based measures that indicate how closely our projected model revenue matches actual property tax revenue. These measures are defined in detail in Appendix 4. Tables 5.3 and 5.4 present these measures for the simple rules discussed in this chapter. Table 5.3 shows how closely the revenue allocation implied by each simple rule matches current allocation within each county. A low ranking indicates a closer match, implying that reform is less urgent. A high ranking indicates a larger disparity between current revenue allocation and the revenue allocation projected by the rule in question. For example, Alameda county ranks 24th in how closely the assessed-value-and-population rule revenue allocation matches the current revenue allocation. The rankings indicate the extent to which a rule would depart from the status quo in each county. For example, the assessed-value-and-population rule would reallocate revenue to a greater degree in Sonoma County (rank 48) and Ventura County (rank 52) than in Fresno County (rank 4) or Orange County (rank 6). Table 5.4 shows the percentage of county revenue that would be redistributed under each rule. The assessed-value-and-population rule would redistribute 21 percent of countywide property tax revenue in Orange County but only 4 percent of revenue in Fresno County. The population-only rule would redistribute the most revenue on average, 8 percent. The other rules would redistribute between 5 and 6 percent on average.

Table 5.3: County Rank for Match between Proposed and Actual Revenue

County	CW Model	AV & POP	AV	POP	Situs Model	AV (Situs)
Alameda	32	24	37	11	25	27
Amador	28	40	12	45	2	3
Butte	34	30	36	13	50	47
Calaveras	21	11	4	14	4	2
Colusa	45	42	24	51	13	38
Contra Costa	8	36	45	31	7	41
Del Norte	51	28	26	40	27	31
El Dorado	36	22	33	10	17	22
Fresno	7	4	10	6	14	21
Glenn	27	10	50	19	51	51
Humboldt	4	18	15	15	23	13
Imperial	15	17	49	23	41	49
Inyo	50	46	21	46	33	14
Kern	41	16	1	32	5	7
Kings	33	49	40	47	15	24
Lake	26	41	25	44	12	10
Lassen	1	50	8	52	45	37
Los Angeles	20	9	18	4	20	11
Madera	18	13	44	30	42	48
Marin	24	38	47	33	26	40
Mendocino	44	25	19	24	21	12
Merced	6	14	9	22	30	20
Modoc	11	39	13	50	37	29
Mono	54	54	54	54	54	54
Monterey	22	23	5	37	11	5
Napa	52	20	17	43	28	43
Nevada	25	33	27	35	46	46
Orange	3	6	14	5	16	9
Placer	48	43	41	38	38	32
Plumas	31	5	2	21	1	4
Riverside	10	21	29	12	9	19
Sacramento	17	7	20	3	36	42
San Benito	43	44	51	17	53	52
San Bernardino	2	29	34	16	8	23
San Diego	19	3	11	2	22	15
San Joaquin	42	47	46	41	35	33
San Luis Obispo	40	37	42	36	32	35
San Mateo	16	26	32	20	19	17
Santa Barbara	49	45	38	42	39	28
Santa Clara	39	35	43	28	40	34
Santa Cruz	37	27	35	18	10	25
Shasta	53	8	16	7	44	36
Sierra	30	53	31	53	29	30

County	CW Model	AV & POP	AV	POP	Situs Model	AV (Situs)
Siskiyou	13	2	7	8	18	16
Solano	29	32	30	29	34	8
Sonoma	46	48	48	39	47	45
Stanislaus	14	31	28	26	31	18
Sutter	12	12	22	34	48	44
Tehama	23	19	6	27	24	6
Tulare	9	34	39	25	6	26
Tuolumne	5	1	3	1	3	1
Ventura	38	52	52	49	43	50
Yolo	47	51	53	48	52	53
Yuba	35	15	23	9	49	39

Table 5.4: Percentage of County Revenue to be Redistributed

County	CW Model	AV & POP	AV	POP	Situs Model	AV (Situs)
Alameda	0.13	0.09	0.11	0.09	0.06	0.08
Amador	0.07	0.07	0.02	0.11	0.01	0.01
Butte	0.08	0.05	0.05	0.05	0.12	0.07
Calaveras	0.02	0.02	0.01	0.02	0.01	0.00
Colusa	0.07	0.05	0.02	0.12	0.01	0.03
Contra Costa	0.06	0.15	0.15	0.16	0.05	0.12
Del Norte	0.08	0.02	0.02	0.05	0.02	0.02
El Dorado	0.06	0.03	0.03	0.03	0.01	0.02
Fresno	0.05	0.04	0.04	0.06	0.03	0.04
Glenn	0.04	0.02	0.07	0.04	0.09	0.08
Humboldt	0.03	0.05	0.03	0.06	0.04	0.03
Imperial	0.05	0.05	0.11	0.08	0.08	0.13
Inyo	0.07	0.04	0.01	0.06	0.02	0.01
Kern	0.13	0.06	0.01	0.11	0.02	0.02
Kings	0.07	0.09	0.05	0.13	0.02	0.03
Lake	0.04	0.04	0.02	0.07	0.01	0.01
Lassen	0.01	0.05	0.01	0.11	0.03	0.02
Los Angeles	0.19	0.14	0.14	0.14	0.12	0.10
Madera	0.03	0.02	0.04	0.05	0.04	0.05
Marin	0.10	0.11	0.11	0.13	0.07	0.08
Mendocino	0.10	0.04	0.03	0.06	0.03	0.02
Merced	0.03	0.04	0.02	0.07	0.04	0.03
Modoc	0.01	0.03	0.01	0.08	0.03	0.02
Mono	0.20	0.20	0.23	0.18	0.16	0.20
Monterey	0.08	0.07	0.03	0.14	0.04	0.03
Napa	0.15	0.04	0.03	0.09	0.03	0.05
Nevada	0.04	0.04	0.03	0.06	0.06	0.05
Orange	0.09	0.09	0.09	0.10	0.08	0.07
Placer	0.15	0.08	0.06	0.10	0.06	0.04
Plumas	0.04	0.01	0.00	0.03	0.00	0.01
Riverside	0.09	0.12	0.10	0.14	0.06	0.07
Sacramento	0.04	0.02	0.03	0.02	0.04	0.04

County	CW Model	AV & POP	AV	POP	Situs Model	AV (Situs)
San Benito	0.06	0.04	0.06	0.03	0.11	0.09
San Bernardino	0.06	0.11	0.11	0.13	0.06	0.08
San Diego	0.09	0.05	0.05	0.06	0.06	0.05
San Joaquin	0.11	0.09	0.08	0.11	0.05	0.05
San Luis Obispo	0.11	0.08	0.07	0.10	0.05	0.05
San Mateo	0.10	0.11	0.10	0.13	0.07	0.07
Santa Barbara	0.16	0.09	0.06	0.12	0.07	0.04
Santa Clara	0.16	0.12	0.12	0.12	0.12	0.09
Santa Cruz	0.08	0.05	0.05	0.05	0.02	0.03
Shasta	0.16	0.02	0.02	0.02	0.05	0.03
Sierra	0.03	0.07	0.02	0.12	0.02	0.02
Siskiyou	0.05	0.02	0.03	0.05	0.03	0.03
Solano	0.08	0.07	0.05	0.09	0.06	0.02
Sonoma	0.17	0.11	0.10	0.12	0.10	0.07
Stanislaus	0.05	0.07	0.05	0.09	0.05	0.04
Sutter	0.02	0.02	0.02	0.05	0.05	0.03
Tehama	0.04	0.03	0.01	0.05	0.02	0.01
Tulare	0.04	0.07	0.07	0.09	0.02	0.04
Tuolumne	0.01	0.01	0.00	0.01	0.01	0.00
Ventura	0.13	0.21	0.19	0.22	0.10	0.16
Yolo	0.11	0.11	0.11	0.12	0.14	0.15
Yuba	0.05	0.02	0.02	0.02	0.07	0.03
Average	0.08	0.07	0.06	0.09	0.05	

Using population as the only allocation factor equalizes revenue per capita across cities within each county. Using assessed value as the only allocation factor equalizes revenue per dollar of assessed value (more commonly known as the effective tax rate) across cities within each county. Using both population and assessed value, of course, does not equalize in either of these ways, and is a middle ground between them. We find that the simple rule using both assessed value and population does a better job matching the results of our needs-and-preferences model than the rules that use assessed value or population only.

To compare and evaluate the three simple rules, we consider the correlation between each rule and actual revenue, as well as between each rule and our countywide and situs approaches to implementing our econometric model. Correlations of total revenue are very high, over .98 in every case, because larger cities get more revenue, regardless of the allocation approach. However, all three simple rules are slightly more highly correlated with both the situs and countywide needs-and-preferences approaches than they are with actual revenue, both for counties and cities. Also, the assessed value and population rule revenue is slightly more highly correlated with actual revenue

as well as with the situs and countywide approaches than are the assessed-value-only or the population-only rules.

We also examine correlations of per capita revenue and effective tax rates (revenue per dollar of assessed value) to gain a better understanding of the implications of the various rules. These are presented in Table 5.5, first for cities and then for counties. For counties, correlation is greater than .93 in every case, so examining the correlations does not allow us to differentiate strongly among the rules. However, the assessed-value-and-population rule revenue is more highly correlated with the needs-and-preferences model results (both countywide and situs) than with actual revenue. This is also true for the other three simple rules. For the counties, then, all three rules produce allocations that match the needs-and-preferences models better than they match current revenue allocations. Any of the rules would be an improvement over current allocations. However, the situs-based assessed-value rule and the assessed-value-and-population rules have the highest correlations with the needs-and-preferences model revenues.

Table 5.5: Correlation of Actual and Proposed Revenue

Correlation of actual and proposed revenue per capita for cities (over 1500 pop.)						
	Actual	**CW Model**	**Situs Model**	**AV & POP**	**AV (CW)**	**POP**
Actual	1.00					
CW model	0.73	1.00				
Situs model	0.77	0.91	1.00			
AV&POP	0.67	0.77	0.93	1.00		
AV (CW)	0.71	0.74	0.92	0.97	1.00	
POP	0.25	0.52	0.54	0.63	0.43	1.00
AV(Situs)	0.71	0.74	0.92	0.97	1.00	0.43
Correlation of actual and proposed revenue per capita for counties						
	Actual	**CW Model**	**Situs Model**	**AV & POP**	**AV (CW)**	**POP**
Actual	1.000					
CW model	0.983	1.000				
Situs model	0.989	0.997	1.000			
AV&POP	0.986	0.992	0.996	1.000		
AV (CW)	0.977	0.989	0.994	0.998	1.000	
POP	0.989	0.990	0.993	0.997	0.990	1.000
AV(Situs)	0.984	0.991	0.996	0.998	0.999	0.992
Correlation of actual & proposed revenue per $ of assessed value for cities (over 1500 pop.)						
	Actual	**CW Model**	**Situs Model**	**AV & POP**	**AV (CW)**	**POP**
Actual	1.00					
CW model	0.44	1.00				
Situs model	0.41	0.81	1.00			
AV&POP	0.30	0.65	0.72	1.00		
AV (CW)	0.11	0.21	0.63	0.50	1.00	
POP	0.30	0.66	0.63	0.97	0.28	1.0000
AV(Situs)	0.11	0.21	0.63	0.50	1.00	0.2773

Correlation of actual and proposed revenue per $ of assessed value for counties						
	Actual	CW Model	Situs Model	AV & POP	AV (CW)	POP
Actual	1.0000					
CW model	0.9290	1.0000				
Situs model	0.9520	0.9880	1.0000			
AV&POP	0.9460	0.9630	0.9800	1.0000		
AV (CW)	0.9320	0.9540	0.9780	0.9930	1.0000	
POP	0.9450	0.9560	0.9660	0.9920	0.9680	1.0000
AV(Situs)	0.9496	0.9570	0.9845	0.9913	0.9956	0.9705

Turning to cities, we see much more variation in the correlation coefficients, but the same patterns emerge as we saw in the case of counties. Again, the revenue allocations generated by all of the simple rules are more highly correlated with our needs-and-preferences revenues than they are with actual revenues, indicating that the simple rules would move us closer to an allocation reflecting needs and preferences. Clear advantages of the assessed-value-and-population model are apparent here, as that rule produces the highest correlations with the needs-and-preferences revenues. Each of the other rules has a weakness: The population-only rule would represent a very dramatic departure from current allocations, very likely changing allocations by amounts far greater than what could be accepted politically (correlation between population-only revenue per capita and actual revenue per capita is only .25). The assessed-value-only rules, both countywide and situs, have very low correlation with needs-and-preferences as well as with actual revenue per dollar of assessed value. Although including population as an allocation factor departs from a situs-based approach, it is interesting to note that the revenue produced by this rule is very highly correlated with revenue allocations generated by the situs version of the needs-and-preferences model (.93 for revenue per capita and .72 for revenue per dollar of assessed value). Including population along with assessed value as an allocation factor, therefore appears to be very much in line with the revenue allocations implied by a situs-based approach that accounts for needs and preferences. We conclude that the simple rule based on assessed value and population serves well as a revenue allocation mechanism that reflects needs and preferences. It is better in this regard than a rule based only on assessed value or a rule based only on population.

Reform of the property tax allocation mechanism would be much easier to implement if it did not result in significant revenue losses in many jurisdictions. Table 5.6 shows the percentage of cities and the percentage of counties that would gain revenue under each of the scenarios that we have discussed. Our preferred simple rule, using assessed value and population, would result in a revenue gain for 82 percent of cities, but for only 15 percent of counties. 85 percent of county governments would lose revenue. These results are sensitive to the assignment of redevelopment district revenue (see notes to Table 5.6).

Table 5.6: Percentage of Jurisdictions Gaining Under Each Rule

RULE	Percent of cities gaining	Percent of counties gaining
Countywide approach to needs-and-preferences model	66	11
Situs approach to needs-and-preferences model	56	50
Simple rule based on AV & population	82	15
Simple rule based on AV	71	35
Simple rule based on population	81	9
Simple rule based on situs shares and AV	62	46
Simple rule based on AV & population, pre-ERAF	90	98
Simple rule based on situs shares and AV, pre-ERAF	76	98

Notes:
[1] The last two rows are based on averages of predicted revenue in 1994-1998, the years in our sample following the implementation of ERAF. Other rows are based on averages of predicted revenue for all years in our sample, 1992-1998.
[2] These results are sensitive to our assumption concerning the source of redevelopment district revenue. We have divided redevelopment revenue evenly between cities and counties. If, instead, we assigned all city redevelopment district revenue to cities and all county redevelopment district revenue to counties, the percentages given in this table would differ. For example, in the case of the simple rule based on assessed value and population, roughly half of cities and half of counties would gain revenue.

One approach to making such a reform possible would be to enlarge the pool of revenue available. An obvious way to do this in California would be to abolish the Educational Revenue Augmentation Fund (ERAF), which is discussed in detail in Chapter 2. If the assessed-value-and population rule were coupled with abolishing ERAF, 90 percent of cities and all but one county (Mono County) would gain revenue. It is not surprising that counties would gain so much disproportionately to cities given that they suffered the greatest revenue loss under ERAF. Of course, the state would have to find another source of school funding to replace lost ERAF revenue, but doing so would improve the state-local fiscal relationship.

Chapter 6: Conclusions

The property tax remains an important source of revenue for local governments, contributing nearly three-fourths of total local tax revenue nationwide throughout the 1990s. It has endured, not because it is popular among taxpayers, but because it can be administered locally with relatively little fear of its tax base migrating to other jurisdictions and it generates a stable and predictable revenue stream. It has survived despite numerous attempts in many states to limit its role in local government and school finance. Even in California, after passage of Proposition 13, the property tax still contributes 80 percent of county and 20 percent of city tax revenues.

The property tax is still regarded as a local tax in California since it is administered locally and the revenue raised within a particular county remains in that county. However, since Proposition 13, the state has determined, through implementing legislation (SB 154 and AB 8) and subsequent legislation (the shift to no/low tax cities and the ERAF shift) how property tax revenue is allocated among the various government entities and schools within the county. Each local government's share of county property taxes, under current allocation rules, is based on revenue patterns from the 1970s. These current property tax shares do not reflect the changes in needs and preferences of local jurisdictions caused by factors such as growth, boundary changes, and new cities.

Despite the Proposition 13 limitations placed on property tax revenue, local governments have attempted to satisfy changing demand for and cost of services by increasing reliance on other revenue sources, such as fees, charges, and the sales tax. The consequences of increased local reliance on the sales tax have led to renewed interest in fiscal reform. Many proposals have involved swapping the local share of the sales tax for increased local government shares of the property tax and it is recognized that any such swap or shift must be preceded by reform of the property tax allocation system. Government leaders, community advocates, and academics agree that allocations to local jurisdictions should reflect community needs and preferences.

As is common practice in analyzing the demand for and cost of government services, we examine per capita spending by local governments in California. Using 1992-98 data we are able to identify several factors that help explain variations in per capita spending by cities and counties. We find that resource variables such as personal income, assessed value of property, and intergovernmental aid have positive and statistically significant effects on spending for both city and county governments. Measures of urban cost such as the crime rate and unemployment rate, as well as the percentage of assessed value in redevelopment districts, have an important positive influence on city spending. Our results are very much in line with theoretical expectations and with findings of other empirical studies. They provide the basis on which we predict city and county expenditure that reflects each jurisdiction's needs and preferences.

We use predicted expenditures from our econometric model as the basis of proposed revenue allocation rules, using two different approaches. The first approach which we refer to as the "countywide" approach assigns a share of countywide non-school property tax revenue to each city and the county equal to its share of countywide predicted expenditures. The second approach, the "situs approach" divides revenue raised within a city's boundaries between the city and its county in proportion to their needs and preferences as measured by predicted expenditures. The two approaches lead to noticeably different

results. Counties tend to fare better relative to the status quo under the situs approach than under the countywide approach. Fifty percent of all counties would receive more revenue if current rules were abandoned and our situs-based rules implemented. The countywide approach only generates a gain for eleven percent of counties. In contrast, cities do slightly better under the countywide approach (66 percent receive increased revenues) than under the situs approach (56 percent receive increased revenues). The percentages of cities and counties gaining revenue depends on treatment of redevelopment district revenue. If more responsibility for redevelopment districts were assigned to cities, then fewer counties would lose revenue. Our approach can be used in conjunction with any treatment of redevelopment revenue.

The revenue increases projected by our needs-and-preferences model for cities are not correlated with characteristics such as population, per capita income, or per capita assessed value. Therefore, we cannot say that the current system puts broad categories of cities, such as large cities or low-income cities at a disadvantage. Rather, cities that would gain under our model are as likely to be large as small, or high-income as low-income. In contrast, there is some correlation between projected revenues for counties and these factors. County governments in lower-income, lower-assessed-value counties would receive somewhat larger percentage revenue increases according to our needs and preferences based approaches.

We consider the property tax shares based on the shares of predicted spending from our econometric model, using both the countywide and situs approaches, to be benchmarks in that they are based on our best estimate of community needs and preferences. Implementation of these rules would, however, require obtaining large quantities of data--data on each of the variables included in our model annually for each city and county in the state, and would not necessarily facilitate citizen understanding of the distribution of property taxes.

Fortunately, we are able to show that a very simple rule, based on assessed value and population addresses these implementation issues and generates allocations that come close to our benchmark shares. The parameters of this formula are derived from our econometric model. The formula first determines the share of revenue that goes to the county, 50 percent of countywide revenue plus an amount determined by the share of assessed value and population in unincorporated areas. The remainder is then allocated among cities on the basis of assessed value and population. We consider rules based on either assessed value or population alone, but reject them because they do not match our benchmarks as closely as a rule based on both factors.

The simple population-and-assessed-value rule generates allocations that are closer to our benchmarks, both “countywide” and “situs,” than they are to actual allocations. Thus, a simple allocation rule that determines each local

government's share of property tax revenues on the basis of its shares of both countywide population and assessed valuation would improve upon the existing system in several ways:

- It would result in an allocation of property tax revenues more closely aligned with current needs and preferences. This would redress issues of unfairness that have resulted from continued use of 1970s revenue patterns as a basis for allocating revenue in spite of subsequent demographic change in California.

- It would be easy to implement.

- It would be easy to understand and explain.

- It would easily accommodate boundary changes and new city formation.

- It would reduce incentives for inefficient land use. Jurisdictions would not have an incentive to favor retail property growth over other types of growth.

- If school entities were given their pre-ERAF allocations, then most cities and counties would be winners, with 98 percent of counties and 90 percent of cities gaining revenue under the new rule as compared to the status quo.

If ERAF were eliminated, the state would have to find new school revenue elsewhere. However, eliminating ERAF would provide sufficient revenue to implement our proposed reform without many jurisdictions losing revenue. Thus, our reform could be implemented as a simple rule, without having to graft yet another rule on top of the existing layers of complexity. Furthermore, elimination of ERAF would reassure local governments that they have a stable and secure source of tax revenue.

Allocation of property tax revenue on the basis of assessed value and population would allow local governments to break free from an outdated revenue allocation mechanism and would reflect needs and preferences. As needs and preferences change, revenue allocation patterns would change automatically, as updated assessed value and population would be used to allocate revenue. With this approach California can undertake basic reform of the property tax allocation system that is more than a zero-sum game. The new system would not only be more equitable, but more efficient and transparent as well. Even if this wholesale reform is not adopted, the rules developed in this study can provide guidance for any additional funds that might be allocated to cities and counties.

Appendix 1: The Property Tax, Reform Proposals in California, and Allocation in Other States

Reliance on the Property Tax

Proposition 13 reduced local government reliance on the property tax in California, as Tables A1.1 and A1.2 indicate. In 1977-78, the property tax provided over 91 percent of county tax revenue and 33 percent of county total revenue in California. One year later, immediately following passage of Proposition 13, these percentages dropped to 83 percent and 17 percent respectively. Over the next 13 years, the property tax grew gradually in importance as a source of revenue for counties until the state shifted property taxes from local governments to schools (ERAF) beginning in 1992-93. The property tax is still an important source of tax revenue for counties, accounting for 80 percent of tax revenue in 1997-98. However, growth in non-tax sources of revenue has reduced the property tax to only 12 percent of total revenue (revenue from all sources, tax and non-tax). It is clear from Table A1.1 that the most important source of replacement funds for counties has been the state. State grants to counties have increased from 24 percent of total revenue in 1977-78 to over 40 percent of revenue in 1997-98.

The experience of California cities has been quite different. To begin with, they were less reliant on the property tax. Property taxes contributed 46 percent of city tax revenue and 22 percent of total revenue in 1977-78, prior to Proposition 13. The next year these percentages fell to about 27 percent and 11 percent, respectively. By 1997-98 the property tax provided only 21 percent of tax revenue and 6.5 percent of total revenue to cities. As Table A1.2 indicates, cities have turned to increased service charges to replace lost property taxes. Current service charges have grown from 8 percent of total revenue for cities in 1977-78 to over 40 percent in 1997-98.

The property tax has endured, despite assaults by legislators and taxpayers, because it is arguably the best source of revenue for local governments. It is essential that local governments have their own source of revenue if they are to preserve local autonomy. The property tax is better suited to local use than other major taxes. The property tax has been the principal source of revenue for local governments because it can be administered locally with relatively little fear of its tax base migrating to other jurisdictions. It doesn't compete with tax bases preferred by higher levels of government, it can be integrated with local planning and zoning systems, and it generates a stable and predictable revenue stream.

The property tax satisfies the ability-to-pay principle and the benefit principle of taxation. Since property ownership tends to increase with income, those with greater ability to pay will pay higher taxes. The property tax provides a method for indirectly taxing certain types of income, such as the imputed rental income of owner-occupants that escape income taxation. The property tax serves as a benefit tax since revenues are used to finance

services, such as police and fire protection, streets, and parks that benefit property owners and increase the value of their property.

Although the property tax has been under attack throughout much of its history, it remains an important source of revenue for local governments nationwide. Throughout the nineties, property taxes provided nearly 30 percent of the general revenue of local governments, second only to intergovernmental aid in importance (Table A1.3). And although many local governments have increased their reliance on local sales and income taxes, property taxes still provide nearly three fourths of total local government tax revenue.

Reform Proposals

An active policy discussion about property tax allocation has begun and has given rise to proposed legislation In particular, proposals from two groups, the State Municipal Advisory Reform Team and the Speaker's Commission on State and Local Government Finance, include specific recommendations for correcting the misallocation of resources resulting from increased local reliance on the sales tax. The California Legislative Analyst's Office has recently released a report describing five alternative proposals, some of which address all four of the above mentioned problems.

In February 1999, the California State Controller, Kathleen Connell, formed the State Municipal Advisory Reform Team (SMART). This task force, composed of representatives of state and local government, business and labor, environmentalists, real estate developers, and economists, was charged with finding a solution to the current imbalance between State and local finances.

Among the SMART task force recommendations is a sales tax distribution plan whereby 90 percent of the sales tax revenue generated from the statewide uniform 1.25 percent local sales tax would be distributed based on the currently used point-of-sale method, and the remaining 10 percent plus all future increases in statewide sales tax revenues would be allocated on the basis of population.[32] It is argued that this scheme would remove the incentives for retail fiscalization and help to equalize per capita tax revenues.

Assembly Speaker Antonio Villaraigosa formed the Speaker's Commission on State and Local Government Finance in December 1998 to study the state-local finance relationship. At their November 1999 meeting in Burbank, the

[32] The Bradley-Burns Uniform Sales and Use Tax Law (1955) created a uniform local sales tax rate throughout California, which is now at 1.25 percent. One-quarter percentage point of the 1.25 percent Bradley-Burns local tax is allocated to the county where the sale occurs and is used to fund transportation projects. The remaining one percentage point is currently allocated to either an incorporated city or the county depending on the location of the sale. For more details on the SMART proposals see California State Controller (2000).

Commission adopted a fiscal reform proposal that calls for the swap of a portion of the locally levied sales tax for an equivalent amount of the property tax. Specifically, the locally levied one percent sales tax rate would be reduced to 0.5 percent and the state rate would be raised by 0.5 percent to 6.5 percent.[33] An equal amount of property tax would be shifted from school and/or community college districts. The state would use its increased sales tax revenues to compensate educational programs through the state aid system. This would alter each local entity's property tax share because each would receive the amount of property tax it received in the prior year plus the amount of sales tax it lost. In subsequent years, each local jurisdiction would receive a pro-rata share of any property taxes resulting from growth in assessed value within their jurisdiction.

Many arguments can be made for state and local governments swapping revenue sources. The fiscalization of land use would be reduced if local governments were not competing for sales tax revenues. This competition would end if the sales tax were entirely, or even primarily, a state tax. The property tax is a locally collected and administered tax, and it makes sense that it be a primary source of local revenues. The property tax base, at least the land component, is immobile, and many of the services provided by local governments are property related. Furthermore, since property tax revenue derives from all types of assessed value (residential, commercial, and industrial), it creates no incentive for retail growth in particular.

The swap of sales and property taxes, as proposed by the Speaker's Commission, would lock in a new set of property tax shares for local governments based on property tax shares from the 1970's and the retail distribution in 1999. It is not clear whether this system would provide a better match between the level of local government revenues and local government program obligations and priorities, but it will share the same flaw as the existing formula by creating a new system that is incapable of responding to changing local circumstances.

The California State Legislature stated formally its intention to revamp the property tax allocation system when it enacted Chapter 94, Statutes of 1999 (AB 676, Brewer). Chapter 94 declared that California's system for allocating property taxes is "seriously flawed" and directed the Legislative Analyst's Office (LAO) to develop alternatives. Their report describes five alternative restructuring proposals, all of which include the establishment of new property tax shares for local governments designed to better reflect current service responsibilities. One of their most comprehensive reform proposals involves significant changes in both the sales and property tax. Specifically, the sales tax would be reduced by 1.25 percentage points through

[33] The state sales tax rate was reduced from 6.0 percent to 5.75 percent effective January 1, 2001 due to a provision in the law that requires this reduction when the budget surplus exceeds four percent of the general fund for two consecutive years.

a reduction in the state rate from 6 percent to 5.25 percent and a reduction in the local Bradley-Burns rate from 1.25 percent to 0.75 percent. One half of the remaining local sales tax would be distributed on the basis of population, rather than on location of sale. The lost sales tax revenues would be partially replaced by increased property tax revenues that would arise from switching to market value assessment for all nonresidential property. The proposal also calls for shifting $1.3 billion in property taxes from schools to cities and counties. The current one percent property tax rate would be split into a series of individual local government rates that sum to one percent initially. Local governments could, after an amendment in the Constitution, raise or lower their property tax rate according to a voter-approved local government charter specifying the process. This ambitious proposal addresses all of the current concerns listed above. However, while it increases property tax revenues of cities and counties, it does not specifically provide for a mechanism to determine the allocation of revenue among cities and counties.[34]

Other States

California's property tax allocation challenge is unique among states. Most property tax limitations apply to specific levels of government (counties, cities and towns, or school districts). Twelve states, including California, have "overall" property tax limitations, which subject all the governments having jurisdiction over a particular parcel of property to a combined tax rate limit.[35] In surveying officials and taxpayer advocacy groups in several of these states, we were not able to find one in which allocation of property tax revenue among local governments was said to be a controversial issue.

In every case, we have found that the issue of how to allocate property tax revenues given a tax rate limit applying to multiple taxing districts is resolved by determining what tax rate each district can apply to its assessed value. In no case, have we found an arrangement like California's under SB 154, in which a taxing district receives revenue that does not equal the revenue generated by applying its tax rate to its assessed value.

In Arizona, if the combined tax rate exceeds the one percent limit, the school tax rates are reduced and the state provides additional aid to the school district to make up the difference. Surprisingly, relatively few jurisdictions have taken advantage of the obvious opportunity to raise tax rates at the state's expense. This is in part because taxing districts cannot increase tax levies more than 2% per year. However, pressure on state revenue is likely to grow over time as municipal tax rates increase. Some districts have been pressured by the state to decrease their tax rates, and pressure for change at the state level is likely to intensify.

Michigan's and Nevada's tax rate limits, 50 mills and 36.4 mills respectively, are rarely binding. In Michigan, when the 50 mill limit is binding,

[34] California Legislative Analyst's Office (2000).
[35] Advisory Commission on Intergovernmental Relations (1995).

there is a "last-in-first-out" provision requiring the largest rate reductions from districts that have most recently raised their tax rates the most. However, districts within a county can negotiate an alternative arrangement if they wish.

Ohio's 10-mill limit is divided up among sub-county taxing districts according to county-specific arrangements made in the 1930s. We were not able to discover how these arrangements were determined. Apparently, this has not been a controversial issue because cities have another important source of revenue--the municipal income tax, because there is no cap on assessments, and because local governments can exceed their tax rate limits with the approval of a majority of voters.

In Washington, each taxing district puts in a budget request. If the sum of requested tax rates in taxing districts governing a particular residence exceeds the tax rate limit, then taxing districts have to reduce their tax rates. There is a "pecking order" of districts that determines the priority that each type of district gets in being able to keep its requested tax rate. In King County (Seattle), only a couple of fire districts have been denied their requested rate in recent years. Properties are reassessed at market value annually. Rapid increases in property values in recent years have forestalled the higher tax rate requests that we might otherwise expect.

Table A1.1: California County Revenues

Year	Various Revenue Sources As Percent of Total Revenue (tax revenue + non-tax revenue)					Property Tax As Percent of Total Taxes
	Property Tax	Sales & Use Tax	Current Service Charges	Federal Grants	State Grants	
1974-75	35.0%	2.0%	9.5%			93.0%
1975-76	35.2%	2.1%	9.1%	22.9%	25.0%	92.8%
1976-77	35.4%	2.2%	8.9%	23.9%	24.7%	92.6%
1977-78	33.2%	2.2%	8.6%	26.5%	23.9%	91.6%
1978-79	16.9%	2.5%	8.7%	27.9%	36.1%	83.1%
1979-80	20.5%	2.9%	7.2%	27.0%	32.9%	84.0%
1980-81	20.5%	2.7%	7.2%	26.8%	33.4%	85.6%
1981-82	21.2%	2.6%	7.7%	25.2%	34.1%	86.7%
1982-83	22.4%	2.4%	8.2%	23.2%	34.8%	88.2%
1983-84	22.3%	2.4%	8.2%	21.8%	35.3%	87.6%
1984-85	23.1%	2.4%	7.9%	21.5%	35.1%	86.9%
1985-86	23.2%	2.2%	8.6%	20.3%	36.1%	87.6%
1986-87	23.0%	2.0%	8.5%	18.9%	36.3%	87.6%
1987-88	24.0%	2.0%	8.3%	19.0%	37.5%	88.2%
1988-89	23.9%	1.9%	8.3%	18.8%	36.6%	88.1%
1989-90	23.6%	1.9%	8.4%	18.4%	37.4%	88.2%
1990-91	23.3%	1.8%	9.1%	19.3%	35.7%	88.6%
1991-92	22.1%	1.5%	9.1%	19.0%	36.5%	89.0%
1992-93	21.2%	1.4%	9.0%	20.1%	38.2%	88.7%
1993-94	15.4%	1.2%	9.2%	21.7%	42.1%	85.5%
1994-95	11.2%	1.1%	8.3%	20.9%	39.3%	83.1%
1995-96	11.6%	1.2%	9.1%	21.4%	42.0%	82.1%
1996-97	12.1%	1.4%	9.9%	21.0%	43.3%	80.9%
1997-98	12.4%	1.4%	10.7%	21.6%	40.5%	80.1%

Source: California State Controller's Office, *Annual report on Financial Transactions Concerning Counties of California*, Sacramento, California, various years.

Table A1.2: California City Revenues

Year	Various Revenue Sources As Percent of Total Revenue (tax revenue + non-tax revenue)					Property Tax As Percent of Total Taxes
	Property Tax	Sales & Use Tax	Current Service Charges	Federal Grants	State Grants	
1974-75	24.3%	15.6%	9.0%			48.7%
1975-76	23.9%	15.0%	8.5%	13.2%	12.2%	48.7%
1976-77	23.8%	15.5%	8.6%	14.4%	11.3%	47.7%
1977-78	21.9%	15.4%	8.2%	18.7%	10.7%	46.1%
1978-79	10.6%	17.2%	9.1%	17.8%	13.9%	26.6%
1979-80	10.9%	17.6%	9.5%	15.1%	10.5%	31.8%
1980-81	11.1%	16.9%	10.5%	12.9%	10.9%	32.7%
1981-82	7.9%	12.6%	38.4%	8.5%	6.3%	25.2%
1982-83	8.6%	12.0%	38.3%	7.6%	5.9%	26.4%
1983-84	8.0%	12.2%	38.0%	6.8%	5.7%	24.0%
1984-85	7.8%	12.2%	37.7%	6.4%	7.1%	23.4%
1985-86	8.0%	11.8%	36.5%	5.7%	8.1%	23.9%
1986-87	8.7%	12.1%	38.1%	4.1%	7.8%	25.0%
1987-88	8.6%	11.8%	38.1%	3.2%	7.3%	25.1%
1988-89	8.6%	11.5%	38.3%	3.2%	7.1%	25.2%
1989-90	8.7%	11.3%	38.1%	2.8%	6.5%	25.9%
1990-91	9.0%	10.8%	37.6%	2.8%	6.7%	27.0%
1991-92	9.0%	9.8%	38.1%	2.8%	6.6%	27.7%
1992-93	8.2%	9.6%	40.0%	2.9%	6.6%	25.8%
1993-94	7.2%	9.5%	41.0%	4.0%	7.2%	23.1%
1994-95	7.0%	9.6%	41.1%	5.3%	6.8%	22.4%
1995-96	6.7%	9.6%	40.5%	5.3%	6.5%	22.1%
1996-97	6.1%	9.2%	38.5%	5.0%	6.8%	21.1%
1997-98	6.5%	9.8%	40.2%	4.7%	6.9%	21.1%

Source: California State Controller's Office, *Annual Report on Financial Transactions Concerning Cities of California*, Sacramento, California, various years.

Table A1.3: Local Revenue Nationwide

Year	Local Revenue Sources As Percentage of Local General Revenue					Property Tax As Percent of Total Taxes
	Property Tax	Sales Tax	Income Tax	Current Charges & Misc.	Inter-govern-mental Aid	
1902	73.1%	0.0%	0.0%	11.0%	6.6%	88.6%
1913	72.8%	0.2%	0.0%	14.2%	5.9%	91.1%
1922	76.9%	0.5%	0.0%	12.3%	8.3%	96.9%
1932	73.1%	0.5%	0.0%	10.6%	14.3%	97.3%
1940	60.1%	1.9%	0.0%	7.3%	27.8%	92.7%
1950	50.2%	3.5%	0.0%	11.4%	31.6%	88.2%
1960	47.8%	4.1%	0.0%	14.6%	30.6%	87.4%
1965	45.9%	4.3%	0.0%	15.2%	31.9%	86.9%
1970	40.7%	3.8%	2.0%	15.5%	36.5%	84.9%
1975	34.5%	4.4%	1.8%	15.7%	42.3%	82.2%
1980	28.2%	5.2%	2.1%	18.8%	44.1%	75.9%
1985	28.2%	5.9%	2.3%	23.1%	39.0%	74.2%
1990	29.2%	6.0%	2.2%	23.5%	37.2%	74.5%
1992	30.0%	5.8%	2.2%	22.7%	37.7%	75.6%
1993	30.1%	5.8%	2.2%	22.7%	37.5%	75.7%
1994	29.5%	5.9%	2.2%	22.7%	37.9%	74.8%
1995	28.7%	6.0%	2.2%	23.0%	38.3%	74.2%
1996	28.1%	6.0%	2.3%	23.7%	38.1%	73.7%
1997	27.9%	6.1%	2.3%	23.5%	38.4%	73.3%

Sources: Census Bureau (www.census.gov) for 1992-1997.
Tax Foundation, *Facts & Figures on Government Finance*, 31st Edition, for 1902-1990.

Appendix 2: Property Tax Apportionment Example: SB 154 & AB 8

Consider a county that consists of two cities and two school districts as illustrated below:

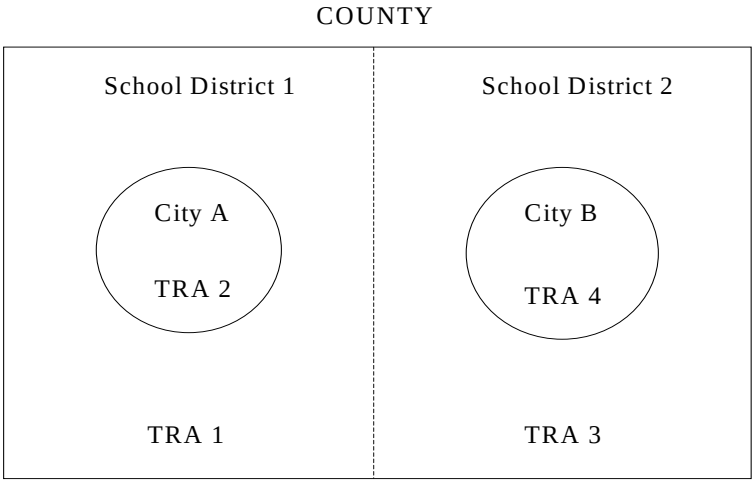

Figure A2.1

There are four tax-rate areas in the county each of which contains $1 million of assessed value. Table A2.1 shows the property tax rates set by each local agency and the property taxes collected within each tax rate area and distributed to the local jurisdictions serving each area prior to Proposition 13.

Table A2.1: Pre-Proposition 13 Property Tax Revenues

		Property Tax Revenues Collected and Received				
	Tax Rate	**TRA 1**	**TRA 2**	**TRA 3**	**TRA 4**	**TOTAL**
County	1.0%	$10,000	$10,000	$10,000	$10,000	$40,000
City A	0.5 %		5,000			5,000
City B	1.5%				15,000	15,000
S.D. 1	0.5%	5,000	5,000			10,000
S.D. 2	0.5%			5,000	5,000	10,000
TOTAL		$15,000	$20,000	$15,000	$30,000	$80,000

After Proposition 13, total property tax revenues were reduced from $80,000 to $40,000 (1 percent of total assessed valuation in the county of $4 million). Under SB 154, these revenues were allocated to agencies within the county based on their share of total county revenues, computed using revenue averaged over the previous three years. Assuming that the above distribution of revenues represents the averages over the previous three years, then the county share would be 0.5 ($40,000/$80,000), city A's share would be 0.0625 ($5,000/$80,000), city B's share would be 0.1875 ($15,000/$80,000), and each school district's share would be 0.1250 ($10,000/$80,000). Thus property tax revenues were distributed under SB 154 as shown in Table A2.2.

Table A2.2: 1978-79 SB 154 Property Tax Allocations

	TRA 1	**TRA 2**	**TRA 3**	**TRA 4**	**TOTAL**
County	$5,000	$5,000	$5,000	$5,000	$20,000
City A		2,500			2,500
City B				7,500	7,500
S.D. 1	2,500	2,500			5,000
S.D. 2			2,500	2,500	5,000
TOTAL	$7,500	$10,000	$7,500	$15,000	$40,000

Since each TRA has the same assessed valuation ($1 million), they all contribute a total of $10,000 in property tax revenues. Notice that TRA 1 and TRA 3 however receive only $7,500 for their local governments. They were the lower-tax areas prior to Proposition 13 and, under SB 154, end up subsidizing the higher-tax rate area, TRA 4 (City B).

In order to determine the property tax allocations for 1979-80, as determined by AB 8, we must adjust each local agency's property tax revenues from 1978-79 by the amount of state assistance they received in the form of block grants in 1978-79. Assume that both cities and the county each received $1,000 in 1978-79 block grants. According to AB 8 city revenue bases were augmented by 82.9 percent of their block grants while county revenue bases were augmented by 100 percent of their block grants (increased by state health and welfare buyouts and decreased by state grants for county health services). These increases in revenue base for cities and counties were subtracted from the revenue bases of their respective school districts. Thus the revenue bases adjusted for state assistance in this example are given in Table A2.3.

Table A2.3: 1978-79 Revenue Base: Adjusted by State Assistance

	TOTAL	TRA 1	TRA 2	TRA 3	TRA 4
County	$20,000	$5,000	$5000	$5000	$5,000
	+ 1,000	+ 250	+ 250	+ 250	+ 250
	$21,000	**$5,250**	**$5,250**	**$5,250**	**$5,250**
City A	$2,500		$2,500		
	+ 829		+ 829		
	$3,329		**$3,329**		
City B	$7,500				$7,500
	+ 829				+ 829
	$ 8,329				**$8,329**
S.D. 1	$5,000	$2,500	$2,500.00		
	- 1,329	- 664.50	- 664.50		
	$3,671	**$1,835.50**	**$1,835.50**		
S.D. 2	$5,000			$2,500	$2,500.00
	- 1,329			- 664.50	- 664.50
	$3,671			**$1,835.50**	**$1,835.50**
Total	**$40,000**	**$7,085.50**	**$10,414.50**	**$7,085.50**	**$15,414.50**

AB 8 provided that each local agency would receive a base amount of revenue as specified above plus a share of the incremental revenue due to growth in assessed valuations. The above adjusted base revenues were used to determine each entities share from the tax rate areas it serves (AB 8 factors). For example, of the total $7,085.50 base revenues in TRA 1, $5,250 are distributed to the county thus the county share for TRA 1 is 74.09 percent ($5,250/$7,085.50). The remaining AB 8 factors for our example are given in Table A2.4.

Table A2.4: AB 8 Factors

	TRA 1	TRA 2	TRA 3	TRA 4
County	74.09%	50.41%	74.09%	34.06%
City A		31.97%		
City B				54.03%
S.D. 1	25.91%	17.62%		
S.D. 2			25.91%	11.91%

To illustrate how AB 8 distributes the tax increment from growth in assessed values, assume that assessed value grows at the rate of 5 percent in the unincorporated area of the county (TRA 1 and TRA 3), 10 percent in City A (TRA 2), and 20 percent in City B (TRA 4). Incremental taxes for each TRA are 1 percent of the increase in assessed valuation:

TRA 1	TRA 2	TRA 3	TRA 4
$500	$1,000	$500	$2,000

These incremental tax revenues are then allocated to the jurisdictions serving each TRA by applying the AB8 factors derived above. Adding these revenues to the 1978-79 adjusted base revenues yields the 1979-80 property tax revenue allocations as illustrated in Table A2.5.

Table A2.5: 1979-80 Property Tax Allocations

	TRA 1	TRA 2	TRA 3	TRA 4	TOTAL	As % of Countywide Total
County	$5,250	$5,250	$5,250	$5,250		
	+ 370.45	+ 504.10	+ 370.45	+ 681.20		
	$5,620.45	**$5,754.10**	**$5,620.45**	**$5,931.20**	**$22,926.20**	**52.11%**
City A		$3,329				
		+ 319.70				
		$3,648.70			**$3,648.70**	**8.29%**
City B				$8,329		
				+ 1,080.60		
				$9,409.60	**$9,409.60**	**21.39%**
S.D. 1	$1,835.50	$1,835.50				
	+ 129.55	+ 176.20				
	$1,965.05	**$2,011.70**			**$3,976.75**	**9.04%**
S.D. 2			$1,835.50	$1,835.50		
			+ 129.55	+ 238.20		
			$1,965.05	**$2,073.70**	**$4,038.75**	**9.18%**
Total Received	**$7,585.50**	**$11,414.50**	**$7,585.50**	**$17,414.50**	**$44,000**	**100%**
Total Paid	**$10,500**	**$11,000**	**$10,500**	**$12,000**		

Notice that property owners in the unincorporated county paid a total of $21,000 in property taxes yet the local agencies that serve them only received a total of $15,171. The difference, $5,829, went to local agencies serving TRA 2 and TRA 4, namely City A and City B.

Appendix 3: Data Sources

[1] California Attorney General's Office, via Rand California
http://www.ca.rand.org/stats/community/crimerate.html
[2] California Board of Equalization Annual Report
[3] California Department of Finance, Demographic Unit, via Rand California
http://www.ca.rand.org/stats/popdemo/popest.html
[4] California Employment Development Department, Labor Market Information Division
http://www.calmis.ca.gov/htmlfile/subject/lftable.htm
[5] California Governor's Office of Planning and Research, California Planners' Book of Lists
http://www.calpin.ca.gov/archives/default.asp
[6] California Secretary of State, California Roster
http://www.ss.ca.gov/executive/ca_roster/2000ca_roster.htm
[7] California State Controller's Office Cities Annual Report, via Rand California
http://www.ca.rand.org/stats/govtfin/cityfin.html
[8] California State Controller's Office Counties Annual Report, via Rand California
http://www.ca.rand.org/stats/govtfin/cntyfin.html
[9] California State Controller's Office Redevelopment Agencies Annual Report
[10] California State Controller's Office Special Districts Annual Report
[11] Construction Industry Research Board, via Rand California
http://www.ca.rand.org/stats/economics/construct.html
http://www.ca.rand.org/stats/economics/cityconst.html
[12] US Bureau of Economic Analysis
http://www.bea.doc.gov/bea/regional/reis/
[13] US Bureau of Labor and Statistics
http://www.bls.gov/sahome.html
[14] US Bureau of Labor Statistics, via Rand California
http://www.ca.rand.org/stats/economics/inflation.html
[15] US Census Bureau, via Rand California
http://www.ca.rand.org/stats/popdemo/popraceage.html
http://www.ca.rand.org/stats/community/popdensity.html

Table A3.1: Data Sources by Variable

Variable	Source	Observation Level	Notes
Government spending	[7] [8] [10]	City County Special District	Sources [3] and [14] used to convert data to real, per capita terms
Population	[3]	City, County	
Population density	[3], [5] [3],[15]	City County	City area is from Governor's office County area from US Census
Population growth	[3]	City, County	
Personal income	[12]	County	Population estimates from [12] are used to convert data to per capita terms
Assessed value	[2]	City, County	[3] and [14] used to convert data to real, per capita terms
New housing	[11]	City, County	[3] and [14] used to convert data to real, per capita terms. Many small cities missing
Assessed value in redevelopment	[9]	Redevelopment agency	[3] and [14] used to convert data to real, per capita terms
Population in unincorporated areas	[3]	County	
Industry composition	[13]	County	[4] was an alternative source for very similar data
Population composition	[15]	County	
Crime rate	[1]	City, County	Many small cities missing
Unemployment Rate	[4]	City, County	Many small cities missing
Intergovernmental aid, state and federal	[7] [8] [10]	City County Special District	[3] and [14] used to convert data to real, per capita terms
Charter city	[6][36]	City	See footnote for other sources
Central city	[15]	City	
Property Tax Revenue	[7] [8] [10]	City County Special District	[14] used to convert data to real terms

[36] Other sources, including [5] and [7], were used for this. Also, calls to individual city controller's were made to resolve conflicting information from the various sources.

Table A3.2: City Summary Statistics for Observations Included in Regression

Variable	Mean	Std Dev	Min	Max
Per capita operating expenditure	608	387	118	2,766
Population	66,213	211,743	1,870	3,716,000
Population density	4,488	3,505	42	24,708
Population growth rate	1.71	3.57	-25.10	92.42
Per capita personal income*	22,759	5,507	13,666	47,036
Per capita assessed valuation	52,216	34,976	5,912	363,292
Per capita new housing	845	915	0	12,203
Per capita redevelopment value	10,366	19,680	0	440,113
Pct population unincorporated area*	23.5	18.3	5.3	92.4
Pct of employees in agriculture*	3.1	4.4	0.1	34.2
Pct population minority*	44.0	15.2	6.6	78.0
Pct population seniors*	11.1	2.1	6.5	21.5
California crime index	2.42	1.34	0.26	10.79
Unemployment rate	8.8	6.0	1.1	38.2
Per capita federal aid	30	50	0	890
Per capita state aid	69	27	36	547
Charter city dummy	0.22	0.42	0	1
Central city dummy	0.15	0.36	0	1

*These variables are measured only at the county level.

Sources: See Appendix 3, Table A3.1

Notes:

- Operating expenditure does not include capital outlays and debt service.
- for all California cities without missing data and with a population of at least 1,500, except San Francisco (which is a joint city and county)
- for years 1992 – 1998
- 2493 total observations (366 cities, 338 cities with all 7 years)
- Dollar values are deflated to 1992 using CPI for California

Table A3.3: County Regressions; Dependent Variable: Log per Capita Operating Expenditure

Model:	OLS	OLS-W	OLS-PC	FGLS	FE
Log population	0.0173*	0.0173*	0.0173	0.0195***	-0.5140**
	(0.0102)	(0.0101)	(0.0205)	(0.0065)	(0.2330)
Log population density	-0.0136	-0.0136	-0.0136	-0.0083	-0.0042
	(0.0084)	(0.0087)	(0.0176)	(0.0053)	(0.1413)
Pct increase population	-0.0048	-0.0048	-0.0048	0.0008	-0.0015
	(0.0048)	(0.0051)	(0.0042)	(0.0032)	(0.0028)
Log per capita income	0.142**	0.142***	0.142	0.137***	0.168*
	(0.057)	(0.054)	(0.099)	(0.034)	(0.099)
Log per capita Assessed value	0.255***	0.255***	0.255***	0.272***	-0.048
	(0.031)	(0.030)	(0.054)	(0.019)	(0.093)
Log per capita new housing	0.0087	0.0087	0.0087	0.0195*	-0.0010
	(0.0170)	(0.0183)	(0.0311)	(0.0115)	(0.0148)
Log per capita AV in redev	0.0046**	0.0046**	0.0046	0.0021*	0.0027
	(0.0021)	(0.0022)	(0.0050)	(0.0013)	(0.0027)
Pct pop'n unincorp area	0.0038***	0.0038***	0.0038***	0.0038***	-0.0004
	(0.0004)	(0.0004)	(0.0007)	(0.0002)	(0.0022)
Pct workers agriculture	-0.0018	-0.0018	-0.0018	-0.0028***	0.0065
	(0.0013)	(0.0013)	(0.0029)	(0.0010)	(0.0056)
Pct population minority	-0.0004	-0.0004	-0.0004	-0.0010**	-0.0048
	(0.0007)	(0.0007)	(0.0016)	(0.0004)	(0.0045)
Pct population seniors	-0.0110***	-0.0110***	-0.0110***	-0.0114***	-0.0180
	(0.0024)	(0.0020)	(0.0040)	(0.0013)	(0.0112)
Crime rate	0.0131	0.0131	0.0131	0.0124**	-0.0054
	(0.0087)	(0.0085)	(0.0145)	(0.0051)	(0.0080)
Unemployment rate	0.0062***	0.0062**	0.0062	0.0092***	0.0058
	(0.0022)	(0.0025)	(0.0054)	(0.0016)	(0.0035)
Log per capita federal aid	0.128***	0.128***	0.128***	0.139***	0.119***
	(0.025)	(0.026)	(0.045)	(0.016)	(0.022)
Log per capita state aid	0.515***	0.515***	0.515***	0.490***	0.261***
	(0.041)	(0.045)	(0.093)	(0.028)	(0.040)
Constant	-1.32***	-1.32***	-1.32	-1.50***	10.06***
	(0.49)	(0.48)	(0.99)	(0.30)	(2.83)
R-squared	0.86	0.86	0.86	--	0.33

N = 392, n = 56, T = 7.

Table A3.4: City Regressions, Dependent Variable: Log per Capita Operating Expenditure

Model:	OLS	OLS-W	OLS-PC	FGLS	FE
Log population	-0.976***	-0.976***	-0.976***	-0.921***	-2.521***
	(0.092)	(0.076)	(0.179)	(0.033)	(0.505)
Log population squared	0.0419***	0.0419***	0.0419***	0.0401***	0.0949***
	(0.0043)	(0.0035)	(0.0082)	(0.0014)	(0.0256)
Log population density	0.0958***	0.0958***	0.0958***	0.1061***	-0.0131
	(0.0142)	(0.0141)	(0.0324)	(0.0083)	(0.0205)
Pct increase population	-0.0011	-0.0011	-0.0011	0.0013	0.0005
	(0.0022)	(0.0020)	(0.0023)	(0.0009)	(0.0007)
Log per capita income	0.531**	0.531**	0.531***	0.571***	0.316***
	(0.254)	(0.250)	(0.172)	(0.117)	(0.074)
Log per capita assessed value	0.678***	0.678***	0.678***	0.669***	0.252***
	(0.026)	(0.027)	(0.062)	(0.013)	(0.045)
Log per capita new housing	0.0049	0.0049	0.0049	0.0055	0.0057
	(0.0110)	(0.0110)	(0.0192)	(0.0058)	(0.0039)
Log per capita AV in redev	0.0167***	0.0167***	0.0167***	0.0166***	0.0006
	(0.0021)	(0.0022)	(0.0053)	(0.0012)	(0.0016)
Pct pop'n unincorp area	0.0097	0.0097	0.0097*	0.0053	-0.0037
	(0.0103)	(0.0078)	(0.0058)	(0.0047)	(0.0029)
Pct workers agriculture	-0.0057	-0.0057	-0.0057	0.0094	0.0190***
	(0.0207)	(0.0185)	(0.0114)	(0.0094)	(0.0058)
Pct population minority	0.0192***	0.0192***	0.0192***	0.0179***	0.0103***
	(0.0074)	(0.0073)	(0.0062)	(0.0035)	(0.0029)
Pct population seniors	0.0016	0.0016	0.0016	0.0283	-0.0183
	(0.0427)	(0.0379)	(0.0246)	(0.0198)	(0.0118)
Crime rate	0.2271***	0.2271***	0.2271***	0.2059***	0.0065
	(0.0207)	(0.0252)	(0.0475)	(0.0100)	(0.0101)
Crime rate squared	-0.0199***	-0.0199***	-0.0199***	-0.0181***	-0.0005
	(0.0026)	(0.0034)	(0.0062)	(0.0012)	(0.0011)
Unemployment rate	0.0160***	0.0160***	0.0160**	0.0170***	-0.0002
	(0.0027)	(0.0032)	(0.0074)	(0.0016)	(0.0029)
Log per capita federal aid	0.0187***	0.0187***	0.0187***	0.0120***	0.0020***
	(0.0023)	(0.0021)	(0.0034)	(0.0012)	(0.0008)
Log per capita state aid	0.219***	0.219***	0.219***	0.160***	0.045***
	(0.032)	(0.031)	(0.049)	(0.016)	(0.011)
Charter city dummy	0.289***	0.289***	0.289***	0.263***	0.021
	(0.022)	(0.021)	(0.050)	(0.010)	(0.026)
Central city dummy	0.0871***	0.0871***	0.0871	0.0872***	--
	(0.0288)	(0.0295)	(0.0735)	(0.0135)	
Constant	-4.31*	-4.31*	-4.31*	-4.96***	15.85***
	(2.46)	(2.43)	(2.40)	(1.13)	(2.69)
R-squared	0.56	0.56	0.56	--	0.15

OLS and FGLS models include a full set of county dummies; FE does not.
N = 2493, n = 366, T = 7

Table A3.5: County Dummy Estimates in City Regressions

County	OLS	OLS-W	OLS-PC	GLS	FE(avg)
Alameda	--	--	--	--	0.37
Amador	0.48	0.48	0.48	0.33	-1.13
Butte	0.28	0.28	0.28	0.11	0.24
Calaveras	0.19	0.19	0.19	0.32	-0.92
Colusa	0.27	0.27	0.27	-0.01	-1.44
Contra Costa	-0.11	-0.11	-0.11	-0.14*	0.06
Del Norte	1.03	1.03**	1.03**	1.13***	0.34
El Dorado	0.08	0.08	0.08	0.27	0.31
Fresno	0.07	0.07	0.07	0.00	-0.60
Glenn	0.22	0.22	0.22	0.01	-1.08
Humboldt	0.43	0.43	0.43	0.56***	-0.21
Imperial	-0.03	-0.03	-0.03	-0.24	0.22
Inyo	0.67	0.67	0.67	0.67*	-0.27
Kern	0.43	0.43	0.43	0.41**	0.08
Kings	0.49	0.49*	0.49	0.47***	-0.48
Lake	0.11	0.11	0.11	0.13	-0.41
Lassen	0.76	0.76*	0.76**	0.82***	-0.28
Los Angeles	-0.38***	-0.38***	-0.38***	-0.36***	-0.01
Madera	-0.16	-0.16	-0.16	-0.25	-0.36
Marin	0.10	0.10	0.10	0.06	-0.09
Mendocino	0.58	0.58	0.58	0.57**	0.20
Merced	0.06	0.06	0.06	0.02	-0.61
Modoc	0.60	0.60	0.60	0.46	-1.17
Mono	0.11	0.11	0.11	0.39*	-0.45
Monterey	-0.26	-0.26	-0.26	-0.25**	-0.14
Napa	0.66	0.66	0.66*	0.52**	-0.39
Nevada	0.14	0.14	0.14	0.17	0.35
Orange	-0.05	-0.05	-0.05	-0.06	0.11
Placer	0.55	0.55	0.55	0.51***	0.35
Riverside	0.00	0.00	0.00	-0.05	0.21
Sacramento	-0.05	-0.05	-0.05	0.10	0.72
San Benito	-0.43	-0.43	-0.43*	-0.45**	-0.38
San Bernardino	0.17	0.17	0.17	0.25***	0.22
San Diego	0.14	0.14	0.14	0.05	0.37
San Joaquin	0.20	0.20	0.20	0.16	0.05
San Luis Obispo	0.49	0.49	0.49	0.38**	0.10
San Mateo	-0.05	-0.05	-0.05	-0.18**	-0.02
Santa Barbara	0.14	0.14	0.14	0.05	0.20
Santa Clara	0.02	0.02	0.02	-0.04	0.32
Santa Cruz	-0.16	-0.16	-0.16	-0.10	0.21
Shasta	1.50***	1.50***	1.50***	1.47***	2.00
Siskiyou	0.89	0.89	0.89**	0.77***	-0.72
Solano	0.32***	0.32***	0.32**	0.30***	-0.06
Sonoma	0.51	0.51	0.51	0.36**	0.53
Stanislaus	0.09	0.09	0.09	0.02	-0.55
Sutter	-0.03	-0.03	-0.03	-0.13	0.27
Tehama	0.68	0.68	0.68	0.54*	-0.12
Tulare	-0.15	-0.15	-0.15	-0.23	-0.46
Tuolumne	-0.38	-0.38	-0.38	-0.18	-0.49
Ventura	0.07	0.07	0.07	0.00	-0.17
Yolo	0.68***	0.68***	0.68***	0.65***	-0.20
Yuba	-0.49	-0.49	-0.49	-0.30	-0.16

Alameda is the county omitted (to avoid perfect collinearity). Alpine, Mariposa & Trinity have no cities; Plumas & Sierra have no cities included in regressions. FE cannot estimate county dummies because there is no variation over time. The FE column is the average of the estimated fixed effects within a county.

Table A3.6: County Regressions with Year Effects, Dependent Variable: Log per Capita Operating Expenditure

Model:	OLS	OLS-W	OLS-PC	FGLS	FE
Log population	0.0177*	0.0177*	0.0177	0.0227***	-0.5570**
	(0.0097)	(0.0096)	(0.0202)	(0.0057)	(0.2353)
Log population density	-0.0150*	-0.0150*	-0.0150	-0.0121***	-0.0084
	(0.0080)	(0.0084)	(0.0175)	(0.0044)	(0.1447)
Pct increase population	-0.0105**	-0.0105***	-0.0105***	-0.0070**	-0.0014
	(0.0047)	(0.0040)	(0.0037)	(0.0029)	(0.0030)
Log per capita Income	0.146***	0.146 ***	0.146	0.139***	0.059
	(0.054)	(0.049)	(0.095)	(0.027)	(0.123)
Log per capita assessed value	0.245***	0.245***	0.245***	0.272***	-0.045
	(0.030)	(0.030)	(0.055)	(0.016)	(0.101)
Log per capita new housing	0.0100	0.0100	0.0100	0.0126	0.0026
	(0.0167)	(0.0171)	(0.0287)	(0.0093)	(0.0168)
Log per capita AV in redev	0.0050**	0.0050**	0.0050	0.0031***	0.0030
	(0.0020)	(0.0021)	(0.0048)	(0.0010)	(0.0027)
Pct pop'n unincorp area	0.0042***	0.0042***	0.0042***	0.0043***	-0.0008
	(0.0004)	(0.0003)	(0.0007)	(0.0002)	(0.0022)
Pct workers agriculture	-0.0011	-0.0011	-0.0011	-0.0010	0.0017
	(0.0013)	(0.0011)	(0.0025)	(0.0008)	(0.0064)
Pct population minority	0.0010	0.0010	0.0010	0.0005	-0.0048
	(0.0007)	(0.0007)	(0.0017)	(0.0004)	(0.0066)
Pct population seniors	-0.0103***	-0.0103***	-0.0103**	-0.0109***	-0.0172
	(0.0023)	(0.0019)	(0.0040)	(0.0010)	(0.0116)
Crime rate	0.0072	0.0072	0.0072	0.0063	-0.0004
	(0.0085)	(0.0077)	(0.0139)	(0.0043)	(0.0083)
Unemployment rate	0.0013	0.0013	0.0013	0.0018	0.0076*
	(0.0023)	(0.0025)	(0.0057)	(0.0014)	(0.0041)
Log per capita federal aid	0.137***	0.137 ***	0.137***	0.165***	0.115***
	(0.024)	(0.026)	(0.047)	(0.014)	(0.023)
Log per capita state aid	0.545***	0.545***	0.545***	0.522***	0.275***
	(0.039)	(0.042)	(0.084)	(0.025)	(0.044)
Constant	-1.50***	-1.50***	-1.50	-1.82***	11.57***
	(0.47)	(0.47)	(0.97)	(0.26)	(3.20)
R-squared	0.88	0.88	0.88	--	0.35

N = 392, n = 56, T = 7.

Table A3.7: City Regressions with Year Effects, Dependent Variable: Log per Capita Operating Expenditure

Model:	OLS	OLS-W	OLS-PC	FGLS	FE
Log population	-0.972***	-0.972***	-0.972***	-0.907***	-2.56***
	(0.092)	(0.076)	(0.179)	(0.029)	(0.51)
Log population squared	0.0417***	0.0417***	0.0417***	0.0395***	0.0986***
	(0.0043)	(0.0035)	(0.0082)	(0.0012)	(0.0256)
Log population density	0.0941***	0.0941***	0.0941***	0.1020***	-0.0142
	(0.0142)	(0.0140)	(0.0323)	(0.0082)	(0.0205)
Pct increase population	-0.0018	-0.0018	-0.0018	0.0005	0.0004
	(0.0022)	(0.0021)	(0.0024)	(0.0009)	(0.0007)
Log per capita income	0.035	0.035	0.035	-0.101	0.185**
	(0.328)	(0.323)	(0.184)	(0.145)	(0.090)
Log per capita assessed value	0.687***	0.687***	0.687***	0.683***	0.308***
	(0.026)	(0.028)	(0.063)	(0.013)	(0.048)
Log per capita new housing	0.0016	0.0016	0.0016	0.0016	0.0051
	(0.0110)	(0.0112)	(0.0196)	(0.0057)	(0.0040)
Log per capita AV in redev	0.0166***	0.0166***	0.0166***	0.0165***	0.0005
	(0.0021)	(0.0022)	(0.0053)	(0.0011)	(0.0016)
Pct pop'n unincorp area	0.0064	0.0064	0.0064	0.0012	-0.0043
	(0.0104)	(0.0081)	(0.0063)	(0.0048)	(0.0029)
Pct workers agriculture	-0.0277	-0.0277	-0.0277**	-0.0165*	0.0125**
	(0.0224)	(0.0201)	(0.0133)	(0.0099)	(0.0064)
Pct population minority	0.0408**	0.0408**	0.0408***	0.0335***	0.0184***
	(0.0204)	(0.0172)	(0.0147)	(0.0075)	(0.0058)
Pct population seniors	0.0490	0.0490	0.0490	0.0931***	-0.0044
	(0.0459)	(0.0403)	(0.0302)	(0.0211)	(0.0129)
Crime rate	0.235***	0.235***	0.235***	0.217***	0.014
	(0.021)	(0.025)	(0.048)	(0.010)	(0.010)
Crime rate squared	-0.0206***	-0.0206***	-0.0206***	-0.0188***	-0.0011
	(0.0026)	(0.0034)	(0.0062)	(0.0012)	(0.0011)
Unemployment rate	0.0163***	0.0163***	0.0163**	0.0173***	0.0001
	(0.0027)	(0.0032)	(0.0075)	(0.0016)	(0.0031)
Log per capita federal aid	0.0187***	0.0187***	0.0187***	0.0116***	0.0020**
	(0.0023)	(0.0021)	(0.0034)	(0.0012)	(0.0008)
Log per capita state aid	0.218***	0.218***	0.218***	0.152***	0.045***
	(0.032)	(0.031)	(0.049)	(0.016)	(0.011)
Charter city dummy	0.287***	0.287***	0.287***	0.262***	0.019
	(0.022)	(0.021)	(0.050)	(0.010)	(0.026)
Central city dummy	0.085***	0.085***	0.085	0.082***	--
	(0.029)	(0.029)	(0.074)	(0.013)	
Constant	-0.98	-0.98	-0.98	0.27	16.10***
	(3.71)	(3.63)	(2.68)	(1.57)	(2.82)
R-squared	0.56	0.56	0.56	--	0.16

OLS and FGLS models include a full set of county dummies; FE does not.
N = 2493, n = 366, T = 7.

Table A3.8: Year Effects in County Regression

Model:	OLS	OLS-W	OLS-PC	FGLS	FE
Year 92	0.091***	0.091***	0.091***	0.088***	-0.019
	(0.020)	(0.019)	(0.022)	(0.010)	(0.033)
Year 93	0.075***	0.075***	0.075***	0.072***	-0.026
	(0.020)	(0.020)	(0.023)	(0.010)	(0.029)
Year 94	0.012	0.012	0.012	0.004	-0.038*
	(0.019)	(0.019)	(0.018)	(0.010)	(0.022)
Year 95	0.002	0.002	0.002	0.002	-0.017
	(0.019)	(0.019)	(0.017)	(0.009)	(0.018)
Year 96	0.002	0.002	0.002	0.004	-0.010
	(0.019)	(0.018)	(0.012)	(0.009)	(0.014)
Year 97	-0.021	-0.021	-0.021*	-0.025***	-0.014
	(0.018)	(0.019)	(0.011)	(0.009)	(0.011)
F (Wald*)	8.43	8.84	8.42	179*	1.49
p-value	0.000	0.000	0.000	0.000	0.182

The omitted year in all regressions is 1998.

The bottom pair of lines give the test statistic (an F-stat for OLS and FE, but a Chi-square for FGLS) and its accompanying p-value for a test that all the year dummies are zero.

Table A3.9: Year Effects in City Regression

Model:	OLS	OLS-W	OLS-PC	FGLS	FE
Year 92	0.079	0.079	0.079	0.034	0.036
	(0.113)	(0.097)	(0.084)	(0.042)	(0.034)
Year 93	0.014	0.014	0.014	-0.030	0.015
	(0.096)	(0.083)	(0.069)	(0.035)	(0.029)
Year 94	-0.041	-0.041	-0.041	-0.087***	-0.006
	(0.077)	(0.068)	(0.055)	(0.029)	(0.023)
Year 95	-0.044	-0.044	-0.044	-0.088***	-0.009
	(0.060)	(0.054)	(0.039)	(0.023)	(0.017)
Year 96	-0.020	-0.020	-0.020	-0.040**	0.006
	(0.044)	(0.040)	(0.027)	(0.017)	(0.013)
Year 97	-0.046	-0.046	-0.046*	-0.043***	-0.006
	(0.033)	(0.032)	(0.016)	(0.014)	(0.009)
F (Wald*)	2.52	2.66	9.43	108*	3.58
p-value	0.020	0.014	0.000	0.000	0.002

The omitted year in all regressions is 1998.

The bottom pair of lines give the test statistic (an F-stat for OLS and FE, but a Chi-square for FGLS) and its accompanying p-value for a test that all the year dummies are zero.

Table A3.10: County regressions Dependent Variable: Log per Capita Total Expenditure

Model:	OLS	OLS-W	OLS-PC	FGLS	FE
Log population	0.0143	0.0143	0.0143	0.0199***	-0.3495
	(0.0096)	(0.0095)	(0.0188)	(0.0063)	(0.2411)
Log population density	-0.0111	-0.0111	-0.0111	-0.0129**	-0.1036
	(0.0079)	(0.0081)	(0.0156)	(0.0051)	(0.1462)
Pct increase population	-0.0049	-0.0049	-0.0049	0.0021	-0.0012
	(0.0045)	(0.0052)	(0.0045)	(0.0031)	(0.0029)
Log per capita income	0.151***	0.151***	0.151*	0.157***	0.258**
	(0.053)	(0.049)	(0.082)	(0.034)	(0.103)
Log per capita assessed value	0.260***	0.260***	0.260***	0.268***	-0.110
	(0.029)	(0.029)	(0.047)	(0.018)	(0.096)
Log per capita new housing	0.0105	0.0105	0.0105	0.0140	-0.0012
	(0.0161)	(0.0177)	(0.0300)	(0.0105)	(0.0153)
Log per capita AV in redev	0.0056***	0.0056***	0.0056	0.0031**	0.0022
	(0.0020)	(0.0021)	(0.0045)	(0.0014)	(0.0028)
Pct pop'n unincorp area	0.0037***	0.0037***	0.0037***	0.0036***	0.0007
	(0.0004)	(0.0003)	(0.0006)	(0.0002)	(0.0023)
Pct workers agriculture	-0.0024*	-0.0024**	-0.0024	-0.0038***	0.0101*
	(0.0013)	(0.0012)	(0.0025)	(0.0009)	(0.0058)
Pct population minority	-0.0011*	-0.0011	-0.0011	-0.0016***	-0.0063
	(0.0006)	(0.0007)	(0.0015)	(0.0004)	(0.0047)
Pct population seniors	-0.0136***	-0.0136***	-0.0136***	-0.0141***	-0.0167
	(0.0022)	(0.0019)	(0.0039)	(0.0013)	(0.0115)
Crime rate	0.0143*	0.0143*	0.0143	0.0115**	-0.0013
	(0.0083)	(0.0074)	(0.0116)	(0.0050)	(0.0083)
Unemployment rate	0.0053**	0.0053**	0.0053	0.0082***	0.0039
	(0.0021)	(0.0024)	(0.0050)	(0.0015)	(0.0037)
Log per capita federal aid	0.115***	0.115***	0.115***	0.113***	0.111***
	(0.024)	(0.025)	(0.042)	(0.016)	(0.023)
Log per capita state aid	0.550***	0.550***	0.550***	0.565***	0.296***
	(0.038)	(0.043)	(0.090)	(0.026)	(0.041)
Constant	-1.47***	-1.47***	-1.47*	-1.78***	8.19***
	(0.46)	(0.44)	(0.86)	(0.31)	(2.92)
R-squared	0.88	0.88	0.88	--	0.36

N = 392, n = 56, T = 7.

Table A3.11 City Regressions; Dependent Variable: Log per Capita Total Expenditure

Model:	OLS	OLS-W	OLS-PC	FGLS	FE
Log population	-1.05***	-1.05***	-1.05***	-0.98***	-2.87***
	(0.10)	(0.08)	(0.19)	(0.04)	(0.74)
Log population squared	0.0463***	0.0463***	0.0463***	0.0439***	0.1124***
	(0.0044)	(0.0037)	(0.0086)	(0.0015)	(0.0375)
Log population density	0.0824***	0.0824***	0.0824***	0.0944***	-0.0173
	(0.0148)	(0.0135)	(0.0299)	(0.0084)	(0.0301)
Pct increase population	0.0003	0.0003	0.0003	0.0021**	0.0005
	(0.0023)	(0.0018)	(0.0020)	(0.0010)	(0.0010)
Log per capita income	0.409	0.409	0.409**	0.687***	0.316***
	(0.264)	(0.262)	(0.189)	(0.133)	(0.108)
Log per capita assessed value	0.678***	0.678***	0.678***	0.694***	0.282***
	(0.027)	(0.029)	(0.065)	(0.015)	(0.065)
Log per capita new housing	0.0193*	0.0193*	0.0193	0.0066	0.0031
	(0.0114)	(0.0114)	(0.0191)	(0.0066)	(0.0058)
Log per capita AV in redev	0.0162***	0.0162***	0.0162***	0.0166***	0.0040*
	(0.0022)	(0.0023)	(0.0054)	(0.0013)	(0.0024)
Pct pop'n unincorp area	0.0086	0.0086	0.0086	0.0095	-0.0061
	(0.0107)	(0.0100)	(0.0085)	(0.0061)	(0.0042)
Pct workers agriculture	-0.0141	-0.0141	-0.0141	-0.0008	0.0112
	(0.0215)	(0.0188)	(0.0128)	(0.0111)	(0.0085)
Pct population minority	0.0175**	0.0175**	0.0175**	0.0131***	0.0081*
	(0.0077)	(0.0078)	(0.0069)	(0.0040)	(0.0042)
Pct population seniors	0.0097	0.0097	0.0097	0.0066	-0.0089
	(0.0444)	(0.0411)	(0.0314)	(0.0241)	(0.0173)
Crime rate	0.212***	0.212***	0.212***	0.168***	0.012
	(0.021)	(0.025)	(0.047)	(0.012)	(0.015)
Crime rate squared	-0.0195***	-0.0195***	-0.0195***	-0.0155***	-0.0015
	(0.0027)	(0.0034)	(0.0062)	(0.0015)	(0.0016)
Unemployment rate	0.0145***	0.0145***	0.0145*	0.0173***	-0.0021
	(0.0028)	(0.0033)	(0.0076)	(0.0018)	(0.0042)
Log per capita federal aid	0.0220***	0.0220***	0.0220***	0.0155***	0.0043***
	(0.0024)	(0.0023)	(0.0034)	(0.0014)	(0.0011)
Log per capita state aid	0.300***	0.300***	0.300***	0.245***	0.122***
	(0.033)	(0.032)	(0.053)	(0.018)	(0.016)
Charter city dummy	0.280***	0.280***	0.280	0.269***	0.035
	(0.023)	(0.022)	(0.052)	(0.010)	(0.038)
Central city dummy	0.097***	0.097***	0.097	0.089***	
	(0.030)	(0.030)	(0.073)	(0.016)	
Constant	-2.84	-2.84	-2.84	-5.82	17.3***
	(2.56)	(2.55)	(2.58)	(1.30)	(4.0)
R-squared	0.56	0.56	0.56	--	0.11

OLS and FGLS models include a full set of county dummies; FE does not.
N = 2493, n = 366, T = 7.

Appendix 4

Once we have suggested a specific revenue allocation, either from our regression-based benchmarks or our proposed simple rules, it becomes useful to have statistics that allow us to compare the differences between the suggested revenue and the actual revenue across counties. This appendix describes the measures that we developed.

Our first measure, $R1_j$, follows this formula:

$$R1_j = \frac{1}{7}\sum_{t=1}^{7}\left\langle \frac{\left[\frac{1}{n_j}\sum_{i=1}^{n_j}\left(P_{ijt}-A_{ijt}\right)^2\right]^{1/2}}{\sum_{i=1}^{n_j}A_{ijt}}\right\rangle$$

where

i indexes jurisdictions (both city and county governments)

j indexes counties

t indexes time

n_j is the number of jurisdictions within county *j*

P_{ijt} is the predicted amount of revenue from our rule for jurisdiction *i* in county *j* at time *t*

A_{ijt} is the actual amount of revenue received (including for redevelopment agencies and special districts) for jurisdiction *i* in county *j* at time *t*

In words, this formula first takes the square of the difference between actual and predicted revenue, then computes the average of these squared differences within each county, then takes the square root of this average and divides it by the total amount of non-school property tax revenue in the county (which provides a normalization for counties of different size), and finally finds the average over time of this square-rooted average.

Our second measure is the percent of the property tax revenue in each county that would be redistributed under our proposed rule. The formula for measure $P1_j$ is:

$$P1_j = \frac{1}{7}\sum_{t=1}^{7}\left[\frac{\frac{1}{2}\sum_{i=1}^{n_j}\left|P_{ijt}-A_{ijt}\right|}{\sum_{i=1}^{n_j}A_{ijt}}\right]$$

where *i*, *j*, *t*, n_j, P_{ijt}, and A_{ijt} all are the same as defined before for $R1_j$.

In words, this rule first finds the absolute value of the difference between actual and predicted revenue for each jurisdiction and then sums that

within a county (we divide by one half so as not to count the money as it leaves one jurisdiction and then count it again as it enters a different jurisdiction). Then we divide this amount of revenue by the total amount of non-school property tax revenue in the county to find the fraction of revenue in county *j* at year *t* that would be redistributed, and finally take the average over time of this fraction.

Appendix 5: Regressions Used to Form Simple Rules

(1) Rule based on assessed value and population, using countywide shares

Dependent variable: Share of predicted expenditure determined using the countywide approach

Variable	Cities	Counties
Constant	-0.004 (-4.69)	0.51 (37.2)
Share of assessed value	0.32 (4.83)	0.20 (2.93)
Share of population	0.26 (4.63)	0.26 (3.78)
Number of observations	3273	392
R-squared	.92	.87

t-statistics computed with panel-corrected standard errors are in parentheses.

(2) Rule based on assessed value, using countywide shares

Dependent variable: Share of predicted expenditure determined using the countywide approach

Variable	Cities	Counties
Constant	-0.003 (-2.98)	0.51 (36.7)
Share of assessed value	0.61 (22.06)	0.44 (21.46)
Number of observations	3273	392
R-squared	.90	.84

t-statistics computed with panel-corrected standard errors are in parentheses.

(3) Rule based on population, using countywide shares

Dependent variable: Share of predicted expenditure determined using the countywide approach

Variable	Cities	Counties
Constant	-0.003 (-3.42)	0.53 (41.9)
Share of population	0.52 (21.75)	0.47 (23.13)
Number of observations	3273	392
R-squared	.89	.85

t-statistics computed with panel-corrected standard errors are in parentheses.

(4) Rule based on assessed value, using situs shares

Dependent variable: Share of predicted expenditure determined using the situs approach

Variable	Cities	Counties
Constant	-0.002 (-2.92)	0.56 (54.4)
Share of assessed value	0.47 (28.12)	0.43 (31.60)
Number of observations	3273	392
R-squared	.95	.94

t-statistics computed with panel-corrected standard errors are in parentheses.

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