Biases in Analysis of Split-Rate Property Tax Reforms:
Hawaii's Experience 1963-1979

Sally Kwak

Lincoln Institute of Land Policy
Working Paper

Lincoln Institute Product Code: WP09SK1

Abstract:

Some localities levy split-rate property taxes, with one rate on land and another on improvements. Simple economic theory suggests this type of tax increases land use efficiency while reducing sprawl. However, empirical analyses of these effects is complicated by the potential non-randomness in adoption (or not) of split-rate systems by localities. To better understand this source of bias, we provide a case study of one particular state, Hawaii. We focus on describing the political, economic and legislative history of split-rate tax legislation in the state over a sixteen year period, 1963-1979.

About the Author

Sally Kwak is Assistant Professor of Economics at the University of Hawaii Manoa.

University of Hawaii-Manoa
531 Saunders Hall
Honolulu HI 96814
Tel: (808) 956-7296
Fax: (808) 956-4347

Email: kwaks@hawaii.edu

Table of Contents

Biases in Analysis of Split-Rate Property Tax Reforms:
Hawaii's Experience 1963-1979

I.   Introduction

Property tax reforms are an important part of ongoing attempts on the part of states and localities to raise revenue in efficient ways. Most local communities in the U.S. tax property at a single rate. However, a few communities have experimented with splitting this rate into two components, levying one rate on the value of the land and another on the value of improvements on the land. Typically, the tax rate on the value of the land is set higher than that on improvements. Basic economic theory suggests that switching from a general property tax to a split-rate tax increases land use efficiency and stimulates urban core development while preserving the environment and reducing urban sprawl. Furthermore, theory predicts that the split-rate system can achieve these objectives while remaining revenue neutral and minimizing excess burden. More recently, some economists have challenged this view, suggesting that implementation of a split-rate tax versus a property tax leads to higher levels of sprawl and less urban development in the central city (for example, see Lavery, 2006).

Unfortunately, there are relatively few empirical papers that convincingly address the impact of the split-rate system of property taxation on outcome variables of interest. This is partly due to the extremely small number of localities that have instituted the split-rate tax and the resulting lack of data. Furthermore, it is difficult to design a study that accurately identifies the causal estimates of interest. In an ideal empirical study, we would randomly assign localities to either the split-rate or the single-rate system and compare outcome variables subsequently. Obviously, it is not feasible to randomly dictate a system of taxation to various localities. Furthermore, localities themselves do not randomly choose systems of taxation. On the contrary, the decision to implement a single-rate or split-rate system is complicated and involves many social, political, economic considerations which are often unobservable to or not measurable by an empirical researcher. Thus, a simple comparison of split-rate to single-rate localities in the absence of this random assignment will not account for unobserved differences between localities that may confound the results and bias estimates.

This problem of bias can be partially remedied by various econometric matching techniques. However, in the absence of a full set of observed variables on treatment localities, these matching techniques are insufficient for addressing the fundamental problem with the research design. In addition, many of the variables that are crucial to estimation of these effects are fundamentally unmeasurable or unobservable to the empirical researcher. Thus in many cases, empirical work is unable to solve the fundamental problem of bias in the parameter estimates.

In light of these hurdles, this paper conducts a case study of Hawaii's first experiment with split-rate taxation 1963 to 1979. We hope to present insight into the factors that lead to bias in empirical analyses of this type of tax policy. In order to fully understand the nature of the biases in interpretation of these correlations as possible causal parameters, this project focuses on identifying factors that are unobserved (to the empirical researcher) and that may be correlated with spatial development and changes in tax systems, thus biasing the results. To this end, special importance will be placed on describing the legislative, political and economic history of

the state and counties over this period. This paper outlines the political narrative underlying the passage and eventual repeal of the legislation.

Section II describes the passage (in 1963) and implementation (in 1965) of the split-rate property legislation in Hawaii and Section III describes the events leading up to its repeal (in 1977). Section IV addresses the question of possible biases in empirical estimations of the effects of the law on models of spatial development and Section V concludes.

II. Passage and Implementation of the Pittsburgh Tax Plan in Hawaii, 1963-65

The Pittsburgh Tax Plan, modeled on a similar assessment approach used in Pittsburgh, Pennsylvania, was passed by the Hawaii legislature and signed into law by then Governor of Hawaii, John Burns in June 1963 to be made effective beginning January 1, 1965. The bill instituted separate rates of property taxation on land and on buildings and improvements.

The initial House version of the bill consisted of three main provisions: first, the bill stipulated a higher tax rate on land than on buildings; second, it provided increases on home exemptions from a maximum of $250 to $5600; third, it allowed owners or lessees of agricultural land a maximum of $10,000 in property tax exemptions for improvements increasing a parcel of land's productivity. These agricultural exemptions were not allowed to exceed five years. In addition, the new rates would be phased in according to a graded schedule: the ratio of rates on improvements to that on land would be 90 percent effective January 1, 1964. It would drop to 80 percent on January 1, 1966 unless the Governor suspended the reduction for two years maximum.   The ratio would drop further to 70 percent two years following the previous reduction. After that the legislative bodies could drop the rate by 10 percents at two year intervals until a 40 percent ratio was reached (Hawaii State Archives, Legislative Notes.)

In the initial discussions of the Pittsburgh Tax Law in the Senate Lands Committee, there was concern about possible inequities under the House version of the Pittsburgh bill. For example, it was noted by the Tax Foundation's Fred Bennion that the House plan made it possible for one property with a high market value to pay less tax than another property with lower market value due to the relative value of land and buildings (Hawaii State Archives, Correspondence of the Hawaii Tax Foundation). There was also concern that agriculture would be unfairly burdened by the new plan. Tax Director Ed Burns said, "I see no benefits for large sugar and pine operations… They'll pay higher taxes" (Honolulu Star Bulletin, April 3, 1963). The Attorney General's office pointed out that land without a need for extensive improvements, such as agricultural land, conservation land, or some industrial land would be disproportionately burdened by the passage of the bill (Hawaii State Archives, Correspondence of the Attorney General).

In the final version passed by the Senate, land was divided into six categories: residential, hotel, commercial, industrial, agricultural, and conservation. Of these, the first four categories would be taxed according to a split-rate system, but agricultural and conservation lands would be exempt. In addition, rates would be phased in according to a graded schedule. The exact realized rates over the period in question are listed in Table 2. Simple graphs of the tax rate across the four counties (Honolulu, Hawaii, Maui, Kauai), property types (residential, hotel,

commercial, industrial), and time show that the law indeed increased the difference in rates on land and on improvements until the repeal of the Pittsburgh plan in 1977 (see Figure 2).

As one of just a handful of state and local governments that have experimented with split-rate property taxation, Hawaii presents an interesting case study. The state of Hawaii is unique in many ways. Geographically, it is the only state that is separated from its nearest neighbor by 2,400 miles and it is one of the smallest states (only Delaware, Connecticut and Rhode Island are smaller). It is the last of the 50 states to achieve statehood, and until the overthrow of Queen Liliuokalani in 1893, it was a functioning monarchy. Demographically, the state population is very racially diverse. In addition to whites (also known as *haoles*) and Japanese, Filipinos, Chinese, and Koreans, there is a sizeable native Hawaiian population.

There are important aspects of Hawaii's history and set of background characteristics that are critical to an explanation of how and why the state passed and implemented this rather unusual experiment with property taxes. We maintain and explore three main factors that lead to the legislation (in 1963) and implementation (in 1965) of the split-rate property tax law. First, the 1960's were a period of extensive growth in the Hawaiian economy. The split-rate property tax legislation was intended to further this growth. Second, the system of state and local government was highly centralized. Without this high degree of fiscal centralization, split rates would have been much more difficult, if not impossible, to implement. Third, the Democrats gained ascendancy in the 1960's against a backdrop of years of past Republican rule. This political change combined with the unique history of land and power in Hawaii contributed to the eventual implementation of split-rate property taxation. We examine each of these three factors in turn.

High-growth Era of the Hawaiian Economy

The 1960's were a period of extremely high-growth and optimism in the state of Hawaii. A special business insert in the January 19, 1960 issue of the Honolulu Star Bulletin heralds: "Honolulu in the Next Decade: Building Boom to Match Times", "10 Years Bring Great Changes in Life of Isles", "1960 the Year to Watch", and "Isle Business Outlook Called Better Than Ever". In addition, the arrival of the jet era heightened Hawaii's anticipation of growth. The Honolulu Star Bulletin again published articles such as "Jet Era Arrives" predicting that jets would be an important part of "Hawaii's outlook for 1960 as the era of near supersonic flight continues to shrink the world and heighten the mid-Pacific's importance as a crossroads" (Honolulu Star Bulletin, 1960). Much of this optimism surrounded hope that tourism to the islands would grow, taking the rest of the state along with it. Figure 1 confirms that the 1960's and 1970's were indeed a period of dramatic growth in the visitor industry.

Frank Lombardi, the State Planning Director of the 1960's, wrote in an editorial column, "the physical destiny of the 50th state will be shaped in the 1960's largely because of planning work now under way. A concerted effort to formulate the General Plan… (will be) submitted to the 1961 session of the legislature. It will be the overall guide for future appropriations for highways, harbors, airports, parks, water development, and other state public facilities. With the visitor industry offering the greatest immediate opportunity for economic development, the State

Planning Office has undertaken a crash program to aid development of visitor destination on all the islands" (Honolulu Star Bulletin, 1960).

Historical records from the Bank of Hawaii's Department of Research show a predicted $200 million worth of new construction in 1960. Additional headlines in the Honolulu Star Bulletin proclaim "Commercial Building Reaches for the Sky in '60." Clarence L. Hodge, manager of the General Contractors Association of Hawaii is quoted as saying that the industrial-commercial construction picture is "very rosy" (Honolulu Star Bulletin, 1960).

The Pittsburgh Tax Plan was an attempt to encourage this growth by taxing idle land at a premium rate and creating a more open, competitive market for land. The planning concept of utilizing land at its "highest and best use" was the guiding motto of the times. Furthermore, legislators believed that the higher tax would help cut down on speculation. House Floor Leader John C. Lanham claimed that it would encourage improvement and productivity of land with a lower rate of exemptions. (Hawaii State Archives, Legislative Notes).

High Levels of Fiscal Centralization

The State of Hawaii was highly fiscally centralized over the period, 1963 to 1979. An examination of the ratio of general revenue and direct expenditure to personal income attests to this high degree of fiscal centralization. Census data show that Hawaii's average state and local general revenues were 21.3 percent of state personal income in 1967 in contrast to the U.S. average of 10.7 percent that same year. The state Tax Review Commission in 1965 claimed that "Hawaii local government per capita general revenue is significantly lower than the U.S. average… This is expected given the smaller fiscal role played in Hawaii by local government" (Tax Review Commission, 1984). Table 1 compares the degree of centralization in Hawaii to that of other western states and for the U.S. as a whole. Over the period in question, the state percentage of total state and local general and own source revenue hovered around 50 and 60 percent for California, Nevada, Oregon, Washington, and for the U.S. as a whole. In contrast, the state government in Hawaii raised about 80 percent of total state and local revenue, leaving a scant 20 percent to the four local county governments (Hawaii, Kauai, Maui, and the City and County of Honolulu).

This centralization is consistent with the state-level provision of K-12 public education. While public schools outside of Hawaii are funded at the local district level and with significant amounts of local property taxes, public K-12 education in Hawaii is provided at the state level. The lack of local education funding in Hawaii obviates the need for local government to levy high the property taxes that are typical in other states. The Hawaii State Constitution also places responsibility for the most costly functions of government at the state level. Thus, the State of Hawaii provides much of the expenditures on welfare, health and hospitals (Tax Foundation of Hawaii, 1969). Consistent with the unique system of state-level provision of public education, health, and welfare programs in Hawaii, table 1 shows that while state shares of total government expenditures to be about 30-50 percent for other western states (California, Nevada, Oregon, and Washington), Hawaii's state share exceeds 80 percent.

Throughout the 1960's and 1970's, Hawaii's state and local governments administered sixteen tax laws. Of these, fourteen were administered by the state government. Only the motor vehicle weight tax and the public utility franchise tax were administered by the four local counties (Hawaii, Kauai, Maui, and the city and county of Honolulu) (Tax Foundation of Hawaii, 1968, 1969b, 1971-1979). The state control of real property tax administration and rates allowed the government to encourage development of the outer islands relative to development on Oahu, where the bulk of the state population resides. The limited powers to raise revenues led to limited responsibilities on the part of local county governments. As a result, county governments often looked to the state government to solve problems accompanying growth (Tax Foundation of Hawaii, 1969a). It was not until the 1978 State Constitutional Convention that the state government agreed to turn over administration of the real property tax to local county governments. However, it did so by also inserting a provision to delay the complete transfer for another eleven years. Thus the counties were unable to set their own property tax rates until 1989 (Kalapa, 1992).

As a result of the uniquely centralized system of public finance in Hawaii, property taxes were not the major source of state and local government revenue. Throughout the 1960's and 1970's, sales taxes accounted for the bulk of state and local revenues, with income taxes second, and property taxes third. In 1968, for example, general sales and selected sales taxes accounted for about 50 percent of total state and local tax collections. Income taxes accounted for approximately 25 percent. And property taxes accounted for only 20 percent of revenues (Tax Foundation of Hawaii, 1969).

The centralized nature of government revenue-raising and expenditure functions in Hawaii allowed a complicated system of rates such as those under the Pittsburgh Tax Plan to be implemented in a fairly straightforward manner. As it was, the Pittsburgh plan increased the number of different property tax rates in the state to 40. It is difficult to imagine how the rates would have been set in a decentralized system of multiple local jurisdictions. Under a decentralized system, it is likely that some localities would have chosen the split-rate system and others would have chosen the single-rate system. The uniformity in the implementation of the Pittsburgh plan across the state is entirely due to the high levels of fiscal centralization.

Democrats, Land, and Power in Hawaii

Since the 1950's, Democrats in Hawaii have wielded consistent control over the state government as well as most local government functions. In 1954, Democrats won control of the Legislature for the first time. They lost control of the senate briefly during 1959-1962 but have been in control since. In 1962, Hawaii elected its first Democratic governor and until recently, the party retained this power. Hawaii has only voted for a Republican presidential candidate two times (Cooper and Daws, 1985).

The primacy of the Democratic Party in state and local politics was not always a given. Following the overthrow of the monarchy in 1893, Hawaii was ruled by *haole* (white) Republicans throughout the first half of the twentieth century. These *haole* Republicans "overthrew the Hawaiian monarchy… and formed a government with the avowed intention of offering the Islands to the United States" (Cooper and Daws, 1985). In the process, they

confiscated about 43% of the surface area of the islands (Cooper and Daws, 1985). As a result, the first part of the twentieth century saw a high concentration of wealth, land ownership, and power in the hands of the *haole* Republicans. Land in Hawaii was more highly concentrated than in any other U.S. urban area (Rose and Lacroix, 1988). Furthermore, the geographical isolation of the islands precluded any substitutes for land in Hawaii (Rose and Lacroix, 1988). As a result, land in Hawaii has always been valuable and "has always been a political battleground and prize" (Cooper and Daws, 1985).

It was not until the sons and daughters of the plantation workers came into their own that the locus of power shifted from the Republicans to the Democrats. In contrast to the mainly *haole* Republican party, the Democratic party was multi-ethnic and consisted of many local Asian immigrants and their children. They came into office promising land reform. This meant "changes in the ownership, taxation, and use of land so as to benefit the ordinary person. And because there was no bigger item than land in Hawaii's politics, land reform was one of the biggest items on the Democratic agenda" (Cooper and Daws, 1985).

The Democrats swept into power in 1962 under promises of "land reform" (Honolulu Star Bulletin, 1963). This platform consisted of three main proposals, one of which was the Pittsburgh Tax Bill. In passing the Pittsburgh Tax Bill, the Democrats wanted to shift a greater burden of taxation to the land while reducing taxes on homes, buildings, and productive agricultural land. One of the primary intended effects of the Pittsburgh plan was to force more land onto the market and encourage development. (Hawaii State Archives, Legislative Notes). In early discussions of the measure, the Democratic House Floor Leader John Lanham predicted the plan would encourage improvement and productivity, cut down speculation, and possibly clean up slums (Honolulu Star Bulletin, 1963). Democratic Governor John Burns said, "Land has a social obligation and society has the right to compel the landowner to meet that obligation" (Honolulu Star Bulletin, 1963). But Republican Floor Leader Fred Rohlfing claimed the Pittsburgh Tax Bill passed with "inadequate examination and research as to its possible consequences" (Honolulu Star Bulletin, 1963).

Thus, the implementation of the Pittsburgh plan was a direct consequence of the mostly local Asian Democrats ascendancy into power in 1954 and the land platform that won them this power, spurred on by the decades-long history of *haole* domination over land and power in the state.

III. Repeal of the Pittsburgh Tax Plan in Hawaii, 1977

The state experienced significant problems with implementation following passage of the Pittsburgh Tax Plan in 1963. The Plan was considered by some to be overly complicated, opaque, and inequitable. In 1977, opponents of the split-rate structure won and the legislature repealed the split-rate system, re-instituting and gradually phasing in a single-rate system. The charges that the plan was complex, opaque and inequitable contributed to the repeal of the legislation in 1977. However, the main impetus for the repeal was concern over what was increasingly considered to be uncontrolled economic growth on the island.

Complicated, Opaque, and Inequitable

From the beginning, neither opponents nor proponents were sure of the Pittsburgh plan's effects. Forrest Black, a local reporter writing prior to the official passage of the Pittsburgh Tax Plan, notes "there's one thing for sure about the so-called Pittsburgh Tax Bill. Everyone's taxes would go up or down if the bill becomes law. What is far from certain is just how much?" (Honolulu Star Bulletin, 1963). In December, 1963, just following passage of the bill, the State Tax Department discovered a flaw which would increase the property taxes of land held in fee relative to land held in leasehold. Under the shifting tax rates, the overall tax on fee-simple properties would increase due to a higher proportion of land value than building value. Contrasted to this, a greater proportion of the overall value on leasehold properties was in buildings and therefore would be taxed relatively less. Ed Burns, the Director of the State Tax Department asked the 1964 session to adjust the mistake, believing "this was not the legislature's intent" (Honolulu Star Bulletin, 1963). On another occasion, Burns reported that overall preparations for implementation of the Pittsburgh Tax Plan were progressing smoothly. Though he did note that "the tax bill is so complicated the department is wondering how to explain it to the taxpayers" (Honolulu Star Bulletin, 1963).

The Honolulu Chamber of Commerce expressed its displeasure with the Pittsburgh Tax Plan and repeatedly encouraged its repeal, claiming the law was needlessly complicated and that goals of growth could be accomplished without the measure. Fred Bennion, executive director of the Hawaii Tax Foundation testified before the 1963 Legislature that "computation of applicable tax rates is extremely complicated" and that "difficulties in administration will increase the cost of collecting taxes" (Honolulu Star Bulletin, 1963).

In 1966, one year after implementation began, the State Tax Department asked the Governor's office for a new of study of the law. The Honolulu Star Bulletin reported on the Tax Director's request, describing the Pittsburgh Plan as "a law so complicated that many of the experts do not thoroughly understand it" (Honolulu Star Bulletin, 1966). Foremost among the concerns was the complexity of the law and the possible inequities unforeseen by lawmakers who passed the law. For example, Ed Burns noted that "a 30-year old residential property with an assessed land value of $14,000 and assessed building value of $4084 and with a home exemption would have an increase of 3.5 percent in its property taxes because of the reduction in the building tax factor. This is (unfair and) not a basic intent of the law" (Honolulu Star Bulletin, 1966). D.R. Porter (1997), writing about public policies for managing growth, notes growth management techniques may appear conceptually simple but are often difficult to successfully execute in practice. It is unsurprising that the early problems with implementation of the Pittsburgh Tax Plan helped justify its eventual demise. However, the true impetus behind the repeal was the reevaluation of the dramatic growth in the state during the 1970's.

Too Much Growth, Too Fast

Despite the early objections to the split-rate system, the Pittsburgh Tax Plan continued to be implemented over the next twelve years. In all categories of property and across all four counties, the disparity between the property tax rate on land and that on buildings and improvements grew over the 1970's (see Figure 2 and Table 2). It was not until concern over the

perceived uncontrolled development and growth in Hawaii dampened the island's appetite for increased growth that the measure was finally repealed.

Some observers of Hawaii tourism in the 1970's noted the three stages of local reaction to tourism growth: enthusiasm, plateauism, and antagonism (Mak, 2008). They postulated that in the beginning stages of growth, local populations would welcome it as a potential source of income, tax revenue and jobs. Antagonism would eventually set in following a period of plateau as criticisms increased. These criticisms might include "alleged harm to the environment, exploitation of local labor, cultural damage, overcrowding, and a drain on tax revenues" (Mak, 2008). In the 1960's, only a minority of Hawaii's residents opposed the growth of tourism. However, throughout the 1970's, this minority grew until a sizeable number of voices began questioning the consequences of such high levels of growth experienced over this period (Mak, 2008).

The arrival of the jet era led to a movement away from reliance on the agricultural industry to heavy reliance on tourism and national defense in Hawaii. Tourism quadrupled in a decade, bringing with it dramatic increases in demand for hotel and tourism-related workers. With the local population unable to fill this demand, immigration soared. Writing in an op-ed piece, Thomas N. Yamabe II, the Executive Secretary of the Hawaii Farm Bureau Federation noted that farmers were worried about "the problem of not being able to keep the ever-increasing population fed" (Honolulu Star Bulletin, 1970).

The opposition to the Pittsburgh Plan was also strengthened by the introduction of new planning concepts emphasizing "open space" rather than those emphasizing "highest and best use" which were used to justify the passage of the law in 1963. The State's property tax program officer noted that "the graded tax encourages more dense type of construction—a lot of improvement—and this is exactly what people don't want now, at least not the planners" (Honolulu Star Bulletin, 1971). The State Tax Department, writing in 1971, noted that abolishing the Pittsburgh Tax Plan would abolish some undesirable aspects of tax law, including "disregard of 'open space' and 'green space' concepts" (Hawaii State Archives,). And Richard Cox of the Honolulu Chamber of Commerce noted, "The Waikiki area is ugly, in the eyes of some, because open and green spaces are no longer present… Land is so costly that no developer is willing to provide share, trees, and walkways" (Honolulu Star Bulletin, 1977).

The State Tax Department also noted that "intensive construction activity in recent years seems to indicate that it is no longer necessary to have this law to encourage development" and that the benefits attained under the Pittsburgh Tax Plan could also be achieved under a single-rate plan (Honolulu Star Bulletin, 1971). Thus, consensus around the desire to repeal the Pittsburgh Tax Plan grew in the 1970's.

According to conversations with Lowell Kalapa, the current President of the Hawaii Tax Foundation, the last straw came with talk of rebuilding the Halekulani hotel. The Halekulani (meaning "House Befitting Heaven") began in 1917 with its acquisition by the Kimball family. Stories of guests such as Clark Gable, Rosalind Russell, and Richard Egan abound. Jack London, Earl Derr Biggers (creator of the Charlie Chan stories), Noel Coward, Ernest Hemingway, and James Michener wrote some of their famous works at the Halekulani. In the

1970's the Oceanside Coral Lanai at the Halekulani was a showplace for many of Hawaii's most famous entertainers. Many felt that "the Halekulani was the last truly Hawaiian hotel on O'ahu" (Allen, 2004).

However, the Halekulani was a low-rise luxury hotel consisting of a series of bungalows surrounded by high-rise luxury hotels, such as the Sheraton-Waikiki. As a result, the Halekulani's owners had to pay an effective tax rate of $18.57 per $1000 of assessed value under the Pittsburgh Tax Plan, while the high-rise Sheraton-Waikiki paid an effective rate of $13.49. The State Tax Department calculated that under a single-rate system of $15.37 per $1000 of assessed value, the Halekulani would pay $15,342 less and the Sheraton-Waikiki $87,422 more (Hawaii State Archives). Randolph Lee, the Manager of the Halekulani Hotel noted, "Since the Halekulani is a low-density hotel operation, the financial burdens are (greater) than those of the newer high-rise hotels" (Honolulu Star Bulletin, 1976). The headline in the March 5, 1976 edition of the Honolulu Star Bulletin read "Fresh Talk of Razing the Halekulani." Talk of tearing down the famous hotel and replacing it with a 900 bed high-rise hotel contributed to public calls to repeal the Pittsburgh Tax Plan. The repeal of the tax law in 1977, however, did not prevent the renovation and eventual sale of the hotel to Mitsui Fudosan (USA), Inc. in January 1981.

Thus, in June 1977, then Governor George Ariyoshi signed into law a bill repealing the Pittsburgh Tax Plan. The tax rate changes were to be gradually phased in over the following few years until all taxable property within Hawaii's four counties were subject to a single tax rate. Figure 2 shows that the disparate rates between land and improvements immediately began to narrow. By 1980, they were almost the same. During the hearings held prior to the repeal, the deputy State tax director Stanley Suyat outlined the basic objections to the bill: the complexity and opaqueness of the tax formulas and the accompanying unintended inequities as well as the failure to promote open space (Honolulu Star Bulletin, 1977). Though the complexity and opaqueness of the tax formulas contributed to opposition to the Pittsburgh Plan, lawmakers were aware of the complexity and inequities in the plan even before its initial passage. The fact that the plan survived twelve years of implementation indicates that the primary impetus behind the repeal in 1977 was not an objection to the complexity of the bill, but a public desire to slow development and growth of high-rise buildings while promoting more open space in Hawaii.

IV. Empirical Estimation of Effects on Spatial Development

Bengston et. al. (2004) note that few empirical evaluations of the effectiveness of policy on elements of spatial development have been conducted. They blame the lack of effective counterfactuals as a leading factor. This is especially true of empirical analyses of the effects of split-rate property taxation on spatial development.

A simple empirical analyses of the effect of split-rate taxation involves the following basic regression: $y = \alpha D + X\beta + W\lambda + Z\gamma + u$, where D takes on the value 1 if a locality has a split-rate tax system and 0 otherwise; X is a matrix of economic characteristics; W is a matrix of demographic characteristics; and Z is a matrix of geographic characteristics. However, without taking into account the political-economic factors that determine whether a locality decides to institute a split-rate system or not, the estimate of α will be biased due to the endogeneity of D.

In order to deal with this bias, some researchers attempt various matching techniques. However, these matching techniques are confounded by the relative lack of localities with split-rate tax systems. As a result, matching does not provide a convincing solution to the underlying problem with research design.

One alternative is to identify the factors leading to endogeneity of D by closer examination of the political-economy of the split-rate tax. Using residual regression and the Frisch-Waugh theorem, we can analytically define the bias. Suppose that the true model to be estimated is:
$y_i = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \beta_3 x_{3i} + \beta_4 x_{4i} + u_i$, where y_i is a spatial development variable; x_{1i} is a dummy variable for whether the locality institutes a split-rate system or not; x_{2i} represents measurable and observable variables describing economic, demographic, and geographic characteristics; and x_{3i} and x_{4i} are variables capturing non-measurable political-economic characteristics. In practice, we estimate the following: $y_i = \beta_0^* + \beta_1^* x_{1i} + \beta_2^* x_{2i} + u_i^*$.

It can be shown that: $\beta_1^* = \beta_1 + \beta_3 \dfrac{cov(\widetilde{x}_{1i}, x_{3i})}{var(\widetilde{x}_{1i})} + \beta_4 \dfrac{cov(\widetilde{x}_{1i}, x_{4i})}{var(\widetilde{x}_{1i})}$, where the second and third terms are the bias terms. To estimate the size this bias then requires careful examination of the non-measurable, unobserved political-economic variables x_{3i} and x_{4i}. Therefore, in order to fully understand the components of empirical bias in the analyses of the effects of split-rate property tax reforms on spatial development, it is crucial to understand the legislative, political, and economic history and institutions surrounding these events. Our examination of the political and economic factors underlying the passage of the Pittsburgh Tax Plan in Hawaii allows us to define x_{3i} and x_{4i} more clearly.

It may be possible then to evaluate whether the bias is positive or negative and relatively small or relatively large. While this does not fundamentally answer the question of the impact of split-rate systems on land use variables, it does provide a reliable basis by which we can identify upper or lower bounds of empirical estimates. By examining Hawaii's experiment with the Pittsburgh Tax Plan in some depth, we are able to provide insight into the nature of the two terms, $\dfrac{cov(\widetilde{x}_{1i}, x_{3i})}{var(\widetilde{x}_{1i})}$ and $\dfrac{cov(\widetilde{x}_{1i}, x_{4i})}{var(\widetilde{x}_{1i})}$, in the equation above. Thus, we may be able to provide an estimate of the direction of overall bias in simple empirical evaluations of this policy on the spatial development variables of interest.

V. Conclusion

Traditional empirical analyses of the effects of growth management policies on elements of spatial development are relatively rare in the literature (see Bengston et. al. for a summary of the relevant existing literature). This is especially true of evaluations of split-rate property taxation. Some theorists hold that the split-rate system of property taxation leads to reduced sprawl and greater levels of development and land use efficiency, while reducing excess burden and holding revenue neutral. More recent empirical studies have shown however that the predictions of theory are not validated in practice. This paper contributes to this discussion by providing a thorough examination of the potential biases (if any) in estimation of these effects.

In order to keep the problem manageable, we focus on the experiences in Hawaii which experimented with the split-rate system in the 1960's and 1970's. In so doing, we find that three main factors contributed to the initial passage of the law. First, the 1960's was a period of dramatic growth in the Hawaiian economy. The split-rate property tax legislation was intended to further this growth. Second, the system of state and local government was highly centralized. Without this high degree of fiscal centralization, split rates would have been much more difficult, if not impossible, to implement. Third, the Democrats gained ascendancy in the 1960's against a backdrop of years of past Republican land ownership and power. Their newfound power was partly due to a platform of land reforms. This political change combined with the unique history of land and power in Hawaii contributed to the eventual implementation of split-rate property taxation. The repeal of the Pittsburgh Tax Plan, on the other hand, was caused mainly by the introduction of new planning ideals of 'open space' and 'green space', the fear of overdevelopment, and concerns for the creation of a 'concrete jungle'.

A better understanding of the factors that lead to endogenous adoption of split-rate property tax systems allows us to understand the biases inherent in empirical evaluations of such systems on spatial development. Though we have no way of solving the fundamental endogeneity problem and lack of a valid counterfactual, an understanding of Hawaii's experience with this policy allows us to postulate the direction of bias in simple empirical evaluations. This has potential implications for local governments contemplating property tax reform. A discussion on property tax reform is informed by a better understanding of the split-rate tax. In particular, comprehension of the possible biases in empirical studies of the split-rate tax is important. Such comprehension and the accompanying policy implications represent a major goal of this paper.

References

Allen, Robert C. (2004). "Creating Hawai'i Tourism: A Memoir," *Bess Press,* Honolulu, Hawaii.

Bengston, D.N., Jennifer O. Fletcher, Kristen C. Nelson (2004). "Public Policies for Managing Urban Growth and Protecting Open Space: Policy Instruments and Lessons Learned in the United States," *Landscape and Urban Planning* 69: 271-286.

Bowman, John H., and Michael E. Bell (2004). "Implications of a Split-Rate Real Property Tax: An Initial Look at Three Virginia Local Government Areas," *Lincoln Institute of Land Policy, Working Paper.*

Brueckner, Jan K. and Fansler, D. (1983). "The Economics of Urban Sprawl: Theory and Evidence on the Spatial Sizes of Cities," *The Review of Economics and Statistics* 65(3): 479-482.

Cooper, George and Gavin Daws (1985). "Land and Power in Hawaii: The Democratic Years," Honolulu: Benchmark Books.

Hawaii State Archives, Legislative Notes.

Hawaii State Archives, Correspondence of the Hawaii Tax Foundation.

Hawaii State Archives, Correspondence of the Attorney General.

Kalapa, Lowell (1992). "Why Is It That the State Seems to 'Bully' the Counties?" In Randall W. Roth, ed., *The Price of Paradise: Lucky We Live Hawaii?* Honolulu: Mutual Publishing: 47-51.

Lacroix, Sumner, James Mak, and Louis A. Rose (1995). "The Political Economy of Urban Land Reform in Hawaii," *Urban Studies*, 32(6): 999-1015.

Lacroix, Sumner and Louis A. Rose (1989). "Urban Land Price: The Extraordinary Case of Honolulu, Hawaii," *Urban Studies*, 26(3): 301-314.

"Land Value Taxation: The Equitable and Efficient Source of Public Finance" (1999) ed. Kenneth C. Wenzer, M.E. Sharpe, Inc.

Lavery, Nathan Gour (2006). "Urban Sprawl and the Split-Rate Property Tax: Evidence from Pennsylvania," Georgetown Public Policy Institute, *unpublished manuscript.*

Mak, Jim (2008). "Developing a Dream Destination: Tourism and Tourism Planning Policy in Hawaii," University of Hawaii Press.

Pollock, Richard and Donald Shoup (1977). "The Effect of Shifting the Property Tax Base," *Land Economics* 53(1): 67-77.

Porter, D. R. (1997). "Managing Growth in America's Communities," *Island Press*, Washington D.C.

Tax Foundation of Hawaii (1968). "Government in Hawaii: A Handbook of Financial Statistics," Honolulu, Hawaii.

Tax Foundation of Hawaii (1969a). "A Compendium of Governmental Finances in Hawaii, 1949-1968," Honolulu, Hawaii.

Tax Foundation of Hawaii (1969b). "Government in Hawaii: A Handbook of Financial Statistics," Honolulu, Hawaii.

Tax Foundation of Hawaii (1971). "Government in Hawaii: A Handbook of Financial Statistics," Honolulu, Hawaii.

Tax Foundation of Hawaii (1972). "Government in Hawaii: A Handbook of Financial Statistics," Honolulu, Hawaii.

Tax Foundation of Hawaii (1973). "Government in Hawaii: A Handbook of Financial Statistics," Honolulu, Hawaii.

Tax Foundation of Hawaii (1974). "Government in Hawaii: A Handbook of Financial Statistics," Honolulu, Hawaii.

Tax Foundation of Hawaii (1975). "Government in Hawaii: A Handbook of Financial Statistics," Honolulu, Hawaii.

Tax Foundation of Hawaii (1976). "Government in Hawaii: A Handbook of Financial Statistics," Honolulu, Hawaii.

Tax Foundation of Hawaii (1977). "Government in Hawaii: A Handbook of Financial Statistics," Honolulu, Hawaii.

Tax Foundation of Hawaii (1978). "Government in Hawaii: A Handbook of Financial Statistics," Honolulu, Hawaii.

Tax Foundation of Hawaii (1979). "Government in Hawaii: A Handbook of Financial Statistics," Honolulu, Hawaii.

Tax Review Commission (1984). "A Comparative Review of Hawaii's Fiscal System, 1965-1981" *Staff Working Paper No. 2*, Honolulu, Hawaii.

Tax Review Commission (1989). "Intergovernmental Fiscal Relations in Hawaii," *Working Papers and Consultant Studies*, Honolulu, Hawaii.

Other Sources

Conversations with Professor Jim Mak, University of Hawaii Manoa.

Conversations with Lowell Kalapa, President of the Tax Foundation of Hawaii.

Figures and Tables

Figure 1. Expansion of the Visitor Industry in Hawaii, 1951-2005.
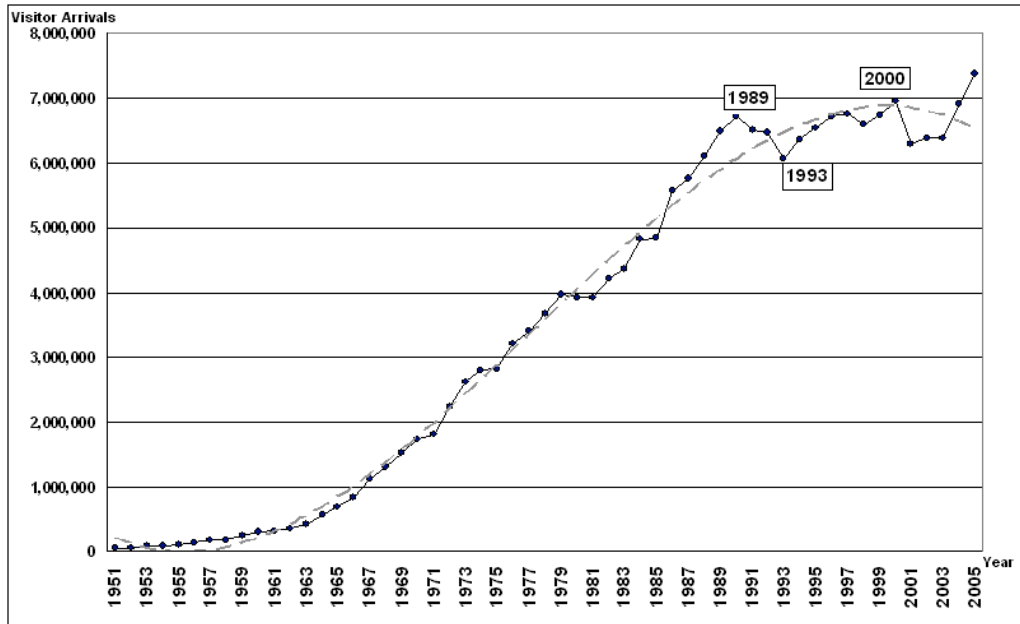
Note: Visitors arriving by air.
Source: Charts kindly supplied by John M. Knox of John M. Knox & Associates, Inc. Original source of data provided by State Statistician Eugene Tian, April 21, 2006.
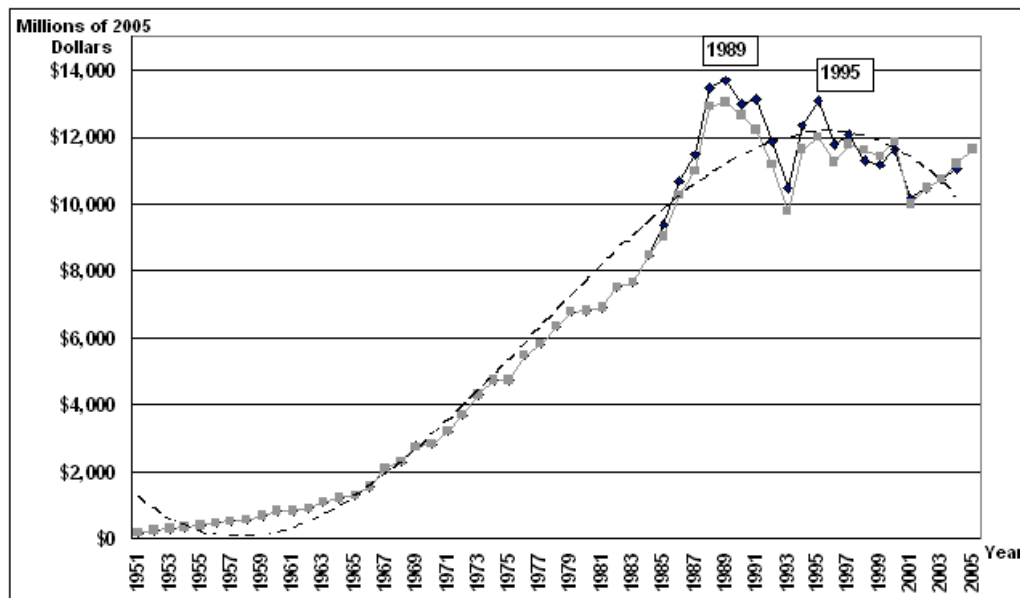
Source: Charts kindly supplied by John M. Knox of John M. Knox & Associates, Inc.
Original source of data from *2005 State of Hawai`i Data Book*

Figure 2A. Evolution of Property Tax Rates under the Pittsburgh Tax Plan 1965-1980, Honolulu and Maui counties
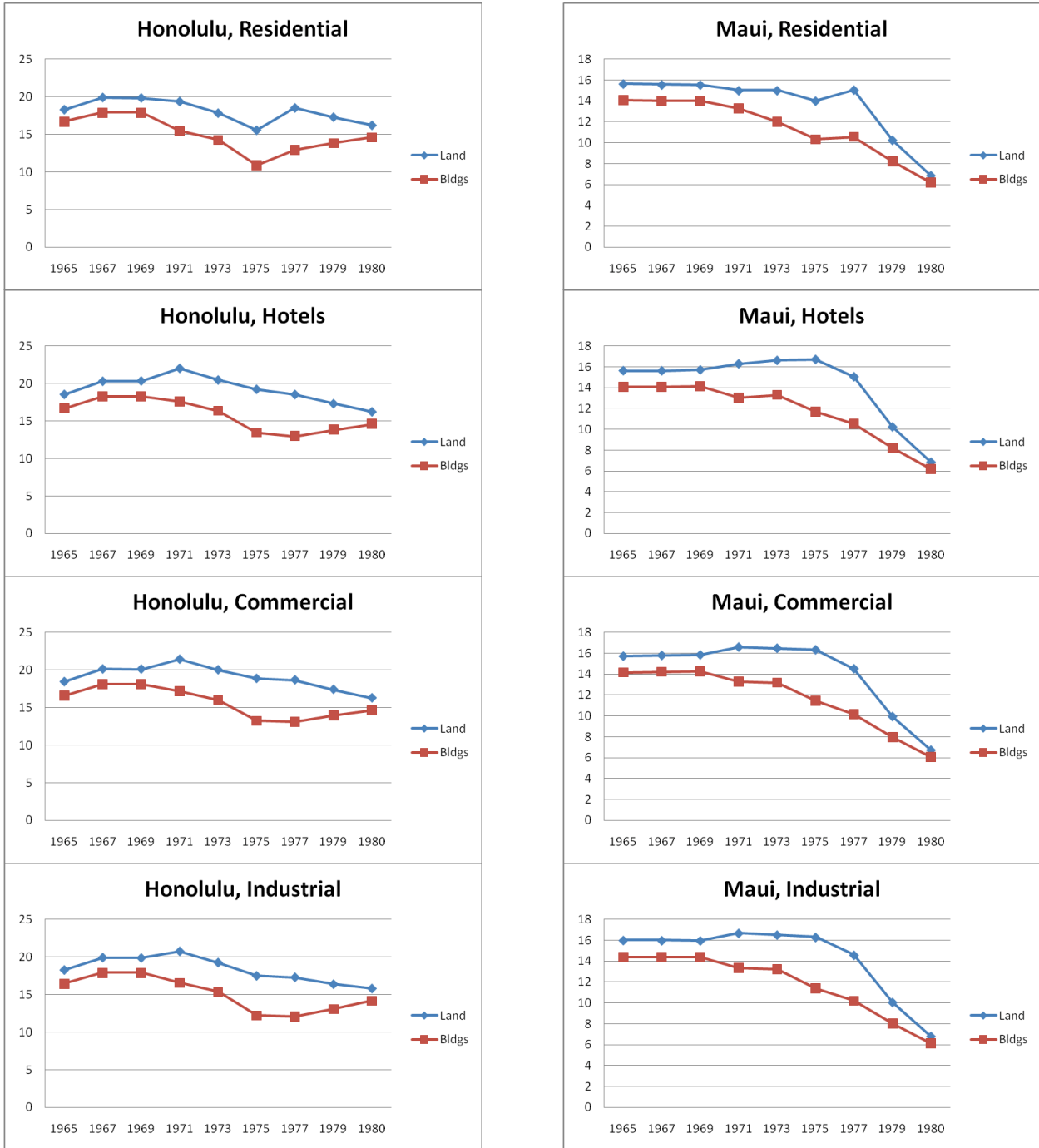
Source: Constructed from Table 2.

Figure 2B. Evolution of Property Tax Rates under the Pittsburgh Tax Plan 1965-1980, Hawaii and Kauai counties
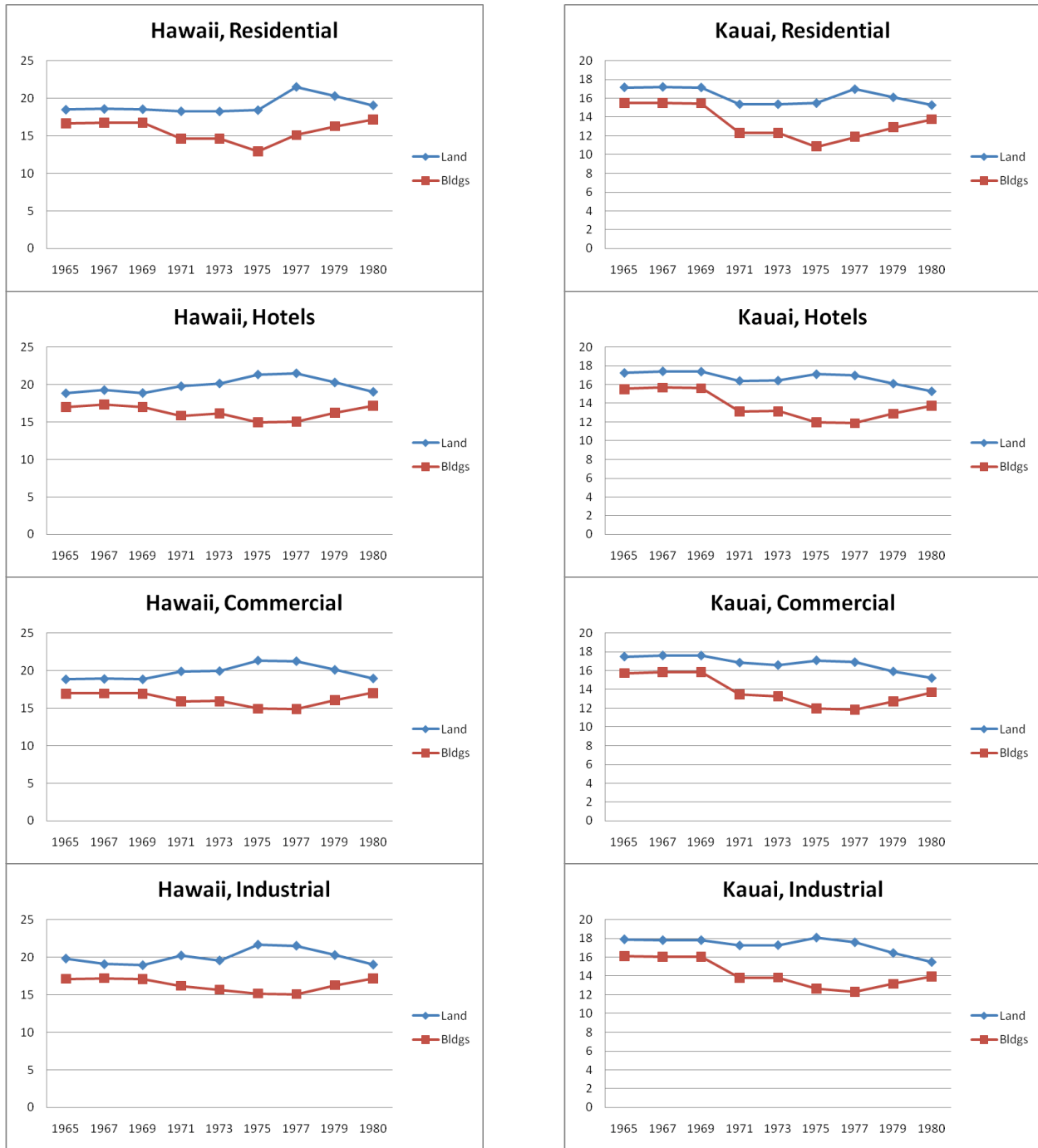
Source: Constructed from Table 2.

Table 1. State percentage of total state and local general and own source revenue and direct and total governmental expenditure for Hawaii, U.S. average, and selected states.

		Revenues			Expenditurers	
	Year	General Revenue	Own Source Revenue		Direct Expenditure	Total Expenditure
U.S.	1980-81	60.9	56.2		40.9	59.8
	1974-75	60.0	53.4		37.6	59.9
	1969-70	59.5	52.8		37.1	57.6
	1964-65	55.1	48.3		34.9	53.7
Hawaii	1980-81	81.2	81.2		79.5	81.2
	1974-75	79.1	77.1		78.5	80.4
	1969-70	80.7	75.7		79.5	83.1
	1964-65	76.5	71.2		65.9	74.1
California	1980-81	63.3	59.3		35.4	63.6
	1974-75	55.8	48.5		29.2	56.4
	1969-70	56.0	45.5		30.8	55.5
	1964-65	50.1	42.4		27.3	51.8
Nevada	1980-81	54.9	47.5		47.0	62.3
	1974-75	56.9	51.7		37.9	54.6
	1969-70	57.8	50.4		40.1	56.6
	1964-65	59.6	47.5		40.2	52.1
Oregon	1980-81	59.1	54.5		44.6	60.0
	1974-75	56.4	52.6		40.5	54.0
	1969-70	57.9	50.6		44.2	59.1
	1964-65	60.2	52.0		45.4	59.2
Washington	1980-81	65.9	59.7		41.0	60.1
	1974-75	63.6	57.2		45.1	64.4
	1969-70	65.8	60.7		44.3	64.5
	1964-65	66.5	61.1		42.2	63.4

Source: Hawaii Tax Review Commission Report, 1984

Table 2. Property Tax Rates By County and Property Type, 1959-1980

	Honolulu	Maui	Hawaii	Kauai	State Average
1959	15.15	16.57	16.50	17.52	15.48
1961	13.89	13.67	16.10	15.50	14.07
1963	14.66	14.00	16.10	15.50	14.74
1965					
Average	17.71	15.00	17.90	16.50	17.54
Residential	18.29	15.64	18.47	17.18	18.16
	16.68	14.08	16.63	15.46	16.32
Hotel/Apartments	18.53	15.64	18.86	17.25	18.39
	16.68	14.08	16.97	15.53	16.57
Commercial	18.44	15.73	18.83	17.51	18.37
	16.59	14.15	16.96	15.76	16.50
Industrial	18.24	15.99	19.84	17.90	18.21
	16.42	14.39	17.14	16.11	16.33
Agricultural	17.71	15.00	17.90	16.50	16.95
Conservation	17.71	15.00	17.90	16.50	17.41
1967					
Average	19.21	15.00	17.90	16.50	18.80
Residential	19.90	15.55	18.57	17.22	19.57
	17.90	14.00	16.71	15.49	17.58
Hotel/Apartment	20.28	15.63	19.28	17.42	19.91
	18.25	14.07	17.35	15.68	18.00
Commercial	20.14	15.80	18.88	17.63	19.92
	18.13	14.22	16.99	15.87	17.87
Industrial	19.88	15.97	19.10	17.81	19.73
	17.89	14.38	17.19	16.03	17.51
Agricultural	19.21	15.00	17.90	16.50	17.47
Conservation	19.21	15.00	17.90	16.50	18.37
1969					
Average	19.21	15.00	17.89	16.50	18.81
Residential	19.84	15.54	18.54	17.16	19.54
	17.86	13.99	16.69	15.44	17.55
Hotel/Apartments	20.32	15.72	18.89	17.39	19.92
	18.29	14.15	17.00	15.63	18.01
Commercial	20.13	15.85	18.83	17.62	19.92
	18.12	14.26	16.94	15.86	17.86
Industrial	19.83	15.95	18.97	17.81	19.69
	17.85	14.36	17.07	16.03	17.48
Agricultural	19.21	15.00	17.88	16.50	17.48
Conservation	19.21	15.00	17.88	16.50	18.23

Note: State average rates are computed by dividing "taxes to be raised" by total county taxable values.
Source: Constructed from "Government in Hawaii: A Handbook of Financial Statistics", for selected years.

Table 2, continued. Property Tax Rates By County and Property Type, 1959-1980

	Honolulu	Maui	Hawaii	Kauai	State Average
1971					
Average	19.21	15.00	17.90	15.00	18.65
Improved Residential	19.21	15.00	17.90	15.00	18.84
Unimproved Residential	19.36	15.00	18.26	15.36	18.04
	15.48	13.28	14.61	12.29	14.37
Hotel/Apartments	21.99	16.30	19.80	16.40	20.78
	17.59	13.04	15.84	13.12	17.11
Commercial	21.45	16.60	19.90	16.87	21.08
	17.16	13.28	15.92	13.49	16.88
Industrial	20.71	16.67	20.24	17.25	20.48
	16.57	13.33	16.19	13.80	16.23
Agricultural	19.21	15.00	17.90	15.00	17.37
Conservation	19.21	15.00	17.90	15.00	17.60
1973					
Average	17.71	15.00	17.90	15.00	17.44
Improved Residential	17.71	15.00	17.90	15.00	17.51
Unimproved Residential	17.83	15.00	18.24	15.36	17.21
	14.27	12.00	14.59	12.29	13.87
Hotel/Apartments	20.44	16.63	20.16	16.43	19.72
	16.35	13.30	16.13	13.14	16.05
Commercial	20.03	16.49	19.94	16.61	19.77
	16.02	13.17	15.95	13.29	15.88
Industrial	19.22	16.51	19.59	17.28	19.07
	15.38	13.21	15.68	13.83	15.20
Agricultural	17.71	15.00	17.90	15.00	17.08
Conservation	17.71	15.00	17.90	15.00	17.17
1975					
Average	15.37	14.00	17.90	14.50	15.31
Improved Residential	15.37	14.00	17.90	14.50	15.42
Unimproved Residential	15.57	14.00	18.41	15.48	15.77
	10.91	10.31	12.89	10.84	11.55
Hotel/Apartments	19.21	16.72	21.36	17.11	18.86
	13.45	11.70	14.95	11.98	13.39
Commercial	18.87	16.34	21.36	17.11	18.86
	13.21	11.44	14.95	11.98	13.22
Industrial	17.47	16.28	21.66	18.08	17.56
	12.23	11.39	15.16	12.66	12.41
Agricultural	15.37	14.00	17.90	14.50	16.48
Conservation	15.37	14.00	17.90	14.50	16.37

Note: State average rates are computed by dividing "taxes to be raised" by total county taxable values.

Table 2, continued. Property Tax Rates By County and Property Type, 1959-1980

	Honolulu	Maui	Hawaii	Kauai	State Average
1977					
Average	15.37	12.50	17.90	14.50	15.31
Improved Residential	15.37	12.50	17.90	14.50	15.30
Unimproved Residential	18.52	15.06	21.52	16.98	18.35
	12.96	10.54	15.07	11.88	13.54
Hotel/Apartments	18.52	15.06	21.52	16.98	18.09
	12.96	10.54	15.07	11.88	12.71
Commercial	18.69	14.52	21.27	16.92	18.58
	13.08	10.17	14.89	11.84	13.05
Industrial	17.27	14.57	21.52	17.58	17.27
	12.09	10.20	15.07	12.30	12.16
Agricultural	15.37	12.50	17.90	14.50	16.10
Conservation	15.37	12.50	17.90	14.50	15.67
1979					
Average	15.23	9.09	17.90	14.50	14.78
Improved Residential	15.23	9.09	17.90	14.50	14.90
Unimproved Residential	17.30	10.24	20.30	16.10	16.02
	13.84	8.19	16.24	12.88	13.00
Hotel/Apartments	17.30	10.24	20.30	16.10	16.02
	13.84	8.19	16.24	12.88	13.00
Commercial	17.41	9.94	20.11	15.93	16.93
	13.93	7.95	16.09	12.74	13.78
Industrial	16.36	10.05	20.30	16.45	16.06
	13.09	8.04	16.24	13.16	12.81
Agricultural	15.23	9.09	17.90	14.50	15.26
Conservation	15.23	9.09	17.90	14.50	14.91
1980					
Average	15.23	6.47	17.90	14.50	14.25
Improved Residential	15.23	6.47	17.90	14.50	14.58
Unimproved Residential	16.22	6.86	19.05	15.27	14.42
	14.6	6.17	17.15	13.74	15.15
Hotel/Apartments	16.22	6.86	19.05	15.27	13.84
	14.60	6.17	17.15	13.74	12.84
Commercial	16.27	6.72	18.95	15.23	15.43
	14.65	6.05	17.05	13.71	14.42
Industrial	15.79	6.80	19.05	15.49	15.25
	14.20	6.12	17.15	13.94	13.57
Agricultural	15.23	6.47	17.90	14.50	14.59
Conservation	15.23	6.47	17.90	14.50	14.59

Note: State average rates are computed by dividing "taxes to be raised" by total county taxable values.
Source: Constructed from "Government in Hawaii: A Handbook of Financial Statistics", for selected years.