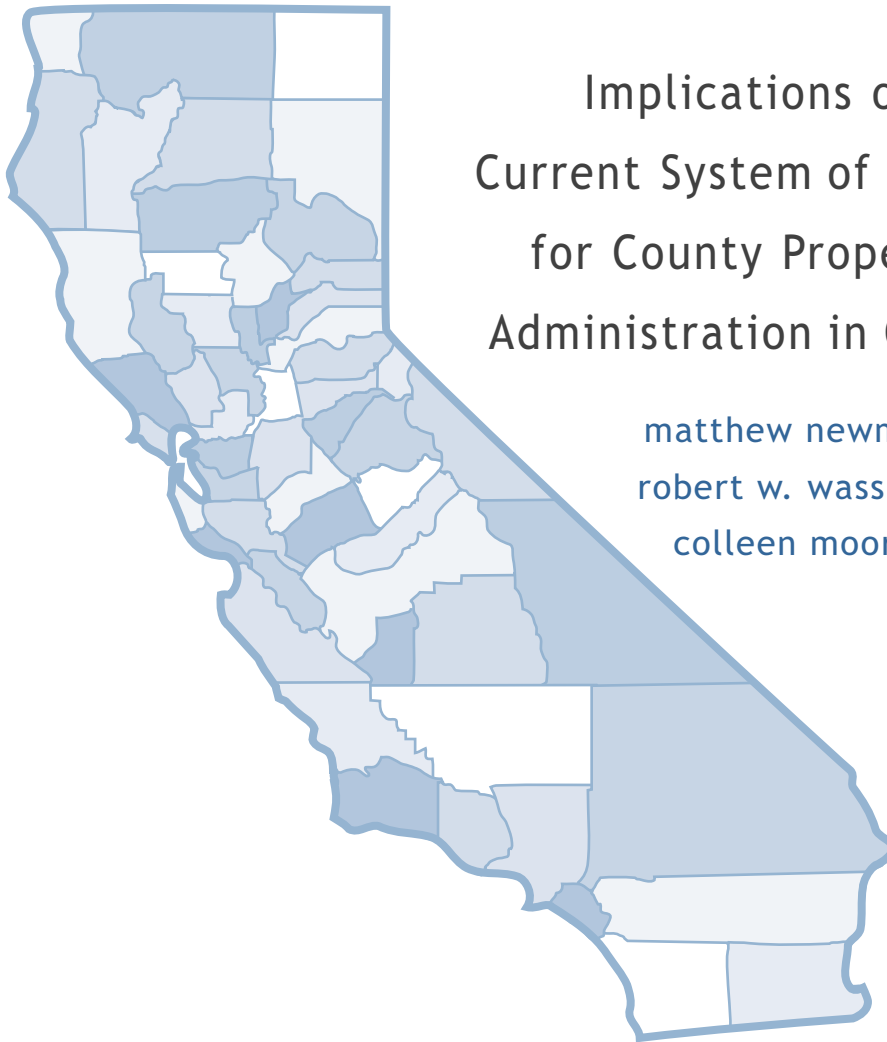


CICG

research brief

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Implications of the Current System of Incentives for County Property Tax Administration in California

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CALIFORNIA INSTITUTE
FOR
COUNTY GOVERNMENT

Letter from the Institute Director

I am pleased to present the first *CICG Research Brief*. This report examines the consequences of the system of fiscal incentives for investment in the California property tax administration system. The property tax is among the state's largest revenue sources, benefiting both state and local governments. Yet, because counties pay the majority of the costs necessary to collect property taxes but receive just one-fifth of the benefits, they face a disincentive to invest additional resources in the system. As a consequence, less property tax revenue is collected and the system is less fair and efficient, with significant implications for both state and local governments.

The analysis presented shows for the first time how counties are responding to these incentives, and what consequences state and local governments face as a result of the current system. The report then suggests some policy options that can help to improve the incentives in the system.

On behalf of my coauthors, Rob Wassmer and Colleen Moore, I want to thank all of those who assisted with the publication of this report. Pedro Reyes provided invaluable insight into the Property Tax Administration Loan program. Eric Brunner, Michael Cohen, Juliet Musso, and Terri Sexton reviewed the early drafts, providing criticisms for which this essay is the better. Any errors are, of course, the authors' alone.

Matthew Newman, Director
California Institute for County Government
June 2000

Executive Summary

County governments in California are responsible for the assessment of taxable property, collection of property tax revenues, and the distribution of these revenues among all taxing entities within the jurisdiction, including cities, redevelopment agencies, special districts, and schools. Under California's current system, cities, redevelopment agencies, and special districts pay the costs of property tax administration – estimated at \$400 million annually – in an amount proportionate to the property tax revenue they receive. Yet, while schools receive the largest share of property tax revenue – more than 50 percent – they do not contribute to administration costs. Consequently, counties pay the schools' tax administration costs, in addition to their own. Currently, county governments receive, on average, less than 20 percent of property tax revenues, while paying approximately 70 percent of the costs of administering the property tax system.

As a result, counties have little incentive to invest additional resources in the property tax administration system. While such investment might result in increased revenues, greater fairness, and improved efficiency in the property tax system, these benefits would primarily accrue to the schools (and by extension, the state, as a result of the school-funding guarantee contained in Proposition 98), not the counties paying for it.

This study empirically measures the impact of these incentives on county-government decisionmaking. Specifically, we examine the relationship between the share of property tax revenues that counties receive and their investment in property tax administration. We expect that counties that receive a larger share of the property tax respond by making additional investments in property tax administration, relative to other, comparable counties receiving smaller shares of the property tax.

We also examine the relationship between the funding level for each assessor's office and the amount of property tax revenue collected. We expect that counties making greater investments in the assessor function reap returns in the form of higher property tax collections, as well as other benefits of an improved property tax administration system.

Our first analysis reveals a statistically significant, positive relationship between the share of the property tax received by counties and the funding levels for assessors' offices. In other words, counties that receive more property tax revenues spend more on their assessors.

The second part of our analysis examines whether higher expenditures on the assessor function are related to higher property tax collections. That is, do these investments pay any dividends in terms of improved property tax collections? The results demonstrate that a one dollar increase in

spending on the county assessor function yields a nearly \$14 increase in property tax revenue collections countywide.

Using the results from our analysis, we simulate the likely outcome of an additional statewide investment in property tax administration. We estimate that an additional \$40 million (or an increase of about 10% above current funding levels) invested in property tax administration would generate additional annual property tax revenues of approximately \$550 million statewide, with about one-half of that amount going to reduce the required state general fund contributions to education.

Our results also indicate that the property tax administration loan program is achieving at least one of its aims: increasing property tax revenues. Our analysis suggests that the approximately \$50 million in state revenues spent on this program each year has resulted in approximately \$475 million in increased property tax revenues annually.

The gains from the property tax administration loan program have served to partially offset losses stemming from the property tax shifts of the early 1990s. Because these shifts reduced the share of property taxes going to counties, they also served to reduce the incentive to invest in property tax administration. The corresponding change in incentives in turn resulted in lower spending on property tax administration and, therefore, property tax revenue collections. Our analysis indicates that the property tax shifts have resulted in property tax collections that are \$550

million lower each year than they would have been absent the property tax shifts.

These results demonstrate that counties have responded rationally to the system of incentives contained in the current property tax administration system. Counties that receive smaller shares of the property tax invest less in the tax administration system. Likewise, counties that receive larger shares of the revenue invest more in property tax administration and, as a result, collect more property tax revenues.

Property tax administration is not simply an issue of local concern, however. The State of California has a significant interest in maintaining a property tax administration system that is adequately funded and efficiently operated. The state is, indirectly, the largest beneficiary of the property tax, because property tax revenue increases generally directly offset state general fund costs for education. Likewise, decreases in the property tax revenues available for education must be made up by the state. Several policy options could enhance the incentives counties have for investing in the property tax administration system. The state could pay the schools' pro-rata share of the costs of property tax administration or, as suggested by the Legislative Analyst's Office, the schools' pro-rata share of all *future* property tax administration costs above current levels. Either option would improve the incentives for counties to invest in property tax administration, because counties would no longer pay a disproportionate share of the costs.

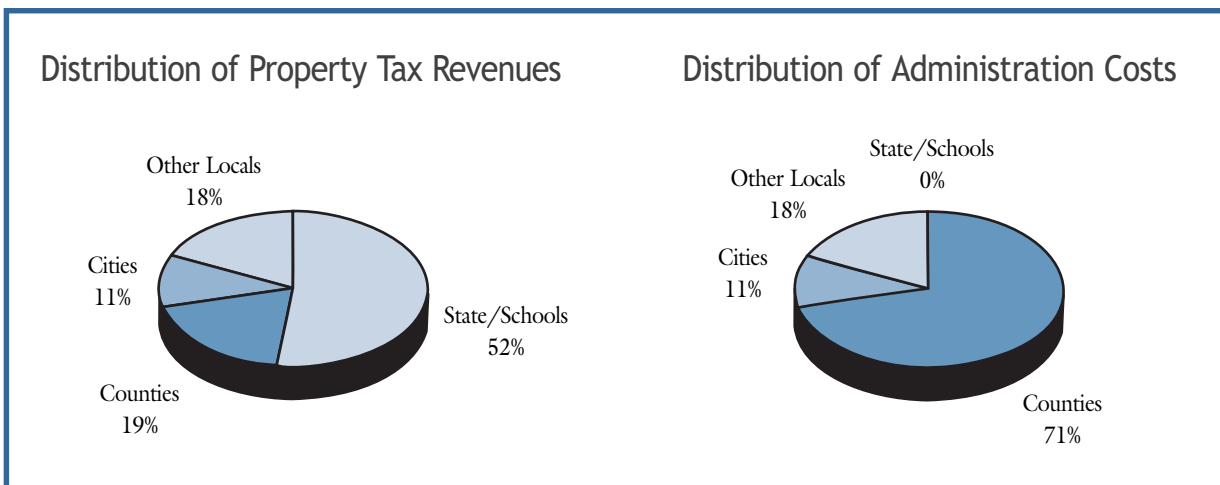
Introduction

County governments in California are responsible for the assessment of taxable property and the collection of all property tax revenues within their boundaries. These property tax revenues are then distributed to all of the taxing entities within the county (cities, redevelopment agencies, special districts, and schools), as prescribed by a formula defined in state law.¹ As Figure 1 indicates, California’s counties currently receive less than 20 percent of property tax revenues collected in the state, yet pay approximately 70 percent of the costs of property tax administration – estimated at approximately \$400 million annually in 1997.²

Because counties receive a relatively small share of the property tax revenues collected while paying the majority of the costs of administration, county officials have little incentive to invest additional resources in the property tax administration system. In this report we examine the consequences of these misplaced incentives. That is, we

look at how counties have administered property tax collection in the absence of incentives to invest additional resources in the system. We also assess the consequences of the county response for other taxing entities that receive property tax revenues. Specifically, we hypothesize that counties rationally adjust their investment in property tax administration to the relative amount of benefit they receive from the property tax. Those counties that receive a larger share of the property tax will likely invest relatively more in the property tax administration system than will those counties receiving a relatively smaller share. Furthermore, we expect that the investments that counties make will bear fruit in terms of an improved property tax administration system (e.g., increased property tax revenues, improved accuracy of assessed value determinations, speedier resolutions of appeals, and more accurate public information).

Figure 1



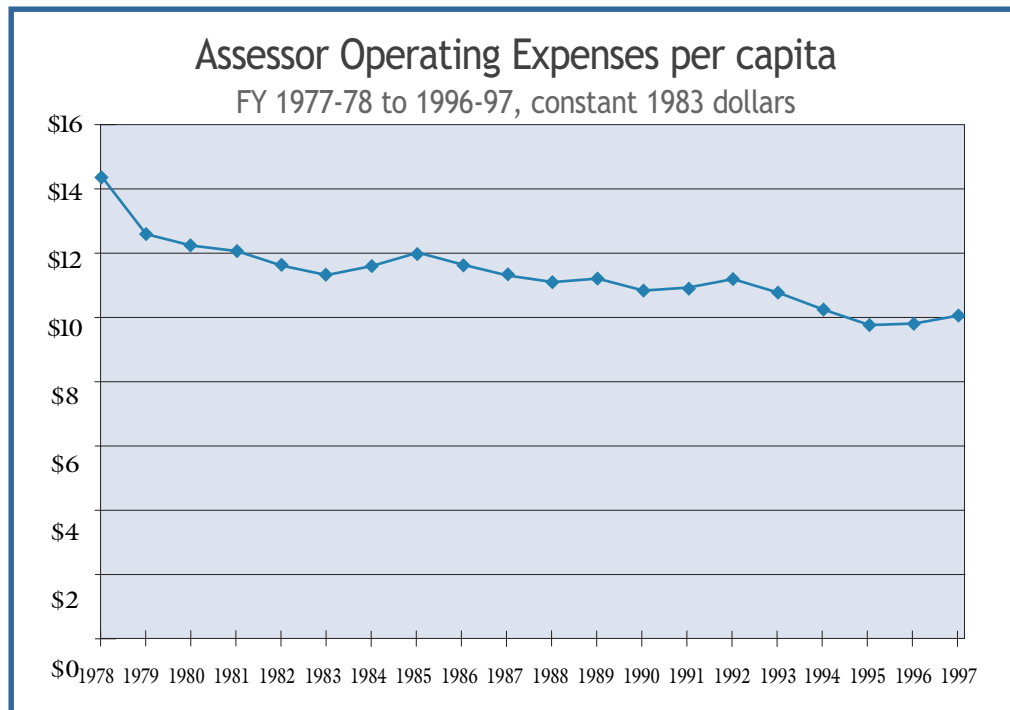
Background

Assessment of property taxes has historically been a county function in California.³ Each year, county officials assess taxable property and collect property taxes on behalf of all local government taxing entities within the county. Prior to the passage of Proposition 13 in 1978, when the costs of property tax administration changed county governments could raise the countywide property tax rate to offset the additional expense of property tax administration. Proposition 13, however, limited the property tax rate to one percent, simultaneously reducing property tax revenues flowing to county treasuries and limiting the ability of counties to adjust their revenues in response to changes in the costs of property tax administration.

Counties responded to the new, post-Proposition 13 fiscal landscape by significantly reducing per-capita expenditures for assessors' offices, as indicated in Figure 2. These expenditures fell by more than 30 percent in inflation-adjusted terms during the years immediately following the passage of the 1978 ballot measure.

While some of this decline is attributable to the reduction in county assessors' workload resulting from changing from a market-value assessment system to one based on acquisition value, the total change is nevertheless significant. Notably, the expenditure reduction has continued for many counties, even beyond any period of post-Proposition 13 workload adjustment. For instance, the average level of per-capita

Figure 2



funding for assessors declined again following the ERAF property tax shifts of the early 1990s, as Figure 2 illustrates. These ERAF shifts had a similar effect to that of Proposition 13, simultaneously reducing the relative importance of the property tax and increasing the fiscal constraints on county governments. Counties responded by reducing their financial commitment to property tax administration (Fig. 2).

State Interest in Property Tax Administration

While the property tax is considered a local tax, the state nevertheless has a significant interest in an efficiently administered property tax system. California's system of school finance must combine state General Fund revenues with county property tax revenues to achieve the level of education spending required by Proposition 98. Under most circumstances, any increase in property tax revenue for the schools results in a decrease in the amount of General Fund revenue the state must contribute to education. Therefore, the state of California is indirectly the largest beneficiary of property tax revenues and has a substantial interest in improving the property tax administration system. The state also has an interest in maintaining uniformity and fairness in the property tax system, since taxpayers throughout the state will view the system more favorably when it functions efficiently and when determinations of assessed value are equitable and consistent.

Recognizing the problems inherent in the property tax administration system, the Legislature acted in 1990 and again in 1995 to improve the property tax administration system. In 1990, the Legislature passed, and the Governor signed, a bill that allowed counties to collect from the other taxing entities in the county — excluding schools — their pro-rata share of the costs of property tax administration.⁴ While this measure provided more incentives for county governments, officials weighing the merits of competing budget priorities still faced a critical trade-off. Because the majority of property taxes, and therefore the benefits of improvements in the property tax administration system, still accrued primarily to entities other than the county, county officials continued to face a disincentive to invest additional resources in property tax administration.

To address this disincentive, the Legislature and the Governor created the Property Tax Administration Loan Program in 1995 and made available \$60 million in loans to counties. Under the program, counties can apply to the Department of Finance for loans to invest in property tax administration. These loans are forgiven if a county can demonstrate that it has generated additional revenues or otherwise complied with the terms of its contract with the state.

Counties may use the funds to update the property tax roll, process backlogs of new construction, pay the costs of property

tax appeals, conduct required audits, and process re-assessments of properties that have declined in value. These activities make the property tax administration system more equitable and efficient, while facilitating the collection of taxes legally owed that would otherwise go uncollected.

Though the additional funds provided by the program result in benefits to the state and local governments, the proscriptive terms in many of the contracts place the state in the position of dictating local assessors' expenditures, as the Legislative Analyst has indicated.⁵ In addition, the structure of the program requires the state to spend time and money reviewing and renewing contracts with all counties that choose to participate. Lastly, the loan program was intended as a temporary solution and does not provide the counties with a reliable source of ongoing funding. For these reasons, the Legislative Analyst has suggested that the loan program, due to expire after fiscal year 2000-01, may not be the best solution for encouraging county investments in property tax administration.

A recent report issued by the California State Auditor, "The State-County Property Tax Administration Program: The State and the Counties Continue to Benefit, but the Department of Finance Needs to Improve Its Oversight," also concludes that the loan program generates benefits for the state and local governments. The state auditor did, however, find that the state's oversight role is problematic. If the state is to continue

to dictate local expenditures made through the program, the auditor suggested that additional oversight from the Department of Finance is required.

Fundamentally, though the administration loan program has increased funding for property tax administration, the program does not serve to change the set of inappropriate incentives that underlies the current system. In spite of the policies adopted by the legislature over the past decade, counties continue to face a disincentive to invest additional resources in the property tax administration system.

Empirical Analysis

While the existence of the disincentives in the property tax administration system has been discussed elsewhere, no study has sought to empirically measure the impact of the present system of disincentives, or to determine what counties have done in response to these disincentives and how the county response has affected other taxing entities. If counties respond rationally to the (dis)incentives contained in the current system, we would expect to find two important effects. First, counties that receive a larger share of the property tax should respond by making additional investments in property tax administration, relative to other, comparable counties receiving smaller shares of the property tax.

The second important effect we would expect to find is that larger assessors' budgets will be associated with improved property tax administration. In other

words, additional investments in property tax administration should yield returns to the county making the investment (or, presumably, they would not be made). Investments in the property tax administration system could take many forms. For example, in the early 1990s, county assessors in California saw an increase in appeals filed by property owners who believed that the market value of their property had fallen below the assessed value. As required by Proposition 8, a county assessor must address such appeals within two years or accept the lower value claimed by the property owners. In this case, an under-funded assessor's office could result in a loss of local property tax revenue due to a lack of resources necessary for processing appeals.⁶ Other examples of investment in property tax administration include pursuing escaped assessments, assessing new construction or remodeled properties, conducting additional audits, hiring mining or geothermal consultants to assist with assessing unique properties, or the addition of legal counsel to assist with defending taxpayer appeals. Each of these activities, if adequately funded, has the potential to improve property tax administration and increase the revenues collected.

For the purposes of our analysis, we measure the amount of property tax collections as the primary indication of “improved” property tax administration. From the standpoint of fiscally stressed local governments, increased collections may be the most important tangible improvement. More funding for a county property tax

assessor's office, however, may also produce such benefits as faster resolution of appeals, greater accuracy in determination of assessed values, improved precision of information provided to the public, and better responsiveness to “customer” requests for this information.

In addition, we limit our analysis of the property tax administration system to funding for assessors' offices, although the same basic principles (and economic effects) should be present in other areas of the property tax administration system, notably the treasurer-tax collector functions. We have not included the treasurer-tax collector in our analysis because it combines two functions (i.e., treasurer and tax collector) and collects a wide array of taxes in addition to the property tax. Therefore, it is difficult to determine the percentage of the treasurer's budget that is devoted to collecting property taxes. In contrast, the assessor is responsible solely for activities related to the property tax; therefore, the full amount of a county's expenditures on its assessor can properly be considered a cost of property tax administration.

Determinants of County Funding for Assessors' Offices

To identify the impact of this system of incentives, we construct an empirically derived model designed to determine the impact of these incentives on assessors' budgets.⁷ According to our hypothesis, we would expect assessors' budgets to be relatively larger in counties receiving a

greater percentage of total countywide property tax revenues because of the stronger incentive for the county to collect all appropriate property taxes.

We examine assessors' budgets during a twelve-year period, from fiscal year 1984-85 through fiscal year 1996-97, with data from all 58 counties.⁸ The results of our analysis indicate that counties do respond to the present system of incentives in determining funding levels for their assessors' offices. We found a statistically significant, positive relationship between the share of the property tax received by a county and the reported spending on the assessor's office. In other words, counties that receive relatively more property tax revenues do in fact spend more on their assessors' operations. Specifically, for the average county observed over the study period, a one-percentage point increase in a county's share of the property tax yields about a \$0.09 per-capita increase in the assessor's budget. On a statewide basis, this same one-percentage point increase would result in an increase in funding for assessors' offices of nearly \$3 million annually.

Our results also indicate that, as intended by the program, increases in property tax administration loan funds translate into increases in assessors' budgets. A one-dollar increase in these loan funds yields about a \$0.68 increase in reported spending by assessors.⁹ Our model is not able to isolate a statistically significant relationship between the amount that a county receives in payments from other local entities for property tax

administration and the average county assessor's office budget over the period examined. This may be due to the fact that several reforms and other actions affecting county budgets were enacted during a relatively concentrated period. For example, the policy allowing counties to charge other local entities for their pro-rata share of property tax administration expenses was adopted in 1990, but was amended to exclude schools the following year. Soon after this change, the state shifted approximately \$4 billion in property tax revenues from cities, counties, and special districts to schools, thereby significantly changing both the resources available to counties for funding assessors' operations and the incentives for investing in property tax administration. Finally, the legislature created the property tax administration loan program, which further affected assessors' budgets. It is also possible, however, that the reason we do not find a statistically significant relationship is that counties are not in fact responding to these incentives. In other words, counties may simply view these reimbursements as an additional revenue source and not spend the additional resources on property tax administration.¹⁰

Determinants of Property Tax Revenue Collections

Having determined that counties respond to the incentives they face for investments in property tax administration, the question nevertheless remains: Do the increased investments improve property tax administration?

To determine the effects of increased funding for property tax administration expenditures on countywide property tax revenue collections, we construct a second empirical model. This model estimates the level of property tax revenue collections associated with a given level of funding for assessors' offices. As with the previous model predicting assessors' budgets, we convert variables into per-capita terms where appropriate.

The results of our second analysis confirm that higher spending for property tax administration is in fact associated with higher property tax collections. Specifically, we find that a one-dollar increase in spending for assessors' operations yields about a \$13.90 increase in property tax revenues collected, on average.

This finding is generally consistent with the results obtained by the California State Auditor in the course of their review of the property tax administration loan program. Using a somewhat different, accounting-based approach, the state auditor found that one dollar spent through the administration loan program resulted in an approximately \$11 increase in property taxes collected.¹¹

Thus, our results confirm that counties do in fact respond to the incentives given them, with significant consequences for other local taxing entities and the state as a whole. A more detailed discussion of our analytical techniques and results can be found in Appendix 1.

Statewide Results

As our analysis indicates, increased investments in property tax administration are associated with higher property tax collections. Therefore, adding resources on a statewide basis should lead to an overall increase in property tax collections. The results from our analysis allow us to simulate the likely outcome of an additional statewide investment in property tax administration.¹² If, for example, an additional \$40 million were invested in property tax administration (representing a 10% increase over the \$400 million spent in 1997), approximately \$550 million in new property tax revenues would be collected statewide.

Impact of State Policies Affecting Property Tax Administration

The results of our analysis can also be used to estimate the impact of the property tax administration loan program. Since the program's inception in 1995, the state has spent approximately \$50 million annually in transfers to counties for property tax administration. According to the results of our regression models, loan-program spending has resulted in additional property tax revenues of \$476 million statewide, each year.

Our results can also be used to estimate the impact of the property tax shifts of the early 1990s on statewide property tax collections. According to our analysis, because these shifts reduced the incentives for counties to collect property tax revenues by decreasing the county share

of property taxes collected, they also served to reduce county spending on property tax administration.

The property tax shifts decreased the share of revenues going to counties from 33 percent to approximately 19 percent. Our results indicate that a one-percentage point change in the county share of the property tax results in a nearly \$3 million change in spending on the assessor function, statewide. The 14-percentage point reduction in the county share would, therefore, have resulted in assessor spending that was approximately \$40 million lower statewide than it would have been without the property tax shifts. Consequently, our analysis indicates that the property tax shifts resulted in property tax collections that are \$550 million lower each year than they would have been, absent the shifts.

Conclusion and Policy Options

Today, California counties face significant disincentives to increase their investment in the property tax administration system. While these additional investments may well result in the collection of additional property tax revenue and other improvements, counties would not realize most of the anticipated benefits. Instead, these benefits would accrue largely to the state. Assessors seeking increases in funding must convince local boards of supervisors that additional expenditures would generate sufficient benefits for the counties to offset their disproportionate share of costs. With

counties paying approximately 70 percent of the costs, yet receiving just 20 percent of the benefits, this is a difficult argument to make.

Indeed, the data shows that counties have, in fact, responded rationally to these incentives by investing more in property tax administration where anticipated benefits are greater, and, conversely, investing less where benefits are fewer. Our analysis further shows that these increased investments are associated with an increase in property tax revenue collections.

State Interest in Property Tax Administration

Property tax administration is not simply an issue of local concern. In fact, the State of California has a significant interest in a property tax administration system that is adequately funded and efficiently operated. The state is indirectly the largest beneficiary of the property tax, because property tax revenue increases generally directly offset state general fund costs for education. Likewise, decreases in property tax revenues available for education must be made up by the state.

The state also benefits from a fairly administered property tax system. Californians will have more positive views of the property tax and those administering it when, for example, determinations of property value are accurate and the tax rolls are up-to-date and complete. Additional investment in property tax administration can lead to more efficient and equitable operation.

Policy Options

Several policy options could enhance the incentives for counties to invest in property tax administration. One possibility is for the state to pay the schools' pro-rata share of the costs of property tax administration. Counties would have much greater incentive to invest in the property tax administration system if their share of the cost for such investment is equal to their share of benefits in the form of higher property tax collections. While this option would require a commitment of additional state revenues, the state would benefit from the additional tax collections in proportion to its investment.

The Legislative Analyst's Office has suggested another possibility¹³. The LAO has proposed that the state pay the schools' pro-rata share of all *future* property tax administration costs. While the counties would continue to pay the largest share (approximately 70%) of current administration costs, any increases in costs due to additional investments in the system would be paid by all beneficiaries of the property tax, according to their share of the revenues. While this system would require the counties to continue paying a

disproportionate share of the base-year administration costs, that should not affect county decisions on future investments. It would still be to a county's advantage to make additional investments in property tax administration because it would receive benefits in the form of higher tax revenues in proportion to its share of any additional costs.

Under the system proposed by the LAO, the state would assume more of the costs for property tax administration, estimated to increase by approximately \$10 million annually. But the state can be assured that efforts would be made to control costs and that any cost increases would be justified. The counties would be committing their own resources to any additional investment in property tax administration, along with resources of the state and other local entities. County supervisors will not commit their own scarce resources without a reasonable expectation of collecting enough additional taxes to justify the investment. Without additional contributions by the state in some form, the property tax administration system will continue to function inefficiently and inequitably.

Appendix 1: Regression Analysis Methods and Results

Regression Model I: Determinants of County Funding for Assessors' Offices

To identify the impact of the system of incentives facing county governments with respect to property tax administration expenditures, we construct a regression model designed to determine the impact of these incentives on assessors' budgets, while holding other factors that affect assessors' funding constant. According to our hypothesis, we expect assessors' budgets to be relatively larger in counties receiving a greater percentage of total countywide property tax revenues because of the relatively stronger incentive for the county to collect all appropriate property taxes.

We examine assessors' budgets during a twelve-year period, from fiscal year 1984-85 through fiscal year 1996-97, with data from all 58 counties.¹⁴ Our model includes a number of factors believed to influence the size of an assessor's budget, as well as the key policy variables that measure the incentives that counties have to invest in property tax administration. To control for population differences in California's counties, we analyze assessors' budgets and other key variables on a per-capita basis.

First, we control for differences in workload, both over time and across counties. To control for these differences in underlying workload levels, we include the number of parcels transferred in a given county in each year, as well as the number

of units on the property tax roll (all in per-capita terms). We also hypothesize that the relationship between the size of a county and the assessor's budget might not be a simple, linear function of the county's population and the assessor's workload. For example, there might be certain economies of scale in assessors' operations. To account for these factors, we include a variable designed to grow as a county's size increases, but not at a linear rate. We use the log of the county's population as a proxy for this effect.

In addition, we hypothesize that overall changes in a county's general fund budget may affect its assessor's funding, independent of the impact of the underlying incentives we examine. Counties with more fiscal resources (as measured in terms of expenditures per capita on certain "general government" departments) may simply spend more on property tax administration than do counties with fewer resources. Conversely, counties experiencing fiscal difficulties may reduce spending for assessors for reasons that have more to do with underlying fiscal conditions than with the incentives we are examining. To control for this effect, we include a measure of county expenditures per capita for other general government functions, including the county counsel, clerk of the board of supervisors, and county administrative office.

Finally, as is standard practice in estimating a regression model that includes observations drawn from different entities over different years, we include “dummy” variables for each county and for each time-period in our data set.¹⁵ A dummy variable is a common statistical technique that measures factors known to exist but that cannot be easily or directly measured with available data sources. For example, certain factors specific to a given county, such as the popularity or political power of the local assessor, will affect funding.

Dummy variables can serve as proxy measures for these factors.¹⁶

Most importantly for our purposes, we include two explanatory variables designed to measure the influence of the incentives to invest in property tax administration. The first variable is the percentage share of the property tax that the county receives. The second variable is the value of “reimbursements” the county receives from its other taxing entities to help pay for property tax administration (measured as the

Table 1
Regression Results
Dependent Variable: Assessor Budgets Per Capita
Mean: 13.89 Std. Dev.: 13.53 R-Squared: 0.976

Variable	Mean (Std. Dev.) for Explanatory Variable	Elasticity	Coefficient Estimate	Standard Error for Estimate	T-Statistic for Estimate
Intercept			72.465	26.410	2.74**
Roll Units	0.633 (0.351)	0.30	6.625	2.2386	2.96**
Transfers	0.054 (0.036)	0.07	18.247	5.433	3.36**
GF Budget	65.79 (89.91)	0.24	0.051	.004	13.10**
Scale	12.01 (1.72)	-0.53	-6.362	2.334	-2.73**
Admin Loan Funds	0.228 (0.664)	0.01	0.678	0.243	2.79**
Reimburse	0.096 (0.123)		-1.900	1.923	-0.97
County Share	0.294 (0.106)	0.19	9.189	5.262	1.75*

The regression uses 628 observations. Dummy explanatory variables for counties and for fiscal years are also included, but results not recorded. Elasticity is a measure of the percentage change in the dependent variable for a one-percent change in an explanatory variable at the mean observation. Elasticities are listed only for statistically significant results.¹⁷

***Statistically significant at the 99% level; *90% level.*

share of property tax administration costs paid by cities, redevelopment agencies, and special districts).

Regression Results

The results of this first regression analysis appear in Table 1. These results indicate that counties do respond to the present system of incentives in determining funding levels for their assessors' offices. We find a statistically significant, positive relationship between the share of property tax received by a county and the relative per-capita value of its assessor's budgets. Counties receiving relatively more property tax revenues spend more on their assessors' operations (holding the other factors contained in our regression analysis constant). Specifically, for the average county observed over the study period, a one-percent increase in the county's share of the property tax yields about a 0.19-percent increase in the assessor's budget.

As expected, the regression results in Table 1 also indicate that assessors' budgets are larger where there are more units per capita on the property tax roll, where there are more transfers to process per person, and where spending per person for other general government departments is higher.

Our regression results also indicate that, as intended by the program, increases in property tax administration loan funds translate into increases in assessors' budgets. A one-dollar per-capita increase in these loan funds yields about a \$0.68 increase in per-capita funding for assessors' offices, holding other factors constant.

Our regression model is not able to isolate a statistically significant relationship between the amount that a county receives in reimbursements from other local entities for property tax administration and the average county assessor's office budget over the period examined. This may be due to several factors, including (a) the fact that multiple actions affecting county budgets and assessor spending were enacted during a relatively concentrated period, or (b) the rate at which counties are reimbursed for property tax administration expenditures is highly collinear with the county-share variable.

It is also possible, however, that the reason we do not find a statistically significant relationship is that counties are not in fact responding to these incentives. In other words, counties may simply view these reimbursements as an additional revenue source and not spend the additional resources on property tax administration.

Regression Model II: Determinants of Property Tax Revenue Collections

Having determined that counties respond to the incentives they face for investments in property tax administration, the question nevertheless remains: Do the increased investments made by those counties that receive a relatively larger share of the property tax improve property tax administration?

To determine the effects of increased funding for property tax administration expenditures on countywide property tax

revenue collections, we construct a second regression model. This model estimates per-capita property tax revenue collections as a function of several key explanatory variables believed to be associated with property taxes, as well as our key policy variable, the funding level for assessors' offices. As with the previous model predicting assessors' budgets, we convert variables into per-capita terms where appropriate.

Specifically, our model estimates property tax collections as a function of personal income, building permits issued in the previous year, population density, parcels transferred, and the assessor's budget (in per-capita terms, where appropriate). As with Model I, we also include dummy variables for each county and time period in our data set.¹⁸

Income per capita in a county is used as a positive proxy for both residential and business demand for property. Thus, we expect that a county with higher per-capita income will also have higher property tax revenues. Building permits per capita acts as a positive proxy for an increase in the supply of new property in the county. Controlling for demand in the regression analysis, and holding other factors constant, an increase in new property could increase or decrease the value of a county's per-capita property tax base and, consequently, its property tax revenues – depending on the price elasticity of demand for the type of property in question.

Besides the use of per-capita personal income, we also control for a county's property demand by taking into account

population density. We expect population density to have a non-linear effect on per-capita property tax revenues. As population density in a county rises from a low level, demand for property in the county should increase and property tax revenues per capita should increase. But population density that exceeds a certain point may actually discourage people and business from residing in a county, thereby decreasing property values and tax revenues. To control for this expected positive and then negative effect of increased population density, population density enters the regression in both a linear and a squared (quadratic) form. Our expectation is that the linear form of population density should have a positive effect and the squared form a negative effect.

In addition, the per-capita number of roll units transferred from one owner to another in a county is expected to exert a positive influence on per-capita property tax revenues. Under California's system of acquisition-value assessment, property can remain at below market-value assessment until it is sold, at which point it enters the property tax roll at its market value. Thus, transfers per capita should be positively related to higher per-capita property tax revenues because more transfers should mean more properties entering the roll at full market value. And as previously discussed, increasing the per-capita budget allocated to a county assessor's office should exert a positive influence on per-capita property tax revenues.

Regression Results

The results of our second regression analysis are contained in Table 2. All of the included variables exhibit the expected signs on the regression coefficients and are statistically significant.¹⁹ Most importantly for our purposes, we confirm that higher spending for property tax administration is associated with higher property tax collections. Specifically, a dollar increase in per-capita spending for assessor’s operations yields about a \$13.90 increase in property tax revenues collected per person, on average.

Our analysis also indicates that higher property tax collections are related to higher personal income (representing residential and business demand for property), fewer building permits (representing property supply), and greater population density (up to a maximum density of 1,659 people per square mile).²⁰ Higher numbers of property transfers are also related to greater tax revenues, as they result in more property being assessed at the current market value.²¹

Table 2
REGRESSION RESULTS
Dependent Variable: Property Tax Revenues Per Capita
Mean: 582.70 Std. Dev.: 274.58 R-Squared: 0.943

Variable	Mean (Std. Dev.) for Explanatory Variable	Elasticity	Coefficient Estimate	Standard Error for Estimate	T-Statistic for Estimate
Intercept			-39.055	59.148	0.66
Income	18,393.30 (5,262.90)	0.60	0.019	0.003	6.33**
Building Permits	1.081 (0.876)	-0.03	-21.499	4.315	4.98**
Population Density	304.44 (585.71)	0.23	0.448	0.226	1.98*
(Population Density) ²	435,272.59 (1,453,999.30)	-0.10	-0.000135	0.000042	3.214**
Assessor Budget	14.75 (13.32)	0.35	13.897	1.839	7.56**
Transfers	0.052 (0.052)	0.02	175.226	87.767	1.99*

The regression uses 628 observations. Dummy explanatory variables for counties and for fiscal years are also included, but results not recorded. Elasticity is a measure of the percentage change in the dependent variable for a one-percent change in an explanatory variable at the mean observation. Elasticities are listed only for statistically significant results.¹⁷

***Statistically significant at the 99% level; *90% level.*

Appendix 2: Data Sources

Data	Source of Data
Property tax revenues	State Controller
Assessor operating expenditures	State Controller
Assessor workload	Board of Equalization
Personal income	Bureau of Economic Analysis
Building permits	Construction Industry Research Board
Land area	U.S. Census Bureau
Administration loan program	Department of Finance

Endnotes

¹ This formula was originally contained in the 1979 Assembly Bill 8 (AB8) and has been modified during the intervening years, notably by the property tax shifts of the early 1990s, which transferred approximately \$4 billion in revenues from local governments into a fund for schools called the Educational Revenue Augmentation Fund (ERAF).

² Legislative Analyst's Office, "Analysis of the 2000-01 Budget Bill," p. F-186, 2000.

³ A small amount of property is assessed by the state each year.

⁴ Schools were originally included in this bill, Chapter 466, Statutes of 1990 (SB 2557, Maddy), but were removed one year later.

⁵ Legislative Analyst's Office, "Improving the Incentives for Property Tax Administration," in Perspectives and Issues (pp. 203 - 213), 1997.

⁶ Sheffrin, Steven M. and Terri Sexton, "Proposition 13 in Recession and Recovery," PPIC, 1998.

⁷ This model uses an analytical technique called regression analysis. Regression analysis is a technique that allows researchers to identify the influence of one factor on the variable of interest while holding other factors constant. Regression analysis estimates the level and direction of the relationship between each factor and the variable of interest, allowing researchers to estimate the effect on the variable of interest of changes in any of the factors.

⁸ Data for some counties has been excluded from certain specifications and years due to data availability. In addition, to control for population differences in California's counties, we analyze assessors' budgets and other key variables on a per-capita basis.

⁹ Though our results do not allow us to determine precisely why a one-dollar increase in the loan fund program does not translate into a one-dollar increase in assessor spending, we hypothesize that several factors account for this circumstance. First, it is possible that counties are in fact spending every dollar that they receive from the program on assessors but are not increasing spending from other sources as much as they might have otherwise, given budget and workload conditions. Second, some portion of the funds may have been spent on other property tax administration functions, such as treasurer tax collector operations. Third,

as noted by the California State Auditor, some counties are not spending all of the funds they receive each year. These funds would not appear in the expenditure figures reported by the State Controller. Finally, our result of \$0.68 is a point estimate. Statisticians typically calculate a confidence interval around any point estimate. In our case, we can be 90% certain that the actual change in assessor funding associated with a \$1 change in administration loan program expenditures will be between \$0.24 and \$1.08 per capita.

¹⁰ There is also a more technical statistical explanation for the lack of a significant finding: because the payments to counties for property tax administration are closely related (in an inverse fashion) to the share of the property tax that counties receive, our analysis may not be able to discern the independent effect of this variable on assessor expenditures.

¹¹ California State Auditor, "The State-County Property Tax Administration Program." April 2000.

¹² N.B.: The figures presented here are estimates based on the results of our regression analyses. Simulation estimates would only be valid for relatively small changes around the mean value.

¹³ Legislative Analyst's Office, op. cit.

¹⁴ Data for some counties has been excluded from certain specifications and years due to data availability.

¹⁵ Econometricians call this a "Fixed Effects" model.

¹⁶ Dummy variables take only a value of zero or one. For example, the dummy variable for Alameda County would have a value of 1 for all observations for Alameda County, and zero for all other observations.

¹⁷ Table 1 also shows the elasticities calculated at the means for all statistically significant explanatory variables. An elasticity measures the percentage change in the dependent variable that results from a one-percent change in the respective explanatory variable. Elasticities are widely used by economists because they allow for a comparison of the relative impacts of different explanatory variables included in a regression model. For example, from Table 1 we see that Scale has the greatest relative influence on per-capita funding allocated to assessors. A one-percent increase in population yields about a half-percent increase in the per-person amount spent on assessing activities. By contrast, roll units per capita and the general fund

budget per capita exerts an influence that is only about half the magnitude of population effects. The policy-relevant variables of county share of property tax revenue received and administrative loan funds per capita are quite different in their relative influences. A ten-percent increase in loan funds only yields the very slight 0.10 percent increase in the assessor budget. Alternatively, a ten-percent increase in the percentage of countywide property tax revenue received by a county (from a mean of 0.294 to 0.320) results in a 1.90-percent increase in per-capita assessor budget (from a mean of \$13.89 to \$14.15).

¹⁸ We encounter an analytical problem in this second estimation related to a key assumption of regression analysis: that the error terms are not correlated with the dependent variable. In our model, it is known that some of the same factors that determine county per-capita property tax collections also determine per-capita spending on a county assessor's office. Therefore, the error term could be correlated with the dependent variable. In order to correct for this problem, we use a technique referred to as two-stage least squares analysis. This correction is reflected in this second regression estimation.

Two-stage least squares analysis involves the estimation of two separate regressions. The first-stage regression predicts the value of the endogenous variable. The second-stage regression uses the predicted values of the endogenous variable in the desired regression model. In order to perform this two-stage technique, the number of explanatory variables in the first-stage regression must be one or more greater than the number of exogenous explanatory variables in the second-stage regression. We satisfy this requirement by using all of the exogenous variables in the property tax revenue regression (Income, Building Permits, Population Density, Population Density², Transfers, Year Dummies, and County Dummies) and all of the independent variables in the assessor's budget regression that are not included in the property tax regression (Roll Units, GF Budget, Scale, Admin Loan Funds, Reimburse, and County Share) as explanatory variables in the first-stage regression used to derive the predicted value of an assessor's budget. As an indicator of how well this regression predicts the value of an assessor's budget, the calculated goodness-of-fit, or R-squared value, is 0.846. The predicted values of assessor budget were then used as an explanatory variable in the regression estimation discussed next.

¹⁹ That is statistically significant from zero at a 90% confidence level.

²⁰ The regression coefficients indicate that for California counties observed over this period, population density contributes to increased property tax revenues per capita as long as population density in the county is below 1,659 people per square mile. To put this in perspective, the mean population density in this sample is about 304 people per square mile, and the maximum is 3,338.

²¹ For the average California county observed over this period, an additional transfer per capita causes about a \$175 per-capita increase in property tax revenues. This is no surprise given how the acquisition-value method of property assessment has held assessed property values below market values in California's real estate market.

²² It is informative to compare the elasticities recorded here. The 0.60 elasticity of income indicates that per-capita property tax revenues are most responsive to per-capita changes in county incomes. A one-percent increase in income yields an inelastic 0.6-percent increase in property tax revenues. Next in magnitude, though only about half the size of income elasticity, is the assessor budget elasticity. A one-percent increase in assessor budget per capita, for the average county in California over this period, would have netted a 0.35-percent increase in per capita property tax revenues. Even smaller in extent were the building-permit elasticity of property tax revenues (at -0.03) and the transfer elasticity of property tax revenues (at 0.02).

About the Authors

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