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INCIDENCE OF THE RETAIL SALES TAX AS APPLIED TO OKLAHOMA

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THE UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

INCIDENCE OF THE RETAIL SALES TAX

AS APPLIED TO OKLAHOMA

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

DOCTOR OF PHILOSOPHY

BY

KAREN S. JOHNSON

Norman, Oklahoma

1981

INCIDENCE OF THE RETAIL SALES TAX

AS APPLIED TO OKLAHOMA

APPROVED BY

DISSERTATION COMMITTEE

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INCIDENCE OF THE RETAIL SALES TAX

AS APPLIED TO OKLAHOMA

BY KAREN S. JOHNSON

MAJOR PROFESSOR: MARILYN R. FLOWERS, Ph.D.

The incidence, or distributional effect, of the retail sales tax
has long been a concern of both economists and state legislators. Because
the sales tax is added to consumer expenditures, and because households
with lower incomes spend a larger proportion of their total income on
consumption, as compared to households with higher incomes, the sales
tax has been labeled a regressive tax. The purpose of this study is to
examine the incidence of the retail sales tax in Oklahoma, using recent
incidence theories, as well as regional modifications of the traditional
method.

The survey of retail sales tax incidence theory includes the develop-
ment of general and partial equilibrium models, and presents the hypo-
thesis allocating burden on the sources, as opposed to the uses, side
of the income equation. An expanded measure of household income is developed
for use as the incidence base, and the burden of Oklahoma's retail sales
tax is expressed using various allocation methods and shifting assumptions.
Actual published information for Oklahoma and interpolation of regional
data provide the statistics used for the comparative analysis. The effect

of the federal offset, since sales taxes can be deducted from federal income tax, and the portion of sales taxes paid by businesses, rather than consumers, influence the actual burden of the sales tax. It is concluded that the present sales tax in Oklahoma is indeed regressive, but not to the extent, either in real or proportional terms, generally assumed.

INCIDENCE OF THE RETAIL SALES TAX

AS APPLIED TO OKLAHOMA

CHAPTER I

INTRODUCTION

The incidence, or distributional effect, of the retail sales tax
has been a concern of economists and state legislatures ever since state
governments initiated the taxation of consumer sales as a way to obtain
state revenue. Because the retail sales tax applies to most consumer
expenditures, and because persons with lower incomes traditionally spend
a larger proportion of their total income on consumer goods, the sales
tax has been labeled a regressive tax, and legislators continually lobby
for expanded exemptions or reduced rates, in order to ease the burden
on the poor. The recent development of more thorough incidence models,
however, has suggested that the incidence of the typical state retail
sales tax is perhaps proportional, or at least, less regressive, than
originally assumed. Since the sales tax has always been relatively easy
to collect, with minimal "pain" experienced by the taxpayer at any one
time, it seems appropriate to investigate the incidence question for
Oklahoma's sales tax.

This study presents an updated analysis of sales tax incidence
theory, especially the development of general equilibrium incidence

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models and Edgar K. Browning's theory applying the sales tax burden to the sources, rather than the uses, side of the income equation. The empirical work is limited to determining the incidence of Oklahoma's rather comprehensive 2.0 per cent state sales tax. Using both the traditional and more recent theories to determine the distribution of the sales tax burden among income brackets, as well as considering those factors peculiar to tax incidence for only one state, the actual incidence or burden of Oklahoma's retail sales tax, as related to a comprehensive before-tax, after-transfers income base, is only about half of the state's 2.0 per cent sales tax rate for most taxpayers. The incidence pattern is less regressive than traditionally assumed, and if the lowest and highest of the ten income brackets utilized in the study are eliminated, the effect of the sales tax is nearly proportional. Moreover, all of Oklahoma's sales tax revenue is earmarked for the funding of the Oklahoma Department of Human Services, which supplies the state's welfare services, as well as certain educational and health programs. Since these programs traditionally benefit lower income groups more than those with higher incomes, the combined tax and expenditure incidence of the sales tax would be shifted further toward a proportional, or even progressive, bias.

Because of data limitations, the statistical work relies on numerous assumptions and approximations concerning income and expenditure patterns. The changes that have occurred in these patterns, as well as in the price level, since the 1973 base year make the actual numbers outdated. Since averages for each income level must be used, the real burden for any given family unit is not known. Nevertheless, the results provide an overview of how the retail sales tax generally affects Oklahoma families.

The format for the study will include first a chapter on the development of a theory of incidence analysis, especially as it pertains to the retail sales tax. Both partial and general models are presented. The problems peculiar to the determination of an individual state's tax incidence are then explored. The following chapters will discuss the establishment of a suitable income base and survey the income measures used by different government agencies in various incidence studies. The procedure for developing the broad income measure accepted as the base in this study is then described.

Chapter VI provides the empirical analysis and actual computation of the incidence of Oklahoma's retail sales tax, using a slightly-modified traditional incidence procedure, which determines burden on the amount of taxable consumption, as well as Browning's sources-of-income model. It is also shown how differing assumptions regarding federal tax offsets and the allocation of business taxes can affect incidence conclusions. Limitations of the analysis are presented so that any conclusions regarding the incidence of the retail sales tax in Oklahoma can be viewed in the proper perspective. A computation of sales tax incidence if food were excluded from the tax base and a differential analysis, comparing the existing sales tax incidence to the incidence of a state income tax providing the same revenue, are described in the final chapter. They provide additional information for use in summarizing the concluding thoughts regarding this extensive survey of Oklahoma's retail sales tax.

CHAPTER II

SALES TAX INCIDENCE THEORY

Incidence analysis describes how a particular tax affects the distribution of the real income available for private use. Total real income for the society is theoretically not changed by the imposition of a tax, for a tax simply causes a transfer of income from private to public use. In that the government spends the revenue it receives in taxes, and thereby utilizes the resources that have been released because of declining demand caused by taxation, there will be no overall burden to the economy, except to the extent that excess burden occurs when taxes distort the economic decisions of the private sector. This distortion causes an efficiency cost and results when the private sector's total burden from a tax is greater than the revenue received by the government.[1] Even when there is no excess burden, however, taxes, and the subsequent government expenditures, can alter either the distribution of factor income or consumption patterns, and thus can cause a change in the amount of income available to specific individuals or overall income classes. This change in real income available is synonymous with incidence.

To properly evaluate the incidence of a tax, recent studies have used either a balanced-budget approach or a differential approach.

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[1]For a thorough discussion on the excess burden of a tax, see Chapter 21 in Musgrave and Musgrave, Public Finance in Theory and Practice, second edition, (New York: McGraw Hill Book Company, 1976), pp. 461-481.

Balanced-budget incidence is actually a "net" concept, which combines

the effects of a tax and the government expenditures financed by the tax·

and describes the resulting effect on the distribution of private incomes.

In order to isolate the tax effects in the balanced-budget model, it is

generally assumed that government spending of tax revenue is "distribution-

ally-nuetral"--meaning that the impact on factor.and product prices of

government spending is no different than the impact made by private in-

dividuals prior to the tax. It is as if tax revenues were simply returned

to households to spend as they wish.[2] It is not necessarily assumed that

the government purchases the exact same goods as individuals, for the

same results should occur as long as the government utilizes the factors

of production that would have been employed to produce the goods demanded

without a tax, or as long as substitution of public for private spending

does not significantly alter relative factor or product prices. According

to Edgar K. Browning, the "distributionally-neutral" assumption "means

that the government purchases goods in amounts that offset the reduction

in private purchases due to the income effects of the tax but not its

substitution effects."[3]

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[2]For an economy producing only two goods, x and y, Charles McLure
defines the "distributionally-neutral" concept more exactly by assuming
"that all individuals and the government have the same marginal propen-
sity to consume x and the same income-compensated elasticity of demand
for good x with respect to relative product prices P_x/P_y, but that indivi-
duals do not necessarily have the same average propensity to consume x."
(Charles E. McLure, Jr., "Tax Incidence, Macroeconomic Policy, and Absolute
Prices," Quarterly Journal of Economics, November, 1970, p. 255.) This
definition, however, seems to be more restrictive than necessary.

[3]Edgar K. Browning, "The Burden of Taxation," Journal of Political
Economy 86 (August 1978): 654.

Differential incidence, in contrast, examines the distributional results caused by substituting one tax for another (the individual income tax traditionally serves as the base tax) while holding public expenditures constant. However, as Peter Mieszkowski observed in 1969, there is actually little difference in the balanced-budget and differential approaches in practice. One can easily be converted to the other, simply by using the proportional income tax as the reference base.[4]

The balanced-budget analysis, with the "distributionally-neutral" assumption regarding government expenditures, is the procedure adopted for this study. It is perhaps important here to distinguish between the usage of the terms "burden" and "incidence" in the following pages. All taxes inflict a burden, in that they reduce either income available for spending or the purchasing power of the overall income of the individual. Incidence, however, refers to how a tax affects the income of different groups in society. When used to describe the overall effect of a tax, incidence defines that one individual or income group which bears a greater than average burden as a result of a tax. "Incidence" and "burden" are not used consistently in tax literature, and thus, they are often used interchangeably.

Sources Versus Uses of Income

In an exchange economy, a tax can influence real income by altering either the prices received in payment for factor services (the sources of income), or the prices paid for goods and services purchased (the uses

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[4]Peter Mieszkowski, "Tax Incidence Theory: The Effects of Taxes on the Distribution of Income," *Journal of Economic Literature*, 7 (December 1969): 1105.

of income). These two effects are additive, and--depending on such vari-
ables as the type of tax, the factor intensities involved in production,
the consumption patterns of different individuals, and the elasticities
of substitution between factors and products--the sources and uses effects
can be either offsetting or reinforcing.

Richard Musgrave, who is credited with developing the sources
and uses concept, describes how taxes enter the household account by de-
fining disposable real income (DRY) as follows.[5]

$$DRY = \frac{E - T_y}{P + T_s} = \frac{DY}{GP} \tag{1}$$

E is earnings or return from any factor, and T_y is income tax which is
subtracted from E to achieve DY, disposable income. P is price (at factor
cost) of products and services bought, while T_s is sales tax that is
added to P to obtain GP, the gross or market price. Dividing DY by GP
provides disposable real income.

The sources of income (as reflected by the numerator of the equa-
tion) will be changed either when income tax is changed (a primary effect),
or when a tax alters factor returns, E, (regarded as a secondary effect).
For example, if a corporation tax decreases capital earnings, DY and con-
sequently, DRY will decline. The same result would occur were taxes on
income raised. On the uses or expenditures side (the denominator of the
equation), the primary tax effect will occur with a change in T_s. How-
ever, a general adjustment or response to a tax may also cause a change
in P, resulting in a secondary effect. In any case, if taxes cause GP

[5]Richard A. Musgrave and Peggy B. Musgrave, Public Finance in
Theory and Practice, second edition (New York: McGraw Hill Book Company,
1976), p. 381.

to increase, disposable real income falls, assuming there has been no offsetting change on the sources side of the household account. Both primary and secondary effects will alter DRY for individual households, but for more general income groups, the primary effects presumably will dominate.

The same idea differentiating between the sources and uses of income in determining tax incidence is defined in a slightly different manner by the numerous general equilibrium analyses of tax effects that have evolved in the last 20 years. Most studies have assumed an all-consumption economy, where two factors (capital, K, and labor, L) are used in the production of two goods (X and Y). Both factor and product markets are perfectly competitive, prices are flexible, there is no net saving or investment, resources are fully-employed, factor supplies are assumed fixed, although factors are initially assumed to be completely mobile between sectors (at least in the long run), and factors receive the value of their marginal products. For convenience, units are defined in such a way so that initial prices equal unity. Thus any absolute change in price is the same as an equal percentage change.[6]

Income before taxes is described as the sum of capital and labor income (the sources of income), which is equivalent to total purchases of X any Y (the uses of income). This assumes that both initial factor earnings and consumption purchases encompass total income.

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[6]The assumption that prices equal unity means that $P_L = P_k = P_x = P_y = 1$. According to McLure and Thirsk, this convention "allows one to use interchangeably physical and value terms for factors or output in the initial no-tax situation." [Charles E. McLure, Jr. and Wayne R. Thirsk, "A Simplified Exposition of the Harberger Model I: Tax Incidence," National Tax Journal 28 (March 1975): 4.]

$$I = P_L L + P_k K = P_x X + P_y Y \qquad (2)$$

P_L and P_k are the prices of labor and capital, P_x and P_y represent the prices of the two goods, and I is income. As noted earlier, a tax may enter the system and change any of these variables.

For an individual household, total income can be expressed on the sources side by defining the amount of income that an individual receives and can spend. In a two-factor economy

$$I_i = P_L L_i + P_k K_i \qquad (2a)$$

Following the imposition of a tax, the equation (or total differential) representing the change that occurs in an individual's income is

$$dI_i + P_L dL_i + L_i dP_L + P_k dk_i + K_i dP_k \qquad (2b)$$

Two of these terms, $P_L dL_i$ and $P_k dK_i$, represent changes in the form, rather than the size, of real income, and thus can be ignored. ($P_L dL_i$ measures the substitution of money for leisure with no loss in real income, whereas $P_k dK_i$ defines a substitution of current consumption for saving and capital accumulation.) Moreover, with the above assumptions that factors are fully employed and are completely mobile between sectors, there can be no change in the amount of overall labor and capital due to a tax. In the long-run analysis of tax incidence, however, these terms need to be considered.[7]

Income, when expressed in terms of the uses of income ($P_x X + P_y Y$), measures the consumption or purchasing power of the individual.

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[7]This discussion is a combination of the ideas expressed by Musgrave (1959) and McLure (1970).

If a tax causes a change in product prices, the change in the purchasing power of a unit of factor income is measured by comparing the cost of the original consumption bundle to the cost of this bundle after a tax is imposed. The resulting equation is

$$dI_i = -(X_i \, dP_x + Y_i \, dP_y) \qquad (2c)$$

The minus sign for this equation indicates that a tax will create a loss in real purchasing power--the situation that occurs when dP_x and dP_y are positive (product prices rise).

Since both the sources and uses sides fully consume income, the fraction of income received by labor can be defined as h_i, with the fraction of income received by capital being defined as $(1 - h_i)$. Likewise, on the uses side, a_i defines the fraction of income spent on good X, the taxed product, with $(1 - a_i)$ representing the fraction of income spent on the untaxed good, Y. The total percentage change in private real income of the ith individual resulting from a tax can then be written as

$$dI_i/I_i = h_i \, dP_L + (1 - h_i) \, dP_k - [a_i \, dP_x + (1 - a_i) \, dP_y] \qquad (3)$$

Because initial factor and product prices were defined to equal unity, the terms, dP_L, dP_k, etc. actually express percentage changes in prices.

Relative Versus Absolute Prices

It is important to realize that in determining tax incidence or chnage in income distribution, it is the change in _relative_ factor and product prices that matters. Incidence is independent of absolute price changes. (This assumes that no variables in the income equation are fixed in monetary terms.) Absolute price level changes are determined by

macroeconomic policy, including the establishment of the level of taxation. In contrast, economic forces, such as changes in the tax structure, dictate the change in relative prices.

This does not mean that changes in absolute prices do not inflict a tax burden upon the individual. Obviously, some change in absolute prices must occur in order to effect relative changes. An overall change in prices, on either side of the income equation, traditionally measures the burden in the economy created by a general tax, such as a proportional income tax. The well-being of one sector of the economy, in relation to another, however, will not be affected in the simple all-consumption model. Moreover, if government spends the tax revenue in a manner consistent with the balanced-budget incidence concept so that new government demand is similar to the former private demand, a tax may not cause changes in relative prices. The resulting effect on incidence will be more-or-less neutral. When relative prices change though, tax burden is no longer borne equally by all, but differs from that of the proportional income tax. This differential burden is actually the measure of tax incidence.

Monetary policy determines whether a tax will cause product prices to increase or factor incomes to decline. Recall once again the simple model equating the sources of income, $P_k K + P_L L$, to the uses of income, $P_x X + P_y Y$, and also the traditional equivalency $I = MV = PT$ or PQ. MV refers to (M) the money supply available in the economy times (V) the velocity of money in circulation. PT refers to the price of goods times transactions, while PQ is price times the quantity of the good purchased. When a tax is imposed, the government's tax revenue must be considered as part of the sources of income. Thus, $MV = P_x X + P_y Y = P_k K + P_L L + T$.

Assume that a 25 per cent sales tax, traditionally depicted as a wedge between the manufacturer's or factor prices for the product and the gross or market price for which the product is sold, is imposed on all commodities in an all-consumption economy. If monetary policy is accomodative, the money supply would expand and prices of X and Y would increase by 25 per cent. Thus, the gross price paid by consumers would equal $1.25 per unit, though only $1.00 per unit would be received by factors. Consumer A, for example, with factor income of $1000, who could originally purchase 1000 units of X and Y, can now purchse only 800 units at the $1.25. (See Table II-1.) To maintain full employment of resources, the government would use its tax revenue to purchase either the other 200 units of X and Y or some other good produced by the released factors. Assuming a general sales tax means that a tax is paid on public, as well as on private, usage, tax revenue to the government would total $250, representing 20 per cent of the newly-inflated income level of $1250. Of the total $250 tax revenue, however, government itself provided $50, as a result of purchasing 200 units at the inflated $1.25 price. Thus, net government revenue equals $200.

If monetary policy does not allow product prices to increase, however, a 25 percent overall commodity tax would cause factor prices to decline if factors are to remain fully employed. In this case, instead of $1.00 per unit, factors after tax would receive only 80 cents per unit. The government would still receive $200 in tax revenue, but the money supply in this case does not change. Real income or purchasing power will decline proportionately in both cases, for after the tax Consumer A could purchase only 800 units of X and Y. Regardless of whether

monetary policy causes product prices to rise or factor prices to fall, factor prices have fallen relative to product prices. Thus, there is a burden on the sources side of the income equation (which refers to changes in the real purchasing power of disposable income). A uses-side effect will occur only when a tax causes changes in the relative prices of the different products purchased.

TABLE II-1

RELATION OF MONEY, PRICES, AND TAXES

Before Tax

$$MV = P_x X + P_y Y = P_k K + P_L L$$
$$MV = \quad P_q Q \quad = \quad P_f F$$
$$1000 = 1 \cdot 1000 = 1 \cdot 1000$$

After Tax

$$MX = \quad P_q Q \quad = P_f F + T$$

If the money supply increases, a 25 per cent sales tax on the price of all goods will cause P_q to increase to 1.25.

$$1250 = 1.25 \cdot 1000 = 1 \cdot 1000 + 250$$

Assuming no increase in prices, factor earnings must decline in order for factors to remain fully-employed.

$$1000 = 1 \cdot 1000 = .8 \cdot 1000 + 200$$

Although tax revenue is different depending on whether or not money (and prices) increase, revenue in real terms is the same. Tax revenue in both cases equals 20 per cent of income.

The importance of relative price changes in income distribution can be further explained by a rather simple example. Assume that income

group A with overall factor earnings of $1,000 spends 40 per cent of income on product X priced at unity and 60 per cent on product Y, also priced at unity. This means that 400 units of X and 600 units of Y would be purchased. Assume that income group B's ratio of spending of its $1,000 total income is the opposite, so that B buys 600 units of X and 400 units of Y. Production in the overall two-product economy will total 1,000 X and 1,000 Y, or 2,000 total units priced at unity.

If a sales tax of 25 per cent is imposed on all goods, and if monetary policy allows product prices to increase by the amount of the tax, prices of each product would equal $1.25. Assuming that factor income and demand for X and Y remains the same, each consumer could purchase only 800 units, and government would receive tax revenue of $400, with consumers A and B each providing $200. To retain equilibrium, the government must either purchase the remaining 400 units of X and Y that could be produced by factors A and B, or use the factors involved to produce another good or service. If the sales tax applies to public as well as to private purchases, tax revenue would total $500, although the government itself would have contributed $100 of this revenue. When government purchases are tax-free, adjustments in prices and money supply differ, depending on whether the public or private price of goods is held constant.

Although a general sales tax reduces the real purchasing power of both consumers, there is no change in the relative positions of income groups A and B. This response reflects the income elasticity of demand, where quantity purchased corresponds to a demand curve shift, rather than to a movement along a specific demand curve. Each group will

presumably decrease its consumption by one-fifth, with Group A buying
320 X and 480 Y; Group B, 480 X and 320 Y. Consumption for each group
will total 800 units. Though both groups A and B are burdened by the
tax, neither group benefits at the expense of the other, so tax incidence
is neutral.

If the government, however, decides to obtain $500 revenue by
taxing only good X, it would need to impose a 50 per cent sales tax on
X, assuming that the tax is entirely reflected by an increase in the taxed
product.[8] The price of X would increase to $1.50. It is assumed the
price of Y would remain at $1.00. The average consumer, representing
the average of consumers A and B, in order to contribute $200 in tax revenue,
would have to buy 400 units of X and 400 units of Y (point J' in Figure I),
even though the relative prices of X and Y had changed. This seems highly
unlikely. As is shown in Figure I, Average Consumer J would be on a higher
indifference curve by purchasing consumption package J", which includes
500 units of Y at $1.00 and only 333 1/3 units of X at $1.50. This, how-
ever, would not provide the tax revenue government had anticipated. Thus,
to obtain an average tax revenue of $200 from each consumer by taxing
only one of two products in the economy, the tax rate would have to be
even higher than the 50 per cent originally estimated. How much higher
would depend on the value of the two goods involved (the elasticities
of substitution, etc.) and the individual preferences of consumers. The
substitutibility of factors involved in the production of X and Y is

---

[8] Recall again that $MV = P_x X + P_y Y = PF + T$ where PF represents
the income received by all factors. With a general sales of 25 per cent,
$MV = \$2500 = \$1.25 \cdot 2000$ units $= \$2000 + \$500$. With a tax only on good
X, $MV = \$2500 = \$1.50 \cdot 1000X + \$1.00 \cdot 1000Y$.

FIGURE I

EFFECT OF GENERAL AND PARTIAL SALES TAX
(Assuming economy with only 2 goods, X and Y
each priced at unity, and consumer income of $1000.)
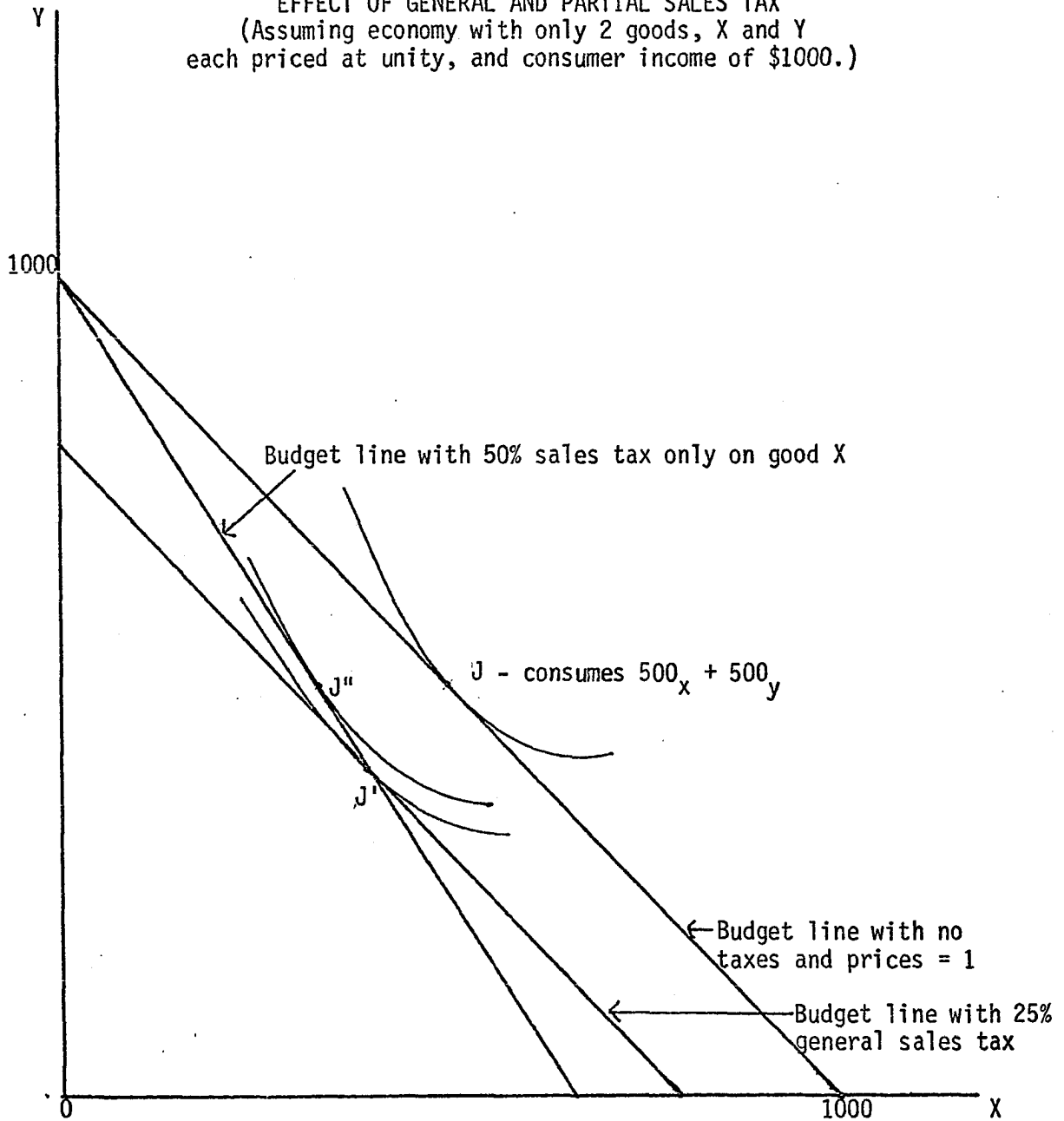
Qty When price of X = $1.50

At J', consumer buys 400_x @ $1.25 and 400_y @ $1.24; government receives
$200 in taxes.

At J", consumer will buy more Y and less X. A 50% sales tax levied only
on good X will not yeild $200 to government.

another factor.

Regardless of how much the partial tax rate must be in order to provide a given amount of tax revenue, the incidence of a partial tax on X will be different for the consumer groups A and B mentioned above. Suppose a tax causes the price of X to increase to $1.67, while Y remains priced at $1.00. It would now cost consumer A $1264 to purchase his original consumption bundle of X and Y, whereas consumer B would have to spend $1398 for his original consumption. Since income did not increase, both consumers undoubtedly would reduce consumption, but a relatively heavy incidence of the tax will fall on group B, which prefers proportionally more of the taxed good. The change in relative product prices means that the redistribution of income will be to B's disadvantage.

Actually, an increase in the price of product X, relative to the price of product Y, would cause both Groups A and B to change their consumption patterns. This relationship is shown in Figure II. Assuming $1000 income for both groups, with units of X measured along the horizontal axis, and units of Y along the vertical axis, the initial budget constraint with both goods priced at 1 would be CD. A series of indifference curves for A and B are also charted, and initially, A and B are on their highest indifference curves at points A and B. The average consumer with $1000 income would be at point J and purchase 500 units each of X and Y.

A general sales tax on both goods (as well as a proportional income tax) would cause the budget line to fall to EF. Tax revenue from each consumer would be determined by applying the tax rate to the amount of each good consumed. For example, average consumer J, with a general

FIGURE II

HOW RELATIVE PRICES INFLUENCE INCIDENCE
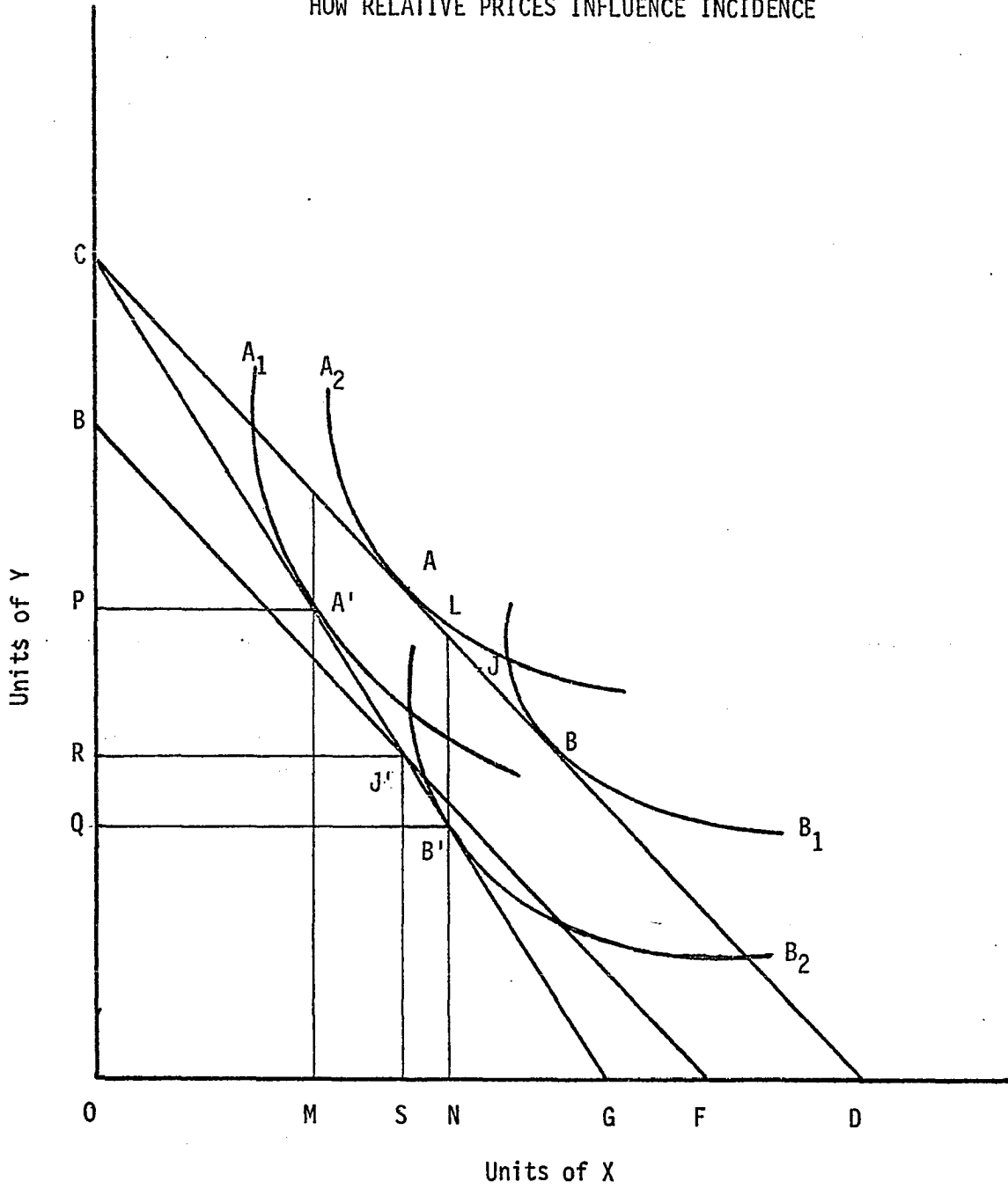
sales tax, would consume consumption bundle J', and his tax would total RJ' plus SJ' times the tax rate. The total tax payment can also be measured as the vertical (or horizontal) distance between J' and budget line CD, if income were substituted on one axis. In the case depicted where equal amounts of both goods are produced and both prices originally equal unity, when a general sales tax is imposed, it makes no difference where on budget line EF an individual is located. The purchasing power of all consumers would be reduced by an equal amount.

If sales taxes were imposed only on good X, however, as opposed to a general sales tax on goods X and Y, the budget line would reflect the resulting change in relative prices and shift to a position such as CG. Consumer A will now be at equilibrium at A', where he will purchase OP of good Y and OM of good X. Part of his expenditure on good X, however, goes for taxes. Consumer B, with his preference schedule, finds his equilibrium at B', and purchases OQ units of Y and ON units of X, which are taxed. Since consumer B prefers more X than consumer A, B must pay more of the partial tax on X, so the incidence of this partial tax is borne by B. The two tax payments can now be depicted in terms of good Y as vertical distances A'K for consumer A and the larger B'L for consumer B.

This analysis shows how changes in relative product prices as a result of tax policy are reflected in the uses of income or expenditure side of the household income equation and thus determine tax incidence. Changes in the relative factor prices on the sources side of the income equation will also affect incidence. Assume consumer products X and Y are produced by industries using inputs K and L. If there is some total

of K and L to be distributed, a Stolper-Samuelson box diagram (Figure III) of the respective isoquant maps for the two industries can be constructed. These isoquant maps reflect possible combinations of inputs K and L that would produce varying outputs of X and Y. The origin for Industry X's isoquant curves is the traditional lower left-hand corner, O_x. Industry Y's isoquant curves originate from O_y, the upper right-hand corner, with higher output levels going toward the lower left.

The points where isoquants X and Y are tangent can be connected by a contract curve $O_x O_y$, which represents the efficiency locus along the production possibilities frontier. At these points of tangency, the marginal rates of technical substitution between the inputs K and L in the production of X and Y are equal. ($MRTS_{klx} = MRTS_{kly}$) Assume that the output combinations for goods X and Y depicted by the contract curve $O_x O_y$ each represent a point along the production possibilities or product transformation curve, CC', in Figure IV. The initial output combination of X and Y, point T on both diagrams, is determined by where the slope of the production possibilities curve equals the slope of the isocost line representing the price relationship of the inputs, K and L. This assumes that prices of both inputs are the same for both industires. Thus,

$$MRTS_{klx} = \frac{\Delta L_x}{\Delta K_x} = \frac{MP_{kx}}{MP_{Lx}} = MRTS_{kly} = \frac{\Delta L_y}{\Delta K_y} = \frac{MP_{ky}}{MP_{Ly}} = \frac{P_k}{P_L} .$$

If a sales tax were levied on both goods X and Y, and monetary policy did not permit product prices to increase, prices received by both factors would decline in order to keep all factors fully employed. The same amount of goods X and Y would continue to be produced with production remaining at point T since the relative prices of K and L would remain the same.

If only good X were taxed, however, there would be a relative

shift in the prices of K and L. (Production might be represented by point U in Figure IV.) The price of labor would decline relative to the price of capital, since X, the taxed good, is depicted as a more labor-intensive product. When factors are assumed to be fixed in supply but fully mobile, labor in both industries will experience the burden, due to the relative decline in wages. With less than full-mobility of factors, the result of a partial tax upon factor earnings, product prices, and overall incidence will be different, depending on the characteristics of the taxed good and which factor is immobile.[9]

These last two exercises, though described in a partial, rather than a general, equilibrium analysis, have not only demonstrated how incidence is a function of relative price changes, but have also shown how tax incidence is discernable only when an individual's consumption pattern or factor share differs from the average. In both Figures II and III, it is recognized that if the indifference curves for consumers A and B were the same, or the isoquant curves for industries X and Y were equivalent, a tax causing a change in relative prices of goods or factors would have no effect on incidence or income distribution of the groups involved. The burden of a tax on a particular individual or household will differ from the burden on the economy as a whole in that the individual's share of income varies from the national average. For example, if an individual's share of factor income falls relative to the average following a tax, there is a source's burden. Consequently, a burden on the uses side is reflected only if the individuals' overall

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[9]For an analysis of the partial mobility case, see McLure and Thirsk, Simplified Exposition, pp. 16-17.

FIGURE III

BOX DIAGRAM REFLECTING COMBINATIONS OF INPUTS K AND L THAT CAN PRODUCE OUTPUTS X AND Y.
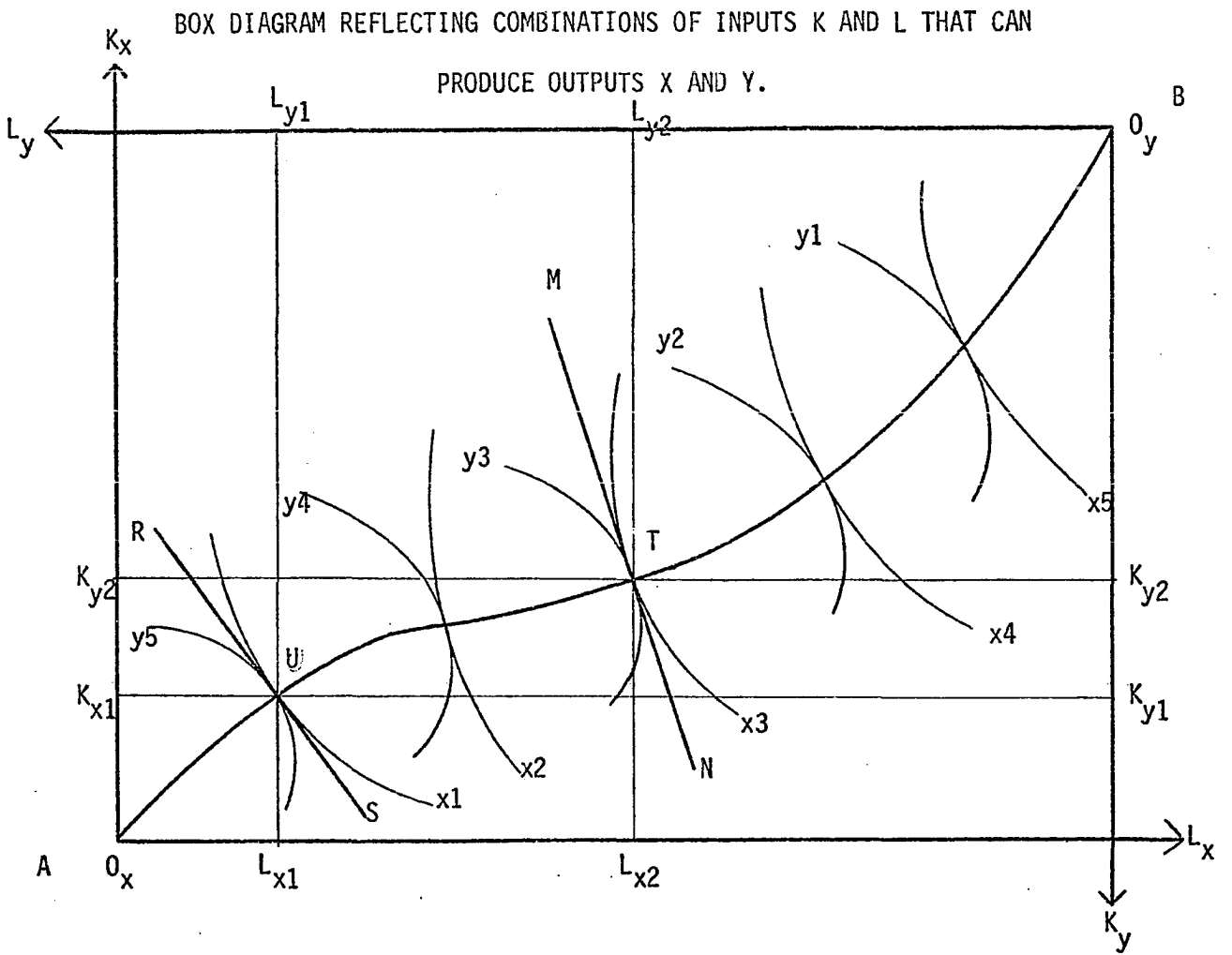
FIGURE IV

PRODUCTION POSSIBILITIES CURVE
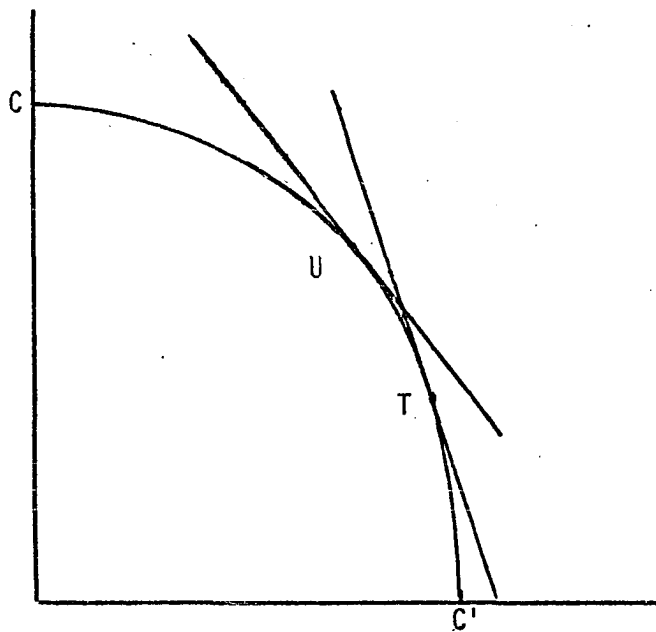
consumption is reduced relative to the average. If households all derived their incomes from the same sources in equal proportions, and if consumption and expenditure patterns were similar, even with relative prices changing, the incidence of any tax would be proportional. It is the fact that specific taxes affect different income groups differently that make incidence analysis important in public decision making.

This dual requirement--of needing both a change in relative prices and an income or consumption pattern that diverges from the average--can be further demonstrated by extending Equation 3 given earlier in this chapter.

$$dI_i/I_i = h_i \, dP_L + (1 - h_i) \, dP_k - [a_i \, dP_x + (1 - a_i) \, dP_y]^- \qquad (3)$$

This equation expresses the change in the income of individual i following the imposition of a tax. Following McLure's analysis, the fractional change in _aggregate_ real private income (or total national income) can be defined by using the capital letters H and A to represent labor's initial share in national income and the fraction that X is of the national product, respectively.[10] Thus,

$$dI/I = H \, dP_L + (1 = H) \, dP_k - [A \, dP_x + (1 - A) \, dP_y] \qquad (4)$$

The difference in the fractional loss in real private income between the individual and society represents the burden to the ith person, expressed as

$$B_i = dI_i/I_i - dI/I$$
$$= (h_i - H)(dP_L - dP_k) - (a_i - A)(dP_x - dP_y). \qquad (5)$$

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[10]McLure, Tax Incidence, pp. 257-58.

When B = 0, the incidence of the tax is proportional, for the ith indi-
vidual shares the burden of the tax in proportion to his initial share
in national income. If B_i is less than zero, then, assuming balanced-
budget incidence, the ith individual bears a greater than proportional
burden because of the tax, wheras if B_i is positive, the ith individual
will supposedly benefit because of the tax. This does not mean that the
individual will not pay any tax or escape a tax burden. When $B_i > 0$,
the individual's burden because of the tax is simply less than proportional
or less than average.

The burden depicted in this last equation can be divided into
that borne because of the sources of income $[(h_i - H)(dP_L - dP_K)]$ and
the redistribution resulting from the uses of income $[-(a_i - A)(dP_X -
dP_y)]$. Both effects include a "share" component, as well as a "change
in relative prices" component. If either component comprising the sources
or uses effect equals zero (i.e. utilization of factors or consumption
of output is the same as the national average or there is no change in
relative prices), then the overall tax incidence reflected by that side
of the household equation will also equal zero. For example, Arnold Harberger
in his 1962 general equilibrium analysis of the corporate income tax,
and several other economists in their extensions of Harberger's theory,
assume that, in general, an individual's consumption pattern does not
differ significantly from the average. Thus, the effects generated from
the "uses of income" can be ignored, and the incidence of a tax can be
determined entirely from the sources of income.

Incidence of a General Tax

Just as it does not matter whether a tax pushes up product prices

or reduces factor income, it makes no difference, as far as final inci-

dence is concerned, at which point in the income stream a truly general

tax is imposed. As seen before with the 25 per cent general sales tax

(in the two-good, all-consumption economy), real income of the individual

would decline by 20 per cent irrespective of monetary policy. Instead

of imposing a sales tax upon the flows generated in the production of

current output, the government could have levied a 20 per cent proportion-

al tax on the current gross income of factor transactions. Real income

would decline proportionately in both cases.

If an all-consumption economy does not exist, a sales tax, in

order to be truly general, would have to be imposed equally upon the gross

value of capital goods, as well as upon consumption goods. (This assumes

that consumer savings flow into the purchase of capital goods.) More-

over, the equivalency of a general sales tax is only with an income tax

levied on _gross_ income. This is not the same as a tax on net income (the

more common base), which is obtained after depreciation is subtracted

from the gross figure. The only way that a truly general tax will affect

the allocation of resources and/or relative commodity prices is if the

government's spending pattern of tax revenue differs from the pre-tax

pattern of private expenditures.[11]

Incidence of Partial Commodity Taxes

In reality, however, sales taxes are not general, and as described

above, when a sales tax is applied only to good X, the interactions in

the economy are far from precise. In the United States, the retail sales

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[11]Peter M. Mieszkowski, "On the Theory of Tax Incidence," _Journal of Political Economy_ 75 (June 1967): 252.

tax is a primary revenue tool of individual state governments and is levied in all but five states.[12] The comprehensiveness of the tax varies from state to state, depending on the initial laws regarding tax rates and the exemptions permitted. The federal government levies excise taxes on selected goods, and a growing number of local governments add additional percentage points to the state sales tax rate in order to provide local revenue. States also obtain a large amount of revenue from selective excise taxes, but the general retail sales tax is the primary concern in this study. The determination of the incidence of these partial taxes upon various income groups depends on the interaction of the effects upon the sources and the uses sides of the income equation (as described earlier).

Empirical studies of sales tax incidence have traditionally assumed that the incidence of the retail sales tax is reflected entirely by the uses of income and falls upon the consumers of the taxed goods. The price of the taxed good is assumed to increase by the amount of the tax, and incidence is determined by relating this additional burden to the consumer's income. $I_i = \dfrac{tC_t}{Y}$ where I_i is the percentage of incidence or burden for a given income group; t is the tax rate; C_t refers to taxable consumption; and Y is whatever income measure is chosen as the income base. The result of this method of incidence analysis is that the retail sales tax is regressive, since the ratio of tax to income falls as income rises. This is because sales taxes are levied only on consumer goods (not capital goods), and people with lower incomes usually consume a

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[12]The five states with no state sales tax at present (and in 1973) are Alaska, Connecticut, Montana, Nevada, and Oregon.

larger portion of their income than those in higher income brackets.

Partial equilibrium analysis of sales tax incidence generally ignores the burden on the sources of income. This omission has been justified "because any labor or capital that may shift from the taxed industries ultimately receives approximately the same income when it is reemployed in the untaxed industries."[13] In the 1950's, Earl Rolph, drawing on earlier work of Harry Gunnison Brown, questioned whether the sources of income could be ignored when determining the incidence of a sales tax, but most empirical studies have overlooked these theoretical arguments.

There was early recognition that the choice of an income measure would affect the actual incidence conclusions. Musgrave and others also pointed out that not all retail sales transactions involve individual consumers. A certain proportion of sales are to businesses, so the burden of this part of the sales tax is similar to a production tax. Other questions, such as the weighting of income brackets according to population size and other variables, the effect of the federal income tax deduction available for sales taxes, and the extent of tax exemptions, were recognized in various studies of sales tax incidence, but in most cases, no basic alterations to the $I_i = \frac{tC_t}{Y}$ equation have been made.

Until recently, the rather limiting partial equilibrium analysis was the procedure used to evaluate sales tax incidence.[14] A tax on commodity X, however, will affect not only the output and consumption of

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[13]Joseph A. Pechman and Benjamin A. Okner, Who Bears the Tax Burden? (Washington, D.C.: Brookings Institution, 1974), p. 31.

[14]A detailed summary of partial equilibrium analysis for selective sales taxes is provided in Musgrave and Musgrave, Public Finance in Theory and Practice, pp. 444-450.

good X, but, except when both the taxed and untaxed goods are produced under conditions of constant cost, a tax on X will also change the price and market relationships for the untaxed good Y. Moreover, changes in relative prices, which have been shown to be a prerequisite for tax incidence, depend on the demand and supply of both goods, as well as upon the elasticities of substitution between X and Y in both the factor and product markets. To determine these complex relationships, a general equilibrium analysis, where the effects of a tax upon both the sources and uses of income are explored, is needed.

General Equilibrium Analysis

Arnold Harberger, in his 1962 classic article, is credited with being the first to develop a general equilibrium tax incidence analysis, although his presentation was limited to the determination of the incidence of the corporation income tax.[15] His ultimate equation solved only for the change in the after-tax rate of return (or price) of capital, dP_k, relative to the price of labor. This solution was then evaluated in terms of incidence determination. Peter Mieszkowski expanded Harberger's model to include the analysis of the incidence of a partial sales or commodity tax in 1967, and Charles McLure utilized and expanded this approach in his numerous incidence studies of the 1970's. McLure also did several studies on the problems and peculiarities associated with a regional tax, such as the typical state-assessed retail sales tax, in which he explored the question of tax exporting that occurs in an open-economy situation.

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[15]Similar analysis had already been explored in the field of international trade, but the extension to incidence study had not been made.

McLure actually defined the incidence equations 2 through 5 presented earlier in this chapter, that provide the basis in this study for measuring how a tax can change income distribution. The origin of these equations, according to McLure, is Musgrave's 1959 classic public finance text, which separated incidence according to the sources and uses of income. McLure's model retained most of Harberger's rather limiting assumptions described earlier. Moreover, all variables are presented in terms of percentage changes, and it is assumed that no assets are fixed in money terms. This "implies that there is no real wealth effect upon consumption patterns."[16] McLure recognized the unrealistic situation protrayed by his model, but he used it "without apologies, since the conclusions derived here may hold, at least qualitatively, in a more realistic description of an economy."[17]

Browning's Theory

In 1978, however, Edgar K. Browning questioned whether the incidence of sales and excise taxes really was regressive, the conclusion that had been typically made by both partial and general equilibrium analyses of the tax system. Using McLure's model, Browning based his challenge on the fact that in traditional studies, which allocated sales and excise taxes according to consumption, the sources-of-income side of the equation was assumed to be neutral. All factor income was assumed to be derived from wages and/or capital, neither of which was defined in fixed money terms. In recent years though, an increasingly larger proportion of the

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[16]McLure, Tax Incidence, p. 255.

[17]Ibid.

sources of income has been provided by transfer payments. This is especially true of lower income families. Browning agreed that "when there are no government transfers the burden of the sales tax could be allocated to either factor earnings or consumption outlays since these two sums are equal for each household in the zero-saving model."[18] In both cases, factor prices would decline relative to product prices. However, when factor earnings are not the only source of income, and transfer payments are involved, it does make a difference on which side of the income equation the tax burden is assigned. Transfer payments are often money-related, either attached by law to the Consumer Price Index, varied by legislation according to price movements, or adjusted when additional taxes are imposed. Whether or not a household receives an average proportion of its income in transfers alters the burden when the tax is allocated only in proportion to consumption outlays.

Browning describes this situation by recounting the sales tax effect on two individuals, each with identical incomes, but with one receiving his entire income as payment for factor services while the other individual's income comes from transfer payments. Assume that a sales tax is applied to some consumer goods in an all-consumption economy. If the tax results in a higher overall price level, both individuals would supposedly suffer equally, for both could buy less goods with their income. However, if the transfer payments for the one individual are tied to the Consumer Price Index, transfer income would subsequently increase with the increase in price level. Thus this individual would bear no burden from the tax.

18Edgar K. Browning, "The Burden of Taxation," _Journal of Political Economy_ 86 (August 1978): 655.

His only burden would be if he consumed a greater proportion of taxed goods than the average consumer. Conversely, if the price level is unchanged, and a tax results in a reduction in earnings for the factors of production, then the individual whose income is provided by transfers would be exempt from the tax burden on the sources side. The transfers-recipient might still bear a burden on the uses side if relative product prices change in response to the tax.

Since it is difficult to determine how much a given tax affects product prices, output levels, and the resulting change in transfer payments, the correct procedure, according to Browning, is to assume an unchanged price level and allocate the tax burden in proportion to factor earnings (sources of income). Browning also assumes that the real value of government transfers is unaffected by changes in tax policy--so no burden is placed on the transfer income source. A tax will affect the uses side of the income equation (because of changes in relative product prices) only when a household's expenditure on the taxed goods differs from the national average. The effects on the sources and the uses sides of the budget must be summed to get overall incidence.

Actually, this method of determining tax incidence is essentially the same as that derived in the traditional manner when an accomodating monetary policy allows product prices to rise and incidence is in proportion to the consumption of the taxed good. When household income is solely in the form of factor earnings, an excise tax is neutral on the sources side, for the tax is assumed to affect all factors equally. The relative price of X, the taxed good, is assumed to increase by the amount of the tax, and those who consume more than the average proportion of the taxed

good would bear the burden. The inclusion in factor income of transfer payments (which often increase along with taxes), however, eliminates the neutrality of an excise tax on the sources side, for all factors are no longer affected equally.

An acceptable result could be obtained with a monetary policy permitting price increases if transfer payments were indexed to the tax increases. (In other words, the sources-of-income side of the equation would show an increase to reflect that the real value of transfers did not change.) Then incidence could be determined in the usual way by relating the burden according to the proportion of consumption of the taxed good--but recognizing the fact that among those receiving greater than average transfer payments, income had, in effect, likewise increased. This means that the before-tax income base would differ from the after-tax base. The complications of analyzing incidence using two income bases, as well as the actual problems involved in indexing transfers demonstrate why Browning's procedure assuming a fixed monetary policy with the burden allocated primarily to factor income is preferable.

The basis of Browning's theoretical analysis is the general equilibrium model developed by Harberger and adapted to sales and excise taxes by Mieszkowski and McLure. For example, Browning simply adapted McLure's equation (Equation 3) defining the change in income as a result of a tax. When transfer payments are included in the sources of income side, the change in income for the ith individual can be expressed as follows.[19]

$$dI_i/I_i = f_i \, dP_L + g_i \, dP_k + h_i \, dT_i - [a_i \, dP_x + (1 - a_i) \, dP_y] \quad (6)$$

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[19]The following paragraphs provide a summary of Browning's ideas expressed in "The Burden of Taxation," pp. 659-661.

where f_i, g_i, and h_i are the fractions of income received as labor, capi-
tal, and transfer income. By assuming that the tax has no effect on the
size of transfer income, dT equals zero. Thus for society as a whole,
the change in income caused by a tax can be defined as

$$dI/I = F \, dP_L + G \, dP_k - [A \, dP_x + (1 - A) \, dP_y] \qquad (7)$$

The assumption of an unchanged price level means that if a tax
causes the price of taxed goods to rise, the price of untaxed goods must
fall if unemployment is to be avoided. The weights defining total spend-
ing in a zero-saving model are A, the average fraction of total outlays
made on good X, the taxed good, and (1 - A), the proportion spent on good
Y, the untaxed good. Thus, the term describing the uses side of the equa-
tion $[A \, dP_x + (1 - A) \, dP_y]$ must always equal zero for society as a whole.
There is no uses burden. "In the aggregate, the entire burden can be as-
signed on the sources of income side; net factor payments fall short of
the total outlays on products by the amount of tax revenue."[20]

Using the Brookings Institution tax burden study by Pechman and
Okner, Browning converted its average burden of sales and excise taxes
to a proportional tax on factor earnings. (The tax was allocated in
proportion to taxable consumption and related to before-tax income.) This
tax rate was used to estimate for each decile the tax burden on the sources-
of-income side of the equation. When factor income was less than average
(as is true for the lower income classes where transfers provide a large
source of income), Browning's estimates showed the burden of sales and
excise taxes to be small. Instead of the regressive incidence found by

[20]Ibid., p. 660.

Pechman and Okner (ranging from 8.9 per cent for the first decile to 3.2 percent for the tenth decile), Browning's exercise resulted in a progressive incidence for sales and excise taxes (ranging from 2.2. to 5.7 per cent).

Although Browning generally discounted the need of measuring the effect of sales and excise taxes on the uses side of the equation when his sources approach was followed, he did demonstrate how estimates could be obtained. As stated earlier, the uses side of the change in income equation is represented by the expression $[A \, dP_x + (1 - A) \, dP_y]$ for society as a whole, or $[a_i \, dP_x + (1 - a_i) \, dP_y]$ for a particular individual or income bracket. If the price level is assumed constant, then if a tax on X causes P_x to rise, the price of Y must fall. For society in general, the uses expression must equal zero. Thus, for any income class that spends the same proportion of income as the average on the taxed good, there likewise will be no uses effect due to changes in relative prices.

If consumption differs from the average, however, the burden can be determined by estimating the change in P_x and P_y that occurs because of a tax on good X. To compute dP_x and dP_y in an all-consumption economy, assume that an average of 30 per cent of income is spent on X, the taxed good, with the remainder spent on Y. ($.30dP_x + .70dP_y = 0.$) Also, with initial prices assumed to equal unity, the difference between the two price changes must equal t, the tax rate, assumed in this example to be .12 on the taxed good. ($dP_x - dP_y = t_x = .12.$) By taking these two equations and solving, it is determined that $dP_x = .084$ and $dP_y = -.036$. Someone who spends more than 30 per cent on the taxed good will

experience a burden (in addition to that determined on the sources side) because of the change in relative prices. Of course, conversely, there will be someone who benefits.

Although this exercise is relatively simple for a partial tax in a two-good economy, the problems multiply when practical application is attempted in a world where some consumer goods are taxed, and a certain proportion of income is saved. The traditional regressiveness of sales tax incidence has resulted primarily because lower income groups consume a much larger proportion of their income than do higher income groups. Browning, in a 1979 study, attempted to account for these consumption-savings differences by substituting consumption and savings for X and Y in the above formulation. This resulted in a uses adjustment that, when combined with his incidence of sales and excise taxes allocated according to factor incomes, resulted in basically a proportional tax structure for all except the lowest and highest income deciles. Browning showed that this was similar to the result obtained if taxes were allocated according to consumption--but holding real transfers constant (showing transfer payments to increase when taxes cause product prices to rise). Because Browning's uses adjustment assumed a sales tax applied to all consumption (not just to certain goods and services), and because the adjustment used disposable income rather than before-tax-after-transfers income as the base, there seems to be some question in the consistency in combining the sources and uses effects.

Browning, however, admits the large risk of inaccuracy in making the estimates necessary to include the effects reflected by the uses side of the income equation. Nevertheless, he believes that in general

the differences in consumption-savings patterns of various income groups were not significant--especially if related to long-term or permanent income, and thus any uses effects would be negligible. The problem with most empirical incidence studies is that limited accounting techniques require the measurement of income and consumption on an annual basis. This results in wide differences in the percentage of income consumed-- and for low-income classes, consumption often exceeds income. No adjustment is made for temporarily-low income or unusually-high expenditures (or vice versa), or the fact that if a longer range of time had been measured originally, the results would be different. Moreover, in the very-long-run, consumption obviously cannot continue to exceed income. By accepting the permanent-income hypothesis (originally formulated by Milton Friedman), which basically "asserts the fraction of income saved is the same fraction of permanent income (long-term or expected income) for every household, regardless of its position in the income distribution,"[21] Browning essentially negates the need for computing a tax burden on the uses-of-income side. This situation applies, however, only when total consumption and savings are the two variables defined on the uses side of the equation.

Finally, Browning discounts the need for determining the uses effects in the derivation of sales and excise tax incidence, by noting that uses effects should also be incorporated when the incidence of other taxes is being estimated. With the corporate income tax, in particular, the uses effect favors consumption over saving in a way much larger than

[21]Martin J. Bailey, National Income and the Price Level: A Study in Macroeconomic Theory, 2d ed. (New York: McGraw-Hill Book Co., 1971), p. 103.

the saving over consumption benefit resulting from a sales tax. This makes the corporate income tax even more progressive than currently assumed. In studies of overall incidence, Browning feels it is imperative to be consistent in evaluating the implications of all taxes, and estimating the uses burden from other taxes would be even more hypothetical.

CHAPTER III

ADJUSTMENTS NEEDED WITH STATE INCIDENCE ANALYSIS

As detailed in the preceding theory chapter, the general equili-
brium model for determining the incidence of the retail sales tax has
definite limitations--primarily its rather restrictive assumptions, as
well as the problems regarding the significance of consumption-saving
differences among income groups. Certain other problems regarding tax
incidence arise, however, when the objective is to establish the inci-
dence for a state, rather than a national, tax. These problems include
the exporting of the tax burden, either to the federal government or
to individuals of other states, tax pyramiding, and the tax coverage
or base upon which a tax is applied.

Federal Offset

The most obvious complication, especially in the incidence analy-
sis of retail sales taxes, is that sales taxes can be deducted from gross
income when individuals (and corporations) compute their federal income
tax. To the extent that these deductions offset the federal tax burden,
it can be said that the state and local taxes are exported to the federal
government. In other words, the federal government bears part of the
burden of a state's tax system. Since the federal offset applies only
when deductions are itemized, families with higher incomes, who are more

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likely to itemize, will typically benefit more from the offset. Indirectly, however, it can be assumed that the standard deduction, used by those with lower incomes who do not itemize deductions, recognizes the magnitude of at least a certain part of the sales tax burden. In this case, though, no allowance is made for the varying sales tax burdens that are borne by citizens of different states. (For example, if Oklahoma were to eliminate its sales tax, it is doubtful that the standard deduction allowed for the shortened income tax form would change. Itemized deductions, in contrast, would be reduced.)

When the determination of the incidence of all taxes (federal, state, and local) is the objective of a study, it is irrelevant whether part of the state's tax burden is shifted to the federal government, since in the long-run, all taxes are shared by all taxpayers in the nation. The distinction that previals when it is the incidence of a specific state tax that is to be determined is that the presence of a federal offset may affect the actual tax burden borne by a taxpayer in a particular state, compared to the burden of a taxpayer in another state paying the same amount of tax money but in a different package of taxes. The overall incidence for the national "average" taxpayer is not affected-- but in that Oklahoma's lower sales tax rate provides a smaller deduction from gross income than that allowed for other states, the Oklahoma taxpayer who itemizes deductions may actually be a net payee in the overall tax system. This occurs since a smaller portion of the Oklahoman's state taxes can be transferred to the federal government.

The Oklahoma taxpayer using the standard deduction is not similarily affected by the offset. In fact, if it is assumed that the

standardized deduction is influenced by the average sales tax payments
made in the individual states, in that the general sales tax deduction
allowed for Oklahomans in the state sales tax tables is relatively small
compared to other states, it could be argued that those Oklahomans using
the standard deduction benefit because of the offset. This would occur
if it is assumed that the burden of the sales tax incorporated in the
standard deduction is greater than what Oklahomans actually bear.

In order to account for the impact of the federal offset in an
incidence study, the amount of a state tax paid, the marginal federal
income tax rate, and the extent that deductions are itemized must be
determined for each income bracket. McLure in 1967 suggested computing
a weighted average of the marginal tax rates paid by taxpayers in each
state, with the weighting taking into account both the percentage of
income subject to each marginal rate and the fraction of income tax re-
turns for each marginal rate on which deductions are itemized.[1] McLure
called this estimate the primary offset rate.

In addition, McLure suggested a "secondary" offset adjustment,
to allow for the fact that certain state taxes can be shifted backwards
and reduce factor incomes.[2] In this case, since the base upon which
personal income tax is computed is reduced, federal income tax receipts
"automatically" fall, and thus the percentage of returns with itemized
deductions is not a factor. The secondary offset is expressed as a

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[1]Charles E. McLure, "The Interstate Exporting of State and Local
Taxes: Estimates for 1962, _National Tax Journal_ 20 (March 1967): 53.

[2]See McLure (above), p. 74, for the actual equations used to
calculate the primary and secondary offset rates.

percentage of adjusted gross income, whereas McLure defines the reduction
in tax liability due to the primary offset as a percentage of taxable
income. There is no distinction between the two kinds of offset for
corporations. For 1962 income data, McLure estimated Oklahoma's primary
and secondary offset rates for all state and local taxes to equal 18.2
and 13.4 per cent, respectively.[3] Oklahoma's secondary rate was average;
the primary rate was in the high range, especially when those states
without a personal income tax were eliminated from the analysis.

The procedure used by Musgrave and Daicoff in their 1958 study
to determine the extent of the federal offset for both individuals and
businesses did not distinguish between a primary and a secondary rate,[4]
although they did recognize the two ways the federal government could
bear the burden of a state tax. They also did not consider the fraction
of taxable income in each income class subject to the differing marginal
tax rates. For businesses, the federal offset was computed for only
the unshifted part of the taxes paid. For individuals, Musgrave and
Daicoff computed the average reduction in federal tax liabilities for
each income class by determining the product of the following averages:
the amount of tax deducted, the percentage of returns with itemized de-
ductions, and the marginal tax rate. This amount was subsequently sub-
tracted from the initial tax estimate for each income group before comput-
ing incidence. The overall reduction in sales tax revenue and burden
because of the personal federal offset is less than 10 per cent. This

[3]Ibid., p. 54.

[4]Richard A. Musgrave and Darwin W. Daicoff, "Who Pays the Michigan
Taxes?" in Michigan Tax Study: Staff Papers (Lansing, Michigan: 1958),
pp. 134-35, 170-71.

estimate is consistent with that obtained by most empirical tax studies
that have acknowledged the influence of the federal offset, (although
not all state studies have separated the effect of the sales tax from
the overall federal offset).[5]

Exporting of Taxes

In addition to exporting a tax to the federal government via
the offset, most empirical studies dealing with the incidence of state
and local taxes also acknowledge that a certain portion of a tax can
be "exported" or "shifted" to residents of other states. The typical
models that determine the incidence of a large national tax system repre-
senting a more-or-less closed economy are no longer applicable. Indivi-
dual states, at least in the United States, are examples of open economies,
where both factors and products can be mobile (either exported or imported)
across state lines. The resulting analysis is thus similar to the
standard model describing international trade.

The determination of the geographical shifting that occurs with
state and local taxes has traditionally been approached in two ways.
The so-called "Michigan approach"[6] (also used by Brownlee of Minnesota)
assumes that the state under analysis acts unilaterally in fiscal deci-
sions. State and local taxes levied in other states of the nation are

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[5]Daniel C. Morgan, Jr., Retail Sales Tax: An Appraisal of New
Issues (Madison, Wisconsin: The University of Wisconsin Press, 1964),
pp. 13-36; University of Wisconsin Tax Study Committee, Wisconsin State and
Local Tax Burden: Impact, Incidence and Tax Revision Alternatives (Madison,
Wisconsin: 1959); O. H. Brownlee, Estimated Distribution of Minnesota
Taxes and Public Expenditure Benefits (Minneapolis: University of Minnesota
Studies in Economics and Business, No. 21, 1960).

[6]This term actually refers to the method proposed by Musgrave
and Daicoff.

of no consequence and therefore are beyond the control of the study-state. In order to determine the share of taxes borne outside of the study-state, not only must the effect of the federal offset and any reduction in federal tax liabilities (as defined by McLure's secondary offset) be defined; but interstate competition, the extent and dominance of the product market, factor mobility, and the distribution of corporate stockholders between in-state and out-of-state groups are important criteria. The major problem with this approach is that much of this information is difficult to obtain on a state-wide basis.

The "Wisconsin approach,"[7] in contrast, considers the effect of taxes in all states, especially neighboring states, with the idea - that "the incidence of taxes levied in one state is not independent of the pattern of taxation in other states."[8] The resulting analysis is more similar to that of a closed, rather than an open, economy. The Wisconsin Committee concluded that when considering the effect of tax exporting, it was also necessary to consider the effect of tax importing. In the absence of reliable export-import data, it was assumed that these taxes were offsetting. This alternative thus meant that Wisconsin taxes were borne entirely by Wisconsin residents. The idea is that the state tax structure should not be viewed in isolation--but as a part of other state systems. The Wisconsin Study, however, did recognize the other approach to exporting, and therefore designated a second incidence

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[7]The method is that detailed in the tax study directed by Harold Groves, University of Wisconsin Tax Study Committee, Wisconsin's State and Local Tax Burden: Impact, Incidence, and Tax Revision Alternatives (Madison, Wisconsin: 1959), especially pages 44 and 45. Daniel C. Morgan in his retail sales tax studies also used this approach.

[8]McLure, "The Interstate Exporting of State and Local Taxes," p. 51.

alternative, which measured the burden of Wisconsin's tax structure after allowing for exports.

The extent to which a state or local tax can be exported depends on such things as the degree in which a particular state specializes in the production of a product, the mobility of the factors involved in production, the elasticity of demand for the products involved, and the tax system of both the exporting and importing states. For example, if a firm that sells a product that is taxed locally must compete with a non-taxed product from another state, the local firm will have to absorb the tax as reduction to profit. If that firm, however, has a product not available in other states, the tax can be exported to the non-resident purchaser through higher prices. In general, taxes that apply to business are more readily shifted to other states, whereas taxes levied on individuals are less mobile. In either case, estimating the various factors involved in the spatial shifting of state taxes is uncertain, at best.

Although both the Michigan and Wisconsin procedures provided estimates of the proportion that state taxes are exported, neither dealt with the question of tax importing. As mentioned previously, the one Wisconsin approach assumed that the effect of tax exporting and tax importing was offsetting. This eliminates the need to estimate exported taxes and permits the incidence simplification that the residents of each state bear the burden of their home state's taxes. The Michigan approach assumed that the importing of taxes from other states is not pertinent, when the main concern is to determine the incidence of a particular state's taxes. The idea is that the pattern or extent of a state's importing of taxes from other states will not influence the

incidence of the study-state's tax structure.

In fact, the offsetting of tax exports and tax imports was dis-
counted by Donald Phares in 1973. Using McLure's estimates on inter-
state exporting, Phares concluded that in most states imported and ex-
ported tax burdens vary extensively and are _not_ offsetting. Since the
average state in 1962 exported approximately one-fifth of total state
and local tax revenue, "the impact of exported taxes upon the geographical
distribution of tax burdens is considerable."[9] Moreover, the percentage
of total taxes exported by individual states ranged from 49.0 per cent
to 15.8 per cent, and the variation in the percentage of specific taxes
exported was even greater.

In Phares' study, the burden shifted to the federal government
because of the existence of the offset represented 36.5 per cent of total
exported taxes. The balance of the exported tax burden therefore re-
mained within the state-local tax system, and had to be recycled to in-
dividuals of other states as imported taxes. Although Phares' study
of state and local taxes in all 50 states dealt with a conglomeration
of types of taxes, tax rates, and tax applicability, he noted that, out-
side of the federal offset, taxes were generally exported in the form
of higher prices. Thus, Phares decided that "allocation on the basis
of consumption expenditures best reflects the relative importation of
taxes."[10]

Exported state and local taxes in Oklahoma in 1962 were estimated

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[9]Donald Phares, State-Local Tax Equity: An Empirical Analysis
of the Fifty States (Lexington, Massachusetts: D. C. Heath and Company,
1973), p. 39.

[10]Ibid., p. 42.

by Phares to equal $103.1 million, or 22.5 per cent of total taxes. Of
this total, the federal offset accounted for $26.7 million, approximately
one-fourth of exported taxes, somewhat lower than the national average.
State and local taxes imported into Oklahoma from other states, however,
were estimated at $60.9 million, so theoretically Oklahoma in 1962 was
a net exporter of $15.5 million in state and local taxes (excluding the
federal offset). Although the export effect of specific Oklahoma taxes
was not available, because of Oklahoma's role as a major supplier of
oil and gas, most of the overall tax export surplus was undoubtedly a
result of the gross production and fuel excise taxes.

The export potential of Oklahoma's general sales tax, however,
would not be great, especially since none of Oklahoma's larger retail
centers border other states. With the possible exception of the taxes
paid by tourists on lodging and food, it seems logical to assume that
general retail sales taxes paid by individuals are borne entirely by
Oklahoma residents--excluding, of course, the effect of the federal tax
offset. Actual sales taxes paid by tourists (and tourism is not a major
Oklahoma industry) represent less than 2.0 per cent of total sales tax
revenue.[11] The possibility of exporting the sales taxes paid by
Oklahoma businesses is discussed in the following section.

Sales Tax on Business

A portion of Oklahoma's sales tax (at least, the way the statutes

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[11]This estimate assumes that tourists from other states provide
approximately 15 per cent of the $9.2 million in 1973 sales tax revenue
received from restaurants, hotels, and other businesses providing tourist-
related services.

are currently written) actually falls on business. This is because certain goods purchased by business firms or used in the production process are subject to the retail sales tax. As a result, the sales tax becomes a cost of production and is treated by most incidence studies in the same way as a production or business turnover tax. Then, depending on the shifting assumptions used, the burden of the tax is either shifted forward to consumers through increased prices, shifted backwards to the factors of production, or simply absorbed by the firm through decreased profits.

A business or firm operating in a local market (one that is geographically limited within one state and sells only to in-state consumers) will generally be able to shift the burden of a production tax forward. In fact, in as much as the final price of the product includes the sales tax paid to make production possible, the in-state residents actually are subject to a pyramiding of taxation. The sales tax is not necessarily a single-stage tax, but can apply at several points in the production and distribution process. Moreover, this hidden tax (included in the cost of goods bought) cannot be deducted from federal taxable income by individuals.

When businesses sell to customers outside the state, the sales tax can be exported, if the tax can be translated into higher prices for the product or service provided. This depends to a great extent on whether or not the state dominates the market for a particular industry. Moreover, as McLure explained,[12] the shifting of the burden of a production

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[12]McLure, "The Interstate Exporting of State and Local Taxes," pp. 56-58.

tax (or sales tax paid by business) may differ in the short-run and long-run time periods. Because capital is largely immobile in the short-run, the initial effect of a tax on a firm facing national competition would be a reduction in profits. In the long-run, however, capital will move in order to equalize earnings, whereas labor and land are less flexible factors. McLure estimated that in the long-run, a firm in a non-dominated market would be able to shift 60 per cent of production taxes backwards to labor and land, leaving only 40 per cent allocated to profits. Firms that dominate the national market would be able to shift a production tax forward through higher prices. Oklahoma, however, has no industry with national market domination.

In terms of how much of a state's retail sales tax is paid by business, Oklahoma's tax system is actually well-defined and excludes most retail sales of goods involved in production. In general, states define retail sales as a sale of tangible property or (sometimes) services to a consumer for any purpose other than resale. With sales to business, most states employ the component part idea, which means that any item that becomes a component part of another good that is sold is excluded from the tax. As a result, machinery involved in the production of other goods is often taxed. Oklahoma, however, is described as a direct-use state, in that its tax laws exclude items that are used directly in processing goods for sale.[13] This is a more liberal definition, and thus, more goods are excluded from the sales taxes paid by business. Of course, these business taxes are also eligible for the federal offset, and as a result, the actual amount that is shifted either forward or

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[13]Morgan, Retail Sales Tax, p. 20.

backwards is reduced.

The actual procedure of allocating the business portion of the sales tax, according to Musgrave and Daicoff, is first to determine what proportion of business sales is made to state residents and what proportion is exported either to other states or to the federal government. The burden to in-state consumers is allocated between consumers and profits by estimating the share of state firms that dominate their markets sufficiently to warrant the assumption that taxes can be shifted forward to the consumer through an increase in prices.[14] The distribution among income brackets of the business portion of the sales tax assumed to be shifted to consumers varied according to consumption patterns. Of the portion of the in-state taxes borne by profits, almost one-half is absorbed by the federal tax offset. The remainder in the Michigan study was distributed between local and out-of-state stockholders, based on the extent of total corporate dividends received by each.

Morgan's analysis of the taxation of business under the retail sales tax dwells more on the determination of how much of the tax is actually borne by business. Since Oklahoma applies the "direct-use" rule described above, a relatively smaller portion of its sales tax is paid by business. In fact, depending on the actual tax statutes concerning the producer goods that are taxable and the consumer goods that are tax-exempt, the business portion of the sales tax can incorporate from less than one-tenth to over one-third of a state's sales tax revenues. Oklahoma is classified by Morgan as a direct-use state for

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[14]Musgrave and Daicoff, "Who Pays the Michigan Taxes?" pp. 171-72.

business purposes (though not as liberal as Ohio and Michigan)--but it has rather limited exemptions in the household sector, which results in a larger sales tax base. Then allocating the business portion of the sales tax, Morgan notes that "the direct-use rule is apt to be more . nearly proportional in its burden on the various brackets of income classes."[15] In arriving at this conclusion, Morgan assumes that the household or consumer portion of the sales tax was based solely on taxable consumption. Except for the regressive tendencies of the lowest income bracket, it made no difference whether the state was considered a "closed economy" or whether exporting to other states and the federal government was included in the analysis.

Whereas Morgan used the intent of the tax statutes to ascertain the amount of sales taxes paid by business, Richard Fryman obtained similar estimates by reviewing the type of business establishment that remits sales tax revenue.[16] Fryman first distinguished between the sales taxes paid by retail and service enterprises and those of manufacturers, wholesalers, and other establishments. This distribution, however, does not provide an accurate estimate of the proportion of sales taxes paid by households and businesses, for retailers often make taxable sales to other businesses, and wholesalers and manufacturers sometimes sell directly to final consumers. Fryman's solution to this problem was to survey business in five major categories[17] and determine what per cent

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[15]Morgan, Retail Sales Tax, p. 27.

[16]Richard F. Fryman, "Sales Taxation of Producer Goods in Illinois," National Tax Journal 22 (June 1969): 273-281.

[17]The five major business groups surveyed by Fryman in his Illinois study were retail, wholesale, mining and manufacturing, construction, and service and leasing. The construction percentage was based on U.S. data.

of their taxable sales were to other businesses. A further breakdown
within types of retail establishments was also made. By combining the
resulting percentages for each group with a corresponding weighted aver-
age based on the amount of overall sales tax revenue, a percentage of
total sales tax revenue derived from taxation of producer goods is ob-
tained. The percentage of tax receipts arising from sales to business
in Fryman's study ranged from approximately eight per cent for retail
sales establishments to almost ninety per cent of the revenues received
from manufacturing firms.[18]

For this study on Oklahoma's sales tax, a combination of the
procedures used in the above empirical works was applied to the break-
down of Oklahoma sales tax collections by classes of business provided
by the Tax Commission. Although Oklahoma is basically a direct-use state
in terms of taxation of producer goods, it does tax sales of commercial
supplies, industrial machines and parts, oil field equipment, and cer-
tain goods used in agricultural production. Moreover, items such as
building materials and public utilities are taxed, whether or not sales
are to households or businesses. The resulting estimates show that 22.8
per cent of Oklahoma's retail sales tax revenue is received from sales
to businesses. This amounted to $26.5 million in 1973 tax revenue. (See
Appendix Table A-1 for specific breakdown.)

The allocation of the incidence of the business portion of the
sales tax in Oklahoma between in-state and out-of-state residents and
between consumers, factors, and profits is even a more uncertain procedure.
Although Musgrave and Daicoff computed the federal offset effect for

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[18]Fryman, "Sales Taxation of Producer Goods," pp. 276-77.

only the portion of business sales taxes that was not assumed to be shift-
ed to consumers, the procedure used in this study is to assume that all
eligible state sales taxes paid by businesses will initially be deducted
when determining federal taxes. The actual amount offset depends on ·
the proportion of incorporated and unincorporated businesses since the
marginal tax rate for each sector differs.

The remainder of the tax is then shifted forward to consumers
(if the firm is strong enough to shift the tax by raising the prices
of its products accordingly), shifted backwards to the factors of pro-
duction, or absorbed through reduced profits. (This profit reduction
could only occur, however, if there had been some economic profits in
the first place.) Of the amount shifted forward to consumers, part can
be exported, in that the sales of the business are to out-of-state con-
sumers. Likewise, a portion of the tax shifted backwards to capital
or absorbed by profits can be exported if capital providers or stock-
holders live out-of-state.

The distribution of the in-state portion of the tax among income
groups is based upon total consumption for the amount shifted forward;
upon wages for that amount shifted backwards to labor; and upon capital
income for that amount shifted to capital or borne by reduced profits.
The actual shifting assumptions used in distributing the portion of the
sales tax paid by business, after the federal tax offset is recognized,
are given in detail in Chapter VI on application.

Tax Coverage

Another problem peculiar to incidence analysis of the state retail

sales tax is the variation between different states in actual tax rates and coverage. As a result, national studies of sales tax incidence include several generalizations. In most cases, sales taxes apply to retail sales of tangible personal property, although the business burden has been recognized. Goods subject to specific excise taxes are often excluded from the tax, as are sales to governments. In addition, most states tax some services, especially those pertaining to tourism. (This segment can thus be exported.) No state sales tax, however, is levied on spending for housing, medical, and educational services.

The good often advocated for exempt status from the sales tax is food (generally defined as food consumed off the premises of the place of purchase). Almost two-fifths of the taxing states have this exemption. The rationale behind this exemption is that lower-income classes spend a larger percentage of their overall income on food. Thus, in order to eliminate some of the regressivity that occurs when the sales tax is applied to all consumer goods, food is exempted. In even more states, prescription drugs are exempt from the tax; whereas clothing and utility services are exempt in other states. The reasoning for most exemptions is that the regressivity of the tax is lessened.

Each exemption, however, decreases the tax base. Thus, states with liberal exemption policies must have higher tax rates in order to achieve a given amount of tax revenue. When higher rates result from more exemptions, the benefit to lower income groups of excluding certain goods and services becomes questionable. For example, studies have shown that the clothing exemption does not lower the tax burden of low income

taxpayers.[19] Even the food exemption may merely have a neutral effect on incidence patterns. Other factors such as age and size of the family unit, rural-urban differentials, and differences in consumption patterns may also affect both the vertical and horizontal equity of the sales tax.[20]

Many expirical studies, using the traditional uses-side allocation of incidence, have concluded that the exclusion of food definitely reduces the regressivity of the sales tax.[21] In some cases, the food exemption has changed the regressive pattern to an almost proportional incidence pattern.[22] National tax incidence studies have used either total consumption or consumption less food as the base upon which to determine the burden of the sales tax. In general, this overstates the burden of the sales tax--especially when non-taxable services are part of consumption.

For a study confined to one state, however, it is possible to distinguish between taxable and non-taxable consumption. Thus, taxable consumption in Oklahoma will be estimated for each income class based on average consumer purchases of goods and services and the Oklahoma

[19]Jeffrey Schaefer, "Clothing Exemptions and Sales Tax Regressivity," _American Economic Review_ 59 (September 1969): 596-599.

[20]Reed R. Hansen, "An Empirical Analysis of the Retail Sales Tax with Policy Recommendations," _National Tax Journal_ 15 (March 1962): 1-13.

[21]Tax Foundation, Inc. _State and Local Sales Taxes_, (New York: 1970); and Hansen, "An Empirical Analysis."

[22]Gerhard N. Rostvold, "Distribution of Property, Retail Sales, and Personal Income Tax Burdens in California: An Empirical Analysis of Inequity in Taxation," _National Tax Journal_ 19 (March 1966): 38-47.

tax law. When it is assumed that sales taxes are shifted to the individual consumer, taxable consumption will provide the base for determining tax burden. An analysis of how a food exemption would affect the incidence pattern in Oklahoma is also provided.

Relation Between Transfer Payments and State Taxes

Browning's tax analysis, which establishes incidence on the sources side of the income equation, is predicated on the fact that most transfer payments (as opposed to factor income) increase when taxes are increased. Transfers are either tied to the Consumer Price Index, or legislative action will boost transfer payments to compensate for any increase in taxes. Prime examples are social security, veterans benefits, and welfare payments. As a result, those families receiving a large portion of income from transfers will not bear the full burden of a change in sales taxation.

Although transfers typically do reflect an overall increase in federal taxes, the response of transfer payments to a change in an individual state's tax is less certain. This would be especially true for a state such as Oklahoma in which no local area is surveyed in developing the Consumer Price Index. In other words, if an increase in sales tax resulted in higher prices in Oklahoma, the Consumer Price Index would not reflect this change, and consequently, any federal or state transfer program tied to the Index would not automatically increase.

This does not mean that state welfare programs do not respond to changes in the tax burden. However, prior to 1936, when the two per cent sales tax became effective; and prior to 1937, when most of the revenues from the tax were earmarked to provide for the needy, there

was basically no official welfare program for Oklahoma (or for that matter, for the United States). Thus, there can be little comparison of transfer payments prior to 1936 to those of the present. Moreover, since the state sales tax rate has not changed since the 1936 law, no reaction to change can be recognized. The large increase in sales tax revenue (from $15.2 million in 1942-43 to $116.5 million in 1972-73) simply reflects the growing population and expanding consumer purchases in Oklahoma.

Since the Oklahoma sales tax is earmarked for welfare purposes, it could be assumed that the increase in tax revenue payed by the entire population of the state would be shifted to welfare payments, which provide greater benefits to the lower income classes. However, in 1972-73, the direct public assistance payments made by the (renamed in 1981) Department of Human Services totaled $39.9 million, only 33.4 per cent of the overall department budget. The remainder of the sales tax revenue provided various medical, educational, rehabilitative, and social services for Oklahomans of all ages and income levels. (As of July, 1973, the operation of Oklahoma Children's Memorial Hospital was added to the Department's responsibilities.)

Direct public assistance payments have not kept pace with the overall growth in revenue in many instances, because the federal government has continually provided a larger portion of the funding for these programs. The Department of Human Services, however, has in many cases provided the matching funds necessary for the state to benefit from the federal programs. In fact, because the revenue has been available and is not subject to annual legislative appropriation, Oklahoma has been able to take advantage of an optimal number of federal matching programs.

In 1973, for example, the federal government provided 63.9 per cent of the Department's net expenditures.[23] Although present activities financed by the sales tax are no longer restricted to welfare recipients, those in lower income groups still benefit more than those with higher incomes from the expanded programs of the Department of Human Services.

Even if state transfer payments are tied to any change in state taxes (as can occur through legislative action, if not through a price index relationship), actual state transfer payments as a percentage of BTAT income are minimal. (See Table III-1.) Whereas all transfer payments provide 55.2 per cent of the income of families in the under $3000 income class, state transfers account for only 9.7 per cent of BTAT income. This difference exists for all income groups. In fact, state transfer payments provide less than one per cent of the income in all but the lowest three income groups.

The meaning of this analysis is that a change in Oklahoma taxes (especially the sales tax) would not automatically be reflected in the amount of transfer payments received by the average resident. This is not to deny that there has been an enormous expansion of transfer payments of both federal and state governments in recent years. Table III-2 shows that total social welfare expenditures during the 13-year period between 1960 and 1973 increased by 309.6 per cent. Federal expenditures expanded at a greater rate (391.0 per cent) than increases in state and local expenditures for social welfare (235.2 per cent), but both forms of government spending far exceeded the 50.1 per cent increase in the

[23]Oklahoma Department of Institutions, Social, and Rehabilitative Services, Annual Report: Fiscal Year 1972-1973 (Oklahoma City: 1973), p. 10.

TABLE III-1

STATE-ORIENTED TRANSFER PAYMENTS IN RELATION

TO BTAT INCOME AND TOTAL TRANSFERS, OKLAHOMA, 1973

Income Bracket (dollars)	State-Related Transfers (1)	BTAT Income (2)	State Transfers as Per Cent of BTAT (3)	Total Transfers as Per Cent of BTAT (4)
Under 3,000	$240	$ 2,473	9.7	55.2
3,000-3,999	200	4,297	4.7	44.4
4,000-4,999	133	5,456	2.4	30.6
5,000-5,999	59	6,636	0.9	24.2
6,000-6,999	48	7,762	0.6	20.0
7,000-7,999	56	8,981	0.6	16.3
8,000-9,999	33	10,591	0.3	13.7
10,000-14,999	13	14,411	0.1	7.7
15,000-24,999	6	21,810	0.03	5.3
25,000 and over	8	48,674	0.02	4.3
Average	$ 86	$11,710	0.7	12.1

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics,
Consumer Expenditure Survey: Interview Survey, 1972-73, Bulletin
1985 (Washington, D.C.: Government Printing Office, 1978),
pp. 477-478.

(1) Includes only welfare and public assistance payments.
(2) Derived in Table V-3.
(4) Total transfers are given in Line 16, Table V-3.

TABLE III-2

CONSUMER PRICE INDEXES, SOCIAL WELFARE

EXPENDITURES, AND PERCENTAGE CHANGE, UNITED STATES,

1960-1973

	1960	1973	Per Cent Change
Price Index*			
All Items	88.7	133.1	50.1
All Commodities	91.5	129.9	42.0
All Services	83.5	139.1	66.6
Food	88.0	141.4	60.7
Medical Care	79.1	137.7	74.1
Social Welfare Expenditures (000,000)			
Federal	$24,957	$122,566	391.1
State & Local	27,337	91,376	234.3
State & Local excluding education	10,579	34,002	221.4
Social Welfare Federal, State, & Local			
Total	$52,294	$213,942	309.1
Social Insurance	19,307	86,166	346.3
Public Aid	4,101	28,691	599.6
Health & Medical	4,464	13,447	201.2
Veterans Programs	5,479	13,026	137.7
Education	17,626	64,734	267.3
Housing	177	2,180	1,131.6
Other Social Welfare	1,140	5,698	499.8

Source: U.S. Department of Commerce, Bureau of the Census, Statistical Abstract of the United States, 1979 (Washington, D.C.:   Government Printing Office, 1979), pp. 326-327, 483.

*1967 = 100.

Consumer Price Index during the same period. Nevertheless, Browning's hypothesis that the sales tax (which is levied by states in the United States) should be shifted backwards in order to compensate for the excessive burden borne by factor income does not seem to provide a viable alternative for the incidence analysis of an individual state.

CHAPTER IV

DETERMINATION OF THE INCOME BASE

Perhaps the most important variable in the actual computation
of tax (or benefit) incidence is the income base used for comparison.
Once it is determined whether, and if so, how a tax is shifted and how
the burden of a tax should be allocated, the incidence conclusion con-
cerning the distribution of a tax can vary significantly, depending on
what income definition is used. Each incidence study, whether for the-
oretical or practical reasons, seems to use a different version of income,
and thus, comparison of these empirical studies is difficult. Some au-
thors have evaded the problem by computing incidence using two or more
income bases. This procedure diminishes the impact of any definitive
conclusion, but it does provide alternatives which may be meaningful
for various government applications. Moreover, especially in state or
regional studies, the availability and comparability of income informa-
tion will limit the selection of a base.

An Income Concept

Assuming that equity is a major tenant of taxation, and that
the ability-to-pay concept is a way to assure equity, a satisfactory
and complete income measure is needed to determine ability-to-pay. Like-
wise, when measuring the distributional effects of a tax, a satisfactory

income measure is needed. Ideally, these two income measures should be the same. According to Joseph Pechman and Benjamin Okner, "Economists define income as the amount an individual can spend during a particular time period and still have the same net assets (valued in money terms) at the end of the period as at the beginning."[1] This is basically the definition originally formulated by Henry Simons and is the same as defining income as consumption plus the increase in net worth in a given time period, or the total accretion to a person's wealth. To obtain a total income measure, all accretions must be included, whether regular or fluctuating, realized or unrealized.

Although the definition of total income is clear, it is difficult to measure for the individual or family. Moreover, most population distributions of income (which provide the brackets generally used in incidence analysis) are based on family money income before taxes. This measure is basically factor income--the sum of wages and salaries, self-employment income, rental income, income from interest and dividends, plus private and government transfers. Some, but not all, income measures include income received from inheritance and gifts. This is certainly part of money income, as are realized capital gains, but because of the difficulty of income allocation, these income components are sometimes ignored.

For a complete base upon which to measure the burden of all taxes, however, certain additions must be made to the overall money income concept. A large addition is imputed income, such as the unrealized rent

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[1]Joseph A. Pechman and Benjamin A. Okner, Who Bears the Tax Burden? (Washington, D.C.: Brookings Institution, 1974), p. 12.

of owner-occupied homes, income-in-kind (home produced and consumed food
and fuel, for example), and interest paid on insurance policies. More-
over, if the burden of corporate taxes is to be allocated according to
income distribution, then all corporate earnings must be included in
the income measure. This means imputing accrued capital gains (usually
accomplished by allocating retained earnings among income classes for
corporations and assigning some value to inventories and assets for other
businesses), plus allocating the unshifted corporate and business taxes
paid before dividends were distributed. This addition, however, means
that corporate tax incidence assumptions must be included in the income
base. An employer's contribution to the social security and unemployment
tax are other additions to money income, as are any sales or production
taxes paid by business and deducted prior to distributing earnings. Non-
reimbursed services of banks and other financial intermediaries must
also be included. A final question concerns the handling of private pen-
sion contributions. If pensions are considered as income in the year
they are received, then the employers' contributions should not be added
to the income base. If employer pension contributions are added to income
when made, however, pensions would need to be regarded as changes is
assets. Whether this procedure is compatible with the treatment of Social
Security contributions depends on whether these payments are regarded
as tax-related pensions or merely transfer payments.

The result of the above calculations provides a more-or-less
total, before-tax, after-transfers income measure for households. It
certainly would represent a relatively accurate measure of a family's
economic well-being. Whether this is the best measure, however, is

another question. Gillespie, in his 1965 study, points out that the

above income definition is inconsistent for measuring the effects of

the overall fiscal burden.[2] It includes transfer payments, but not the

other benefits from government expenditures on goods and services. He

suggests that an appropriate income base must either exclude the entire

public sector (meaning that transfer payments not be added in the above

definition) or include the entire public sector, in which case taxes,

as well as public spending (including transfers) must be distributed

by income class. The first measure Gillespie defines as Y, or "broad

income" where Y equals net money plus non-money income, and tax and expendi-

ture incidence can be measured as a percentage of income prior to the

introduction of the public sector. His second measure, called "adjusted

broad income" is defined as $Y + B + R - T$, where B equals benefits from

public services, R equals transfer payments, and T equals taxes.

Several writers after Gillespie have agreed that an "ideal" in-

come measure must be consistent in either including or excluding the

public sector.[3] The methods for achieving this consistency, however,

have varied. Herriot and Miller defined total income "as the total

household claims on the nation's product after the receipt of transfer

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[2]W. Irwin Gillespie, "Effect of Public Expenditures on the Distri-
bution of Income," in R. A. Musgrave (ed.) Essays in Fiscal Federalism
(Washington, D.C.: Brookings Institution, 1965), pp. 126-127.

[3]Richard A. Musgrave, Karl E. Case, and Herman Leonard, "The
Distribution of Fiscal Burdens and Benefits," Public Finance Quarterly
2 (July 1974): 250-311; G. C. Ruggeri, "On the Incidence of Canada's
Provincial Sales Taxation," Public Finance Quarterly 6 (October 1978):
473-484; Tax Foundation, Inc., Tax Burdens and Benefits of Government
Expenditures by Income Class, 1961 and 1965 (New York: 1967); Roger.
A. Herriot and Herman P. Miller, "Tax Changes among Income Groups: 1962-
68," Business Horizons 15 (February 1972): 41-50.

payments and the payment of taxes to finance transfer payments."[4] But

determining what amount of taxes in each income group goes for transfers

is difficult--and can distort the distribution,[5] especially when transfers

exceed taxes.

The Tax Foundation, in contrast, believed that net national pro-

duct, as defined in the national income and product accounts, (GNP less

capital consumption allowances) was the most appropriate total income

measure to exclude government effects.[6] The Foundation noted that its

alternative income measure, NNP less taxes plus government benefits,

would provide the same overall income, assuming that the government's

budget is balanced. The distribution of total income among income brac-

kets, however, would differ significantly depending on which income

measure was used. It is because the effects of government taxation and

spending generally result in a redistribution of income from higher to

lower income brackets, that most incidence studies prefer to include

at least transfer payments in the income definition. This is especially

true in tax incidence studies, for money transfer payments are definitely

used to pay taxes.

Other Questions Concerning Income

Even if an ideal income measure can be defined, there are other

problems that must be considered before an income base can be adopted

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[4]Herriot and Miller, "Tax Changes," p. 46.

[5]Roger A. Herriot and Herman P. Miller, "The Taxes We Pay: An
Analysis of the Tax Burden at each Income Level," The Conference Board
Record 8 (May 1971): 31-40.

[6]Tax Foundation, Tax Burdens and Benefits, p. 8.

for incidence purposes. Perhaps the most serious difficulty in income distribution is determining whose income is being measured. The Bureau of Economic Analysis measures total income, which they sometimes express in a per capita measure. The Bureau of the Census, in contrast, defines income brackets according to family or household income. Sometimes the income of households headed by one person are included in this measure, although in other publications, income of families and income of unrelated individuals is recorded separately. The various government studies of income also differ in their treatment of income of military personnel. Individuals residing in institutions (nursing homes, hospitals, prisons, dormitories, etc.) are generally excluded from the income distribution catagories, although the income of these individuals is included in the national income and product accounts. Also included in these accounts is the income of non-profit organizations.

The time element is another factor influencing income measures. Usually income is expressed in annual terms on a calendar-year basis. This method often results in extreme fluctuations, especially in terms of income and consumption expenditures. For example, if income receipts are delayed or a loss occurs, or perhaps there is a windfall profit, a change in consumption spending will not happen immediately. This is why several economists have advocated a form of "permanent income," with a time horizon greater than one year, as a preferable base for in-cidence studies.[7] In this way, the actual timing of income and spending will not affect incidence conclusions.

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[7] Roy D. Adams and David J. Walker, "The Lifetime Incidence of Consumption Sales Taxes," National Tax Journal 30 (December 1977): 463-466.

The "permanent income" measure was first proposed by Milton Friedman in 1957[8] as a way to explain the macroeconomic consumption function. Actual income and consumption were composed of a permanent and a transitory part, and permanent consumption was thought to be a stable fraction of permanent income. Modigliani and Brumberg in 1954 and Ando and Modigliani in 1963[9] developed a similar "life-cycle" hypothesis, which made consumption a function of the age, current wealth, and expected earnings of a household, as well as the actual income. Although this information can be obtained to a greater or lesser extent either by surveying families over a period of years in regard to consumption-income patterns, or by analyzing time-series studies for a period of years, the consumption and income data available for various income brackets in states and regions do not distinguish between current and the more permanent type of income or consumption. No information regarding age patterns and existing wealth is available for households in the different income groups. As a result, permanent or life-cycle income does not provide a satisfactory base for incidence analysis.

Another base, other than income, that is still occasionally suggested is that of consumption or total expenditures. This was Irving Fisher's choice, since consumption, he believed, is the destruction of utility and therefore comes closest to measuring real income. One benefit

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[8]Milton Friedman, A Theory of the Consumption Function (Princeton, N.J.: Princeton University Press, 1957).

[9]Franco Modigliani and Richard Brumberg, "Utility Analysis and the Consumption Function" in K. Kurihara (ed.) Post-Keynesian Economics (New Brunswick: Rutgers University Press, 1954), pp. 388-436; and Albert Ando and Franco Modigliani, "The Life-Cycle Hypothesis of Saving: Aggregate Implications and Tests," American Economic Review 53 (March 1963): 55-84.

of using total expenditures as a base is that it eliminates the problems
that occur when expenditures exceed income for the lower income classes.
When a tax is allocated according to consumption expenditures and consump-
tion is greater than income, incidence implications are distorted. Never-
theless, most economists agree that, except in certain situations, con-
sumption does not provide a satisfactory income base. Neither consump-
tion nor net worth (another possible base) are appropriate measures of
taxpaying ability, and both are not well-defined by reliable statistics.

Finally, there is the problem of inflation. Ideally, incidence
should be measured in real terms--but the problem of reconciling the
many statistics needed in comparable real terms would be overwhelming.
The question of inflationary adjustment is especially relevant in allocat-
ing capital gains and others gains and losses pertaining to fixed assets.
In fact, the inflation problem may justify ignoring these imputations
in determining a satisfactory income concept. All studies do ignore
the subject of leisure and the estimation of the value of human capital.

Existing Income Measures

Government measures of income, especially those related to income
distribution, are, by necessity, primary sources in incidence determina-
tion. Unfortunately, these measures are often not comparable in defini-
tion and coverage. By understanding the meaning of each, however, ad-
justments can be made so that a practical income base for computing inci-
dence can be obtained.

The Department of Commerce's Bureau of Economic Analysis had
for many years published in the Survey of Current Business the national
income and product accounts, including GNP, net national product, national

income, and the personal income series. These data are primarily estimated

from the administrative records of business and government sources for

th nation as a whole. Less-detailed personal income statistics are pro-

vided for regions, states and smaller local areas. Income for all resi-

dents in the United States is estimated, including military personnel

and occupants of institutions. The national accounts differ from the

local area estimates in that they also include the income paid by the

federal government to non-resident civilian and military personnel.

As defined by the Bureau of Economic Analysis, "Personal income

is the current income received by residents of an area from all sources.

It is measured before deduction of income and other personal taxes, but

after deduction of personal contributions to social security, govern-

ment retirement, and other social insurance programs."[10] Basically,

it includes the traditional wages and salary disbursements, proprietors'

income, net rental income, dividends, interest, and cash returns from

capital investments; plus certain non-money income such as imputed rent

of owner-occupied dwellings (as determined by data constructed in the

Census of Housing), wages and other income in kind (including food and

fuel produced and consumed on farms), insurance disbursements, and the

value of bank and financial services. It also includes various types

of supplementary earnings, especially employer contributions to private

pensions, health programs, and welfare funds. Personal contributions

for social insurance are considered a negative component of personal

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[10]U.S. Department of Commerce, Bureau of Economic Analysis, "County and Metropolitan Area Personal Income," Survey of Current Business (April 1975): 30.

income. Both government and private transfer payments, including medicare and medicaid benefits, are a major part of personal income. Moreover, government payments to nonprofit organizations are included. If personal tax and nontax payments are subtracted from the personal income total, disposable income is obtained.

Since most of the personal income estimates are based on business and government information, labor and proprietors' income is initially allocated according to place of work when income series are developed for states and smaller areas. This total is then adjusted to a place-of-residence concept primarily by using Census data on commuting patterns and updating if significant economic or geographic changes have occurred in the specific area since the last Census. The dividend, interest, and rent computations, as well as transfer payments, are then added to net labor and proprietors' income by place of residence in order to achieve personal income by place of residence. By dividing this total by the total estimated population of the area in question, a per capita income figure is obtained. Unfortunately, no distribution of income among the population is provided by this measure.

In contrast to the Bureau of Economic Analysis data, which are obtained from factor sources, Census Bureau information is derived directly from households through field interviews and surveys. The Census data do not include the comprehensive non-money additions of the Bureau of Economic Analysis, but the money income before taxes definition does incorporate contributions for support received from persons not residing in the same household, income from roomers and boarders, and employee contributions to social insurance. Gifts and lump-sum payments, such

as inheritances, tax refunds, insurance payments, and money received

from the sale of property, however, are excluded.

Income data are compiled for families and for unrelated indivi-

duals 14 years old and over, and for these units, both median and mean

income are recorded. Total money income is also allocated according

to income brackets, so a monetary distribution of families and unrelated

individuals is available. Because the answers on Census Bureau income

questionnaires are often based on memory, certain information is forgotten

and there is a tendency towards underreporting of income. Estimates

of the extent of underreporting have ranged from 6 to 13 per cent of

money income.[11]

Income, as defined for tax purposes by the Internal Revenue Service,

is less inclusive than the Census definition. Perhaps the most important

omission is that individuals and families with low incomes (the actual

amount differs according to the year in question and the family status

and exemptions that apply) are not required by law to file tax returns,

although in recent years, the possibility of obtaining a tax credit has

lessened the effect of this restriction. Moreover, gross income for

tax purposes does not include most government transfer payments, and

even some private pensions are tax free. The method of including net

capital gains and loss carryovers creates additional problems in defining

income. Furthermore, since some tax returns are filed by separate in-

dividuals, while others are joint returns, there is no consistency in

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[11]David Brainin and John J. Germanis, "Comments on 'Distribution
of Property, Retail Sales, and Personal Income Tax Burdens in California:
An Empirical Analysis' by Gerhard N. Rostvold," National Tax Journal 20
(March 1967): 109; Herriot and Miller, "The Taxes We Pay," p. 31.

whether the income reported is that of a family or an individual.

Although Internal Revenue information may provide a cross-reference check for the accuracy of the higher brackets on income distribution in the nation or in individual states, the income data provided are not directly comparable with other income statistics. Likewise, earnings data from Social Security Administration records are not very useful, since earnings above the legislated maximum are not recorded. Also, Social Security coverage excludes most government employees, as well as some employees of non-profit organizations and railroads. Others are not covered because of insufficient earnings.

A final source of income information used for many incidence studies is the Consumer Expenditure Survey, undertaken by the Bureau of Labor Statistics. Although the earlier surveys were primarily for the purpose of evolving and then updating the Consumer Price Index, the latest survey of 1972-73 presents a detailed analysis of both income and expenditure patterns. Prior to 1971, the University of Michigan also conducted annual surveys of consumer finances. The latest Consumer Expenditure Survey is actually a combination of two survey techniques: an interview survey, in which the consumer unit was personally interviewed every three months during a 15-month period; and a diary survey, which included record keeping of daily expenditures by the consumer unit for two one-week periods. Interviewers were also used for the diary survey to clarify data and to obtain more general information.

The sample included housing units selected by computer to represent various geographical areas, as well as urban and rural differences. Information was obtained from family units, a group of two or more persons

who usually lived together and shared resources and expenses, and also
from financially-independent individuals. In contrast to the Census
procedure, these two groups were not reported separately in the overall
survey tables. The income and expenditure data for each survey were
expanded and recorded for the nation and four major geographical areas
for 12 separate income brackets based on family income before taxes.
In addition, an integration of the two surveys was made, but only for
the nation as a whole. Basically, after adjusting the data to compensate
for the differing collecting time periods, the integration used the inter-
view survey results for income, net assets, and major expenditures, and
incorporated the diary survey for small frequently-purchased items, such
as food.

The income concept for the consumer unit is defined as the combined
money income of all members of the family unit 14 years old and over.
Family income combines the traditional concept of factor income for the
civilian and military population, including payments-in-kind; public
and private transfer payments, including the value of food stamps net
of purchase cost; regular contributions for support; net proftis on the
sale of stocks, bonds, and mutual funds both purchased and sold during
the survey year; refunds on taxes and insurance policies; and workers'
compensation. Although not included in the family income before taxes
measure, other financial information about inheritances, lump-sum settle-
ments, and gifts by income bracket was also gathered and presented in
the interview survey, along with net change in assets and liabilities,
goods and services received without direct expense, and the market value
of financial assets. Thus, a rather complete income picture by income

bracket is available for the survey years, though incomplete reporting

of income, sample error, and the tendency to underreport income in inter-

view surveys affect the overall accuracy of the results. Furthermore,

as is true in all studies defining income distribution, only the average

can be presented, and no one individual or family necessarily fits the

average.

Actual Income Bases used for Incidence Computation

Most studies have used one of the above income measures, which

are publicly available, as the basis for determining the income measure

used to compute tax and expenditure incidence. Depending on the avail-

ability of financing and the scope of the study, some groups have expanded

the money income measures by estimating indirect tax burdens, realized

and unrealized capital gains, imputed rent, and other income-in-kind

that is part of the total income concept defined earlier. The Brookings

Institution, for example, constructed the 1966 MERGE file, a microanalytic

data base which combined Internal Revenue Service information available

from tax returns with the 1967 Survey of Economic Opportunity, conducted

by the Bureau of the Census, which provided needed information for low

income families. Adjustments for underreporting and nonreporting were

made, and certain imputations were added in order to develop the final

income base.

Actually, as Table IV-1 shows, most major incidence studies in

the last 20 years have utilized an income base with many characteristics

in common. All start with a definition of family current money income,

including the traditional factor income received from gross wages and

salaries (generally expressed before contributions to social security

TABLE IV-1

FAMILY INCOME BASE MEASURES

Income Item	Browning & Johnson Household Income	Pechman & Okner Family Income	Musgrave et al. 1974 Total Income[2]	Herriot & Miller Total Income[4]	Gillespie (a)[5]	Gillespie (b)	Musgrave & Daicoff Broad Income[7]	Bishop-Tax Foundation Uses NNP	Wisconsin Broad Concept[9]
Labor									
Gross Wages and Salaries	X	X	X	X	X	(6)	X	X	X
Employer - Social Security	X	No	X	X	X	No		X	
Employer - Unempl., health, etc.	X	X	X	X	X			X	
Payment-in-kind	X	No	X	X	X	X	X	X	X
Employer -- Payments to pensions	No	X	No	X	No	No	No	X	X
Capital									
Interest, Dividends, Rent	X	X	X	X	X	X	X	(8)	X
Imputed Rent	X	X	X	X	X	X	X	X	X
Corporate Tax	X	X	X	X	X	No	No	X	
Undistributed capital gains	X	X	X	X	X	X	X	X	X
Accrued gains on farm inventories, nonfarm real estate adjustments		X	X	X					
Realized capital gains	No	No	No	X	X	X	X	X	
Transfers									
Public	X	X	X	No	No	X	X	No	X
Private	X	No	X	No	X	X	X	No	X
In-Kind	(1)	No		X	No	X		No	
General government benefits	No	No	X	No	No	X	No	No	No
Indirect taxes[3]	X	X	No	X	No	No	No	X	
Imputed services of banks, etc.		No		No	X	X		X	
Regular contributions from others	X	No	X	X			X	No	
Gifts and bequests		No		No	X	X			No

Footnotes - Table IV-1

[1] Includes Medicare and Medicaid imputed for actual medical expenses, as opposed to estimating yearly insurance value of benefits.

[2] Total income includes money income, certain imputed items and transfer payments. Total income expanded adds benefits from public services. Another income concept is derived by subtracting taxes and charges from expanded total income. Also total income minus transfers is an additional measure.

[3] Inclusion of indirect taxes makes tax base dependent on shifting assumptions. Since Browning assumes sales tax incidence based on factor income, he includes the value of sales and excise taxes in order to obtain his before-tax, before-transfer income measure.

[4] Total income is expanded money income, including taxes, but less transfers. An alternative measure, "adjusted total income," includes taxes, but only to the extent that they exceed transfer payments for each income group. In their 1972 study, where adjusted total income was used as the base, adjusted total income was defined as "the total household claims on the nation's product after the receipt of transfer payments and the payment of taxes to finance the transfer payments." (p. 46)

[5] Gillespie used two income concepts, broad income, or Y, which excludes the entire public sector; and adjusted broad income, or Y + B + R - T, which includes the entire public sector within its distribution and is defined as money income plus some non-money items less tax payments plus government benefits and transfer payments. Family money income is derived from the personal income series.

[6] Net wages and salaries, since employee contributions to Social Security and personal income tax payments are excluded.

[7] One income base used was family money income as defined by the University of Michigan Survey Research Center for the North Central Region, and then updated according to the relationship between Michigan and the region found in the personal income series. A second broader income measure is depicted. A third income measure was money income after federal taxes.

[8] Interest payments exclude net interest paid by government and net interest paid by consumers and subsidies less current surplus of government enterprises.

9Wisconsin's income concept, adjusted gross income, is derived from income tax returns and is defined as total family money income from all sources less business expenses. This measure was expanded to include imputed and in-kind income. (This broad income version is the one surveyed here.) A third measure expressed adjusted gross income after the deduction of federal taxes, including all business taxes assumed paid by individuals.

are paid or taxes are deducted), net income from self-employment, and capital earnings from dividends, interest, net rent, and income from estates and trusts. Other inclusions depend to a great extent on whether the income base was derived from Census Bureau statistics or the Bureau of Economic Analysis' personal income series. Personal income, as noted earlier, takes into account payments-in-kind, food and fuel produced and consumed on farms, and imputed rent from owner-occupied homes, as well as public transfers from social security, welfare, etc. It also treats such employer payments to unemployment, health funds, and private pensions as income--but it considers the receipt of private pensions as merely a change in asset form. The Census Bureau, in contrast, counts private pensions as income, but does not include employer payments to these funds.

The various incidence studies of Browning, Herriot and Miller, and Musgrave started with the Census Bureau's money income distribution and then adjusted it. All estimated income-in-kind and imputed rent, and Musgrave and Browning treated private pensions as income when received. Pechman and Okner and the Tax Foundation, which started with personal income as the base, included the employer pension payments, rather than the actual pension payment, as the current income figure. All studies, regardless of the money income base used, estimated undistributed capital gains. This was usually done by allocating retained earnings among the various income brackets according to the distribution of dividends. Some studies also included an estimate of accrued gains on farm assets and a non-farm real estate adjustment, whereas others either did not or failed to specify such. (See Table IV-1.) Likewise, the inclusion of realized capital gains was not consistent.

The treatment of public transfer payments presents a special problem in the determination of an income base. Although both the Census data and the personal income series count public transfers as current money income, several economists have emphasized the inconsistency depicted by this procedure. Gillespie, for example, believed that the income base should either exclude the entire public sector, so that Y, or broad income, would equal money plus non-money income before either taxes or public benefits (including transfers); or include the public sector, with Y + B + R - T, representing broad income plus government benefits and transfers but minus taxes.

The treatment of taxes is closely related to the government-no government problem, for theoretically any income before government action should include such indirect tax payments as the corporate tax, business tax, and even the retail sales and excise tax. In fact, all the studies surveyed, except Gillespie's base, which included the public sector (so that taxes were deducted), allocated at least a certain percentage of the corporate tax to the income measure. Browning, Herriot and Miller, Pechman and Okner, and the Tax Foundation imputed other indirect taxes to their income bases. The problem with this procedure, however, is that the incidence assumptions which assigned the burdens of the indirect taxes become part of the income base which is then used to define incidence. A similar dependence occurs when general government benefits are added to the income base. Gillespie, in his adjusted broad income measure, and Musgrave et. al. in the 1974 study attempted this derivation.

The inclusion or exclusion of other items in the various income bases can not be reliably compared because of either the use of different definitions or the lack of a sufficiently detailed description of the

income base in the published work. However, it would seem safe to assume that imputed items not specifically mentioned were not added to the original current money base used. These items, such as imputed interest from the services of banks and other financial intermediaries, imputed interest from insurance, gifts and bequests, regular monetary contributions, and certain lump-sum payments, do not, in general, represent a large portion of any income base. Also, none of the studies surveyed (with the possible exception of Gillespie) included the income from persons living in institutionalized or group situations. The income earned by pension funds and certain non-profit organizations was likewise omitted from the family income base measure used.

Finally, since Wisconsin's income measure was derived from income tax returns and then adjusted, the comparability of that measure with others is difficult to analyze. An alternative income base for Wisconsin, however, was the definition of family money income after the deduction of federal taxes. Musgrave, in his Michigan study, also noted the possible benefit of expressing the incidence of state taxes and benefits according to an income base that excluded federal taxes. In this way, state tax incidence can be related to the ability to pay state taxes.

CHAPTER V

SELECTION OF ALTERNATIVE INCOME BASES

The purpose of this study, as stated earlier, is to determine
the incidence of the retail sales tax for one state--specifically Oklahoma.
To accomplish this goal, a general equilibrium model is presented, and
the tax is approached from both the uses and the sources sides of the
income equation. Tax incidence is an income-related measure; it actually
expresses the percentage of a household's income that is used to pay
a certain tax. As a result, the income base used can influence whether
a tax is viewed as proprotional, progressive or regressive. Since the
incidence pattern is determined by comparing the tax burden of average
households for various income levels, it is necessary that the pertinent
income components are available for the income groups selected. In addi-
tion, in order to employ Browning's sources-oriented model, household
income must be expressed according to factor distribution--i.e., whether
it is obtained from wages, capital, transfers, etc. All of these con-
siderations affect the actual income base chosen.

Income brackets in tax incidence studies generally refer to money
income of a family or individual earning unit. Logically, this seems
correct, for taxes must be paid with the money available to each house-
hold unit. Sources such as the Census and Internal Revenue Service
divide income from various sources according to income brackets--but in

recent years, only the Consumer Expenditure Survey, (hereafter referred to as the CES) conducted in 1972-1973 by the Bureau of Labor Statistics,[1] but generally utilizing Census definitions regarding income, has provided the extensive breakdown of consumer expenditures by income distribution, which is information needed to estimate the retail sales tax burden in the traditional manner. The CES also classifies income by source and provides other important related information, such as changes in financial assets and liabilities, for the various income classes. As a result of the availability of this information, 1973 is the base year chosen for the present study.

Because the CES not only gives this detailed information for the nation as a whole, but also for each of the four major regions, its definition of family money income before taxes provides the initial income base for this study on the incidence of Oklahoma's retail sales tax. Moreover, it is this measure that determines the placement of a household or consumer unit within an income bracket. In general, the CES included the civilian noninstitutional population, although members of the Armed Forces living outside the military installation and a few minor groups living in business quarters were also measured.[2]

The consumer or household unit is defined by the CES as (1) a

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[1]The statistics for the South used in this study are actually obtained from four separate bulletins: U.S. Department of Labor, Bureau of Labor Statistics, Consumer Expenditure Survey: Diary Survey, July 1972-June 1974, Bulletin 1959 (1977); Interview Survey 1972-73, Bulletin 1985 (1978); Integrated Diary and Interview Survey Data, 1972-73, Bulletin 1992 (1978); Interview Survey, 1972-73, Bulletin 1979 (1978).

[2]For a detailed description of coverage and income definitions, see Consumer Expenditure Survey: Diary Survey, July 1972-June 1974, pp. 6-7.

group of two or more persons, usually living together, who pool income
and share major expenses; or (2) a financially-independent individual
(although never-married children living with parents are considered a
member of the core consumer unit.) Family income is defined as the com-
bined income earned by all family members 14 years of age and over. This
comprises wages and salaries, including tips, bonuses, and other forms
of monetary compensation received for work done; net income from business,
professional practice, or farms; dividends, net rental income, interest,
and income from estates and trusts; social security, welfare and other
public assistance payments, including the value of food stamps net of
cost; government pensions, alimony, and other money income received period-
ically or regularly regardless of the source.

Procedure for Obtaining Oklahoma's Family Money Income

Because the CES's definitions of population, consumer unit, and
family income differ in varying degrees from those of other government
sources (see the discussion on Existing Income Measures in Chapter IV),
the estimation of an approximate 1973 income total and income distribution
for Oklahoma involved making several assumptions. Oklahoma's overall
mean or per capita income has traditionally been slightly below the average
for the South, but by comparing 1970 Census distributions of 1969 income,
for both Oklahoma and the South, the difference seems to be explained
by Oklahoma having a larger proportion of consumer units with lower in-
comes. Thus, the mean income estimated for each income bracket by the
CES for the Southern region will be maintained for this study, but an
appropriate income distribution for Oklahoma is necessary.

To obtain a realistic income distribution, a corresponding total

family money income measure for Oklahoma must first be determined. This
was done by following the procedure used by Musgrave and Daicoff in their
Michigan study.[3] Total money income for the South as defined by the
CES - Interview Survey was compared to total personal income for the re-
gion as reported by the Survey of Current Business in 1973.[4] Personal
income is the larger of these two measures for it includes certain non-
money income, as well as all types of money income. (See the detailed
discussion in Chapter IV.) If Oklahoma's money income is assumed to
be the same proportion of personal income as that of the South, then
Oklahoma's total money income should equal $8,845 million for 1973.[5]

It must be recognized that this income relationship between money
and personal income might be low, especially since the CES presented
income averages for a two-year period. Thus, the actual time, as well
as the method, of income measurement differed, but the overall analysis
should not be affected. Moreover, a similar money income total for Oklahoma
is obtained using a comparison of mean incomes for Oklahoma and the South,
as reported in the 1970 Census. Oklahoma's mean income for 1969 for
families and unrelated individuals was 94.2 per cent of the mean income
in the South. Applying this same percentage to the CES average family
income before taxes in the South, and assuming 920,000 consumer units
in Oklahoma in 1973, total family income before taxes in Oklahoma for

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[3]Richard A. Musgrave and Darwin W. Diacoff, "Who Pays the Michigan
Taxes? in Michigan Tax Study: Staff Papers (Lansing, Michigan: 1958),
pp. 161-166.

[4]U.S. Department of Commerce, Bureau of Economic Analysis, "State
Personal Income, 1974-75," Survey of Current Business (August 1976).

[5]$\frac{\text{1973 CES Money Income-South}}{\text{SCB 1973 Personal Income-South}} = \frac{\$227.6 \text{ billion}}{\$297.8 \text{ billion}} = .764$ per cent

x Oklahoma's 1973 personal income ($11,573 million) =
Oklahoma's money income = $8,845 million

1973 would equal $9,134 million. This is only 3.3 per cent higher than the
above $8,845 million estimate for Oklahoma money income and would certainly
provide a realistic income range.

Another total estimate needed is the number of consumer or family
units in Oklahoma in 1973. This figure is perhaps the least exact of
all estimates made, because of the varying definitions for consumer units.
Depending on whether total population is compared to the number of con-
sumer units, and then extended for region or state--or whether the number
of consumer units in Oklahoma is estimated for 1973, based on Census
data which defines Okalhoma's consumer units as a percentage of those
in the South or nation, the estimated number of consumer units in Oklahoma
in 1973 can vary from 883,000 to 957,000. Because of these differences,
an average of 920,000 family units in Oklahoma in 1973 was established,
and income distributions were based on this total.

The distribution of households among varying income brackets
in Oklahoma is provided only by the Census and the Internal Revenue Service
reports[6] on individual returns filed. The now-annual Internal Revenue
reports supply information for both 1969 (the year reported in the 1970
Census) and 1973 (the year for this study). Corresponding income-distribu-
tion data are also provided by the IRS and the 1970 Census for the South
and the United States. Moreover, income distribution for the South and
nation is presented in the 1973 Current Population Report,[7] as well as

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[6]Internal Revenue Service, Individual Returns/1973 (Washington,
D.C.: 1976).

[7]U.S. Department of Commerce, Bureau of the Census, Consumer
Income: Money Income in 1973 of Families and Persons in the United States,
Current Population Reports, Series P-60, No. 97 (January 1975).

in the CES bulletins.

In order to obtain an appropriate income distribution for the 920,000 household or consumer units in Oklahoma in 1973, several methods were tried, but the following procedure was adopted as the most realistic. Both the 1970 Census of Population detailing 1969 income information and the Current Population Report regarding consumer income in 1973 provided income distributions for the South region. As these studies were a product of the Bureau of the Census, the definitions of family unit and money income were similar. The percentage change in the number of family units and unrelated individuals between 1969 and 1973 in the South was computed. The difference between the 1973 totals for each income bracket, as reported in the Current Population Report, and the number of consumer units in each bracket in the Bureau of Labor Statistics' CES was also noted. (The number of units not reporting income in the CES was distributed among the two lower income brackets, in a manner consistent with the estimated mean income of these units.)

By assuming that the change in the representation of Oklahoma family units between 1969 and 1973 followed a pattern similar to that of the South, Oklahoma's 1969 Census income distribution was updated to 1973. The small difference between the total number of consumer units obtained in this manner and the 920,000 assumed consumer units was eliminated by adjusting the consumer unit totals that seemed to vary significantly from other distributions.[8] The consumer unit distribution and the resulting income totals for Oklahoma in 1973 are given in Table V-1.

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[8]In this case, the 1,911 unit deficit was assigned to the $5000-$5999 income bracket, which, when using the above percentage change adjustment, resulted in a lower-than-anticipated total.

TABLE V-1

ESTIMATED CONSUMER UNITS AND INCOME DISTRIBUTION

BY FAMILY MONEY INCOME BRACKETS, OKLAHOMA, 1973

Income Bracket (dollars)	Number of Consumer Units in Oklahoma	Percentage Distribution of Consumer Units	Mean[1] Money Income	Total Income (000)
Under 3,000	205,011	22.3	$ 1,756	$ 359,999
3,000-3,999	72,234	7.9	3,489	252,024
4,000-4,999	55,800	6.1	4,489	250,486
5,000-5,999	44,514	4.8	5,483	244,070
6,000-6,999	52,073	5.7	6,490	337,954
7,000-7,999	47,672	5.2	7,502	357,635
8,000-9,999	92,704	10.1	8,951	829,794
10,000-14,999	171,976	18.7	12,355	2,124,763
15,000-24,999	136,636	14.9	18,857	2,576,545
25,000 and over	41,380	4.5	40,860	1,690,787
Total (or average)	920,000	100.0	$ 9,809	$9,024,057

[1]Mean income is the amount for each bracket according to the Consumer Expenditure Survey: Interview Survey, 1972-73, Bulletin 1985, pp. 461-462.

The total money income that resulted using the estimated income distribution for Oklahoma was $9,024.1 million. This is only 2.0 per cent higher than the original $8,845 million total income estimate, and represents a reasonable variance. Moreover, the distribution is very similar to that obtained by comparing the number of individual Oklahoma income tax returns distributed according to the size of adjusted gross income for 1969 and 1973.

When using tax returns, however, it must be recognized that certain types of incomes--especially social security and some other government and private transfers--are not included in adjusted gross income. Some family or consumer units may file separate rather than joint returns, a procedure that benefits those couples where both husband and wife have above-average earnings. It is also assumed that the exclusion of certain transfer income results in an underreporting in the lower income brackets, although the availability of tax credits in recent years has reduced this bias. Another consideration that would increase the number of returns in the under-$3000 bracket is that minors with non-wage income above a $600 minimum must file tax returns, even though no tax is due and other studies would simply include these minors as part of the family unit. Although it is not known how these various requirements affect the overall income distribution of family units, it seems logical that any distribution of consumer units for a state should have at least as many units in the higher income brackets as reported by the Internal Revenue Service for that year. Oklahoma's distribution in Table V-2 meets this requirement, with 349,992 consumer units with $10,000 and more income, compared to 321,151 Oklahoma tax returns reporting adjusted gross income of $10,000 or more in 1973. (See Table V-2).

TABLE V-2

INCOME TAX RETURNS BY SIZE OF ADJUSTED

GROSS INCOME, OKLAHOMA, 1969 AND 1973

Size of Adjusted Gross Income (dollars)	1969		1973	
	Number of Returns	Percent Distribution	Number of Returns	Percent Distribution
Under 3,000	276,173	31.5	228,700	24.5
3,000- 3,999	72,607	8.3	71,539	7.7
4,000- 4,999	53,867	6.1	46,107	4.9
5,000- 5,999	56,136	6.4	61,532	6.6
6,000- 6,999	62,589	7.1	42,198	4.5
7,000- 7,999	47,568	5.4	48,614	5.2
8,000- 9,999	107,938	12.3	112,653	12.1
10,000-14,999	137,175	15.6	166,884	17.9
15,000-24,999	47,849	5.4	114,239	12.3
25,000 and over	14,961	1.7	40,028	4.3
Total	876,863	100.0	932,494	100.0

SOURCE: Internal Revenue Service, Individual Income Tax Returns: Statistics of Income, 1969-Table 5-2, p. 225; Statistics of Income, 1973- Table 5-4, p. 170.

Broad Income Measure

Although family money income as defined by the CES is perhaps
the best measure to use when determining the incidence of a tax, there
is theoretical support for using a broader definition of income. The
advocates of this measure contend that it is the overall net worth of
an individual or family that must be used to determine the burden of
taxation. Thus, in addition to money income, such non-money values as
rental value of an owned home, home-produced goods, pensions and other
non-monetary contributions made be employers, and other goods and services
received without direct expense must be imputed to each consumer unit.
Moreover, both realized and accrued capital gains and fiduciary income
must be distributed. The resulting amount should provide an income total
close to that provided by the personal income estimates in the Survey of
Current Business. Because the broad measure of income is larger than
money income for all income brackets, the relative burden of any tax
will be less.

The computation of the broad income measure is shown in Table
V-3 and its accompanying line explanation. The format follows closely
the procedure used by Browning and Johnson, who define before-tax, after-
transfers (BTAT) income,[9] in order to allocate sales taxes on the sources
side of the income equation. The income measure established in Table
V-3 separates income sources among factor (labor and capital) and trans-
fer income.

Added to the gross wages reported as money income in the CES

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[9]Edgar K. Browning and William R. Johnson, The Distribution of
the Tax Burden (Washington, D.C.: American Enterprise Institute for
Public Policy Research, 1979), p. 47.

TABLE V-3

ESTIMATES OF AVERAGE BEFORE-TAX, AFTER TRANSFERS (BTAT) INCOME

BY INCOME BRACKETS, OKLAHOMA, 1973

| Line | Components of Income | Income Brackets (dollars) and Number of Consumer Units in Each Bracket (in parentheses) | | | | | | | | | | Average | Total (thousands of dollars) |
		Under 3,000 (205,011)	3,000-3,999 (72,234)	4,000-4,999 (55,800)	5,000-5,999 (44,514)	6,000-6,999 (52,073)	7,000-7,999 (47,672)	8,000-9,999 (92,704)	10,000-14,999 (171,976)	15,000-24,999 (136,626)	25,000 and over (41,360)		(920,000)
1	Average Money Income	$1,756	$3,489	$4,489	$5,483	$6,490	$7,502	$8,951	$12,355	$18,857	40,660	$ 9,809	$9,024,057
	Labor Income:												
2	Gross Wages	426	1,184	2,424	3,433	4,068	5,276	6,542	10,152	15,897	27,536	7,161	
3	Employer Soc.Sec.Payment	19	52	106	150	178	230	286	443	524	524	313	
4	Unemployment Insurance	6	16	33	46	55	63	63	63	63	63	63	
5	Self-employment Income	33	216	181	320	416	461	591	725	1,168	7,083	705	
6	Sub-total	484	1,468	2,744	3,949	4,717	6,030	7,482	11,383	17,652	35,206	8,322	7,656,547
	Capital Income												
7	Interest, dividends, rent, etc.	84	237	235	240	393	320	402	346	616	3,316		
8	Imputed rent of owner-occupied housing	444	480	504	528	660	720	816	1,095	1,700	2,856		
9	Value of retained earning	35	63	72*	60*	83	96	109	130	271	3,770		
10	Private pensions, contributions and other income	60	139	230	236	357	353	327	353	409	1,414		
11	Sub-total	623	919	1,041	1,084	1,493	1,489	1,654	1,924	2,996	11,356	1,970	1,812,661
12	Factor Income	1,107	2,387	3,785	5,033	6,210	7,519	9,136	13,307	20,648	46,562	10,293	9,469,208
	Transfers Income												
13	Obtained from CES	1,153	1,713	1,419	1,253	1,257	1,092	1,089	780	767	1,511		
14	Goods & Services received without direct expense	122	117	152	208	111	143	140	168	167	197		
15	Other money receipts	91	80	100	142	184	227	226	156	228	404		
16	Sub-total	1,366	1,910	1,671	1,603	1,552	1,462	1,455	1,104	1,162	2,112	1,417	1,304,035
17	Before-tax, After transfer income	$2,473	$4,297	$5,456	$6,636	$7,762	$8,981	$10,591	$14,411	$21,810	$48,674	$11,710	10,773,243
18	Per cent factor income	44.8	55.6	69.4	75.8	80.0	83.7	86.3	92.3	94.7	95.7	87.9	87.9
19	Per cent transfer income	55.2	44.4	30.6	24.2	20.0	16.3	13.7	7.7	5.3	4.3	12.1	12.1

Source: See individual line explanations for definition and source of income measures.

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TABLE V-3 BEFORE-TAX, AFTER-TRANSFERS INCOME - Line Explanations

Line 1 - Average money income for the South according to the Bureau of
Labor Statistics, Consumer Expenditure Survey, Interview Survey,
Bulletin 1985 (Washington, D.C.: 1978), pp. 461-462. The income
averages for Oklahoma are lower than those reported by the CES,
since Oklahoma has a higher concentration of consumer units in
the lower income brackets.

2 - CES, Interview Survey, Bulletin 1985, pp. 475-476.

3 - Estimated to equal 4.85 per cent of first $10,800 of taxable
wages. (Health benefit contributions, equalling 1.0 per cent,
are included in line 14 under transfers.) Taxable wages are
assumed to equal 90 per cent of gross wages, according to the
coverage estimates in Musgrave and Musgrave, Public Finance in
Theory and Practice, p. 682.

4 - Estimated to equal 1.5 per cent on first $4,200 of wages, again
considered to equal 90 per cent of gross wages. A 1.5 percentage
is used since it is the average of the 0.4 per cent and the 2.7
per cent minimum and maximum rates applicable in Oklahoma in
1973.

5 - CES, Interview Survey, Bulletin 1985, pp. 475-476.

7 - CES, Interview Survey, Bulletin 1985, pp. 477-478.

8 - Imputed rent is the estimated average monthly rental value of
owned homes for each income bracket as reported in CES, Interview
Survey, Bulletin 1997, pp. 146-147, times 12.

9 - Using Survey of Current Business data for retained earnings for
1973 and Internal Revenue Service 1973 information on dividends,
Oklahoma has .00646 per cent of the nation's dividends according
to the IRS. If this same percentage is applied to retained
earnings, which are estimated to equal $22.6 billion in 1973
according to the Survey of Current Business, then Oklahoma's
share was $146 million after inventory valuation and capital
consumption and credit allowances. Before these adjustments,
U.S. retained earnings according to the National Income accounts
were $39,264 million, or $253.6 million in Oklahoma before
adjustments. Retained earnings for Oklahoma are allocated
according to the dividend distribution in the Internal Revenue
Service, Individual Returns/1973, p. 15.
*The two starred brackets have been adjusted slightly to reflect
more normal trends, but the overall total retained earnings is
the same.

TABLE V-3 Line Explanations (continued)

Line 10 - <u>CES, Interview Survey</u>, Bulletin 1985, pp. 477-478. Includes
private pensions, one-half regular contributions, and the
factor portion of other income, which includes net profits
on sales of stocks, etc., refunds from insurance, taxes, and
other sources as described in <u>CES, Interview Survey</u>, Bulletin
1985, p. 507.

12 - Factor income equals the sum of labor income (Line 6) and
capital income (Line 11).

13 - Includes social security, government retirement, veterans and
unemployment payments, welfare and public assistance, one-half
regular contributions, workmen's compensation, and the value
of food stamps, net of cost, as listed in <u>CES, Interview
Survey</u>, Bulletin 1985, pp. 477-478, and Bulletin 1997, pp. 210-211.

14 - Totals obtained from <u>CES, Interview Survey</u>, Bulletin 1997,
pp. 216-217, and includes health and hospitalization insurance,
home-produced goods, etc.

15 - Listed in <u>CES, Interview Survey</u>, Bulletin 1985, pp. 479-480,
but is not included in the money income measure. Includes
lump-sum inheritances, gifts, and other lump-sum receipts.

17 - Total of factor income (Line 12) and transfer income (Line 16).

are estimated employer payments for social security and unemployment
insurance. The addition of these tax payments does not constitute a
double-counting of income, even though actual social security and un-
employment payments are included as transfer income. In contrast to
private pension funds, where payments are generally made from a specific
fund established by employer and employee contributions, social security
and unemployment payments are financed by the current income of govern-
ment. The employer and employee contributions can thus be considered
a tax. Although there is some relationship between taxes paid and the
benefits received, the relationship has proved to be insignificant. Since
all employers making regular wage payments must allocate specific funds
for social security and unemployment taxes, these payments are included
in overall pre-tax labor income for the average family unit.

Self-employment income, as detailed in the CES, is also considered
as labor income. This income measure includes net income from privately-
owned businesses or professional practices, as well as net income from
privately-owned farms. Although part of this income undoubtedly reflects
a return on capital invested, it is assumed that most self-employment
income is a result of the labor of the self-employed individual. Actual-
ly, when the burden of the sales tax is assumed to be the same for both
labor and capital income (total factor income), it makes no difference
how self-employment income is classified.

As for determining an expanded measure of capital income, the
CES's average money income comprises total interest, dividends, net rent,
etc., as well as income from private pensions. (Lines 7 and 10 in
Table V-3.) In addition, one-half of the regular contributions included

in the CES's money income measure and a portion of other money income has been allocated as capital income. Thus, net profits received from the sale of capital assets, fiduciary income, and occasional money refunds are actually provided by the CES's capital income measure. In addition, the value of annual rent of owner-occupied housing, another form of capital income, is imputed using CES estimates.

In order to estimate accrued capital gains, which define the annual additional value to an income unit of capital assets currently owned, corporate retained earnings are allocated among each income class in the same manner as the distribution of dividends. Retained earnings are available in the Survey of Current Business only for the nation in 1973. Corporate dividends, however, for both the nation and Oklahoma, are provided by the IRS. Using this same state-national proportion as dividends (.646 per cent), 1973 retained earnings applicable to Oklahoma before adjustments equal $253.6 million. This total is allocated among income brackets according to the dividend distribution represented by the IRS individual returns of Oklahoma in 1973. Then, by adding these retained earnings estimates plus imputed rent to the capital portion of money income, total capital income for each income bracket can be obtained.

Actually, an estimate for indirect capital taxes is needed to complete a comprehensive income measure. This addition reflects the fact that those taxes that are not shifted forward are borne by shareholders, thereby reducing the money income of these individuals. Consequently, in order to allocate these indirect taxes among income brackets, conclusions concerning their incidence must be made. The major indirect

taxes on capital are the federal and state corporation income taxes, and when involved in business situations, the property tax.

Browning and Johnson assumed that "the net of tax rate of return on all types of capital will be equalized by the flows of capital from one use to another ......[so]......all capital income is reduced equally by the amount of taxes on capital income."[10] Thus, they allocated corporate income taxes and property tax as a proportion of net capital income. Musgrave, in contrast, was concerned with adding only the unshifted portion of the corporate income tax to the broad income measure. In the 1958 Musgrave and Daicoff study, the two-thirds portion of the tax assumed to be unshifted was distributed according to the pattern of dividend payments. There was no imputation of the property tax to the income measure. Although most other incidence studies followed the Musgrave procedure and imputed only the corporate income tax, various incidence assumptions affected the allocation to income.

Because the determination of the incidence, and the subsequent income allocation, of indirect taxes on capital is beyond the scope of this study, the imputation of these taxes will simply not be included as part of broad capital income. In that these indirect taxes are borne primarily by capital owners, the effect of this exclusion will be to lower the overall income of the higher income brackets, where capital income is greatest. This can thus affect incidence analysis by reducing the regressiveness or increasing the progressiveness of any other tax.

The combination of labor and capital income gives factor income before taxes and before transfers. In addition, Browning, in his

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[10]Ibid., p. 45.

sources-oriented sales tax incidence model, proposed that estimated sales tax payments be included in total factor income. Since Browning's model assumes that factor income is reduced because of the sales tax, the tax burden should initially be included in broad income in order to provide a true before-tax income measure. However, here too, when sales tax incidence is determined using methods other than the sources-only model, incidence assumptions affect the amount of tax to be added to income. Moreover, when the sales tax is allocated according to consumption, it has not reduced the value of factor income--so it should not be added into the income base. Since the other indirect taxes have not been included in broad income, it seems consistent not to include an estimate of sales and excise taxes.

The final computation to be made in order to provide a broad income measure is to add the value of money and in-kind transfers to factor income. Although government transfers are actually financed from tax revenue, the inclusion of transfers in the broad-income measure does not constitute double-counting. For one thing, transfers provide a significant portion of money income, especially for low-income groups. Even non-monetary transfers add to the overall standard of living for a household, and it is this broad-income base that is desired for use in incidence analysis. Moreover, if sales taxes are assumed to be allocated according to consumption expenditures, the transfer income certainly is used to pay part of the sales tax burden.

The average value of most cash transfer payments by income group is provided by the CES. In addition, an estimated value of goods and services received without direct expense is available in the CES, although

it is not included in money income. Since this figure includes such
things as the value of home-produced goods, it might be argued that this
increment is a part of factor, rather than transfer, income. The same
argument could be used in regards to the estimate of other money receipts
(Line 15), which is included in transfer income. This latter figure
includes such lump-sum items as inheritances and gifts. Nevertheless,
since the overall value of these items is a small--but rather consistent--
proportion of total income, the actual allocation between factor and
transfer income should make little difference in any incidence conclusions.
Total transfers are given on Line 16 of Table V-3 and when added to factor
income provide a general estimate of average before-tax, after-transfers
income. (Line 17.) This before-tax, after-transfers (BTAT) income aver-
age is actually a broad measure of money income, income-in-kind, and
an imputed estimate of the increase in net worth for the ten income groups
designated.

Another income measure that might be meaningful is money income
after federal taxes. This measure represents the disposable income avail-
able to pay state and local taxes. For a study such as this of the
incidence of a state tax, the after-federal tax measure could be rele-
vant, although here too the question of whether to include indirect tax
burdens in the income base must be considered. Moreover, although
federal income and payroll taxes can easily be estimated for each income
bracket, the average amount of capital, property, and other federal taxes
paid by each income group is less certain.

As a result, only two income measures shall be used in this study.
The first is money income for each income group (Line 1 in Table V-3) as

reported by the CES. The primary function of this measure is to estab-

lish the income distribution of Oklahoma's population in 1973 for the

purpose of incidence analysis. The second, more comprehensive, and more

important income measure is before-tax, after·transfers income for each

of the income brackets, assigned according to money income figures. This

base provides a consistent means for surveying the burden of the sales

tax, regardless of the incidence assumptions used.

CHAPTER VI

COMPUTATION OF OKLAHOMA'S SALES TAX INCIDENCE

The incidence of the sales tax (or any other tax) is expressed as the percentage that the particular tax payment is of the income base. The actual amount of taxes paid by a household in any particular income group depends, to a great extent, on whether it is assumed that the tax is shifted forward to consumers, backwards to the factors of production, or some combination of both. Because of the uncertainties in the shifting process of the state sales tax, this study will explore several alternatives in order to reach some conclusion concerning sales tax incidence. (An econometric model, however, would be necessary to determine the specific degree of forward and backwards shifting represented by the various models.)

Traditionally, when it has been assumed that sales taxes are borne by consumers (on the uses side of the income equation), the incidence among the different income classes is regressive. The poorer income groups are assumed to bear a larger burden than the wealthier income groups, primarily because the consumption to income relationship is greater for those with less income. Incidence assumptions regarding sales taxes paid by businesses, however, can modify the traditionally regressive patterns.

Furthermore, Edgar Browning, as noted earlier, has argued that

the amount of transfer payments that a family receives affects the actual incidence of the sales and excise tax, in that any tax causing an increase in the price level will result in most transfer payments being adjusted upward accordingly. Since transfer payments represent a much larger proportion of total income for lower, rather than higher, income groups, the incidence of the sales tax, when expressed as a percentage of factor income, is progressive. Whether this relationship between transfers and a sales tax prevails in a specific state analysis, however, was questioned in Chapter III.

In order to fully appreciate how incidence conclusions depend on the assumptions made, several estimates of the sales tax incidence in Oklahoma in 1973 will be calculated. Initially, the incidence of Oklahoma's sales tax is determined by the traditional uses-oriented method, but using estimates of Oklahoma's actual taxable consumption as the base. In addition, Browning's original model, using both the sources-only procedure and the sources-plus-uses-side adaptation, will be applied. Although it is recognized that Browning's model has limited application for a one-state study with existing tax and welfare systems, the possibility that welfare and other federal transfer payments could be made the responsibility of individual states (and thus closely related to state taxes) gives Browning's hypothesis some meaning in state tax incidence analysis. Moreover, Browning's realization that factor and transfer payments may respond differently to the imposition of a tax is an important consideration whenever a tax is assumed to be shifted backwards.

In all the incidence calculations, it is recognized that a portion of the sales tax is paid by business and that the existence of the

federal offset affects final incidence. A differential incidence analysis, substituting a proportional state income tax for the state sales tax, and an estimate of sales tax burden if food were exempted from the base are detailed in Chapter VII and provide comparisons--so that some consensus can be derived concerning the overall effect of the retail sales tax in Oklahoma.

Total sales tax receipts in Oklahoma in 1973 were $116.5 million. This revenue was obtained from a 2.0 per cent tax rate levied on the gross receipts from the sale and rental of tangible personal property, and from the provision of certain services. Sales of all personal property are taxed, unless specifically exempted by law. (Major exemptions include sales of motor vehicles, gasoline, cigarettes, and other items which are taxed by specific excises, as well as certain agricultural exemptions.) In general, most of the taxed goods and services are purchased by households,[1] but as noted in Chapter III on Adjustments, a part of the sales tax is paid by businesses. Business taxes, when recognized by incidence studies, have generally been treated in a similar manner as a cost tax. In any case, the incidence is different than that reflected by the household portion of the sales tax. Thus, it will be treated separately later in this chapter.

By using the breakdown of business classes reporting sales tax collections provided in the Oklahoma State Sales Tax Collections Report

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[1] A portion of the sales tax is undoubtedly exported to tourists for food and lodging, but the actual amount is relatively small, (about 1.2 per cent of the total sales tax revenue). This fraction was obtained by estimating that tourists from other states provided about 15 per cent of the $9.2 million in 1973 tax revenue received from restaurants, hotels, and various entertainment sources that would be frequented by non-residents.

and by estimating average taxable consumption by income class using
the information provided in the Consumer Expenditure Survey (hereafter
identified as the CES), it was determined that the amount of sales taxes
paid by business concerns in Oklahoma in 1973 was $26.5 million, or
22.8 per cent of the total. (See Appendix Table A-1.) The portion of
the sales taxes paid by out-of- state tourists was estimated to equal
$1.4 million. The remaining $88.6 million in tax revenue is the amount
assumed to be borne directly by households. It is for this amount
that incidence will initially be determined. The incidence reflect-
ing the burden of the sales tax paid by business will be added later.

Sales Tax Incidence--The Traditional Procedure

With the exception of Browning, almost all studies of sales
tax incidence have allocated the tax burden to the uses of income, ex-
pressed as either a percentage of total consumption or total taxable
consumption. In fact, in order to incorporate the uses-of-income effect
into Browning's model, this traditional incidence estimate is necessary.
The amount of taxable consumption used for determining both taxes and
incidence depends on tax laws and interpretations. The incidence of
state taxes also is affected by the federal tax offset--which (by causing
a reduction in federal income taxes owed) results in the federal govern-
ment actually bearing part of the burden levied by the states upon their
citizens.

In order to determine the taxable consumption and consequently,
the traditional sales tax burden for the various income groups in Okla-
homa in 1973, the amount of consumption that is taxed by a retail sales tax
must be estimated. Fortunately, the CES detailed average spending within

several major catagories by income brackets for the South in 1973. Using these spending averages as typical of Oklahoma and applying Oklahoma's sales tax laws, an estimate was made of average taxable consumption for each income group in Oklahoma. By multiplying this average by Oklahoma's income distribution of consumer units, an estimate of total taxable consumption can be made.

Most of the computation of taxable consumption is straightforward, with spending on such items as food and other household goods assumed to be all taxable, and estimates of taxable percentages being made to determine the appropriate figures for other spending categories. (See Table A-2 detailing these estimates in the Appendix.) The CES, however, does not include mortgage payments or new home purchases as expenditures (interest payments are included but principal payments are reflected as a change in assets). Since Okalhoma's sales tax receipts show that a relatively large amount of taxes are a result of spending for new homes and other residential construction, that part of the cost reflecting taxable purchases must be allocated among income classes.

A review of the source of Okalhoma's tax receipts indicates that approximately $6.0 million represents taxes included in new residential purchases in 1973. With a 2.0 per cent sales tax rate, the value of taxable products in new household construction is approximately $300 million.[2]

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[2]The $300 million estimate agrees with 1973 construction statistics in the Statistical Abstract of the United States. The value of new private residential construction contracts in Oklahoma in 1973 was $589 million. In the United States, about half of the value of new construction is for materials, which are subject to the sales tax. The remainder is used for payment of non-taxable labor and profits.

Since new household construction is purchased for both homes and rental property, the $300 million of taxable construction was initially divided into two parts: $208 million for new owner-occupied homes reflecting the fact that in 1970, 69.2 per cent of all housing units in Oklahoma were owner-occupied (as compared to a 62.9 per cent rate for the United States), and $92 million, representing the taxable value of new housing in private rental units.

The taxable value of new owner-occupied homes was allocated among income brackets using the distribution of sales prices of new homes in the South, and the traditional housing-purchase rule of thumb: that the price of a home should not exceed 2.5 times a household's annual income. (This allocation is shown in Appendix Table A-3, Columns 1, 2, and 3.) Since only one per cent of the new homes in 1973 had a sales price of $15,000 or less, it was assumed that families in the income brackets below $5000 were not purchasing new homes.

Once new homes are distributed by income bracket, the total value of these new homes can be determined by multiplying the average sales price of the new homes by the percentage of new homes in each sales price category. This total value is then described in percentage terms by income groups, in order to define the proportion of new home taxable consumption upon which retail sales taxes are levied. (Appendix Table A-3, Columns 4 and 5.) This same distribution of taxable value is then applied to the $208 million assumed to represent taxable consumption in new owner-occupied homes in Oklahoma in 1973 and provides the taxable consumption by income brackets. (See Table VI-1, Columns 1 and 2.)

The allocation of the $92 million of taxable construction for

TABLE VI-1

ALLOCATION OF TAXABLE CONSUMPTION IN NEW HOME

CONSTRUCTION BY INCOME BRACKETS, OKLAHOMA, 1973

Income Bracket (dollars)	New Owner-Occupied Homes		Taxable-Consumption-Rental Property-Assumption A*		Total Taxable Consumption in New Construction (000) (5)
	Per Cent of Taxable Consumption (1)	Distribution of $208 Million (000) (2)	50% Shifted Forward (000) (3)	50% Shifted Backwards (000) (4)	
Under 3,000	0	0	$ 8,740	$ 2,300	$ 11,040
3,000- 3,999	0	0	3,772	2,116	5,888
4,000- 4,999	0	0	2,990	1,472	4,462
5,000- 5,999	0.3	$624	2,254	1,288	4,166
6,000- 6,999	2.4	4,992	3,036	2,162	10,190
7,000- 7,999	5.4	11,232	2,760	1,242	15,234
8,000- 9,999	9.8	20,384	5,566	3,956	29,906
10,000-14,999	12.8	26,624	9,384	5,750	41,758
15,000-24,999	38.5	80,080	6,256	7,590	93,926
25,000 and over	30.8	64,064	1,242	18,124	83,430
Average (or total)	100.0	$208,000	$46,000	$46,000	$300,000

*Assumption A assumes that 50.0 per cent of the taxable value in new home construction for rental purposes is shifted forward to the tenant (allocated according to percentage of rental expenditures, Column 1 of Appendix Table A-4); and 50.0 per cent is shifted backwards and borne by the landlord (allocated according to proportion of total rental income in Column 1 of Appendix Table A-5).

(1) From Appendix Table A-3, Column 5.

rental use depends on the incidence assumptions made: whether the tax can be shifted forward and thereby be passed on to the tenants or consumers of the new rental property (Construction Assumption B), or whether the tax is borne by the owners of the property (Construction Assumption C). The possibility of tenants and landlords sharing the burden also exists. (Tables A-4 and A-5 in the Appendix show the determination of total and average taxable consumption using Construction Assumptions B and C, with the forward-shifted Assumption B being distributed according to the percentage of total rental expenditures for each income group, and the backwards-shifted Assumption C allocated according to the distribution of rental income.)

A third assumption, A, with half of the taxable construction consumption for rental-occupied units being shifted forwards and half backwards is also made, with the actual breakdown shown in Table VI-1, Columns 3 and 4. Column 5 in Table VI-1 provides the estimated income distribution of the total $300 million representing taxable consumption of new household construction. This estimate is not affected by the percentage of home ownership among the varying income brackets, since it is the total (not the average) of consumption expenditures that is distributed.

Although the taxable value of new rental construction varies significantly among income groups depending on the incidence assumption used,[3] when it is combined with the taxable consumption allocation for

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[3] For example, using forward-shifting Assumption B, taxable consumption in new rental units is $17.5 million for those households with incomes under $3000 and $2.5 million for households with incomes of $25,000 and over. With backwards-shifting Assumption C, the comparable amounts are $4.6 million and $36.2 million.

owner-occupied homes and the $4,129 million in other taxable consumption, the effect on incidence conclusions is minimal. Traditional incidence for the lowest income bracket, for example, is 1.60 of BTAT income using Assumption B and 1.55 of BTAT income using Assumption C. Assumption A averages the difference with a 1.57 incidence figure for this group. The difference in the incidence for the other income brackets, using construction assumptions B and C, is even less than .05. In all cases, Assumption A provides a satisfactory compromise.

The resulting estimates of overall taxable consumption, using Assumption A for determining consumption applicable to new rental construction, are given in Table VI-2. The addition of the $300 million assumed to be the taxable consumption included in new construction to the estimates of taxable consumption for all other purchases gives a total taxable consumption by Oklahoma households in 1973 of $4,428.5 million. This provides $88.6 million in state revenue with a 2.0 per cent state sales tax rate.

Traditional tax incidence is determined as follows. The 2.0 per cent sales tax rate is applied to average taxable consumption for each income bracket in order to provide average sales taxes paid. Actual sales taxes paid by average households in each income group are given in Column 5 of Table VI-2 and range from $39 for the lowest income bracket to $258 for the highest group. By dividing these tax payments by the appropriate BTAT (before tax-after transfers) income measure, traditional tax incidence is determined. (Table VI-2, Column 6)

As is typical of all sales tax incidence studies when sales taxes are applied only to the uses of income, the incidence determined here is

TABLE VI-2

TAXABLE CONSUMPTION BY INCOME BRACKETS, OKLAHOMA, 1973

Income Bracket (dollars)	Original Taxable Consumption (000) (1)	Taxable Consumption Incl. in New Construction Assumption A (000) (2)	Total Taxable Consumption (A)(000)(3)	Average Taxable Consumption (4)	Two Per Cent Sales Tax of Col. 4 (5)	Traditional Tax Incidence as Per cent of BTAT Income (6)
Under 3,000	$ 387,266	$ 11,040	$ 398,306	$ 1,943	$ 38.9	1.57
3,000 - 3,999	198,716	5,888	204,604	2,833	56.7	1.32
4,000 - 4,999	163,215	4,462	167,677	3,005	60.1	1.10
5,000 - 5,999	146,985	4,166	151,151	3,396	67.9	1.02
6,000 - 6,999	199,023	10,190	209,213	4,018	80.4	1.04
7,000 - 7,999	204,990	15,234	220,224	4,620	92.4	1.03
8,000 - 9,999	418,002	29,906	447,908	4,832	96.6	.91
10,000 -14,999	951,027	41,758	992,785	5,773	115.5	.80
15,000 -24,999	1,008,237	93,926	1,102,163	8,066	161.3	.74
25,000 & over	451,083	83,430	534,513	12,917	258.3	.53
Total (or average)	$4,128,544	$300,000	$4,428,544*	$4,814	$96.3	.82

*Taxable consumption of $4,428.5 million with a 2.0 per cent tax rate yields $88,570,880 in sales tax revenue, representing 76.03 per cent of Oklahoma's total sales tax receipts in 1973.

(1) Estimates of total taxable consumption by income group in Appendix Table A-2, Line 16.
(2) Table VI-1, Column 5.

consistently regressive, with the lower income classes, which have a greater percentage of taxable consumption, bearing a heavier burden than those with higher incomes. Incidence ranges from 1.57 per cent for those with money incomes of $3000 or less to .53 per cent for those with incomes above $25,000. Average incidence for the family unit in Oklahoma was .82 per cent, which is, of course, the same regardless of whether it is determined on the sources or uses side of the income equation. How the sales tax burdens individual households, however, is significantly different depending on which incidence method is used. This is especially true for the lower-income brackets.

Sales Tax Burden Expressed on Sources Side

Theoretical tax incidence of the ith individual, as proposed by Browning's model in Chapter II is

$$dI_i/I_i = f_i \, dP_L + g_i \, dP_k + h_i \, dT_i - [a_i \, dP_x + (1 - a_i) \, dP_y]$$

This expresses the change in an individual's income because of a tax as a combination of the effects upon the sources and uses of income. Browning, however, was concerned primarily with the effect of a sales tax upon the sources side of the income equation. Since the uses portion of the income equation (in brackets) is only meaningful when a household's consumption pattern differs from the average, Browning believed the "uses effect" to be negligible.

Sources-only Approach

Browning assumed there was no change in the real value of transfers when a tax was imposed, so the ultimate procedure was to estimate

the burden of a tax as a percentage of factor income. The $88,570,880
in sales taxes paid by Oklahoma households in 1973 represented 0.935
per cent of total factor income as estimated in Table V-3. By applying
this percentage to factor income for each income bracket, an estimate
of average sales taxes paid by members of the ten income groups can be
made. If these tax payments are then related to before-tax, after-
transfer income, tax incidence for each income group can be estimated.
(See Table VI-3.) The income base used here (Line 17 of Table V-3) ex-
cludes any taxes on the sources side, although the income base used by
Browning included the effect of these taxes. Actually, using an income
base with sales taxes included causes a difference in tax incidence of
only .02 per cent at the most--compared to the BTAT income measure used.
Unless capital taxes on the sources side can also be imputed, there is
little effect on incidence patterns.[4]

The result of this exercise shows a consistently progressive
tax trend--with sales tax incidence ranging from .42 per cent for those
with money income of $3000 or less, where an average family unit bears
a true tax burden of only $10 per year, to an incidence of .89 per cent
for those family units having money income of $25,000 or more. The ef-
fective tax burden increases regularly as taxable income increases. Be-
cause of the small monetary figures involved, however, whether there
is a noticeable difference in the sales tax burden among income classes
is questionable.

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[4]Chapter V, "Selection of Alternative Income Bases," discusses
the problems involved in imputing indirect taxes and presents the argu-
ments for the BTAT income measure chosen.

TABLE VI-3

INDIVIDUAL SALES TAXES* AND INCIDENCE WHEN

APPLIED TO SOURCES-OF-INCOME, OKLAHOMA, 1973

Income Bracket (dollars)	Factor Income (1)	Average Sales Taxes Paid (2)	BTAT Income (3)	Tax Incidence (4)
Under 3,000	$ 1,107	$ 10.4	$ 2,473	.42
3,000- 3,999	2,387	22.3	4,297	.52
4,000- 4,999	3,785	35.4	5,456	.65
5,000- 5,999	5,033	47.1	6,636	.71
6,000- 6,999	6,210	58.1	7,762	.75
7,000- 7,999	7,519	70.3	8,981	.78
8,000- 9,999	9,136	85.5	10,591	.81
10,000-14,999	13,307	124.5	14,411	.86
15,000-24,999	20,648	193.1	21,810	.89
25,000 and over	46,562	435.5	48,674	.89
Average	$10,293	$96.3	$11,710	.82

*Assumes sales taxes paid by individuals in 1973 totaled $88,570,880 (76.03 per cent of total sales tax revenue), with remainder either paid by business or exported.

(1) Table V-3, Line 12.
(2) Estimated on sources of income side - with total sales taxes paid by individuals representing .00935 of factor income.
(3) Table V-3, Line 17.

Incorporating Uses Effects into Browning's Model

A principal reason why sales tax incidence is so different depend-
ing on whether it is computed using Browning's sources-of-income model
or the traditional method based on the uses of income is that taxable
consumption (the basis for establishing the amount of sales taxes paid
with the uses procedure) accounts for a much larger percentage of BTAT
income for those in the lower income brackets, as compared to those with
higher incomes. For example, taxable consumption for those family units
with less than $3000 in money income represented 78.6 per cent of the
before-tax, after-transfers (BTAT) income measure, but only 26.5 per
cent for those units with money incomes of $25,000 or more. The aver-
age taxable consumption to income figure for Oklahoma in 1973 was 41.1
per cent.

To compensate for this difference in consumption patterns and
to adjust for the fact that the prices of goods and services subject
to the sales tax are probably higher relative to the prices of non-tax-
able goods and services, Browning developed a method to include the uses-
of-income effect in his sources-oriented incidence determination. The
idea is that for those family units which consume the average amount
of goods and services affected by the sales tax, it will make no dif-
ference whether sales tax incidence determination is made on the sources
or uses side of the income equation. For the household with average
consumption, the uses burden is zero. As was detailed earlier, the $88.6
million representing Oklahoma's sales tax collections from individuals
in 1973 can be viewed as a .82 per cent burden on total BTAT income when
traditional uses-of-income incidence method is applied. This is the

same as a 0.935 per cent burden on factor income, which is .879 of total BTAT income.

The $88,570,880 in sales tax collections is 2.0 per cent of taxable consumption, (the state sales tax rate in Oklahoma). By using this percentage and the .411 percentage of total BTAT income that reflects consumption on which the sales tax is applied, the price changes that would occur in taxable and non-taxable consumption following the imposition of a sales tax can be estimated. Implied in this procedure is the assumption that all income is either consumed or saved, and that no dissaving (or consuming more than BTAT income) occurs. As long as dissaving does not exist, not only the price of non-taxable goods, but the price of savings, will reflect any tax-induced change in the price of taxed goods. As Browning and Johnson describe, the "'price' of saving can best be conceptualized as the present cost of future consumption."[5] This change is revealed by fluctuations in the interest rate.

Identifying the change in price of taxable goods occuring because of the imposition of a sales tax as dP_t and the change in the price of nontaxable goods as dP_n, the following two equations can be used to ascertain these price changes.

(1) $.4111 \, dP_t + .5889 \, dP_n = 0$

(2) $dP_t - dP_n = .02$

The first equation reflects the assumption that there is no overall change in the price level, following the imposition of a sales tax. Thus, any

[5]Edgar K. Browning and William R. Johnson, The Distribution of the Tax Burden (Washington, D.C.: American Enterprise Institute for Public Policy Research, 1979), p. 74.

change in prices occurring for taxable consumption, representing .4111
of BTAT income will be counteracted by a compatible change in the price
of non-taxable goods. For society as a whole, there is no net burden
on the uses side. Equation (2) reflects the actual burden of the sales
tax when computed on the uses-of-income side as a percentage of taxable
consumption. Sales taxes are assumed to increase the price of taxable
goods relative to the price of non-taxable goods by 2.0 per cent. By
solving for these two equations, using BTAT income (not including any
taxes implied on the sources side), the two unknowns can be determined.

$$dP_t = .0118 \qquad dP_n = -.0082$$

These two price changes and the percentage that taxable consump-
tion is of total BTAT income (representing "a" in the Browning equation)
can be incorporated into Browning's incidence equation in order to deter-
mine a uses effect for the sales tax. Recall the equation of Chapter II
indicating the change in income (incidence) occurring because of a sales
tax.

$$dI_i/I_i = f_i \, dP_L + g_i \, dP_k + h_i \, dT_i - [a_i \, dP_t + (1 - a_i) \, dP_n]$$

The first part of the equation, representing the sources-of-income side,
is obtained (as described previously) by multiplying the percentage of
factor income for each income group by the effective tax rate as applied
to the sources-of-income side (.935 per cent). This is assuming the
value of real transfer income is not affected by the imposition of a
sales tax. The result provides sales tax incidence when computed on
the sources side. (Table VI-3, Column 4.)

The uses-of-income tax effect is reflected in the portion of

the equation in brackets. By inserting the values for dP_t and dP_n obtained above and by using the percentage of taxable consumption for each income group for "a," the uses burden of the sales tax can be obtained. For the lowest income bracket, a_i, the percentage taxable consumption is of BTAT income is .786. Thus

$$\text{Uses burden} = a_i \, dP_t + (1 - a_i) \, dP_n$$

$$= .786 \, (.0118) + .214 \, (-.0082)$$

$$= .0093 - .0018$$

Uses burden = .0075

Incidence   = Sources Burden + Uses Burden

Incidence for family units with money income of $3000 or less =

.0042 + .0075

Overall incidence = 1.17 per cent.

The overall incidence, including both sources and uses effects for all income brackets is given in Table VI-4.

By adding the uses burden to the incidence determined on the sources side, the progressiveness of the sales tax shifts, and once again, the incidence for the lower income classes is greater than that of the higher income groups. Actually, if the two income-bracket extremes are excluded from this new estimation, the overall incidence of the sales tax is almost proportional, with only minimal changes occurring between income groups.

Applicability of the Browning Model

A serious question concerning Browning's sources-plus-uses procedure is whether adding the uses burden to the sources computation adequately

TABLE VI-4

COMPUTATION OF USES EFFECTS IN BROWNING'S MODEL

CONSIDERING SALES TAXES PAID BY INDIVIDUALS, OKLAHOMA, 1973

	Taxable Consumption as Per Cent of BTAT Income (1)	Uses Effects (2)	Sources Effects (3)	Tax Incidence: Total Sources and Uses Effects (4)
Under $3,000	78.6	.75	.42	1.17
$3,000– 3,999	65.9	.50	.52	1.02
$4,000– 4,999	55.1	.28	.65	.93
$5,000– 5,999	51.2	.20	.71	.91
$6,000– 6,999	51.8	.21	.75	.96
$7,000– 7,999	51.4	.20	.78	.98
$8,000– 9,999	45.6	.09	.81	.90
$10,000–14,999	40.1	–.02	.86	.84
$15,000–24,999	37.0	–.08	.89	.81
$25,000 and over	26.5	–.29	.89	.60
Average	41.1	0	.82	.82

SOURCE: Edgar K. Browning, "The Burden of Taxation," Journal of Political Economy 86 (August, 1978): 649–671.

(1) Average taxable consumption, Table VI-2, Column 4 divided by BTAT income, Table V-3, Line 17.

(2) Obtained by solving the uses part of Browning's equation,

$$- a_i dP_t + (1 - a_i) dP_n$$, where a_i is the percentage in column 1, $dP_t = .011779$, and $(dP_n = -.008221)$.

(3) Table VI-3, Column 4.

accounts for the consumption-savings differences between income groups.
By applying the tax rate only to the consumption of taxable goods, no
recognition is made of the fact that some families actually dissave and
consume more than their income. Moreover, in this study, savings and
non-taxed consumption have been lumped together, and the computation
of the price changes used to determine the uses portion of tax incidence
showed no distinction between the two non-taxed expenditures. (It seems
unlikely that when compared to the supposed price increase for taxed
goods, the price effect of non-taxed goods is the same as the price effect
on savings.) When it is also recognized that the very miniscule price
changes computed can, when applied to average taxable and non-taxable
income, affect whether tax incidence is regressive or progressive, the
validity of the entire exercise must be questioned.

It was this difficulty in accounting for the consumption-savings
differences that made Browning and Johnson discount these price differ-
ences and advocate determining tax incidence using only the sources side
of the income equation. They argued that if time periods were not limited
to a year, and if a concept of permanent income could be measured and
used as a base, there would be little difference in the consumption-
savings ratios between income classes. Moreover, when the burden of
all taxes is considered, the benefit of savings over consumption that
is innate to the sales tax will be counteracted by other taxes. Both
the corporation income tax and property tax, for example, tend to penal-
ize savings compared to consumption.

Browning also ignored the uses side because it represented only
a small change in incidence when added to the sources-of-income figures.

This was the situation in his study where sales and excise taxes represented 5.1 per cent of total income or a 6.2 per cent rate on factor earnings. In this study, however, general retail sales taxes paid by individuals in Oklahoma represented only 0.82 per cent of total income or 0.935 per cent of factor income. The resulting tax burden using the sources side computation is small in and of itself. The small uses effect that is added to the sources burden therefore represents a proportionally much greater change.

In addition to these limitations, there is the question of the applicability of Browning's sources-oriented incidence analysis for an individual state study. (This topic was discussed in Chapter III.) Browning's hypothesis that it could be assumed that the sales tax was shifted backwards and affected only factors of income (excluding transfer payments) has little bearing when statewide transfers, which might be tied to the tax, represent such a small portion of income for any one income group. Moreover, when the uses-side variations are added in Browning's model, (as was done in the previous section), the resulting incidence pattern does not differ significantly from incidence obtained using the traditional method.

In fact, as Table VI-5 shows, if Browning's model is applied on the sources side upon income excluding only state transfers, a practically proportional incidence results when the sources-only assumption is made; and when the sources-plus-uses effects are combined, the result is almost identical to the traditional pattern in Column 6 of Table VI-2. With the exception of the lowest two income groups, where incidence using the two methods differs by .07 and .03, the tax incidence for the other

TABLE VI-5

TAX INCIDENCE USING SOURCES-PLUS-USES MODEL, IF ONLY

STATE TRANSFERS UNAFFECTED BY SALES TAXES*, OKLAHOMA, 1973

Income Bracket (dollars)	Average State-Provided Transfer Income (1)	Total Oklahoma Transfer Income (000) (2)	Average BTAT Income Excluding Oklahoma Transfers (3)	Taxes Paid (4)	Tax Incidence	
					Sources only-as Per Cent of BTAT Income (5)	Sources- Plus - Uses Effect (6)
Under 3,000	$240	$49,202.6	$ 2,233	$ 18.5	.75	1.50
3,000- 3,999	200	14,446.8	4,097	34.0	.79	1.29
4,000- 4,999	133	7,421.4	5,323	44.1	.81	1.09
5,000- 5,999	59	2,626.3	6,577	54.5	.82	1.02
6,000- 6,999	48	2,499.5	7,714	63.9	.82	1.03
7,000- 7,999	56	2,669.6	8,925	74.0	.82	1.02
8,000- 9,999	33	3,059.2	10,558	87.5	.83	.92
10,000-14,999	13	2,235.7	14,398	119.3	.83	.81
15,000-24,999	6	819.8	21,804	180.7	.83	.75
25,000 and over	8	331.0	48,666	403.3	.83	.54
Average (or total)	$93	$85,311.9	$11,617	$96.3	.82	.82

*Browning based his sources-only tax incidence analysis on the idea that transfer income did not bear the burden of a sales tax, since transfers often increased with the price level. Thus, he determined incidence according to factor income. In a single state, however, only state-provided transfers might not bear the burden of a sales tax, so here, the sources side analysis means that tax burden is estimated by computing taxes according to factor and other non-Oklahoma transfer income.

(4) Sales taxes paid by individuals in Oklahoma are .008287 of this income source (factor plus non-Oklahoma transfer income).

(6) Equals sources in Column 5 plus uses effects from Table VI-4, Column 2.

income groups varies by only .01. As a result, Browning's hypothesis—though interesting—has little bearing in a state incidence analysis.

Personal Income Tax Offset

An additional consideration when estimating overall sales tax incidence is the effect that the federal tax offset has on consumers. As discussed earlier, all taxpayers who itemize deductions can include a deduction for sales tax payments when computing taxable income for federal income tax purposes. Although it might be argued that the burden of sales tax payments is considered in the establishment of the standard deduction used most often by lower income groups in determining federal tax obligations, the benefit from the federal tax offset is not realized unless deductions are itemized when filing the personal income tax return.

The amount of sales tax deducted is generally obtained from the tax table provided for each state and varies according to income and the number of persons in the household unit. The sales tax deduction reduces taxable income, and obviously, the higher the taxable income, the more important is the tax deduction. Moreover, since more families with higher incomes itemize deductions, the offset generally increases the regressive incidence pattern of the sales tax.

In order to calculate the effect of the offset on the incidence of the household portion of the sales tax, the procedure developed by Musgrave and Daicoff is used. For each income bracket, an estimate of average taxable income is made, recognizing that certain forms of money income, including dividend exclusions and most transfer payments, are not taxed by the Internal Revenue Service. In addition, personal

exemptions of $750 per individual vary according to the average family
size of each income bracket. The resulting figure is used to determine
the marginal tax rate for each income group. This tax rate is then multi
plied by the per cent in each income group itemizing deductions (these
percentages were actually those for all individual returns in the United
States in 1973) in order to provide an average effect representing tax
deductions as a percentage of income. (Table VI-6, Column 3.)

Applying the average effect of deductions to the actual amount
of sales taxes that can be deducted for each income group according to
the tax table for Oklahoma gives an average dollar amount representing
the sales tax offset. By dividing the actual dollar amounts gained,
because of the availability of the offset, by the BTAT income for each
income bracket, offsets can be depicted as a reduction in effective in-
cidence. (These computations are shown in Table VI-7.)

The resulting negative incidence reflecting the federal offset
is added to the traditional incidence figures in Table VI-8 and thus
provides a more realistic estimate of the incidence of the household
portion of the sales tax in Oklahoma in 1973. With the exception of
the two lowest income brackets, which receive no benefit from the off-
set as presently calculated, the offset represents a reduction in the
overall tax burden, and the effective incidence for all other income
brackets is less. Because households with higher incomes both itemize
deductions to a greater extent and have a higher marginal tax rate than
lower-income households, the negative incidence reflecting the benefits
of the offset is greater for the higher income groups. The overall re-
sult is that the incidence of the household portion of the sales tax

TABLE VI-6

TAX RETURNS WITH ITEMIZED DEDUCTIONS, MARGINAL TAX

RATES, AND EFFECT OF STATE TAX DEDUCTIONS ON INCOME,

UNITED STATES, 1973, BY INCOME BRACKET

Income Bracket (dollars)	Per Cent Tax Returns with Itemized Deductions (1)	Average Marginal Tax Rate within Income Bracket (per cent) (2)	Effect of Deductions of State and Local Taxes (3)
Under 3,000	1.8	0	0
3,000- 3,999	8.2	0	0
4,000- 4,999	12.4	14	1.74
5,000- 5,999	17.1	15	2.57
6,000- 6,999	23.8	16	3.81
7,000- 7,999	27.9	17	4.74
8,000- 9,999	37.2	19	7.07
10,000-14,999	48.8	19	9.27
15,000-24,999	72.5	25	18.13
25,000 and over	89.9	39	35.06
Average	34.8	19	6.61

SOURCE: Internal Revenue Service, Individual Returns, 1973 (Washington, D.C.: 1975), pp. 14, 17.

(3) Equals Column 1 times Column 2.

TABLE VI-7

EFFECT OF FEDERAL TAX OFFSET ON SALES

TAX INCIDENCE, OKLAHOMA, 1973

Income Bracket (dollars)	BTAT Income (1)	Effect of Deductions on Income (2)	Amount of Sales Tax Deducted (3)	Effective Tax Offset (4)	Tax Incidence of Offset as Per Cent of BTAT Income (5)	Total Tax Burden Borne By Government (6)
Under $3,000	$ 2,473	0	$ 29	$0	0	$ 0
3,000- 3,999	4,297	0	37	0	0	0
4,000- 4,999	5,456	1.74	44	0.8	-.01	42,720
5,000- 5,999	6,636	2.57	58	1.5	-.02	66,353
6,000- 6,999	7,762	3.81	64	2.4	-.03	126,975
7,000- 7,999	8,981	4.74	70	3.3	-.04	158,176
8,000- 9,999	10,591	7.07	79 .	5.6	-.05	517,780
10,000-14,999	14,411	9.27	97	. 9.0	-.06	1,546,391
15,000-24,999	21,810	18.13	125	22.7	-.10	3,096,513
25,000 and over	48,674	35.06	183	64.2	-.13	2,654,933
Average (or total)	$11,710		$ 82	$8.9	-.08	$8,209,841

(1) Table V-3, Line 17.
(2) Table VI-6, Column 3.
(3) Based on Internal Revenue Service, 1973 Federal Income Tax Sales Tax Tables for Oklahoma and estimates of average taxable income and size of household per income bracket.
(4) Column 2 (expressed as a per cent) times Column 3.
(5) Column 4 divided by Column 1.
(6) Column 4 times Oklahoma's distribution of consumer units by income bracket.

TABLE VI-8

TRADITIONAL TAX INCIDENCE OF THE

HOUSEHOLD SECTOR OF SALES TAX, INCLUDING

EFFECT OF THE FEDERAL OFFSET: OKLAHOMA, 1973

Income Group	Traditional Tax Incidence (1)	Tax Incidence of Offset (2)	Average Incidence of Household Sector of Sales Tax (3)
Under $3,000	1.57	0	1.57
$3,000- 3,999	1.32	0	1.32
$4,000- 4,999	1.10	-.01	1.09
$5,000- 5,999	1.02	-.02	1.00
$6,000- 6,999	1.04	-.03	1.01
$7,000- 7,999	1.03	-.04	.99
$8,000- 9,999	.91	-.05	.86
$10,000-14,999	.80	-.06	.74
$15,000-24,999	.74	-.10	.64
$25,000 and over	.53	-.13	.40
Average	.822	-.08	.74

(1) From Table VI-2, Column 6.
(2) From Table VI-7, Column 5.

using the traditional procedure is even more regressive than before, with the burden of the lowest income group being almost four times greater than that of the highest group.

The total tax burden of consumers that is effectively borne by the federal government through the use of the personal offset was $8.2 million in 1973, representing 9.3 per cent of Oklahoma's sales tax receipts from households. (See Table VI-7, Column 6.) When this consumer offset is added to the federal offset provided for the sales taxes paid by business, as described later in this chapter, it is recognized that the federal government actually bears a substantial portion of the total tax burden. Although it can be argued that it is the individual or business concern which actually pays the sales tax, and thus a reduction in individual incidence cannot occur, if the offset did not exist, Oklahomans would have paid much more to the federal government in individual and corporate income taxes.

Incidence of Sales Taxes Paid by Businesses

Although Oklahoma sales taxes assumed to be shifted forward and paid by households comprise more than three-fourths of Oklahoma sales tax revenue and reveal a traditional regressive incidence pattern, the portion of sales taxes paid by businesses can alter final incidence patterns. The actual burden to individual households of the business portion of the sales tax depends to a great extent on the incidence assumptions made. This analysis of business taxes could constitute a separate study, but for present purposes, an attempt to incorporate the business sector in a realistic--yet simple--manner will be made.

The business portion of the sales tax basically represents a cost-tax burden. Depending on the position of each business in its specific market, the taxes can be either shifted forward to consumers, shifted backwards to the factors of production, or absorbed by the business in the form of reduced profits. Moreover, a portion of the Oklahoma sales taxes paid by business can be exported to other states--either to consumers or shareholders, especially by those firms with a national market.

As explained in Chapter III, because of the lack of data, the allocation of the incidence of the business portion of the sales tax is at best uncertain. However, it will be shown by applying various shifting assumptions, that the overall incidence pattern of the sales tax will not change significantly, regardless of the shifting assumptions used.

At present, the breakdown of the source of Oklahoma's sales tax revenue in 1973 is as follows (in thousands of dollars).

Total Sales Tax Revenue	$116,494.3
Household Sector	88,570.9
Exported to Tourists	1,380.0
Business Portion	26,543.4

Because of the structure of Oklahoma's sales tax base and the items that are taxable, it is assumed that all businesses pay a certain amount in sales tax, regardless of the industry involved or whether the business is a corporation, sole proprietorship or partnership.[7] It is also assumed

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[7]Admittedly, the taxes on such items as oil field equipment mean that a greater proportion of sales taxes are borne by purchasing firms, but at present, this problem shall be ignored.

that all business concerns would keep a record of the sales taxes paid,

include these taxes as business deductions in determining taxable income

for corporate or personal income tax determination, and thus obtain the

benefit of a federal offset. The marginal tax rate differs for corpora-

tions and business proprietors and partners. Using the national average

that 85.0 per cent of business receipts are provided by corporations,

the business portion of Oklahoma's sales tax revenue is divided between

the two types of business organizations and the relevant marginal tax

rate is applied. The results, given in Table VI-9, show that $12.1 million

or 45.4 per cent of the business portion of the sales tax in Oklahoma

will be shifted to the federal government via the offset, and $14.5 mil-

lion must be allocated elsewhere.

The allocation of this $14.5 million will initially be made fol-

lowing, in a general manner, McLure's procedure described in his 1967

article on the interstate exporting of taxes.[8] First of all, the non-

offset business portion of the sales taxes will be distributed among

major non-government industries using the percentages that the income

of these industries is of total private personal income in Oklahoma in

1973. (See Table VI-10.) Although government provided 21.1 per cent

of Oklahoma's personal income in 1973, (a larger proportion than in the

United States as a whole), the allocation of the sales tax payments ex-

clude the government sector, since in most cases, government agencies

are exempt from the payment of the sales tax.

Adhering to McLure's opinion, it is assumed that production or

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[8]Charles E. McLure, Jr., "The Interstate Exporting of State and
Local Taxes: Estimates for 1962," National Tax Journal 20 (March, 1967):
56-60.

TABLE VI-9

FEDERAL OFFSET PAID BY BUSINESS SECTOR AND

TOTAL FEDERAL OFFSET RESULTING FROM SALES TAX DEDUCTIONS

OKLAHOMA, 1973

	Corporations	Single Proprietors and Partnerships
Percent of Business Recepits	85	15
Sales Taxes Paid[1]	$22,561,890	$3,981,510
Marginal Tax Rate[2]	48	31
Taxes Offset	$10,829,707	$1,234,268
Taxes to be Shifted	$11,732,183	$2,747,242

Total Business Taxes (excluding
  offset) to be allocated $14,479,425

Federal Offset from Sales Taxes in Oklahoma

Business Portion $12,063,975 = 45.4 per cent of sales taxes paid by
                                                            business
Personal Portion[3]   8,209,841

    Total $20,273,816 = 17.4 percent of all tax revenue

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[1]Total sales taxes in Oklahoma assumed to be paid by business
sector = $26,543,400.

[2]Appendix Table A-6 shows the derivation of the marginal tax rate
for single proprietors and partnerships.

[3]Table VI-7, Column 6.

TABLE VI-10

PERSONAL INCOME BY MAJOR SOURCES IN OKLAHOMA

AND DISTRIBUTION OF SALES TAX BURDEN, 1973

Income by Industry	Amount (millions of dollars) (1)	Per Cent of Non-Gov't. Income (2)	Business Sales Taxes Allocated According to Industry Income (000)(3)	Portion Borne Locally (4)(000)
Total	$8,698.1	100.0	$14,479	$10,335
Farm	801.1	11.7	1,694	753[a]
Non-Farm	7,897.0			
Private	6,058.8	88.3		
Manufacturing	1,466.6	21.4	3,099	620[b]
Mining	417.3	6.1	883	159[a]
Construction	511.2	7.5	1,086	1,086
Wholesale and Retail Trade	1,401.9	20.4	2,954	2,954
Finance, Insurance, Real Estate	406.9	5.9	854	854
Transportation, Communications, Public Utilities	680.6	9.9	1,433	1,433
Services	1,143.9	16.7	2,418	2,418
Other	30.4	0.4	58	58
Government	1,838.1			

SOURCE: University of Oklahoma, Center for Economic and Management Research, Statistical Abstract of Oklahoma, 1979.

[a]This reflects the difference between Oklahoma and U.S. income provided by these sectors.

[b]Assumption is that 20.0 per cent of the sales taxes paid by manufacturing is borne locally. See text.

cost taxes on purely local activities are borne by consumers; and for lack of other information, it is assumed that firms engaged in construction, trade, finance, transportation, communications, public utilities, and service activities serve local markets. Once the federal offset is deducted, the sales taxes borne by these industries are assumed to be shifted to local consumers and shall be allocated according to the percentage of total consumption for each income group.

Taxes paid by the remaining industrial categories: agriculture, mining, and manufacturing, must be borne either locally or exported outside of Okalhoma. McLure estimated that 22.5 per cent of Oklahoma's manufacturing in 1958 was for local markets. Since Oklahoma's manufacturing sector between 1958 and 1973 increased in relation to the nation (although the proportion of 1973 manufacturing to overall income in Oklahoma was still only two-thirds of the national average), it shall be assumed that only 20.0 per cent of sales taxes paid by manufacturers was borne locally. For agriculture and mining, the distribution between local and national markets is determined according to the portion of income produced by these sectors in Oklahoma compared to the national distribution. (See Table VI-10, Column 4.)

The result of this exercise is that $10.3 million of the business portion of the sales tax is assumed to be borne by industries that primarily serve a local market. Since consumers have little choice in the consumption of locally-produced goods (all of which bear any implied sales tax), it is assumed that the portion of business taxes paid by these industries is shifted to local consumers and is allocated according to total consumption expenditures. This distribution differs from

that of taxable consumption expenses that was derived earlier in order
to determine incidence of the household sector of the sales tax in the
traditional manner. Since the business taxes are in effect "hidden"
in the cost of all goods and services, the tax base defined by the tax
statutes is no longer applicable. Thus, the distribution of total con-
sumption expenditures provides a better allocation. Although paid by
consumers, the personal federal offset cannot be applied to this portion
or the tax.

The remaining $4,144,000 in business taxes is supposedly borne
by transactions of Oklahoma business in a national setting. If these
businesses dominated their respective industries nationally, it is as-
sumed that, as with local industries, the cost tax would take the form
of higher prices, and thus be shifted to consumers. Since the consumers,
however, were outside of Oklahoma, the effect of this shifting would
be an exportation of the tax burden.

Although Oklahoma is a leader in the production of petroleum
and natural gas and has a large agricultural base, no one firm or group
of firms in either of these industries or in the manufacturing sector
dominates the national market to such an extent that it can increase
the price of its product in order to shift the sales tax that it pays.
Likewise, the selling price of the goods provided to the national market
would not change were the Oklahoma sales tax eliminated. As a result,
it seems reasonable to assume that the sales tax paid by those businesses
serving a national market either are shifted backwards to the factors
of production or absorbed by business profits. Profits, of course, can
only be reduced if a firm is making profits in the first place, and for

a competitive firm, economic profits do not exist. However, it is pos-
sible that the return on invested capital can be reduced, and thus, in
this manner, a cost tax (representing a business payment of the sales
tax) would be shifted to capital.

In McLure's opinion the sales tax paid by business with non-
dominated national markets would be borne in the short run entirely by
profits.[9] Capital, however, is more mobile than land or labor, so in
the long run, 60 per cent of the tax is assumed to be shifted to land
and labor, with the remaining 40 per cent allocated to profits. It is
the long-run situation that is important in incidence analysis, and since
the actual amount of sales taxes shifted backwards is relatively small,
a simple 50-50 allocation between labor and profits shall be made. This
estimate, combined with the consumer-shifted distribution in Table VI-11
constitutes Business Assumption A.

Assuming one-half of the backwards-shifted portion of the sales
tax paid by business is borne by profits or owners, $2,072,000 will be
distributed in the same way as dividends received as income by the various
income brackets. The remaining $2,072,000 assumed shifted to labor will
be allocated according to gross wage distribution. After combining the
three parts involved in the shifting of the business portion of the sales
tax, the average tax burden and the incidence for the ten income groups
is determined. The incidence pattern resulting from this exercise (Table
VI-11, Column 6) is still regressive, although the minimal variations
between income groups are not significant. In fact, when the two lowest and
the highest income brackets are removed, the result is basically proportional.

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[9]McLure, "Interstate Exporting," p. 57.

TABLE VI-11

ALLOCATION OF BUSINESS PORTION OF SALES TAX,

ASSUMPTION A,* OKLAHOMA, 1973

Income Bracket (dollars)	Portion to Local Consumer (000) (1)	Portion Shifted Backwards (000)		Burden of Business Portion		Incidence (6)
		To Owner (2)	To Labor (3)	Total (000) (4)	Average (5)	
Under 3,000	$ 950.8	$ 18.6	$ 27.0	$ 996.4	$ 4.86	.20
3,000- 3,999	459.9	60.1	26.8	546.8	7.57	.18
4,000- 4,999	390.7	24.9	43.5	459.1	8.23	.15
5,000- 5,999	358.6	22.8	47.7	429.1	9.64	.15
6,000- 6,999	499.2	58.0	66.3	623.5	11.97	.15
7,000- 7,999	496.1	53.9	78.7	628.7	13.19	.15
8,000- 9,999	1,052.1	109.8	190.6	1,352.5	14.59	.14
10,000-14,999	2,439.1	190.6	549.1	3,178.8	18.48	.13
15,000-24,999	2,564.1	532.5	683.8	3,780.4	27.67	.13
25,000 and over	1,124.4	1,000.8	358.5	2,483.7	60.02	.12
Average or total	$10,335.0	$2,072.0	$2,072.0	$14,479.0	$15.74	.13

*The business portion shifted to local consumers is allocated according to current consumption (Appendix Table A-7); the remainder is shifted backwards: one-half allocated to owners according to the distribution of dividends (Appendix Table A-8), and one-half is allocated to labor and distributed according to wages (Appendix Table A-9). It is assumed that $12,063,975 of the business portion of the sales tax is borne by the federal government through the offset.

The preceding allocation of the business portion of the sales tax does not export any taxes to residents of other states. Although the portion shifted backwards to profits could be exported in that stockholders of Oklahoma companies are residents of other states, the amount is so small that it would make little difference in the actual incidence pattern developed. Moreover, it can be assumed that since almost all other states in the union have sales taxes which are likewise exported, Oklahoma residents will probably pay a similar percentage of sales taxes from other states. Thus, the portion of Oklahoma business taxes exported elsewhere shall be ignored.

Nevertheless, in addition to Business Assumption A just presented, other assumptions concerning the burden of the sales tax paid by business can be made. Musgrave and Daicoff, for example, when estimating the incidence of the business portion of the sales tax, assumed that the federal offset could be computed only for that portion of taxes paid that remained unshifted. Following their procedure[10] in allocating cost-tax burdens, it is estimated that approximately one-third of the $26.5 million in sales taxes assumed to be paid by businesses in Oklahoma is eventually shifted to the consumer. These taxes, ($8,847,800), distributed among income groups based on the percentage of total consumption for each income group, are calculated in Table VI-12, Column 1. (The distribution of total consumption is given in Table A-7 in the Appendix.)

To allocate the $17,695,600 in business sales taxes assumed to be borne by reduced profits, two assumptions must be made. First of

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[10]Richard A. Musgrave and Darwin W. Diacoff, "Who Pays the Michigan Taxes?" in Michigan Tax Study: Staff Papers (Lansing, Michigan, 1958): 170-172.

TABLE VI-12

INCIDENCE ALLOCATION OF BUSINESS PORTION

OF SALES TAX, ASSUMPTION B*, OKLAHOMA, 1973

Income Bracket (dollars)	Total Business Taxes Shifted to Consumers (1) (000)	Total Business Taxes Borne by Profits (2) (000)	Burden of Business Portion Assumption B		
			Total (000) (3)	Average (4)	Incidence (5)
Under 3,000	$ 814.0	$ 79.6	$ 893.6	$ 4.36	.18
3,000- 3,999	393.8	256.6	650.4	9.00	.21
4,000- 4,999	334.4	106.2	440.6	7.90	.14
5,000- 5,999	307.0	97.3	404.3	9.08	.14
6,000- 6,999	427.3	247.7	675.0	12.96	.17
7,000- 7,999	424.7	230.0	654.7	13.73	.15
8,000- 9,999	900.7	468.9	1,369.6	14.77	.14
10,000-14,999	2,088.1	814.0	2,902.1	16.88	.12
15,000-24,999	2,195.1	2,273.9	4,469.0	32.71	.15
25,000 and over	962.6	4,273.6	5,236.2	126.54	.26
Total or Average	$8,847.8	$8,847.8	$17,695.6	$19.23	.16

*Following Musgrave's and Daicoff's procedure, Assumption B assumes one-third of the $26,543,400 business sector or $8,847,800 is borne by the federal government through offset.

(1) One-third of business portion of sales tax allocated to consumers according to the distribution of total consumption in Table A-7, Column 3.
(2) Distributed according to proportion of dividends received by income bracket, Table A-8, Column 3.

all, since these taxes represent a business cost, they can be deducted from taxable earnings when computing the federal corporate income tax liability. Assuming an average marginal rate for corporate income of 50 per cent, (this simplification is higher than actual), the federal offset then is $8,847,800. The second assumption affects the distribution of the remaining equal amount. In that this portion of business sales taxes cannot be shifted, business profits will be lower, thereby reducing the income of the owners of business. Since dividends traditionally reflect earnings on business holdings, it is assumed that the remaining $8,847,800 in sales tax revenue is distributed among income groups in the same manner as the distribution of dividend income. (Table VI-12, Column 2 gives the tax amounts based on the dividend distribution provided in Table A-8 in the Appendix.)

The average amount of the business portion of the sales tax paid is estimated according to income groups in Column 4 of Table VI-12. The tax ranges from an additional $4 for the lowest income bracket to $127 for the highest group. In terms of incidence, the business sales tax adds a burden of .16 per cent to the average household in Oklahoma. The two lowest groups, however, experience a slightly greater burden because of the allocation of one-third of the business tax according to the distribution of total consumption, which represents a higher proportion of income for lower income groups.

In contrast, the allocation of a third of the business sales taxes according to dividend distribution increases the tax burden borne primarily by those households with incomes of $25,000 or more. (This income bracket has an incidence of .26 per cent.) The overall effect on

incidence from allocating the burden of the sales taxes paid by business, however, is minimal. Except for the highest income group, the additional tax burden is almost proportional.

A third method of allocating the business portion of the sales tax (Assumption C) is to simply assume that one-half of the tax is borne by consumers and allocated according to total consumption, one-fourth is shifted backwards to labor and allocated according to gross wages, and one-fourth is borne by profits and allocated according to dividend distribution. These calculations will be made on the $14,479,425 remaining when the federal offset is assumed to apply to the entire amount of business sales taxes (as was true with Assumption A) in the way depicted in Table VI-9. The incidence obtained by this procedure is shown in Table VI-13 and is practically proportional throughout the income range.

As was true with the other business assumptions, Assumption C does not shift any part of the business sales tax to residents of other states. In other words, outside of the sales tax assumed to be paid by tourists, there is no tax exporting of Oklahoma's state sales tax. McLure's idea concerning the effect of a secondary offset, which reflects a lower income tax burden due to a reduction in taxable income, could be applied when the business portion of the sales tax is shifted backwards. The actual offset amount, however, would be no small, incidence for any one income group would not change by more than .01 per cent. As a result, the secondary offset is not applied to this Oklahoma incidence study.

The total incidence of Oklahoma's sales tax, combining both the

TABLE VI-13

INCIDENCE ALLOCATION OF BUSINESS PORTION OF
SALES TAX, ASSUMPTION C,* OKLAHOMA, 1973

Income Brackets (dollars)	One-Half Distributed by Consumption (1)(000)	One-Fourth Borne by Labor (000) (2)	One-Fourth Borne by Capital (000) (3)	Burden of Business Portion Total (000) (4)	Average (5)	Incidence (6)
Under 3,000	$ 666.1	$ 47.1	$ 32.6	$ 745.8	$ 3.64	.15
3,000- 3,999	322.2	47.1	105.0	474.3	6.57	.15
4,000- 4,999	273.7	76.0	43.4	393.1	7.04	.13
5,000- 5,999	251.2	83.3	39.8	374.3	8.41	.13
6,000- 6,999	349.7	115.8	101.4	566.9	10.89	.14
7,000- 7,999	347.5	137.5	94.1	579.1	12.15	.14
8,000- 9,999	737.0	333.0	191.8	1,261.8	13.61	.13
10,000-14,999	1,708.6	959.2	333.0	3,000.8	17.45	.12
15,000-24,999	1,796.3	1,194.5	930.3	3,921.1	28.70	.13
25,000 and over	787.7	626.2	1,748.3	3,162.2	76.42	.16
Average/Total	$7,240.0	$3,619.7	$3,619.7	$14,479.4	$15.74	.13

*Assumption C is that federal offset is taken initially as in Table VI-9, and the $14,479,425 remaining is allocated one-half, one-fourth, one-fourth to consumers on basis of total consumption; to labor, according to distribution of wages; and to capital, according to distribution of dividends.

incidence of the household portion and the incidence of the business

portion using the three different assumptions, is given in Table VI-14.

Because the federal offset for Assumption B provides a smaller deduction

than for Assumptions A and C, the use of Business Assumption B results

in total sales tax incidence for the average consumer of .90 per cent

of BTAT income, compared to the .87 per cent average using the other

two assumptions. The differences among income groups using the three

assumptions, however, is minimal. In most cases, overall incidence varies

by less than .03 per cent. The largest difference occurs for the in-

come group of $25,000 and over, when incidence, using Assumption B, with

one-third of the business portion assumed to be borne by profits, is

.66 per cent, compared to a .52 per cent incidence average using Assump-

tion A.

No matter what assumptions are used to allocate the business

portion of the sales tax, the incidence pattern remains regressive. In

that the incidence of the business portion is generally proportional,

its addition to the household portion does reduce the regressivity of

the overall sales tax incidence. Whereas the incidence determined in

the traditional manner of the household portion of the sales tax is al-

most four times greater for the lowest compared to the highest income

groups, the addition of the business portion results in an incidence

difference of 3.4 times to 2.65 times between highest and lowest income

groups, depending on the business assumption made.

To summarize, the burden from the state sales tax for the aver-

age family unit in Oklahoma is less than one per cent of BTAT (before

tax-after transfers) income. Even those families in the lowest income

TABLE VI-14

TOTAL INCIDENCE OF OKLAHOMA SALES TAX, 1973

Income Bracket (dollars)	Incidence of Household Sector Including Federal Offset Effect (1)	Incidence Including Business Portion Assumptions		
		A(2)	B(3)	C(4)
Under 3,000	1.57	1.77	1.75	1.72
3,000- 3,999	1.32	1.50	1.53	1.47
4,000- 4,999	1.09	1.24	1.23	1.22
5,000- 5,999	1.00	1.15	1.14	1.13
6,000- 6,999	1.01	1.16	1.18	1.15
7,000- 7,999	.99	1.14	1.14	1.13
8,000- 9,999	.86	1.00	1.00	.99
10,000-14,999	.74	.87	.86	.86
15,000-24,999	.64	.77	.79	.77
25,000 and over	.40	.52	.66	.56
Average	.74	.87	.90	.87

*The federal offset deducted from business portion is $3,216,175 less for Assumption B than for Assumptions A and C.

(1) From Table VI-8, Column 3.

tax bracket bear an overall burden of less than two per cent, the exist-

ing state sales tax rate. Moreover, no matter what assumptions are used

to distribute the household or business portions of the tax, the incidence

pattern remains regressive, though perhaps not to the extent originally

thought by earlier incidence analyses.' For the middle income brackets,

there is almost no difference. Also, it must be recognized that the

incidence assumptions used mean that the federal government actually

bears 17.3 per cent of the state sales tax because of the offset. If

the offset did not exist, the resulting incidence pattern would, in gen-

eral, be less regressive, since those in higher income brackets receive

a greater benefit from the offset.

Limitations of the Incidence Analysis

Although the preceding presentation of the incidence of Oklahoma's

retail sales tax seems quite exact, the limitations and simplifications

embodied in the analysis need to be recognized. The problems related

to Browning's sources-only approach in computing the incidence of the

sales tax have already been stated. The application of the sources-

only theory basically depends on whether transfers vary with consumer

prices. There is also the question of any lag time involved in the ad-

justment. In that the real value of transfers does decline following

the imposition of a tax, the allocation of taxes only to factor income

will understate the tax burden for those income groups receiving a large

portion of total income from transfers.

Moreover, the Browning model, which was originally developed

in terms of a national analysis of a general sales tax, cannot be easily

adapted for an individual state, since the sales tax is not general--and

there is no guarantee that the amount or type of production or the pro-
portion of factor use will not be affected by a tax that applies to only
a portion of the economy. These simplifying assumptions, plus those
of perfect market competition and full employment, are the basic tenants
upon which Browning's general equilibrium model was built. Though no
attempt has been made to adjust for possible changes that a sales tax
may cause in the market structure, it is necessary to realize that tax
effects not reflected by the model could occur.

A problem more related to the practical application of the tradi-
tional, as well as the Browning, model concerns the actual statistics
used. As mentioned earlier, almost all the data used in the study are
estimates. Though these have been based on a certain knowledge of exist-
ing conditions, there is still no guarantee that the numbers assumed
for Oklahoma's population distribution, income, and consumption are ac-
curate. Moreover, the entire incidence analysis has been one of averages.
The burden for each income bracket has been determined according to the
average tax paid by the average family unit. It is unlikely that any
one family is typical of the average in terms of family size, age composi-
tion, source of income, and consumption expenditures.

As has been noted, those families in the lower income brackets
are typically smaller--an average of 1.6 persons per family for those
family units with money incomes under $3000 compared to an average 3.6
to 3.7 person size for those units with annual money incomes of $20,000
or more. The elderly and the young, who are at lower points in their
life-time income cycle, are disproportionately represented in the lower
income brackets. Thus, both family size and age distribution combine

to overemphasize the actual tax burden borne by those in the lower income groups. In that the lower income groups receive a major portion of the basically tax-neutral transfer income, Browning's sources-only incidence analysis has merit.

A consideration that tends to overstate the regressiveness of the retail sales tax burden using the traditional procedure is that many in-kind transactions are not counted in the income base used for inci-dence determination. The expanded income measure used in this study attempted to include various types of in-kind and inferred income in the overall income base. A 1980 Wall Street Journal article, however, implies that the so-called "underground economy"--where business trans-actions occur outside the traditional statistically-reported sector-- could represent as much as 27 per cent of the gross national product. Although the article indicates that much of this growth had occurred in recent years, even in 1973, the "underground economy" probably ac-counted for as much as 10 per cent of the GNP.[11]

The importance of this fact in a tax incidence study is that much of the non-reported activity probably occurs in the lower-income groups. The employee receiving wages from an established firm or the person receiving income from dividends, interest of rent cannot easily escape either the GNP or tax records. These sources provide most of the income for those families in the middle or higher income brackets. The elderly, retired person or the individual on welfare, in contrast, can more easily perform a small service, whether for cash or in exchange

[11]Alfred L. Malabre, Jr., "Underground Economy Grows and Grows," Wall Street Journal, 20 October 1980, p. 1. See also Robert D. Fierro, "In Cash We Trust," (Reprinted from Prime Time), Eastern Review (March 1981): 57+.

for goods or services, without the necessity of reporting the transaction.
The result is that the income of those in the lower income brackets is
underreported. This underreporting of income means that the federal
or state income tax can be evaded, although a sales tax, paid at the
point of purchase, cannot be avoided. In any situation, however, tax
incidence, when expressed as a percentage of recorded income only would
be higher than that based on actual family income. In that lower income
families have a larger amount of unreported income, the incidence of
a tax would appear to be more regressive than reality.

The income measure used as a base can also affect the pattern
of incidence in other ways. For example, if taxes are measured against
an after-tax income base, both the actual amount and the percentage re-
duction in the income measure of those consumer units in the higher income
brackets would be greater than that of lower income groups. Higher income
brackets are burdened by the rather progressive corporate and individual
income tax. In that after-tax income is smaller for those in the higher
income groups, the regressiveness of any tax is reduced.

Another question discussed earlier about the components of the
income base is whether indirect taxes implied in reduced sources of in-
come should be added into the BTAT income figure. Because only one in-
come measure to be used with various methods of determining incidence
was desired in this study, and because the addition of indirect taxes
would require the computation of the incidence of taxes other than the
retail sales tax, the sources-based taxes were not included in the BTAT
income formulated. Had these taxes been included, however, BTAT income
for all income groups would have been higher and thus incidence would

would have been lower. The change in the incidence pattern would have been slight.

Finally, when incidence of only one tax is the object of a study, there is the difficulty of separating that tax from the entire tax system. Incidence studies developing the burden of the entire tax system, for example, are not concerned with the problem of how to account for the federal tax offset, since overall tax burden is the same regardless of which tax bears the burden. In addition, the recognition that part of the retail sales tax is borne by business, as opposed to households, means that separate shifting assumptions must be made, using very little confirmed information. The result is that by acknowledging the many limitations of incidence computations, only general conclusions can be made regarding the analysis.

CHAPTER VII

OKLAHOMA RETAIL SALES TAX--INCIDENCE: CONCLUSIONS

Incidence of Oklahoma's retail sales tax, as revealed in the
preceding analysis, is influenced by many factors and dependent on a
variety of assumptions. Irrespective of the various averages and com-
promises used, the overall burden of the state sales tax is relatively
small (less than one per cent of the broad income measure for the aver-
age taxpayer). The incidence pattern, when based on taxes paid on tax-
able consumption and including the effect of the federal offset and the
portion of sales taxes paid by business, is indeed regressive, but not
to the extent traditionally assumed either in real terms or proportionally.

If retail sales taxes in Oklahoma in 1973 simply reflected the
distribution of total consumption expenditures by income group, tax in-
cidence would reveal a strong regressive pattern as shown in Table VII-1.
The tax burden for the lowest income group (with annual money incomes
less than $3,000) would actually be more than the 2.0 per cent applicable
sales tax rate, since in many cases, consumption exceeds income among
the poor. When sales taxes are applied only to taxable consumption,
however, and when it is recognized that the federal government bears
part of the tax burden through the tax offset and that part of the sales
tax is borne by business necessitating various shifting assumptions,
the incidence pattern of the retail sales tax changes.

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TABLE VII-1

ALLOCATION OF SALES TAX REVENUE ACCORDING TO DISTRIBUTION
OF TOTAL CONSUMPTION EXPENDITURES, OKLAHOMA, 1973

Income Bracket (dollars)	Per Cent Distribution of Total Consumption (1)	Allocation of Retail Sales Tax		Incidence (Per cent) (4)
		Total Taxes Paid (2)(000)	Average (3)	
Under 3,000	9.20	$ 10,717.5	$ 52.28	2.11
3,000- 3,999	4.45	5,184.0	71.77	1.67
4,000- 4,999	3.78	4,403.5	78.92	1.45
5,000- 5,999	3.47	4,042.4	90.81	1.37
6,000- 6,999	4.83	5,626.7	108.05	1.39
7,000- 7,999	4.80	5,591.7	117.30	1.31
8,000- 9,999	10.18	11,859.1	127.92	1.21
10,000-14,999	23.60	27,492.7	159.86	1.11
15,000-24,999	24.81	28,902.2	211.53	.97
25,000 and over	10.88	12,674.6	306.30	.63
Average or total	100.00	$116,494.3	$126.62	1.08

(1) Table A-7, Column 3.

(2) Sales taxes are allocated according to the distribution
    in Column 1, assuming all taxes are borne by consumers
    and not allowing for the effect of the federal offset.

As summarized in Table VI-14, overall burden of the state sales tax in Oklahoma in 1973 ranged from 1.77 per cent of before-tax, after-transfers (BTAT) income for the lowest income group to only .52 per cent of BTAT income for the average consumer unit with money income of $25,000 and over. In reality, the primary effect of the incidence methodology used in this study is a reduction in the overall tax burden for all income brackets. The percentage change among income brackets is minimal. In fact, if incidence is determined for only those sales taxes remaining after excluding the portion borne by the federal offset and out-of-state tourists, the incidence pattern is almost identical to the traditional results in Table VI-14. (See Table A-11.)

The versions of the traditional method presented in Table VI-14 show that the different assumptions used to determine consumption expenditures by income group or to allocate the portion of the sales tax paid by businesses actually have little effect on the eventual incidence pattern. The recent hypothesis by Edgar K. Browning, in contrast, relating sales tax payments only to factor income (excluding transfers) on the sources side of the income equation, did result in a progressive incidence pattern. However, when the differences in consumption-savings patterns among income brackets were considered on the uses side of the income equation, and when the limitations of Browning's analysis relating transfer payments and a state tax were recognized, Browning's procedure also resulted in a regressive incidence pattern, similar to the traditional result. The sales tax incidence patterns revealed by these various procedures are plotted in Chart VII-1.

The limitations of the actual incidence computations of Oklahoma's

CHART VII-1

INCIDENCE OF OKLAHOMA'S RETAIL SALES TAX USING VARIOUS APPROACHES
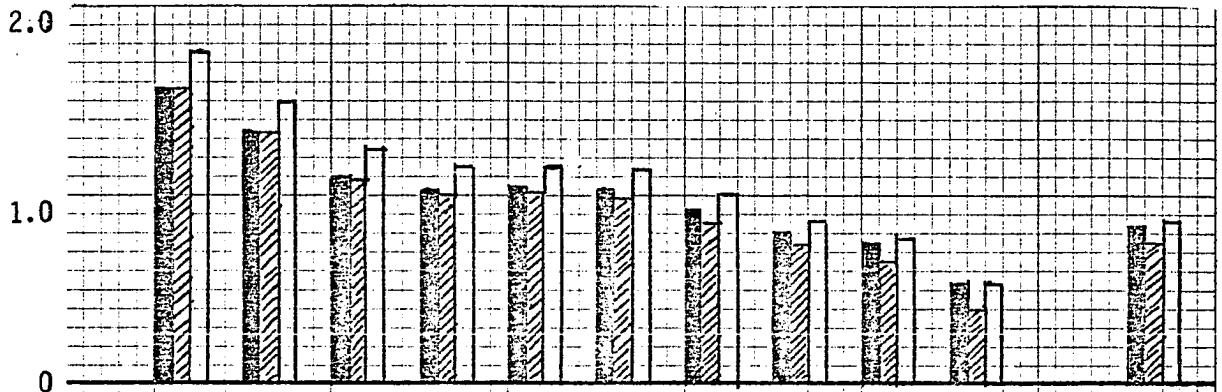
Adapted Tradition Approach   Household Portion -

Including Offset -

Including Business Portion - (Plain)
Assumption A
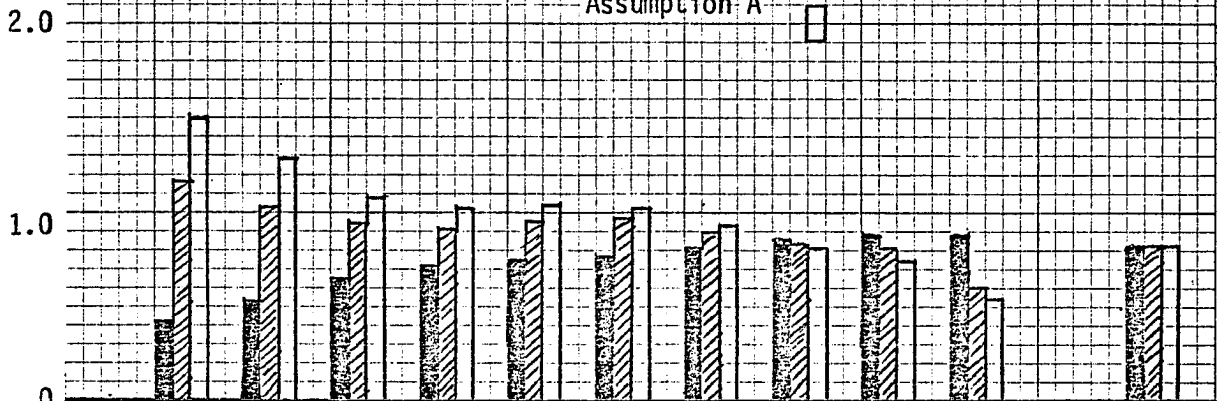
Browning's Approach: Sources Only -

Household Portion: Sources Plus Uses -

Sources Plus Uses if Only State
Transfers Unaffected -
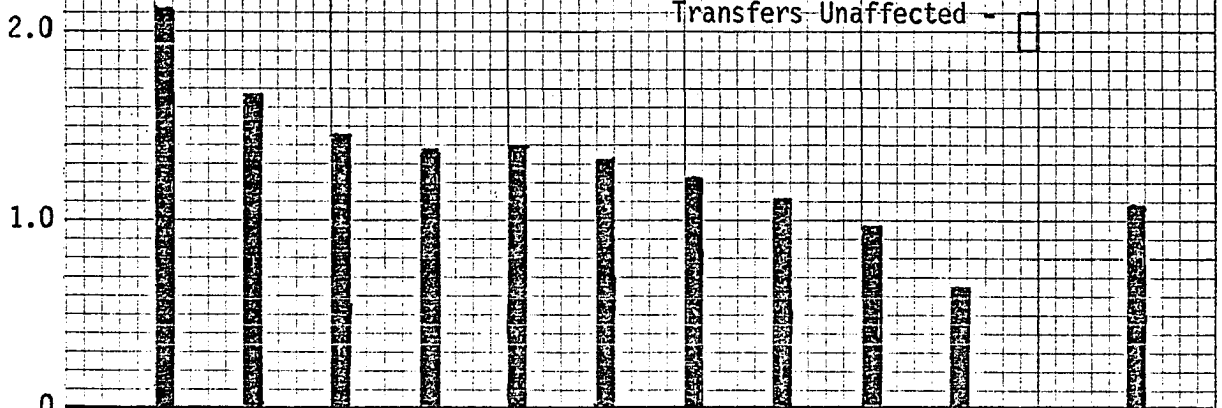
Incidence if 2.0 per cent rate applied to total consumption

Under 3,000 4,000 5,000 6,000 7,000 8,000 10,000 15,000 25,000 Average
3,000 3,999 4,999 5,999 6,999 7,999 8,999 14,999 24,999 and over

Income Bracket (dollars)

retail sales tax were discussed in detail in Chapter VI and earlier.
They included possible inaccuracies in making the many estimates need-
ed for the analysis, questions regarding the income base selected, the
reliability of the shifting assumptions used, and the unrealistic results
that often prevail when a subject is approached using generalities. In
all respects, the practical adaptation of incidence theory, especially
in a state setting, is a rather unsophisticated application of the gen-
eral equilibrium incidence models described.

Before ending this analysis, however, it seems appropriate to
view Oklahoma's retail sales tax incidence using two alternative approaches.
First of all, the change in incidence patterns that would occur if food
were exempted from Oklahoma's income base is surveyed. Secondly, Okla-
homa's retail sales tax incidence is compared with that of a proportional
state income tax in a differential analysis. These comparisons are im-
portant in order to evaluate possible changes in sales tax policy.

Effect of Exempting Food from the Tax Base

A continual discussion in Oklahoma, by the legislature and citi-
zens alike, is the desirability of exempting food (usually only that
food consumed at home) from the sales tax base. The purpose is to elimi-
nate the sales tax burden on a necessity. (Prescription drugs are another
item often suggested for exemption.) Since lower income groups, in com-
parison to higher income groups, spend a larger proportion of their in-
come on food, it is assumed that were food exempted from the sales tax
base, the incidence pattern would be less regressive.

Of the 45 states with retail sales taxation, 21 exempted the sale
of food for consumption away from the place of sale as of September, 1978.

The sales tax rate in the states with food exempted, however, was higher than the 2.0 per cent rate in Oklahoma. Even when it is recognized that local sales taxes often are added to the state rate and apply to the same consumer goods, Oklahoma's sales tax rate is relatively low. Most communities in Oklahoma levy an additional 2.0 per cent sales tax, resulting in an effective sales tax rate of 4.0 per cent. More than half of the sales-taxing states in the United States allow for similar additional local sales taxation. Of those states that both exempt food from the base and do not allow local sales taxes to be levied, only North Dakota and Vermont have a tax rate lower than the 4.0 per cent state and local rate effective in Oklahoma.[1] Thus, if Oklahoma were to exempt food and/or drugs from the sales tax base, it would be realistic to assume that the sales tax rate would have to increase, unless services provided by sales tax revenue were to be severely curtailed.

In application, several studies have used total consumption expenditures less food consumed at home as the taxable base for determining sales tax incidence. Although a regressive pattern in sales tax incidence still occurs, the extent of the regressiveness is less than when total consumption expenditures provide the sales tax base. Table VII-2 shows how exempting food consumed off the premises from Oklahoma's sales tax base affects sales tax incidence, using the traditional method advocated earlier. So that tax revenue is not reduced, it is assumed that the sales tax rate must be increased. The equivalent rate using 1973 figures would be 2.64 per cent of taxable consumption if food purchases

[1]Tax Foundation, Inc., _Facts and Figures on Government Finance_, 20th Biennial edition, 1979 (New York, 1980): Section V.

were excluded. (Only sales taxes initially paid by individual house-holds is considered at this time.)

If food were excluded from the tax base in Oklahoma, incidence determined in the traditional method (Column 5) would still be regressive, declining from 1.31 per cent of BTAT income for the lowest income group to .60 per cent for those households with incomes of $25,000 and over. Although the burden of the lowest group is still more than two times greater than the highest income group, the difference is not as great as that determined using the current base, with food included. (Table VII-2, Column 6.) In fact, when food is removed from the tax base, incidence becomes more proportional, with slighter variations among income groups. Surprisingly, those with incomes between $7000 and $7999 have the third highest incidence with food excluded from the base. This irregularity in the regressive pattern, however, is probably the result of inaccuracies in the individual estimates which are magnified when averages are obtained.

Including the portion of the sales taxes paid by business in this analysis would cause little change in the incidence pattern reflected in Table VII-2. Actually, since the tax base determining the business portion of the sales tax would not be affected by the exclusion of food consumed at home, the increase in the tax rate necessary to maintain revenue would be less than the 2.64 per cent indicated earlier. Since initial taxes paid by individuals and businesses are so closely intertwined, only one sales tax rate is realistic. Using the data developed in this study, a rate of 2.45 per cent would provide the same overall sales tax revenue, when the portion of the sales tax paid by business

TABLE VII-2

SALES TAX INCIDENCE OF HOUSEHOLD

PORTION OF TAX IF FOOD EXCLUDED FROM BASE AND RATE

INCREASED TO MAINTAIN REVENUE,* OKLAHOMA, 1973

Income Bracket (dollars)	Average Taxable Consumption (1)	Average Food Consumption at Home (2)	Average Taxable Consumption Excluding Food (3)	Taxes with 2.642 Per Cent Rate (4)	Incidence (5)	Incidence Food Included (6)
Under 3,000	$1,943	$ 713	$1,230	$32.50	1.31	1.57
3,000- 3,999	2,833	1,037	1,796	47.45	1.10	1.32
4,000- 4,999	3,005	1,017	1,988	52.52	.96	1.10
5,000- 5,999	3,396	1,039	2,357	62.27	.94	1.02
6,000- 6,999	4,018	1,167	2,851	75.32	.97	1.04
7,000- 7,999	4,620	1,199	3,421	90.38	1.01	1.03
8,000- 9,999	4,832	1,221	3,611	95.40	.90	.91
10,000-14,999	5,773	1,364	4,409	116.49	.81	.80
15,000-24,999	8,066	1,535	6,531	172.55	.79	.74
25,000 and over	12,917	1,856	11,061	292.24	.60	.53
Total	$4,814	$1,170	$3,644	$96.27	.82	.82

*To maintain the same revenue ($88,570,880) from the household portion
of the tax when food is excluded from the base, the sales tax rate
would have to increase to 2.642 per cent of taxable consumption.

(1) Table VI-2, Column 4.
(2) From CES, Diary Survey, Bulletin 1959, Food consumed at home, pp. 272-273.
(3) Column 1 minus Column 2.
(6) Table VI-2, Column 6

is included.

In brief, it eliminating the regressive incidence pattern of
the retail sales tax is the primary objective of Oklahoma's (or any other
state's) legislature, then exempting food from the tax base and increasing
the tax rate is an appropriate action. The exemption of prescription
drugs from the tax base would have a similar effect, although since sales
taxes on drugs represent such a small fraction of the total sales tax
burden for the average consumer unit, the effect would be minimal. (Medi-
caid and other welfare programs already provide drugs and related products
for lower income groups.) The exemption of food from the tax base, how-
ever, is not necessarily a simple administrative procedure. Retail clerks
would have to learn to distinguish between taxable and nontaxable goods,
and cash registers and store computers would have to be adjusted. Certain
items (such as soft drinks) might present a question as to whether or
not they should be exempted.

Another problem that has been ignored in the discussion of the
desirability of exempting food from Oklahoma's sales tax base is the
effect on local governments. Whereas revenue from the income tax and
other state taxes can be used if food is exempted from the tax base and
the rate is not increased at the state level, many localities, where sales
tax revenue supplies a major portion of the budget, might find revenue
severely curtailed. There also might be problems in obtaining an increased
local tax rate from the voters.

Differential Analysis

Instead of expressing tax incidence as a certain percentage of
income using the balanced-budget analysis of this study, a differential

approach can be used. In this way, the distributional effects of the
state retail sales tax are compared to those of a substitute tax provid-
ing the same yield. This approach eliminates the problem of how government
action can affect before and after-tax income status. Since Oklahoma's
state income tax is the only general state tax, except for the sales
tax, it is used for comparison. In effect, it is assumed that the state
income tax is substituted for the retail sales tax in such a way as to
yield an equivalent amount of income. As Musgrave and Musgrave pointed
out, however, an "equivalent amount" does not necessarily mean the same
amount of dollars.[2] Different taxes may cause changes in relative prices
and cost of goods purchased by the government. As a result, "the equiva-
lent amount is that which permits government to make the same real pur-
chases. Moreover, the equivalent amount should be such as to maintain
the same level of aggregate demand."[3]

Although it is recognized that a sales tax will cause certain
relative price changes which might influence government expenditures
and aggregate demand, because this information is not available, it shall
be assumed that the $116.5 million received from state sales tax revenue
in 1973 is obtained instead through a proportional tax on income. Income
taxes are generally levied only on the money income received in labor
and capital endeavors, and most transfer income is not counted for income
tax purposes. Although family size and various deductions and exemptions
affect taxable income in application, for simplicity, average taxable
income for each household unit in this comparison is assumed to equal

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[2]Richard A. Musgrave and Peggy B. Musgrave, Public Finance in Theory
and Practice, second edition, (New York: MeGraw-Hill Book Company, 1976), pp.
379-80.

[3]Ibid., p. 379 (footnote 2).

money income less transfer income reported in the CES, Interview Survey, and included in the development of BTAT income in Table V-3. Using this definition, total taxable income in Oklahoma in 1973 was $8,009 million. To provide $116.5 million in revenue using this base, each unit would have to be taxed at a rate of .0145 per cent.

The calculations incorporating this proportional income tax rate and including the effect of the federal offset are shown in Table VII-3. A progressive incidence pattern results, except for the two highest income groups, which receive the greatest benefits from the offset. The difference in the burden caused by the proportional income tax and the retail sales tax, using the traditional approach and allocating the business portion of the tax according to Assumption A (Table VI-14, Column 2) is shown in Column 7 of Table VII-3. For household units in the six lowest income brackets, the retail sales tax creates a greater burden. There is no difference between the burdens of the two taxes for those in the $8,000-9,999 income bracket. The higher income groups prefer the sales tax to the proportional income tax, although their advantage is not as great as the disadvantage of the lower groups. The benefit of the sales tax for the average taxpayer reflects the fact that the sales tax assumes more taxes are offset to the federal government and exports some burden to out-of-state tourists.

In actual application, however, it could be assumed that if an income tax were to replace the sales tax, it would not be proportional in the way depicted, especially if a state income tax already existed. In Oklahoma, for example, a progressive rate schedule yielded income

TABLE VII-3

TAX INCIDENCE OF A PROPORTICNAL STATE INCOME TAX,
OKLAHOMA, 1973

Income Bracket (dollars)	Average Taxable Income (1)	Proportional Income Tax (2)	Effect of Federal Deductions on Income (Per Cent) (3)	Effective Tax Offset (4)	Income Tax Excluding Offset (5)	Incidence of Proportional State Income Tax (6)	Differential of Sales Tax Incidence (7)
Under 3,000	$ 603	$ 8.8	-0-	$-0-	$ 8.8	.35	-1.42
3,000- 3,999	1,776	25.8	-0-	-0-	25.8	.60	- .90
4,000- 4,999	3,070	44.7	1.74	0.8	43.9	.80	- .44
5,000- 5,999	4,230	61.5	2.57	1.6	59.9	.90	- .25
6,000- 6,999	5,233	76.1	3.81	2.9	73.2	.94	- .22
7,000- 7,999	6,410	93.2	4.74	4.4	88.8	.99	- .15
8,000- 9,999	7,862	114.4	7.07	8.1	106.3	1.00	-0-
10,000-14,999	11,575	168.4	9.27	15.6	152.8	1.06	.19
15,000-24,999	18,090	263.1	18.13	47.7	215.4	.99	.22
25,000 and over	39,349	572.3	35.06	2(0.6	371.7	.76	.24
Average or total	$8,705	$126.6		$20.4	$ 106.2	.91	.03

(1) Income subject to state income tax is assumed to equal money income (Table V-3, Line 1) less transfer income reported by the CES, Interview Survey (Table V-3, Line 13), since money transfer income usually is not taxed.

(2) To obtain $116.5 million in tax revenue, a proportional income tax rate of .014545 per cent of taxable income is required.

(3) Table VI-6, Column 3.

(4) Column 2 times Column 3.

(5) Column 2 minus Column 4.

(6) Column 5 divided by BTAT income (Table V-3, Line 17).

(7) Column 6 minus traditional sales tax incidence, using business assumption A, in Table VI-14, Column 2.

tax revenue of $122.9 million in 1973.[4] If the $116.5 million received

from the state sales tax in 1973 were instead obtained using an additional

income tax based on increasing present state income tax payments, the

differential benefit of the sales tax for lower income groups would be

even greater than that in Table VII-3.

Using the estimates of average state and local income tax pay-

ments in the South as reported in the CES, Interview Survey, the distribu-

tion of Oklahoma's total income tax revenue by income bracket is used

to allocate the additional income tax. This assumes that the $116.5

million currently provided by the sales tax is distributed proportionally

among income brackets. All state income taxes are assumed to be borne

directly by the households paying them; whereas some sales taxes are

paid by businesses, causing the need for varying shifting assumptions.

The resulting incidence pattern, including the effect of the

federal tax offset, is shown in Table VII-4. The not-surprising result

is that incidence from the state income tax has a consistently progres-

sive pattern, except for the highest income bracket, reflecting the limit

in progressiveness of the state income tax rate when taxable income of

households exceeded $15,000. Changes in the state income tax rate struc-

ture since 1973, however, have increased the progressive burden to higher

levels. The sharply progressive burden of the income tax contrasts with

the more-gradual regressive burden of the sales tax in Table VI-14.

The average household in Oklahoma in 1973 paid $103 annually

in sales tax for an incidence of .88 per cent of BTAT income. If the

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[4]Oklahoma Tax Commission, Annual Report, Fiscal Year, 1973
(Oklahoma City, 1974), p. 14.

TABLE VII-4

INCIDENCE IF ADDITIONAL
STATE INCOME TAX PROVIDES REVENUE RECEIVED FROM
SALES TAX, OKLAHOMA, 1973

Income Bracket (dollars)	Additional State Income Tax Paid by Average Household (1)	Effective Tax Offset (2)	Tax Paid Excluding Offset (3)	BTAT Income (4)	Incidence of State Income Tax (5)
Under 3,000	$ 2.8	$ -0-	$ 2.8	$ 2,473	.11
3,000- 3,999	9.4	-0-	9.4	4,297	.22
4,000- 4,999	19.6	0.3	19.3	5,456	.35
5,000- 5,999	28.0	0.7	27.3	6,636	.41
6,000- 6,999	39.4	1.5	37.9	7,762	.49
7,000- 7,999	59.9	2.8	57.1	8,981	.64
8,000- 9,999	79.5	5.6	73.9	10,591	.70
10,000-14,999	164.7	15.3	149.4	14,411	1.04
15,000-24,999	309.0	56.0	253.0	21,810	1.16
25,000 and over	726.8	254.8	472.0	48,674	.97
Average	$126.6	$ 23.6	$103.0	$11,710	.88

(1) Table A-10. Column 4.
(2) Table A-10, Column 6.
(3) Column 1 minus Column 2.
(4) Table V-3, Line 17.
(5) Column 3 divided by Column 4.

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same revenue is obtained via the state income tax, the results are identical. (Actually, since the offset provides a much greater benefit to those with higher incomes, the average offset overstates the benefit for the average household.) When income tax payments are determined as in Table VII-4, the amount of tax exported is very similar, regardless of whether state revenue is obtained from the retail sales or the income tax. For the sales tax, it was estimated that $20.1 million was paid by the federal government through the personal and business offsets (using Assumptions A and C) and $1.4 million was exported to tourists for a total of $21.5 million. The personal offset resulting from a state income tax providing $116.5 million in tax revenue was $21.6 million. Although the federal offset with neither tax benefited the two lowest income brackets, the offset with the income tax provided a much greater benefit to those with higher incomes--the same groups which bore the greater burden from the tax.

It is also interesting to compare the total incidence pattern of the state sales and income tax that existed in 1973 (Table VII-5, Column 7) with the incidence that would have prevailed had sales tax revenue been obtained from an addition to the existing state income tax (Table VII-5, Column 6). An all-income tax system created a highly-progressive incidence pattern, with those with higher incomes bearing a burden more than eight times greater than those in the lowest income bracket. The tax burden for those households with incomes of $25,000 and over, however, shows a drop in progressiveness, compared to the second and third highest income brackets. The existing system, in contrast, reveals an almost proportional distribution of tax burden.

TABLE VII- 5

INCIDENCE OF STATE INCOME TAX; TOTAL INCIDENCE,
SALES PLUS INCOME, INCOME-ONLY ALTERNATIVE, OKLAHOMA, 1973

Income Bracket (dollars)	1973 State Income Tax Payments Adjusted		Effective Tax Offset	1973 State Income Tax		Total 1973 Tax Incidence	
	Total (000)	Average		Average	Incidence	Income Tax Only	Actual
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Under 3,000	$ 602.1	$ 2.9	$ -0-	$ 2.9	.12	.23	1.89
3,000- 3,999	712.7	9.9	-0-	9.9	.23	.45	1.73
4,000- 4,999	1,155.0	20.7	0.4	20.3	.37	.72	1.61
5,000- 5,999	1,314.8	29.5	0.8	28.7	.43	.84	1.58
6,000- 6,999	2,162.6	41.5	1.6	39.9	.51	1.00	1.68
7,000- 7,999	3,010.5	63.1	3.0	60.1	.67	1.31	1.81
8,000- 9,999	7,778.0	83.9	5.9	78.0	.74	1.44	1.74
10,000-14,999	29,883.4	173.8	16.1	157.7	1.09	2.03	1.96
15,000-24,999	44,530.2	325.9	59.1	266.8	1.22	2.38	1.99
25,000 and over	31,726.5	766.7	268.8	497.9	1.02	1.99	1.54
Average (or total)	$122,875.8	$133.6	$ 24.8	$108.8	.93	1.81	1.80

(1)(2) The distribution of total state income tax revenue in Table A-10, Column 2 is applied to the $122,875,800 to obtain estimates of total and average actual tax payments by income class.

(3) Effect of tax deduction on federal income tax from Table VI-6, Column 3.

(7) Sales tax incidence from Table VI-14, Column 2 using Assumption A to allocate business portion, plus Column 5.

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Incidence: Future Directions

Although insight concerning the incidence of Oklahoma's retail
sales tax has been gained from this study, it is also obvious that addi-
tional research, especially on a state or local level, would be benefi-
cial. For example, a more comprehensive incidence analysis including
other Oklahoma taxes could be undertaken, so that the incidence of the
retail sales tax could be viewed in perspective. In this situation,
various shifting assumptions would have to be made, and then the desir-
able benefit of including indirect taxes in the income base could be
achieved. Another direction of future research might be a more thorough
study of the shifting assumptions involved in the portion of the retail
sales tax assumed to be paid by business. Also, if expenditure incidence
of the retail sales tax revenue were determined, the overall burden of
Oklahoma's retail sales tax could be ascertained.

In terms of policy decisions concerning possible changes in the
current structure of Oklahoma's retail sales tax, it must be remembered
that the retail sales tax in Oklahoma presently creates only a small,
though admittedly regressive, burden on taxpayers. Other state and federal
taxes (primarily the corporation and individual income tax) result in
progresssive incidence. Also, since Oklahoma's sales tax is earmarked
for the Department of Human Services, any increase in tax revenue that
automatically results from inflation and increased sales by an expanding
population is directed to those services that provide the greatest bene-
fits for those in lower income brackets. The best course of action for
Oklahoma might be to retain its well-defined retail sales tax with its
relatively small burden on all citizens and to use other tax and expenditure

programs if income is to be redistributed. The existing tax structure of Oklahoma, with income and sales tax providing most of the revenue, seems to represent an optimal means (with relatively minimal burden) of obtaining revenue for the state.

APPENDIX

TABLE A-1

STATE SALES TAX COLLECTIONS BY CLASS OF BUSINESS
AND ESTIMATE OF SALES TAXES PAID BY BUSINESS
SECTOR, OKLAHOMA, 1973

Business Classification	State Sales Tax Revenue	
	Total (000)	Paid by Businesses for Producer Goods
Food	$ 27,777[a]	$ 640
Apparel	4,713	-0-
General Merchandise	26,245	3,000
Furniture, Equipment, Etc.	7,085	2,000
Motor Vehicles	9,164	2,500
Lumber and Materials	12,513	4,500
Service	5,294[a]	1,700
Utilities and Transportation	10,716	4,200
Miscellaneous	12,988[b]	8,000
TOTAL	$116,495	$26,540

SOURCE: Oklahoma Tax Commission, Oklahoma Sales Taxes: Statistical Report for Fiscal Year Ended June 30, 1973 (Oklahoma City: 1974), pp. 10-11.

[a]Of the revenue received from restaurants, hotels, and various entertainment sources, it is assumed that $1,380,000 is exported to out-of-state tourists.

[b]The major sources included are oil field equipment, retail liquor, industrial machinery, and commercial supplies.

TABLE A-2

ESTIMATES OF AVERAGE AND TOTAL ANNUAL TAXABLE CONSUMPTION*

BY INCOME BRACKETS, OKLAHOMA, 1973

Line	Average Annual Taxable Consumption (to nearest dollar)	Income Brackets (dollars) and Number of Consumer Units in Each Bracket (in parentheses)									
		Under 3,000 (205,011)	3,000-3,999 (72,234)	4,000-4,999 (55,800)	5,000-5,999 (44,514)	6,000-6,999 (52,073)	7,000-7,999 (47,672)	8,000-9,999 (92,704)	10,000-14,999 (171,976)	15,000-24,999 (136,636)	25,000 and over (41,380)
1	Food	$ 815	$ 1,203	$ 1,240	$ 1,306	$ 1,464	$ 1,568	$ 1,631	$ 1,859	$ 2,252	$2,927
2	Alcohol, tobacco products	25	29	48	62	64	66	63	69	121	267
3	Fuel and Utilities	215	262	276	308	348	367	362	439	543	704
4	Housing Expenses	165	215	235	244	295	339	337	420	517	819
5	Home maintenance	51	66	68	70	86	86	104	112	150	261
6	Home Furnishings	90	174	165	184	230	336	368	434	578	937
7	Clothing	137	203	226	305	356	418	458	603	887	1,439
8	Transportation	80	153	191	231	286	337	364	444	598	755
9	Health care, drugs & Supplies	120	140	148	160	206	179	174	218	272	354
10	Personal Care Products	44	65	79	91	108	120	125	161	207	253
11	Recreation	99	169	175	237	257	355	365	555	940	1,687
12	Pets, toys, & games	18	27	30	41	46	42	63	80	96	118
13	Reading & Education	20	25	23	40	47	54	57	91	160	294
14	Miscellaneous	10	20	21	23	29	33	38	45	58	86
15	Average	$1,889	$2,751	$2,925	$3,302	$3,822	$4,300	$4,509	$5,530	$7,379	$10,901
16	Total Taxable Consumption	$387,266	$198,716	$163,215	$146,985	$199,023	$204,990	$418,002	$951,027	$1,008,237	$451,083

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, Consumer Expenditure Survey, Bulletins 1959, 1985, and 1992.

*Taxable consumption does not include the $300 million involved in new housing construction. Taxable consumption is determined according to Oklahoma law, but averages are those for South region. Total taxable consumption is based on Oklahoma distribution.

Line Explanations

(1) Represents annual amount of food, total reported in Diary Survey, Bulletin 1959, pp. 274-275.
(2) Total spending on alcoholic beverages (excluding beer, not taxed) increased by 20.0 per cent to reflect underreporting, plus spending on tobacco products, other than cigarettes, as reported in Diary Survey, Bulletin 1959, pp. 276-277.
(3) All fuel and utilities from Interview Survey, Bulletin 1985, pp. 465-466.
(4) Includes telephone and ½ of other housing expenses (for repairs and taxable services) from Interview Survey, Bulletin 1985, pp. 465-466; plus annual amount of housekeeping supplies from Diary Survey, Bulletin 1959, pp. 278-279.
(5) Ten per cent of total shelter expenses in Interview Survey, Bulletin 1985, pp. 463-464 assumed to go for taxable goods used for redecorating and maintenance.
(6) Total housefurnishings, equipment from Interview Survey, Bulletin 1985, pp. 467-468.
(7) Total clothing expenses reported in Interview Survey, Bulletin 1985, pp. 467-468 less dry cleaning and ½ of materials and services category.
(8) Includes only other vehicle operations expenses in Interview Survey, Bulletin 1985, pp. 469-470. Although part of this expense is non-taxable service, the taxable portions in the other transportation categories are approximately equal to this amount.
(9) Non-prescription drugs and medical supplies from Diary Survey, Bulletin 1959, pp. 276-277 plus ½ of health care expenses (excluding health insurance) reported in Interview Survey, Bulletin 1985, pp. 469-470 for spending on prescription drugs and other taxable medical equipment.
(10) Annual spending on personal care products from Diary Survey, Bulletin 1959, pp. 276-277 plus ½ of selected personal care expenses in Interview Survey, Bulletin 1985, pp. 469-470.
(11) Total recreation spending less amount spent for owned vacation homes and gasoline from Interview Survey, Bulletin 1985, pp. 469-472.
(12) Represents difference in other recreation expenses between Interview Survey and Integrated Survey. Allocated as .88 per cent of U.S. averages in Integrated Survey, Bulletin 1992.
(13) Assumes ½ of all education expenses are taxable. Includes all reading materials, though newspapers are not taxed. Interview Survey, Bulletin 1985, pp. 473-474.
(14) Assumes ½ of all miscellaneous consumption in Interview Survey, Bulletin 1985, pp. 473-474 are taxable.

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TABLE A-3

VALUE AND PERCENTAGE DISTRIBUTION OF NEW HOMES

IN SOUTH, 1973; ALLOCATION OF VALUE BY INCOME BRACKETS*

New Homes, South, 1973 and Allocation by Income Bracket				
Sales Price (dollars) (1)	Per Cent of Homes (2)	Income Bracket (dollars) (3)	Proportional Value (000) of New Homes (4)	Per Cent of Taxable Consumption (5)
Under 15,000	1	5,000- 5,999	$ 12.5	0.3
15,000-17,499	5	6,000- 6,999	81.3	2.4
17,500-19,999	10	7,000- 7,999	187.5	5.4
20,000-24,999	15	8,000- 8,999	337.5	9.8
25,000-29,999	16	10,000-14,999	440.0	12.7
30,000-39,999	29	15,000-24,999	1,015.0	29.4 ╲
40,000-49,999	14 ⎨ 7 ⎰ 7	15,000-24,999	315.0	9.1 ╱ 38.5
		25,000 and over	315.0	9.1 ╲
50,000 and over	10	25,000 and over	750.0	21.7 ╱ 30.8
Total	100		$3,453.8	100.0

SOURCE: U.S. Department of Commerce, Bureau of the Census, Construction Reports: Characteristics of New One-Family Homes, 1973) (Washington, D.C.: 1974), p. 96.

* The allocation by income brackets is made by using the realtor's rule-of-thumb that households can afford a home 2½ times their gross income. It is thus assumed that those in income brackets of $5,000 or less did not purchase a new home.

(4) The proportional value of new homes is obtained by multiplying the percentage of new homes (Col. 2) by the average sales price. For homes selling under $15,000, the average was assumed to be $12,500; for homes selling at $50,000 and over, $75,000 was the average used.

TABLE A-4

TAXABLE CONSUMPTION IN NEW RENTAL CONSTRUCTION,

ASSUMPTION B*, OKLAHOMA, 1973

Income Bracket (dollars)	Per Cent of Total Rental Expenditures (1)	Allocation of Taxable Consumption in New Rental Housing (000) Assumption B(2)	Taxable Consumption in New Owner- Occupied Homes (000) (3)	Total Taxable Consumption in New Construction Assumption B (000) (4)
Under 3,000	19.0	$17,480	$ 0	$ 17,480
3,000- 3,999	8.2	7,544	0	7,544
4,000- 4,999	6.5	5,980	0	5,980
5,000- 5,999	4.9	4,508	624	5,132
6,000- 6,999	6.6	6,072	4,992	11,064
7,000- 7,999	6.0	5,520	11,232	16,752
8,000- 9,999	12.1	11,132	20,384	31,516
10,000-14,999	20.4	18,768	26,624	45,392
15,000-24,999	13.6	12,512	80,080	92,592
25,000 and over	2.7	2,484	64,064	66,548
Total	100.0	$92,000	$208,000	$300,000

*Assumption B means that retail sales taxes paid on construction of new rental property are assumed to be shifted forward to the tenant, and allocated according to the distribution of total rental expenditures.

(1) This percentage is the distribution of total rental expenditures, obtained by multiplying the average annual expenditures on rent by each income bracket according to CES, Interview Survey, Bulletin 1985, p. 463, times the number of Oklahoma consumer units in each income bracket.

(3) Table VI-1, Column 2.

TABLE A-5

TAXABLE CONSUMPTION IN NEW RENTAL CONSTRUCTION,

ASSUMPTION C,* OKLAHOMA, 1973

Income Bracket (dollars)	Percentage Distribution of Rental Income (1)	Allocation of Taxable Consumption in New Rental Housing (000) Assumption C (2)	Taxable Consumption In New Owner- Occupied Homes (000) (3)	Total Taxable Consumption New Construction Assumption C (000) (4)
Under 3,000	5.0	$ 4,600	$ 0	$ 4,600
3,000- 3,999	4.6	4,232	0	4,232
4,000- 4,999	3.2	2,944	0	2,944
5,000- 5,999	2.8	2,576	624	3,200
6,000- 6,999	4.7	4,324.	4,992	9,316
7,000- 7,999	2.7	2,484	11,232	13,716
8,000- 9,999	8.6	7,912	20,384	28,296
10,000-14,999	12.5	11,500	26,624	38,124
15,000-24,999	16.5	15,180	80,080	95,260
25,000 and over	39.4	36,248	64,064	100,312
Total	100.0	$92,000	$208,000	$300,000

*Assumption C means that retail sales taxes paid on construction of new rental property are shifted backwards and are borne by the owners of rental property according to the distribution of rental income.

(1) This represents the percentage of total rental income, obtained by multiplying the annual average of rental income by income bracket in the CES Interview Survey, Bulletin 1985, pp. 477-478, by the Oklahoma distribution by incomes.
(3) Table VI-1, Column 2.

SELF-EMPLOYMENT INCOME, MARGINAL TAX RATES BY
INCOME BRACKET, OKLAHOMA, 1973

Income Bracket (dollars)	Self-Employment Income		Self-Employment Income		Cumulative Percentage Distribution (5)	Marginal Tax Rate for Each Income Bracket (6)
	Average (1)	Per Cent of Money Income (2)	Total Oklahoma (000)(3)	Per Cent (4)		
Under 3,000	$ 33	1.9	$ 6,765	.94	.94	0
3,000- 3,999	216	6.2	15,603	2.16	3.10	0
4,000- 4,999	181	4.0	10,100	1.40	4.50	14
5,000- 5,999	320	5.8	14,244	1.97	6.47	15
6,000- 6,999	416	6.4	21,662	3.00	9.47	16
7,000- 7,999	461	6.1	21,977	3.04	12.51	17
8,000- 9,999	591	6.6	54,788	7.58	20.09	19
10,000-14,999	725	5.9	124,683	17.26	37.35	19
15,000-24,999	1,168	6.2	159,591	22.09	59.44	25
25,000 and over	7,083	17.3	293,095	40.57	100.00	39
Average (or total)	$ 785	8.0	$722,508	100.01		

Note: By interpolation, it is determined that the marginal tax rate for the median dollar of self-
        employment income is 31 per cent.

(1)   CES, Interview Survey, Bulletin 1985, pp. 475-476.
(2)   Column 1 divided by Money Income in Table V-3, Line 1.
(3)   Column 1 times estimated number of households in each bracket for Oklahoma.
(6)   Table VI-6, Column 2.

TABLE A-7

ALLOCATION OF LOCALLY-BORNE BUSINESS SALES TAXES
OKLAHOMA, 1973

Income Bracket (dollars)	Average Current Consumption (1)	Total Current Consumption Oklahoma (000)(2)	Per Cent Distribution of Total Consumption (3)	Allocation of Locally-Borne Business Taxes (000)(4)
Under 3,000	$ 2,795	$ 573,006	9.20	$ 950.8
3,000- 3,999	3,842	277,523	4.45	459.9
4,000- 4,999	4,217	235,309	3.78	390.7
5,000- 5,999	4,851	215,937	3.47	358.6
6,000- 6,999	5,781	301,034	4.83	499.2
7,000- 7,999	6,278	299,285	4.80	496.1
8,000- 9,999	6,840	634,095	10.18	1,052.1
10,000-14,999	8,547	1,469,879	23.60	2,439.1
15,000-24,999	11,309	1,469,879	24.81	2,564.1
25,000 and over	16,385	678,011	10.88	1,124.4
Average or total	$6,771	$6,229,296	100.00	$10,335.0

(1) CES, Interview Survey, Bulletin 1985, pp. 463-464.

TABLE A-8

DISTRIBUTION OF DIVIDENDS, OKLAHOMA, 1973

Income Bracket (dollars)	Average Dividend Income (1)	Total Dividend Income for Oklahoma (000) (2)	Per Cent Dividend Distribution (3)	Allocation of One Half Backwards Shifted Taxes (A)(000) (4)
Under 3,000	$ 4.35	$ 891.8	0.9	$ 18.6
3,000- 3,999	41.00	2,961.6	2.9	60.1
4,000- 4,999	23.19	1,294.0	1.2	24.9
5,000- 5,999	24.91	1,108.8	1.1	22.8
6,000- 6,999	54.97	2,862.5	2.8	58.0
7,000- 7,999	56.81	2,708.2	2.6	53.9
8,000- 9,999	57.99	5,375.9	5.3	109.8
10,000-14,999	54.54	9,379.6	9.2	190.6
15,000-24,999	191.87	26,216.3	25.7	532.5
25,000 and over	1,192.27	49,336.1	48.3	1,000.8
Average (or total)	$111.0	$102,134.8	100.0	$2,072.0

(1) CES, Interview Survey, Bulletin 1997, pp. 208-209.

Note: Dividend income for income group $7,000-$7,999 was reduced by $50.00, which was shifted to interest income to eliminate an apparent reporting distortion.

TABLE A-9

DISTRIBUTION OF WAGES, OKLAHOMA, 1973

Income Bracket (dollars)	Average Wages (1)	Total Wages Per Income Group (000) (2)	Per Cent Wage Distribution (3)	Allocation of One-Half of Backwards Shifted Taxes (A) (000) (4)
Under 3,000	$ 426	$ 87,334.7	1.3	$ 27.4
3,000- 3,999	1,184	85,525.1	1.3	26.8
4,000- 4,999	2,424	135,259.2	2.1	43.5
5,000- 5,999	3,433	152,816.6	2.3	47.7
6,000- 6,999	4,068	211,833.0	3.2	66.3
7,000- 7,999	5,276	251,517.5	3.8	78.7
8,000- 9,999	6,542	606,469.6	9.2	190.6
10,000-14,999	10,152	1,745,900.4	26.5	549.1
15,000-24,999	15,897	2,172,102.5	33.0	683.8
25,000 and over	27,536	1,139,439.7	17.3	358.5
Average (or total)	$ 7,161	$6,588,198.3	100.0	$2,072.0

(1) Table V-3, Line 3.

TABLE A-10

DIFFERENTIAL INCIDENCE - STATE INCOME TAX SUBSTITUTED FOR SALES TAX, AND EFFECT OF FEDERAL TAX OFFSET, OKLAHOMA, 1973

Income Bracket (dollars)	Average State and Local Income Tax Payments	Per Cent Distribution of Total Revenue from State Income Tax	Revenue if $116.5 Million Additional Distributed Same as Income Tax		Effect of Deductions on Income	Effective Tax Offset
			Total	Average		
	(1)	(2)	(3)	(4)	(5)	(6)
Under 3,000	$ 3	.49	$ 575.5	$ 2.8	-0-	$ -0-
3,000- 3,999	10	.58	675.7	9.4	-0-	-0-
4,000- 4,999	21	.94	1,095.0	19.6	1.74	0.3
5,000- 5,999	30	1.07	1,246.5	28.0	2.57	0.7
6,000- 6,999	42	1.76	2,050.3	39.4	3.81	1.5
7,000- 7,999	64	2.45	2,854.1	59.9	4.74	2.8
8,000- 9,999	85	6.33	7,374.1	79.5	7.07	5.6
10,000-14,999	176	24.32	28,331.4	164.7	9.27	15.3
15,000-24,999	330	36.24	42,217.5	309.0	18.13	56.0
25,000 and over	776	25.82	30,074.2	726.8	35.06	254.8
Average (or total)	$135	100.0	$116,494.3	$126.6	23.60	8.4

(1) CES, Interview Survey, Bulletin 1997, pp. 210-211.
(2) Equals of total revenue received from state income tax using average tax payments in Column 1 and the Oklahoma distribution of consumer units.
(3) The $116.5 million in present sales tax revenue is distributed to income brackets according to the percentages in Column 2.
(5) Table VI-6, Column 3.
(6) Column 4 times Column 5.

TABLE A-11

ALLOCATION OF SALES TAX REVENUE EXCLUDING TAX

OFFSET AND EXPORTED* ACCORDING TO DISTRIBUTION OF

TOTAL CONSUMPTION EXPENDITURES, OKLAHOMA, 1973

| Income Bracket (dollars) | Per Cent Distribution of Total Consumption (1) | Taxes Paid | | Incidence (4) |
		Total (000) (2)	Average (3)	
Under 3,000	9.20	$ 8,737.9	$ 42.62	1.72
3,000- 3,999	4.45	4,226.5	58.51	1.36
4,000- 4,999	3.78	3,590.1	64.34	1.18
5,000- 5,999	3.47	3,295.7	74.04	1.12
6,000- 6,999	4.83	4,587.4	88.10	1.13
7,000- 7,999	4.80	4,558.9	95.63	1.06
8,000- 9,999	10.18	9,668.7	104.30	.98
10,000-14,999	23.60	22,414.7	130.34	.90
15,000-24,999	24.81	23,563.9	172.46	.79
25,000 and over	10.88	10,333.5	249.72	.51
Average (or total)	100.00	$94,977.5	$103.24	.88

*Total sales tax revenue allocated equals $94,977,500 ($116,494,300 total revenue for 1973 less $20,136,800 exported to federal government via offset and $1,380,000 exported to tourists).

(1) Table A-7, Column 3.

BIBLIOGRAPHY

Aaron, Henry and McGuire, Martin. "Public Goods and Income Distribution." Econometrica (November 1970): 907-921.

Adams, Roy D. and Walker, David J. "The Lifetime Incidence of Consumption Sales Taxes." National Tax Journal 30 (December 1977): 463-466.

Ando, Albert and Modigliani, Franco. "The Life-Cycle Hypothesis of Saving: Aggregate Implications and Tests." American Economic Review 53 (March 1963): 55-84.

Bailey, Martin J. National Income and the Price Level: A Study in Macro Economic Theory. New York: McGraw-Hill Book Company, 1971.

Bateman, J. Fred. "Taxes: Who Benefits and Who Pays? Interpretation and Expansion of Herriot-Miller Data." Business Horizons 15 (February 1972): 51-62.

Boulding, Kenneth E. and Pfaff, Martin, editors. Redistribution to the Rich and the Poor: The Grants Economics of Income Distribution. Belmont, California: Wadsworth Publishing Company, 1972.

Brainin, David and Germanis, John J. "Comments on 'Distribution of Property, Retail Sales, and Personal Income Tax Burdens in California: An Empirical Analysis' by Gerhard N. Rostvold." National Tax Journal 20 (March 1967): 106-113.

Break, George F. "The Incidence and Economic Effects of Taxation." In The Economics of Public Finance, pp. 119-237, Washington, D.C.: The Brookings Institution, 1974.

Brittain, John A. The Payroll Tax for Social Security. Washington, D.C.: The Brookings Institution, 1972.

Brown, Harry Gunnison. "The Incidence of a General Output or a General Sales Tax." In A.E.A. Readings in the Economics of Taxation, pp. 330-339. Edited by Richard A. Musgrave and Carl S. Shoup. Homewood, Illinois: Richard D. Irwin, Inc., 1959.

Browning, Edgar K. "The Burden of Taxation." Journal of Political Economy 86 (August 1978): 649-671.

_____. "The Trend Toward Equality in the Distribution of Net Income." Southern Economic Journal 43 (July 1976): 912-923.

Browning, Edgar K. and Johnson, William R. The Distribution of the Tax Burden. Washington, D.C.: American Enterprise Institute for Public Policy Research, 1979.

Brownlee, O. H. Estimated Distribution of Minnesota Taxes and Public Expenditure Benefits. Minneapolis: University of Minnesota Studies in Economics and Business, No. 21, 1960.

Buchanan, James M. "The Methodology of Incidence Theory: A Critical Review of Some Recent Contributions." In Fiscal Theory and Political Economy, pp. 125-50. Durham, N.C.: Seeman Printery, 1960.

_____. Public Finance and Democratic Process. Chapel Hill, N.C.: University of North Carolina Press, 1967.

Cline, Denzel C. "The General Sales Tax." In Michigan Tax Study: Staff Papers, pp. 415-430. Lansing, Michigan: 1958.

Davies, David G. "A Further Reappraisal of Sales Taxation." National Tax Journal 16 (December 1963): 410-415.

_____. "Progressiveness of a Sales Tax in Relation to Various Income Bases." American Economic Review 50 (1960): 987-995.

_____. "The Sensitivity of Consumption Taxes to Fluctuations in Income." National Tax Journal 15 (September 1962): 281-290.

Due, John F. State and Local Sales Taxation: Structure and Administration. Chicago: Public Administration Service, 1971.

Fierro, Robert D. "In Cash We Trust." Reprinted from Prime Time. Eastern Review (March 1981): 57+.

Friedman, Milton. A Theory of the Consumption Function. Princeton, N.J.: Princeton University Press, 1957.

_____. "The 'Welfare' Effects of Taxes." In Price Theory: A Provisional Text, Revised Edition, pp. 56-67. Chicago: Aldine Publishing Company, 1962.

Fryman, Richard F. "Sales Taxation of Producers' Goods in Illinois." National Tax Journal 22 (June 1969): 273-281.

Ghazanfar, S. M. Retail Sales Taxation of Services in Idaho: Equity Effects and Revenue Potential. Moscow, Idaho: University of Idaho, Bureau of Business and Economic Research, 1973.

Gillespie, W. Irwin. "Effect of Public Expenditures on the Distribution of Income." In Essays in Fiscal Federalism." Edited by Richard A. Misgrave. Washington, D.C.: Brookings Institution, 1965.

Gillespie, W. Irwin and Labelle, J. Brian. "A Pro-Poor or Pro-Rich Redistribution of Income?" National Tax Journal 31 (June 1978): 185-189.

Hansen, Reed R. "An Empirical Analysis of the Retail Sales Tax with Policy Recommendations." National Tax Journal 15 (March 1962): 1-13.

Harberger, Arnold C. The Incidence of the Corporation Income Tax." Journal of Political Economy 70 (June 1962): 215-240.

Herriot, Roger A. and Miller, Herman P. "Tax Changes Among Income Groups: 1962-68." Business Horizons 15 (February 1972): 41-50.

_____. "The Taxes We Pay: An Analysis of the Tax Burden at Each Income Level." The Conference Board Record 8 (May 1971): 31-40.

Hibdon, James E. Price and Welfare Theory. New York: McGraw-Hill Book Company, 1969.

Hochman, Harold M. and Rodgers, James D. "Pareto Optimal Redistribution." American Economic Review 59 (September 1969): 542-557.

Johnson, Karen S. "State Individual Income Tax with an Evaluation of Oklahoma's State Income Tax." Norman, Oklahoma: University of Oklahoma, 1974. (Typewritten.)

Joint Committee on the Economic Report. Federal Tax Policy for Economic Growth and Stability. Washington, D.C.: Government Printing Office, 1955.

Maital, Shlomo. "Apportionment of Public Goods Benefits to Individuals." Public Finance 30 (1975): 397-416.

_____. "Public Goods and Income Distribution: Some Further Results." Econometrica 41 (May 1973): 561-568.

Malabre, Alfred L., Jr. "Underground Economy Grows and Grows." The Wall Street Journal 20, October, 1980; p. 1.

Maxwell, James A. Financing State and Local Governments. Revised edition. Washington, D.C.: Brookings Institution, 1971.

McLure, Charles E., Jr. "Commodity Tax Incidence in Open Economies." National Tax Journal 17 (1964): 187-204.

_____. "Commentary" (on Browning's paper). In Income Inequality: Trends and International Comparisons , pp. 111-114. Edited by John R. Moroney. Lexington, Mass.: D. C. Heath and Company, 1978.

_____. "Economic Effects of Taxing Value Added." In Broad-Based Taxes: New Options and Sources. Edited by Richard A. Musgrave. Baltimore, MD: John Hopkins University Press, 1973.

_____. "General Equilibrium Incidence Analysis: The Harberger Model After Ten Years." Journal of Public Economics 4 (1975): 125-161.

_____. "The Inter-Regional Incidence of General Regional Taxes." Public Finance 24 (1969): 457-484.

_____. "The Interstate Exporting of State and Local Taxes: Estimates for 1962." National Tax Journal 20 (1967): 49-77.

_____. "Tax Incidence, Macroeconomic Policy, and Absolute Prices." Quarterly Journal of Economics (November 1970): 254-267.

McLure, Charles E., Jr. and Thirsk, Wayne R. "A Simplified Exposition of the Harberger Model I: Tax Incidence." National Tax Journal 28 (March 1975): 1-27.

Meerman, Jacob. "Do Empirical Studies of Budget Incidence Make Sense?" Public Finance 33 (1978): 295-313.

_____. "The Incidence of Sales and Excise Taxes, or Where Do We Put the Transfers?" Journal of Political Economy 88 (December 1980): 1242-1248.

Mieszkowski, Peter M. "On the Theory of Tax Incidence." Journal of Political Economy 75 (June 1967): 250-262.

_____. "Tax Incidence Theory: The Effects of Taxes on the Distribution of Income." Journal of Economic Literature 7 (December 1969): 1103-1124.

Minarik, Joseph J. "Who Wins, Who Loses from Inflation?" The Brookings Bulletin 15 (Summer 1978): 6-10.

Modigliani, Franco and Brumberg, Richard. "Utility Analysis and the Consumption Function." In Post-Keynesian Economics, pp. 388-436. Edited by K. Kurihara. New Brunswick: Rutgers University Press, 1954.

Morgan, Daniel C., Jr. "Reappraisal of Sales Taxation: Some Recent Arguments." National Tax Journal 16 (March 1963): 89-101.

_____. Retail Sales Tax: An Appraisal of New Issues. Madison, Wisconsin: The University of Wisconsin Press, 1964.

Musgrave, Richard A. The Theory of Public Finance. New York: McGraw-Hill Book Company, 1959.

_____, Ed. Broad-Based Taxes: New Options and Sources. Baltimore, Maryland: The Johns Hopkins University Press, 1973.

Musgrave, Richard A., Carroll, J. J., Cook, L. D., and Frane, L. "Distribution of Tax Payments by Income Groups: A Case Study for 1948." National Tax Journal 4 (March 1951): 1-53.

Musgrave, Richard A., Case, Karl E., and Leonard, Herman. "The Distribution of Fiscal Burdens and Benefits." Public Finance Quarterly 2 (July 1974): 259-311.

Musgrave, Richard A. and Daicoff, Darwin W. "Who Pays the Michigan Taxes?" In Michigan Tax Study: Staff Papers, pp. 131-183. Lansing, Michigan: 1958.

Musgrave, Richard A. and Musgrave, Peggy B. Public Finance in Theory and Practice, 2nd ed. New York: McGraw-Hill Book Company, 1976.

Oklahoma Department of Institutions, Social and Rehabilitative Services. Annual Report (various years). Oklahoma City, Oklahoma.

Oklahoma Tax Commission. Annual Report (various years). Oklahoma City, Oklahoma.

_____. Oklahoma Individual Income Tax Forms and Instructions, 1973. Oklahoma City, Oklahoma: 1973.

_____. Oklahoma State and Municipal Sales and Use Tax Collection Reports (various years). Oklahoma City, Oklahoma.

Ott, David J., Ott, Attiat F., and Yoo, Jang H. Macroeconomic Theory. New York: McGraw-Hill Book Company, 1975.

Pechman, Joseph A. and Okner, Benjamin A. Who Bears the Tax Burden? Washington, D.C.: Brookings Institution, 1974.

Phares, Donald. State-Local Tax Equity: An Empirical Analysis of the Fifty States. Lexington, Massachusetts: D. C. Heath and Company, 1973.

Rostvold, Gerhard N. "Distribution of Property, Retail Sales, and
    Personal Income Tax Burdens in California: An Empirical Analysis
    of Inequity in Taxation." National Tax Journal 19 (March 1966):
    38-47.

Ruggeri, G. C. "On the Incidence of Canada's Provincial Sales Taxa-
    tion." Public Finance Quarterly 6 (October 1978): 473-484.

Schaefer, Jeffrey M. "Clothing Exemptions and Sales Tax Regressivity."
    American Economic Review 59, Part I (September 1969): 596-599.

_____. "Sales Tax Regressivity Under Alternative Tax Bases and
    Income Concepts." National Tax Journal 22 (December 1969):
    516-526.

Tax Foundation, Inc. Facts and Figures on Government Finance: 20th
    Biennial Edition, 1979. New York: 1980.

_____. State and Local Sales Taxes. New York: 1970.

_____. Tax Burdens and Benefits of Government Expenditures by
    Income Class, 1961 and 1965. (Under direction of George A.
    Bishop.) New York: 1967.

U.S. Department of Commerce, Bureau of the Census. Consumer Income:
    Money Income in 1973 of Families and Persons in the United States.
    Current Population Reports, Series P-60, No. 97 (January 1975).

_____. Statistical Abstract of the United States, 1979.

_____. United States Census of Housing: 1970. Housing Charac-
    teristics for States, Cities, and Counties.

_____. United States Census of Population: 1970. General Social
    and Economic Characteristics: U.S. Summary and Oklahoma.

U.S. Department of Commerce, Bureau of Economic Analysis. "County
    and Metropolitan Area Personal Income." Survey of Current
    Business (April 1975).

_____. Local Area Personal Income 1971-1976. Volume I: Summary.
    August 1978.

_____. "State Personal Income, 1974-75." Survey of Current
    Business (August 1976): 14-27.

U.S. Department of Labor, Bureau of Labor Statistics. Consumer
    Expenditure Survey: Diary Survey, July 1972-June 1974.
    Bulletin 1959, 1977.

_____. Consumer Expenditure Survey Series: Interview Survey, 1972-73. Bulletin 1985, 1978.

_____. Consumer Expenditure Survey: Integrated Diary and Interview Survey Data, 1972-73. Bulletin 1992, 1978.

_____. Consumer Expenditure Survey: Interview Survey, 1972-73. Bulletin 1997, 1978.

U.S. Treasury Department, Internal Revenue Service. Instructions for Form 1040-1973. Washington, D.C.: U.S. Government Printing Office, 1973.

_____. Statistics of Income: Individual Returns/1973. Washington, D.C.: U.S. Government Printing Office, 1975.

University of Oklahoma, Center for Economic and Management Research. Statistical Abstract of Oklahoma, 1979. Norman, Oklahoma: 1980.

University of Wisconsin Tax Study Committee. Wisconsin's State and Local Tax Burden: Impact, Incidence and Tax Revision Alternatives. Madison, Wisconsin: 1959.