# DIFFERENTIAL IMPACTS OF USE VALUE TAXATION ON LOCAL PROPERTY TAX BASES OVER TIME

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## Abstract

Relative distributional impacts are measured by comparing effective tax rates with vs without (simulated) the use value program in Hawaii. Economic growth and capitalization of taxes both tend to lessen long term transfer effects and more so in SMSA than rural counties even if the growth potentials of foregone taxes are taken into account.



Keywords: taxation, agricultural lands, use value, effective tax rates, distributional impacts, capitalization, foregone growth rates, transfer effects, simulation.

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# DIFFERENTIAL IMPACTS OF USE VALUE TAXATION ON LOCAL PROPERTY TAX BASES OVER TIME

## Introduction

The experiences with use value taxation programs in most states have led to the general conclusion that the land allocational performance of these programs have not been very impressive and the distributive consequences are of greater public concern. This is not all too surprising since taxes are primarily distributive devices and at best indirect allocative tools[1/] with uncertain results. The trend toward use value taxation of agricultural lands nevertheless continues to be an important component of land use policies to preserve agricultural lands and their joint product open space.[2/]

The concerns over distributive effects take on various forms, e.g., how is the impact of the tax benefits distributed among different income groups, counties, and regions; is there shifting and if so what is the incidence of these tax benefits to different producers and consumers classes; are these tax benefits being capitalized into land values and if so to what extent; and what are the transfer effects of the foregone taxes on other tax bases.[3/]

In the analysis of these problems, a useful first step is to measure the differential impacts of use value taxes on local property tax bases. This will help in the further analyses of more complicated issues relating to foregone growth effects of reduced tax bases, incidence, capitalization and other transfer effects. The experience of Hawaii is drawn upon for this purpose, but the general methodology employed and the long-run economic implications derived can be easily adapted to other use value tax programs.

Measuring Foregone Taxes

The problem of measuring the foregone taxes is essentially one of simulating the growth in the tax base as if without the program. The approach is to start with the tax base for the first year of the program and then to add back each successive year's reduction in valuations compounded by appropriate growth rates.

Thus, beginning with year 1 of the program, the tax base as if without the program would have grown as follows:

$$(1) \quad V_{0,t} = \begin{cases} V_{w,1} + \Delta v_1 \ , & \text{for } t = 1 \\ V_{w,2} + \Delta v_1 \rho_2 + \Delta v_2 \ , & \text{for } t = 2 \\ V_{w,t} + \left[ \sum_{i=1}^{t-2} \Delta v_1 \left( \sum_{j=i+1}^{t-1} \rho_j \right) + \Delta v_{t-1} \right] \rho_t & \\ \quad + \Delta v_t \ , & \text{for } t > 2 \end{cases}$$

Where,

$V_{0,t}$ = tax base in year t as if without the program.

$V_{w,t}$ = tax base in year t with the program.

$\Delta v_t$ = annual reductions in nominal tax base in year t due to the program - i.e., difference between market value and use value of all agricultural land in the program in year t.

$\rho_t$ = $(V_{w,t} - V_{w,t-1})/V_{w,t}$ for all agricultural lands in the property tax base. A variable growth rate of foregone tax base for each year t.

From this, it is a simple matter to take the difference between the without and with tax bases to find the foregone tax base for each year as follows.[4/]

$$(2) \qquad \Delta B_t = V_{0,t} - V_{w,t} = \begin{cases} \Delta v_1 , & \text{for } t = 1 \\ \Delta v_1 \rho_2 + \Delta v_2 , & \text{for } t = 2 \\ \left[ \sum_{i=1}^{t-2} \Delta v_1 \left( \prod_{j=i+1}^{t-1} \rho_j \right) + \Delta v_{t-1} \right] \rho_t & \\ \quad + \Delta v_t , & \text{for } t > 2 \end{cases}$$

Measuring Distributional Impacts on Local Tax Bases

To determine the distributional impacts over time the objective is to measure the relative differences in the effective tax rates with vs. without the program and to compare these differences among urban and rural taxing jurisdictions. These effective tax rates are given by:

$$(3) \qquad r_{w,t} = \frac{TR_t}{TB_t} \qquad \text{(with use value program)}$$

$$(3') \qquad r_{0,t} = \frac{TR_t}{TB_t + \Delta B_t} \qquad \text{(without use value program)}$$

Where,

$r$ = effective tax rate

subscripts w = with the program

o = without the program

t = time in years

$TR_t$ = total property tax revenues required by local taxing jurisdiction in year t.

$TB_t$ = total property tax base of taxing jurisdiction in year t.

$\Delta B_t$ = cumulative foregone agricultural land tax base due to use value program (including growth effects) as of year t, i.e., eqn (2).

Total revenues are determined by local government budgetary requirements and are the same in either case since budgetary processes at any particular point in time are, by and large, independent of the use value program. The only difference comes from the annual foregone agricultural land tax base which not only would have accumulated but also would have grown over time as shown earlier. The relative difference in effective tax rates is then given by:

$$(4) \quad \left( \frac{r_{w,t}}{r_{o,t}} - 1 \right) = \frac{\Delta B_t}{TB_t}$$

Equation (4) then essentially measures the relative increase in the effective tax rate which has to be burdened by the total property tax base. It reflects both the relative tax impact and transfer effects of the use value program.

These effects will vary from rural to urban counties and also with changes in their respective economic structures over time. Since in rural counties the proportion of agricultural lands in the total property tax base is larger than in urban counties, the effect of the use value program should be felt stronger in the rural counties. Over time, the cumulative increase and growth effects of the foregone tax base, $\Delta B_t$, should also be felt stronger in the rural counties as compared to the urban counties. But the effect of urbanization or relative decline of agriculture in rural counties should tend to lessen the distributional impacts and subsequent transfer effects.

Capitalization of Taxes and Foregone Growth Effects of Reduced Tax Bases

A problem arises in the proper accounting of tax capitalization effects and foregone growth effects of reduced tax bases. These are two separate processes which relate to the with and without scenarios respectively. Proper accounting for these separate effects have important implications for interpreting the net transfer effects.

The capitalization process applies to the real time with the program scenario. In this scenario, the challenge is to properly interpret the observed data. The capitalization process (to the extent it occurs) should be reflected in the observed differences between market and use values of land. But even if this capitalization process occurs smoothly as in theory, not all the tax savings to farmers would be capitalized into increased land values. This is simply because the claims to the increased net incomes occasioned by the tax savings would be distributed among owners of various productive factors (land, labor, and capital) and also government. Government shares through its battery of tax programs. One is through increased

income taxes (Hansen and Schwartz, 1977) and another through the partial capitalization into land values (Jensen, 1931; Pasour, 1973, 1975; Bevins, 1975) and thus subsequent property taxes. Partial capitalization of tax savings, therefore, tends to moderate the tax shift effect. The same reasoning applies when interpreting the effects of any increase in taxes to the remaining or non-benefitting property tax base. Any partial capitalization of increased taxes into lower land values in this sector will tend toward lower assessed values and taxes. Therefore, the capitalization process is directly relevant to interpreting the real world scenario. To the extent it occurs, it should lessen the tax transfer effects due to the use value assessment program. It is not the same as accounting for the cumulative growth effects of foregone tax bases over time.

The cumulative growth effects of foregone tax bases over time relates to the simulated as if without the program scenario. To properly measure the impacts of the use value assessment program, it was necessary to have a base of reference for comparison since all measurements are relative and require points of reference. For our purpose, it was useful to simulate the property tax base as if the program had not been initiated at all. To do this, we started at the beginning and cumulatively added back the annual increments of potential assessed valuations taken off the property tax base as a result of the program. Each year's increment of foregone tax base was the difference between market value and use value of agricultural lands enrolled into the program in that year. In the evaluation of this difference, any partial capitalization effects which might have occurred were in fact accounted for since the differences were computed from real time data. But this did not necessarily account for the cumulative growth effects of foregone tax bases over time.

In fact, because the simulated scenario was computed from real time data which accounted for any partial capitalizations that actually occurred, it becomes more so necessary to also account for the cumulative growth effects of foregone tax bases. If the result of capitalization is to moderate the tax transfer effects, the simulated tax base with real time data will also tend to reflect this moderating effect. But ideally, the simulated scenario should be free of any influence from the real time scenario. After all, we are postulating what would have happened to the tax bases if the use value program were never instituted. At any rate, to the extent capitalization effects are involved in our real time data, their influence would tend to be offset by accounting for the cumulative growth effects of foregone tax bases over time. To ignore these cumulative growth effects would only leave another unanswered question on the part of urban taxpayer interests as to the full extent of any tax transfer effects due to the use value assessment program. This would tend to weaken rather than strengthen use value assessment programs.[5/]

Application to Hawaii

Data on Hawaii's agricultural use value taxation program which is an integral part of the State's pioneering Land Use Law of 1961 actually begins to accumulate from 1963 when the first use value assessments were made on lands voluntarily dedicated to agricultural uses on a 10-year continuing basis. Periodic revisions in the program up to 1973 were for the most part in the nature of marginal refinements to the original program. Thus, the period from 1963-73 serves as a useful data base for empirical analysis.

In 1973, major revisions in the program were enacted by the State Legislature (through Act 175) and subsequent promulgation of new rules and regulations on assessment practices by the Department of Taxation. From 1974 on, all lands in the State Agricultural District, whether dedicated or not, are destined to be assessed at use value as long as the lands are used for agricultural purposes. Also extended voluntary dedications on a 20-year continuing basis are now assessed at half of use value thereby doubling the tax savings benefits. Recapture taxes (i.e., rollback taxes plus penalties) are also substantially increased. This is accomplished through the setting of shadow fair market values at speculative levels (in some cases as much as 10-times above traditional fair market values), and also the doubling of retroactive penalties from 5 to 10 percent annually in cases of breeches in dedication.

These recent institutional changes have raised new concerns at the policy level regarding the distributional effects of the vastly expanded program. Modified computational formulas have been worked out but the possibility for meaningful empirical analysis is hindered by data problems and a question as to whether or not sufficient time has elapsed to stabilize the new phase of the program. Reassessment cycles run on the average about three years and the present accumulation of data reflect at best a transitional stage.

Thus, our problem is one of seeing whether or not valid implications for long term transfer effects can be derived from the first phase (1963-73) empirical analysis.

Empirical Results, 1963-73

In Figure 1, the pattern of time trends in the agricultural land tax base as a percent of total property tax base for each county reflects the

changing economic structure of the State. As expected, the highly urbanized City and County of Honolulu (the only SMSA), does not rely as heavily on agricultural lands in its property tax base as do the other three rural counties. There is about a ten-fold order of magnitude difference in tax base structures between SMSA and rural counties in Hawaii. The gradual declining trends reflect relative changes in the tax base structures away from agriculture. Only the County of Hawaii has maintained a constant agricultural tax base of around 30 percent.

In Figure 2, the time trends in foregone agricultural land base as a percent of total property tax base reflect the distributional impacts of the use value program. Again, as expected, these distributional impacts are more strongly felt in the rural counties as compared to the SMSA county, Honolulu. While they have increased over time, the relative levels have remained small (around 1 percent and less). These distributional impacts are not simple tax transfer effects from agriculture to non-agriculture. In order to meet the county budgetary needs, the foregone taxes must be made up from the remaining property tax base. This remaining property tax base is not only urban property but also agricultural property. And this agricultural property includes some lands that are not enrolled as well as other lands that are enrolled in the use value program. Thus, the distributional impacts are on agricultural as well as non-agricultural property.

The relations between changing economic structure and distributional impacts are shown in Figure 3. The effect of urbanization in moderating the increase in distributional impacts over time is evident in all cases. For the Honolulu SMSA where the agricultural land tax base is relatively small and has steadily diminished from around 5 percent to around 1 percent, the

distributional impacts have remained very minor. The foregone taxes of the use value program were easily made up from a larger remaining tax base. For the rural counties with much larger agricultural bases, the distributional impacts tend to increase quite rapidly as long as the balance in the tax base structure remains constant (e.g., Hawaii County). However, as soon as this fiscal balance begins to shift away from agriculture, this increase stops and even tends to decline as in the cases of Maui and Kauai where the agricultural bases have steadily been cut back to around half of their earlier shares (i.e., from about 25 percent down to 12 percent).

Implications for the Long Run

Despite the empirical problems of extending our analysis to the present expanded program in Hawaii, it is still possible to derive some useful implications for the long term. Since the relative impacts on local tax bases are primarily determined (and limited) by the structure of local property tax bases, it is clear that rural counties with relatively large agricultural bases (in our case the counties of Hawaii, Maui and Kauai) will continue to be more heavily impacted by use value taxation programs than SMSAs (the City and County of Honolulu). Further, agricultural sectors will continue to share in burdening the tax transfer effects.

The effects of economic growth and capitalization of taxes will tend to lessen the shifting of tax burdens from agricultural to urban tax payers even if the foregone growth effects of reduced agricultural tax bases are properly taken into account. This is true for all growing areas and is plainly evident from the dynamic changes that have occurred in all of Hawaii's counties over the past decade and a half.

Finally, the potential for realizing more of the indirect allocative function of agricultural use value programs may lie in policies that affect recapture taxes (i.e., rollback taxes plus interest penalties) rather than use-value assessments per se. This applies especially where there is strong competition for important prime agricultural lands in the fringes of large metropolitan areas. This last observation is in direct contradiction to a conclusion on this point in the recent national study for the Council of Environmental Quality that "rollback requirements, even with substantial interest payments are not likely to be effective deterrent to development. This is particularly so in areas where development demands is strong and land values are increasing rapidly," (p. 117, Untaxing Open Space, 1976). The experience of Hawaii suggests the contrary.

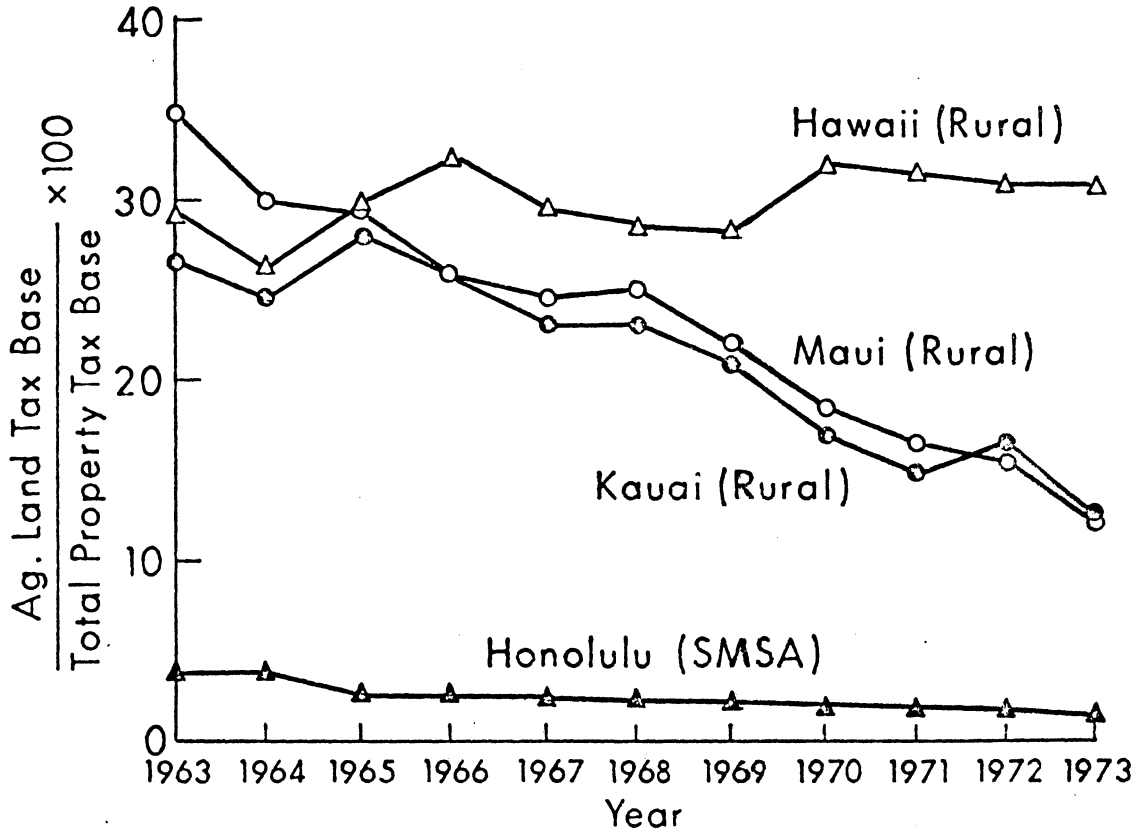


Figure 1. Time Trends - Agricultural Land Tax Base as a Percent of Total Property Tax Base

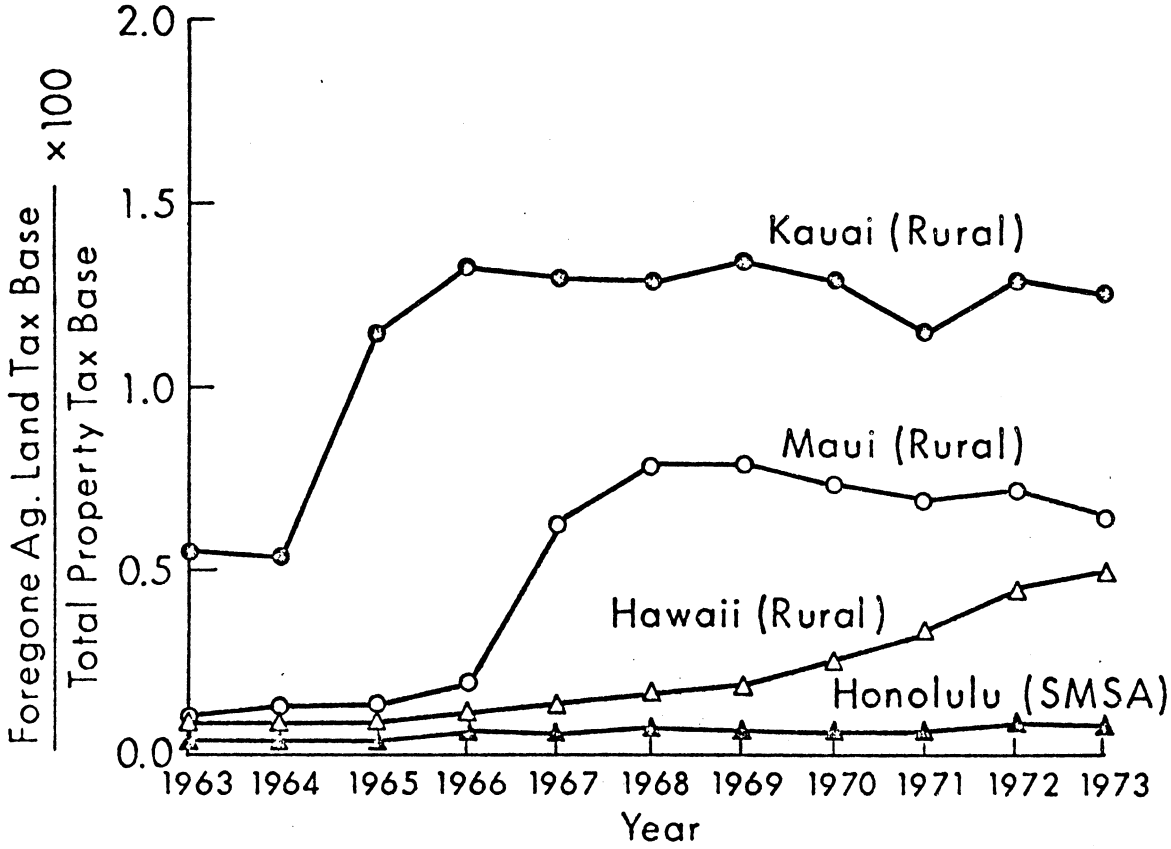


Figure 2. Time Trends - Foregone Agricultural Land Tax Base as a Percent of Total Property Tax Base

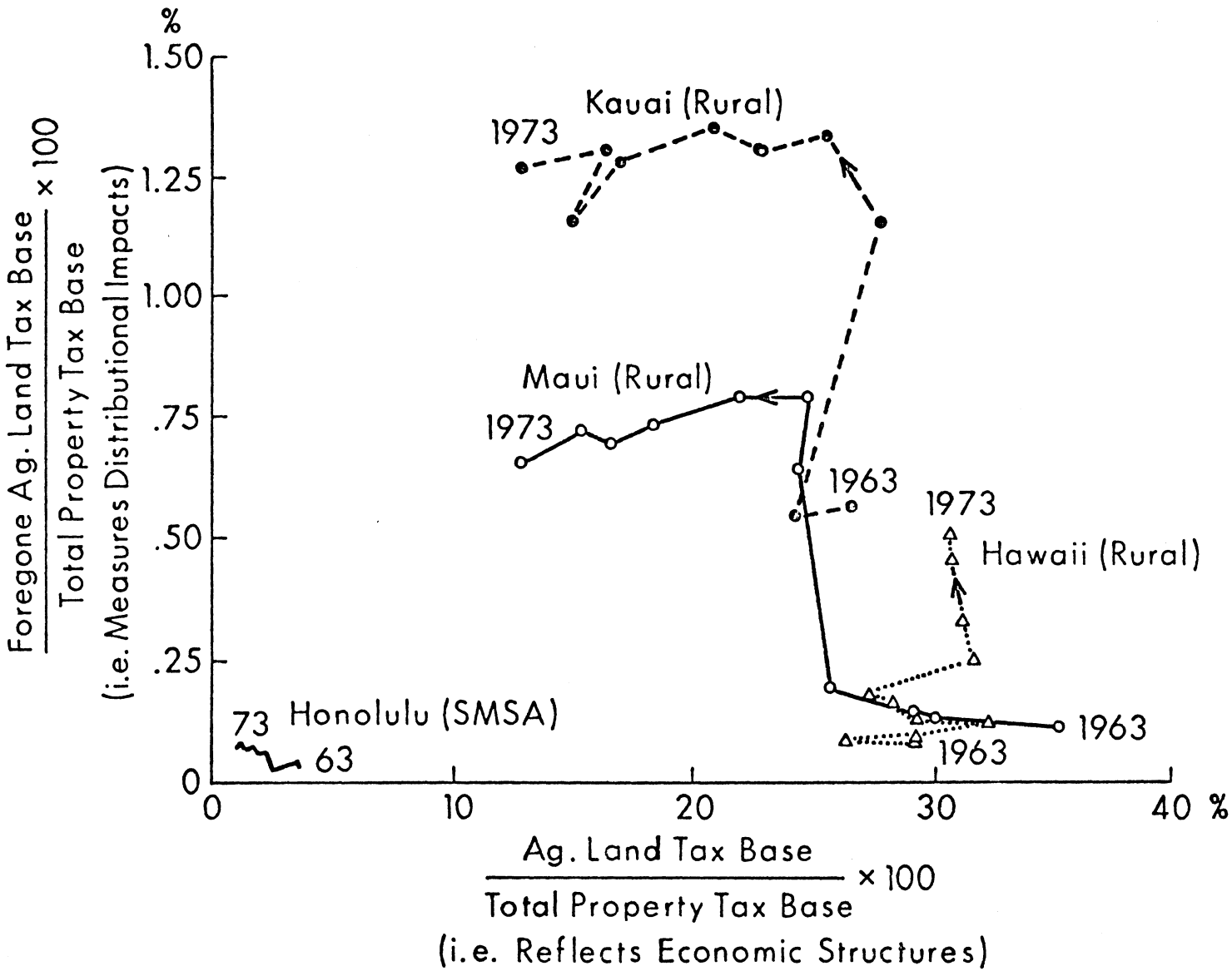


Figure 3. Relations Between Changing Economic Structures and Distributional Impacts over Time

## Footnotes

1/ Taxes can be regarded as "indirect tools" in the sense that they may influence land allocation decisions through incentive effects of changing net incomes. The results of these indirect incentive effects are never as certain (in degree, geographical location, and timing) as the "direct tools" of zoning and regulations which derive from the police power (S.V. Ciriacy-Wantrup, 1968).

2/ Untaxing Open Space, 1976, reports: "Since 1957, when Maryland enacted the first statute authorizing differential assessment of farm land, 42 states have responded by passing laws which granted preferential treatment to farm or other types of undeveloped land. Most of the remaining states have so-called classification laws, which allow modest preferential treatment of agricultural land, or are currently considering differential assessment legislation," (p.5). Use value assessment is either explicit or implied in all these state programs.

3/ See for instance, Gustafson and Wallace, 1975; Pasour, 1973, 1975; Deaton and Mundy, 1975; Bevins, 1975; Schwartz, Hansen and Foin, 1975; and Hansen and Schwartz, 1977. The net result of capitalization is to moderate the transfer effects as a consequence of both increasing farm property values and decreasing non-farm property values. This is discussed in greater detail in a later section.

4/ Foregone tax revenues over time can be computed by applying the appropriate nominal tax rates to eqn (2). But in computing the relative impacts in terms of either revenues or tax bases, it is not essential to be concerned with the nominal tax rates since they cancel out. The relative impacts in terms of revenues or bases it turns out are the same.

5/ Even if a common constant rate, p, were to apply for both the discount and growth factors, the non-identity between capitalization of tax savings ($S_t$) and cumulative growth effects of foregone tax bases ($C_{t-1}$) can be seen by the following expressions.

Capitalization of tax savings:

$$v = \sum_{t=1}^{T} \frac{S_t + rv}{(1 + p)^t}$$ (relates to the real time with scenario)

Cumulative growth effects of foregone tax bases:

$$C_{t-1} = \sum_{i=1}^{t-2} \Delta v_i \, (1 + p)^{t-1} + \Delta v_{t-1}$$ (relates to the simulated without scenario)

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