Chapter 9 *Who Bears the Tax Burden?*

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The municipalities in Central County contend that they are paying taxes to support certain functions—for example, road maintenance for which they levy their own municipal taxes, because the county does not maintain the roads inside municipal boundaries. In addition, these municipalities contend that they have to provide services such as traffic control that are partly attributable to residents of the unincorporated area of the county who commute to jobs in the municipalities. In other words, the cities contend that they are being exploited by the suburban areas. But who is actually paying the taxes levied by the municipalities in Central County? Is the ultimate burden of some of these taxes exported to residents of the unincorporated portion of the county? If so, how much? Enough to offset the exploitation claimed by the municipalities?

Homeowners and business firms in Central County are complaining about high property taxes; they contend that they bear an unfair portion of the total county tax burden and that it would be preferable to implement a local sales tax and correspondingly reduce property tax rates. Would homeowners bear smaller tax burdens with a sales tax and reduced property taxes? If so, what group of taxpayers would have to take up the slack?

Both of the issues just described are often raised in discussions of local government taxation. In both cases, the answers depend on who ultimately pays local taxes—that is, who really bears the tax burden. Whose income is affected, how much is it affected, and how fair is the result?

Before illustrating how Central County might undertake a tax incidence analysis of property taxes versus sales taxes, the following underlying concepts need to be defined and discussed:

Tax incidence:

- Who really ends up paying any given tax?
- How much of any given tax is exported outside the community?
- Does the tax base decline as a result of the tax imposition?

Tax equity:

- How do taxes relate to income levels?

WHO REALLY PAYS THE TAX?

The burden of any tax is ultimately borne by individuals. Although a business firm may initially write the check for property taxes (or some other tax) the ultimate incidence of a tax is out of some individual's income. To determine whose income or purchasing power is decreased by a tax increase, it is necessary to determine the reaction of consumers, employees, and employers to that tax. For example, suppose that local government officials are planning to increase the property tax rate. Who will bear the burden of this tax increase? Off hand, one might be tempted to answer that property owners (whether residential or business property) will pay the tax, since they write the check. But this answer assumes that property owners cannot shift the tax burden to someone else. Yet

the apartment owner may be able to shift the increase in property taxes to the renter through higher rents. Similarly, a business firm may shift all or part of the increase in taxes to consumers of its products through higher prices, or to its employees, through lower wages. If such shifting is not possible, then the property owner (or stockholders, for a corporation) must bear the tax. Ultimately, a person or a household bears the burden of all taxes.

Tax Incidence Assumptions

The reaction to a tax change will depend on many factors, including the degree of competition in markets, and the ability of producers to switch to the production of other commodities and of consumers to buy other products. Since these factors are so varied, it is very difficult to generalize reactions that result from the imposition of a tax. Assumptions about the final resting place of taxes are used in tax incidence studies. Incidence assumptions for which general agreement exists, for local sales, income, and property taxes, are outlined here.

Local sales taxes. Economists are in general agreement that most consumption-based taxes (including a general sales tax as well as excise taxes on tobacco, alcohol, etc.) are shifted forward to the consumer in the form of higher prices.

Local personal income taxes. It is also reasonable to assume that the taxpayer himself or herself bears the burden of personal income tax.

Property taxes. Only the incidence of ad valorem taxes on real property, which account for the major portion of local property tax revenues, is considered here. The reaction to an increase in the real property tax will differ between (1) owner-occupied housing, (2) renter-occupied housing, and (3) nonresidential real property (commercial, industrial, and utilities).

1. For *owner-occupied housing*, it is safe to say that the *owner will pay* the property tax, because the owner has no one else to whom the tax can be shifted. The owner of the house is also the tenant in the case of owner-occupied housing.
2. The incidence of an increase in property tax on *renter-occupied housing* is more complex. Does it result in increased rent payments or does it result in lower profits for the owners of the rental building? The most common assumption made in tax incidence analysis is that the *increase* in property taxes is *paid by the renter* in the form of higher rents. Note that this generalization pertains to an increase in property taxes and not to the total property tax on rental housing. The current view of many economists is that the portion of the property tax on rental housing common to all jurisdictions is borne by the owners of the property while the differences between jurisdictions are paid by renters.
3. The incidence of an increase in the property tax on nonresidential property is even more complex. Tax incidence studies have used several alternative incidence assumptions for this component of the property tax. Basically, they involve various combinations of sharing the tax in the form of reduced profits and increased prices for products. Among the alternative incidence assumptions that have been used are:
   a. 100 percent shifting of the property tax to consumers through higher prices
   b. 100 percent in reduced profits to owners of the property
   c. 50 percent forward shifting as shown in (a) above, and 50 percent in reduced profits as in (b) above

It seems reasonable that some portion of the property tax, as a cost of business, does find its way into the price of products. (For further reading on the complex issue of property tax incidence, the reader is referred to the suggested readings at the end of the chapter.)

Tax Exporting

Taxes, or portions of taxes, that are paid by nonresidents of the community are said to be exported. The exported portion of a tax reduces the tax burden on local residents. It is not surprising, therefore, that local governments favor taxes for which a greater portion of the total burden can be exported.

Examples of exported taxes include:

1. A tax on hotel rooms, paid by tourists, conventioneers, visiting businessmen, and by other nonresidents
2. The portion of a payroll tax levied by the central city of an SMSA that is paid by commuters from the suburbs
3. A property tax on manufacturing plants that ship most of their products outside the local area (assuming that the tax is shifted forward in the form of higher product prices)

It is usually difficult to estimate the exported portion of property tax yields. Ad valorem taxes on residential property are not usually exported. The portion of nonresidential property taxes that is exported (assuming such taxes are shifted forward to consumers) may be estimated in various ways. Estimates of exported sales from commercial, industrial, and utility property sectors might be developed with the assistance of information obtained from the local chamber of commerce, bank research departments, or local university economists. The results of location quotient studies of the economic base (see chapter 1) might also be used. A last resort is a best guess of the proportion of export sales from a general knowledge of the local community.

Local taxable sales to nonresidents are the basis for estimates of exported local sales taxes. In addition to the sources of information already mentioned, the local convention bureau may have data on estimated sales to conventioneers and tourists.

The amount of local income or payroll tax that is exported depends on the kind of tax levied. If the tax is levied on both residents and nonresidents, the portion derived from nonresidents is exported. The U.S. Census provides data on place of work versus place of residence, which can be used to estimate the exported portion.

Tax Base Decline

Business firms and individuals will react to increased taxes in a taxing jurisdiction by trying to avoid them (legally). For example, in the case of a sales tax increase, consumers may drive into surrounding lower tax jurisdictions to make a large purchase if the savings in sales tax are worthwhile. The extent to which the tax base will migrate out of the taxing district depends on many factors, including the mobility of the tax base, the tax rate differential between jurisdictions, and the advantages of the higher tax area (such as a superior transportation system).

Reactions to tax changes are very difficult to determine. When reactions do occur, they may be so delayed that it becomes impossible to disentangle cause and effect. In actual incidence studies, it is usually assumed that the tax base will not decline because of the imposition of the tax.

WHAT IS TAX EQUITY?

Once the incidence of a tax is determined, including that portion of the burden that is exported, the next question concerns how tax burdens are distributed among residents of the local jurisdiction by income classes. Because taxes are ultimately paid out of family income, the equity of any tax is measured by relating the ultimate tax burdens to family income. Local officials may differ in their views as to the ideal relationship between income and tax burdens, or on the ability of families at various income levels to pay taxes. There is no single correct view on this issue; rather value judgments are involved.

Regardless of how local officials might feel on how much families at various income levels should pay in taxes, they still need the facts on how much they actually do pay. The relationships between family income and tax burdens constitute the *tax rate structure.* Tax rate structures may be proportional, regressive, or progressive:

A Tax Is:	If, as Income Rises, the Tax as a Percentage of Income:	Example
Proportional	Remains the same	A 1 percent local income tax that applies to all sources of income with no exemptions
Regressive	Declines	A sales tax on food and other necessities which represents a higher proportion of low incomes than it does of higher incomes
Progressive	Rises	A local income tax that has higher tax rates at higher income brackets than at lower income brackets

These three concepts of *vertical equity* (or how families at different income levels are treated in terms of tax burdens) are illustrated in table 1. Tax A is a proportional tax; tax B is a regressive tax; and tax C is a progressive tax.

Note that the percentage of income paid as tax, and not the total tax paid, determines whether a tax rate structure is proportional, regressive, or progressive. Even for a regressive tax, such as tax B, the amount paid in tax increases at the higher income levels. Yet income increases faster than the tax so the tax becomes a lower percentage of income at the higher income levels. This is stressed because the term *regressive* is frequently misused in the heat of emotional discussions about tax equity.

The study of incidence, and resulting tax burdens by income classes, provides the information on vertical equity of the present tax structure. Whether or not the tax rate structure that actually exists is desired at the local level is a matter of value judgments which are decided through the political process.

Determining the relationships of tax burdens to income in table 1 assumes knowledge of which individuals bear the burden of the tax (incidence) and the ability to measure their income in dollars. In practice there are several sources of income that are difficult to measure in dollars. A discussion of the problems in defining and measuring income and some common sources of local income data are contained in the addendum to this chapter.

The ultimate objective of most tax incidence studies is to produce information similar to that shown in table 1 for a given tax change. The steps to be followed in producing this information are demonstrated in the following example of Central County's tax dilemma, contained in the following sections.

SALES TAX VERSUS PROPERTY TAX BURDENS IN CENTRAL COUNTY: INTRODUCTION

Central County is faced with a dilemma. The local property tax rate in Central County is currently thirty-five mills (3.5 percent of assessed taxable property values). Homeowners are complaining about property taxes. Local developers contend that Central County's tax rate, which is higher than surrounding counties, is a deterrent to attracting new industrial devel-

Table 1

An example of proportional, regressive, and progressive tax burdens

Household Income Level	Tax A (Proportional)		Tax B (Regressive)		Tax C (Progressive)	
	Amount	Percentage of Income	Amount	Percentage of Income	Amount	Percentage of Income
$ 5,000	$ 50	1%	$ 50	1.0%	$ 50	1.0%
10,000	100	1	90	.9	110	1.1
15,000	150	1	120	.8	195	1.3
20,000	200	1	140	.7	300	1.5
25,000	250	1	150	.6	500	2.0
50,000	500	1	250	.5	1,500	3.0
100,000	1,000	1	400	.4	4,000	4.0

opment. Apartment owners claim that the higher taxes in Central County place them in a poor competitive situation and that they could postpone rental increases if a property tax cut were enacted. There is increasing political sentiment for a local sales tax and a corresponding reduction in property tax rates. Central County is authorized by state law to levy a 1 percent sales tax to be piggybacked on a state sales tax, but to date has not chosen to do so.

A 1 percent sales tax in Central County is estimated to yield $7 million per year, which would equal the property tax yield of nine mills applied to the current $777.8 million of assessed taxable property values in Central County. The county governing authority directs the staff to produce a tax incidence study for Central County, showing the differential results by income classes of a 1 percent sales tax levy versus a nine-mill reduction in property taxes.

There are two basic approaches:

1. Take the entire $7 million levy for both sales and property taxes and estimate the final incidence of every dollar of both taxes for each income class of the local area's population.

2. Choose representative households at various income levels, and estimate the tax burdens that will be incurred by each of these typical households.

The second method is less difficult than the first, and in most cases will yield sufficiently useful results for policy guidance. Therefore Central County staff members choose the second approach.

In order to apply property tax incidence assumptions, the staff members divide the property tax study into owner-occupied housing, renter-occupied housing, and nonresidential property. The burden for representative households for each of these three components of the property tax is estimated in the following sections. This review is followed by estimates of the 1 percent sales tax burden and a comparison of the two burdens.

THE INCIDENCE OF THE PROPERTY TAX ON OWNER-OCCUPIED HOUSING

As discussed earlier, property taxes on owner-occupied housing are borne by homeowners. Thus, the entire nine-mill property tax cut on owner-occupied housing will accrue to these households. The procedure for estimating the incidence of these taxes is to determine the relationship between taxes paid on owner-occupied housing and the income of the taxpayer. This involves the following steps:

1. Obtain assessments (taxable property values) for owner-occupied

homes and determine the relationship between assessments and market values of such homes.

2. Determine the relationship between market value of home and income of the owner-occupant.

3. Apply the nine-mill tax rate to the taxable value of home to get the property tax on owner-occupied housing and compare this with income of the homeowner to obtain tax as a percentage of income.

These three steps are discussed in more detail here.

Table 2

Assessments and estimated market values of owner-occupied homes: Central County

1	2	3	4	5
Information from Central County Tax Records		Market Values at	Midpoint of Range of:	
Number of Homes	Range of Assessments	35% Average Assessment-Sales Ratio	Assessment	Market Value
4,375	$ 2,800-$ 6,000	$ 8,000-$17,000	$ 4,400	12,500
6,250	6,000- 7,750	17,000- 22,000	6,875	19,500
9,413	7,750- 9,500	22,000- 27,000	8,625	24,500
6,653	9,500- 16,000	27,000- 46,000	12,750	36,500
3,107	16,000- 24,000	46,000- 68,000	20,000	57,000

The Relationship Between Assessments and Market Value

The Central County tax assessor uses computerized tax assessment records to provide a frequency distribution of the assessments of owner-occupied homes. (In states that provide homestead exemptions, the tax assessor readily has information available that differentiates owner-occupied parcels and assessments.) The assessments are shown in column 2, table 2. The relationship between assessment and market values must be understood in order to determine market value from assessment figures. The legal assessment ratio in Central County is 40 percent, but this is probably not the actual assessment ratio. Yet the actual assessment ratio is needed in order to convert assessments into market values. Actual assessment ratios are available from state sales-ratio studies or the U.S. *Census of Governments,* as discussed in chapter 4. From one of these sources, the actual assessment ratio for homes in Central County is found to be 35 percent of market value. Dividing the assessments in column 2 by 35 percent yields the range of estimated market values of owner-occupied homes shown in column 3. Since it is difficult to work with ranges of values, the midpoints are used, as shown in columns 4 and 5 for assessments and market values respectively. These are the representative housing values for owner-occupied households for which property tax and sales tax burdens will be estimated.

The Relationship Between Housing Value and Household Income

The second step is to estimate the income levels likely to be associated with the housing values shown in table 2. The following income-housing value relationships are calculated from the 1970 U.S. Census *Metropolitan Housing Characteristics* HC (2)-1:

Income Range	Median House Values	Ratio of Median House Value to Income
$2,000 or less	$ 9,575	4.8
$5,000-$5,999	$12,175	4.2
$6,000-$6,999	$12,875	2.0
$7,000-$9,999	$14,850	1.9
$10,000-$14,999	$18,700	1.5
$15,000-$24,999	$23,850	1.2
$25,000 and over	$37,250	1.2.

These relationships are averages for all SMSAs in the United States but are likely to be close approximations for any specific local area. (Jurisdictions that desire information on the relationships between incomes and housing values in their own jurisdictions can obtain these from the 1970 Census fourth-count computer tapes.) Both housing and income levels are probably understated in the census;

persons often do not know their housing values, and are reticent about divulging total income.

Data from the 1970 Census are somewhat outdated at this time but data from the 1980 Census will not be available until 1982. Although both income levels and housing values have risen sharply since 1970 (primarily due to inflation), the relationship between these two values has probably remained about the same.

The representative home values from table 2 are carried over to column 1, table 3. The housing-to-income ratios from the U.S. Census have been judgmentally adjusted in column 2 to reflect the increase in housing values from 1970 to 1977. Estimated household incomes in column 3 are obtained by applying the ratios in column 2 (or column 1 divided by column 2).

Table 3

Household income and owner-occupied housing property tax as percentage of income: representative Central County homes and households

1 Representative Home Market Value (from column 5, table 2)	2 Estimated Home Value to Income Ratio	3 Estimated Household Income[a] (column 1 divided by column 2)	4 Assessments (from column 4, table 2)	5 Nine-Mill Property Tax on Owner-Occupied Housing (column 4 x .009)	6 Property Tax as Percentage of Income (column 5 ÷ column 3)
$12,500	4.6	$ 2,700	$ 4,400	$ 40	1.48%
19,500	2.0	9,800	6,875	62	.63
24,500	1.5	16,200	8,625	78	.48
36,500	1.2	30,400	12,750	115	.38
57,000	1.2	47,500	20,000	180	.38

[a] Rounded to the nearest $100.

Owner-Occupied Property Tax Burdens by Income Level

We are now ready to calculate the burden of a nine-mill property tax on owner-occupied housing. The assessments from column 4, table 2, are shown in column 4, table 3. Multiplying these net assessments by nine mills (0.9 percent) yields the estimated tax burden shown in column 5. This tax is shown in column 6 as a percentage of estimated household income for the representative Central County homes.

A further refinement could be added if it is assumed that homeowners itemize deductions against federal income taxes, and thereby shift a portion of the local property tax (or for that matter sales tax) to the federal treasury in the form of lower personal income tax liabilities. For the sake of brevity, however, the assumption made in this example is that most families do not itemize their deductions. We have now estimated the incidence of one of the three components of the property tax, and turn to renter-occupied housing.

THE INCIDENCE OF THE PROPERTY TAX ON RENTER-OCCUPIED HOUSING

The discussion of incidence assumptions earlier indicated that there would be no unanimity on whether a nine-mill property tax reduction in Central County would be completely shifted forward to renters in the form of reduced rent payments. The county staff assumes that one-half of the nine-mill tax rate decrease will be passed on to tenants in the form of delayed rent increases. Rents will not decrease, but future increases will come more slowly than they would have come without the property tax cut. This incidence assumption was made by the staff on the basis that vacancy rates are currently low in Central County, but that numerous apartment projects are nearing completion in adjacent counties where lower land prices and taxes will result in lower rentals.

Given this incidence assumption (that 4.5 mills will accrue to the tenants and 4.5 mills will accrue to the landlords from a 9-mill property tax reduction), the required information and relationships for the tax reduction accruing to the tenants is somewhat similar to the case of owner-occupied housing. We need to determine the relationship between income and taxable property value of apartment units. This involves the following steps:

1. Obtain assessments (taxable property values) for apartment units and determine the relationship between assessments and rental payments.
2. Determine the relationship between rental payments and the in-

Income Range	Median Rent as a Percentage of Income
Below $5,000	35% or more
$ 5,000-$ 9,999	20%
$10,000-$14,000	Below 20%
$15,000 and over	Below 20%

come of the occupants of apartments.

3. Apply the 4.5-mill tax rate to taxable property values to get the property tax reduction accruing to tenants, and compare this with the income of the tenants to obtain tax as a percentage of income.

These three steps are discussed here, followed by a discussion of the estimated incidence of the 4.5-mill property tax reduction accruing to landlords.

The Relationship Between Rent Payments and Assessed Value

The Central County Apartment Owners Association provided the estimated rental ranges and number of apartments found in each rental range as shown in columns 1 and 2, table 4. The midpoints of the rental ranges of column 2 are listed in column 3. These are multiplied by twelve in column 4 to get estimated annual rentals. The occupants of apartments with these midpoint rentals will be used as representative renter households. The Central County assessor's office indicates the value of apartments is assessed by multiplying the annual rental (gross rent) by 2.7. This yields the average estimated assessment shown in column 5, table 4.

The Relationship Between Rent Payments and Household Income

The second step is to estimate the relationship between income level of apartment occupants and rent payments. The following median rent-to-income ratios shown on this page were calculated from the 1970 Census *Metropolitan Housing Characteristics* HC(2)-1:

The annual rents of representative apartments shown in table 4 imply incomes above $5,000; thus, the 35 percent rent-to-income ratio is not applicable to these representative apartments. The census data indicate that the rent-to-income ratio is relatively stable around 20 percent for income in excess of $5,000. Thus, the estimated incomes shown in column 3, table 5, are computed by dividing the annual rents shown in column 1 by 20 percent.

Renter-Occupied Property Tax Burdens on Tenant by Income Level

The assessments from column 5, table 4, are carried over to column 4, table 5. Multiplying these assessments by 4.5 mills (.0045) yields the estimated tax burdens on tenants (or tax cuts in the form of delayed rental increases) shown in column 5. This tax is shown as a percentage of estimated household income for representative Central County renter households in column 6. We now turn to the 4.5-mill property tax burden reduction estimated to accrue to landlords.

Renter-Occupied Property Tax Burdens on Landlords

Except for a few rental houses, the staff determines that the number of apartments shown in column 1, table 4, represents essentially all renter-occupied housing in Central County. The estimated total taxable property value of rental housing

is obtained by multiplying column 1 (the number of apartments) by column 5 (average estimated assessment), table 4, and adding the five resulting amounts together. This yields an estimated total taxable property value of $49,908,312. If the county's tax records show actual assessments for renter-occupied housing, this figure can be obtained directly.

The 4.5-mill property tax reduction assumed to accrue to landlords would mean an estimated tax reduction of $224,587 (.0045 times $49,908,312). To which households do these landlords belong?

From the Central County Apartment Owners Association, the staff determines that about one-third of all the apartments in Central County are owned by persons residing outside of Central County.

Table 4

Assessments and rents for renter-occupied housing: Central County

1 Number of Apartment Units	2 Rental Range	3 Midpoint of Rental Range	4 Annual Rent (col. 3 × 12)	5 Assessments Per Unit (col. 4 × 2.7)
1,200	$120-$160	$140	$1,680	$4,536
1,512	160- 185	173	2,070	5,589
1,800	185- 235	210	2,520	6,804
1,326	235- 285	260	3,120	8,424
1,215	285- 355	320	3,840	10,368

Table 5

Renter income and renter-occupied housing property tax as percentage of income: representative Central County apartment units

1 Annual Rent (from col. 4, table 4)	2 Estimated Rent-to-Income Ratio	3 Estimated Income (col. 1 ÷ col. 2)	4 Estimated Assessments (from col. 5, table 4)	5 4.5-Mill Property Tax on Renter-Occupied Housing Tenant (col. 4 × .0045)	6 Property Tax as Percentage of Income (col. 5 ÷ col. 3)
$1,680	.20	$ 8,400	$ 4,536	$20	.24%
2,070	.20	10,350	5,589	25	.24
2,520	.20	12,600	6,804	31	.24
3,120	.20	15,600	8,424	38	.24
3,840	.20	19,200	10,638	47	.24

Thus, one-third of the $224,587 tax reduction (or $74,862) is estimated to be exported outside of the county. This calculation leaves $149,725 ($224,587 minus $74,862) to be assigned to Central County residents. The staff assumes that these apartments are owned by higher-income households in Central County, who most likely live in owner-occupied housing. As indicated in column 1, table 2, there are 3,107 houses in the highest market value range. The $149,725 is divided by 3,107 to yield an average $48 tax reduction to these highest-income households. Of course, not all of these households actually own apartments, but the study is dealing with representative households; thus, the $48 average tax reduction is assigned to the highest-income group of representative households, and added to the $180 tax cuts in column 5, table 3, which these households would receive on their own homes.

We have now estimated the incidence of the renter-occupied housing property tax estimated to accrue to both the tenant and the landlord. To complete our estimate of the incidence of the property tax, we now turn to the incidence of the nine-mill tax on nonresidential property.

THE INCIDENCE OF THE NONRESIDENTIAL PROPERTY TAX

Estimating the incidence of the property tax on the nonresidential component of the Central County property tax is more difficult than estimating the incidence on residential property. Many tax incidence studies fail to include estimates of the incidence of property tax on commercial and industrial parcels. As a result, the conclusions of such studies are misleading at best. As discussed earlier, the incidence of nonresidential property taxes will depend on specific factors such as the degree of competition in markets in which local business firms sell their products, the supply and demand conditions in each market, and the degree to which business firms are selling their goods and services outside the jurisdiction. For the Central County study, the staff uses the incidence assumption common to many studies: that all of the nine-mill property tax on commercial and industrial property is shifted forward to consumers in the form of higher product prices.

Given this incidence assumption, the task of tracing out relationships for individual firms of their property taxes, the amount they shift forward, the extent to which they sell in local versus nonlocal markets, etc., would be very complex and time-consuming. Therefore, the staff adopts some short cuts for allocating the nonresidential property tax to representative Central County renter and homeowner households by income.

Tax Exporting

From the results of an economic base study (as discussed in chapter 1), the staff estimates that 40 percent of the nonresidential tax will be exported. Total Central County commercial, industrial, and utility assessments are $295.6 million. A nine-mill property tax rate on this tax base would yield $2,660,400. If 40 percent is estimated to be exported, this leaves 60 percent, or $1,596,200 (60 percent of $2,660,400), of the nonresidential tax burden to be allocated to Central County residents. How is this shifted nonresidential tax burden to be distributed among residents? If what they purchase locally is more expensive because it includes the shifted property tax originally billed to business property, how much greater are these prices?

Relationship of Income to Consumption of Products with Increased Prices

The staff assumes that the effect of shifting nonresidential property taxes to Central County residents in the form of higher product prices is similar to a sales tax. From the state revenue department, the staff determines that total taxable sales in Central County are $700 million. The Central County staff obtains an estimate of total annual taxable sales to nonresidents as the result of local convention, hotel, restaurant, and entertainment activities. From these and other sources, they estimate that 20 percent of taxable retail sales in Central County are made to nonresidents, or exported. Thus, taxable sales to county residents are estimated to be $560 million (80 percent of $700 million). The nonresidential property tax estimated to be shifted to Central County residents in higher prices is $1,596,200, or 0.29 percent of the estimated local taxable sales base of $560 million. Thus, the staff estimates the nonresidential property tax burden to Central County residents to be equivalent to a 0.29 percent rate change on the existing state sales tax.

The problem now is to relate sales taxes to household income. The simplest and most direct method of relating sales taxes to household income is to use the "Optional State Sales Tax Tables" published annually by the Internal Revenue Service (IRS) as part of the federal individual income tax forms. These tables indicate the deductible sales tax amount for each state at various income levels and for different family sizes. Column 1, table 6, shows the representative household incomes being used in the Central County study. If Central County is located in Georgia, we can refer to the state sales tax table for Georgia to give the state sales tax payments by household of given size. From the 1970 U.S. Census, the staff determines that the average family size for owner-occupied and renter-occupied housing in Central County is four and three, respectively. These family sizes are then used to find the amount of state sales tax payment on the IRS tables, as shown in column 2, table 6.

Column 3, table 6, gives the amount of sales tax that would be equivalent to an additional 0.29 percent sales tax. This is equal to the ratio of the additional tax (0.29 percent) to the state sales tax (3 percent) or 0.097 multiplied by the state sales tax shown in column 2.

The tax burdens of all three components of the nine-mill Central County property tax have now been estimated. We turn next to an estimate of the incidence of the alternative 1 percent sales tax.

THE INCIDENCE OF THE 1 PERCENT SALES TAX

The discussion of tax incidence assumptions earlier indicated a general agreement that sales taxes rest on consumers in the form of higher prices. Thus, the basic procedure for estimating the incidence of the 1 percent sales tax in Central County is to determine the relationship between sales taxes paid by resident consumers and their incomes. We again use the IRS optional sales tax tables. Thus table 7, which shows the estimated 1 percent sales tax burdens, resembles table 6. This time the amounts estimated at various income levels in column 3 are one-third of the state sales tax (column 2) because a 1 percent sales tax is one-third of the 3 percent state sales tax. The burden of the 1 percent sales tax as a percentage of household income is shown in column 4.

Table 6

Estimated nonresidential property tax burdens: representative Central County homeowner and renter households

1 Representative Household Income	2 Deduction Permitted for 3% State Sales Tax from IRS Tax Tables	3 Estimated Nonresidential Property tax burden (col. 2 × .097)
Owner-Occupied Housing:		
$ 2,700	$ 59	$ 6
9,800	134	13
16,200	188	18
30,400	254	25
47,500	316	31
Renter-Occupied Housing:		
$ 8,400	$125	$12
10,350	143	14
12,600	159	15
15,600	181	18
19,200	208	20

COMPARISON OF ESTIMATED PROPERTY TAX VERSUS SALES TAX BURDENS

The final estimated results of a nine-mill property tax cut offset by a new 1 percent sales tax in Central County are summarized in table 8. The representative household incomes used throughout the study are shown in column 1. The estimated 1 percent sales tax burdens are brought forward from table 7 and shown in columns 2 and 3. The estimated reductions in property tax burdens are shown in columns 4 and 5, for the residential and nonresidential portions of the nine-mill property tax, respectively. The residential property tax burdens for owner-occupied housing, shown in column 4, table 8, are brought forward from column 5, table 3, with the addition of $48 to the tax burdens of homeowners in the $47,500 income class. This $48 is the estimated average tax reduction to Central County landlords as discussed earlier.

Total residential and nonresidential property tax reductions are shown in column 6, and expressed as a percentage of income in column 7. Column 8 shows the difference in tax burdens for each representative household, and column 9 expresses these differences as a percentage of household income. The results in table 8 indicate that families living in rental housing will be losers from the proposed change to a sales tax, while homeowners will be gainers.

The switch from property tax to sales tax in this example would not materially alter the tax structure in terms of its regressive character. Among homeowners, the lowest-income group would gain slightly more than the highest-income group in reductions as a percentage of income. Among tenants, however, the lower-income families would lose slightly more than the more affluent households in added taxes as a percentage of income.

It is also important to summarize the difference between the two taxes in terms of the total burden borne by residents of Central County as opposed to the portion that is exported to nonresidents. Forty percent of the nonresidential property tax of $2,660,400, or $1,064,160, was estimated to be exported. In addition, $74,862 of the property tax burden reduction accruing to owners of rental units was estimated to accrue to landlords living outside Central County. Thus, the total property tax burden exported was estimated to be $1,139,022. The estimated portion of the $7 million sales tax that was exported was $1.4 million. Although both taxes are estimated to yield the same $7 million in revenues, more would be exported with the sales tax than with the property tax. The difference is not great, but it may be a factor for Central County to consider with respect to its economic development strategy.

DIFFICULTIES AND QUALIFICATIONS

Tax incidence analysis is obviously complex. The results depend on (1) the incidence assumptions employed, (2) the measure of household income used to relate to tax burdens, and (3) the methods and data used for assigning tax burdens to households, by income. The difficulties associated with these three factors have been discussed in the preceding sections and additional factors are mentioned below. For a fuller understanding of the difficulties of tax incidence analysis, the suggested readings listed at the end of this chapter are recommended.

The time period for which income is measured is usually one year, because most available data on family incomes are for one year. But in any one year there are some households whose income is especially low or especially high relative to their average income for a longer period of time (say ten years or a lifetime). For many families, good years (high overtime pay or large Christmas bonuses) and bad years (lengthy unemployment or illness) tend to even out over a longer period of time. Most studies indicate that the amount a household spends on housing and other forms of consumption is determined more by its members' average income over a long period than by income in any one year. One year's extra high or extra low income is unlikely to cause the household to move to a different house or apartment. Because residential property and sales taxes are based on housing value and consumption, respectively, the percentages of these taxes measured against long-term income might be considerably different than when they are related to just one year's income.

Table 7

Estimated sales tax burdens as percentage of income: representative Central County renter and homeowner households

1 Representative Household Income	2 Deduction Permitted for 3% State Sales Tax From IRS Tables	3 Estimated Local Sales Tax Burden (1/3 of col. 2)	4 Local Sales Tax as Percentage of Income (col. 3 ÷ col. 1)
Owner-Occupied Housing:			
$ 2,700	$ 59	$ 20	.74%
9,800	134	45	.46
16,200	188	63	.39
30,400	254	86	.28
47,500	316	105	.22
Renter-Occupied Housing:			
$ 8,400	$125	$ 42	.50%
10,350	143	48	.46
12,600	159	53	.42
15,600	181	60	.39
19,200	208	69	.36

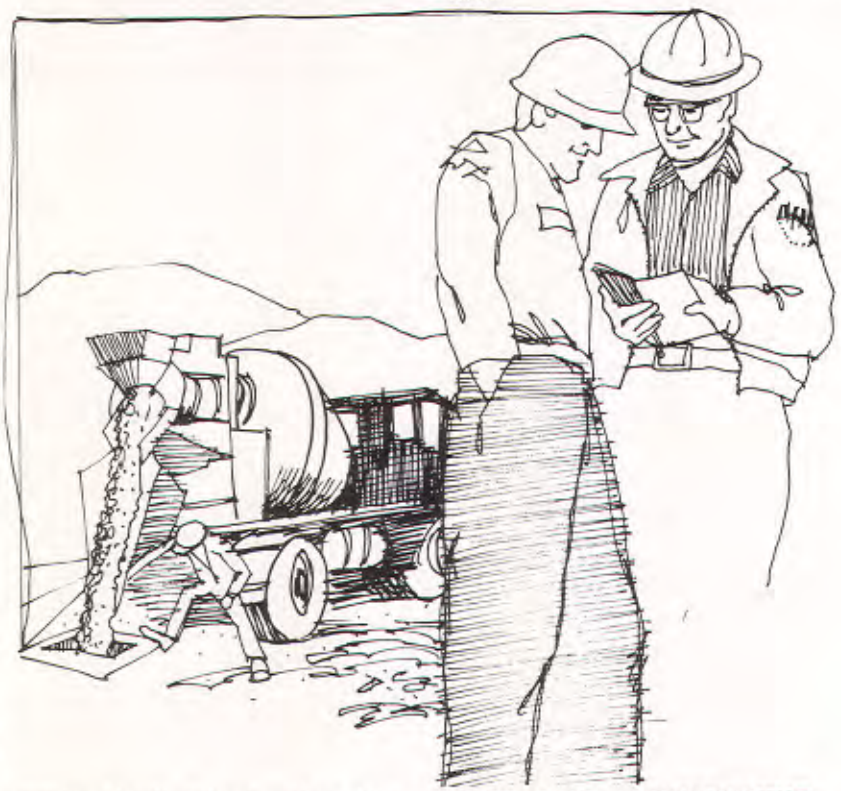
The different effects on tax rate structure obtained by relating property taxes on owner-occupied housing to one year's income (1977), as against ten years', are illustrated in table 9. The 1977 incomes of two households are shown in column 1; the household with $10,000 income has had an unfortunate year, while the household with $30,000 has had unusually good luck, because both households have had the same average annual income of $20,000 over the last ten years, as shown in column 2.

If the value of housing of these two households depended on longer-term income, we would expect them to live in housing of approximately the same value, as shown in column 3. Actual property taxes paid are shown in column 4. If we relate these 1977 property taxes to 1977 income (as shown in column 5), this property tax appears to be regressive; however, if we relate 1977 property taxes to longer-term income (as shown in column 6), the property tax is proportional. Recent studies

using long-term income indicate that many taxes traditionally thought to be regressive (when taxes are compared to one year of income) are closer to being proportional. (See the suggested reading by Aaron for an excellent discussion of this concept.) Such taxes may not be proportional, however, when considering families who consistently earn very low incomes year after year, and those who tend consistently to be very high earners over their lifetimes. The use of current versus long-term income in relating tax burdens to households is but one example of how different definitions and measures of income can affect the estimated tax rate structure of an incidence study. Caution is also in order in interpreting the results for representative families as used in the Central County tax incidence study. While the results indicate average tax burdens per income class, this does not mean that all taxpayers within the income class would be paying the average amount. Households within the $10,000 to $12,000 bracket, for example, may include ten-member households as well as one- or two-member households. A 5 percent tax burden for a ten-member household with $10,000 of income is a greater burden than it is for a one-member household with the same income. A tax incidence analysis that deals with average tax burdens for representative households does not usually focus on these different characteristics between households of the same income class.

From the standpoint of overall equity, the distribution of tax burdens among households of a local jurisdiction is only one-half of the issue. In other words, tax incidence studies do not deal with the question of who receives the benefits of local government services financed by taxes. The ultimate question of burden or equity is the distribution among households of benefits received from services minus the taxes paid to finance them—the distribution of net benefits (benefits minus costs).

Although tax incidence studies are complex and require assumptions that cannot always be proven, they are useful tools for local tax planning. The differences between tax burdens do enter into decisions on local tax revenue sources. The degree to which various taxes are exported is an important factor in issues of interjurisdictional exploitation as referred to early in this chapter. Finally, an understanding of the tax incidence principle that only persons pay taxes helps local officials to defuse myths about who pays city or county taxes, such as the controversy over the division of taxes between persons and business firms.



TIME, COST, AND EXPERTISE

Although a tax incidence analysis is a large undertaking, like a cost-revenue study, it is not something that a local government will do frequently. The results of a tax incidence analysis should not differ substantially from year to year, unless major changes occur in the tax structure. Thus, the considerable amount of time required for a tax incidence study should produce results that will be relevant for a long period of time.

Although tax incidence analysis is based on sophisticated economic theory, the actual performance of

an incidence study does not involve complex concepts if commonly accepted incidence assumptions are used. When there is no general agreement on incidence assumptions, such as on nonresidential property, the incidence of a tax can be estimated under alternative incidence assumptions without much extra effort.

A comprehensive tax incidence study may warrant the use of a professional economist to guide the work, select incidence assumptions when no general agreement exists, and insure against conceptual errors. However, most of the information gathering and actual work involved in a tax incidence study can be performed by local government staff. Staff with background in local government finance and accounting can frequently follow the steps suggested in this chapter and produce a respectable analysis without the use of consultants.

Table 8

Summary of estimated sales tax versus property tax burdens: representative Central County renter and homeowner households

1	2	3	4	5	6	7	8	9
	1 Percent Sales Tax (table 7)		4.5 Mills Property Tax Cut (tables 3, 5, and 6) Amount				Net Gain (Loss) to Household from Substituting Sales Tax for Property Tax	
Representative Household Income	Amount	Percentage of Income	Residential	Nonresidential	Total	Percentage of Income	Amount (col. 6 – col. 2)	Percentage of Income
Owner-Occupied Housing:								
$ 2,700	$ 20	.74%	$ 40	$ 6	$ 46	1.70%	$ 26	.96%
9,800	45	.46	62	13	75	.77	30	.31
16,200	63	.39	78	18	96	.59	33	.20
30,400	86	.28	115	25	140	.46	54	.18
47,500	105	.22	228	31	259	.55	154	.32
Renter-Occupied Housing:								
$ 8,400	42	.50	20	12	32	.38	(10)	(.12)
10,350	48	.46	25	14	39	.38	(9)	(.09)
12,600	53	.42	31	15	46	.37	(7)	(.06)
15,600	60	.39	38	18	56	.36	(4)	(.03)
19,200	69	.36	47	20	67	.35	(2)	(.01)

Table 9

Property taxes on owner-occupied housing as a percentage of income: 1977 income versus ten-year average income

1	2	3	4	5	6
				1977 Property Taxes as a Percentage of:	
1977 Income	Long-Term Income (Average Income for Last Ten Years)	Value of House (2 x Long-Term Income)	1977 Property Taxes on House (2% of col. 3)	1977 Income (col. 4 ÷ col. 1)	Long-Term Income (col. 4 ÷ col. 2)
$10,000	$20,000	$40,000	$800	8%	4%
$30,000	$20,000	$40,000	$800	2.67%	4%

SUGGESTED READINGS

Henry Aaron, *Who Pays the Property Tax?* Washington, D.C.: The Brookings Institution, 1975.
This book covers all facets of property tax incidence. The impact of current versus long-term income on resulting tax incidence by income class is clearly discussed. With the exception of the latter part of chapter 2 on tax incidence, the book is clearly written and understandable by the lay reader. Some of the better-known studies of property tax incidence are reviewed also.

Joseph Pechman and Benjamin Okner, *Who Bears the Tax Burden?* Washington, D.C.: The Brookings Institution, 1974.
The total tax burden (federal, state, and local) by income class in 1966 is analyzed using a representative sample of 72,000 U.S. families. Chapter 2, on tax incidence assumptions, provides an overview of almost every conceivable incidence assumption for all taxes.

ADDENDUM: INCOME DEFINITION, MEASUREMENT, AND DATA SOURCES

A determination of the relationships of tax burdens to income assumes that family incomes may be accurately measured. But what is income? If accurately measured, income is a measure of economic wellbeing that should show each household's power to consume in some specific time period (such as a year) without diminishing its net worth (assets minus liabilities).

Most sources of income accrue to the recipient in dollars; there is little question that items such as wages, salaries, interest and dividend incomes, rental income, and profits from unincorporated businesses constitute a part of personal income, and that they are measurable in dollars. Yet there are several sources of income that are difficult to measure because they do not directly generate dollars of income for a given year:

1. Capital gains. Increases in the value of assets (other than increases resulting from inflation) increase the individual's potential consumption power. The income measurement problem arises for unrealized capital gains, that is, increases in the value of assets that are not sold and converted to cash income.

2. Rental value of owner-occupied homes. The owner-occupant of a house is both landlord and tenant, yet no cash rental income changes hands because the landlord and the tenant are the same person. This source of income to homeowners is difficult to measure because no cash is exchanged. To understand why rental value of owner-occupied homes is a part of income, consider two cities that are identical in all ways, except that in one city, all residents live in their own homes, while in the second city, each resident owns a house but lives in another house, rented from someone else. In looking at the money incomes of the two cities, the second city would have much higher money incomes than the first, even though the two cities are really identical in terms of incomes and in all other respects. The difference is that rental income is cash income (easily identified and measured) in the second city and noncash income (difficult to measure in equivalent dollars) in the first city. A comprehensive measure of income would include the imputed value of rental income in the first city, but this value is difficult to measure in practice.

3. Unearned income (transfers). There are several sources of income for which the recipient provides no services but which should be included as income, inasmuch as these sources add to the recipient's economic well-being. One kind of such income is referred to as cash transfers (transfer payments in cash), which include welfare, unemployment compensation, and social security. The other type is referred to as in-kind transfers (transfer payments not received in money but in goods and services). In-kind transfers include the price reduction of public (subsidized) housing, food stamps, and subsidized medical care (medicaid, medicare, etc.). The value of in-kind transfers is often difficult to measure in dollars and to include in the measure of income. All of these transfers increase the individual's well-being and should therefore be included in the income measure.

Source of Income Data

There is no published source of income data that provides a comprehensive measure of income in dollars as discussed above. The four income data sources outlined below are readily available but all have certain advantages and disadvantages which will be briefly described.

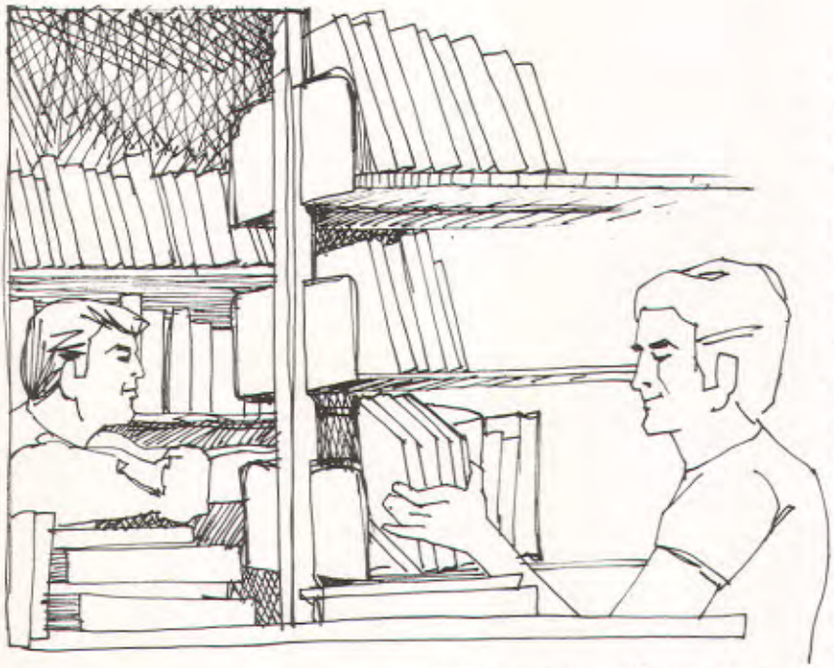
U.S. Census of Population. The U.S. Census, conducted every ten years, includes income data for families and individuals for cities, counties, and SMSAs. The definition of income used by the census includes money income described above (including cash transfer payments) but excludes capital gains (whether or not they are realized in cash). The imputed rental income value of owner-occupied housing and in-kind transfers (food stamps, etc.) are also excluded in the census definition of income.

While the census definition of income is fairly comprehensive, some problems are associated with census data, including the following:

1. There is considerable underreporting of income. Whether accidental or intentional (so as to hide income sources), underreporting is substantial. The portion of salaries and wages that is reported is larger than the portion of transfer payments reported; this situation implies that a lower-income household's income is more understated than is that of a household whose primary source of income is salaries and wages.

2. There is a long interval between U.S. Censuses. The 1970 Census reports 1969 incomes. Thus, the 1970 Census data are nine or ten years old by 1978 or 1979. Changes that occur over such a long period of time may be substantial and cast some doubt over tax incidence results that otherwise would not be questioned. Also, there is a lag in publication of census data. The 1970 Census, for example, reports 1969 income data but the necessary information was not published until about 1972. However, beginning in 1980, the census will be taken every five years, instead of every ten years as in the past.

Income tax return statistics. The IRS publication *Statistics of Income: Individual Income Tax Returns* is published annually and shows the proportion of taxpayers in different income groups. Most



state income tax collection agencies publish similar statistics for the state on an annual basis.

While the Internal Revenue Service publishes federal income tax data annually, there is a few years' lag in publication. The major weakness in these data is that income statistics are not published for cities and are shown for only a few income groups for SMSAs. The federal tax definition of income is different from the U.S. Census definition (it includes a portion of realized capital gains, but excludes cash transfer payments). Also, data are excluded for households with incomes too low to require tax returns. Therefore, tax return incomes are likely to show fewer low-income households than census incomes.

When state income tax data exist, these might be used in conjunction with local data, keeping in mind any difference between the state definition of income and the federal definition.

Sales Management Magazine. As part of an ongoing effort to transmit information about localities, *Sales Management*, in its annual edition of "Survey of Buying Power," estimates incomes annually for each county in all SMSAs in the U.S. Thus, this source of income data does not have the reporting lags associated with census and income tax data. *Sales Management's* concept of income, which it terms effective buying power, is basically money income net of all federal, state, and local taxes. Unfortunately, there is no well-specified methodology given for these estimates, but the editors of this magazine state that their estimates are quite similar to government-produced estimates.

Bureau of Labor Statistics. The Bureau of Labor Statistics publishes *Survey of Consumer Expenditures*, which relates consumer expenditures to household income and is published for many SMSAs. The definition of income used by the Bureau of Labor Statistics is similar to that used by the census. The principal weakness of these data is that the survey is undertaken only about once every ten years. There were surveys in 1950-51, in 1961-62, and in 1972-73. The data of this most recent survey are just being released; for several years, they may be the most useful source for many studies of local tax burdens.