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THE IMPACT OF PROPOSITION 13 ON  
HOUSE PRICES IN NORTHERN  
CALIFORNIA: A TEST OF  
THE INTERJURISDICTIONAL  
CAPITALIZATION HYPOTHESIS

by

Kenneth T. Rosen

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The Impact of Proposition 13 on House Prices  
in Northern California: A Test of the  
Interjurisdictional Capitalization Hypothesis

by

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Berkeley

June 1980

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The Impact of Proposition 13 on House Prices  
in Northern California: An Initial Test of the  
Interjurisdictional Capitalization Hypothesis

by

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The statewide property tax limitation initiative, known as Proposition 13 or the Jarvis-Gann initiative, was approved by California voters on June 7, 1978. The initiative, which took effect on July 1, 1978, had the following key provisions. First, the maximum amount of any ad valorem tax on real property could not exceed one percent of the "full cash value" of the property. The one exception to this rule concerned any taxes used to pay the interest and redemption charges on any indebtedness approved by the voters prior to the passage of Proposition 13.

Second, in addition to limiting the rate of taxation on real property, the initiative defined the "full cash value" of the property in a quite restrictive way. "Full cash value" was defined as the county assessor's evaluation of real property as shown on the 1975-1976 tax bill. If the property had been transferred since 1975, then the "full cash value" was defined as the market value which accompanied the change in ownership.

Third, changes in the "full cash value" over time were limited

to annual increases of two percent, with, of course, the exception of properties that were sold, in which case, as stated earlier, the "full cash value" became the market price.

Finally, Proposition 13 prohibited both State and local governments from imposing any additional ad valorem taxes on real property. It also prohibited the state from imposing any additional taxes without a two-thirds majority vote of the legislature, and prohibited the cities, counties, and special districts from imposing additional taxes without a two-thirds majority vote of the electorate.

It is quite clear that Proposition 13 encompassed a broad and fundamental change in the property tax system in California. As a result, a number of interesting research issues were raised for the astute political economist. The first question one might ask is why did Proposition 13 occur? Were there any systematic relationships between votes for Proposition 13 and prior increases in property taxes and property values? Were there differential voting patterns based on the household's economic and political characteristics?

In addition to the political economy question, one can study the economic impacts of Proposition 13. Much of the pre-proposition debate centered on the potential overall impacts on the California economy. Massive layoffs and a collapse of the local public sector were predicted by some. Proponents of the proposition predicted a construction boom.

In addition to these macroeconomic impacts the distributional effects are important areas for research. The distribution of gains between landlords and tenants and between residential and commercial property owners are clearly of interest. The focus of this paper is on a more

subtle aspect of the distribution of gains, the interjurisdictional capitalization effects of this property tax reduction.

### Previous Literature and the Theoretical Model

The impact of interjurisdictional differences in property taxes and public spending on property values has given rise to a number of articles. The classic works of Orr and Oates\* have shown a substantial capitalization of interjurisdictional differences in local property taxes and public spending on median rent per room and on the median price of a single family home.

The studies of Smith, Church, Wicks, Little and Beck\*\* take a somewhat different approach. They examine the impact of changes of property tax bills on the value of individual properties. These studies again find strong evidence of property tax capitalization.

The results we present in this paper attempt to combine both the interjurisdictional comparison and the property tax change literature. Proposition 13 led to a substantial differential reduction in property taxes between jurisdictions, while the state provided a financial bailout for local communities which caused a fairly small uniform re-

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\* Larry Orr, "The Incidence of Differential Property Taxes on Urban Housing", National Tax Journal, September, 1968.

Wallace Oates, "The Effects of Property Taxes and Local Public Spending on Property Values: An Empirical Study of Tax Capitalization and the Tiebout Hypothesis", Journal of Political Economy, December 1969.

\*\* Albert Church, "Capitalization of the Effective Property Tax Rate on Single Family Residences", National Tax Journal, XXVII.

John Wicks, Robert Little, and Ralph Beck, "A note on Capitalization of Property Tax Changes", National Tax Journal, September 1968.

R. Stafford Smith, "Property Tax Capitalization in San Francisco", National Tax Journal, June 1970.



duction in service levels. Thus we can fairly confidently look at the impact of property tax changes on house prices as a measure of the initial capitalization effects of Proposition 13.

The theoretical framework for our analysis relies on two simple models. The first, on interjurisdictional effects, is developed by Henderson\*. His model shows that in a metropolitan area with differing fiscal jurisdictions, if there is to be any community that has a heterogenous mix of incomes within the community, then net house prices must vary between jurisdictions. To show this, assume that there are two types of consumers (high income (h) and low income (l)), and three types of communities: homogenous low income (l), homogenous high income (h), and mixed communities (m). If we assume that each consumer type consumes the same amount of housing no matter where he/she lives, and that the level of public services is the same in each community, we can isolate pure tax effects. "Given that they consume the same level of public services and housing (regardless of place of residence), in order for them to have equal utility, their expenditures on all other goods must be equalized between the communities." Thus, assuming that they are mobile between communities, the gross expenditure (before taxes) on housing must be the same or, given that tax rates differ by community, their net expenditures must be different. This assumes that utility levels are equal in each location. Equation (1) shows the relationship between house prices and tax rates in different jurisdictions.

$$(1) \quad P_h^m = P_h^h \frac{(1 + t^h)}{(1 + t^m)}$$

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\* J. Vernon Henderson, Economic Theory and the Cities, Academic Press, London, 1977.

This states that the price of high income housing in a middle income community will be equal to the price of high income housing in a high income community times the ratio of relative tax rates. Since  $t^h < t^m$ ,  $P_h^h > P_h^m$ , reflecting the interjurisdictional capitalization effect.

The second model shows the overall capitalization effect of a property tax change. Simply put, it states that the reduction in property tax leads to a gain in property value which is far more than one years tax reduction. The effect can be written in equation (2).

$$(2) \quad \Delta P_1 = \sum_{t=1}^n \frac{\Delta T_t^e}{(1+i)^t}$$

The change in price today will depend on the expected change in property tax payments from year 1 to year n, and the rate of interest. This also assumes that local public services are valued and/or would not be materially affected by Proposition 13.

Combining equations (1) and (2) we have a model which can test this interjurisdictional capitalization effect.

$$(3) \quad \Delta P_{1j} = \left( \sum_{t=1}^n \frac{\Delta T_{tj}^e}{(1+i)^t} \cdot X_{1j} \right)$$

This states that the change in house prices in period 1 in jurisdiction j is a function of the change in the overall tax rate in jurisdiction j, the market rate of interest (i), and a vector of other factors which may influence property values in jurisdiction j.

### Empirical Implementation

In order to empirically implement the model described above two key pieces of data were required: tax rates and house prices pre- and post- Proposition 13 by jurisdiction.

Tax rate data was obtained by surveying county assessors in the Bay Area. Data was gathered for the 1976, 1978 and 1979 fiscal years for all jurisdictions.

The effect of Proposition 13 has been to dramatically reduce both the level and the variance of tax rates in Bay Area jurisdictions. Table I shows effective composite tax rates for 64 jurisdictions in the Bay Area in fiscal 1976, 1978 and 1979. The 1979 numbers fully reflect the tax limitation effects of Proposition 13. The coefficient of variation of tax rates in these years has declined from 17.9% in 1978 to 9.9% in 1979. The remaining variations in 1979 are due primarily to those bond issue servicing expenses exempted from the limitation effects of Proposition 13. However, one town, Burlingame, actually rebated its bailout money to taxpayers and so its tax rate appears to be the lowest in the Bay Area.

House price data was obtained at great expense and effort from the Society for Real Estate Appraisers (SREA) raw data files. These files, on computer tapes, contain data on house prices and other characteristics of actual market transactions in the Bay Area. Mean house price data for each jurisdiction pre- and post-Proposition 13 was compiled from these tapes. While most jurisdictions had well over 100 transactions in each period, some of the smaller municipalities had closer to twenty transactions. Any jurisdiction with less

TABLE I: Composite Property Tax Rates in San Francisco Metropolitan Area Pre- and Post-Proposition 13

Municipality	Fiscal 1976 (1975-1976)	Fiscal 1977 (1977-1978)	Fiscal 1978 (1978-1979)
Alameda	13.2320	12.9380	5.0318
Albany	14.2530	12.5400	5.0340
Berkeley	16.6930	13.7520	5.0431
Fremont	12.7630	12.4410	5.7250
Hayward	13.1330	12.9380	5.4390
Livermore	13.0800	12.8614	5.8220
Newark	15.1240	14.4430	6.1202
Oakland	14.8436	13.7690	4.8700
Pleasanton	13.1380	12.8300	5.5960
San Leandro	9.4650	8.7660	4.4930
Union City	13.1520	12.7340	5.3700
Antioch	11.1560	11.1520	4.7020
Clayton	11.2500	11.7370	5.2500
Concord	12.5280	11.8930	5.4000
El Cerrito	11.5860	12.0740	4.8270
Hercules	12.7010	10.1890	4.6160
Martinez	12.5510	11.1600	4.7500
Moraga	12.4140	11.1460	4.9000
Pinole	12.8330	11.2890	4.7500
Pittsburg	12.6840	12.6770	5.0000
Pleasant Hill	11.6230	11.3780	5.2500
Richmond	14.2220	12.8150	4.2500
San Pablo	13.7360	12.4400	5.0000
Walnut Creek	11.0000	11.4460	5.2500
Corte Madera	11.1780	8.5120	4.6550
Fairfax	12.0120	9.2370	4.4300
Larkspur	10.9980	8.5740	4.2500
Mill Valley	11.5000	8.9550	4.4200
Novato	12.2450	10.6200	4.8130
San Anselmo	11.6720	8.9710	4.2300
San Rafael	10.3110	8.6670	4.8050
Sausalito	9.7900	8.1930	4.2850
Tiburon	11.5140	9.1260	4.6750
Napa	10.1600	10.3100	4.7500
St. Helena	7.5500	6.5500	4.8000
Yountville	9.5800	9.2100	4.5600
Atherton	9.5800	8.8090	4.1400
Belmont	9.5814	8.8868	4.2600
Burlingame	7.8567	7.2985	3.8500
Daly City	11.1626	10.6083	4.8500
Half Moon Bay	11.2525	10.3629	4.6131
Hillsborough	8.7755	7.7030	4.2000
Menlo Park	10.8342	8.6386	4.0900

TABLE I (con't.)

Municipality	Fiscal 1976 (1975-1976)	Fiscal 1978 (1977-1978)	Fiscal 1979 (1978-1979)
Millbrae	8.0507	7.3006	4.4423
Pacifica	11.4396	11.0862	4.8107
Portola Valley	9.7824	8.4160	4.2045
Redwood City	7.8522	8.5180	4.3000
San Bruno	8.6761	8.1842	4.2157
San Carlos	8.9063	7.8376	4.2256
San Mateo	10.5413	8.1968	4.3436
South San Francisco	8.7551	8.4424	4.2526
Woodside	9.8459	8.4408	4.1384
Cotati	13.0900	10.6500	5.2030
Healdsburg	11.0470	10.1000	4.5300
Petaluma	12.8800	11.0700	4.5440
Rohnert Park	13.1130	11.3000	5.0900
Santa Rosa	12.6320	10.9000	4.3950
Sebastopol	11.4860	10.2200	4.4960
Sonoma	12.0010	11.1000	4.3310
Benicia	9.0823	9.1672	4.7269
Fairfield	11.2926	10.9835	5.2803
Suisun City	11.0526	10.7435	5.1131
Vacaville	10.5871	10.9288	5.0307
Vallejo	13.1682	11.5511	4.8018

than twenty observations was eliminated from our sample. House price data and house price changes for the pre- (January to June 1978) and post- (January to June 1979) proposition period are shown in Table II.

Econometric Test of Interjurisdictional Capitalization Effects

The simple theoretical model outlined in an earlier section was then tested in an econometric framework using the data just described. In addition to the property tax and house price data, variables were included to control for changes in the characteristics of houses sampled by the SREA and differences in basic economic conditions in the jurisdictions.

Three variables were used to control for the mix of houses recorded in the SREA data: mean square footage, mean age, and a measure of quality of houses as rated by SREA appraisers. Basic economic conditions were proxied by median income, and transportation time to San Francisco. All variables except the latter two represented percentage changes between the pre- and post-Proposition 13 period. The income and transportation time variables represent one point in time (1975) and are proxies for the shifting locational advantages due to energy costs and taste changes and to macroeconomic influences on the income distribution.

The estimated model is specified as follows:

$$(4) \quad PCPOST = a_1 + a_2(PTAXSAV) + a_3(PCHSE) + a_4(\text{Income}) + a_5(\text{Location})$$

where: PCPOST = Change in mean house prices post-Proposition 13.

PTAXSAV = Change in property tax bill on mean house post-Proposition 13

TABLE II: House Prices in San Francisco Metropolitan Area Pre- and Post- Proposition 13

	Jan - June 1978 (000)	Jan - June 1979 (000)	% Change Post/Pre	% Change Pre/1976 Base
Alameda	\$79.0	\$85.0	7.6	56.5
Albany	64.0	74.0	15.6	41.8
Berkeley	80.0	94.0	17.5	45.4
Fremont	69.5	85.0	22.3	58.6
Hayward	60.0	70.0	16.7	39.5
Livermore	67.0	78.0	16.4	50.0
Newark	65.0	77.0	18.5	48.8
Oakland	50.0	56.0	12.0	-
Pleasanton	78.0	87.0	11.5	46.3
San Leandro	62.0	76.0	22.6	39.5
Union City	62.0	67.0	8.1	53.6
Antioch	52.0	58.0	11.5	34.2
Clayton	87.0	108.0	24.1	37.5
Concord	64.0	68.0	6.2	35.4
El Cerrito	73.0	87.0	19.2	42.3
Hercules	75.0	78.0	4.0	61.7
Martinez	62.0	67.0	8.1	46.3
Moraga	121.0	135.0	11.6	57.5
Pinole	63.0	69.0	9.5	36.3
Pittsburg	52.0	55.0	5.8	40.0
Pleasant Hill	88.0	109.0	23.9	39.3
Richmond	42.0	49.0	16.7	38.7
San Pablo	44.0	51.0	15.9	33.3
Walnut Creek	88.0	94.0	6.8	33.8
Corte Madera	87.0	132.0	51.7	29.7
Fairfax	87.0	105.0	20.7	44.8
Larkspur	109.0	149.0	36.7	18.8
Mill Valley	116.0	143.0	23.3	37.5
Novato	90.0	112.0	24.4	47.4
San Anselmo	98.0	131.0	33.7	15.0
San Rafael	94.0	114.0	21.3	36.9
Sausalito	135.0	181.0	34.1	47.8
Tiburon	179.0	259.0	44.7	77.1
Napa	64.0	71.0	10.9	43.2
St. Helena	66.0	82.0	24.2	38.7
Yountville	63.0	83.0	31.7	34.0
Atherton	236.0	337.0	42.8	38.2
Belmont	103.0	128.0	24.3	27.6
Burlingame	121.0	138.0	14.1	46.9
Daly City	69.0	76.0	10.1	34.6
Half Moon Bay	91.0	129.0	41.7	-
Hillsborough	243.0	337.0	38.7	29.1
Menlo Park	103.0	123.0	19.4	42.1

TABLE II (con't.)

	Jan - June 1978 (000)	Jan - June 1979 (000)	% Change Post/Pre	% Change Pre/1976 Base
Millbrae	110.0	116.0	5.4	35.0
Pacifica	70.0	78.0	11.4	36.0
Portola Valley	187.0	246.0	31.6	53.0
Redwood City	92.0	106.0	15.2	30.2
San Bruno	81.0	84.0	3.7	45.6
San Carlos	94.0	113.0	20.2	39.7
San Mateo	101.0	105.0	4.0	42.8
South San Francisco	76.0	82.0	7.9	50.0
Woodside	226.0	269.0	19.0	86.1
Cotati	61.0	83.0	36.1	-
Healdsburg	63.0	70.0	11.1	-
Petaluma	65.0	78.0	20.0	-
Rohnert Park	59.0	70.0	18.6	-
Santa Rosa	60.0	75.0	25.0	-
Sebastopol	73.0	77.0	5.5	-
Sonoma	64.0	82.0	28.1	-
Benicia	59.0	73.0	23.7	-
Fairfield	47.0	50.0	6.4	-
Suisun City	53.0	51.0	-3.8	-
Vacaville	55.0	61.0	10.9	-
Vallejo	50.0	52.0	4.0	-



POPC = Change in population in 1978 (%).

PCHSE = Change in three house characteristic variables.

While this equation should provide an adequate test of the initial capitalization effect following Proposition 13, there are several potential problems which should be noted. First, it is possible that the passage of Proposition 13 was anticipated by the housing market and so a portion of the capitalization may have occurred prior to June 1978. Working in the opposite direction is the possibility that there was and still is so much uncertainty regarding the impact of Proposition 13 on local services that households have not yet capitalized the reduction in taxes. Additionally, the state bailout of localities may erode over time because of further state tax limitations.

Another potential difficulty with this test concerns other factors which may have differentially effected housing demand by location in the second half of 1978 and the first half of 1979. It is possible that rising energy prices, changing demographics, and other trend variables could increase the demand for close in housing relative to distant suburban housing. While the tests reported here do include a travel time to San Francisco variable, it is only a proxy of these effects.

A final qualification, our test is only attempting to capture interjurisdictional capitalization and not the potential overall capitalization effects of this reduction in property taxes.

With these caveats in mind, the results of the econometric test of the initial interjurisdictional capitalization effects of Proposition 13 are reported below.

The basic results are reported for a weighted OLS regression which corrects for heteroskadasticity and also scales each variable.\*

$$\begin{aligned} (5) \quad PCPOST &= 7.275 * PTAXSAV + .5468 * SQFT + .00073 * INCOME \\ &\quad (2.97) \qquad\qquad\qquad (2.32) \qquad\qquad\qquad (1.34) \\ &+ .0638 * AGE - .0043 * TRANSPORTATION TIME \\ &\quad (3.26) \qquad\qquad\qquad (2.24) \\ &+ .857 * Condition - .171 \\ &\quad (1.8) \qquad\qquad\qquad (3.21) \end{aligned}$$

$$\begin{aligned} \bar{R}^2 &= .886 & F &= 82 & n &= 64 \\ &(+ - statistics in ( ) ) \end{aligned}$$

The results of this regression provide strong confirmation that the differential interjurisdictional tax reductions of Proposition 13 were partially capitalized in the year following the effective date of the statewide initiative. The capitalization rate implied by this equation is about 7, which is precisely the magnitude that one would expect given an interest rate of about 12-15%.

The robustness of this result is indicated by several alternative specifications of the same basic model. A simple equation with two dependent variables, property tax savings and change in square footage shows

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\*Each variable is weighted by the inverse of the number of sales transactions reported in 1978 to correct for heteroskadasticity.

the same capitalization rate of 7. A logarithmic transformation and different scaling of the independent variables moves the implied capitalization rate in the 6 to 8 range. In all cases the results are quite insensitive to changing specification.

### Summary

This paper has carefully examined the impact of the massive property tax cuts following California's Proposition 13. The results of this study provide probably the strongest confirmation yet of the interjurisdictional capitalization described by authors such as Oates. Each dollar decrease in property taxes appeared to increase property values by about seven dollars. It should be emphasized, however, that these tax cuts occurred without any substantial corresponding reduction in services as the State of California's surplus was used to "bailout" local communities. Thus, these results, while strongly confirming the theory of property tax capitalization, must be viewed as tentative because of the remaining uncertainty regarding future service cutbacks in local communities.

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