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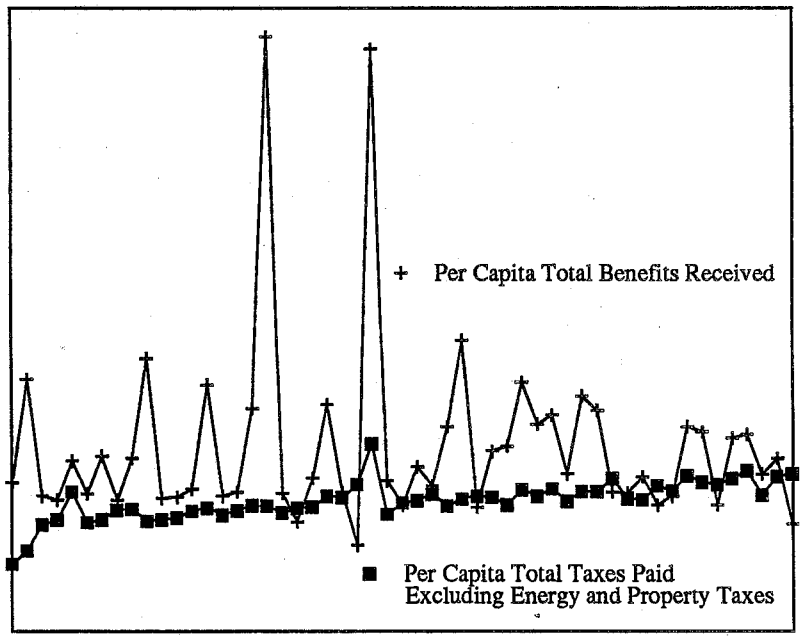
Agricultural Economics Report No. 241 November 1988

State-Level Tax Equity in North Dakota in 1986: A Summary



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Acknowledgements

The authors would like to thank the following state agency personnel for their assistance and cooperation in assembling the data required for this project:

State Agency Personnel	State Agency
Sid Bender and Kathy Strombeck	Tax Department
Dave Clark	Office of Management and Budget
Ralph Messmer	Department of Public Instruction
Reyne Buckholz, Les Weidrick, and Mike Becker	State Highway Department
Leroy Bollinger and Nels Grundvig	Department of Human Services
Blain Braunberger	State Treasurer

Thanks is also extended to Shelly Swandal, Darla Christensen, and Mary Altepeter who typed the manuscript.

Financial support for the project was provided by the North Dakota State Extension Service, the Department of Agricultural Economics, the Agricultural Experiment Station and the Office of the Vice-President for Academic Affairs, North Dakota State University.

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Highlights

The purpose of this study was to assess the fairness of the North Dakota state tax system in 1986. Counties were used as proxies for taxpayers and benefit recipients. The ability to pay and the benefits received principles were applied to various tax, benefit, and net benefit categories for various county groups.

Generally, the state tax system was found to be based on the benefits received principle. County taxes paid were similar to the benefits counties received. This implies that those (counties) who received state government goods and services were also the ones (counties) who paid for them. The state tax system seems to be fair based on the benefits received principle.

There was some untapped potential for taxing according to the ability to pay principle. Tax liabilities among low and high per capita income counties were similar. This implies that the state and local (with property taxes included) tax system was proportional. Therefore, the tax system appeared to be less than equitable based on the ability to pay principle.

Tax liability among farm income groups shows that counties where net farm income accounts for a larger percentage of county personal income generally had a higher average per capita tax liability. However, these counties had only a slightly higher tax burden as a percentage of total personal income.

Tax liability by location revealed that the west and east had higher average per capita tax liabilities than the west central and east central areas of the state. However, tax burdens as a percentage of total personal income were nearly constant across locations among tax liability categories.

STATE-LEVEL TAX EQUITY IN NORTH DAKOTA IN 1986: A SUMMARY[1]

James F. Baltezore, Jay A. Leitch, and Norbert A. Dorow[*]

Introduction

The state of North Dakota is experiencing financial problems as a result of declining tax revenues, increasing demand for public services, and rising costs of providing public services (Baltezore et al. 1988). These problems are the result of the simultaneous slowdown in the oil production industry and the economic recession in agriculture which have negatively impacted the North Dakota economy (Dorow et al. 1988). The economic downturn in these basic industries has caused tax revenues to decline (Figure 1) steadily since a peak in 1985. The combination of lower tax revenues, increased demand for public goods, and higher costs of providing government services has put a financial strain on state government, affecting its ability to meet the needs of its citizens.

A recent ACIR publication estimated the tax capacity and effort of the states (Advisory Commission on Intergovernmental Relations 1987). Tax capacity is the dollar amount of revenue each state would raise if it applied a nationally uniform set of tax rates to a common set of tax bases. Tax effort is estimated by dividing the state's actual tax collections by its tax capacity. North Dakota's tax capacity was slightly above the U.S. average in 1985 while its tax effort was below average (Figure 2). (Tax effort includes property taxes which is the primary revenue source of local governments and does not provide revenue to the state.) Thus, the state was above the national average in its ability to raise tax revenues yet below the national average in its effort to raise tax revenues. However, tax capacity would have declined and tax effort would have increased some since 1985 due to the sharp decline in oil prices and increases in some state tax rates.

An examination of specific tax bases shows that North Dakota's general sales tax collections per capita were below both the "average state" tax capacity and the U.S. average capacity (Figure 3). The state also collected less tax revenue per capita from personal income than its capacity and the U.S. average. Tax revenues from user charges and mineral resources exceeded the state's tax capacity and the U.S. average capacity. North Dakota's revenue mix relies heavily on user charges (most non-tax revenue sources except interest earnings) and mineral resources taxes. The state places less emphasis than the average state on the general sales and personal income taxes as revenue sources to fund state services.

---

[1]Summary of State-Level Tax Equity in North Dakota in 1986 (Baltezore et al., 1988).

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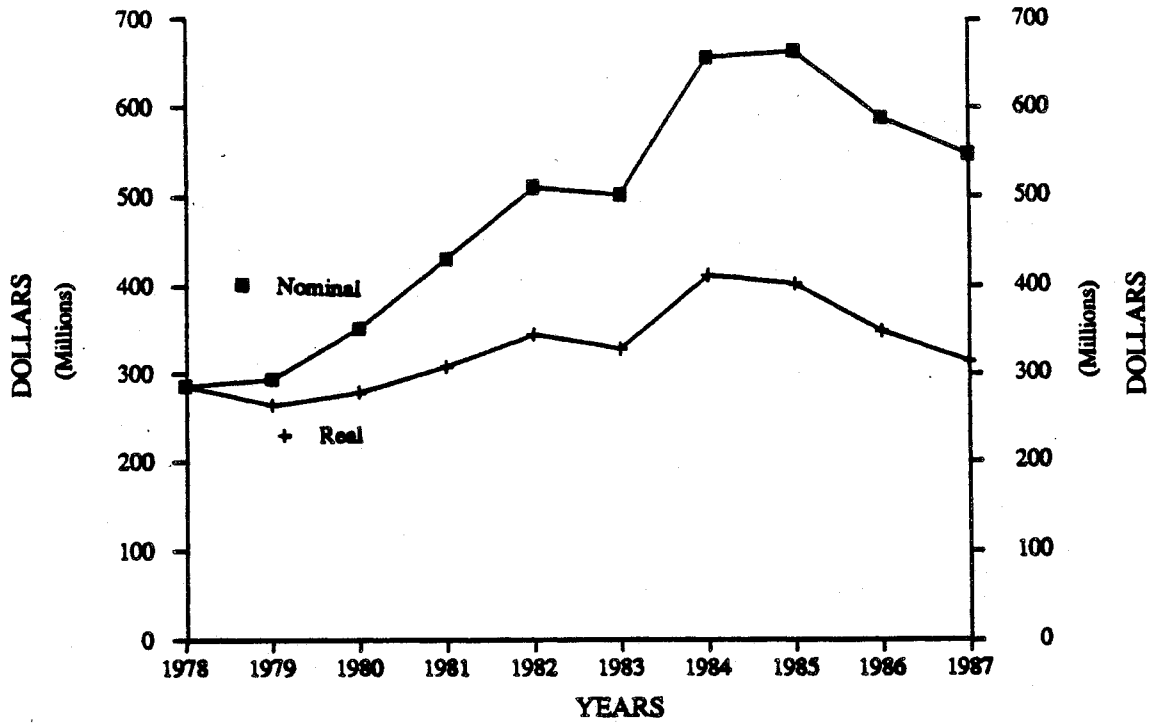


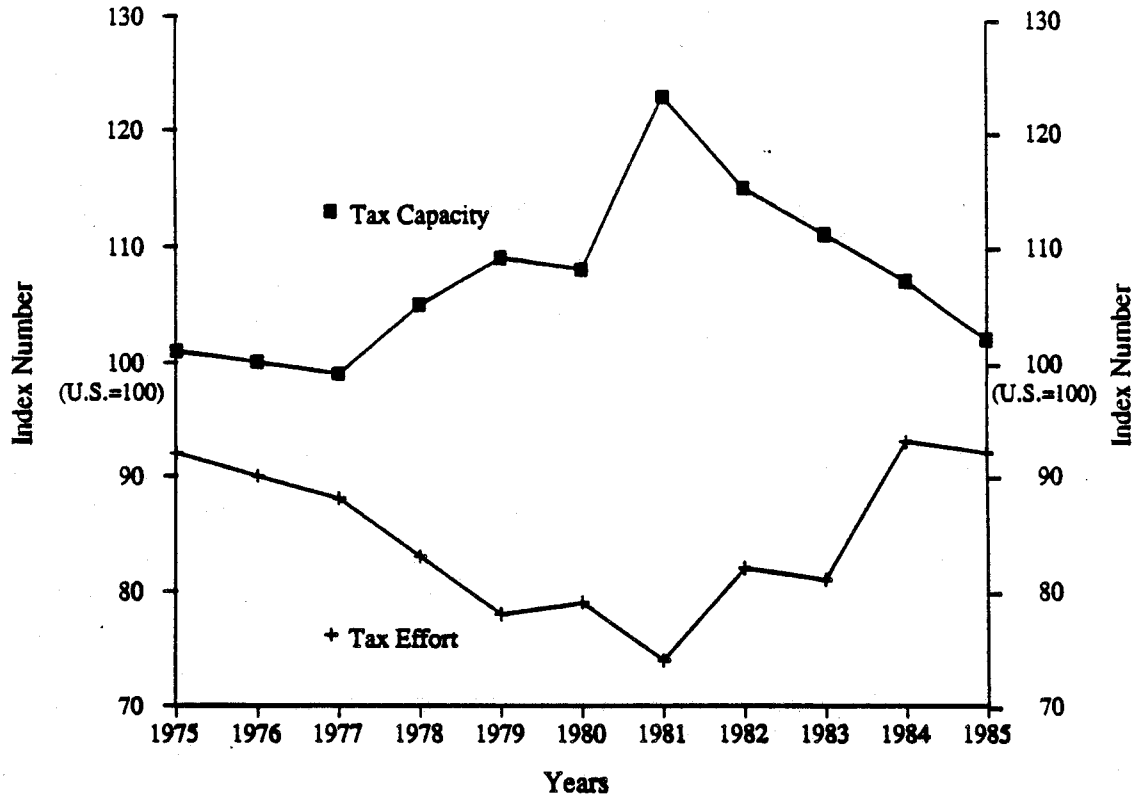
Figure 1. Total State Collected Taxes, Fiscal Years 1978-1987, North Dakota, Nominal and Real

North Dakota state government revenues have become difficult to predict and often insufficient to meet expenditure commitments. Tax rates and bases could be modified to stabilize tax revenues even during times of economic volatility. However, any tax modifications should conform to the basic tax fairness principles of ability to pay and benefits received.

Tax Fairness

Tax decisions often involve considerable discretion about who should pay and how much. Elected government officials are responsible for making tax decisions; however, they are influenced by people in all economic sectors when debating what type of tax to use, defining the tax base, and selecting a tax rate. Tax fairness (equity) is achieved by basing tax decisions on the principles of either ability to pay or benefits received. Basing tax decisions on these principles should produce a tax system which the majority of the populace believes is fair in its distribution of the tax burden.

The ability to pay principle is that taxes should be distributed according to the ability of taxpayers to pay them (Davis et al. 1983). Those with more ability should be taxed more heavily or at a higher rate. It requires some collective agreement on equitable distribution among taxpayers



SOURCE: Advisory Commission on Intergovernmental Relations (1987)

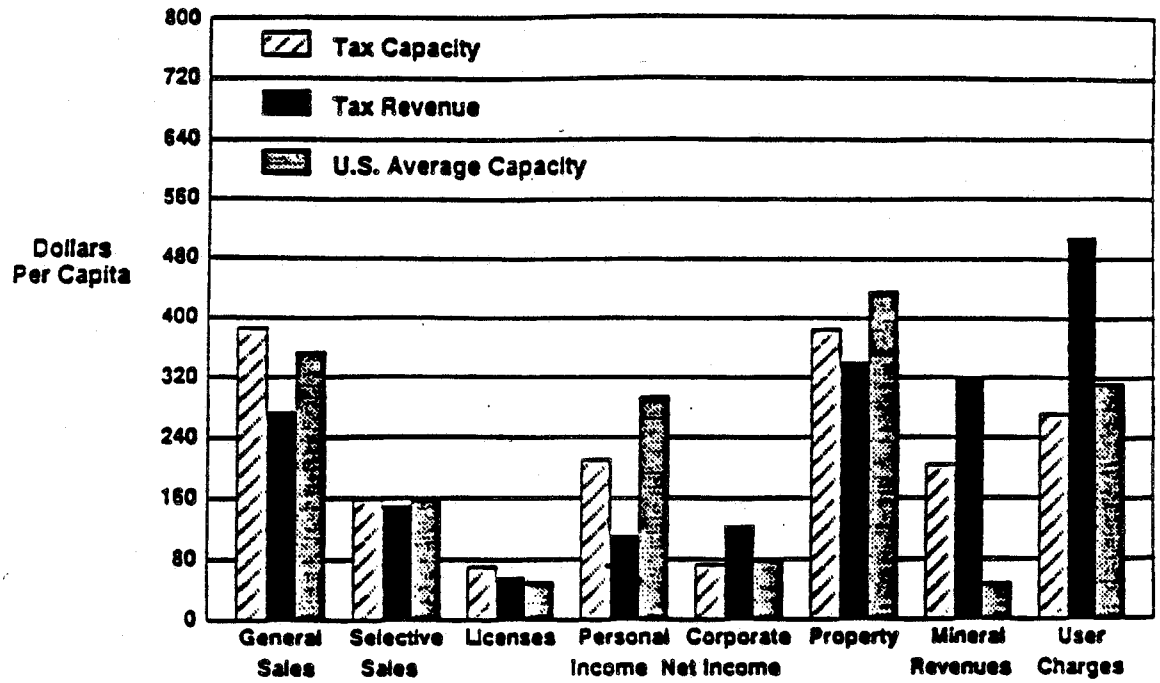
Figure 2. Tax Capacity and Effort (all taxes), North Dakota, 1975-85

based on individual income, consumption, or wealth levels. Individuals with equal economic capacities should pay the same amount of taxes while individuals with different economic abilities should pay taxes that differ according to some degree of fairness (Rosen 1985). The degree of fairness is a subjective decision made by legislators when determining tax rates and bases.

The benefits received principle--"Those who benefit, pay"--relates the means of financing government goods and services to the benefits citizens receive (Buchanan et al. 1987). Examples where the benefits received principle applies include gasoline tax for roads and streets, property tax for police and fire protection, tuition for college, and entrance fees for using state parks. Services provided by the source of tax revenue are consumed by those who pay for them.

Study Cautions

Several cautions need to be mentioned to put the following results into perspective. First, counties were used as proxies for taxpaying and benefiting units. This assumes that counties pay taxes and receive benefits. However, people in each county actually pay taxes and receive benefits.



SOURCE: Advisory Commission on Intergovernmental Relations (1987)

Figure 3. Tax Capacity and Tax Revenue, Selected Tax Bases, North Dakota, 1985

Estimating tax liabilities and benefits received on an individual taxpayer basis would be more revealing. Second, human services and higher education expenditures were allocated among counties assuming residents in the counties where facilities are located received all benefits. This is not entirely true because people go to health facilities or attend colleges or universities outside of their county of residence. Agricultural and industrial development expenditures were attributed assuming that only counties where the institutions or facilities were located receive the benefits. This is not entirely accurate since these expenditures benefit people across the entire state. Finally, results reflect conditions in 1986 which could be different than past, present, or future years.

North Dakota State-Level Tax Equity

The North Dakota state-level tax system was examined to assess its fairness based on the ability to pay and benefits received principles (Baltezore et al. 1988). Counties were used as the surrogate taxpaying and benefit receiving unit because data are not available for individual taxpaying households or businesses. It was assumed that counties were sufficiently internally homogenous to treat them as taxpaying units and that people living

in the county pay taxes and receive the benefits. Counties were placed into several groups based on

(1) per capita county total personal income,
(2) percentage of county total personal income from farming,
(3) location, and
(4) other characteristics.[2]

State collected taxes (Figure 4) were attributed to counties using a number of techniques and data sources. Sales and use taxes were attributed to counties based on a 5-year average of county total personal income (1980 to 1984) (Figure 5). This makes the sales tax proportional to income by design. However, North Dakota sales and use taxes are thought to be regressive (Dorow et al. 1988). County shares of income tax collections were provided directly by the state Tax Department. Energy taxes and the estate tax were attributed

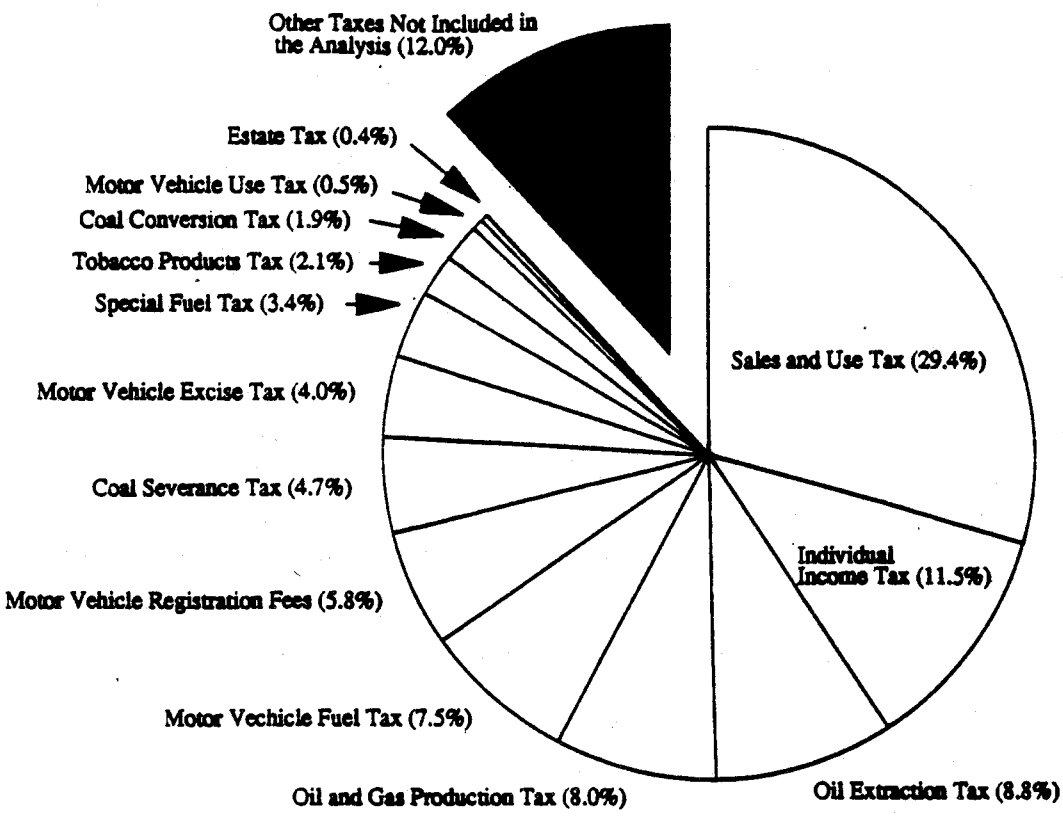


Figure 4. State-Level Collections, North Dakota, 1986

[2]Other characteristics included in Baltezore et al. (1988) but not discussed here were county total personal income, county federal adjusted gross income, state planning regions, and county population.

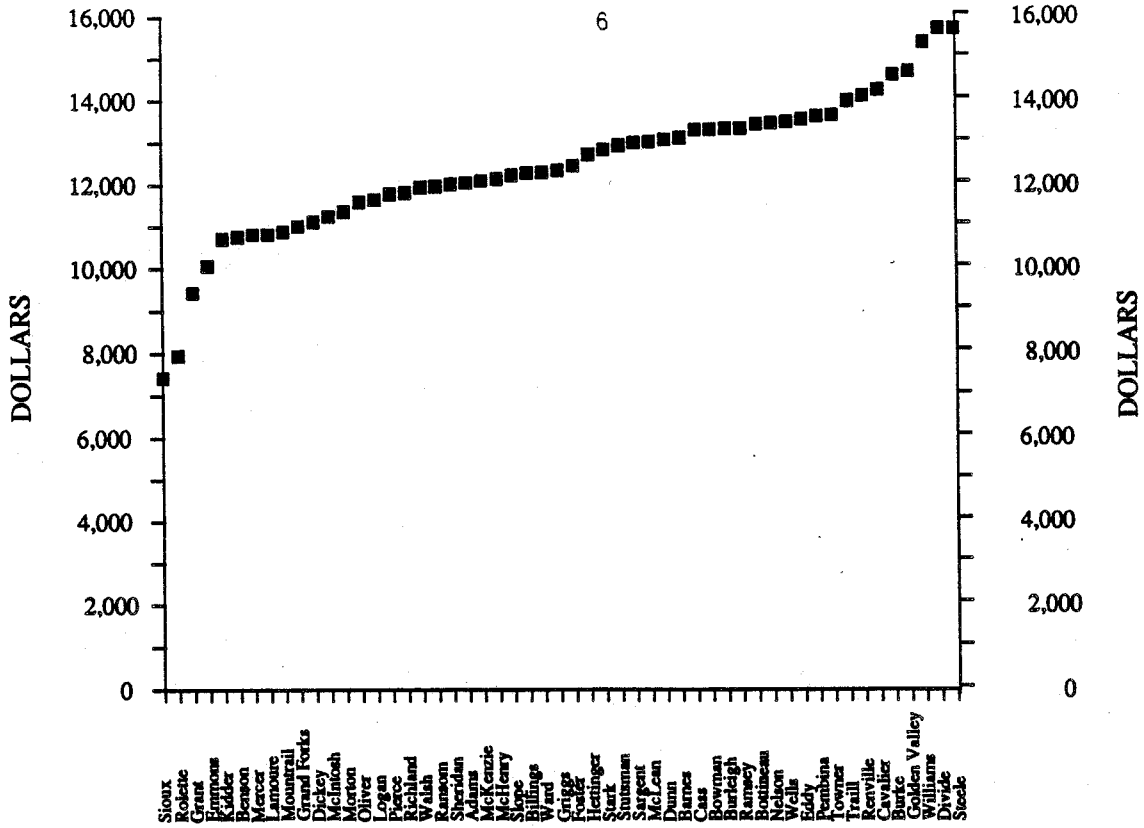


Figure 5. Per Capita County Total Personal Income, North Dakota, 1986

to counties based on Tax Department Biennial Reports. Motor vehicle and special fuel taxes were attributed to counties using county vehicle miles of travel. Vehicle registrations were used to attribute registration fees, motor vehicle excise tax, and motor vehicle use tax to counties. Tobacco products taxes were attributed to counties based on county population.

Taxes collected were aggregated into three tax liability categories.

(1) **Total taxes paid excluding energy and property taxes:** state taxes paid by people in the county. This category is used to compare with benefits received.

(2) **Total taxes paid excluding energy taxes:** excludes oil extraction, oil and gas production, coal severance, and coal conversion tax collections. Energy taxes are paid primarily by corporations and not by citizens within the county.

(3) **Total taxes paid:** sum of all taxes presented in Figure 4 plus property taxes. Property taxes are the primary revenue source of local government units.

Tax liability categories were divided by county total personal income to estimate the percentage of tax collections per dollar of income (tax burden). Tax liabilities were also estimated on a per capita basis.

Total Taxes Paid Excluding Energy and Property Taxes

This tax measure includes all non-federal taxes paid by county residents except energy and property taxes.[3] Average per capita tax liability was $626 per person for counties with per capita incomes of $14,000 or more (Table 1). Counties with less than $11,000 per capita income had an average per capita tax liability of $445. However, tax liability as a percentage of total personal income was similar, about 4.3 percent, across county per capita income classifications. This implies that the state tax system is proportional and not based on the ability to pay principle. High per capita income counties would be taxed at a rate greater than low per capita income counties if the ability to pay principle were to be followed.

Tax liability among farm income groups shows that counties where net farm income accounts for a larger percentage of county personal income generally had a higher average per capita tax liability. Counties with a high percentage of farm income also had a slightly higher tax burden as a percentage of total personal income. These counties paid higher motor vehicle taxes per capita but lower income taxes than counties less dependent on farming.

Tax liability by location (Figure 6) indicates that the west (Regions 1 and 8) and east (Regions 4 and 5) had higher average per capita tax liabilities than the west central (Regions 2 and 7) or east central (Regions 3 and 6) areas of the state. However, tax burdens as a percentage of total personal income were nearly constant across locations.

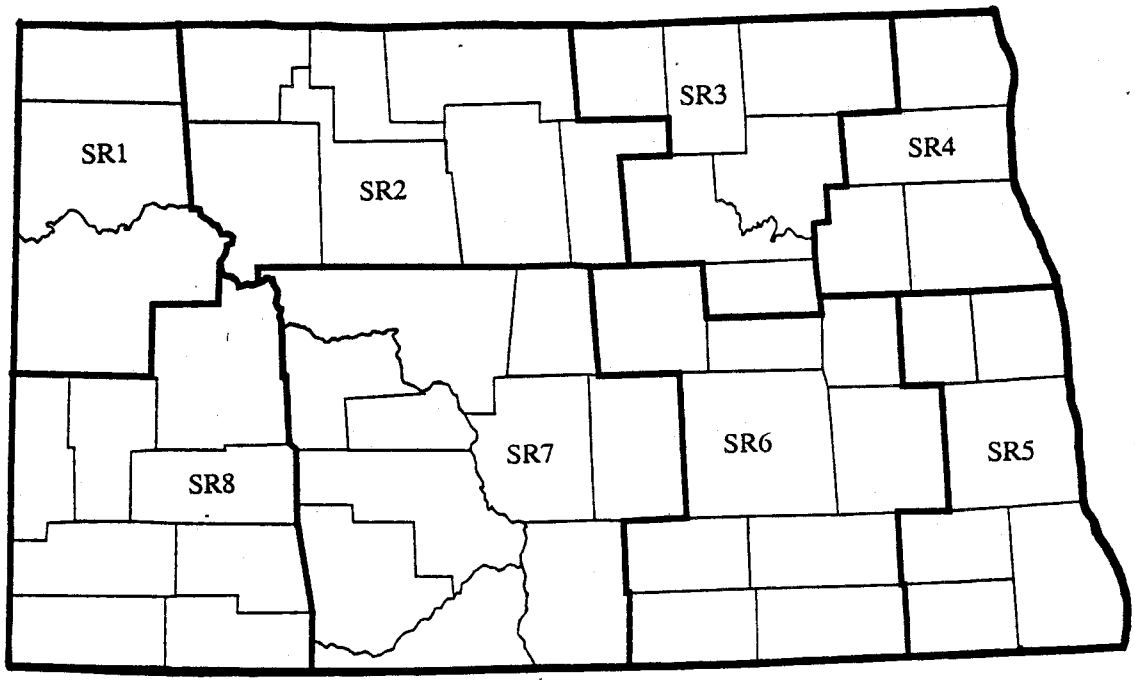


Figure 6. North Dakota State Planning Regions

[3]Results are based on findings presented in Baltezore et al. (1988).

TABLE 1. STATE AND LOCAL TAX LIABILITIES, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Total Taxes Paid Excluding Energy and Property Taxes		Total Taxes Paid Excluding Energy Taxes		All Taxes	
	Average Per Capita Annual Tax Liability	Percentage of Total Personal Income	Average Per Capita Annual Tax Liability	Percentage of Total Personal Income	Average Per Capita Annual Tax Liability	Percentage of Total Personal Income
	- $ -	- % -	- $ -	- % -	- $ -	- % -
Per capita income						
$14,000 or more	626	4.20	1,130	7.57	1,615	10.85
$13,000 to $13,999	576	4.30	1,023	7.63	1,282	9.60
$12,000 to $12,999	559	4.51	971	7.83	2,617	21.27
$11,000 to $11,999	490	4.25	899	7.79	1,202	10.39
less than $11,000	445	4.48	770	7.69	927	9.15
Farm income						
25% or more	589	4.74	1,047	8.34	3,758	30.32
20% to 24%	553	4.24	1,019	7.83	1,130	8.62
15% to 19%	536	4.37	967	7.86	1,238	10.01
10% to 14%	549	4.40	933	7.48	1,566	12.50
less than 10%	498	4.13	873	7.21	1,045	8.67
Location						
West	594	4.50	1,006	7.61	3,350	26.34
West central	512	4.38	876	7.49	1,293	10.93
East central	518	4.25	958	7.83	956	7.83
East	563	4.34	1,045	8.02	1,045	8.02

Generally, the state tax system is not based on the ability to pay principle. Taxes paid as a percentage of total personal income show that counties with relatively low per capita total personal incomes paid nearly the same percentage of their income in taxes as high per capita income counties (Figure 7). Counties are shown from the lowest per capita income (Sioux) on the left of Figure 7 (and subsequent figures) to the highest per capita income (Steele) on the right. This suggests that the state tax system is proportional.

Total Taxes Paid Excluding Energy Taxes

This tax measure includes all non-federal taxes paid by county residents. Average per capita tax liabilities ranged from $1,130 for counties with per capita income $14,000 or more to $770 for counties with per capita income less than $11,000 (Table 1). Taxes paid as a percentage of total personal income were similar across county per capita income classifications. This suggests that the tax system (with property taxes included) is proportional and not based on the ability to pay principle.

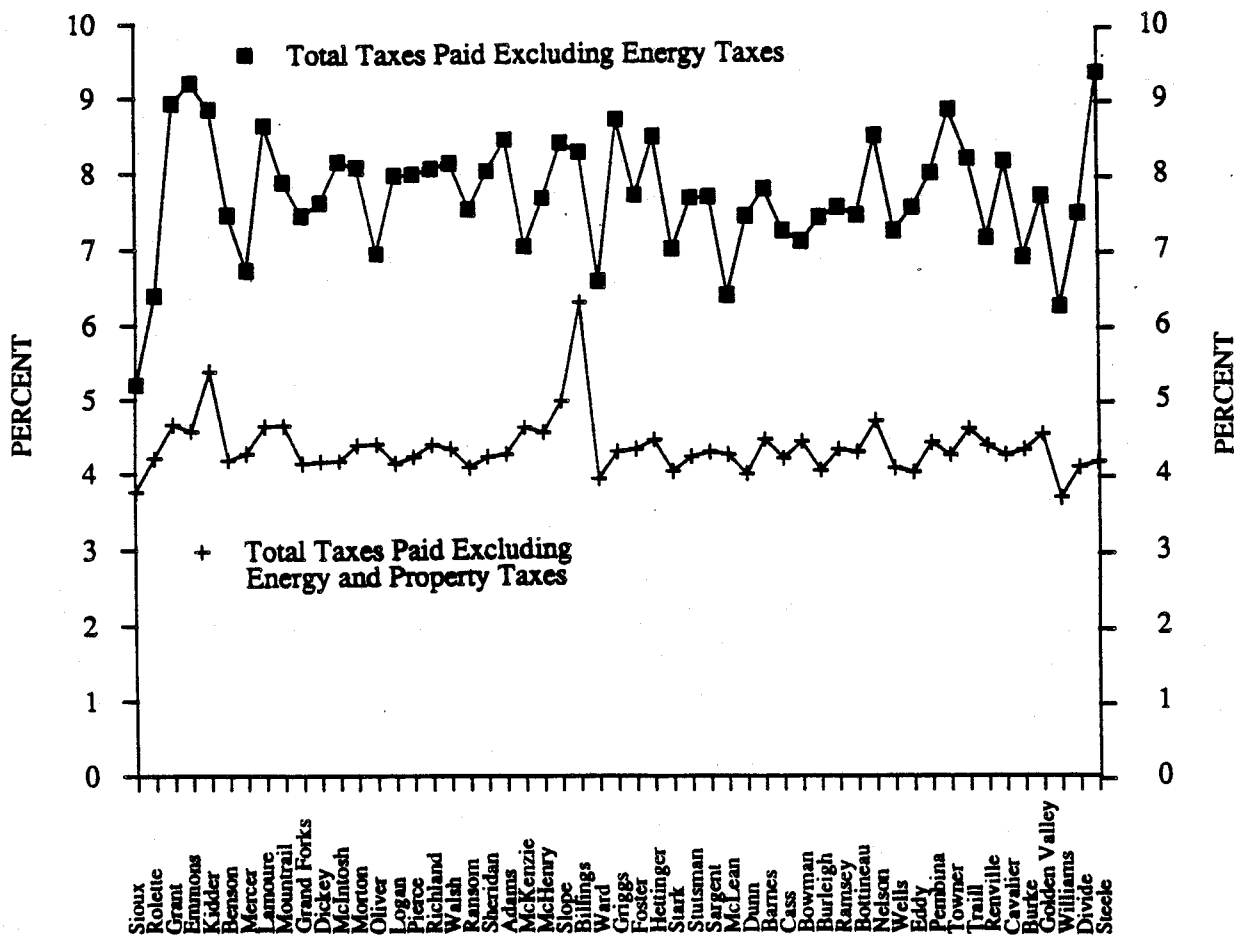


Figure 7. Per Capita Total Taxes Paid Excluding Energy Taxes and Total Taxes Paid Excluding Energy and Property Taxes as a Percent of Per Capita County Total Personal Income, by County, North Dakota, 1986

Tax liability among farm income groups shows that counties with a higher percentage of farm income had a greater average per capita tax liability and paid somewhat more taxes as a percentage of total personal income. When property taxes are included, as in this example, the difference between farm dependent counties and those less dependent on farming was somewhat greater than for state taxes only.

Tax liability by location indicated that the west and east had the greatest average per capita tax liability. However, taxes paid as a percentage of total personal income were similar across locations. Taxes paid as a percentage of income were generally proportional among counties (Figure 7). This held true whether or not property taxes were included.

Total Taxes Paid

This tax measure includes all non-federal taxes paid in the county. Revenue includes energy taxes which are, for the most part, exported to energy consumers outside the county and not paid by county residents.

Average per capita tax liability was highest for counties with per capita incomes from $12,000 to $12,999 (Table 1). These counties also had the highest tax liability as a percentage of total personal income. Counties in which farm income comprises 25 percent or more of the county's total personal income paid more taxes per capita and as a percentage of total personal income. The west had the highest average per capita tax liability and had the highest tax liability as a percentage of total personal income.

Some counties paid considerably more taxes per capita than others (Figure 8). Counties with high tax liabilities were energy counties which pay taxes on the oil produced or coal mined within the county. Citizens in these counties do not actually pay the energy taxes. Accounting for these anomalies, as was done above, results in a tax system that is proportional.

Benefits Received

Benefits received were examined to reveal where state government revenues are spent. Total benefits received represents the sum of all state expenditures except for other expenditures not included (Figure 9). Other expenditures not included are general government, public safety, natural resources, and legislative and judicial budget expenditures. Average per capita benefits received and benefits received as a percentage of total personal income were estimated for each county group.

Counties with relatively high per capita total personal income received fewer benefits per capita and as a percentage of total personal income than low per capita total personal income counties (Table 2). Relatively low farm income counties received more state goods and services per capita and as a percentage of total personal income than high farm income counties. The western and eastern areas of the state generally received more benefits per capita and as a percentage of total personal income than the west central and east central areas of the state. The west receives a considerable amount of money from energy tax distributions while the east receives state money to support health facilities (Grafton) and higher education institutions (North Dakota State University and the University of North Dakota).

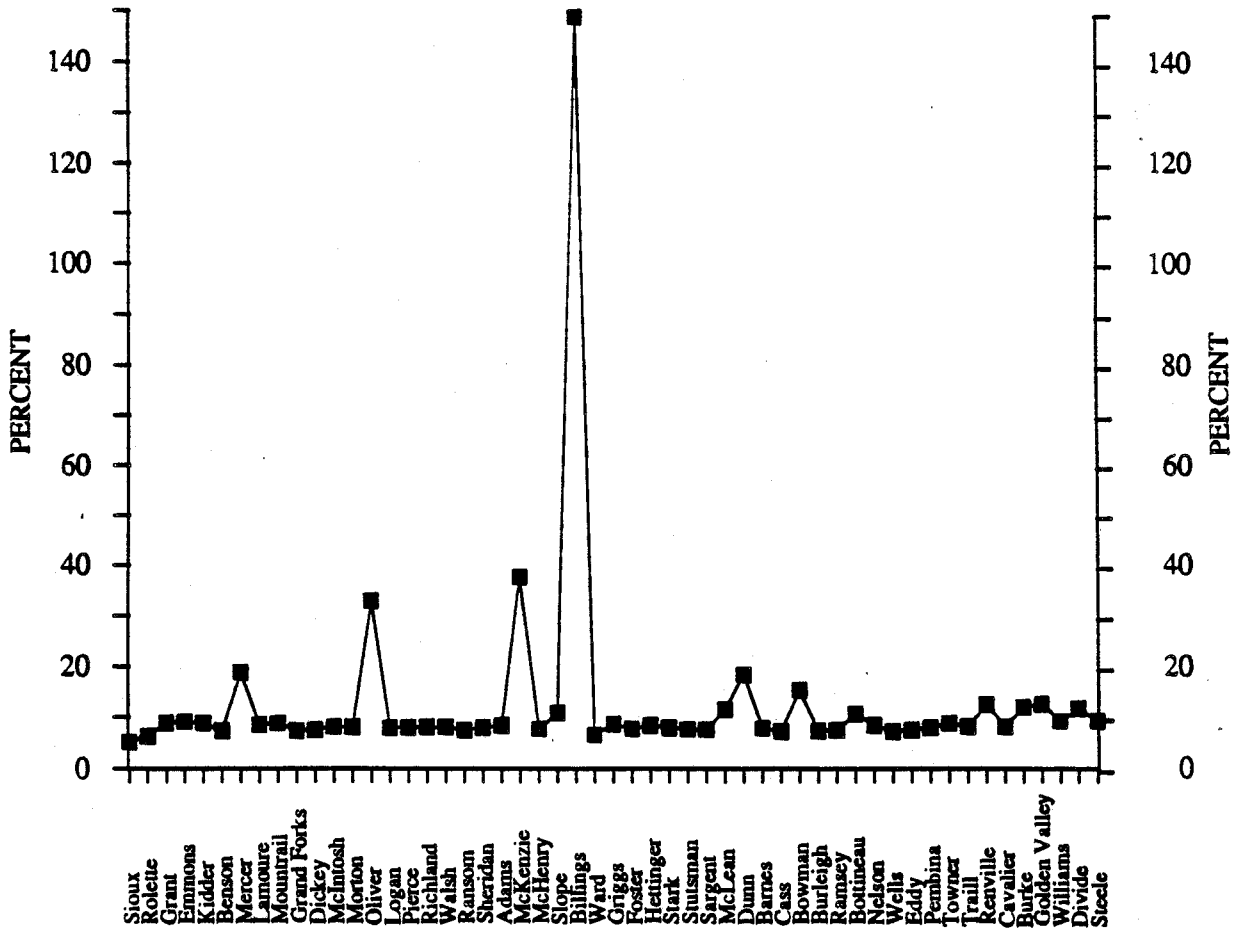


Figure 8. Per Capita Total Taxes Paid as a Percent of Per Capita County Total Personal Income, by County, North Dakota, 1986

Per capita benefits received seem to be relatively constant across counties (Figure 10). Counties which appear to receive considerably more benefits either receive money from energy tax distributions (Billings County) or have a state health facility located within the county (Walsh County). Generally, there was not a relationship between county per capita income and per capita benefits received. However, it does appear that relatively low per capita total personal income counties received slightly more benefits than relatively high per capita income counties.

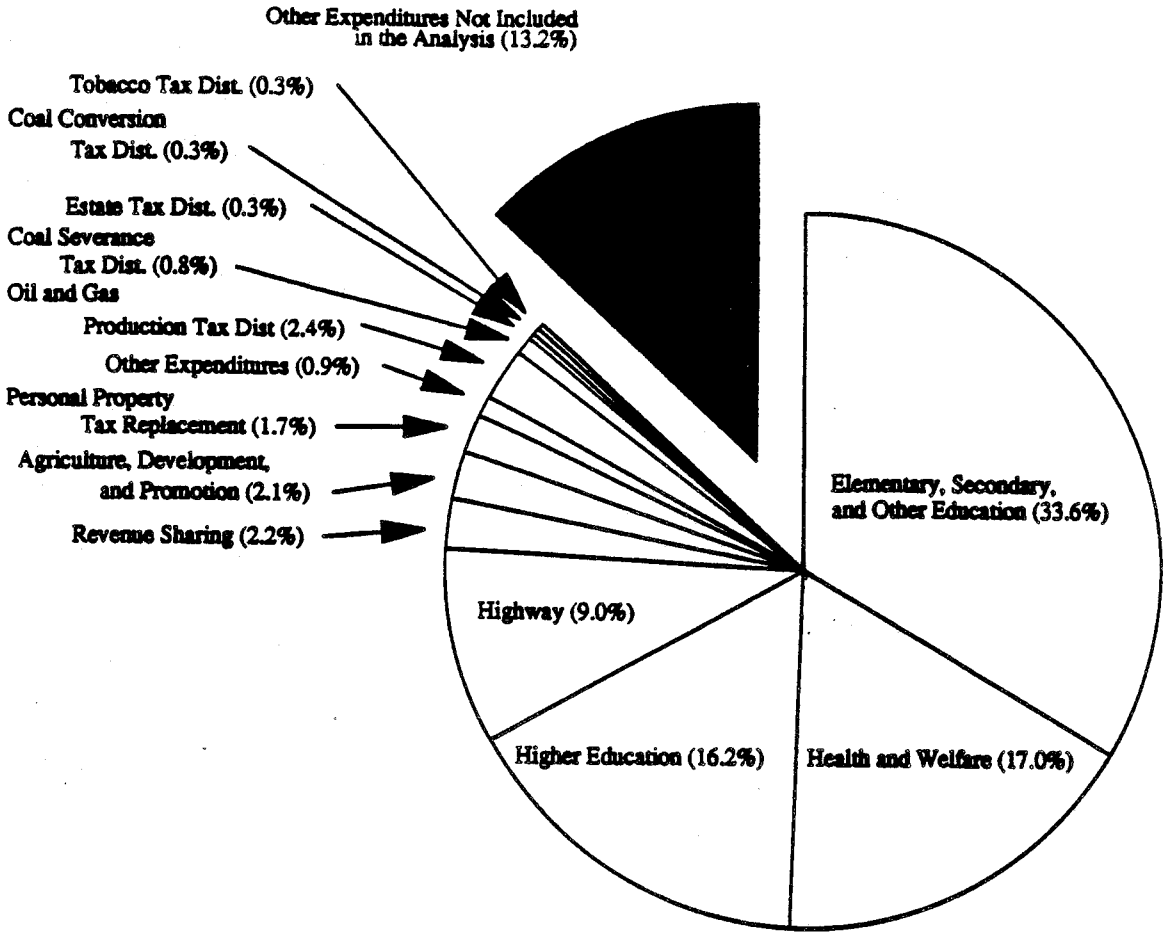


Figure 9. State-Level Expenditures, North Dakota, 1986

Net Benefits Received

Net benefits received is a measure of total state expenditures in a county less the state taxes paid in the county. Energy taxes and property taxes were excluded. Property taxes were not included since they are collected and spent within counties. Energy taxes were not included because they are not paid by county residents. Net benefits received were divided into two categories:

(1) total benefits received less total taxes paid excluding energy and property taxes, and

(2) total benefits received excluding energy tax distributions less total taxes paid excluding energy and property taxes.

TABLE 2. TOTAL STATE GOVERNMENT BENEFITS RECEIVED, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Per Capita Benefits Received[a]	Percent of Total Personal Income
	- $ -	- % -
Per capita income		
$14,000 or more	681	4.60
$13,000 to $13,999	754	5.64
$12,000 to $12,999	799	6.44
$11,000 to $11,999	896	7.72
less than $11,000	668	6.99
Farm income		
25% or more	815	6.64
20% to 24%	607	4.67
15% to 19%	668	5.55
10% to 14%	972	7.85
less than 10%	816	7.03
Location		
West	877	6.73
West central	684	5.92
East central	703	5.95
East	887	7.11

[a]Benefits received are the state-level expenditures shown in Figure 9.

Net benefits received were divided by total personal income to estimate the percentage of net benefits per dollar of total personal income. Net benefits were also estimated on a per capita basis. A net benefit ratio index was calculated by dividing the counties' average net benefit ratios by the average net benefit ratio of all counties. The net benefit ratio is estimated by dividing benefits received by taxes paid. Net benefit indexes greater than one imply that counties receive more benefits relative to taxes paid than the average county. An index less than one suggests that counties receive fewer benefits relative to taxes paid than the average county.

The first net benefit category -- total benefits received less total taxes paid excluding energy and property taxes -- was positive among county groups for average per capita net benefits received (Table 3). This implies that counties received more benefits than they paid in taxes. Positive net benefits were expected since energy taxes, corporation income taxes, insurance premium taxes, and several minor taxes were not included in taxes paid. High per capita income counties generally received fewer net benefits than low income counties. This suggests that the state government is redistributing

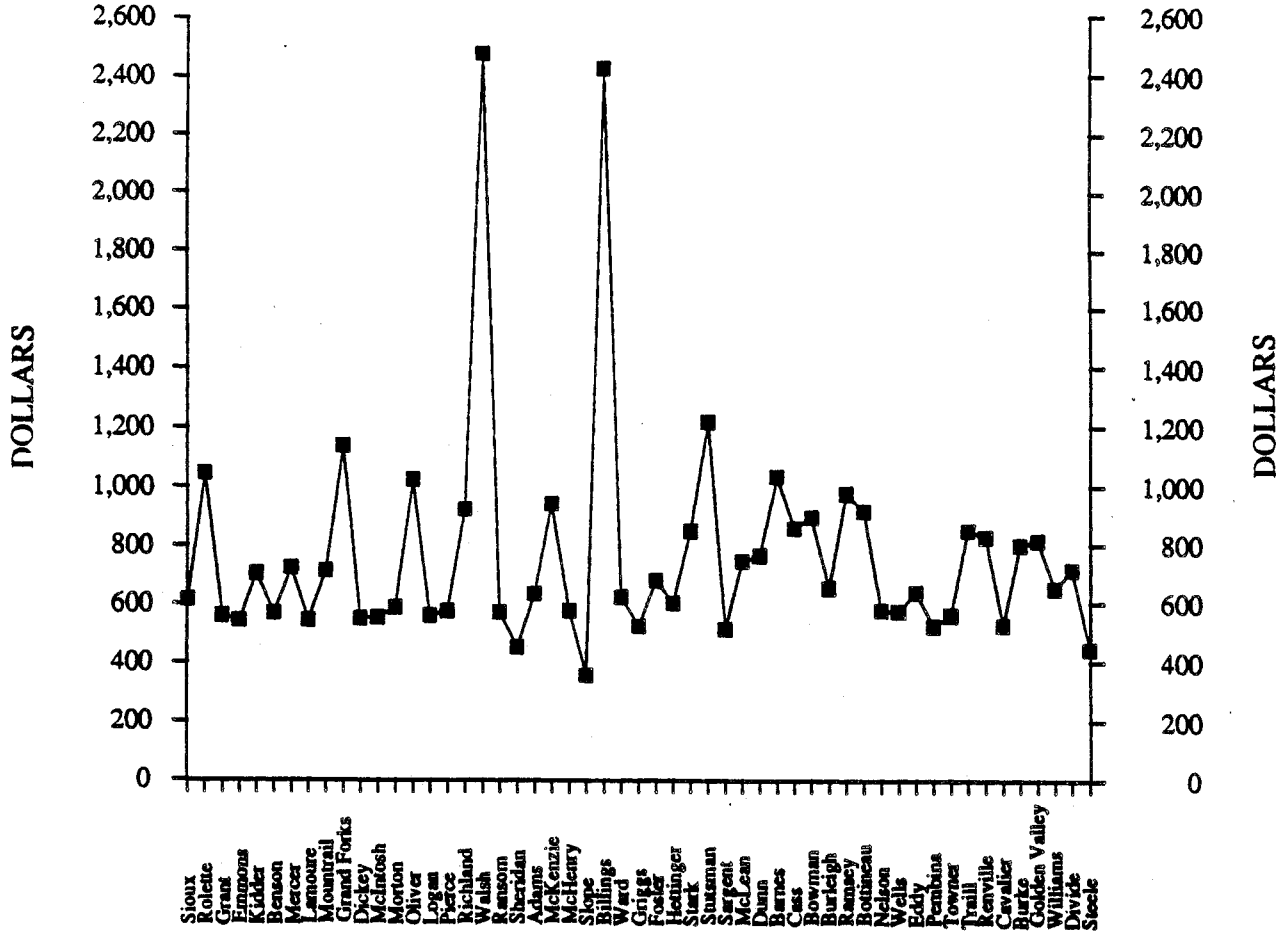


Figure 10. Per Capita Total State Government Benefits Received, by County, North Dakota, 1986

wealth from high per capita income counties to low per capita income counties. Low per capita income counties received more net benefits than the average county. Counties with low farm income percentages received more net benefits than high farm income counties. The west and east had slightly greater net benefit ratio indexes than the west central and east central areas of the state.

Comparing benefits received and taxes paid shows that they are similar (Figure 11). Generally, the state tax system seems to conform with the benefits received principle in that those who are paying taxes are receiving proportionate levels of state services. Initially, benefits received exceed taxes paid for low per capita income counties. Low per capita income counties paid slightly less taxes and received somewhat more benefits than high per capita income counties implying some wealth redistribution and some hint of ability to pay.

The second net benefits category -- total benefits received excluding energy tax distributions less total taxes paid excluding energy and property taxes -- indicates that high per capita income counties received less net

TABLE 3. NET BENEFITS RECEIVED, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Total Benefits Received Less Total Taxes Paid Excluding Energy and Property Taxes			Total Benefits Received Excluding Energy Tax Distributions Less Total Taxes Paid Excluding Energy And Property Taxes		
	Average Per Capita Net Benefit Received	Net Benefit Ratio Index[a]	Percentage of Total Personal Income	Average Per Capita Net Benefit Received	Net Benefit Ratio Index[a]	Percentage of Total Personal Income
	- $ -		-- % --	- $ -		-- % --
Per capita income						
$14,000 or more	56	0.76	0.39	-84	0.68	-0.55
$13,000 to $13,999	178	0.91	1.34	113	0.94	0.85
$12,000 to $12,999	240	0.96	1.93	27	0.85	0.19
$11,000 to $11,999	405	1.26	3.47	342	1.32	2.92
less than $11,000	223	1.10	2.51	186	1.19	2.17
Farm income						
25% or more	226	0.90	1.90	-136	0.63	1.03
20% to 24%	55	0.76	0.43	17	0.82	0.16
15% to 19%	132	0.89	1.18	63	0.91	0.64
10% to 14%	423	1.24	3.45	307	1.25	2.56
less than 10%	317	1.17	2.89	278	1.27	2.56
Location						
West	283	1.00	2.23	-63	0.72	-0.49
West Central	172	0.94	1.54	76	0.93	0.76
East Central	185	0.97	1.69	179	1.09	1.65
East	324	1.14	2.77	317	1.28	2.72

[a]Index represents the county group's average net benefit ratio divided by the state's average net benefit ratios.

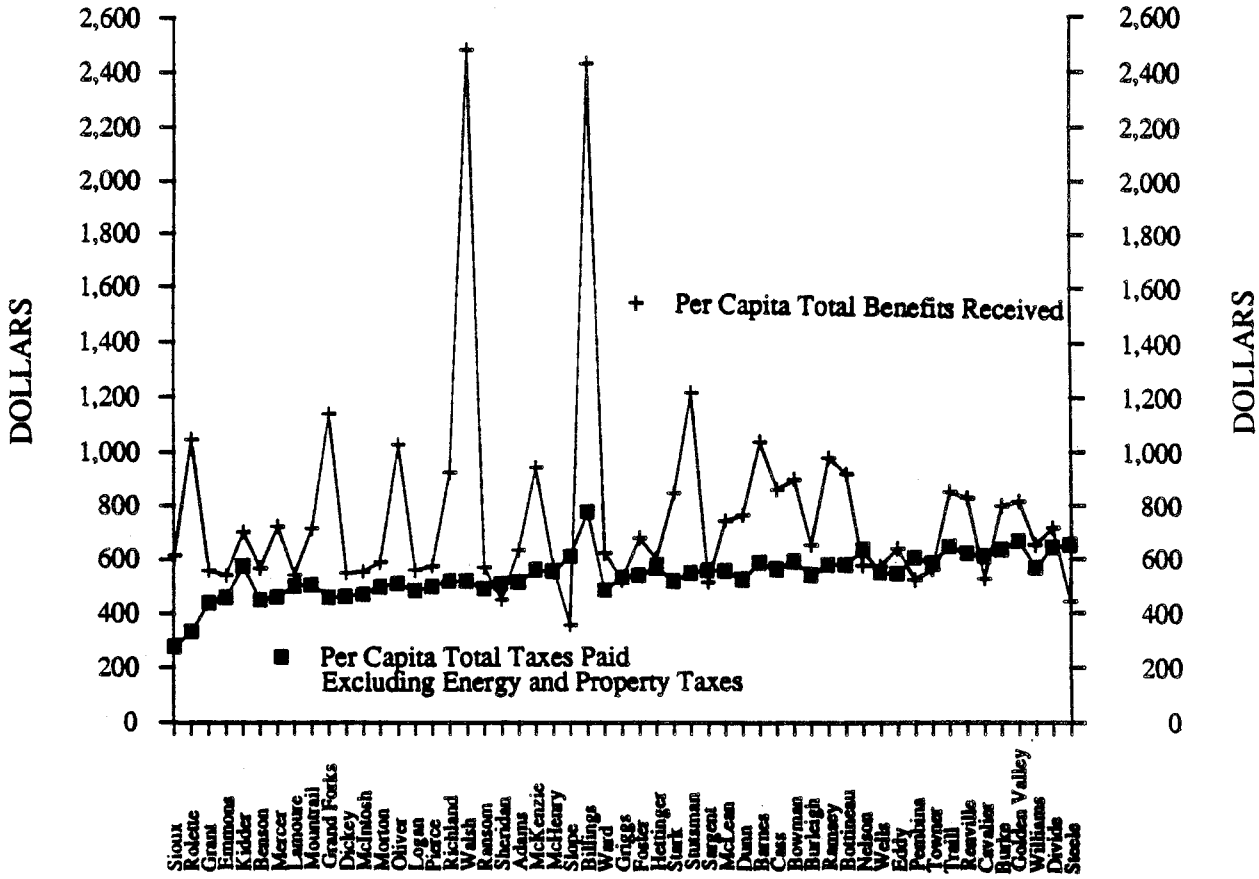


Figure 11. Per Capita Total Taxes Paid Excluding Energy and Property Taxes and Per Capita Total Benefits Received, by County, North Dakota, 1986

benefits than low per capita income counties (Table 3). Counties with relatively high farm income percentages received less net benefits than the average county. The west and west central areas received considerably less net benefits than the rest of the state.

Generally, those counties paying taxes received benefits in proportion to the taxes they paid (Figure 12). Counties which appear to receive more than others contained either state health facilities or higher education institutions. Accounting for these anomalies indicated that the state tax system generally conforms with the benefits received principle. However, there appears to be some potential for incorporating the ability to pay principle to capture a larger share of the revenue capacity. High per capita income counties appeared to pay less than their fair share of taxes in North Dakota in 1986. Some of the potential for taxing based on the ability to pay principle may have been captured during the 1986 special legislative session and the 1987 legislative session. Legislation passed included

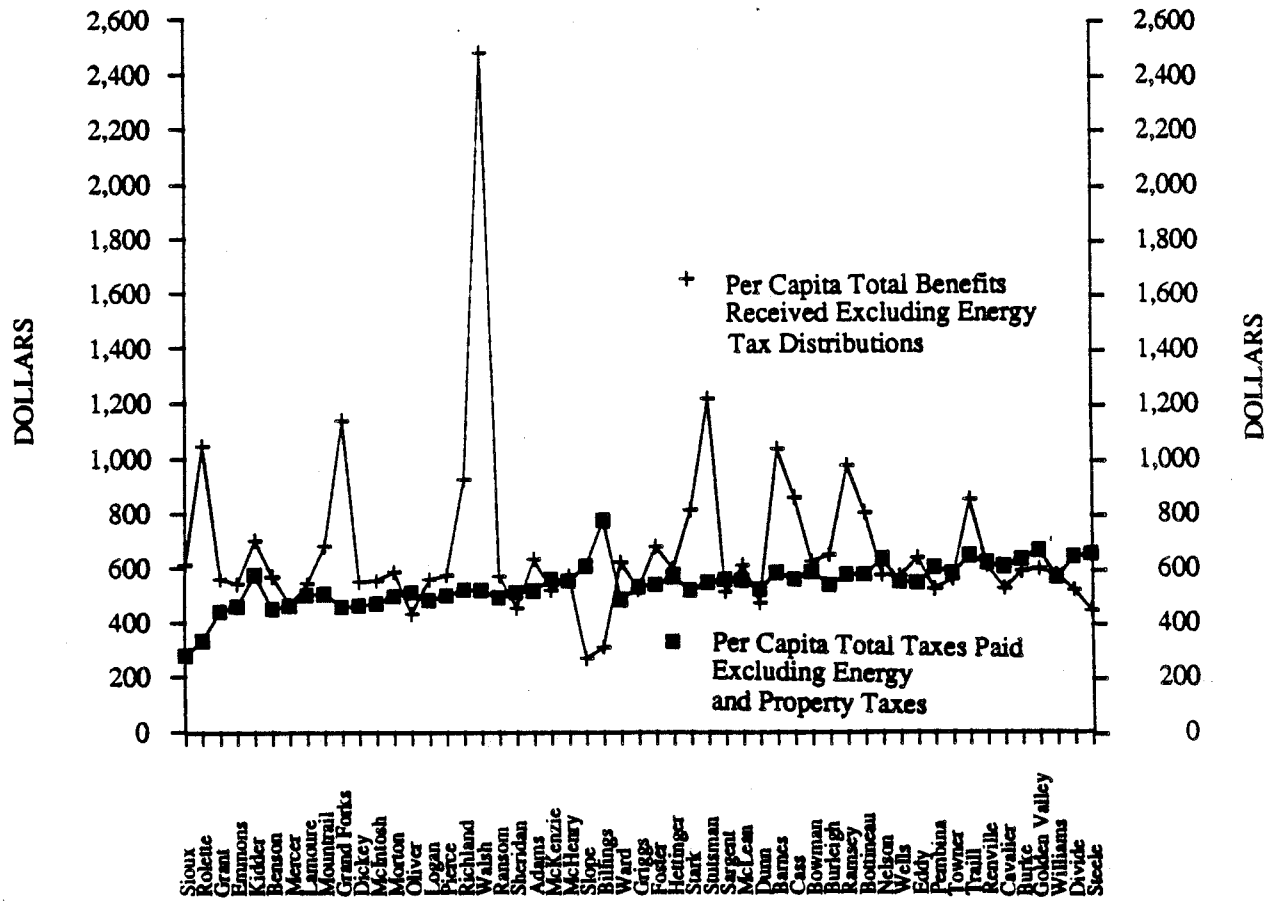


Figure 12. Per Capita Total Taxes Paid Excluding Energy and Property Taxes and Per Capita Total Benefits Received Excluding Energy Tax Distribution, By County, North Dakota, 1986

- increasing the income tax rate on the short form from 10.5 percent to 14 percent of the adjusted federal income tax liability, and increasing the tax rate on the long form from 2 percent to 2.67 percent on income up to and including $3,000 and from 9 percent to 12 percent on income over $50,000,

- placing a 10 percent surtax on individual state income tax liability, and

- changing the general retail sales tax rate from 4 percent to 5.5 percent.

These modifications will change the absolute level of taxes collected, however, relative taxes paid among individuals or counties may be unaffected.

Ideally, a state tax system should reflect a balance of both the ability to pay and benefits received principles. How to achieve that balance is difficult, at best, to determine. However, basing decisions on these two fundamental principles should help to provide an overall tax system which is equitable and, thus, supported by taxpayers across the state.

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