

AN ABSTRACT OF THE THESIS OF

CHARLES SHINCHUL KANG for the MASTER OF SCIENCE
(Name of Student) (Degree)

in Agricultural Economics presented on August 21, 1972
(Major) (Date)

Title: A COMPARISON OF FAMILY TAX BURDENS IN ELEVEN
WESTERN STATES

Abstract approved: _____

Dr. R. C. Vars ✓

This study seeks to estimate and compare tax burdens for hypothetical families assumed to reside in each of the eleven contiguous Western states--Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. The estimates are made for a wide range of incomes--from \$3,500 to \$50,000--in each state.

The taxes are allocated employing various shifting assumptions based on economic and tax incidence analysis. The tax exporting issue is acknowledged, and the estimates of burden adjusted to account for this phenomena. As a result, the rankings of states by level of tax burden shown in this study differ from those yielded by the more usual taxes per capita and taxes per \$1,000 of personal income measures.

The procedure used in this study allows for interstate comparisons of tax burden at each of the ten income levels considered. As a by-product, it gives an estimate of the distribution of the tax burden within each of the eleven states.

A Comparison of Family Tax Burdens
in Eleven Western States

by

Charles Shinchul Kang

A THESIS

submitted to

Oregon State University

in partial fulfillment of
the requirements for the
degree of

Master of Science

June 1973

APPROVED:

Associate Professor of Economics

in charge of major

Head of Department of Agricultural Economics

Dean of Graduate School

Date thesis is presented 21 August 1972

Typed by Illa W. Atwood for Charles Shinchul Kang

ACKNOWLEDGMENTS

I wish to thank Dr. R. C. Vars for stimulating my interest in economics, and for his encouragement and assistance in the preparation of this study.

The hypothetical approach to allocating tax burdens adopted in this study was developed, to a large extent, by Stephen E. Lile in an unpublished doctoral dissertation. My thanks to Professor Don M. Soule of the University of Kentucky for making it available for inspection.

Support from the Oregon State University Federal Cooperative Extension Service made this study possible.

TABLE OF CONTENTS

<u>Chapter</u>	<u>Page</u>
I.	INTRODUCTION 1
	Method 3
	Advantages of the Method 5
	Limitations of the Method 6
	Other Studies 8
	Concepts and Definitions 13
II.	THE SHIFTING AND INCIDENCE OF PERSONAL TAXES 15
	Personal Income Taxes 16
	Estimating Procedure 17
	General Sales Taxes 18
	Estimating Procedure 20
	Selective Excise Taxes 21
	Estimating Procedure 21
	The Property Tax on Owner-Occupied Houses 23
	Estimating Procedure 24
III.	THE SHIFTING AND INCIDENCE OF BUSINESS TAXES 27
	Estimating Procedure 32
IV.	PRESENTATION OF FINDINGS 35
	Comparisons of Total Tax Burdens Among States 46
	The Low Income Groups 46
	The Middle Income Groups 48
	The High Income Groups 48
	Comparisons of Burden by Type of Tax 49
	Comparisons of Rankings 54
	Comparisons of the Tax Burden Distribution 57
V.	SUMMARY AND CONCLUSIONS 61
	BIBLIOGRAPHY 65
	APPENDIX A: SOURCES OF ESTIMATES 70
	APPENDIX B: ESTIMATES USING DIFFERENT SHIFTING ASSUMPTIONS 75

LIST OF TABLES

<u>Table</u>		<u>Page</u>
1	Family tax burdens in eleven Western states by type of tax, 1970: Family A: \$3,500 of AGI	36
2	Family tax burdens in eleven Western states by type of tax, 1970. Family B: \$5,000 of AGI	37
3	Family tax burdens in eleven Western states by type of tax, 1970. Family C: \$7,500 of AGI	38
4	Family tax burdens in eleven Western states by type of tax, 1970. Family D: \$10,000 of AGI	39
5	Family tax burdens in eleven Western states by type of tax, 1970. Family E: \$12,500 of AGI	40
6	Family tax burdens in eleven Western states by type of tax, 1970. Family F: \$15,000 of AGI	41
7	Family tax burdens in eleven Western states by type of tax, 1970. Family G: \$17,500 of AGI	42
8	Family tax burdens in eleven Western states by type of tax, 1970. Family H: \$20,000 of AGI	43
9	Family tax burdens in eleven Western states by type of tax, 1970. Family I: \$25,000 of AGI	44
10	Family tax burdens in eleven Western states by type of tax, 1970. Family J: \$50,000 of AGI	45
11	Rankings of states by total family tax burdens, 1970.	50
12	Rankings of states by type of tax, 1970: Personal income taxes.	51
13	Rankings of states by type of tax, 1970: Property, sales, and excise taxes.	52
14	Family tax burden measures compared with conventional measures, 1970.	55

LIST OF TABLES (continued)

<u>Table</u>		<u>Page</u>
A-1	Estimated federal income tax burdens of 10 hypothetical families.	71
A-2	State individual income tax rates, provisions.	72
A-3	State property, sales, and excise tax rates.	73
A-4	Estimated dividend incomes and consumption expenditures of 10 hypothetical families.	74
B-1	Estimates of the burden of business taxes employing three different shifting assumptions.	75
B-2	Total family tax burden in eleven Western states as percentages of AGI, 1970.	76
B-3	Total family tax burden in eleven Western states as percentages of AGI, 1970.	77

A COMPARISON OF FAMILY TAX BURDENS IN ELEVEN WESTERN STATES

I. INTRODUCTION

For decades economists have estimated the distribution of the burdens of taxation by various income classes and compared tax burdens among governments. In recent years, with state and local governments faced with the necessity of raising revenues to finance increasing demands for public services, the comparison of interstate differences in state and local tax burdens has been a focus of interest.

While there are many reasons behind this intensified interest, several are of practical concern to both state legislators and the public at large. First, the need for raising taxes by states and local governments has generated concern over the effects taxes may have on the level of economic activity within their jurisdictions. State and local tax measures must be based on knowledge of the levels and types of taxes in use in competing states and localities if they are to have the intended effects, for unlike the taxes of the Federal government, the base on which state and local levies are applied is highly mobile.

Second, higher taxes are inevitably accompanied by an increased concern over the possible effects they may have on the distribution of the total tax burden among taxpaying units with differing abilities to pay. Knowledge of the distribution of the tax burden is desirable in

order to make informed judgments on the justice of a tax system.

The question of achieving horizontal equity within a federal system of governments also calls forth comparisons of tax burdens among states and localities. The principle of horizontal equity is the generally accepted criterion for judging the fairness of taxes. Simply put, it states that people in similar circumstances should be treated equally by the tax system.¹ This means that taxpayers who reside in different localities, but are similar in all other respects, should bear the same burden of taxes. Comparisons of interstate differences in tax burdens would show to what extent horizontal equity is achieved within a federal system of governments.

This study attempts to make such comparisons. It seeks to estimate and compare the state and local tax burdens in eleven Western states.

¹ Isbister has recently suggested a reformulation of this principle. He suggests that equity judgments ought to involve comparisons, not of amounts of tax paid, which is the traditional criterion, but of amounts of dispensable income received with and without the tax:

"The criterion for horizontal equity proposed is that people who receive equal real disposable incomes in the absence of a tax should enjoy equal real disposable incomes in the presence of the tax."

This reformulation would adjust for unequal abilities to shift taxes. See John Isbister, "On the Theory of Equitable Taxation," National Tax Journal, XXI, pp. 332-339.

Method

Estimates of the tax burden are made for hypothetical families in each of the eleven contiguous Western states--Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. In selecting the hypothetical cases, a wide range of incomes, from \$3,500 to \$50,000, has been chosen. In other respects, families have been assumed to be as much alike as is reasonable in view of the differences in their incomes. Families with equal incomes but residing in different states are assumed to be practically identical in their tastes and preferences--their levels and patterns of consumption expenditures are the same; they reside in homes of equal value. All the families have been assumed to be of the same size--a married couple and two minor children. All are homeowners, have cars, and use tobacco. All within a given state live in the same area and are, in consequence, subject to the same property tax rates.

The assumed budgets of the hypothetical families are not presented as being strictly representative of the income groups from which the cases have been selected. They are considered to be reasonable for each income group, but it is recognized that the levels and patterns of expenditures will vary widely even among families of the same income group, particularly in the higher income classes. The same point needs to be made with respect to the assumed value of the

house owned by each family. The estimates are believed to be reasonable, but not necessarily typical.

It should be noted at the outset that not enough is known about the shifting of taxes and the production and consumption habits of the populace to make possible any accurate statement of the distribution of the tax burden. This study, therefore, is confined to broad estimates of the distribution of the burden of the main state-local taxes.

The taxes covered in this study may be conveniently classified into two groups. The first group includes those taxes believed to be borne primarily by residents of the taxing state--the personal income tax, the property tax on owner-occupied houses, the general retail sales tax, and the selective excise taxes. The second group consists of the following business taxes--the corporation income tax, severance and other gross receipts taxes, unemployment insurance taxes, property taxes on business, and various business license taxes. A significant portion of the burden of these taxes is believed to be exported and borne by out-of-state consumers and stockholders. They are grouped together to facilitate adjustments to account for the exporting of taxes.

Tax burden estimates are derived for the following hypothetical families in each of the eleven Western states:

<u>Family</u>	<u>Family Size</u>	<u>Income Level</u>
A	4	\$3,500
B	4	\$5,000
C	4	\$7,500
D	4	\$10,000
E	4	\$12,500
F	4	\$15,000
G	4	\$17,500
H	4	\$20,000
I	4	\$25,000
J	4	\$50,000

Advantages of the Method

The hypothetical approach to estimating tax burdens employed here yields the following advantages:

(a) The method allows for comparisons of tax burdens among states for a wide range of taxpayer situations while at the same time giving an estimate of the distribution of tax burdens among families with different incomes within particular states. States can be ranked according to level of tax burden for each income level, and the changes in their rankings noted as comparisons are made at low, middle, and high incomes.

(b) The approach accounts for the phenomena of tax exporting in a manner consistent with tax incidence analysis. Other methods of comparing interstate differences in tax burdens, such as the tax per capita or the tax per \$1000 of personal income measures, fail to do

so, assuming implicitly that tax exports equal tax imports for each state. It will be seen that the rankings of the states according to the weight of the tax burden differ greatly when adjustments are made for tax exporting.

(c) It gives some indication of the influence of different types of taxes on the tax burden distribution in each state. It will be seen in particular that the absence of sales and income taxes in some states plays a large role in determining their rankings and in shaping the pattern of their tax burden distributions.

(d) Once developed, the method allows for variations in the main factors affecting a taxpayer's total burden. Estimates could be derived, using the same method, for many other hypothetical cases. It may be of interest, for example, to hold income constant and vary family size to see how relative tax burdens are affected.

Limitations of the Method

There are several limitations to studies of this type which are shared by the method employed in this study. These and others characterizing this study in particular are enumerated below.

(a) Studies of tax incidence present only a partial picture of fiscal incidence -- "the changes in relative income positions of families due to the tax and expenditure policies of the public sector."²

² W. Irsin Gillespie, "Effect of Public Expenditures on the Distribution of Income," in R. A. Musgrave, ed., Essays in Fiscal Federalism, p. 125.

This study does not attempt to estimate the distribution of benefits received from public expenditures. Insofar as differences in tax burden are due, to some extent, to differences in benefits received from public expenditures, this partial treatment of fiscal incidence diminishes the significance of the results of this study.

(b) The paucity of information concerning consumption habits has already been alluded to. That the consumption and house value estimates used in this study are based on studies conducted some time ago casts some doubt on the accuracy of the results. Interstate comparisons of burden from particular taxes will not, however, be affected by this reliance on dated estimates, since the same levels of consumption and the same house values are assumed for families with equal incomes. The use of dated estimates will affect the reliability of the estimated tax burden distribution within states.

(c) Some of the assumptions made as to the degree and direction of tax shifting in all studies of this type are necessarily arbitrary, being based on incomplete information.

(d) No allowance has been made in this study for differences in the cost of living among states, the same expenditures being assumed for families in all states. The slight difference in tax burdens that might result from such an adjustment did not seem to justify this refinement.

(e) Only homeowners are included in the estimates of the

property tax burden. The estimation task would have become much more difficult had renters been included, and insofar as further assumptions as to the extent to which property taxes are shifted to tenants would have been required, added a further source of error to the results without adding much useful information.

(f) The method adopted in this study does not account for differences between tax administration and tax law. Nor does it account for tax evasion.

(g) It is in the nature of studies of this type that they are soon out of date. The estimates of this study are for the year 1970. With changes in the tax systems of many states forthcoming, the rankings of states by tax burdens are likely to change in future years. A major reason for undertaking tax burden studies, especially at the state and local level, is to provide the factual information necessary for undertaking such changes. Hence, if such studies are to help influence tax reform, they must necessarily become obsolete.

Other Studies

Most studies in this area have, in the past, restricted themselves to either comparing taxes among states or estimating the tax burden distribution within a given state or nation. In the former case, the most common method is to compare the rankings of states on the basis of total tax revenues per capita or total taxes per \$1,000 of

personal income. Higher taxes per capita or per \$1,000 of personal income are said to indicate a heavier tax burden. In the latter case, the method used allocates the total revenues collected from each tax among various income classes.

Both these methods suffer from several defects. The tax per capita and tax per \$1,000 of personal income measures include all of a state's revenues as burdens on the residents of the taxing state and thus fail to account for tax exporting or tax importing, whichever the case may be for a given state. These measures implicitly assume that no part of the tax burden in any state can be shifted to residents of other states, when in fact a large portion of the business taxes in a state such as California may be shifted forward to customers in other states.

Studies which deal with the distribution of tax burden among income classes provide information about whether or not various taxes, as well as the total tax system, are progressive, proportional, or regressive. They do not provide information useful for interstate comparisons. Most of these studies deal with the total tax structure of the United States³ and do not, therefore, face the problem of tax

³ For an extensive discussion of the nature and methods of such studies, see the Musgrave-Tucker debate of 1951-52:

Richard A. Musgrave, et al., "Distribution of Tax Payments by Income Groups; A Case Study for 1948," National Tax Journal IV, March 1951, pp. 1-54.

exporting since the United States as a whole may be reasonably viewed as a closed economy for purposes of tax incidence. In some studies that do focus on state and local taxes, tax exporting is acknowledged, then either ignored or treated in an unsatisfactory manner.⁴ The

3 continued from page 10

Richard A. Musgrave, "Distribution of Tax Payments by Income Groups: A Review," Proceedings of the Forty-fifth Annual Conference of the National Tax Association, 1952, pp. 179-222.

Rufus S. Tucker, "Distribution of Tax Burdens in 1948," Proceedings, pp. 195-222.

_____, "Distribution of Tax Burdens in 1948," National Tax Journal, IV, September 1951, pp. 269-286.

The following studies also estimated the distribution of the tax burden in the U. S. by income class.

J. H. Adler, "The Fiscal System, the Distribution of Income, and Public Welfare," in K. E. Poole (ed.), Fiscal Policies and the American Economy. (New York, 1951), pp. 359-409.

A. H. Conrad, "Redistribution through Government Budgets in the United States, 1950," in A. T. Peacock (ed.), Income Redistribution and Social Policy. (London, 1954), pp. 178-268.

G. A. Bishop, "The Tax Burden by Income Class, 1958," National Tax Journal, XIV, 1961, pp. 41-55.

J. W. Gillespie, "The Effect of Public Expenditures on the Distribution of Income: An Empirical Investigation," in R. A. Musgrave (ed.), Essays in Fiscal Federalism. (Washington, 1965), pp. 122-186.

National Tax Foundation, Tax Burdens and Benefits of Government Expenditures by Income Class, 1961 and 1965. (New York, 1967).

⁴ Maryland Tax Study Staff, Maryland Tax Study. College Park: The University of Maryland, 1965.

Mohinder S. Bhatia, Redistribution of Income through the Fiscal System of Puerto Rico, Bureau of Economics and Statistics, Puerto Rico Planning Board, 1960.

Wisconsin and Minnesota tax studies did attempt to distinguish between taxes borne by residents and those exported to non-residents.⁵

While these studies indicate the tax burden level in each income class for particular states, as well as the degree of regression among classes, they do not show a particular family of certain size and income its absolute and relative tax burden.⁶ In allocating burdens by income classes, the comparisons that could be made of tax burden differentials due to differences in income are obscured by differences in family size, sources of income, uses of income, and other variables which affect the level of tax burden.

Several other studies have used methods similar to that adopted in this study in estimating and comparing tax burdens. Only a few of these studies have attempted to estimate the total tax burdens of families. Most have dealt with specific types of taxes paid by corporations or individuals.

⁵ University of Wisconsin Tax Study Committee, Wisconsin's State and Local Tax Burden: Impact, Incidence, and Tax Revision Alternatives. Madison: the University of Wisconsin, 1959.

O. H. Brownlee, Estimated Distribution of Minnesota Taxes and Public Expenditure Benefits. Minneapolis: The University of Minnesota Press, 1960.

⁶ The following studies, using aggregate data, estimate family tax burdens:

James R. Beaton, "Family Tax Burdens by Income Levels," National Tax Journal, XV, March 1962, pp. 14-25.

Benjamin Bridges, Jr., "Family Need Differences and Family Tax Burden Estimates," National Tax Journal, XXIV, pp. 423-447.

Mabel Newcomer was perhaps the first to adopt a hypothetical approach in estimating tax burdens for states.⁷ Her study, however, was made over thirty years ago, confined to two states--New York and Illinois, and intended only to illustrate an alternative method to estimating tax burdens. It has not been subject to much attention in the literature.

More recently, Lile and Soule have used a similar approach in estimating state and local tax burdens for all 50 states.⁸ The method employed in this study owes much to the approach developed by these authors, especially as concerns the manner in which business taxes and the property tax on owner-occupied houses are treated.

Despite these similarities in approach, the present study is justified for several reasons:

(a) It presents current estimates of the tax burden for the eleven Western states.

(b) Since it focuses on one region, the comparisons of burden estimated in this study will in many ways be more detailed and

⁷ Mabel Newcomer, "Estimates of the Tax Burden on Different Income Classes," in Studies in Current Tax Problems. (New York: The Twentieth Century Fund, 1937), pp. 1-52.

⁸ Stephen E. Lile and Don M. Soule, "Interstate Differences in Family Tax Burdens," National Tax Journal, XXII, December 1969, pp. 433-445.

This article summarizes an earlier dissertation by Lile. Stephen E. Lile, Interstate Comparisons of Family Tax Burdens, Unpublished Doctoral Dissertation, University of Kentucky, 1969.

meaningful to the residents of the region than would the comparisons in a nation-wide study.

(c) The study attempts to refine the hypothetical approach by relying almost exclusively on statutory tax rates, as opposed to aggregate revenue measures, in estimating the tax burdens.

For these reasons, the findings differ significantly from those past studies employing similar methods.

Concepts and Definitions

Before turning to a discussion of the incidence assumptions chosen for each tax, it is necessary to define and clarify certain concepts. In the literature, the term tax burden usually refers to the effect a tax has on a person's real income as opposed to his money income. Although this is the sense in which the term is used in this study, it should be noted that this study is concerned only with estimating the immediate burden of a tax. The macroeconomic effects of taxes--the effects a tax may have on a person's real income via its effects on aggregate income, employment and the price level--are not considered.

The incidence of a tax refers to the ultimate location of the burden of a tax. The concept of incidence, according to Musgrave, refers not merely to who pays a tax, but to the total effect of a tax

on income distribution.⁹ The meaning of the term as used in this study is again limited in that all macroeconomic effects are ignored.

A concept which is traditionally a source of difficulties in incidence studies is that of income. A major part of these difficulties, however, stem from the fact that most studies of tax incidence rely on aggregate revenue data. These studies have generally used a broad income concept which includes various imputed non-money services such as rent of owner-occupied homes and food grown and consumed on farms. This study uses a narrow concept of income which includes only income from factor earnings.

It should be noted that using a narrow concept of income results in our estimates of tax burden being overstated. As far as comparisons of burden among states are concerned this will not matter too much, since the estimates of burden for families of equal income will be overstated to the same extent in all states.

⁹ See Richard A. Musgrave, The Theory of Public Finance: A Study in Public Economy. (New York: McGraw-Hill, 1959) Chapter 10.

II. THE SHIFTING AND INCIDENCE OF PERSONAL TAXES

Associated with taxes are a number of effects: taxes may distort the allocation of resources and lead to inefficiencies; they affect work incentives, saving and investment behavior; taxes have an impact on the level of aggregate demand and employment; they determine the level of disposable income and the distribution of after tax money income among various groups. Tax incidence analysis is concerned with investigating the distributive effects of taxes. While this is not the place to discuss the theory of tax incidence,¹⁰ some discussion is included in explaining the shifting assumptions chosen in this study.

The following taxes are discussed in this chapter: the personal income tax, the general sales tax, the property tax on owner-occupied houses, and the selective excise taxes. With the exceptions of the sales and excise taxes, both the initial impact and ultimate incidence of these taxes are on consumers. Although the initial impact of sales and excise taxes are on businesses, they are considered under the category of personal taxes since like the other personal taxes their burden applies mostly to residents of the taxing state.

¹⁰ See Peter Mieszkowski, "Tax Incidence Theory: The Effects of Taxes on the Distribution of Income," Journal of Economic Literature, VII, December 1969, pp. 1103-1124.

Personal Income Taxes

The generally accepted view in the literature is that the personal income tax is not shifted. This is the assumption adopted in this study.

Tax shifting occurs when the demand or supply conditions of the objects taxed are altered. With taxes on commodities, the cost conditions are altered and output tends to be reduced. While it is possible that a personal income tax may result in shifts in the demand and supply of labor, such changes are unlikely. Shifts in labor demand, although not likely to be significant, become possibilities if macroeconomic effects are taken into consideration. An analysis of the macroeconomic effects of income taxation is beyond the scope of this study.

Changes in labor supply are real and immediate possibilities. It is sometimes contended that the reduction in disposable income caused by an income tax reduces labor supply in the same way that a fall in wages might. The price of leisure relative to that of other commodities falls, and individuals are said to substitute leisure for work. Without knowledge of an individual's tastes and preferences, however, it is not possible to determine the effect an income tax will have on his work effort. As most texts in public finance or labor economics show, the net effect of a tax on work effort depends on the

direction and relative strengths of the income and substitution effects. These in turn depend on the shape of the individual's indifference curves showing the rate at which he is willing to substitute work for leisure. Since we do not know the tastes and preferences of all individuals, it is not possible to determine in advance the net effect that an income tax will have on aggregate labor supply. As Musgrave states,

There is no a priori reason to expect that an income tax will either decrease or increase work effort; . . . this is a matter for empirical investigation to establish.¹¹

Unfortunately, empirical work has failed to establish any firm conclusions on the effects of income taxation on work effort.

Due to this uncertainty, and the fact that in the real world, as opposed to the textbook world of complete freedom of choice, institutional rigidities prevent workers from choosing any combination of work and leisure they desire, it is assumed that personal income taxes are borne by those who assume its initial impact.

Estimating Procedure

State income taxes are estimated by applying the appropriate statutory rates to an individual's taxable income. Estimates of local income taxes are not made. As far as could be determined, for the year in question, 1970, Albuquerque, New Mexico was the only

¹¹ Richard A. Musgrave, The Theory of Public Finance. (New York: McGraw-Hill, 1959), p. 238.

locality in the area under analysis employing a personal income tax. Three of the states in the region--Nevada, Washington, and Wyoming--do not levy taxes on individual income. The tax rates and the procedure used in determining the income tax base are explained in more detail in Appendix A.

General Sales Taxes

It is assumed that retail sales taxes are fully shifted forward from seller to buyer in higher prices. While this is the traditional and still dominant view in the literature, it has always been subject to some criticism. Earl R. Rolph¹² has argued that given certain conditions, a general sales tax leaves output and prices unchanged while reducing the money income of resource owners. The tax is shifted backwards to factors of production. The conditions specified by Rolph--perfect competition in all markets, perfectly inelastic factor supplies, a constant money supply and aggregate demand--seem, however, to be so restrictive that backward shifting can only be considered a special case.

Due has argued for the traditional case using a less restrictive set of assumptions.¹³ He shows that given conditions of less than

¹² Earl R. Rolph, The Theory of Fiscal Economics, Bureau of Business and Economic Research, University of California Press, 1954, Chapter 6.

¹³ John F. Due, Sales Taxation, (Urbana: University of Illinois Press, 1957), Chapter 2.

perfect competition, with firms using average cost pricing in response to cost increases, and with the government spending all its tax revenue and pursuing an expansive monetary policy to allow for the sale of output at after tax prices, the burden of a general retail sales tax falls on consumers, not resource owners.

In adopting the traditional view, Gillespie argues as follows:

Consider the substitution of a general sales tax for an income tax where income is divided between consumption and saving, and output is composed of both capital and consumption goods. On the income sources side of an individual's income position, such a substitution is neutral in its effects--an income tax wedge between factor earnings and disposable income is replaced by a sales tax wedge between firm receipts and factor payments. These wedges are general in nature and chargeable against all earnings or cost payments equally. The tax is not neutral, however, in its effects on income uses. The prices of consumer goods subject to tax rise relative to the prices of capital goods which are tax free. The position of consumers relative to savers is harmed by the substitution. It is this change in relative prices adverse to the consumer which indicates that the incidence of the tax, in a general equilibrium setting, is on the consumer.¹⁴

Empirical studies of price reactions to general sales taxes have been relatively rare. Several studies have been made relating to excise tax changes. Following the 1954 reduction in Federal excise

14

W. Irwin Gillespie, "The Incidence of Taxes and Public Expenditures in the Canadian Economy," Studies of the Royal Commission on Taxation, No. 2, Ottawa, 1966. p. 40.

taxes, Due,¹⁵ and later H. L. Johnson¹⁶ analyzed the responses of prices of electrical appliances. Both reported similar results, Due's study concluding that prices were immediately reduced on 94 percent of the items on manufacturers' supply lists. The case for forward shifting received further substantiation from two studies occasioned by the 1965 reduction in Federal excises. The more extensive of these studies, by O. Brownlee and G. L. Perry,¹⁷ concluded that prices of commodities subject to excises fell immediately by the amount of the tax with very few exceptions.

Estimating Procedure

State and local sales taxes are estimated by applying the appropriate statutory rates to the assumed consumption expenditures of our hypothetical families. The total consumption estimates are used for all states except California which exempts food purchases from taxation. A total consumption less food purchases for home preparation estimate was derived to allocate the state and local sales tax burden

¹⁵ John F. Due, "The Effect of the 1954 Reduction in Federal Excise Taxes upon the List Prices of Electrical Appliances," National Tax Journal, VII, September 1954, pp. 222-226.

¹⁶ Harry L. Johnson, "Tax Pyramiding and the Manufacturer's Excise Tax Reduction of 1954," National Tax Journal, XVII, September 1964, pp. 297-302.

¹⁷ Oswald Brownlee and George L. Perry, "The Effects of the 1965 Federal Excise Tax Reduction on Price," National Tax Journal, XX, September 1967, pp. 235-249.

in California. Other interstate variations in expenditures subject to tax were minor and hence ignored.

Selective Excise Taxes

Selective excises, like the general retail sales taxes, are assumed to be fully shifted forward to the consumer. Although it might seem that there is less reason to expect a tax on a handful of commodities to be shifted forward because there would be untaxed substitutes and thus a higher elasticity of demand for the taxed goods, the goods on which states levy excises generally have a low price elasticity of demand. Due to the lack of untaxed substitutes for such goods as tobacco, alcoholic beverages, and motor fuels, the quantity response to a tax-induced price rise is negligible.

The three main excises are levied on purchases of tobacco, gasoline, and alcoholic beverages. It was not possible to include estimates of burden from excises on alcoholic beverages in this study because consumption data by type of beverage was not available and because some of the states operate state-owned liquor stores and do not tax liquor consumption explicitly.

Estimating Procedure

The burden from excises on tobacco is estimated assuming that each family purchases 400 packs annually. The estimates of the

burden from taxes associated with the use of motor vehicles include the gasoline excise, the levy on motor vehicles, and the levy on motor vehicle operators. In arriving at these estimates, it was necessary to deviate from the tax rate method used for the other taxes. For the levies on motor vehicles and motor vehicle operators, the procedure used is simple: each family is assumed to bear a portion of the total revenue collected from these taxes by its state of residence in proportion to its share of expenditures on automobile operation. The aggregate revenue measures can be used for these taxes since it can be safely assumed that they are borne by residents of the taxing state.

This assumption cannot be made for the excise tax on motor fuels. The per capita revenue figures for this tax in Nevada, for example, were found to be much higher than seemed reasonable considering the fact that the tax rate there was no higher than those in several other Western states. This is probably due to the fact that a significant portion of the burden that the aggregate revenue measure allocates to in-state residents is borne by non-resident visitors. A mixture of the aggregate revenue and the tax rate methods is used in estimating the burden from the tax on motor fuels. The total revenue collected from the motor fuels excise in all eleven states is divided by the total population of the eleven Western states. This per capita revenue figure is arbitrarily assigned to all states having a tax of 7¢ per gallon. The per capita figure is then adjusted up or down for

states with higher or lower tax rates. Multiplying the appropriate per capita measure by 40, the number of hypothetical individuals in each state, gives an estimate of the total revenues from motor fuels excises collected from our ten hypothetical families by each state. A portion of this state total is allocated to each family in proportion to its share of automobile operation expenditures.

This somewhat arbitrary procedure is designed to make the burden estimates for the motor fuels taxes consistent with those for the other taxes. It adjusts for the problem of tax exporting; the differences in tax burden among states now reflect differences in tax rates.

It should be mentioned that the estimates include that portion of the levies on motor vehicle operation which falls on businesses. It is assumed that this portion of the burden is ultimately shifted to consumers. To be completely accurate, therefore, this portion should be allocated among consumers according to their consumption expenditures, not their expenditures on automobile operation. This could not be done since it was not possible to get reliable estimates of the proportion of these taxes initially paid by businesses.

The Property Tax on Owner-Occupied Houses

It is generally held that the burden of taxes on real property cannot be shifted if the property is for personal use. No market

transactions take place in this case, and there is little opportunity for shifting. Where market transactions are involved, shifting may occur. Present homeowners, for example, may have been able to shift part of the burden of the tax to the seller at the time of purchase. As buyers, they would have been less willing to pay a given sum with the tax than in the absence of the tax, for the tax would have reduced the value of the stream of expected future services. This possibility is not considered in this study. It is assumed that present homeowners bear the full burden of the tax.

Estimating Procedure

Estimates of burden are made on the basis of assumed house values and full market value rate of tax. The full value rates used are those estimated by the Department of Commerce.¹⁸ The house values are based on estimates of the house value-income ratio at different income levels made by the Survey of Consumer Finances and the 1960 Census of Housing Residential Finance Survey. The table below shows the estimates of house value and the house value-income ratios obtained from these sources.

¹⁸ Taxable Property Values, U. S. Dept. of Commerce, Census of Governments, 1967, Vol. 2, Table 21, pp. 150-156.

<u>Income Level</u>	<u>S.C.F., 1965¹⁹ Median Value</u>	<u>Value/Income</u>	<u>1960 Housing Census²⁰ Median Value</u>	<u>Value/Income</u>
\$ 2,500			\$ 8,200	3.3
3,500	\$10,200	2.9	8,600	2.5
4,500			9,800	2.2
5,000	11,800	2.4	10,600	2.1
5,500			11,400	2.1
6,500			12,800	2.0
7,500	13,425	1.8	14,600	1.9
8,500			15,600	1.8
9,500			15,900	1.7
10,000	16,240	1.6	16,370	1.6
11,000			17,500	1.6
13,500			19,900	1.5

Estimates of the house value used in this study are the average of the above estimates up to the \$10,000 income level. At higher levels of income, estimates of the house value are made assuming that the house value-income ratio is 1.5. The house values assumed for each income level are:

¹⁹ George Katona, et al., 1965 Survey of Consumer Finances (Ann Arbor: University of Michigan Press, 1966), p. 120.

²⁰ Dick Netzer, Economics of the Property Tax, (Washington: The Brookings Institution, 1966), Appendix D, Table D-10, p. 264.

<u>Income Level</u>	<u>House Value</u>	<u>Income Level</u>	<u>House Value</u>
\$ 3,500	\$ 9,500	\$15,000	\$22,500
5,000	11,200	17,500	26,250
7,500	14,000	20,000	30,000
10,000	16,300	25,000	37,500
12,500	18,750	50,000	75,000

III. THE SHIFTING AND INCIDENCE OF BUSINESS TAXES

The business taxes considered in this chapter consist of the following levies--corporation income taxes, taxes on business property, severance taxes, selective sales and gross receipts taxes, the portion of the unemployment insurance taxes paid by employers, and business license taxes. These taxes are essentially costs that a business must either shift forward to customers, backward to factor suppliers, or, if not shifted, reduce business earnings. It is with these taxes that problems associated with tax exporting assume significance, for the open economies of the Western states are characterized by heavy interstate trade and diffused ownership of businesses.

Tax exporting occurs in several ways. The major part of exporting arises out of the deductibility of state taxes from the federal individual and corporation income tax bases, sales of a state's products out of state, and non-resident ownership of a state's businesses. Another way in which taxes are exported--the sale of taxed consumer goods to tourists, salesmen, and other visitors from out-of-state was noted earlier. Here we are concerned with exporting arising out of sales of a state's products out-of-state, non-resident ownership of a state's businesses, and exporting to the Federal government.

Our problem is to determine "to what extent differences in business taxes among states contribute to differences in individuals' tax

burdens among states, given an economy with considerable interstate movement of goods and dispersion of business ownership."²¹

According to Lile and Soule,²² business taxes are only a minor source of tax burden differences for families of the same size and income living in different states. This study adopts the approach outlined by these authors to allocate the burden of these taxes. It is assumed that families of equal size and income bear similar burdens from business taxes regardless of where they live. What minor differences in burden may exist are ignored in the burden estimates.

The assumption is based on the following considerations:

(a) Suppose business taxes are shifted forward. If we consider the diverse origins of the numerous components of final goods purchased by consumers, it is reasonable to suppose that a consumer's state of residence will only have a small effect on the geographic origin of the goods he purchases. Business tax burdens, therefore, will tend to be diffused among equal income residents of the United States in basically the same manner. Consider an individual living in any given state. Most of his purchases will be of goods produced

²¹ Stephen E. Lile, Interstate Comparisons of Family Tax Burdens, Unpublished Ph. D. dissertation, University of Kentucky, 1969, p. 42. The discussion which follows relies largely on the arguments presented in this dissertation and in Lile and Soule, "Interstate Differences in Family Tax Burdens," op. cit., pp. 433-445.

²² Stephen E. Lile and Don M. Soule, op. cit., p. 435.

in the other 49 states. His tax burden due to these purchases will be no different from that of any other individual residing in a different state and having the same income. Small differences in tax burden will exist due to purchases of goods produced in an individual's state of residence. The proportion of an individual's budget that goes toward purchases of goods produced in-state will depend on the state's contribution to total U. S. production. An individual residing in a large, industrial state bears more burden from his state's business taxes than one residing in a state whose share of U. S. production is not as large.

This will lead to differences in the burden of equals residing in these states if the amount of business taxes per dollar of goods purchased in these states are unequal. Since there is evidence to suggest that business tax loads differ very little as percentages of total costs among states,²³ it would seem that they would differ even less as percentages of total revenues from sales. Hence this source of difference in burden is assumed likely to be small and is ignored.

(b) For the reasons discussed above, even if parts of the business tax load are not shifted, the resulting reduction in burdens to consumers will vary little among states. Partial non-shifting therefore, could only affect interstate business tax burden differentials of

²³ Don M. Soule, "Are Interstate Tax Load Differences Important as Business Costs?" Taxes. XXXIX, September, 1961, pp. 712-723.

equals in their roles as stockholders. There are two reasons why these burden differentials are not likely to be very large.

First, the non-shifted portion of business taxes will probably only be a small proportion of the total business tax burden and hence not cause large differences in business earnings. Assume that two competing firms located in different states produce the same products for the same market, and therefore have the same selling price. The differences in the tax loads of these firms will result in cost differences and they will not both be able to shift forward all of their tax loads since their selling price could not then remain the same. It is assumed here that firms shift forward that part of their tax loads which they share in common, and that this common part makes up a larger proportion of the firms' total burdens than the differentials. In view of all the factors contributing to the total costs of firms, these business tax differentials are probably so small as percentages of total cost that they do not have a significant effect on earnings.

Secondly, even if the non-shifted tax differentials were significant, tax burden differences among equals residing in different states will result only if investors concentrated their holdings within their resident states. Business investments, however, are probably dispersed among the states according to profitability of investment. The geographic distribution of a person's business investments will not be significantly affected by his state of residence. Most

of his investments will be in businesses in the other 49 states. Tax burden differences among equals due to the non-shifting of business taxes will, for these reasons, be insignificant.

Three alternative shifting assumptions are used in presenting the estimates. The estimates in this chapter are made assuming that half of the burden of business taxes are shifted forward to consumers and that the other half is not shifted and hence borne by dividend earners. Two sets of estimates are presented in Appendix B. These are based on the assumption that (a) the full burden is shifted forward, and (b) no part of the burden is shifted.

Estimates could have been made applying specific incidence assumptions for each business tax. The method employed was chosen for several reasons:

(a) The literature on the incidence of business taxes, especially concerning the corporate income tax and business property taxes, is still in a state of confusion. There is no widespread agreement on the question of who bears the various taxes.

(b) The alternative assumptions employed in this study cover the extremes of opinion expressed in the literature. Backward shifting is generally ignored as a realistic possibility.

(c) Differing assumptions have been found not to affect the results significantly. The added refinement of treating each business tax separately would not have produced results to justify the effort.

Estimating Procedure

It was argued above that interstate differentials in business tax burdens are not significant. The burden of business taxes are similar for individuals of equal income. In the estimating procedure adopted here, therefore, a portion of the national burden due to business taxes, regardless of where they are levied, is allocated directly to each hypothetical taxpayer. Families of equal size and income are assumed to bear an equal burden of business taxes no matter where they live.

Not all business taxes are included in determining the national burden. As noted previously, motor vehicles taxes paid by business are treated together with that portion of these taxes bearing directly on individuals. Regardless of which assumption concerning the incidence of business taxes is adopted, therefore, these taxes are always assumed to fall on the taxpayer qua consumer.

License taxes on business collected by local governments are not included. All local license tax collections are listed together in the Department of Commerce figures, and it was not possible to determine the portion of the total collected from business.

The following taxes make up the national burden allocated to individuals.

<u>Type of Tax</u>	<u>Amount</u> ²⁴
Property	\$13,962,345,000 ²⁵
On Corporations	\$11,588,746,350 ²⁶
On Non-Corporations	2,373,598,650
Corporation Income Tax	3,737,944,000
Selective Sales and Gross Receipts	2,100,497,000
Business License Taxes	1,321,244,000
Severance Taxes	685,892,000
Unemployment Insurance Taxes	<u>3,102,000,000</u> ²⁷
Total Business Taxes	\$24,909,922,000

This total tax load is adjusted to account for the federal offset.

The gross amount is reduced by 52 percent for those taxes paid by

²⁴ Source: U. S. Dept. of Commerce, Bureau of the Census, Annual Report, Governmental Finances in 1969-70 and State Tax Collections in 1970.

²⁵ In 1964, revenues from taxes on business property amounted to 41 percent of total property tax revenue. Source: Advisory Commission on Intergovernmental Relations, State-Local Taxation and Industrial Location (Washington: U. S. Government Printing Office, 1967), p. 32. The estimate here represents 41 percent of \$34,054,500,000.

²⁶ Corporations held approximately 83 percent of business real assets in 1951. Source: Raymond W. Goldsmith et al., Studies in the National Balance Sheet of the United States, Vol. 2. (Princeton: National Bureau of Economic Research, 1963).

²⁷ Because Employee contributions fluctuate widely from year to year, this figure represents the average of the contributions for 1967, 1968 and 1969. Source: U. S. Dept. of Commerce, Statistical Abstract of the United States: 1971. (Washington: U. S. Government Printing Office), p. 403.

corporations and by 25 percent for those paid by noncorporations.²⁸

A total net burden of \$13,497,844,312 is allocated to the hypothetical families on the basis of their consumption expenditures or stock ownership.²⁹

²⁸ If a corporation pays state taxes of \$10,000 which is deductible for federal income tax purposes, then, with a 52 percent federal tax rate, the imposition of the \$10,000 state tax results in additional taxes of only \$4800 over the total tax bill the corporation would have had in the absence of the state levy. In effect, half of the corporation's state tax bill is paid by the federal government.

²⁹ The net burden per capita of \$66.85 is multiplied by 40, the number of individuals assumed to reside in each state, to get a "total" burden of \$2,673.89 for each state; this "total" is allocated to each of the ten families assumed to reside in each state according to their consumption or stock ownership.

IV. PRESENTATION OF FINDINGS

Tables 1 through 10 show the estimated tax burden experienced by hypothetical families in the eleven Western states. The estimates of the business tax burden are based on the assumption that half the taxes are shifted forward while the other half remains unshifted.

The estimates are derived using the procedures outlined earlier: the individual income tax is estimated by applying the statutory rates in effect in 1970 to a family's taxable income; state and local sales tax liabilities are estimated by applying the relevant statutory rates to a family's assumed consumption expenditures; the property tax burden is derived from applying full-value rates on assumed house values; the cigarette excise estimates are derived on the basis of assumed purchases of 400 packs per year per family; the motor vehicle levies are estimated by the tax rate--aggregate revenue approach described earlier.

The sum of these taxes make up the gross burden of personal taxes. Since the burden of a state's tax system on its residents is the net additional amount of taxes that must be borne as a result of the imposition of state and local taxes, this gross burden needs to be adjusted to account for exporting to the Federal government. For families with incomes of \$7500 and over, therefore, the gross burden is adjusted downward to allow for the effect that payment of these

Table 1. Family tax burdens in 11 Western states by type of tax. Family A: \$3,500 of AGI.

State	Indi- vidual Income	Prop- erty	General Sales		Motor Vehicle	Ciga- rette	Total Per- sonal Taxes		Total Plus \$76 Business Taxes
			State	Local ^c			Gross	Net	
Arizona	0	223	109	-	97	40	469	469	545
California	0	178	118	29	110	40	474	474	551
Colorado ^a	-28 ^d	193	109	73	97	20	465	465	541
Idaho ^b	-8 ^d	185	109	-	112	28	426	426	502
Montana	14	180	-	-	95	32	320	320	396
Nevada	-	147	109	18	101	40	416	416	492
New Mexico	6	123	146	18	104	48	445	445	521
Oregon	21	228	-	-	112	16	376	376	453
Utah	12	145	146	18	92	32	446	446	522
Washington	-	124	164	18	121	44	471	471	547
Wyoming	-	133	109	-	132	32	406	406	482

^a Estimates include a 0.5% tax credit for taxable incomes up to \$9,000.

^b Estimates include the \$10 filing fee.

^c Assumes that the legal maximum rate is in effect except for Colorado where the tax rate assumed is 2% (legal maximum is 4%).

^d The negative amounts are due to an income tax credit on sales taxes paid on purchases of food.

Table 2: Family tax burdens in 11 Western states by type of tax. Family B: \$5,000 AGI.

State	Individual Income	Property	General Sales		Motor Vehicle	Cigarette	Total Personal Taxes		Total Plus \$106 Business Taxes
			State	Local ^c			Gross	Net	
Arizona	20	263	136	-	114	40	592	592	699
California	13	209	146	36	129	40	574	574	680
Colorado ^a	- 6 ^d	227	136	91	115	20	584	584	690
Idaho ^b	- 1	218	136	-	132	28	513	513	619
Montana	48	212	-	-	111	32	403	403	509
Nevada	-	174	136	23	120	40	492	492	598
New Mexico	29	144	182	23	122	48	549	549	655
Oregon	74	269	-	-	139	16	498	498	604
Utah	43	171	182	23	109	32	560	560	666
Washington	-	146	204	23	143	44	560	560	666
Wyoming	-	157	136	-	155	32	480	480	586

^a Estimates include a 0.5% tax credit for taxable incomes up to \$9,000.

^b Estimates include the \$10 filing fee.

^c Assumes that the legal maximum rate is in effect except for Colorado where the tax rate assumed is 2% (legal maximum is 4%).

^d The negative amounts are due to an income tax credit on sales taxes paid on purchases of food.

Table 3. Family tax burdens in 11 Western states by type of tax. Family C: \$7,500 AGI.

State	Individual Income	Property	General Sales		Motor Vehicle	Cigarette	Total Personal Taxes		Total Plus \$153 Business Taxes
			State	Local ^c			Gross	Net ^d	
Arizona	59	329	193	-	168	40	789	655	809
California	67	262	210	52	191	40	822	683	836
Colorado ^a	22	284	193	129	169	20	818	679	832
Idaho ^b	55	273	193	-	194	28	744	617	771
Montana	100	265	-	-	164	32	561	466	619
Nevada	-	217	193	32	177	40	659	547	701
New Mexico	69	181	258	32	180	48	768	637	791
Oregon	146	336	-	-	205	16	702	583	736
Utah	91	214	258	32	161	32	788	654	808
Washington	-	182	290	32	211	44	760	631	784
Wyoming	-	196	193	-	229	32	651	540	693

^a Estimates include a 0.5% tax credit for taxable incomes up to \$9,000.

^b Estimates include the \$10 filing fee.

^c Assumes that the legal maximum rate is in effect except for Colorado where the tax rate assumed is 2% (legal maximum is 4%).

^d The taxable income of \$3,453 falls within the 17% Federal tax bracket. Net state and local burden, therefore, equals 83% of gross burden.

Table 4. Family tax burdens in 11 Western states by type of tax. Family D: \$10,000 AGI.

State	Indi- vidual Income	Prop- erty	General Sales		Motor Vehicle	Ciga- rette	Total Per- sonal Taxes		Total Plus \$174 Business Taxes
			State	Local ^c			Gross	Net ^d	
Arizona	139	383	233	-	194	40	989	801	975
California	170	305	254	64	221	40	1054	853	1027
Colorado ^a	82	331	233	155	196	20	1017	823	997
Idaho ^b	169	318	233	-	225	28	972	718	961
Montana	186	308	-	-	190	32	716	580	754
Nevada	-	253	233	39	204	40	768	622	796
New Mexico	144	210	310	39	209	48	960	778	951
Oregon	257	391	-	-	237	16	901	730	904
Utah	187	249	310	39	186	32	1003	812	986
Washington	-	212	349	39	244	44	888	719	893
Wyoming	-	228	233	-	265	32	758	614	788

^a Estimates include a 0.5% tax credit for taxable incomes up to \$9,000.

^b Estimates include the \$10 filing fee.

^c Assumes that the legal maximum rate is in effect except for Colorado where the tax rate assumed is 2% (legal maximum is 4%).

^d Taxable income equals \$5,600 and falls within the 19% Federal tax bracket. The net burden, therefore, equals 81% of gross burden.

Table 5. Family tax burdens in 11 Western states by type of tax. Family E: \$12,500 AGI.

State	Individual Income	Property	General Sales		Motor Vehicle	Cigarette	Total Personal Taxes		Total Plus \$194 Business Taxes
			State	Local ^c			Gross	Net ^d	
Arizona	255	441	269	-	231	40	1235	1001	1195
California	312	351	296	74	263	40	1335	1081	1276
Colorado ^a	161	381	269	179	233	20	1243	1007	1201
Idaho ^b	321	366	269	-	268	28	1254	1013	1208
Montana	291	354	-	-	227	32	904	732	927
Nevada	-	291	269	45	243	40	888	719	913
New Mexico	246	242	359	45	248	48	1188	962	1157
Oregon	388	450	-	-	282	16	1136	921	1115
Utah	293	287	359	45	221	32	1236	1001	1195
Washington	-	244	403	45	291	44	1027	832	1026
Wyoming	-	262	269	-	315	32	879	712	906

^a Estimates include a 0.5% tax credit for taxable incomes up to \$9,000.

^b Estimates include the \$10 filing fee.

^c Assumes that the legal maximum rate is in effect except for Colorado where the tax rate assumed is 2% (legal maximum is 4%).

^d Taxable income equals \$7,826 and falls within the 19% Federal tax bracket. The net burden, therefore, equals 81% of gross burden.

Table 6. Family tax burdens in 11 Western states by type of tax. Family F: \$15,000 AGI.

State	Individual Income	Prop- erty	General Sales		Motor Vehicle	Ciga- rette	Total Per- sonal Taxes		Total Plus \$228 Business Taxes
			State	Local ^c			Gross	Net ^d	
Arizona	390	529	303	-	246	40	1508	1176	1404
California	481	421	335	84	280	40	1641	1280	1508
Colorado ^a	253	457	303	202	249	20	1483	1157	1385
Idaho ^b	471	439	303	-	285	28	1526	1190	1418
Montana	405	425	-	-	241	32	1103	861	1089
Nevada	-	349	303	50	259	40	1001	781	1009
New Mexico	376	290	404	50	265	48	1434	1118	1347
Oregon	528	540	-	-	301	16	1384	1080	1308
Utah	414	344	404	50	236	32	1480	1155	1383
Washington	-	292	454	50	310	44	1151	898	1108
Wyoming	-	315	303	-	336	32	986	769	997

^a Estimates include a 0.5% tax credit for taxable incomes up to \$9,000.

^b Estimates include the \$10 filing fee.

^c Assumes that the legal maximum rate is in effect except for Colorado where the tax rate assumed is 2% (legal maximum is 4%).

^d Taxable income equals \$10,020 and falls within the 22% Federal tax bracket. The net burden, therefore, equals 78% of gross burden.

Table 7. Family tax burdens in 11 Western states by type of tax. Family G: \$17,500 AGI.

State	Individual Income	Property	General Sales		Motor Vehicle	Cigarette	Total Personal Taxes		Total Plus \$267 Business Taxes
			State	Local ^c			Gross	Net ^d	
Arizona	526	617	335	-	250	40	1768	1326	1593
California	685	491	373	93	285	40	1967	1475	1742
Colorado ^a	362	533	335	223	253	20	1725	1294	1560
Idaho ^b	621	512	335	-	290	28	1785	1339	1606
Montana	539	496	-	-	245	32	1312	984	1251
Nevada	-	407	335	56	263	40	1101	825	1092
New Mexico	531	339	446	56	269	48	1689	1267	1533
Oregon	681	630	-	-	306	16	1633	1224	1491
Utah	525	402	446	56	239	32	1700	1275	1542
Washington	-	341	502	56	315	44	1258	944	1210
Wyoming	-	367	335	-	342	32	1076	807	1074

^a Estimates include a 0.5% tax credit for taxable incomes up to \$9,000.

^b Estimates include the \$10 filing fee.

^c Assumes that the legal maximum rate is in effect except for Colorado where the tax rate assumed is 2% (legal maximum is 4%).

^d Taxable income equals \$12,215 and falls within the 25% Federal tax bracket. The net burden, therefore, equals 75% of gross burden.

Table 8. Family tax burdens in 11 Western states by type of tax. Family H: \$20,000 AGI

State	Individual Income	Property	General Sales		Motor Vehicle	Cigarette	Total Personal Taxes		Total Plus \$293 Business Taxes
			State	Local ^c			Gross	Net ^d	
Arizona	654	705	365	-	254	40	2018	1513	1806
California	898	561	410	102	289	40	2300	1725	2018
Colorado ^a	482	609	365	244	256	20	1976	1482	1775
Idaho ^b	762	585	365	-	293	28	2034	1525	1818
Montana	680	567	-	-	249	32	1527	1145	1438
Nevada	-	465	365	61	267	40	1198	898	1191
New Mexico	691	387	487	61	273	48	1947	1460	1753
Oregon	805	720	-	-	310	16	1851	1388	1681
Utah	629	459	487	61	243	32	1911	1433	1726
Washington	-	390	548	61	319	44	1362	1022	1315
Wyoming	-	420	365	-	346	32	1164	873	1165

^a Estimates include a 0.5% tax credit for taxable incomes up to \$9,000.

^b Estimates include the \$10 filing fee.

^c Assumes that the legal maximum rate is in effect except for Colorado where the tax rate assumed is 2% (legal maximum is 4%).

^d Taxable income equals \$14,345 and falls within the 25% Federal tax bracket. The net burden, therefore, equals 75% of gross burden.

Table 9. Family tax burdens in 11 Western states by type of tax. Family I: \$25,000 AGI

State	Individual Income	Property	General Sales		Motor Vehicle	Cigarette	Total Personal Taxes		Total Plus \$440 Business Taxes
			State	Local ^c			Gross	Net ^d	
Arizona	905	881	426	-	257	40	2508	1806	2246
California	1327	701	485	121	292	40	2957	2129	2570
Colorado ^a	728	761	426	284	259	20	2478	1784	2224
Idaho ^b	1040	731	426	-	297	28	2522	1816	2256
Montana	963	708	-	-	252	32	1955	1408	1848
Nevada	-	581	426	71	270	40	1388	999	1439
New Mexico	1012	484	567	71	276	48	2458	1770	2210
Oregon	1153	900	-	-	313	16	2383	1715	2156
Utah	833	574	567	71	246	32	2322	1672	2112
Washington	-	487	638	71	323	44	1564	1126	1566
Wyoming	-	525	426	-	350	32	1333	960	1400

^a Estimates include a 0.5% tax credit for taxable incomes up to \$9,000.

^b Estimates include the \$10 filing fee.

^c Assumes that the legal maximum rate is in effect except for Colorado where the tax rate assumed is 2% (legal maximum is 4%).

^d Taxable income equals \$18,628 and falls within the 28% Federal tax bracket. The net burden, therefore, equals 72% of gross burden.

Table 10. Family tax burdens in 11 Western states by type of tax. Family J: \$50,000 AGI.

State	Individual Income	Prop- erty	General Sales		Motor Vehicle	Ciga- rette	Total Per- sonal Taxes		Total Plus \$743 Business Taxes
			State	Local ^c			Gross	Net ^d	
Arizona	2244	1762	577	-	265	40	4889	2542	3285
California	3514	1402	677	169	302	40	6104	3174	3917
Colorado ^a	2058	1522	577	385	268	20	4829	2511	3254
Idaho ^b	2740 ^e	1462	577	-	307	28	5114	2659	3402
Montana	2748	1417	-	-	260	32	4457	2318	3061
Nevada	-	1162	577	96	279	40	2154	1120	1863
New Mexico	2755	967	769	96	285	48	4921	2559	3302
Oregon	2828	1800	-	-	324	16	4968	2583	3326
Utah	1921	1147	769	96	253	32	4219	2194	2937
Washington	-	975	865	96	334	44	2314	1203	1946
Wyoming	-	1050	577	-	362	32	2020	1051	1794

^a Estimates include a 0.5% tax credit for taxable incomes up to \$9,000.

^b Estimates include the \$10 filing fee.

^c Assumes that the legal maximum rate is in effect except for Colorado where the tax rate assumed is 2% (legal maximum is 4%)

^d Taxable income equals \$40,500 and falls within the 48% Federal tax bracket. The net burden, therefore, equals 52% of gross burden.

^e Includes a 2% surtax on an assumed intangibles income of \$10,000.

state-local taxes has on their federal income tax liability.

These families are assumed to itemize deductions on their federal tax returns. For families using the standard deduction, the fact that their state tax payments are deductible has no effect on their federal tax bill--their deductions are the same regardless of the amount of state taxes paid. For a family itemizing deductions, the federal tax offset is equal to the product of their marginal tax rate and their state tax liability.

Assume a family itemizing deductions pays state-local taxes of \$1,000 and has a marginal federal income tax rate of 20 percent. Deductibility of state-local taxes against the federal tax base reduces this family's federal tax by \$200. The net additional tax burden resulting from state and local levies is therefore \$800. The federal government has paid one-fifth of this family's state-local tax load.

The total burden is obtained by adding the burden of business taxes to this net personal tax burden.

Comparisons of Total Tax Burdens Among States

The discussion which follows briefly describes the results shown in Tables 1 through 10.

The Low Income Groups

California has the highest tax burden for all of the income levels except one. At the \$5,000 income level, Arizona's burden is the

highest in the Western states. California's high burden throughout the income scale is due to above average burdens for all the major taxes.

With one exception, for the three lowest income levels, California, Colorado, and Arizona have the highest tax burdens. At the lowest income level, \$3,500, the tax burden in Washington is heavier than that in Colorado and Arizona. This can be explained by the fact that Washington's state-local sales taxes are the highest among the eleven Western states. Arizona ranks high at the low income groups mainly due to a large property tax burden, while Colorado's high ranking is explained by its high state and local sales tax rates.

Montana, Wyoming, and Nevada are generally the lowest tax states at this end of the income scale. For families with \$3,500 income, Oregon has one of the lowest tax burdens in the West, ranking tenth. Montana and Oregon's low rankings are due to the absence of sales taxes. With Oregon, the absence of sales taxes more than makes up for the fact that its property taxes are the highest in the West. Wyoming's low burden is due mainly to low sales and property taxes. The fact that it does not levy a tax on individual income is not significant at these low income levels. The difference in burden between the highest and lowest tax states amounts to \$155 at the \$3,500 income level, \$190 at the \$5,000 level, and \$217 for families with \$7,500 income.

The Middle Income Groups

In the three middle income groups, Colorado and Utah, at the \$10,000 level, Idaho and Colorado at the \$12,500 income level, and Idaho and Arizona at \$15,000 of income join California as the three highest tax states. The income tax explains the changes in ranking. Utah's income tax burden, for example, reaches a peak at the \$10,000 income level relative to that of the other Western states, then declines. Idaho's income tax burden ranks only behind California's from the \$12,500 level and above. Colorado's rank drops above the \$15,000 level due to its low income taxes. The three lowest tax states remain Montana, Wyoming, and Nevada, with Wyoming replacing Montana as the lowest tax state at incomes above \$10,000. The differences in tax burden between the highest and lowest tax states are \$273 at \$10,000 of income, \$370 at \$12,500 of income, and \$511 at \$15,000 of income.

The High Income Groups

At the income levels from \$17,500 to \$25,000, California, Idaho, and Arizona have the heaviest tax burdens. The three states without income taxes--Wyoming, Nevada, and Washington--have the lowest taxes. The differences in burden between California and Wyoming now amount to \$668, \$853, and \$1,170 at the \$17,500, \$20,000, and \$25,000 levels of income respectively. The tax burden in California at these income levels is significantly higher than that in any of the

other ten Western states.

For families with \$50,000 income, the three states with the most progressive income taxes--California,³⁰ Idaho, and Oregon--have the highest total tax burdens. The estimated burden in California is over \$500 above that in any other state. The tax burden ranges from \$3,917 in California to \$1,794 in Wyoming. Wyoming, Nevada, and Washington continue to have the lowest burdens.

Table 11, showing the rankings of states for the ten income levels, summarizes the above discussion.

Comparisons of Burden by Type of Tax

Tables 12 and 13 show the rankings of the states for each of the taxes considered in this study. Due to our assumptions--that equal income families residing in different states have similar consumption levels and patterns and own houses of equal value--the rankings of states do not change for different income levels for the property,

³⁰ California's income tax rate structure is not unusually progressive. Its income taxes are, nevertheless, highly productive, especially at the higher income levels. In computing the income base, neither personal exemptions nor deductions of the federal income tax are allowed. A tax credit of \$66 applies for a family of four.

Taxable income at the \$50,000 level in California was estimated to be approximately \$43,000. At the same income level, taxable income in Oregon, which has one of the most progressive income tax rate structures of the eleven Western states, was estimated to be about \$31,380.

Table 11. Rankings of states by total family tax burdens, 1970.

Rank	Adjusted Gross Income									
	\$3,500	\$5,000	\$7,500	\$10,000	\$12,500	\$15,000	\$17,500	\$20,000	\$25,000	\$50,000
1	California	Arizona	California	California	California	California	California	California	California	California
2	Washington	Colorado	Colorado	Colorado	Idaho	Idaho	Idaho	Idaho	Idaho	Idaho
3	Arizona	California	Arizona	Utah	Colorado	Arizona	Arizona	Arizona	Arizona	Oregon
4	Colorado	Washington	Utah	Arizona	Utah	Colorado	Colorado	Colorado	Colorado	New Mexico
5	Utah	Utah	New Mexico	Idaho	Arizona	Utah	Utah	New Mexico	New Mexico	Arizona
6	New Mexico	New Mexico	Washington	New Mexico	New Mexico	New Mexico	New Mexico	Utah	Oregon	Colorado
7	Idaho	Idaho	Idaho	Oregon	Oregon	Oregon	Oregon	Oregon	Utah	Montana
8	Nevada	Oregon	Oregon	Washington	Washington	Washington	Montana	Montana	Montana	Utah
9	Wyoming	Nevada	Nevada	Nevada	Montana	Montana	Washington	Washington	Washington	Washington
10	Oregon	Wyoming	Wyoming	Wyoming	Nevada	Nevada	Nevada	Nevada	Nevada	Nevada
11	Montana	Montana	Montana	Montana	Wyoming	Wyoming	Wyoming	Wyoming	Wyoming	Wyoming

Table 12. Rankings of states by type of tax, 1970: Personal income taxes.

Rank	Adjusted Gross Income									
	\$3,500	\$5,000	\$7,500	\$10,000	\$12,500	\$15,000	\$17,500	\$20,000	\$25,000	\$50,000
1	Oregon	Oregon	Oregon	Oregon	Oregon	Oregon	California	California	California	California
2	Montana	Montana	Montana	Utah	Idaho	California	Oregon	Oregon	Oregon	Oregon
3	Utah	Utah	Utah	Montana	California	Idaho	Idaho	Idaho	Idaho	New Mexico
4	New Mexico	New Mexico	New Mexico	California	Utah	Utah	Montana	New Mexico	New Mexico	New Mexico
5	Arizona	Arizona	California	Idaho	Montana	Montana	New Mexico	Montana	Montana	Idaho
6	California	California	Arizona	New Mexico	Arizona	Arizona	Arizona	Arizona	Arizona	Arizona
7	Idaho	Idaho	Idaho	Arizona	New Mexico	New Mexico	Utah	Utah	Utah	Colorado
8	Colorado	Colorado	Colorado	Colorado	Colorado	Colorado	Colorado	Colorado	Colorado	Colorado

Table 13. Rankings of states by type of tax; 1970: Property, sales and excise taxes.

Rank	Property	State-Local Sales	Motor Vehicle	Cigarette
1	Oregon	Colorado ^a	Wyoming	New Mexico
2	Arizona	Washington ^a	Washington	Washington
3	Colorado	New Mexico ^b	Oregon	Arizona ^d
4	Idaho	Utah ^b	Idaho	California ^d
5	Montana	California	California	Nevada ^d
6	California	Nevada	New Mexico	Montana ^e
7	Nevada	Arizona ^c	Nevada	Utah ^e
8	Utah	Idaho ^c	Colorado	Wyoming ^e
9	Wyoming	Wyoming ^c	Arizona	Idaho
10	Washington		Montana	Colorado
11	New Mexico		Utah	Oregon

a, b, c State-local sales tax burdens are the same in Colorado and Washington; New Mexico and Utah; and Arizona, Idaho, and Wyoming.

d, e Cigarette excises are 10 cents per package in Arizona, California, and Nevada; 8 cents per package in Montana, Utah, and Wyoming.

general sales, and selective excise taxes since these taxes are levied at a single rate.

For the income tax, both the rate structure and tax base differ in each of the states. The rankings of states consequently changes as we consider the tax burden at different income levels. Up to the \$12,500 income level, Oregon, Montana, and Utah are the three highest income tax states. From the \$12,500 level up to the \$50,000 income level, California, Oregon, and Idaho have the heaviest burdens. At the \$50,000 level, New Mexico replaces Idaho as one of three highest tax states.

The income tax differential among the eight states using the tax varies from a high of \$21 in Oregon and a low of -\$28 in Colorado,³¹ a difference of \$49, at the \$3,500 income level, to a high of \$3,514 in California and a low of \$1,921 in Utah, a difference of \$1,593 at the \$50,000 income level.

The changes in the relative rankings of some states as income rises is of interest. California's income tax exhibits the most "progressivity" when compared to the income taxes of the other states, with its rank rising from sixth to first. Utah's income taxes are "proportional" for the first three income levels, "progressive" around the \$10,000 level, and "regressive" thereafter. Oregon's

³¹ The negative amount results from an income tax credit on sales taxes paid on the purchase of food.

income tax burden stays high relative to that of other states throughout the income range, while Colorado's remains the lowest for most income levels.

Comparisons of Rankings

Table 14 compares the rankings of states by the family tax burden estimates of this study to those given by the per capita and per \$1,000 of personal income measures. The estimates under each method are presented as percentages of the average of the burdens for all eleven Western states. The rankings of states for Family D, with \$10,000 income, may be used to compare the different methods.

For over half of the states--Idaho, New Mexico, Utah, Nevada, Washington, and Wyoming--an above-average family tax burden contrasts with a below-average per capita burden, or vice-versa. When the burden on Family D is compared with the burden per \$1,000 of personal income, the rankings of four states--Colorado, Idaho, Montana, and Wyoming--are reversed in terms of above or below average burden.

The extent to which the relative burden in a particular state changes when the family burden estimates are compared to the per capita measure is striking. Nevada and Wyoming, which rank second and third respectively in terms of per capita burden, rank ninth and tenth by the family burden estimates. Utah's ranking, on the other

Table 14. Family tax burden measures compared with conventional measures, 1970 (Percentages of eleven state average).

State	Total Taxes		Adjusted Gross Income									
	Per Capita	Per \$1,000 Personal Income	\$3,500	\$5,000	\$7,500	\$10,000	\$12,500	\$15,000	\$17,500	\$20,000	\$25,000	\$50,000
Arizona	102	106	108	110	106	107	108	111	112	112	112	113
California	131	107	109	107	110	113	116	119	122	126	128	134
Colorado	101	98	107	109	109	109	109	109	109	110	111	112
Idaho	79	93	99	98	101	105	110	112	112	113	113	117
Montana	91	103	78	80	81	83	84	86	88	89	92	105
Nevada	126	99	98	94	92	87	83	80	76	74	72	64
New Mexico	84	102	103	103	104	104	105	106	107	109	110	113
Oregon	94	92	90	95	97	99	101	103	104	105	108	114
Utah	87	101	103	105	106	108	109	109	108	107	105	101
Washington	102	92	108	105	103	98	93	87	85	82	78	67
Wyoming	103	107	96	93	91	86	82	79	75	72	70	61

hand, rises from ninth to third when the emphasis is on family tax burdens.

The main reason for these differences in rankings lies with the per capita measure's treatment of all taxes collected by a state as burdens on in-state residents. The result is that a state like Nevada, which obtains large amounts of revenue from taxes on businesses and out-of-state visitors, shows a high burden per capita whereas a state like Idaho, which does not derive such a large proportion of its revenue from exportable taxes, shows a low rank.

The differences in ranking may also be due to the fact that the per capita measure gives undue weight to the population of each state, showing a high burden in low population states like Nevada, and Wyoming even though the actual burden in these states may be below the average.

Using Table 14, we can also compare the changes that occur in the relative tax burdens of states as income changes. Most of the states show a steady rise in position as income rises. The tax systems of California, Montana, and Oregon exhibit the most "progressivity," California's relative burden rising by about 25 percentage points, Montana's by 27 percentage points, and Oregon's by 24 percentage points.

The average tax burden in the three non-income tax states are about the same as that for the eleven states as a whole at the lowest

income level. At the other end of the income scale, their average tax burden is only 64 percent of the eleven state average. The greater than average "regressivity" of the tax systems of these states allows for the slight "progressivity" exhibited by most of the other states.

Comparisons of the Tax Burden Distribution

Table 15, which shows the effective tax rates in each state for the ten income levels, contains further information about the pattern of tax distribution among income groups. It should be noted that these effective rates are for particular hypothetical families, whereas those shown in other studies relate to the portion of income paid, on the average, by all taxpayers within a particular income group. Consequently, the problems associated with determining appropriate weights to reflect differences in income and population concentration by income group is avoided.

As in most other studies, the tax burden as a percentage of adjusted gross income generally declines as income rises. This regressive distribution of state-local taxes can be explained by the importance of property and sales taxes in the tax systems of state and local governments.

An interesting result is the extent to which the effective rates are proportional in many states for the middle income groups. The

Table 15. Total family tax burdens in eleven Western states as percentages of adjusted gross income, 1970.^a

State	Adjusted Gross Income									
	\$3,500	\$5,000	\$7,500	\$10,000	\$12,500	\$15,000	\$17,500	\$20,000	\$25,000	\$50,000
Arizona	15.58	14.14	10.78	9.75	9.56	9.36	9.10	9.03	8.98	6.57
California	15.74	13.60	11.15	10.27	10.20	10.05	9.95	10.09	10.28	7.83
Colorado	15.47	13.80	11.10	9.97	9.61	10.23	8.92	8.87	8.89	6.51
Idaho	14.35	12.38	10.27	9.60	9.66	9.46	9.17	9.09	9.02	6.80
Montana	11.31	10.18	8.26	7.53	7.41	7.26	7.15	7.19	7.39	6.12
Nevada	14.07	11.97	9.34	7.96	7.31	9.73	6.24	5.95	5.76	3.73
New Mexico	14.88	13.09	10.54	9.51	9.25	8.98	8.76	8.79	8.84	6.60
Oregon	12.94	12.07	9.82	9.03	8.92	8.72	8.52	8.40	8.62	6.65
Utah	14.92	13.32	10.77	9.86	9.57	9.22	8.81	8.62	8.45	5.87
Washington	15.64	13.32	10.45	8.93	8.21	7.51	6.92	6.57	6.26	3.89
Wyoming	13.78	11.73	9.24	7.88	7.25	6.65	6.13	5.83	5.60	3.59

^a Assumes that half the burden of business taxes is shifted forward.

general pattern is one of sharp regressivity at the upper and lower ends of the income scale with roughly proportional rates in the middle.

States with income taxes manage to offset much of the regressivity inherent in state-local taxes, especially in the middle income groups, through the use of graduated sets of tax rates (Oregon, Idaho), non-deductibility of the federal income tax in computing state taxable income (California, New Mexico), and income tax credits for sales tax paid on food (Idaho, Colorado).

The non-income tax states--Nevada, Washington, and Wyoming--exhibit greater than average regressivity in their tax systems, having to rely more on sales and property taxes which involve a regressive distribution with respect to income.

These results are based on the incidence assumptions discussed in the previous chapters. Although the assumptions employed were based on a review of the tax incidence literature, they are not likely to be accepted by everyone. Much of the controversy in this area concerns the incidence of the major business taxes. There is broad agreement about the incidence of personal taxes. Almost all tax incidence studies assume that the personal income tax and the property tax on owner-occupied houses cannot be shifted, and that sales and excise taxes are ultimately borne by consumers.

With business taxes, the only agreement seems to be that significant backward shifting can be ruled out. As mentioned in Chapter III,

three different assumptions were used in this study, covering extremes of opinion regarding the incidence of business taxes. The ranking of states does not change under these different assumptions since business taxes are allocated equally to a given taxpayer regardless of state of residence. Two sets of estimates are therefore relegated to the appendix. The tables in this chapter present the total burden of taxes based on the assumption judged to be the most reasonable.

Changing the incidence assumption does affect the distribution of burden among families within a particular state. Assuming full forward shifting results in an increased burden on lower income families, whereas the assumption of non-shifting results in an increased burden on stockholders who are normally concentrated in the higher income groups. The changes in effective tax rates which result from the different assumptions can be seen in Tables B-1 and B-2 in the appendix.

V. SUMMARY AND CONCLUSIONS

This study has attempted to estimate the burden of state and local taxes in eleven Western states for one family size at ten different income levels. The inadequacy of taxes per capita and taxes per \$1,000 of personal income as measures of the level of taxation among states when used to compare tax burdens of families was shown. The differences in rankings of states, as compared with the above measures, resulted largely from the assumption that business taxes are diffused through the price system to become equal burdens in each state for families of equal size, income, and use of income. It was argued that this assumption more closely approximates the situation in the real world than the assumption implied in the per capita and per \$1,000 of personal income measures--that residents of a taxing state bear the burden of all taxes collected in the state.

Several factors which could affect the level of tax burdens are not accounted for by the present study. The variety and quality of public services provided through taxation probably varies widely from state to state. Not accounting for differences in benefits received from public expenditures weakens the conclusions which can be drawn from this study. A more thorough study would attempt to estimate the net fiscal impact on similarly situated individuals in different states.

No adjustments are made for differences in the level of per

capita income among states. A higher per capita income generally allows for more alternative sources of revenue available to a government. The burden on a particular taxpayer, therefore, is likely to be lighter in states with higher per capita incomes.

The study ignores unequal user-charges incurred by taxpayers living in different states. Taxes may be higher in some states simply because they rely more heavily on them to support public services. Although non-tax charges vary greatly among states,³² they constitute a relatively small percentage of the total revenues collected by states, and neglect of this factor does not significantly alter the conclusions of this study.

An important application of this study has to do with the distribution of federal aid among the states. Insofar as measures of tax effort are used in determining the amount of federal grants-in-aid received by states, the application of family tax burden measures in place of conventional measures of tax effort would result in a different distribution of federal aid.

Consider Table 14 again. Column 2, taxes per \$1,000 personal income, is an often used measure of tax effort. Wyoming's tax effort by this measure is 107 percent of the eleven state average. If we use the burden on a family of four with \$10,000 income, however,

³² Tax Foundation, Inc., Nontax Revenue. (New York, 1968), p. 22.

Wyoming's tax effort is only 86 percent of the eleven state average. Wyoming, therefore, would receive a much smaller share of federal aid if tax effort were based on family tax burdens. Idaho, on the other hand, has a tax effort of only 93 percent by the per \$1,000 of personal income measure, but its effort is 105 percent of the eleven state average when based on family tax burdens. It would receive a larger share of federal aid if tax effort measures were based on family burdens.³³

These differences arise due to differences in the treatment of business taxes noted earlier. The per \$1,000 measure is not adjusted to account for tax exporting, and consequently overstates the efforts of some states while understating it for others. Using family tax burdens as a measure of tax effort is a step toward overcoming this deficiency.

Studies of this type are of obvious benefit to taxpayers and businesses in considering where to locate, and to residents and legislators concerned with the distribution of the tax burden within their particular state. The estimates of this study show that interstate tax differentials are large enough to be significant in location decisions of tax-paying units. They should enable legislators to see more clearly the relative ranking of their states in terms of the tax burden on particular

³³ These points are discussed in more detail in Lile and Soule, op. cit., pp. 437-439.

types of families, and how the tax burden in their respective states differ among income levels. The large interstate differences in the tax burdens of similar families indicate a failing of federalism: horizontal equity is clearly not achieved in the Western United States. This principle, however, need not be the overriding criterion in evaluating the fiscal systems of the Western states. Federalism may confer other benefits which compensate for this failure to achieve horizontal equity.

It is important to know who ultimately bears a tax rather than pays a tax. Otherwise, we cannot explain how certain taxes may influence the behavior of taxed persons, or how taxes may affect firms, markets, and the economies of municipalities, counties, states, and nations. Without knowledge of who ultimately bears a tax, moreover, we cannot pass judgments on the fairness of the distribution of taxes, regardless of the criteria by which we choose to evaluate a tax system. This study has attempted to make a modest contribution towards this goal.

BIBLIOGRAPHY

- Aaron, Henry. "Some criticism of tax burden indices." National Tax Journal, XVIII (September, 1965), 313-317.
- Aaron, Henry, and McGuire, Martin. "Public goods and income distribution." Econometrica, XXXVIII (November, 1970), 907-920.
- Adelman, M. A. "The corporate income tax in the long-run." Journal of Political Economy (April, 1957), 152-157.
- Adler, J. H. "The fiscal system, the distribution of income, and public welfare." Fiscal Policies and the American Economy. Edited by K. E. Poole. New York, 1951.
- Beaton, James R. "Family tax burden by income levels." National Tax Journal, XV (March, 1962), 14-25.
- Bhatia, Mohinder S. Redistribution of Income Through the Fiscal System of Puerto Rico. Puerto Rico Planning Board, Bureau of Economics and Statistics, 1960.
- Bird, R. "A note on tax sacrifice comparisons." National Tax Journal, XVII (September, 1964), 303-308.
- Bishop, George A. "The tax burden by income class." National Tax Journal, XIV (March, 1961), 41-58.
- Bridges, Benjamin. "Family need differences and family tax burden estimates." National Tax Journal, XXIV (1971), 423-447.
- Brownlee, O., and Perry, George L. "The effects of the 1965 federal excise tax reduction on price." National Tax Journal, XX (September, 1967), 235-249.
- Brownlee, O. H. Estimated Distribution of Minnesota Taxes and Public Expenditure Benefits. Minneapolis: The University of Minnesota Press, 1960.
- Buchanan, J. M. "Federalism and fiscal equity." American Economic Review, XL (September, 1950), 583-599.

Buchanan, James M. The Public Finances. Homewood, Illinois: Richard D. Irwin, Inc., 1970.

Collier, Robert P. "Some empirical evidence of tax incidence." National Tax Journal, XI (March, 1958), 35-55.

Conrad, Alfred H. "On the calculations of tax burden." Economica, XXII (November, 1955), 343-348.

_____. "Redistribution through government budgets in the United States, 1950." Income Redistribution and Social Policy. Edited by A. T. Peacock. London, 1954.

Cragg, John G., et al. "Empirical evidence on the incidence of the corporation income tax." Journal of Political Economy, LXXV (December, 1967), 811-821.

Due, John F. "The effect of the 1954 reduction in federal excise taxes upon the list prices of electrical appliances." National Tax Journal, VII (September, 1954), 222-226.

_____. "Toward a general theory of sales tax incidence." Quarterly Journal of Economics, XLVIII (May, 1953), 253-256.

_____. Government Finance: Economics of the Public Sector. 4th edition. Homewood, Illinois: Richard D. Irwin, Inc., 1968.

_____. Sales Taxation. Urbana: University of Illinois Press, 1957.

Frank, Henry J. "Measuring state tax burdens." National Tax Journal, XII (June, 1959), 179-185.

Gillespie, W. Irwin. "Effect of public expenditure on the distribution of income." Essays in Fiscal Federalism. Edited by R. A. Musgrave. Washington, D. C.: The Brookings Institution, 1965.

_____. "The incidence of taxes and public expenditures in the Canadian economy." Studies of the Royal Commission on Taxation, No. 2, Ottawa: Queen's Printer, 1966.

Goode, Richard. Corporation Income Tax. New York: John Wiley and Sons, Inc., 1951.

- Gordon, Robert J. "The incidence of the corporation income tax in U. S. manufacturing, 1925-62." American Economic Review, LVII (September, 1967), 731-758.
- _____. "Incidence of the corporation income tax in U. S. manufacturing: reply." American Economic Review, LVIII (December, 1968), 1360-1367.
- Hirsch, Werner Z. The Economics of State and Local Government. New York: McGraw-Hill Co., 1970.
- Isbister, John. "On the theory of equitable taxation." National Tax Journal, XXI, 332-339.
- Johnson, Harry L. "Tax pyramiding and the manufacturer's excise tax reduction of 1954." National Tax Journal, XVII (September, 1964), 297-302.
- Kane, Michael. A Brief Comparison of Taxes in Oregon, Washington and California. State of Oregon, Department of Commerce, Economic Development Division, 1968.
- Krzyzaniak, Marian, and Musgrave, R. A. "Incidence of the corporation income tax in U. S. manufacturing: comments." American Economic Review, LVIII (December, 1968), 1350-1360.
- Krzyzaniak, M., ed., Effects of Corporate Income Tax. Detroit: Wayne State University Press, 1966.
- Lile, Stephen E. Interstate Comparisons of Family Tax Burdens. Unpublished Doctoral Dissertation. University of Kentucky, 1969.
- Lile, Stephen E. and Soule, Don M. "Interstate differences in family tax burdens." National Tax Journal, XXII (December, 1969), 433-444.
- Maryland Tax Study Staff, Maryland Tax Study. College Park: The University of Maryland, 1965.
- McLure, Charles E., Jr. "Tax exporting in the U. S.: Estimates for 1962." National Tax Journal, XX (March, 1967), 49-77.
- Mieszkowski, Peter. "Tax incidence theory: The effects of taxes on the distribution of income." Journal of Economic Literature, VII (December, 1969), 1103-1124.

Musgrave, R. A., et al. "Distribution of tax burdens by income groups: A case study for 1948." National Tax Journal, IV (March, 1951), 1-53.

Musgrave, R. A., et al. "Distribution of tax payments by income groups: A review." Proceedings of the Forty-Fifth Annual Conference of the National Tax Association, 1952, 179-222.

Musgrave, R. A. "On incidence." Journal of Political Economy, LXI (August, 1953), 306-323.

_____. The Theory of Public Finance: A Study in Public Economy. New York: McGraw-Hill, 1959.

Netzer, Dick. Economics of the Property Tax. Washington, D. C.: The Brookings Institution, 1966.

Newcomer, Mabel. "Estimates of the tax burden on different income classes." Studies in Current Tax Problems. New York: The Twentieth Century Fund, 1937.

Ratchford, B. U., and Han, P. B. "The burden of the corporate income tax." National Tax Journal, X (December, 1957), 318-320.

Recktenwald, H. C. Tax Incidence and Income Redistribution. Translated by Martha V. Stolper. Detroit: Wayne State University Press, 1971.

Rolph, Earl R. The Theory of Fiscal Economics. Bureau of Business and Economic Research, University of California Press, 1954.

Soule, Don M. "Are interstate tax load differences important as business costs?" Taxes, XXXIX (September, 1961), 712-723.

Tax Foundation, Inc. Nontax Revenues. New York, 1968.

_____. Tax Burdens and Benefits of Government Expenditures by Income Class, 1961 and 1965. New York, 1967.

_____. Allocation of the Tax Burden by Income Class. New York, 1960.

Tucker, Rufus S. "Distribution of tax burdens in 1948." Proceedings of the Forty-Fifth Annual Conference of the National Tax Association, 1952, 195-222.

_____. "Distribution of tax burdens in 1948." National Tax Journal, IV (September, 1951), 269-285.

University of Wisconsin Tax Study Committee. Wisconsin's State and Local Tax Burden: Impact, Incidence and Tax Revision Alternatives. Madison: The University of Wisconsin, 1959.

U. S. Department of Commerce, Bureau of the Census, Census of Governments, 1967, Vol. 2. Taxable Property Values. Washington, D. C.: Government Printing Office, 1968.

U. S. Department of Commerce, Bureau of the Census, Governmental Finances in 1970. Washington, D. C.: Government Printing Office, 1971.

_____. State Tax Collections in 1970. Washington, D. C.: Government Printing Office, 1971.

_____. Bureau of Labor Statistics. Survey of Consumer Expenditures, 1960-61. Washington, D. C.: Government Printing Office, 1965.

APPENDICES

APPENDIX A

The tax burden estimates of this study are derived using the income, expenditure, and house value bases and the tax rates presented in this appendix.

Income Taxes

To estimate state individual income taxes, it is first necessary to calculate the burden of federal income taxes. The table below shows the estimated federal income tax liabilities of our hypothetical taxpayers.

The state individual income tax rate structures are summarized in Table A-2.

Other Taxes

Table A-3 shows the tax rates used in estimating the burden of property, sales, and the gasoline and cigarette excises.

Consumption Expenditures, Dividend Incomes

The consumption levels and dividend incomes assumed for each hypothetical family are presented in Table A-4.

Table A-1. Estimated federal income tax burdens of 10 hypothetical families.

Adjusted Gross Income	Deduc- tions ^a	Exemp- tions ^b	Taxable Income	Tax ^c
\$ 3,500	\$ 402	\$2,500	\$ 598	\$ 84
5,000	535	2,500	1,965	285
7,500	1,547	2,500	3,453	527
10,000	1,900	2,500	5,600	924
12,500	2,174	2,500	7,826	1,347
15,000	2,479	2,500	10,021	1,825
17,500	2,785	2,500	12,215	2,314
20,000	3,155	2,500	14,345	2,846
25,000	3,872	2,500	18,628	3,996
50,000	7,000	2,500	40,500	9,120

^a These are the average deductions of returns of heads of households reported by the Department of the Treasury. Returns are assumed to be itemized for incomes of \$7,500 and above. Source: Department of the Treasury, Internal Revenue Service, Statistics of Income, 1969. pp. 82-97.

^b Federal exemptions in 1970 were \$625 for a single individual, \$1,250 for a married couple, and \$625 for each dependent.

^c Federal income tax rates range from 14 percent for taxable incomes below \$1,000 to 50 percent for taxable incomes above \$44,000.

Table A-2. State individual income tax rates, provisions.

State	Rates Applying to Taxable Income			Taxable Income Brackets		Personal Exemptions	Federal Income Tax Deductible
	Lowest Rate	Highest Rate	No. of Steps	Lowest Amount Under	Highest Amount Over	For a Family of 4	
Arizona	2.0	8.0	7	\$1,000	\$ 6,000	\$3,200	Yes
California	1.0	10.0	10	2,000	14,000	66 ^a	No
Colorado	3.0 ^{b,d}	8.0	11	1,000	10,000	2,250	Yes
Idaho	2.5 ^{c,d}	9.0	6	1,000	5,000	2,500	Yes
Montana	2.0	11.0	10	1,000	35,000	2,400	Yes
New Mexico	1.0	9.0	16	500	100,000	2,500	Yes
Oregon	4.0	10.0	7	500	5,000	2,500	Yes
Utah	2.0	6.5	6	1,000	5,000	2,400	Yes

^a Tax credit.

^b Plus surtax of 2 percent on intangibles income over \$5,000. Tax credit of one-half percent applies to the first \$9,000.

^c Plus filing fee of \$10; tax credit of \$10 for each personal exemption is allowed.

^d Tax credit on sales taxes paid on purchases of food is allowed.

Source: U. S. Department of Commerce, Bureau of the Census, Governmental Finances in 1970.
p. 12.

Table A-3. State property, sales, and excise tax rates.

State	Property ^a	Sales ^b		Excises ^b	Cigarette (per package)
		State	Local ^c	Motor Fuels (per gallon)	
Arizona	2.35	3.0	-	7¢	10¢
California	1.87	4.0	1.0 ^d	8	10
Colorado	2.03	3.0	2.0	7	5
Idaho	1.95	3.0	-	7	7
Montana	1.89	-	-	7	8
Nevada	1.55	3.0	0.5	6	10
New Mexico	1.29	4.0	0.5	7	12
Oregon	2.40	-	-	7	4
Utah	1.53	4.0	0.5	7	8
Washington	1.30	4.5	0.5	9	11
Wyoming	1.40	3.0	-	7	8

^a Source: U. S. Department of Commerce, Census of Governments, 1967, Vol. 2. Taxable Property Values. Table 21, pp. 150-156.

These full-value rates are the averages of those estimated by the Department of Commerce. The Department of Commerce estimates were mainly for large cities and their surrounding counties. These estimates, therefore, apply mainly to urban areas.

^b Source: U. S. Department of Commerce, Bureau of the Census, State Tax Collections in 1970, Government Finances/GF70, No. 1, Table 7, p. 11.

^c These are the authorized maximum local rates, except for Colorado's. The authorized maximum in Colorado is 4 percent. We have assumed that the 2 percent rate in Denver is typical.

^d Purchases of food are exempt from state and local sales taxes in California.

Table A-4: Estimates incomes and consumption expenditures of 10 hypothetical families.

Family	Adjusted Gross Income		Dividend Income ^a		Total Consumption ^b	Total Consumption Less Food ^b	Automobile Operation ^b	
	Dollar Amount	As a percentage of the 10 family total	Dollar Amount	As a percentage of the 10 family total	Dollar Amount	Dollar Amount	Dollar Amount	As a percentage of the 10 family total
A	\$ 3,500	2.1	\$ 554	2.0	\$ 3,640	\$ 2,940	\$ 588	4.6
B	5,000	3.0	892	3.3	4,544	3,644	692	5.5
C	7,500	4.5	1,343	4.9	6,449	5,249	1,022	8.1
D	10,000	6.0	1,391	5.1	7,758	6,358	1,181	9.3
E	12,500	7.5	1,467	5.4	8,966	7,391	1,407	11.1
F	15,000	9.0	1,837	6.8	10,091	8,378	1,500	11.9
G	17,500	10.5	2,331	8.6	11,156	9,318	1,523	12.1
H	20,000	12.1	2,587	9.5	12,181	10,243	1,543	12.2
I	25,000	15.1	5,016	18.5	14,184	12,121	1,563	12.4
J	50,000	30.1	9,771	36.0	19,228	16,915	1,613	12.8

^a Source: Department of the Treasury, Internal Revenue Service. Statistics of Income, 1969, p. 26. Where the income levels chosen in this study do not coincide with the mean incomes of the income classes, the point estimates are derived based on the assumption that the marginal propensity to derive income from dividend earnings remains constant within an income class for incomes up to and including \$25,000. The estimate of dividend income for the \$50,000 income level assumes an increasing marginal propensity.

^b Source: U. S. Department of Commerce. Bureau of Labor Statistics. "Consumer expenditure and income, total Western region, urban and rural, 1960-61," Survey of Consumer Expenditures, 1960-61. Bureau of Labor Statistics Report Nos. 237-92, May 1965. The point estimates are based on the assumption that the marginal propensities to consume remain constant within an income class up to incomes of \$15,000. For income levels over \$15,000 marginal propensities to consume are assumed to diminish.

APPENDIX B

The tabulation below presents estimates of the burden of business taxes using three alternative incidence assumptions. As noted in Chapter III, the total tax burden estimates contained in Tables 1 through 10 in Chapter IV, are made employing Assumption B below.

Table B-1. Estimates of the burden of business taxes employing three different shifting assumptions.

Adjusted Gross Income	Assumption A Full forward shifting	Assumption B One-half forward shifting	Assumption C Non- shifting
\$ 3,500	\$ 99	\$ 76	\$ 53
5,000	124	106	88
7,500	176	153	131
10,000	211	174	136
12,500	244	194	144
15,000	274	228	182
17,500	304	267	230
20,000	332	293	254
25,000	386	440	495
50,000	524	743	963

Tables B-2 and B-3 show the effective tax rates obtained using assumptions A and C respectively and are comparable to Table 15 in the main body of the text. The results are as might be expected. When full forward shifting is assumed, the burden on the lower income groups are higher: The tax systems of the Western states become more regressive. Assuming non-shifting results in an increased burden on the higher income groups.

Table B-2. Total family tax burdens in eleven Western states as percentages of adjusted gross income, 1970.^a

State	Adjusted Gross Income									
	\$3,500	\$5,000	\$7,500	\$10,000	\$12,500	\$15,000	\$17,500	\$20,000	\$25,000	\$50,000
Arizona	16.23	14.33	11.08	10.12	9.96	9.67	9.31	9.23	8.77	6.13
California	16.39	13.96	11.44	10.65	10.60	10.36	10.17	10.28	10.06	7.40
Colorado	16.12	14.15	11.52	10.35	10.01	9.55	9.13	9.07	8.68	6.07
Idaho	15.01	12.73	10.57	9.98	10.06	9.77	9.39	9.28	8.81	6.37
Montana	11.97	10.53	8.55	7.91	7.81	7.57	7.36	7.38	7.18	5.68
Nevada	14.72	12.32	9.64	8.33	7.70	7.04	6.45	6.15	5.54	3.29
New Mexico	15.54	13.45	10.84	9.89	9.65	9.29	8.97	8.96	8.62	6.16
Oregon	13.59	12.43	10.12	9.41	9.32	9.03	8.73	8.60	8.41	6.21
Utah	15.57	13.68	11.07	10.23	9.96	9.53	9.02	8.82	8.34	5.44
Washington	16.29	13.68	10.75	9.31	8.61	7.82	7.13	6.77	6.05	3.45
Wyoming	14.43	12.08	9.54	8.25	7.65	6.96	6.35	6.02	5.38	3.15

^a Assumes full forward shifting of business taxes.

Table B-3. Total family tax burdens in eleven Western states as percentages of adjusted gross income, 1970.^a

States	Adjusted Gross Income									
	\$3,500	\$5,000	\$7,500	\$10,000	\$12,500	\$15,000	\$17,500	\$20,000	\$25,000	\$50,000
Arizona	14.93	13.61	10.48	9.37	9.16	9.05	8.89	8.84	9.20	7.01
California	15.09	13.25	10.85	9.90	9.81	9.74	9.74	9.90	10.50	8.27
Colorado	14.82	13.44	10.80	9.60	9.21	8.92	8.71	8.68	9.11	6.95
Idaho	13.70	12.02	9.98	9.23	9.26	9.15	8.96	8.90	9.24	7.24
Montana	10.66	9.82	7.96	7.16	7.01	6.95	6.94	7.00	7.61	6.56
Nevada	13.42	11.61	9.04	7.59	6.91	6.42	6.03	5.76	5.98	4.17
New Mexico	14.23	12.74	10.24	9.14	8.85	8.67	8.55	8.60	9.06	7.04
Oregon	12.29	11.72	9.52	8.66	8.52	8.41	8.31	8.21	8.84	7.09
Utah	14.27	12.97	10.47	9.49	9.17	8.91	8.60	8.43	8.67	6.31
Washington	14.99	12.96	10.16	8.56	7.81	7.20	6.71	6.38	6.48	4.33
Wyoming	13.13	11.37	8.95	7.50	6.85	6.34	5.92	5.63	5.82	4.03

^a Assumes non-shifting of business taxes.