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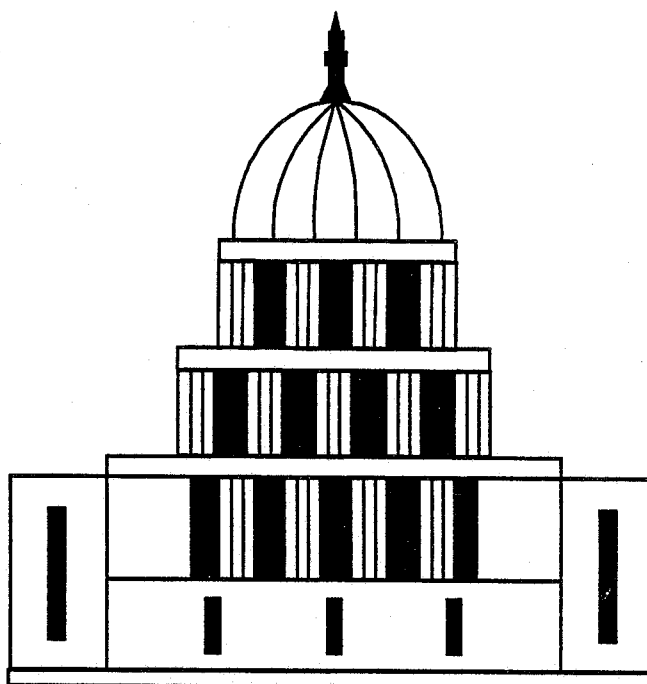
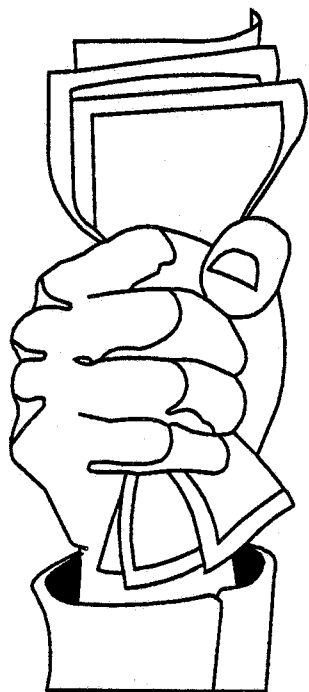
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## State-Level Tax Equity in North Dakota in 1986



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### Highlights

This study assesses fairness of North Dakota's state tax system. The ability to pay and benefits received principles were applied to aggregate and individual tax, benefit, and net benefit categories for various county groups and individual counties. Counties were used as proxies for taxpayers and benefit recipients and provided the basis for analyzing equity associated with individual taxes and benefits and the tax system as a whole.

Some North Dakota counties appeared to pay or receive more than their fair share of either state taxes or benefits in 1986. Counties included in this group were energy counties and/or counties which contain state health facilities or higher education institutions. These counties seemed to pay or benefit disproportionately based on the ability to pay and benefits received principles. However, actual taxes paid and benefits received by these counties were misrepresented to some degree. Energy taxes are paid primarily by out-of-state corporations, not by county residents. Counties containing health facilities actually provide services to residents in other counties who come to the facility for health care. Counties with higher education institutions provide benefits to citizens all across the state who attend the institution.

Generally, the state tax system was fair according to the benefits received criteria. County taxes paid were similar to the benefits counties received. Those (counties) who received state government goods and services were also the ones (counties) who paid for them.

There was some untapped potential for taxing according to the ability to pay principle, an equally compelling tax equity principle. Tax liabilities of low per capita income counties were often greater than those of high per capita income counties. High per capita income counties paid a smaller percentage of their income in taxes than low per capita income counties. High per capita income counties appeared to pay less than their fair share of state taxes in North Dakota in 1986. The state tax system was less than fair 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 total 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 indicated that the west and east had higher average per capita tax liabilities than the west central and east central areas of the state. However, taxes paid 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

James F. Baltezare, Jay A. Leitch,  
Norbert A. Dorow, Cole R. Gustafson<sup>1</sup>

### INTRODUCTION

North Dakota is facing financial problems as a result of declining tax collections, increasing demand for public services, and rising costs of providing public services. Declining tax collections have been caused by the simultaneous slowdown in the oil production industry and the economic recession in agriculture (Dorow et al. 1988). The economic downturn in these industries has caused real and nominal total state tax collections to decline steadily since a peak in 1985 (Figure 1). Financial problems have resulted because tax revenues are insufficient to meet the growing demand for state government goods and services. The state's financial problems are compounded by increases in the costs of maintaining public services. The combination of lower tax revenues, increased demand for goods and services, and higher cost of government services has put a financial strain on state government affecting its ability to meet the needs of its citizens.

State government revenues have become unpredictable and insufficient to meet expenditure commitments. The state tax system with current tax rates and bases is not generating a reliable and consistent flow of funds to support state government. Tax bases and rates could be modified to stabilize tax revenues even in times of economic volatility. However, tax modifications should conform to two basic tax equity or fairness principles--ability to pay and benefits received.

The purpose of this study is to assess the fairness of the North Dakota state-level tax system<sup>2</sup>. Specific objectives are to estimate taxes paid, benefits received, and net benefits received by various sectors within North Dakota. Examining equity of the current system may provide insight into

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<sup>2</sup>This publication is the third in a series of four which examine the North Dakota tax system. The first, North Dakota's State and Local Tax System (Dorow et al. 1988), describes the North Dakota tax system. Included are discussions of taxation concepts and principles as well as an historical perspective of state-level revenue sources. The report also compares the North Dakota tax system with tax systems used by neighboring states. The second report, North Dakota's State and Local Tax System--An Overview (Dorow et al. 1988a) is an Extension publication highlighting information from the first publication. The fourth, State-Level Tax Equity in North Dakota in 1986: A Summary (Baltezare et al. 1988), highlights information from this publication.

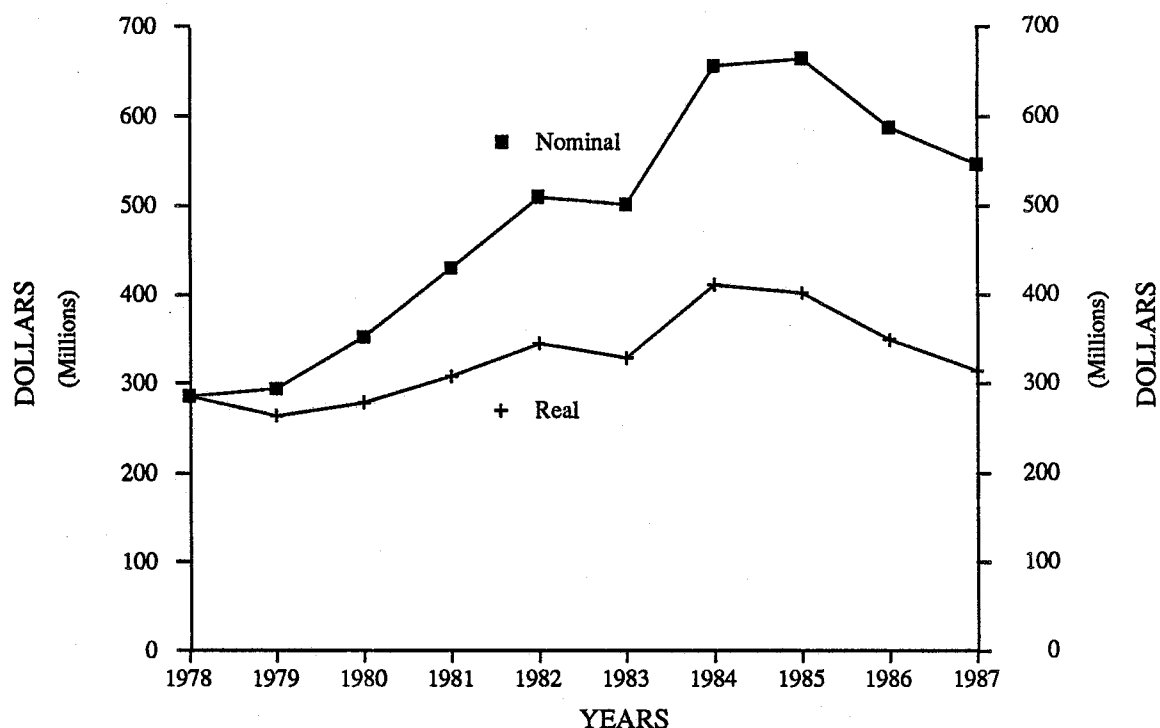


Figure 1. Total State Collected Taxes, Fiscal Years 1978-1987, North Dakota, Nominal and Real

possible changes which could improve the system's fairness and ability to generate a reliable and consistent flow of revenue. Improvements to the system will ensure that state revenue will be sufficient to support increasing costs and demands for public services.

#### State-Level Tax System

Taxes are the major component of state revenue, supplying state government with the funds necessary to provide public goods and services (Figure 2). Taxes generate 45 percent of total state government revenue. Fees, charges, and other non-tax revenue sources account for 29 percent. Federal transfers provide an additional 26 percent of North Dakota's state government revenue (U.S. Department of Commerce 1987).

A recent ACIR publication measuring state fiscal capacity presents estimates of tax capacity and effort of the states (Advisory Commission on Intergovernmental Relations 1987). Tax capacity is the dollar amount of revenue that each state would raise if it applied a nationally uniform set of tax rates to a common set of tax bases. A uniform tax rate is the national average tax rate applied to each specific tax base. Tax effort is calculated by dividing the state's actual tax collections by its estimated tax capacity. North Dakota's tax capacity was slightly above the U.S. average in 1985 while its tax effort was below average (Figure 3). (Tax

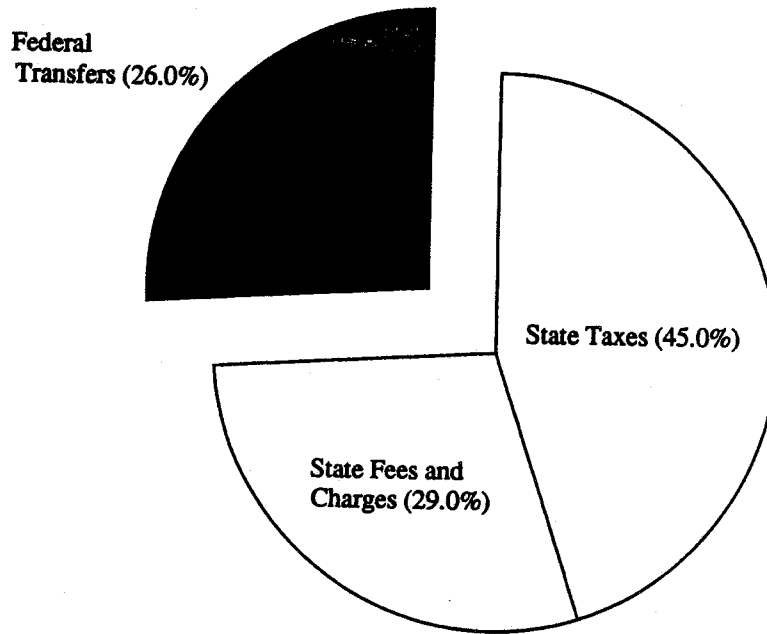
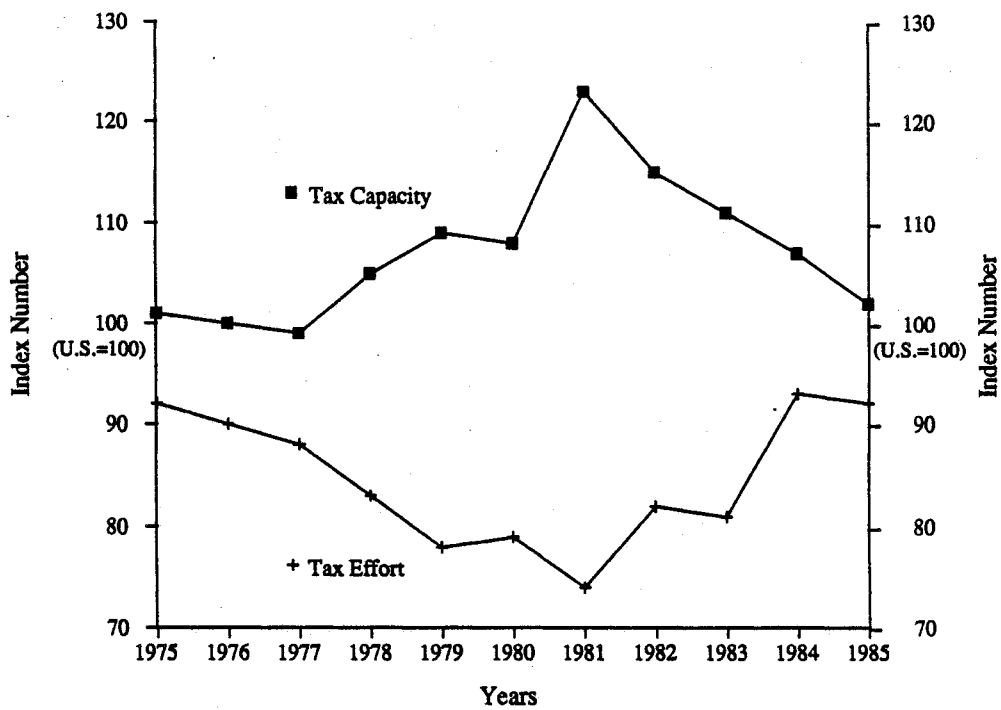


Figure 2. State Government Revenue Sources, North Dakota, 1986



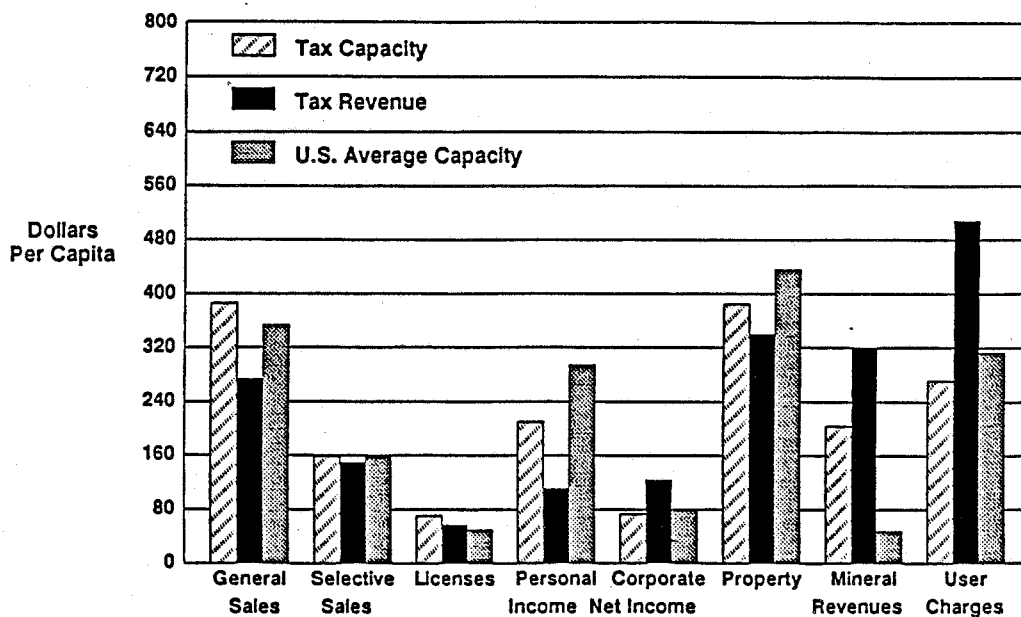
Source: Advisory Commission on Intergovernmental Relations

Figure 3. Total Tax Capacity and Effort (all taxes), North Dakota, 1975-1985

effort includes property tax, which is a revenue source used by local government units and not by the state.) The state was above the national average in its ability to raise tax revenues. However, the state's tax system was lower than the national average in its effort to raise tax revenues. (Tax capacity should have declined some since 1985 due to the sharp decline in oil prices and increases in some state tax rates.)

Examining specific tax bases shows that North Dakota's actual general sales tax collections per capita were below both the "average state" tax capacity and the U.S. average capacity (Figure 4). North Dakota collected less revenue from a general sales tax than the "average state." Lower revenues suggest that the state's sales tax rate is less and/or the state's sales tax base is more narrowly defined than the average US state. The state also collected less tax revenue per capita from personal income and property taxes than the average state.

Tax collections from selective sales tax were slightly below the average state while license tax collections were slightly below the average state but somewhat above the national average. Tax revenues from corporate income, mineral resources, and user charges greatly exceeded those collected by the average state and the national average. (Corporate income tax collections were unusually high in 1985 because of changes in how often corporate income taxes were collected.)



Source: Advisory Commission on Intergovernmental Relations

Figure 4. Tax Capacity and Tax Revenue, Selected Tax Bases, North Dakota, 1985

North Dakota has a revenue mix which relies on user charges and mineral resource taxes. The state places less emphasis on general sales, personal income, and property taxes than the national average. The state may rely too heavily on some tax bases while not enough on others. This in turn calls for an examination of changing the tax emphasis to improve fairness and reliability of the tax system.

Overall, North Dakota ranked 22nd in the nation in per capita total taxes in 1986 (Table 1) (U.S. Department of Commerce 1987a). North Dakota's per capita total tax liability was \$907, which was below the US average of \$948. North Dakota was below the U.S. average in both general sales and personal income tax collections. However, the state exceeded the national average in per capita motor vehicle fuel taxes. This information further supports ACIR's findings that suggest the state has some excess tax capacity and could increase its tax effort.

TABLE 1. NORTH DAKOTA PER CAPITA TAXES AND RANK, 1986

Tax Category	Per Capita	Tax Rank
	-dollars-	
Total Taxes	907	22
U.S. Average	948	
General Sales Tax	261	33
U.S. Average	311	
Personal Income	108	37
U.S. Average	280	
Motor Fuel Tax	74	18
U.S. Average	59	

#### State Government Appropriations

State appropriations or expenditures are monies spent by state government to produce goods and services and provide financial assistance to local governments. The amount of goods and services supplied by the state is subject to decisions made by the legislative and executive branches of government through the political process.

State appropriations are made from two funds--general and special. The general fund provides revenue to support state expenditures on

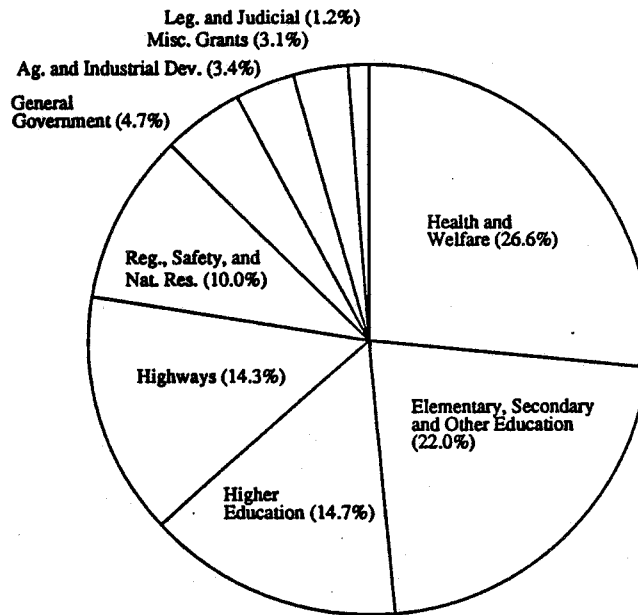
- elementary, secondary, and other education,
- health and welfare,

- higher education,
- agricultural and industrial development,
- highways, and
- other state expenditures.

Other state expenditures include general government, regulatory, public safety, natural resources, miscellaneous, Judicial, and Legislative expenditures. Special funds support highway and other expenditures. Money appropriated is either spent by the state agency itself or transferred to political subdivisions (i.e., counties, townships, cities, school districts, and other special districts) responsible for providing government goods and services.

North Dakota state government per capita total expenditures in 1986 were \$2,264 (U.S. Department of Commerce 1987). North Dakota per capita expenditures for education and highways were \$2,101 and \$273, respectively. Caution should be used when interpreting these expenditures because federal transfers were included. North Dakota receives \$2,033 per capita from federal transfers to state and local governments.

Examining total state legislative appropriations shows that 27 percent was spent on health and welfare programs in 1986 (Figure 5) (North Dakota Office of Management and Budget 1985). Legislative expenditures for education (elementary, secondary, and other education plus higher education) were 37 percent. Highways accounted for an additional 14 percent of state appropriations.



SOURCE: Office of Management and Budget, 1985

Figure 5. Total State Legislative Appropriations, By Program, North Dakota, 1986

### Efficiency

Tax decisions involve considerable discretion on who should pay and how much. Elected government officials are responsible for developing tax policies. However, elected officials are influenced by people in all economic sectors when debating what type of tax to use, defining the tax base, and selecting an appropriate tax rate. Since government officials are elected, their decisions are affected by public opinion and sentiments. Thus, decisions on both revenue sources and uses may be guided more by political pressures than by sound economic principles.

One problem government officials face is how to distribute government costs among citizens in an efficient and equitable manner. Achieving such a goal is rarely, if ever, accomplished. There is no practical way to distribute the cost of government goods and services so that everyone bears a fair share of the tax burden. However, there are basic principles that government officials should consider when developing tax policies.

Taxes impose an additional cost upon the taxpayer and distort economic decisions by changing the prices of goods and services. This could result in an excess burden or a loss of welfare beyond the amount paid in taxes. Different taxes affect taxpayers in different ways and some taxes are more efficient than others. Efficient taxes are those which have the ability to raise revenues with relatively little impact on the decisions people make.

Taxes affect output and input prices, causing reduced market efficiency by preventing prices from accurately reflecting marginal social costs and benefits of goods and services. Marginal social cost is the minimum amount of money required to compensate society for producing an additional good or service. Marginal social benefit is the extra consumer well-being created by making one additional unit of a good or service available.

Taxes act as wedges in the market by making prices paid by buyers diverge from the net prices received by sellers. Competitive markets cannot automatically equate marginal social costs and marginal social benefits causing lower market efficiency. Efficiency loss or excess burden varies with the tax rate, expenditures on the taxed good, and its price elasticities of demand and supply (Hyman 1987).

In general, the higher the tax rate, the greater the excess burden. The total burden of the tax grows, expressed in terms of deadweight loss, as tax rates increase. Deadweight loss is the lost efficiency that cannot be recovered even if tax revenues collected provide benefits equal in dollar amount to the value paid by the taxpayer.

An efficient tax does not distort resource allocation and does not affect or change behavior that individuals would have in the absence of the tax. Taxes are neutral with respect to individual decision making unless their intent was to induce changes in behavior.

### Equity

Conflicts arise when developing a tax system which is both efficient and equitable. Efficient taxes are not necessarily equitable. Therefore, state government should develop a tax system which represents a balance between efficient and equitable taxes. This balance is achieved by basing tax decisions on the principles of either benefits received or ability to pay.

#### Benefits Received

The benefits received principle states that the costs of producing government supplied goods and services should be borne by citizens who receive the benefits (Buchanan et al. 1987). "Those who benefit, pay." Fees and charges are common methods used to ensure that those who receive the benefit of the service also pay for it in some way. Fees and charges distribute government costs among those who consume the good or service. Charges ration who receives goods and services. The benefit approach links the marginal cost per unit of government services with the marginal benefit of the service. Distribution of tax shares per unit of a public good reflects the marginal benefit received by the taxpayer and induces an individual to purchase or consume the efficient level of output. However, most government-supplied goods and services result in collectively consumed benefits that are difficult to assign individually.

Benefit taxation ties together tax decisions with expenditures so that benefits and costs of public services may be compared. Benefit taxation should be used for categories of expenditures where beneficiaries are easily identified. Instances where benefits received applies involve clear cut exchanges between what the user pays and the benefits received. Gasoline tax for roads and streets, property tax for police and fire protection, tuition for college, and entrance fees for using state parks are good examples.

Financing government supplied goods and services should be tied to the benefits citizens receive. This forces individuals to consume efficient levels of goods and services. The more closely costs and benefits are tied, the more efficient the tax system. Comparing taxes paid against benefits received will provide one measure of a tax system's equity.

Estimating taxes paid and benefits received shows if and where the government is redistributing income. State government taxes and expenditures can be used to redistribute income or wealth from economic sectors with relatively high wealth levels to those with relatively low income potentials. A progressive tax system taxes economic agents with high incomes at rates greater than economic agents with low incomes. Tax revenues collected are then used to support social programs and services which benefit primarily low income economic agents.

### Ability to Pay

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. This principle separates the individual's marginal benefit received from the government activity. It requires some collective agreement on equitable distribution among taxpayers based on individual income, consumption, or wealth levels. Problems arise when trying to estimate these bases. Tax laws do not define tax bases very well and merely establish rules for what must be included and what may be deducted.

Concepts related to the ability to pay principle are horizontal and vertical equity. Horizontal equity means that individuals with equal economic capacities pay the same amount of taxes. The requirement of horizontal equity can be handled when determining a tax base. The tax base is the value or unit subject to taxation. Defining and measuring the tax base determines classes of individuals for the purpose of taxation. Within classes, individuals are considered equals because their tax base should be the same. Among various classes, the tax base should be different so that individuals in other classes are not considered equal.

Requirements of vertical equity deal with tax rates. Tax rate is the ratio of the tax to the tax base. If the tax base is different among individuals, then these individuals may be taxed at rates that increase, decrease, or stay the same (progressive, regressive, and proportional, respectively) as the taxable base increases. Vertical equity implies that individuals with different economic abilities pay taxes that differ according to some degree of fairness (Rosen 1985).

Fairness is a subjective decision left to legislators when determining tax rates and bases. Tax rates and bases should be based on the principles of either ability to pay or benefits received. Basing tax policies on these principles should produce a tax system which the majority of the populace believes is fair in its distribution of the tax burden. This study will not deal directly with fairness questions. Determining what is fair is a policy decision to be addressed by those in the political system. However, this study will provide the basis for analyzing taxes and tax systems from which fairness issues can be understood and then debated.

### PROCEDURE

This study analyzes the North Dakota state-level tax system to evaluate its equity. Procedures are based on the ability to pay and benefits received principles. Specifically, total and per capita tax liabilities and benefits received for different county groups are estimated. Counties are grouped according to:

- total personal income,
- North Dakota federal adjusted gross income,
- per capita income,

- percentage of total personal income from farming,
- population,
- North Dakota state planning region, and
- location (see county group section, page 30, for details).

Tax liabilities and benefits are also estimated as a percentage of income, measured in terms of total personal income and North Dakota federal adjusted gross income. Examining the tax liability of different economic sectors relative to their income shows if the current tax system is regressive, progressive, or proportional. This provides the basis for applying the ability to pay principle to determine if the current tax system is equitable in its distribution of the tax burden.

Tax revenues can be grouped into categories according to which state account tax collections are deposited (Figure 6). State accounts include general and special funds. The general fund supplies money for a wide range of state projects and agencies. Special fund accounts contain money earmarked for special projects or specific government agencies. One special fund account is the Highway Distribution Fund used to support the State Highway Department.

Some taxes collected by the State Tax Department are transferred directly to political subdivisions -- counties, cities, townships, and special districts. Taxes collected and transferred directly to political subdivisions are primarily energy taxes (i.e., oil and gas production, coal conversion, and coal severance taxes). Portions of cigarette, estate, and other taxes collected by the state are also transferred directly to political subdivisions.

Tax categories were developed to show what taxes are collected, where tax revenues are deposited, and what state goods and services are supported by state tax collections. A list of tax categories, taxes included, and corresponding state accounts is presented below.

Category I: All tax revenues are deposited into the general fund account only. Taxes included are sales and use, individual income, motor vehicle excise, and tobacco products.

Category II: Tax revenues are deposited into both the general fund and special fund accounts. Taxes included are oil extraction and motor vehicle use. Revenue from the oil extraction tax is distributed 90 percent to the state general fund with the remaining 10 percent split between the Southwest Water Pipeline Sinking Fund and the Resources Trust Fund. (These are special fund accounts.) Revenue from the motor vehicle use tax is divided 50 percent to the general fund and 50 percent to other special fund accounts for vehicles purchased out-of-state.

Category III: Tax revenues are deposited into special fund accounts only. Taxes included are motor vehicle fuel, special fuel, and motor vehicle registration fees. Revenues are deposited into the Highway Tax Distribution Fund (a special fund account).

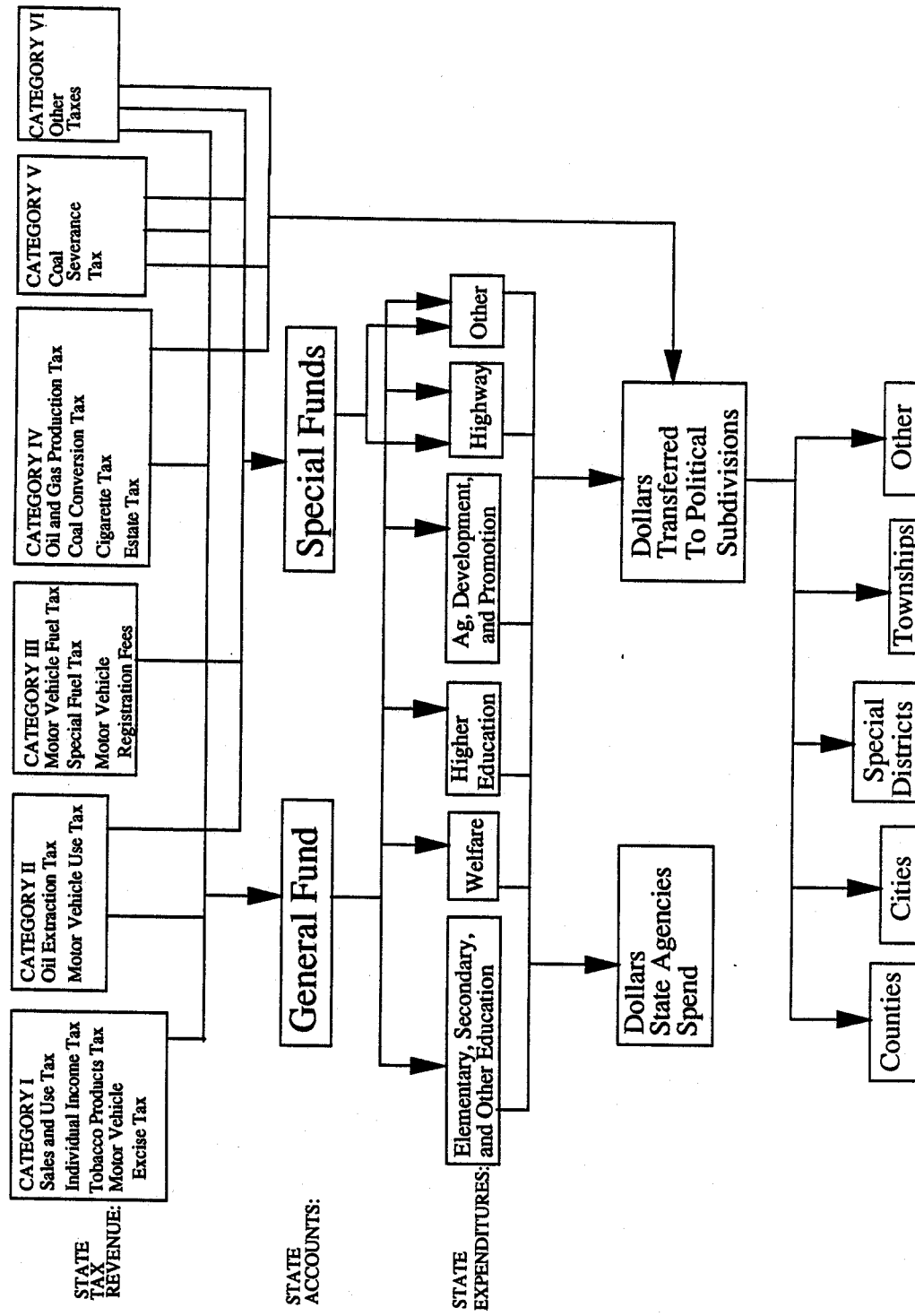


Figure 6. State-Level Tax and Expenditure Flows

Category IV: Tax revenues are divided among the general fund account and other political subdivisions. Taxes included are oil and gas production, coal conversion, cigarette, and estate.

Category V: Tax revenues are divided among the general fund, special fund, and other political subdivisions. The coal severance tax is the only tax included. Revenue is divided 30 percent to the state general fund, 15 percent to a trust fund, 35 percent to the State Coal Development Impact Fund, and 20 percent to coal-producing counties. (The Impact Fund was discontinued by 1987 legislation.)

Category VI: This category represents tax revenues not accounted for in the other categories. Insurance premium tax, liquor and beer tax, gaming tax, aircraft excise tax, corporate income tax, business and corporate privilege tax, miscellaneous remittances, transmission line tax, music and composition tax, sales and use cash bonds, and fuel dealers fee are included in this category. State revenue from these sources are distributed to general, special, and/or other political subdivisions. Some of these revenue sources could be placed in tax categories one through five. However, for this study they are placed into a separate category because they are not administered so that collections can be readily allocated among counties.

#### Analytical Model

Counties were considered the surrogate taxpaying and benefit receiving units. It was assumed that counties were sufficiently internally homogenous to treat them as taxpaying units and that people living in counties pay taxes and receive benefits. Taxes paid and benefits received by county units were used to assess the system's equity.

The analysis is conducted in three parts. Part one examines taxes paid. Tax liabilities for each county group are estimated both in the aggregate (the overall state tax system) and on an individual tax basis. Part two examines benefits received. Benefits received are estimated to show the portion or level of benefits county groups receive in the form of state goods and services. Part three examines net benefits received. Net benefits received are estimated by subtracting taxes paid from benefits received for each county. Examining net benefits shows which groups bear more or less of the tax burden in relation to the benefits they receive.

#### Data

State tax collections and expenditures were attributed to counties using a number of techniques and data sources. Each tax and expenditure is discussed separately to identify methods used to distribute county shares. County shares for many taxes and expenditures were taken directly from available information. However, some county shares were estimated using secondary data. Most data were reported by fiscal year. The 1986

calender year was estimated by adding fiscal years 1986 and 1987 tax collections or expenditures together and dividing by two.

### Revenue Variables

County shares for each state tax revenue category are provided in Table 2. A discussion of methods used to attribute county shares for each tax category is presented below.

#### Total State Tax Collections

Total state tax collections accounted for in Table 2 were \$485,962,372 (excluding property taxes). Other taxes collected but not included in Table 2 because of difficulty in attributing and determining county shares were:

<u>Tax</u>	<u>Amount(\$)</u>
Corporate income tax	42,191,147
Insurance premium tax	12,778,098
Liquor and beer tax	5,882,141
Business & corporation privilege tax	2,436,080
Gaming tax	1,419,998
Transmission line tax	415,830
Aircraft excise tax	187,311
Sales & use cash bonds	66,805
Music and composition tax	41,655
Fuel dealers fee	6,044
Miscellaneous remittances	1,228
TOTAL	65,426,337

Figure 7 presents a summary of total state tax collections. Table 2 accounts for 88 percent of state-level tax collections. Of the 12 percent not accounted for in the Table 2, 64 percent is corporate income tax collections and 20 percent is insurance premium tax.

Approximately two-thirds of the corporate income taxes collected in 1986 was paid by out-of-state corporations. Only a small percentage of corporate tax collections were paid by firms operating solely in the state. This suggests a large portion of the corporate tax burden is exported to other states. The insurance premium tax is paid by insurance companies based on the gross amount of its annual premiums and membership and policy fees received from state policy holders. Part of the tax is paid by policy holders in the form of higher premiums. However, the majority of tax burden will be paid by the insurance companies because of a relatively large number of insurance companies selling a wide range of policies. The competitive nature of the insurance industry makes it difficult to shift the tax burden entirely to the policy holder.

TABLE 2. STATE TAX REVENUE, BY COUNTY, NORTH DAKOTA, 1986

County	Sales and Use Tax	Individual Income Tax	Oil Extraction Tax	Oil & Gas Production Tax	Motor Vehicle Fuel Tax	Vehicle Registration Fees	Coal Severance Tax	Motor Vehicle Excise Tax
dollars								
Adams	821,316	248,830	—	—	202,798	202,344	214	139,754
Barnes	3,309,479	1,141,791	—	—	1,232,034	684,813	—	472,983
Benson	1,602,805	335,703	—	—	560,521	346,107	—	239,047
Billings	298,784	44,960	11,480,551	10,426,163	333,437	73,294	—	50,622
Bottineau	2,364,935	822,026	2,101,698	1,908,675	711,593	503,102	—	347,480
Bowman	1,092,446	388,865	1,438,279	1,306,186	297,806	260,522	1,931,792	179,936
Burke	1,008,685	307,703	1,428,350	1,297,169	313,496	233,160	700	161,038
Burleigh	15,397,361	7,165,231	—	—	2,726,665	2,737,411	—	1,890,660
Cass	24,822,380	12,705,874	—	—	5,311,266	4,197,375	—	2,899,021
Cavalier	1,878,109	738,237	—	—	436,290	423,932	—	292,799
Dickey	1,488,029	422,788	—	—	399,172	350,234	—	241,897
Divide	980,585	285,839	1,149,660	1,044,074	255,068	221,094	—	152,704
Dunn	1,224,426	202,785	3,658,324	3,322,339	424,401	240,292	—	165,964
Eddy	823,155	223,705	—	—	202,673	183,505	—	126,742
Emmons	1,088,595	359,587	—	—	335,219	318,655	—	220,087
Foster	1,080,288	421,052	—	—	267,163	247,604	—	171,014
Golden Valley	688,373	235,727	940,207	853,858	250,818	153,765	—	106,202
Grand Forks	14,651,348	6,426,533	—	—	3,211,196	2,562,294	—	1,769,712
Grant	763,663	209,068	—	—	253,138	247,514	—	170,952
Griggs	848,060	268,591	—	—	238,649	206,336	—	142,511
Hettinger	968,361	366,274	15,927	14,465	258,412	259,266	—	179,069
Kidder	770,797	171,502	—	—	525,627	212,078	—	146,477
LaMoure	1,261,244	482,013	—	—	366,503	369,028	—	254,878
Logan	708,721	175,706	—	—	168,007	194,719	—	134,487
McHenry	1,746,292	474,856	41,454	37,647	698,084	430,256	—	297,167
McIntosh	965,361	266,746	—	—	231,953	254,870	—	176,032
McKenzie	1,966,915	443,791	16,502,278	14,986,689	983,316	415,140	—	286,727
McLean	3,046,674	991,670	—	—	932,467	658,392	5,278,683	454,735
Mercer	2,863,875	1,380,958	—	—	615,369	565,496	12,816,389	390,574
Morton	5,579,043	1,976,626	—	—	1,773,086	1,214,379	—	838,741
Mountrail	1,686,036	615,864	439,602	399,228	568,712	421,689	—	291,250
Nelson	1,263,692	569,513	—	—	450,566	292,325	—	201,901
Oliver	586,257	185,055	—	—	201,207	133,401	5,864,372	92,137
Pembina	2,687,834	1,158,552	—	—	767,635	574,378	—	396,708
Pierce	1,307,306	415,472	—	—	372,868	295,375	—	204,008
Ramsey	3,265,433	1,503,981	—	—	850,099	623,764	—	430,818
Ransom	1,475,297	561,695	—	—	291,833	310,940	—	214,758
Renville	958,214	341,866	1,433,499	1,301,845	288,798	215,218	—	148,646
Richland	4,302,584	1,792,582	—	—	1,210,849	897,743	—	620,048
Rolette	1,981,880	480,418	—	—	576,166	452,953	—	312,843
Sargent	1,287,114	463,552	—	—	343,646	293,536	—	202,738
Sheridan	598,156	99,826	—	—	195,402	165,338	—	114,195
Stoux	541,964	52,950	—	—	152,200	103,168	—	71,256
Slope	273,200	22,178	184,084	167,178	175,941	77,242	—	53,349
Stark	6,291,317	2,102,339	1,463,268	1,328,880	1,541,568	1,184,730	227,094	818,263
Steele	855,969	271,252	—	—	257,668	171,394	—	118,377
Stutsman	5,772,569	2,093,558	—	—	1,665,997	1,155,035	—	797,754
Towner	1,064,180	336,190	—	—	289,976	238,094	—	164,446
Trail	2,535,808	1,183,845	—	—	888,727	466,231	—	322,014
Walsh	3,514,001	1,253,715	—	—	987,146	805,340	—	556,228
Ward	14,418,516	5,278,428	51,199	46,497	2,998,631	2,538,027	23,257	1,752,951
Wells	1,758,150	479,028	—	—	479,986	381,498	—	263,491
Williams	7,749,597	2,273,534	6,448,865	5,856,593	1,426,707	1,272,333	22,015	878,768
Total	162,285,176	63,220,429	48,777,246	44,297,483	41,498,556	32,036,729	26,164,515	22,126,958

TABLE 2. STATE TAX REVENUE, BY COUNTY, NORTH DAKOTA, 1986 (CONTINUED)

County	Special Fuel Tax	Tobacco Product Tax	Coal Conversion Tax	Motor Vehicle Use Tax	Estate Tax	Total Ad Valorem Property Taxes	Total Tax Revenue
dollars							
Adams	91,062	60,702	—	19,089	47,707	1,789,255	3,623,070
Barnes	553,221	224,715	—	64,605	25,685	5,765,792	13,475,118
Benson	251,691	132,503	—	32,651	1,173	2,726,147	6,228,349
Billings	149,723	21,655	—	6,915	4,926	308,787	23,199,817
Bottineau	319,527	156,648	—	47,462	31,337	3,899,737	13,214,219
Bowman	133,724	73,115	—	24,577	79,549	1,526,921	8,733,718
Burke	140,770	61,502	—	21,996	31,326	1,355,258	6,361,155
Burleigh	1,224,356	1,028,500	—	258,245	138,859	27,103,435	59,670,723
Cass	2,384,922	1,662,201	—	395,977	199,033	39,316,857	93,894,906
Cavalier	195,908	117,396	—	39,993	47,760	3,831,237	8,001,662
Dickey	179,241	119,152	—	33,041	2,330	2,670,586	5,906,470
Divide	114,533	55,637	—	20,858	6,971	1,732,226	6,019,250
Dunn	190,569	83,414	—	22,669	4,591	2,198,201	11,737,975
Eddy	91,006	54,018	—	17,312	6,669	1,515,024	3,243,808
Emmons	150,524	96,287	—	30,062	0	2,626,442	5,225,458
Foster	119,964	77,258	—	23,359	38,809	1,904,362	4,350,873
Golden Valley	112,625	41,758	—	14,506	25,808	1,137,939	4,561,585
Grand Forks	1,441,926	1,183,494	—	241,725	154,579	25,188,084	56,830,890
Grant	113,667	72,109	—	23,350	5,377	1,701,851	3,560,689
Griggs	107,161	61,162	—	19,466	14,833	1,956,702	3,863,470
Hettinger	116,035	67,812	—	24,459	14,554	2,040,193	4,324,826
Kidder	236,023	64,061	—	20,007	17,087	1,396,204	3,559,862
LaMoure	164,571	103,687	—	34,814	16,550	2,628,630	5,681,919
Logan	75,440	54,154	—	18,370	1,699	1,414,924	2,946,228
McHenry	313,461	128,087	—	40,590	33,575	2,835,018	7,076,486
McIntosh	104,154	76,337	—	24,044	493	2,002,274	4,102,265
McKenzie	441,539	144,746	—	39,164	33,069	2,471,457	38,714,830
McLean	418,706	208,449	2,951,254	62,112	11,160	3,397,049	18,411,352
Mercer	276,320	235,662	5,319,298	53,348	1,711	3,654,235	28,173,235
Morton	796,170	436,915	—	114,563	20,370	10,739,023	23,488,918
Mountrail	255,369	137,755	—	39,782	66,386	2,847,473	7,769,145
Nelson	202,318	83,601	—	27,578	17,039	2,504,427	5,612,959
Oliver	90,348	44,981	2,117,446	12,585	243	776,154	10,104,185
Pembina	344,692	175,574	—	54,186	44,412	5,024,480	11,228,451
Pierce	167,429	98,777	—	27,865	936	2,559,393	5,449,428
Ramsey	381,721	218,082	—	58,845	59,623	5,495,742	12,888,108
Ransom	131,042	109,723	—	29,334	26,853	2,639,815	5,791,289
Renville	129,679	60,463	—	20,303	25,975	1,386,735	6,311,240
Richland	543,709	324,037	—	84,692	93,654	8,240,075	18,109,974
Rolette	258,716	222,430	—	42,731	24,640	2,260,397	6,613,176
Sargent	154,308	88,239	—	27,692	27,331	2,285,188	5,173,344
Sheridan	87,742	44,316	—	15,598	2,436	1,184,029	2,507,037
Sioux	68,342	64,998	—	9,733	0	405,500	1,470,111
Slope	79,003	19,899	—	7,287	2,994	488,993	1,551,345
Stark	692,211	436,404	—	111,766	90,669	9,735,222	26,023,732
Steele	115,701	48,561	—	16,169	2,403	2,321,665	4,179,159
Stutsman	748,084	397,715	—	108,965	38,131	10,356,419	23,134,226
Towner	130,208	69,398	—	22,462	48,841	2,555,117	4,918,912
Traill	399,066	161,320	—	43,984	92,111	4,747,103	10,840,208
Walsh	443,259	261,801	—	75,975	63,744	6,961,865	14,923,074
Ward	1,346,477	1,044,460	—	239,435	69,501	19,925,398	49,732,778
Wells	215,529	115,981	—	35,990	11,667	2,909,124	6,650,444
Williams	640,635	448,936	—	120,031	103,070	10,367,722	37,608,806
Total	18,634,126	11,580,589	10,387,999	3,022,317	1,930,249	270,811,886	756,774,258

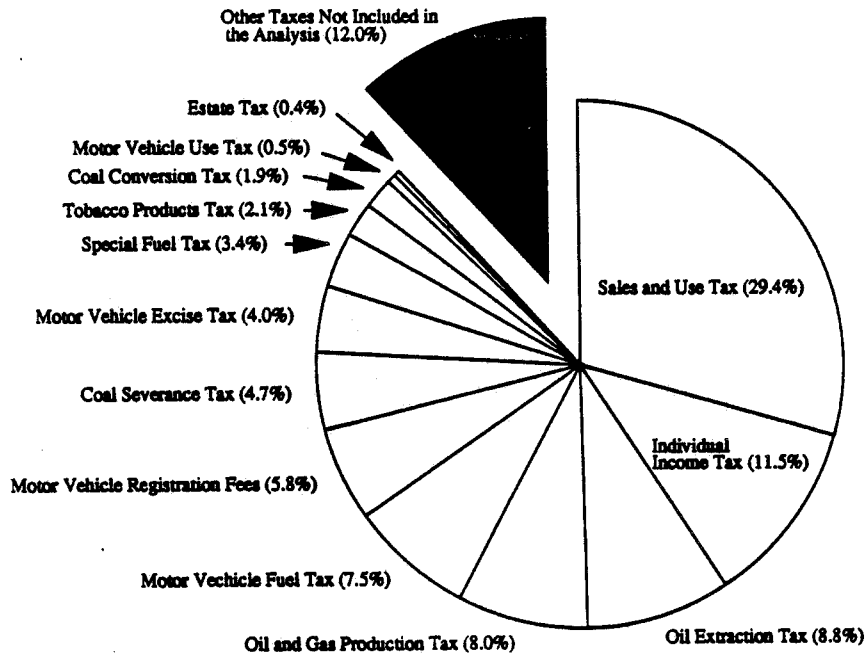


Figure 7. State-Level Collections, North Dakota, 1986

#### Sales and Use Tax

Sales and use tax collections for each county are reported by the North Dakota State Tax Department. However, using these values will not accurately reflect the taxes paid by residents in each county. Residents may shop in more than one county, which could overestimate taxes paid by residents in some counties while underestimating taxes paid in another. Therefore, county total personal income was used as a proxy for allocating sales and use tax collections.

Sales and use taxes were attributed to counties based on county total personal income. County total personal income from 1980 to 1984 (adjusted to reflect 1986 dollars) was used to estimate a five-year average county total personal income (U.S. Department of Commerce 1986). Average county total personal income was divided by the state's average total personal income to estimate the percentage of state total personal income for each county. The county percentage was multiplied by 1986 state total personal income (U.S. Department of Commerce 1987b) to estimate 1986 county total personal income. County shares of sales and use tax were then estimated by dividing 1986 county total personal income by state total personal income multiplied by net sales and use tax collections for calendar year 1986 (North Dakota State Tax Department 1987). The 1986 calendar year tax collection was estimated by adding collections from fiscal years 1986 and 1987 and dividing by two. This method of allocating sales and use taxes assumes counties pay taxes in direct proportion to their level of income. This makes the tax proportional by definition. However, studies have

concluded that the sales and use tax in North Dakota is regressive (Dorow et al. 1988).

Total sales and use tax collections include taxes paid by residents of neighboring states who purchase goods and services in North Dakota. As a result, 1986 total collections represent taxes paid not only by North Dakota residents, but residents of surrounding states as well. North Dakota residents also purchase goods and services which are subject to sales and use taxes in other states. Thus, total state sales tax collections do not include sales and use taxes paid by North Dakota residents to other states. If the amount of tax imported from other states equals the amount of tax exported to other states, then total sales and use tax collections are relatively accurate. However, if tax exports are significantly different than imports, total collections would be inaccurate. This could affect total sales tax collections but would not change the relative distribution of sales taxes paid among counties.

#### Individual Income Tax

County shares of individual income tax collections were provided by the North Dakota State Tax Department for each school district during the 1986 calendar year. School districts were aggregated into counties based on codes provided by the Tax Department. Tax collections represent the net tax liability of the county. County net tax liabilities do not necessarily represent actual taxes paid or collected during the year. Actual taxes paid in 1986 could be different since some filers are allowed extensions.

#### Oil Extraction Tax

Tax collections were attributed to counties based on the distribution of net oil and gas production tax revenues. County shares were determined by dividing 1986 calendar year total net oil and gas production tax revenue distribution for the county by the state total net oil and gas production tax revenue distribution to estimate the county percentage of state tax revenue distributions. The county percentage was multiplied by the 1986 calendar year state total net oil extraction tax collections to determine the county share (North Dakota State Tax Department 1987).

County shares assume oil and gas production levels are similar for each oil producing county. However, some counties may produce more or less gas relative to oil. Therefore, using oil and gas production levels to estimate oil extracted may over (under) estimate the amount of oil produced if a county actually produces more (less) oil relative to gas. This will over (under) estimate oil extraction tax distributions to counties which produce more (less) gas with respect to oil.

### Oil and Gas Gross Production Tax

Tax collections were attributed to counties using 1986 calendar year distributions of net oil and gas production tax revenues (North Dakota State Tax Department 1987).

### Motor Vehicle Fuel Tax

Tax collections were attributed to counties based on 1986 county vehicle miles of travel (North Dakota State Highway Department 1987a). County shares were estimated by dividing the 1986 county vehicle miles of travel by the 1986 total state vehicle miles of travel to determine the percentage of state miles of travel within each county. The county percentage was multiplied by the 1986 calendar year motor vehicle fuel tax gross tax collections to determine the county share (North Dakota State Tax Department 1987).

### Motor Vehicle Registration Fees

Collections were attributed based on 1986 motor vehicle registrations supplied by the North Dakota Motor Vehicle Department. County shares were estimated by dividing 1986 county vehicle registrations by the state total vehicle registrations to determine the percentage of state vehicle registrations for each county. County percentages were multiplied by the 1986 calendar year registration fees collected to estimate the county share (North Dakota State Highway Department 1987a).

### Coal Severance Tax

Tax collections were estimated based on the number of taxable tonnages severed for calendar year 1986. Coal was taxed at \$1.04 per ton. County shares were estimated by multiplying the county taxable tonnages severed by \$1.04 (North Dakota State Tax Department 1987).

### Motor Vehicle Excise Tax

Tax collections were attributed based on 1986 motor vehicle registrations supplied by the North Dakota Motor Vehicle Department. County shares were estimated by dividing 1986 county vehicle registrations by the total state vehicle registrations to estimate the percentage of state vehicle registrations for each county. The county percentage was multiplied by the 1986 calendar year gross motor vehicle excise tax collections to estimate the county share (North Dakota State Tax Department 1987).

### Special Fuel Tax

County shares were estimated by dividing 1986 county vehicle miles of travel by the total state vehicle miles of travel to determine the county percentage of state vehicle miles of travel. The county percentage was multiplied by 1986 calendar year total special fuel tax gross collections to estimate the county share (North Dakota State Tax Department 1987).

### Tobacco Products Tax

Tobacco products tax includes both tobacco products and cigarette tax collections. Tax collections were attributed based on county population (Bureau of the Census 1987). County shares were estimated by dividing county population by the total North Dakota population for 1986 to determine the county percentage of state population. The county percentage was multiplied by combined cigarette and tobacco product net tax collections to estimate county shares (North Dakota State Tax Department 1987).

County shares assume that smokers are distributed equally across the state according to population. For example, a county which contains 10 percent of the state's population is assumed to have 10 percent of the state's smokers.

### Coal Conversion Tax

Tax collections were based on kilowatt hours of electricity produced by coal fired electric generating plants in each county. County shares were estimated by dividing county kilowatt hours of electricity produced by the total number of kilowatt hours of electricity produced by all electric generating plants in North Dakota to determine the county percentage of state electricity produced. The county percentage was multiplied by the 1986 calendar year total gross coal conversion tax collections to estimate county shares (North Dakota State Tax Department 1987).

### Motor Vehicle Use Tax

County shares were estimated by dividing 1986 county vehicle registrations by the total North Dakota vehicle registrations to determine the county percentage of state vehicle registrations. The county percentage was multiplied by 1986 calendar year motor vehicle gross tax collections to estimate county shares (North Dakota State Tax Department 1987).

Tax distributions assume the percentage of vehicles purchased out-of-state by county residents equals the county percentage of state vehicle registrations. This may underestimate taxes paid by residents who live in counties located on or near the North Dakota border who are more likely to purchase vehicles outside of the state.

### Estate Tax

Estate tax collections by county were provided in the 38th Biennial Report adjusted to calendar year 1986 (North Dakota State Tax Department 1987).

### Ad Valorem Property Taxes

Property taxes were provided in the 1987 Property Tax Statistical Report (North Dakota State Tax Department 1987a).

### Tax Liabilities

Taxes collected were aggregated into several tax liability categories including:

- total taxes paid excluding energy taxes,
- total taxes paid excluding energy and property taxes,
- total taxes paid, and
- total taxes paid excluding property taxes.

Total taxes paid is the sum of all county taxes listed in Table 2 (page 14). Energy taxes include oil extraction, oil and gas production, coal severance, and coal conversion taxes. A motor vehicle tax category was developed representing the sum of motor and special fuels, motor vehicle registration fees, and motor vehicle excise and use tax collections.

County tax liability categories were divided by county total personal income and North Dakota federal adjusted gross income to estimate the percentage of taxes paid per dollar of income (tax burden) for each county group. Sales and use, income, property, motor vehicle, and energy taxes collected were also divided by total personal income and federal income to estimate the percentage of taxes paid per dollar of income (tax burden) for these specific tax bases. Taxes paid for aggregate tax categories and individual tax bases were also estimated on a per capita basis.

Tax liabilities were estimated for each county group. Total personal, federal, and per capita income county groups were used to examine taxes paid relative to income to determine the nature of the tax system and specific taxes (i.e., regressive, proportional, or progressive). Percentage of county total personal income from farming was used to compare taxes paid by agriculturally dependent counties against nonagricultural counties. State planning regions were used to examine taxes paid for each specific state planning region. Location examined taxes paid by various areas of the state.

### Expenditure Variables

State expenditures were divided into categories corresponding to those outlined in the Executive Budget Detail Appropriations Requested and Recommended for the 1985-1987 Biennium (North Dakota State Office of Management and Budget 1985). Expenditures were grouped into

- general government,
- education,
- health and welfare,
- regulatory,
- public safety,
- agricultural and industrial development,
- natural resources,
- highways, and
- legislative and judicial budgets.

Education was divided into two categories: (1) elementary, secondary, and other education and (2) higher education. Only state appropriations from the general and highway funds provided directly from state taxes within each budget category were considered.

Table 3 presents the county share of each expenditure category. Each state expenditure category is discussed separately because different methods were used to allocate county shares. Expenditures in parentheses in the tables presented below represent line items in the Executive Budget not included in Table 3. These expenditures were not included since they could not be directly traced to a particular county.

### Total Expenditures

Total expenditures by the state based on general and special fund appropriations were \$647,546,903 in calendar year 1986. Out of this total, \$562,935,549 (87 percent) was allocated to counties and accounted for in Table 3. Of the \$84,611,354 not accounted for in Table 3, 25 percent was general government expenditures and 18 percent was legislative and judicial budget expenditures.

Table 3 accounts for dollars transferred directly to other political subdivisions, including oil and gas production, coal conversion, coal severance, cigarette, and estate tax revenue distributions. Figure 8 presents a summary of state expenditures including dollars transferred to political subdivisions. Thirteen percent of state appropriations are not accounted for in Table 3.

TABLE 3. NORTH DAKOTA STATE EXPENDITURES, BY COUNTY, 1986

County	Elementary, Secondary, and Other Education	Human Services	Higher Education	Highway	State Revenue Sharing	Agricultural Development and Promotion	Personal Property Tax Replacement
dollars							
Adams	1,218,901	347,909	—	226,714	85,799	237,451	81,495
Barnes	3,967,300	1,346,667	3,767,323	3,934,065	311,844	—	251,025
Benson	2,613,528	1,077,370	—	404,685	159,853	—	136,528
Billings	193,160	17,777	—	127,119	19,214	—	28,175
Bottineau	3,464,788	783,247	2,086,974	595,737	211,601	—	178,150
Bowman	1,914,580	243,889	—	275,141	82,487	—	79,408
Burke	1,509,620	119,659	—	297,094	80,944	—	78,055
Burleigh	18,294,931	5,836,196	—	6,705,163	1,343,595	—	951,443
Cass	25,096,168	8,059,123	28,177,505	6,958,494	2,041,135	11,414,579	1,407,101
Cavalier	2,005,410	385,399	—	510,580	193,483	281,898	169,295
Dickey	2,307,901	824,147	—	393,431	155,064	—	137,401
Divide	997,931	215,647	—	290,585	90,619	—	80,014
Dunn	1,595,196	235,251	—	295,808	87,428	—	84,043
Eddy	1,012,448	623,804	—	211,137	81,893	—	77,065
Emmons	2,178,265	271,519	—	371,128	116,484	—	111,945
Foster	1,709,253	450,542	—	258,820	104,156	413,880	90,301
Golden Valley	1,059,422	80,768	—	186,072	57,013	—	49,989
Grand Forks	19,545,215	4,273,752	46,949,575	5,528,465	1,330,259	—	948,608
Grant	1,596,286	232,484	—	332,521	93,401	—	94,444
Griggs	1,149,266	287,242	—	230,629	94,364	—	87,788
Hettinger	1,572,751	265,008	—	312,825	100,955	—	102,788
Kidder	1,537,627	215,021	—	269,254	80,898	424,063	87,168
LaMoure	2,324,090	242,643	—	429,482	143,936	—	136,493
Logan	1,203,259	160,509	—	248,368	78,430	—	74,545
McHenry	3,119,750	282,704	—	542,336	158,298	—	140,562
McIntosh	1,465,820	483,426	—	306,424	95,700	—	115,266
McKenzie	2,967,704	651,271	—	494,065	125,069	—	105,480
McLean	5,263,434	1,092,799	—	683,233	231,731	—	179,561
Mercer	4,692,962	737,882	—	560,151	254,882	—	176,307
Morton	10,444,384	2,463,589	—	1,177,711	520,476	—	384,353
Mountrail	3,305,984	1,318,182	—	509,123	163,220	—	133,729
Nelson	1,746,059	473,733	—	330,751	130,951	—	114,642
Oliver	840,443	39,338	—	151,684	48,211	—	51,825
Pembina	3,513,244	638,425	—	639,407	252,623	—	254,701
Pierce	2,030,633	678,879	—	365,106	132,561	—	104,715
Ramsey	6,533,797	1,393,561	—	3,918,212	296,516	—	246,923
Ransom	2,250,977	758,550	—	344,256	147,144	—	123,593
Renville	1,581,716	122,928	—	261,402	80,304	—	70,225
Richland	5,185,236	1,225,970	9,267,762	954,406	424,719	—	329,300
Rolette	4,814,491	7,823,997	—	467,356	195,535	—	102,947
Sargent	1,809,519	240,717	—	330,319	123,368	—	113,165
Sheridan	699,878	119,575	—	217,265	63,061	—	65,573
Stoux	1,348,432	778,180	—	119,185	51,848	—	32,185
Slope	105,540	17,493	—	126,258	27,096	—	29,115
Stark	7,854,716	2,803,352	4,753,133	3,824,514	565,363	504,980	367,002
Steele	789,088	43,554	—	224,595	99,599	—	96,881
Stutsman	7,236,311	18,843,606	—	1,196,528	549,007	—	437,310
Towner	1,344,191	375,695	—	277,849	117,551	—	103,665
Traill	3,158,955	607,123	3,189,225	519,316	238,838	—	192,773
Walsh	4,553,371	31,913,097	—	848,184	367,943	—	264,007
Ward	18,425,145	4,681,803	6,961,648	5,419,903	1,167,134	343,325	817,878
Wells	2,316,644	792,043	—	459,927	155,836	—	135,312
Williams	8,390,510	1,886,982	—	3,422,871	560,098	239,157	416,025
Total	217,856,230	109,884,027	105,153,145	58,085,656	14,489,537	13,859,333	11,228,287

TABLE 3. . NORTH DAKOTA STATE EXPENDITURES, BY COUNTY, 1986 (CONTINUED)

County	Other Expenditures	Oil & Gas Production Tax Distribution	Coal Severance Tax Distribution	Estate Tax Distributions	Coal Conversion Tax Distribution	Cigarette Tax Distributions	Totals
dollars							
Adams	—	—	43	47,707	—	9,805	2,255,824
Barnes	—	—	—	25,686	—	36,297	13,640,207
Benson	—	—	—	1,173	—	21,403	4,414,539
Billings	—	2,689,414	—	4,926	—	3,498	3,083,283
Bottineau	—	1,034,287	—	31,335	—	25,303	8,411,421
Bowman	—	769,608	386,237	79,545	—	11,810	3,842,704
Burke	—	751,773	140	31,326	—	9,934	2,878,545
Burleigh	5,822,351	—	—	138,732	—	166,129	39,258,540
Cass	—	—	—	198,993	—	268,487	83,621,585
Cavalier	—	—	—	47,760	—	18,962	3,612,787
Dickey	—	—	—	2,330	—	19,246	3,839,520
Divide	—	641,091	—	6,946	—	8,987	2,331,820
Dunn	—	1,426,447	—	4,592	—	13,473	3,742,238
Eddy	—	—	—	6,669	—	8,725	2,021,741
Emmons	—	—	—	0	—	15,553	3,064,894
Foster	—	—	—	38,810	—	12,479	3,078,241
Golden Valley	—	528,340	—	25,744	—	6,745	1,994,093
Grand Forks	—	—	—	154,574	—	191,164	78,921,612
Grant	—	—	—	5,378	—	11,647	2,366,161
Griggs	—	—	—	14,833	—	9,879	1,874,001
Hettinger	—	9,177	—	14,429	—	10,953	2,388,886
Kidder	—	—	—	17,087	—	10,347	2,641,466
LaMoure	—	—	—	16,551	—	16,748	3,309,942
Logan	—	—	—	1,699	—	8,747	1,775,558
McHenry	—	23,727	—	33,575	—	20,689	4,321,642
McIntosh	—	—	—	493	—	12,330	2,479,459
McKenzie	—	3,594,546	—	33,061	—	23,380	7,994,576
McLean	—	—	1,055,394	11,146	543,332	33,670	9,094,299
Mercer	—	—	2,562,447	1,711	979,295	38,065	10,003,702
Morton	—	—	—	20,370	—	70,573	15,081,456
Mountrail	—	253,142	—	66,326	—	22,251	5,771,957
Nelson	—	—	—	17,034	—	13,504	2,826,673
Oliver	—	—	1,172,494	243	389,826	7,265	2,701,329
Pembina	—	—	—	44,362	—	28,360	5,371,122
Pierce	—	—	—	932	—	15,955	3,328,781
Ramsey	—	—	—	59,623	—	35,226	12,483,858
Ransom	—	—	—	26,853	—	17,723	3,669,096
Renville	—	773,052	—	25,975	—	9,766	2,925,368
Richland	—	—	—	93,654	—	52,340	17,533,387
Rolette	171,000	—	—	24,640	—	35,928	13,635,894
Sargent	—	—	—	27,331	—	14,253	2,658,672
Sheridan	—	—	—	2,436	—	7,158	1,174,946
Sioux	—	—	—	0	—	10,499	2,340,329
Slope	—	103,855	—	2,903	—	3,214	415,474
Stark	—	785,593	45,404	90,646	—	70,490	21,665,193
Steele	—	—	—	2,403	—	7,844	1,263,964
Stutsman	—	—	—	38,132	—	64,241	28,365,134
Towner	—	—	—	48,841	—	11,209	2,279,001
Traill	—	—	—	92,111	—	26,057	8,024,398
Walsh	—	—	—	63,744	—	42,287	38,052,634
Ward	—	29,721	4,650	69,403	—	168,706	38,089,317
Wells	—	—	—	11,660	—	18,734	3,890,156
Williams	—	2,028,508	4,401	103,058	—	72,514	17,124,125
Total	5,993,351	15,442,281	5,231,210	1,929,484	1,912,453	1,870,555	562,935,549

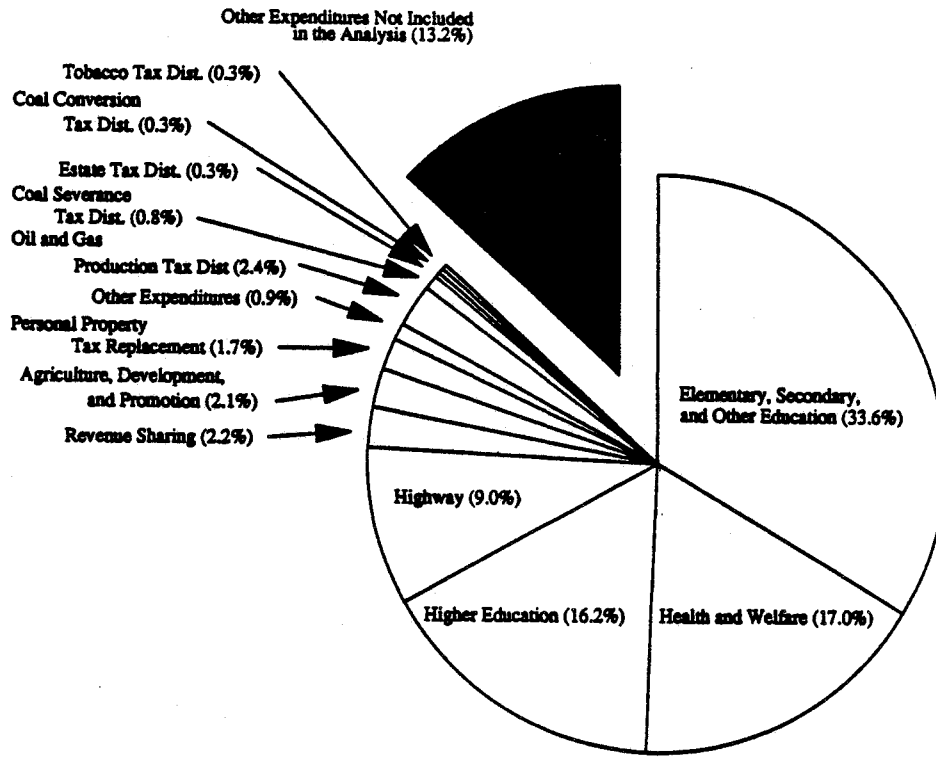


Figure 8. State-Level Expenditures, North Dakota, 1986

#### Elementary, Secondary, and Other Education

State general fund expenditures for each line item in the executive budget for this category are:

	Amount(\$)
Department of Public Instruction	\$211,859,481
Division of Independent Study	(\$250,000)
State Industrial School (Morton Co.)	\$1,980,351
State Library (Burleigh Co.)	\$972,254
School for the Deaf (Ramsey Co.)	\$1,864,057
School for the Blind (Grand Forks Co.)	\$1,153,587
Boys and Girls Clubwork (\$500/Co.)	\$26,500
TOTAL	\$218,106,230
Included in Table 3	\$217,856,230
Not Included in Table 3	\$250,000

Department of Public Instruction expenditures in each county were provided directly from the Department of Public Instruction. Over 99 percent of the general fund expenditures in this budget category are accounted for in Table 3.

Health and Welfare

State general fund appropriations for each line item in the budget for this category are:

	<u>Amount(\$)</u>
State Department of Health	(\$5,219,340)
Grafton State School (Walsh Co.)	\$11,609,295
San Haven State Hospital (Walsh Co.)	\$2,107,028
Jamestown State Hospital (Stutsman Co.)	\$15,551,218
Indian Affairs Commission	(\$352,745)
Department of Human Services	\$80,616,486
Council on Human Resources	(\$102,670)
Protection and advocacy Project	(\$403,166)
TOTAL	<u>\$115,961,948</u>
Included in Table 3	\$109,884,027
Not Included in Table 3	\$6,077,921

Department of Human Service expenditures were supplied directly by the Department of Human Services. Over 95 percent of the Health and Human Services general fund budget is accounted for in Table 3.

Department of Human Services expenditures represent a number of different programs including Medicaid, Aid to Families with Dependent Children (AFDC), foster care, general assistance, mandatory and optional supplemental security income, subsidized adoption, and developmental disabilities. Payments for these programs are made to a number of entities including counties, institutions, and individuals. Payments made to institutions for developmental disabilities assume the individual being served resides in the county where the service was provided. This may not be the case in many instances, for people may travel to or be located in facilities outside of their physical or legal county residence. Benefits are assigned to counties where services are performed rather than to the county where the resident is physically or legally located. In addition, some counties share facilities. Counties which share resources are Golden Valley with Billings and Bowman with Slope.

Higher Education

State general fund expenditures for each line item in the higher education budget are:

	<u>Amounts(\$)</u>
Board of Higher Education	(\$12,430,939)
Reciprocal Agreements	(\$1,180,050)
UND (Grand Forks Co.)	\$32,674,605
UND Medical Center (Grand Forks Co.)	\$14,274,970
NDSU Toxicology Center (Cass Co.)	\$225,079
NDSU (Cass Co.)	\$27,952,426
State School of Science (Richland Co.)	\$9,267,762

Dickinson State College (Stark Co.)	\$4,753,133
Mayville State College (Trail Co.)	\$3,189,225
Minot State College (Ward Co.)	\$6,961,648
Valley City State College (Barnes Co.)	\$3,767,323
NDSU-Bottineau J.C. (Bottineau Co.)	\$1,568,587
NDSU-Bottineau Forest Service (Bott. Co.)	<u>\$518,387</u>
TOTAL	\$118,764,134

Included in Table 3	\$105,153,145
Not included in Table 3	\$13,610,989

Over 88 percent of general fund expenditures for higher education are accounted for in Table 3.

Expenditures assume that only people located in the particular county where the institution is located receive benefits. While state expenditures may primarily benefit the county or city where the institution is located, education is a public good which benefits people all across the state who attend the school.

#### Highways

State highway appropriations are almost entirely from special funds. The special fund for the Highway Department is the Highway Distribution Fund. The county share of state appropriations was provided by the State Highway Department. Additional appropriations for district offices were estimated from the Highway Department's Biennial Report (North Dakota State Highway Department 1987).

#### State Revenue Sharing

County shares of state revenue sharing appropriations were supplied by the State Treasury's Office.

#### Agricultural and Industrial Development

General fund expenditures for each line item in this budget category are:

Economic Development Commission	(\$746,374)
Department of Agriculture	(\$1,460,314)
Predatory Animal Control	(\$358,634)
Livestock Sanitary Board	(\$255,829)
State Fair Association (Ward Co.)	\$107,500
Cooperative Extension Service	(\$4,687,463)
Northern Crops Institute (Cass Co.)	\$301,575
Main Experiment Station (Cass Co.)	\$11,113,004
Dickinson Exp. Sta. (Stark Co.)	\$504,980
Central Grasslands Exp. Sta. (Kidder Co.)	\$424,063
Hettinger Exp. Sta. (Adams Co.)	\$237,451

Langdon Exp. Sta. (Cavalier Co.)	\$281,898
North Central Exp. Sta. (Ward Co.)	\$235,825
Williston Exp. Sta. (Williams Co.)	\$239,157
Carrington Exp. Sta. (Foster Co.)	\$413,880
TOTAL	\$21,367,947

Included in Table 3	\$13,859,333
Not Included in Table 3	\$7,508,614

Over 65 percent of general fund expenditures are accounted for in Table 3 for this budget category.

#### Personal Property Tax Replacement

County shares were provided in the 1987 Property Tax Statistical Report (North Dakota State Tax Department 1987a).

#### Other State Government Expenditures

Other state government expenditures from the general fund listed in the executive summary, by category, are:

General Government	(\$21,137,366)
Regulatory	(\$5,537,138)
Public Safety	
State Penitentiary (Burleigh Co.)	\$5,822,351
Total not included in Table 3	(\$5,780,099)
Natural Resources	
International Peace Garden (Rolette Co.)	\$171,000
Total not included in Table 3	(\$8,949,467)
Miscellaneous	(\$445,000)
Legislative Budget	(\$4,186,714)
Judicial Budget	(\$11,188,046)
TOTAL	\$63,217,181
Included in Table 3	\$5,993,351
Not Included in Table 3	\$57,223,830

#### Transfers to Political Subdivisions

Some revenue collected by the State Tax Department is transferred directly to political subdivisions. Political subdivisions include counties, cities, townships, and special districts. Methods used to attribute county shares of tax revenue distributions are presented below.

#### Oil and Gas Production Tax Distributions

County shares of oil and gas production tax distributions were provided in the 38th Biennial Report (North Dakota State Tax Department 1987).

### Coal Severance Tax Distributions

County shares of coal severance tax distributions were estimated using taxable tonnages severed from a county (North Dakota State Tax Department 1987). County taxable tonnages severed were divided by total state tons severed to estimate the county percentage of state total tons severed during calender year 1986. The county percentage was then multiplied by the total state coal severance tax distribution to estimate the county share.

### Estate Tax Distributions

County shares of estate tax distributions were provided in the 38th Biennial Report (North Dakota State Tax Department 1987).

### Coal Conversion Tax Distribution

County shares of coal conversion tax distributions were estimated based on kilowatt hours of electricity produced during the 1986 calender year (North Dakota State Tax Department 1987). Kilowatt hours of electricity generated by a county was divided by the total state kilowatt hours produced to estimate the county percentage of the state's total. The county percentage was then multiplied by the total state coal conversion tax distribution to estimate county shares.

### Cigarette Tax Distributions

County shares of cigarette tax distributions were estimated based on county population. County population was divided by the total state population to estimate the county percentage of state population. The county percentage was multiplied by the total state cigarette tax distribution to estimate county shares (North Dakota State Tax Department 1987).

### Benefits Received

Benefits received were aggregated into several categories including:

- total benefits received,
- total benefits received excluding energy tax distributions,
- total benefits received excluding energy tax distributions, higher education expenditures, and other expenditures,
- total benefits received excluding energy tax distributions, higher education expenditures, agricultural and industrial development expenditures, and other expenditures, and
- total benefits received excluding energy tax distributions, higher education expenditures, agricultural and industrial development expenditures, health and human services expenditures, and other expenditures.

Total benefits received are the sum of all state expenditures listed in Table 3 (page 22) for a particular county. Energy tax distributions include oil and gas production, coal conversion, and coal severance tax distributions.

Aggregate benefit categories were developed including education and transfers to political subdivisions. Education benefits received include elementary, secondary, and other plus higher education expenditures. Transfers to political subdivisions include

- oil and gas production,
- coal severance,
- estate,
- coal conversion, and
- cigarette tax distributions.

Benefits received categories were divided by total personal income and North Dakota federal adjusted gross income to estimate the percentage of benefits received for each dollar of county income. Welfare and highway expenditures were divided by total personal income and federal income to estimate the percentage of benefits received for each dollar of income for these specific expenditure categories. Benefits received were also estimated on a per capita basis for each expenditure category. Benefits received were estimated for each county group.

#### Net Benefits Received

Benefits received less state taxes paid represents net benefits received. Net benefit categories were

- total benefits received less total taxes paid excluding energy taxes,
- total benefits received less total taxes paid excluding energy and property taxes,
- total benefits received less total taxes paid,
- total benefits received less total taxes paid excluding property taxes,
- total benefits received excluding energy tax distributions less total taxes paid excluding energy taxes,
- total benefits received excluding energy tax distributions less total taxes paid excluding energy and property taxes,
- total benefits received excluding energy tax distributions, higher education expenditures, and other expenditures less total taxes paid excluding energy taxes,
- total benefits received excluding energy tax distributions, higher education expenditures, and other expenditures less total taxes paid excluding energy and property taxes,
- total benefits received excluding energy tax distributions, higher education expenditures, agricultural and industrial development expenditures, and other expenditures less total taxes paid excluding energy taxes, and
- total benefits received excluding energy tax distributions, higher

education expenditures, agricultural and industrial development expenditures, and other expenditures less total taxes paid excluding energy and property taxes.

Net benefit categories were divided by total personal income and federal adjusted gross income to estimate the percentage of net benefits received per dollar of county income. Net benefits were also calculated on a per capita basis. Net benefits received were estimated for each county group.

### County Groups

Counties were placed into groups based on total personal income, North Dakota federal adjusted gross income, per capita total personal income, percentage of total personal income from farming, population, state planning region, and location. Total personal income, North Dakota federal income, and per capita income were chosen to examine tax liabilities, benefits received, and net benefits received with respect to income. These county groups will show how much counties, as proxies for taxpayers, pay in taxes and receive in benefits relative to their income and provides the basis for applying the ability to pay and benefits received principles.

Tax liabilities, benefits received, and net benefits received are also estimated for counties based on percentage of total personal income from farming, population, state planning region, and location. Agricultural counties and nonagricultural counties, population centers (urban versus rural), state planning regions, and locations (east versus west) are compared to isolate possible differences across sectors.

### Total Personal Income

County total personal income in 1986 (U.S. Department of Commerce 1987b) was based on a five-year average from 1980 to 1984 (U.S. Department of Commerce 1986) adjusted to reflect 1986 dollars. County total personal income categories were:

<u>Category</u>	<u>County Total Personal Income</u>	<u>Number of Counties</u>	<u>Percent of Counties</u>
1	\$750,000,000 or more	4	7.5
2	\$150,000,000 to \$749,999,999	9	17.0
3	\$ 90,000,000 to \$149,999,999	9	17.0
4	\$ 50,000,000 to \$89,999,999	18	34.0
5	less than \$50,000,000	13	24.5

(Counties in each category are presented in Figure 9 and a ranking of counties by total personal income is provided in Appendix Figure A1.) Estimating tax liabilities by county total personal income (one measure of a county's ability to pay) shows if counties having the ability to pay taxes are indeed paying their share of taxes. Benefits received and net benefits received are also examined relative to total personal income for indications of income redistribution.

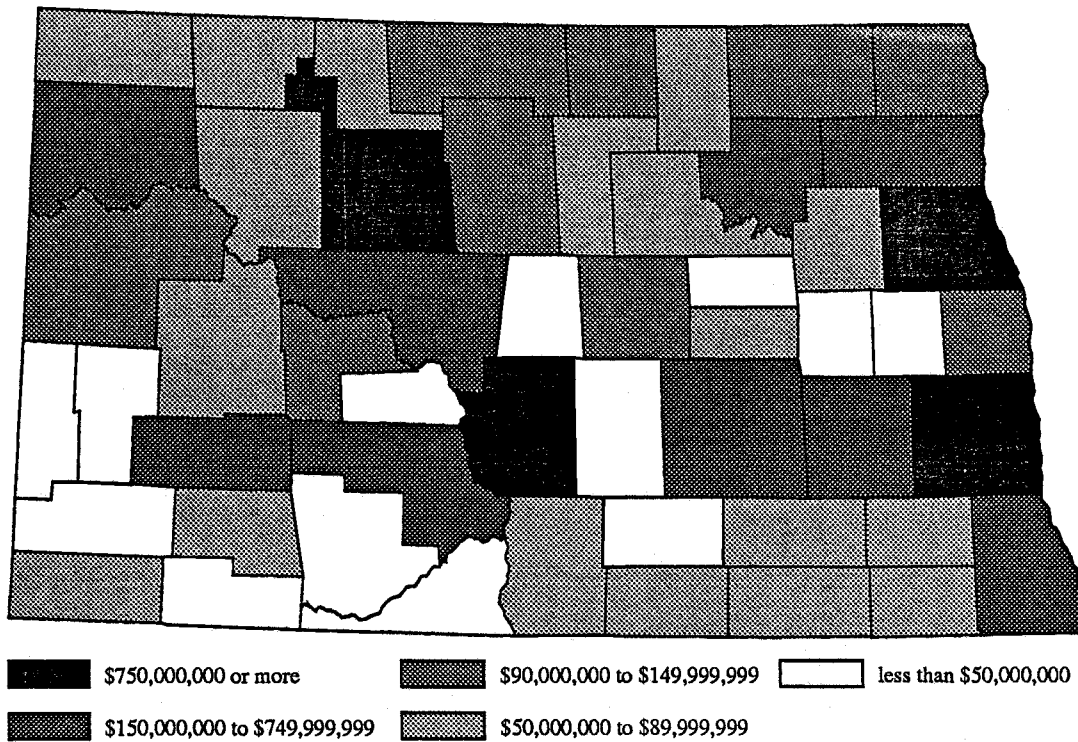


Figure 9. County Groups Based on Total Personal Income, 1986

#### Federal Adjusted Gross Income

North Dakota federal adjusted gross incomes by county were supplied by the North Dakota State Tax Department. Federal adjusted gross income categories were:

<u>Category</u>	<u>County Federal Adjusted Gross Income</u>	<u>Number of Counties</u>	<u>Percent of Counties</u>
1	\$180,000,000 or more	4	7.5
2	\$ 80,000,000 to \$179,999,999	11	20.8
3	\$ 35,000,000 to \$79,999,999	12	22.6
4	\$ 20,000,000 to \$34,999,999	13	24.5
5	less than \$19,999,999	13	24.5

(Counties included in each category are presented in Figure 10 and county rankings are provided in Appendix Figure A2.) North Dakota federal adjusted gross income provides another measure of income which can be used to apply the ability to pay and benefits received principles to taxes paid, benefits received, and net benefits received. County federal adjusted gross income is highly correlated with county total personal income for each county (correlation coefficient of 0.99 which is significant at a 90 percent significance level).

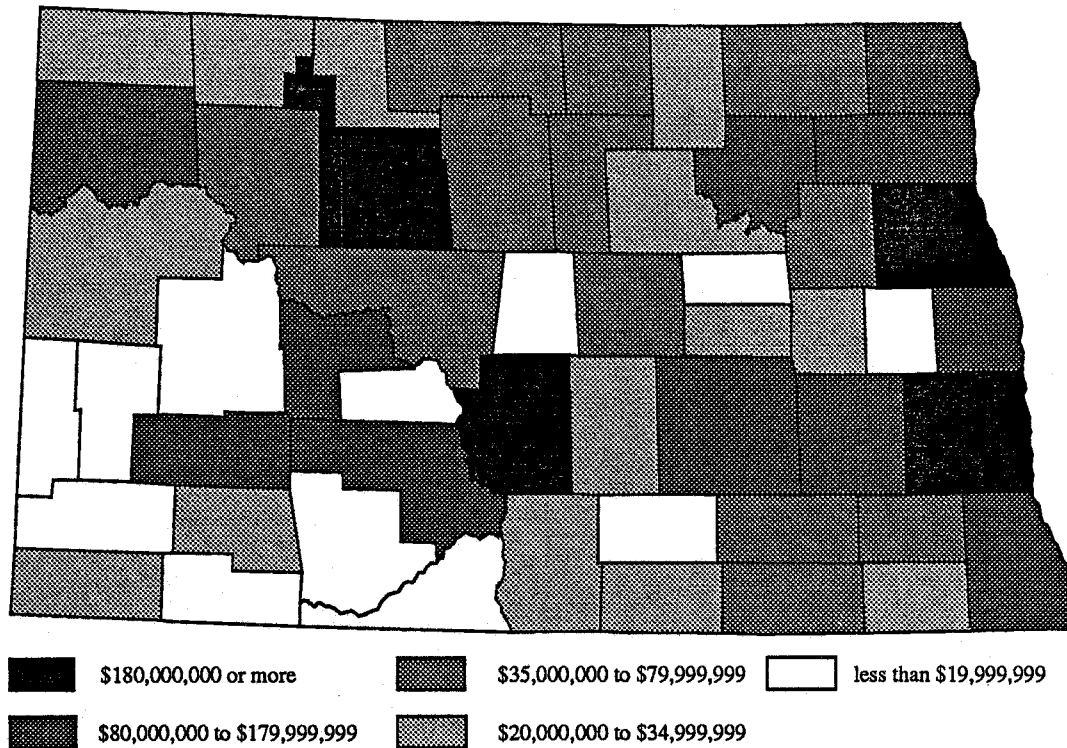


Figure 10. County Groups Based on North Dakota Federal Adjusted Gross Income, 1986

### Per Capita Income

County per capita income was estimated by dividing county total personal income by county population (Bureau of the Census 1987). County per capita income categories were:

<u>Category</u>	<u>County Per Capita Income</u>	<u>Number of Counties</u>	<u>Percent of Counties</u>
1	\$14,000 or more	7	13.2
2	\$13,000 to \$13,999	14	26.4
3	\$12,000 to \$12,999	13	24.5
4	\$11,000 to \$11,999	10	18.9
5	less than \$11,000	9	17.0

(Counties included in each category are presented in Figure 11 and county rankings by per capita income are provided in Appendix Figure A3.) County per capita income provides a good measure of a county's ability to pay. Counties with relatively high per capita income should pay more taxes as a percentage of total personal income than low per capita income counties if the ability to pay tax equity principle is followed. Per capita county income groups are used to determine if the aggregate tax system and specific taxes are progressive, regressive, or proportional. Net benefits received by county per capita income groups provides the basis for applying the benefits received principle.

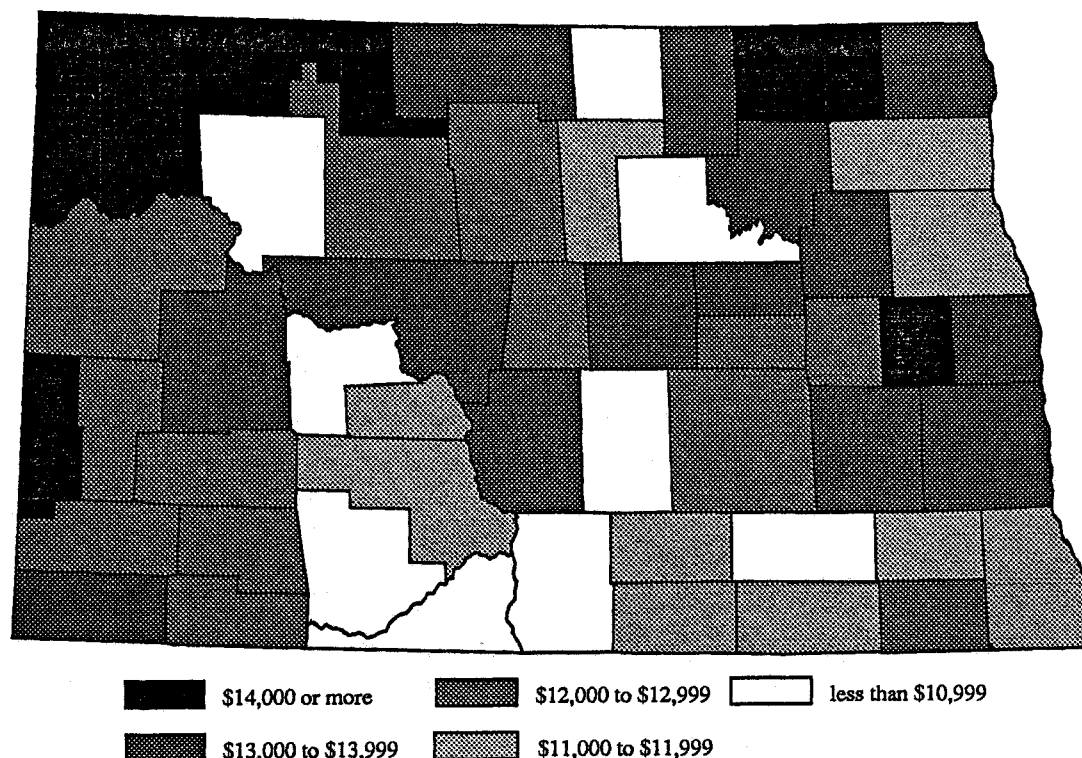


Figure 11. County Groups Based on Per Capita Total Personal Income, 1986

#### Farm Income

Farm income categories were based on the percentage of county total personal income derived from farm sources. County net farm income was based on a five year average (1980-1984 adjusted to 1986 dollars) (U.S. Department of Commerce 1986). Average county net farm income was divided by average county total personal income to estimate the percentage of total personal income earned from farm sources. Farm income categories were:

<u>Category</u>	<u>Percentage of Total Personal Income From Farm Sources</u>	<u>Number of Counties</u>	<u>Percent of Counties</u>
1	25 percent or more	7	13.2
2	20 to 24 percent	7	13.2
3	15 to 19 percent	18	34.0
4	10 to 14 percent	10	18.9
5	less than 10 percent	11	20.8

(Counties included in each farm income category are presented in Figure 12. county farm income ranks are provided in Appendix Figure A4.) Farm income categories were used to compare tax liabilities, benefits received, and net benefits received of relatively agricultural county groups against nonagricultural county groups.

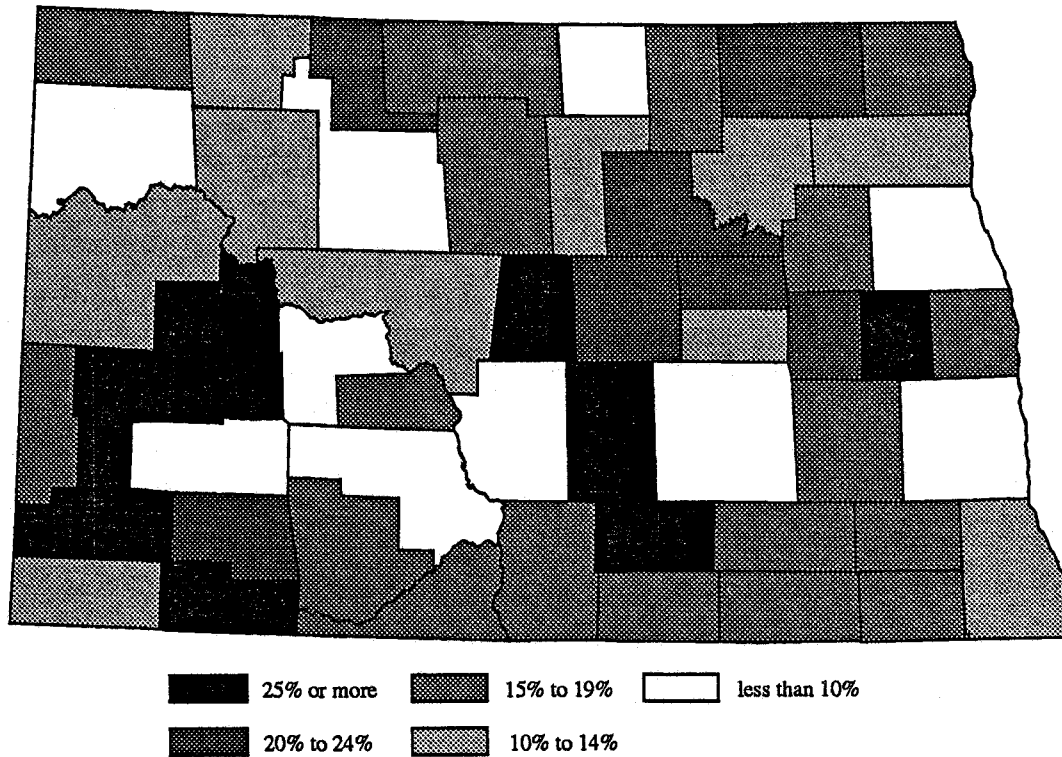


Figure 12. County Groups Based on Percentage of Total Personal Income From Farm Sources, 1986

### Population

Population groups were based on county population estimates (Bureau of the Census 1987). Population categories were:

<u>Category</u>	<u>County Population</u>	<u>Number of Counties</u>	<u>Percent of Counties</u>
1	50,000 or more	4	7.5
2	12,500 to 49,999	10	18.9
3	6,500 to 12,499	11	20.8
4	3,600 to 6,499	16	30.2
5	less than 3,600	12	22.6

(Counties included in each category are presented in Figure 13 and county population ranks are provided in Appendix Figure A5). Population groups were developed to compare taxes paid, benefits received, and net benefits received of relative urban counties versus non-urban counties within the state.

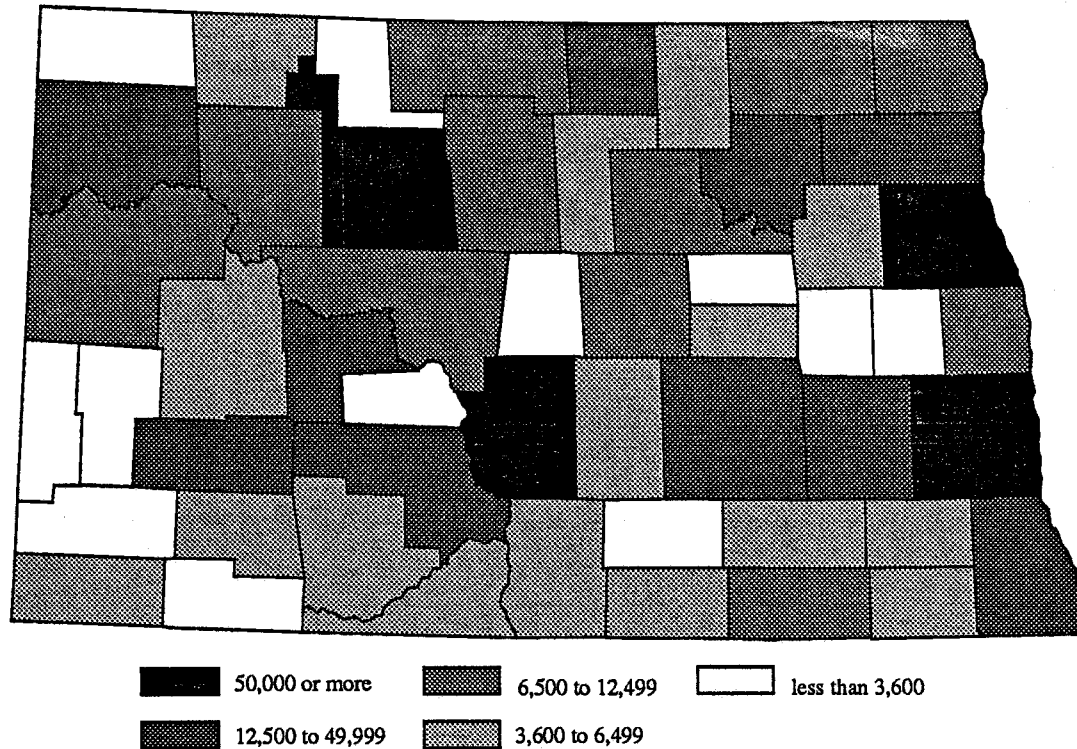


Figure 13. County Groups Based on Population, 1986

#### State Planning Regions

County taxes paid, benefits received, and net benefits received were aggregated by state planning regions (Figure 14). Planning regions were used to compare taxes paid, benefits received, and net benefits received for specific state planning regions. This shows which regions are paying and receiving the majority of taxes and benefits, respectively.

#### Location

Counties were aggregated into west, west central, east central, and east locations based on state planning regions. The west represents counties included in state planning regions 1 and 8. The west central, east central, and east include counties from planning regions 2 and 7, 3 and 6, and 4 and 5, respectively.

### RESULTS

Taxes paid, benefits received, and net benefits received were estimated by county group and plotted by county to assess the equity of the North Dakota state tax system in 1986. Equity was analyzed using the ability to pay and benefits received principles. Taxes paid, benefits received, and net benefits received were estimated for aggregate and individual tax and benefit categories for each county group.

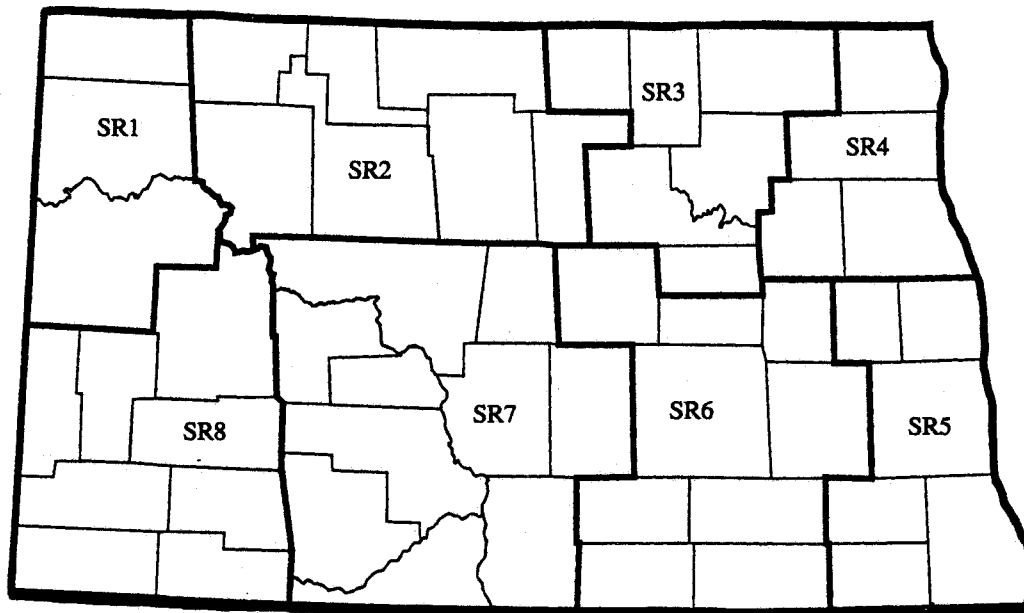


Figure 14. North Dakota State Planning Regions

#### Taxes Paid

Average annual tax liability per county, per capita, and as a percentage of total personal and federal adjusted gross income was estimated for each county group. Examining taxes paid as a percentage of income shows if the tax system or individual taxes are progressive, regressive, or proportional--the basis for applying the ability to pay principle.

#### Total Tax Liability Excluding Energy Taxes

Total tax liabilities excluding energy taxes for each county group is the sum of all taxes listed in Table 2 (page 14) less energy taxes. Energy taxes were excluded because they are paid primarily by out-of-state corporations and not by individuals within the county. This tax category represents the combined tax revenues of state and local governments since property taxes (the primary revenue source of local governments) were included.

#### Total Personal Income County Group

The average annual tax liability per county of high total personal income counties was greater than counties with low total personal incomes (Table 4). Average annual per capita tax liability was greatest for low

TABLE 4. TAX LIABILITY, EXCLUDING ENERGY TAXES, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Annual Tax Liability Per County	Average Per Capita Annual Tax Liability	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars		percent	
Total Personal Income (millions)				
\$750 or more	65,002,086	895	7.17	11.74
150 to 749	18,276,295	951	7.44	13.97
90 to 149	8,533,176	933	7.43	15.53
50 to 89	4,973,174	979	7.88	16.22
less than 50	2,795,100	972	8.03	24.20
Federal Adjusted Gross Income (millions)				
\$180 or more	65,002,086	895	7.17	11.74
80 to 179	16,946,495	971	7.59	13.62
35 to 79	6,918,359	920	7.62	15.06
20 to 34	4,652,060	996	7.84	16.77
less than 20	2,863,857	964	7.93	24.88
Per Capita Income (thousands)				
\$14.0 or more	7,323,717	1,130	7.57	16.39
13.0 to 13.9	17,901,691	1,023	7.63	15.04
12.0 to 12.9	10,483,000	971	7.83	21.54
11.0 to 11.9	13,967,090	899	7.79	14.86
less than 11.0	5,478,603	770	7.59	18.33
Farm Income (percent)				
25% or more	2,920,398	1,047	8.34	30.16
20 to 24	5,122,581	1,019	7.83	16.80
15 to 19	5,994,657	967	7.86	16.27
10 to 14	8,775,145	933	7.48	14.87
less than 10%	34,108,263	873	7.21	13.51
Population (thousands)				
50.0 or more	65,002,086	895	7.17	11.74
12.5 to 49.9	17,095,596	896	7.37	14.01
6.5 to 12.4	8,126,765	954	7.56	16.20
3.6 to 6.4	4,477,578	945	7.95	17.27
less than 3.6	2,928,921	1,053	8.00	23.12
State Planning Region				
1	12,110,904	995	6.92	18.12
2	12,200,519	937	7.38	14.70
3	6,982,335	952	7.66	16.93
4	22,148,844	1,006	8.02	13.86
5	22,998,147	1,071	8.01	14.65
6	7,790,112	961	7.95	15.79
7	12,182,413	834	7.58	17.57
8	5,624,658	1,011	7.87	24.86
Location				
West	7,393,634	1,006	7.61	23.02
West Central	12,189,868	876	7.49	16.39
East Central	7,467,002	958	7.83	16.25
East	22,658,426	1,045	8.02	14.33

total personal income counties. Taxes as a percentage of total personal income showed that the highest total personal income counties (\$750 million or more) paid 7 percent of their total personal income in taxes while the lowest total personal income counties (less than \$50 million) paid 8 percent of their income in taxes. Counties with relatively low total personal income bear somewhat more of the tax burden than counties with high total personal incomes. This implies that the state and local tax system as a whole is slightly regressive. Thus, North Dakota's state and local tax system is not based on the ability to pay principle of tax equity. Counties with the highest total personal incomes paid 12 percent of their North Dakota Federal adjusted gross income in taxes compared with 24 percent for the lowest total personal income counties. Counties with relatively high total personal incomes had a smaller tax burden (based on North Dakota federal adjusted income) than counties with relatively low total personal incomes. This provides further evidence that the state and local tax system is regressive and not based on the ability to pay principle.

Caution: Total personal income is not a precise measure of ability to pay, because counties with high total personal income also have more people. Therefore, a county with high total personal income could be the result of a large number of people with relatively low total personal income. Total personal income may not be a precise proxy for measuring the ability of counties to pay taxes.

#### Federal Adjusted Gross Income Group

Counties with the highest federal adjusted incomes (\$180 million or more) had smaller per capita annual tax liabilities than counties with the lowest federal adjusted incomes (less than \$20 million). Tax liability as a percentage of income showed that relatively high federal income counties had a tax burden of 7 percent while the tax burden of low federal income counties was 8 percent. This suggests North Dakota's tax system is generally regressive and not based on the ability to pay principle. Counties with high federal incomes should pay a greater portion of their income in taxes than low federal income counties if the ability to pay tax equity principle is applied. Tax liability as a percentage of federal adjusted gross income showed that the highest federal income counties paid only 12 percent of their federal income in taxes compared with 25 percent for low income counties. This again implies that the tax system is regressive and inconsistent with the ability to pay principle. However, federal adjusted gross income is not a precise measure of ability to pay. High federal income counties could be the result of a large number of taxpayers living in a county with relatively low federal incomes.

#### Per Capita Income Group

Counties with the highest per capita income (\$14 thousand or more) paid \$1,130 on average in taxes per person compared with \$770 per person on average for the lowest per capita income counties (less than \$11 thousand). High per capita income counties paid more taxes per person than low per capita income counties. However, high and low per capita income counties

had nearly the same tax liability as a percentage of total personal income. Tax liabilities were proportional across per capita income county groups (about 8 percent).

The state and local (with property taxes included) tax system is inconsistent with the ability to pay principle. High per capita income counties do not pay a larger portion of their income in taxes than low per capita income counties. Thus, the tax system is not equitable based on the ability to pay principle. Taxes paid as a percentage of federal adjusted gross income show no clear pattern relative to county per capita income. Per capita income should provide a good measure of counties' ability to pay taxes. Counties with high per capita income should have a greater ability to pay than counties with low per capita incomes. High per capita income counties could be taxed at rates exceeding those of low per capita income counties (relative to total personal income) based on the ability to pay principle. Practically speaking, tax instruments could be more progressive with respect to income.

#### Farm Income Group

Counties with a high percentage of income from farm sources relative to total personal income had a greater average annual per capita tax liability than relatively low farm income counties. High farm income counties paid somewhat more taxes as a percentage of total personal income and considerably more as a percentage of federal adjusted gross income than low farm income counties. Agricultural counties paid more taxes than nonagricultural counties. This may be due in part to how "farm income" is reported. Also, farm operators tend to pay little federal tax when compared to other socioeconomic groups in North Dakota (Pederson et al. 1985).

#### Population Group

High population counties paid less annual taxes per capita on average than relatively low population counties. Taxes paid as a percentage of total personal and federal adjusted gross income were greater for low population counties. Urban areas of the state seem to bear less of the tax burden than rural areas of the state.

#### State Planning Region Group

Counties in state planning region 5 had the greatest average per capita tax liability (\$1,071 per person). State planning region 7 had the lowest average per capita tax liability. Tax liability as a percentage of total personal income was relatively proportional across state planning regions (ranging from 7 to 8 percent).

### Location Group

Western and eastern counties of the state had the greatest average per capita tax liabilities. Taxes paid as a percentage of total personal income were generally proportional across locations. The west had the greatest tax burden as a percentage of federal adjusted gross income.

### Total Tax Liability Excluding Energy and Property Taxes

Property taxes, the primary revenue source of local government units, were subtracted from total taxes paid excluding energy taxes (Table 5) eliminating the primary revenue source of local government units from the analysis. The remaining revenue sources are those used to support only state government operations.

### Total Personal Income Group

Average annual per capita tax liability was nearly the same (\$540 per person) across low and high total personal income county groups. Tax liability as a percentage of total personal income was also relatively proportional across total personal income county groups. Taxes paid as a percentage of federal adjusted gross income ranged from 7 percent for the highest total personal income county group to 14 percent for the lowest. This implies that the state tax system could be somewhat regressive and thus inconsistent with the ability to pay principle.

### Federal Adjusted Gross Income Group

Average tax liability per capita and as a percentage of total personal income were similar across federal adjusted gross income county groups. Tax liability as a percentage of federal adjusted gross income was greater for low federal adjusted gross income counties. Hence, the state tax system is not based on the ability to pay principle.

### Per Capita Income Group

High per capita income counties had a larger average annual tax liability per capita than low per capita income counties. However, high per capita income counties had nearly the same tax burden as a percentage of total personal income as low per capita income county groups. As a result, the tax system is proportional based on taxes paid as a percentage of total personal income. The tax system does not conform with the ability to pay principle implying the tax system is not equitable. High per capita income counties should have a higher tax liability (as a percentage of total personal income) than low per capita income counties based on the ability to pay principle. Tax liability as a percentage of federal adjusted income indicated no clear trend in taxes paid based on per capita income.

TABLE 5. TAX LIABILITY, EXCLUDING ENERGY AND PROPERTY TAXES, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Annual Tax Liability Per County	Average Per Capita Annual Tax Liability	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars		percent	
Total Personal Income (millions)				
\$750 or more	37,118,642	510	4.09	6.70
150 to 749	10,380,860	543	4.24	7.98
90 to 149	5,018,422	543	4.37	9.24
50 to 89	2,740,430	540	4.33	8.92
less than 50	1,533,790	545	4.55	14.22
Federal Adjusted Gross Income (millions)				
\$180 or more	37,118,642	510	4.09	6.70
80 to 179	9,574,888	549	4.29	7.70
35 to 79	4,003,119	522	4.35	8.64
20 to 34	2,608,289	554	4.34	9.35
less than 20	1,583,971	545	4.53	14.65
Per Capita Income (thousands)				
\$14.0 or more	4,161,891	626	4.20	9.07
13.0 to 13.9	10,190,333	576	4.30	8.44
12.0 to 12.9	6,076,767	559	4.51	12.78
11.0 to 11.9	7,647,871	490	4.25	8.11
less than 11.0	3,228,950	445	4.48	10.92
Farm Income (percent)				
25% or more	1,589,998	589	4.74	17.71
20 to 24	2,784,700	553	4.24	9.13
15 to 19	3,331,420	536	4.37	9.19
10 to 14	5,099,185	549	4.40	8.83
less than 10%	19,523,167	498	4.13	7.77
Population (thousands)				
50.0 or more	37,118,642	510	4.09	6.70
12.5 to 49.9	9,737,945	513	4.24	8.10
6.5 to 12.4	4,730,454	552	4.37	9.44
3.6 to 6.4	2,456,967	521	4.40	9.71
less than 3.6	1,594,551	588	4.49	13.34
State Planning Region				
1	7,253,769	589	4.14	10.96
2	7,227,803	553	4.34	8.66
3	3,918,391	516	4.21	9.37
4	12,229,130	553	4.40	7.60
5	13,073,030	571	4.29	7.74
6	4,278,022	519	4.28	8.50
7	6,884,021	483	4.40	10.38
8	3,221,469	595	4.63	15.04
Location				
West	4,321,187	594	4.50	13.93
West Central	7,025,578	512	4.38	9.67
East Central	4,134,170	518	4.25	8.85
East	12,735,470	563	4.34	7.68

### Farm Income Group

Average per capita tax liability was greatest for the highest farm income counties (25 percent or more). Taxes paid as a percentage of total personal income indicated that high farm income counties paid slightly more taxes than low farm income counties. Taxes paid as a percentage of federal adjusted income were considerably greater for counties with the highest percentage of farm income. This suggests that agricultural counties paid more taxes than nonagricultural counties.

### Population Group

Counties with high populations paid less taxes per capita on average than low population counties. Taxes paid as a percentage of total personal income were slightly larger for rural areas. Tax liability as a percentage of federal income was higher for less populated counties. Rural areas of the state appear to have a greater tax burden than urban areas.

### State Planning Region Group

Average per capita tax liability and taxes paid as a percentage of total personal income were similar among state planning regions. Taxes paid as a percentage of federal adjusted income were greatest for regions 1 and 8 while regions 4 and 5 had the smallest tax liability.

### Location Group

Average per capita tax liability was greater for the west and east locations. Tax burdens were proportional based on taxes paid as a percentage of total personal income. The west had the greatest tax burden according to taxes paid as a percentage of federal adjusted gross income.

Tables containing total tax liability and total tax liability excluding property taxes by county group are presented in Appendix B (Tables B1 and B2). Conclusions made from these results should be viewed with caution because both tax categories include energy taxes. Energy taxes are paid primarily by out-of-state corporations and not by county residents. Therefore, tax liability of residents in energy counties will be overstated.

### State and Local Tax Systems

State and local tax systems were analyzed to determine if they conform with the ability to pay tax equity principle. The state tax system was represented by total taxes paid excluding energy and property taxes (Figure 15). Energy taxes are considered a state tax, however, they are paid primarily by out-of-state corporations, not by state residents. Thus, energy taxes were not included in the state tax system. The state and local tax system was estimated by total taxes paid excluding energy taxes (Figure

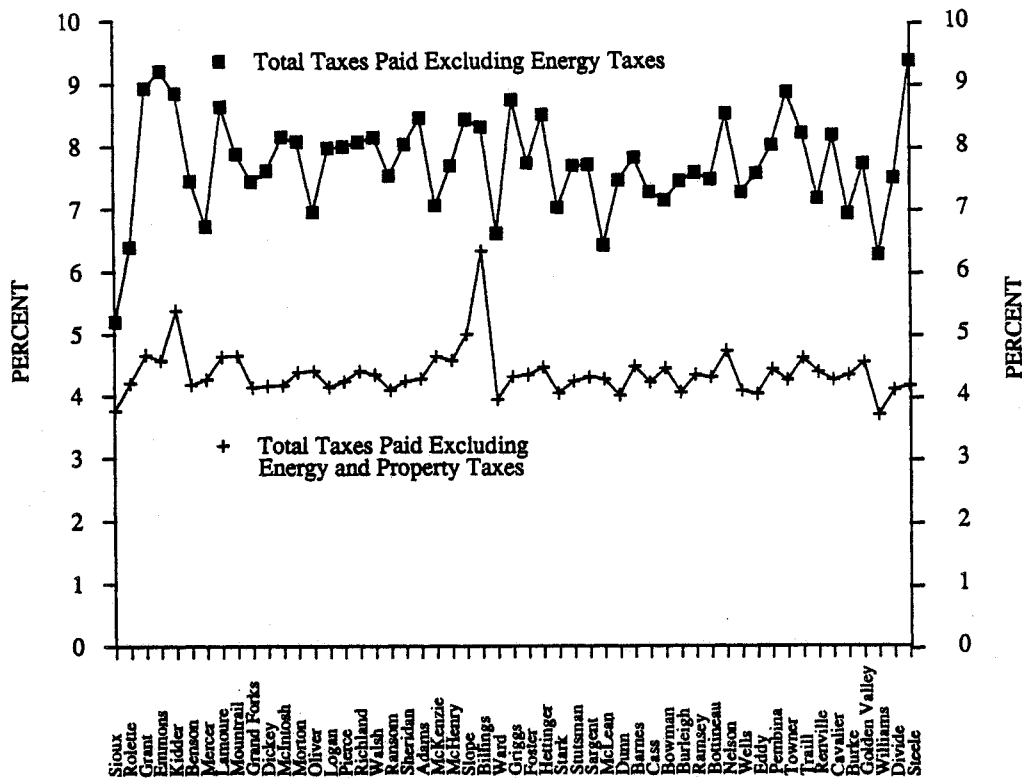


Figure 15. Per Capita Total Taxes Paid Excluding Energy Taxes and Total Taxes Paid Excluding Energy and Property Taxes as a Percent of Per Capita County Total Personal Income, by County, North Dakota, 1986

15) and total taxes paid (Figure 16). Counties in Figures 15 and 16 (and subsequent figures) were ranked by per capita county total personal income with Sioux County on the left as the lowest per capita income county and Steele County on the right as the highest per capita income county.

#### State Tax System

Total taxes paid excluding energy and property taxes as a percentage of total personal income indicated that the tax system was proportional (Figure 15). Low and high per capita income counties paid a similar percentage of state taxes relative to income (about 4 percent). A regression equation representing the total taxes paid excluding energy and property taxes line in Figure 15 was:

$$Y = -0.004X + 4.46 \quad (F = 1.22)$$

where,

Y = county per capita total taxes paid excluding energy and property taxes as a percentage of county per capita total personal income and

X = county per capita total personal income ranking.

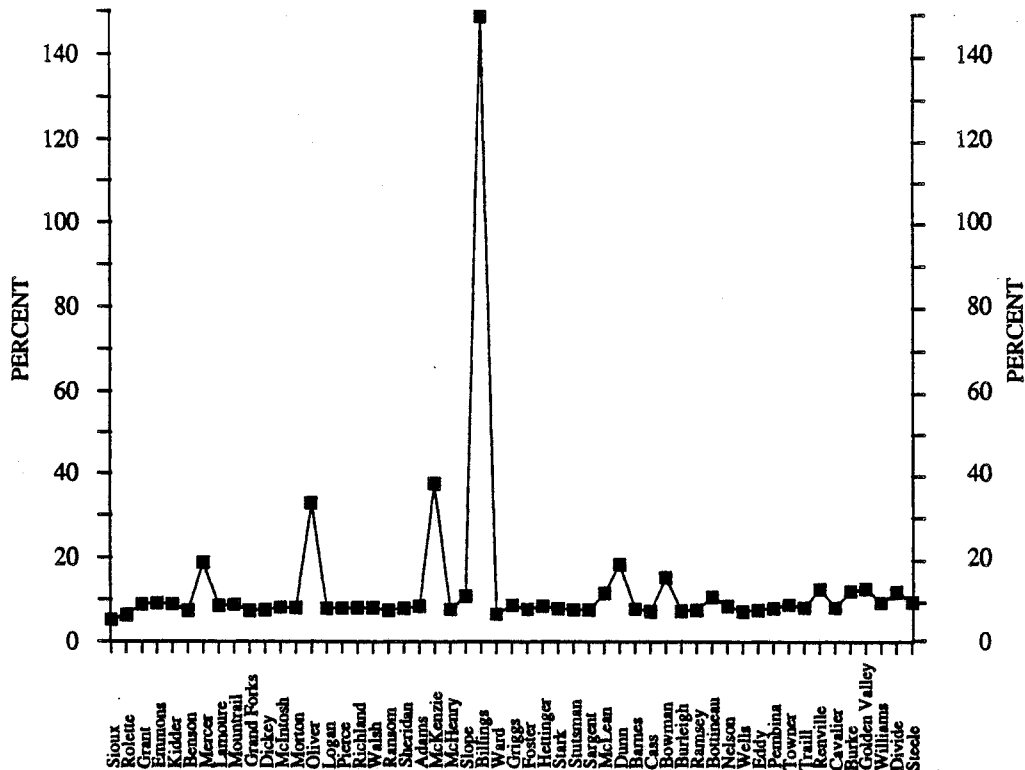


Figure 16. Per Capita Total Taxes Paid as a Percent of Per Capita County Total Personal Income, by County, North Dakota, 1986

The regression equation was not significant at a 90 percent significance level. There was not a significant trend in taxes paid based on county per capita income. The state tax system (excluding energy taxes) was proportional.

Generally, the state tax system is not based on the ability to pay equity principle. Each county resident pays on average 4.4 percent of their total per capita income in state taxes annually. High per capita income counties should pay more taxes relative to income if the tax system followed the ability to pay tax equity principle.

#### State and Local Tax System

Total taxes paid excluding energy taxes indicated that the tax system was proportional (Figure 15). Low per capita income counties generally paid the same percentage of taxes as high per capita income counties. A regression equation representing the total state and local taxes paid (excluding energy taxes) line in Figure 15 was:

$$Y = -0.0006X + 7.73 \quad (F = 0.01)$$

where,

Y = county per capita total taxes paid excluding energy taxes as a percentage of county per capita total personal income and

X = county per capita total personal income ranking.

The equation was not significant at a 90 percent significance level. There was not a significant trend in taxes paid relative to county per capita income. The state and local tax system was proportional since high and low per capita income counties paid nearly the same level of taxes relative to income.

Generally, the state and local tax system (excluding energy taxes) is not based on the ability to pay principle. Each county resident paid an average of 7.7 percent of their total personal income in state and local taxes. High per capita income counties do not have a greater tax burden relative to income than low per capita income counties. High per capita income counties are not paying their share of the state and local tax burden based on the ability to pay equity principle.

Total taxes paid (Figure 16) indicated that most counties paid about the same amount of taxes relative to county total personal income. There were some counties which appeared to pay more than their fair share of taxes. These counties produced coal and/or oil which are subject to taxation. Energy taxes are paid primarily by out-of-state corporations and not by county residents. A regression equation representing the total state and local taxes paid line (Figure 16) was:

$$Y = -0.024X + 13.34 \quad (F = 0.02)$$

where,

Y = county per capita total taxes paid as a percentage of county per capita total personal income and

X = county per capita total personal income ranking.

The equation was not significant at a 90 percent significance level. There was not a significant trend in total state and local taxes paid relative to county per capita total personal income.

Generally, the state and local tax system is not based on the ability to pay tax equity principle. County residents paid on average 13 percent of their per capita total personal income in state and local taxes. High and low per capita income counties paid the same percentage of taxes relative to income. If the ability to pay principle were followed, high per capita income counties would pay a larger percentage of their income in taxes than low per capita income counties.

#### Specific Tax Liabilities

Tax liabilities for specific tax bases were estimated for each county group to show if individual taxes conform with the ability to pay principle. Tax categories examined included sales and use, income, motor vehicle,

energy, and property taxes. Motor vehicle taxes include motor and special fuel taxes, motor vehicle registration fees, and motor vehicle excise and use collections. Energy taxes include oil extraction, oil and gas production, coal severance, and coal conversion taxes.

#### Sales Tax Liability

The sales tax liability for total personal and federal adjusted gross income county groups showed that the sales tax is somewhat regressive based on taxes paid as a percentage of federal adjusted gross income (Table 6). (Taxes paid as a percentage of total personal income could not be applied since county total personal income was used to allocate county shares of sales tax collections.) Average annual sales tax liability per capita was greater for high per capita income county groups. However, there was little evidence of a relationship between sales taxes paid as a percentage of federal adjusted income and per capita total personal income. Generally speaking, the sales tax was proportional, ranging from 4 to 5 percent of federal adjusted income among per capita total personal income county groups. This implies that sales tax is not equitable based on the ability to pay principle. Counties where farm income comprises a higher percentage of total personal income paid a greater percentage of their federal income in sales taxes than low farm income counties. Counties with larger populations paid less sales tax as a percentage of federal income than low population counties. People living in the west and west central locations have a greater sales tax burden as a percentage of federal income than those in the east or east central locations.

#### Income Tax Liability

The North Dakota income tax was found to be slightly progressive based on taxes paid as a percentage of county total personal and federal adjusted gross income for total personal and federal adjusted gross income county groups (Table 7). Tax liability as a percentage of total personal income was somewhat proportional, across county per capita income groups. However, taxes paid as a percentage of federal adjusted gross income were slightly progressive across per capita income county groups. Counties with a high percentage of farm income have a smaller income tax burden than counties with a low percentage of farm income. Counties with a high percentage of income from farming paid 0.37 percent of their total personal income in income taxes compared with 0.72 percent for counties with low farm income percentages. High population counties paid more income tax as a percentage of total personal and federal adjusted gross income than low population counties. The eastern portion of the state has a greater income tax burden than the rest of the state.

#### Motor Vehicle Tax Liability

Motor vehicle taxes paid by total personal and federal adjusted gross income county groups were regressive based on taxes paid as a percentage of

TABLE 6. SALES AND USE TAX LIABILITY, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Annual Sales Tax Liability Per County	Average Per Capita Annual Tax Liability	Percent of ND Federal Adjusted Income
	dollars		percent-
<b>Total Personal Income</b>			
(millions)			
\$750 or more	17,322,401	239	3.15
150 to 749	4,758,966	246	3.62
90 to 149	2,198,200	238	4.05
50 to 89	1,211,259	239	3.97
less than 50	659,878	229	5.86
<b>Federal Adjusted Gross Income</b>			
(millions)			
\$180 or more	17,332,401	239	3.15
80 to 179	4,351,958	246	3.46
35 to 79	1,771,470	230	3.82
20 to 34	1,147,047	245	4.12
less than 20	688,829	230	6.09
<b>Per Capita Income</b>			
(thousands)			
\$14.0 or more	2,017,076	286	4.15
13.0 to 13.9	4,618,282	257	3.79
12.0 to 12.9	2,797,760	238	5.20
11.0 to 11.9	3,457,795	221	3.66
less than 11.0	1,395,651	189	4.77
<b>Farm Income</b>			
(percent)			
25% or more	675,722	240	6.96
20 to 24	41,262,408	250	4.14
15 to 19	1,449,928	235	4.08
10 to 14	2,227,037	240	3.84
less than 10%	9,122,655	232	3.61
<b>Population</b>			
(thousands)			
50.0 or more	17,322,401	239	3.15
12.5 to 49.9	4,462,978	232	3.68
6.5 to 12.4	2,069,235	242	4.14
3.6 to 6.4	1,072,714	227	4.29
less than 3.6	703,399	252	5.47
<b>State Planning Region</b>			
1	3,565,699	276	5.01
2	3,355,712	244	3.82
3	1,769,260	235	4.27
4	5,529,219	240	3.31
5	5,879,859	255	3.46
6	1,910,211	232	3.82
7	3,123,639	210	4.58
8	1,457,278	247	5.96
<b>Location</b>			
West	2,032,302	255	5.70
West Central	3,219,198	224	4.26
East Central	1,853,831	233	4.00
East	5,739,603	249	3.40

TABLE 7. INDIVIDUAL INCOME TAX LIABILITY, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Annual Income Tax Liability Per County	Average Per Capita Annual Tax Liability	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars		percent	
Total Personal Income (millions)				
\$750 or more	7,894,016	107	0.85	1.39
150 to 749	1,681,088	88	0.69	1.29
90 to 149	795,746	84	0.67	1.32
50 to 89	396,862	79	0.63	1.25
less than 50	169,950	57	0.46	1.20
Federal Adjusted Gross Income (millions)				
\$180 or more	7,894,016	107	0.85	1.39
80 to 179	1,623,771	96	0.75	1.33
35 to 79	587,798	78	0.64	1.26
20 to 34	352,751	78	0.61	1.27
less than 20	164,888	54	0.44	1.19
Per Capita Income (thousands)				
\$14.0 or more	636,308	93	0.63	1.35
13.0 to 13.9	2,062,361	95	0.71	1.32
12.0 to 12.9	948,326	68	0.55	1.25
11.0 to 11.9	1,347,692	75	0.65	1.22
less than 11.0	454,229	56	0.55	1.21
Farm Income (percent)				
25% or more	141,173	47	0.37	1.17
20 to 24	393,343	79	0.60	1.27
15 to 19	511,766	80	0.63	1.26
10 to 14	813,470	84	0.67	1.30
less than 10%	3,830,212	88	0.72	1.31
Population (thousands)				
50.0 or more	7,894,016	107	0.85	1.39
12.5 to 49.9	1,599,950	85	0.70	1.30
6.5 to 12.4	696,942	80	0.63	1.29
3.6 to 6.4	348,435	73	0.60	1.21
less than 3.6	200,295	67	0.51	1.25
State Planning Region				
1	1,001,055	75	0.52	1.33
2	1,179,459	81	0.64	1.26
3	603,039	76	0.61	1.28
4	2,352,078	101	0.80	1.38
5	2,829,800	104	0.78	1.38
6	639,030	74	0.61	1.20
7	1,259,247	66	0.58	1.20
8	451,494	66	0.51	1.25
Locations				
West	601,374	68	0.51	1.27
West Central	1,226,393	72	0.60	1.23
East Central	624,634	75	0.61	1.23
East	2,638,711	102	0.79	1.38

total personal and federal adjusted gross income (Table 8). There was no trend in the motor vehicle tax liability across per capita income county groups. High farm income counties had a greater tax burden (2.3 percent) than low farm income counties (1.3 percent). Low population counties paid more motor vehicle taxes as a percentage of total personal and federal adjusted gross income than high population counties. The west has a higher tax burden as a percentage of total personal and federal adjusted gross income than the east.

#### Energy Tax Liability

Energy taxes were paid primarily by counties with low total personal and federal adjusted gross incomes (Table 9). Counties with low to moderate per capita incomes had the highest energy tax liabilities. Counties with high farm income percentages had the greatest energy tax burden. The least populated areas of the state paid 26 percent of their total personal income in energy taxes compared with 0 percent for the most populated counties. Counties only in the west and west central portions of the state paid energy taxes.

#### Property Tax Liability

Property taxes were proportional (about 3 percent) for total personal, federal adjusted, and per capita income county groups (Table 10). There was little difference in tax liabilities by farm income or population county groups. Property taxes among state planning regions were also similar. Tax liabilities as a percentage of total personal income were slightly higher in the east and east central locations.

#### Benefits Received

Average benefits received per county and per capita were estimated for each county group. Benefits received as a percentage of total personal and federal adjusted incomes are also provided. Benefits received were examined to show where state government revenues are spent.

#### Total Benefits Received

Total benefits received for each county group represents the sum of all state expenditures listed in Table 3 (page 22) for each county. Benefits received included direct state appropriations and transfers to state agencies and political subdivisions. Some expenditures were directly traced to a particular county. However, some expenditures spent in one county actually benefit residents in another. This was especially true of human services and higher education expenditures. Therefore, counties which contain health institutions or higher education facilities appeared to receive more than their share of state appropriations.

TABLE 8. MOTOR VEHICLE TAX LIABILITY, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Annual Motor Tax Liability Per County	Average Per Capita Annual Tax Liability	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars		percent	
Total Personal Income (millions)				
\$750 or more	10,532,068	14	1.16	1.91
150 to 749	3,556,01	188	1.47	2.77
90 to 149	1,826,907	200	1.61	3.50
50 to 89	1,020,956	201	1.61	3.34
less than 50	643,612	239	2.00	6.63
Federal Adjusted Gross Income (millions)				
\$180 or more	10,532,068	145	1.16	1.91
80 to 179	3,239,673	187	1.46	2.62
35 to 79	1,486,190	19	1.62	3.28
20 to 34	1,001,769	209	1.64	3.58
less than 20	668,979	240	2.01	6.83
Per Capita Income (thousands)				
\$14.0 or more	1,354,569	224	1.51	3.24
13.0 to 13.9	3,146,433	202	1.51	3.01
12.0 to 12.9	92,099,066	232	1.88	5.87
11.0 to 11.9	2,534,957	175	1.52	2.92
less than 11.0	1,238,801	181	1.81	4.45
Farm Income (percent)				
25% or more	719,932	283	2.30	9.01
20 to 24	1,024,383	203	1.56	3.39
15 to 19	1,243,214	202	1.65	3.49
10 to 14	1,850,301	202	1.62	3.32
less than 10%	5,838,875	158	1.32	2.52
Population (thousands)				
50.0 or more	10,532,068	145	1.16	1.91
12.5 to 49.9	3,302,219	175	1.45	2.79
6.5 to 12.0	1,784,951	209	1.66	3.66
3.6 to 6.4	34,590	200	1.70	3.80
less than 3.6	631,694	247	1.90	6.16
State Planning Region				
1	2,422,872	218	1.56	4.23
2	2,414,528	206	1.62	3.24
3	1,379,003	183	1.51	3.42
4	3,851,772	192	1.52	2.62
5	3,890,793	191	1.43	2.60
6	1,575,407	193	1.59	3.17
7	2,251,783	189	1.73	4.18
8	1,178,252	258	2.02	7.27
Location				
West	1,517,694	247	1.90	6.44
West Central	2,318,795	196	1.68	3.79
East Central	1,496,846	189	1.56	3.27
East	3,875,185	191	1.47	2.61

TABLE 9. ENERGY TAX LIABILITY, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Annual Energy Tax Liability Per County	Average Per Capita Annual Tax Liability	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars		percent	
Total Personal Income (millions)				
\$750 or more	120,953 (n=1)	2	0.00	0.00
150 to 749	7,858,884 (n=3)	420	3.05	6.45
90 to 149	13,428,532 (n=4)	1,367	11.54	31.00
50 to 89	2,883,063 (n=7)	690	5.01	12.60
less than 50	6,406,815 (n=5)	4,262	34.81	145.66
Federal Adjusted Gross Income (millions)				
\$180 or more	120,953 (n=1)	2	0.00	0.00
80 to 179	11,160,801 (n=3)	633	5.37	9.24
35 to 79	3,289,560 (n=4)	306	2.37	4.68
20 to 34	7,308,485 (n=6)	1,168	8.98	24.30
less than 20	6,502,456 (n=6)	3,789	30.82	127.93
Per Capita Income (thousands)				
\$14.0 or more	4,355,367 (n=5)	680	4.60	9.87
13.0 to 13.9	5,974,307 (n=4)	907	6.89	17.91
12.0 to 12.9	7,124,606 (n=8)	2,675	21.84	95.10
11.0 to 11.9	7,981,818 (n=1)	3,026	26.09	57.55
less than 11.0	9,487,258 (n=2)	708	6.54	10.25
Farm Income (percent)				
25% or more	9,746,213 (n=3)	6,326	51.29	233.08
20 to 24	1,382,868 (n=2)	390	2.77	5.36
15 to 19	3,211,818 (n=5)	975	7.74	16.90
10 to 14	9,592,042 (n=5)	1,267	10.04	27.53
less than 10%	6,720,714 (n=5)	380	3.22	5.55
Population (thousands)				
50.0 or more	120,953 (n=1)	2	0.00	0.00
12.5 to 49.9	11,160,801 (n=3)	633	5.37	9.24
6.5 to 12.0	8,929,442 (n=5)	987	8.03	23.50
3.6 to 6.4	3,603,383 (n=4)	820	6.09	16.54
less than 3.6	5,280,450 (n=7)	3,250	26.25	106.92
State Planning Region				
1	15,336,725 (n=3)	1,617	12.67	38.54
2	1,751,803 (n=6)	347	2.40	5.03
3	— (n=0)	—	—	—
4	— (n=0)	—	—	—
5	— (n=0)	—	—	—
6	— (n=0)	—	—	—
7	11,449,147 (n=3)	1,670	14.46	28.84
8	4,844,851 (n=8)	2,616	21.01	90.94
Location				
West	7,706,271	2,343	18.73	76.65
West Central	4,984,251	788	6.48	12.96
East Central	—	—	—	—
East	—	—	—	—

TABLE 10. PROPERTY TAX LIABILITY, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Property Tax Liability Per County	Average Per Capita Tax Liability	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars		percent	
Total Personal Income (millions)				
\$750 or more	27,883,443	385	3.09	5.04
150 to 749	7,895,434	408	3.20	5.99
90 to 149	3,514,754	389	3.06	6.29
50 to 89	2,232,744	439	3.54	7.30
less than 50	1,261,310	426	3.48	9.97
Federal Adjusted Gross Income (millions)				
\$180 or more	27,883,443	385	3.09	5.04
80 to 179	7,371,607	422	3.30	5.92
35 to 79	2,915,241	397	3.28	6.42
20 to 34	2,043,771	443	3.50	7.42
less than 20	1,279,887	419	3.40	10.23
Per Capita Income (thousands)				
\$14.0 or more	3,161,826	504	3.37	7.32
13.0 to 13.9	7,711,358	447	3.33	6.60
12.0 to 12.9	4,406,232	412	3.32	8.76
11.0 to 11.9	6,319,219	409	3.54	6.75
less than 11.0	2,249,653	324	3.21	7.40
Farm Income (percent)				
25% or more	1,330,400	457	3.59	12.45
20 to 24	2,337,880	466	3.59	7.67
15 to 19	2,663,238	430	3.49	7.07
10 to 14	3,675,960	383	3.09	6.04
less than 10%	14,585,095	374	3.07	5.74
Population (thousands)				
50.0 or more	27,883,443	385	3.09	5.05
12.5 to 49.9	7,357,649	383	3.13	5.92
6.5 to 12.0	3,396,310	403	3.18	6.76
3.6 to 6.4	2,020,611	423	3.55	7.55
less than 3.6	1,334,369	465	3.52	9.77
State Planning Region				
1	4,857,135	405	2.79	7.15
2	4,972,716	384	3.04	6.04
3	3,063,944	436	3.45	7.56
4	9,919,714	454	3.62	6.26
5	9,925,117	501	3.72	6.91
6	3,512,090	443	3.66	7.29
7	5,298,392	351	3.18	7.19
8	2,403,189	416	3.23	9.82
Location				
West	3,072,447	413	3.11	9.09
West Central	5,164,290	364	3.12	6.72
East Central	3,332,832	440	3.58	7.40
East	9,922,956	482	3.68	6.65

Counties with relatively high total personal and federal adjusted gross incomes received more average annual benefits per capita than low income counties (Table 11). However, benefits received as a percentage of total personal income were somewhat proportional across total personal and federal adjusted gross income county groups. Counties with high per capita incomes received less benefits per capita and as a percentage of total personal income than low per capita income counties. 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. Urban areas received considerably more state benefits per capita and as a percentage of total personal income than rural areas of the state. State planning region 4 received more benefits per capita and as a percentage of total personal income than any other state region. (This was due primarily to the state expenditures supporting the Grafton State School.) The west and east generally received more benefits per capita and as a percentage of total personal and federal adjusted gross income than the rest of the state. The west received a considerable amount of state money from energy tax distributions. The east received state money to support health facilities (Grafton) and higher education institutions (North Dakota State University and University of North Dakota).

#### Total Benefits Received Excluding Energy Tax Distributions

High total personal and federal adjusted gross income counties received more benefits per capita than low income counties (Table 12). High per capita income counties generally received less state benefits per capita and as a percentage of total personal and federal adjusted income than low per capita income counties. High farm income counties received fewer benefits per capita and as a percentage of total personal income than low income counties. Urban areas received considerably more benefits per capita and as a percentage of total personal income than rural areas. State planning region 4 received considerably more benefits per capita and as a percentage of total personal and federal adjusted income than the other regions (primarily due to Grafton). The east and east central locations received the most benefits per capita and as a percentage of total personal income.

#### Total Benefits Received Excluding Energy Tax Distributions, Higher Education, and Other Expenditures

The second total personal and federal adjusted gross income county groups received considerably more average benefits per capita than any other (Table 13). The remaining total personal and federal adjusted gross income county groups received proportional benefits both per capita and as a percentage of total personal income. High per capita income counties received less benefits per capita and as a percentage of total personal and federal adjusted income than low income counties. High farm income counties received less benefits per capita and as a percentage of total personal income than low farm income counties. The second population county group (\$12.5 to \$49.9 thousand) received considerably more benefits per capita and

TABLE 11. TOTAL BENEFITS RECEIVED, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Annual Benefits Received Per County	Average Per Capita Annual Benefits Received	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars		percent	
Total Personal Income (millions)				
\$750 or more	59,972,763	817	6.68	10.94
150 to 749	19,226,699	1,051	8.32	15.62
90 to 149	7,251,744	741	6.34	14.07
50 to 89	3,268,352	642	5.15	10.74
less than 50	1,992,936	750	6.42	20.98
Federal Adjusted Gross Income (millions)				
\$180 or more	59,972,763	817	6.68	10.94
80 to 179	17,031,383	982	7.80	14.14
35 to 79	5,476,014	659	5.74	11.87
20 to 34	3,246,978	678	5.27	11.54
less than 20	2,136,646	768	6.54	21.93
Per Capita Income (thousands)				
\$14.0 or more	4,590,100	681	4.60	9.86
13.0 to 13.9	14,179,139	754	5.64	11.10
12.0 to 12.9	9,028,091	799	6.44	18.68
11.0 to 11.9	16,738,283	896	7.72	14.67
less than 11.0	5,283,209	668	6.99	18.09
Farm Income (percent)				
25% or more	2,013,847	815	6.64	25.43
20 to 24	3,018,211	607	4.67	10.16
15 to 19	4,201,654	668	5.55	12.32
10 to 14	10,405,898	972	7.85	15.71
less than 10%	31,638,398	816	7.03	13.54
Population (thousands)				
50.0 or more	59,972,763	817	6.68	10.94
12.5 to 49.9	18,758,559	1,048	8.91	17.42
6.5 to 12.0	5,886,038	679	5.42	11.95
3.6 to 6.4	2,930,943	628	5.40	12.73
less than 3.6	1,984,783	784	6.09	18.66
State Planning Region				
1	9,150,173	769	5.53	15.13
2	9,389,576	718	5.62	11.18
3	6,407,970	719	6.38	14.67
4	31,293,010	1,178	9.80	17.62
5	19,461,850	693	5.31	9.17
6	6,916,913	692	5.66	11.13
7	8,772,712	660	6.12	15.08
8	4,923,462	918	7.18	23.59
Location				
West	6,076,201	877	6.73	21.28
West Central	9,026,715	684	5.92	13.48
East Central	6,713,336	703	5.95	12.54
East	24,194,314	887	7.11	12.55

TABLE 12. TOTAL BENEFITS RECEIVED, EXCLUDING ENERGY TAX DISTRIBUTIONS,  
BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Annual Benefits Received Per County	Average Per Capita Annual Benefits Received	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars		percent	
<b>Total Personal Income</b>				
(millions)				
\$750 or more	59,625,123	812	6.64	10.88
150 to 749	18,621,552	1,018	8.08	15.12
90 to 149	6,279,523	646	5.53	12.11
50 to 89	2,952,923	566	4.61	9.43
less than 50	1,598,984	512	4.48	13.26
<b>Federal Adjusted Gross Income</b>				
(millions)				
\$180 or more	59,625,124	812	6.64	10.88
80 to 179	16,342,729	943	7.47	13.57
35 to 79	5,187,786	630	5.51	11.42
20 to 34	2,676,183	561	4.45	9.56
less than 20	1,633,479	508	4.43	13.60
<b>Per Capita Income</b>				
(thousands)				
\$14.0 or more	3,860,776	542	3.65	7.85
13.0 to 13.9	13,701,809	689	5.14	9.88
12.0 to 12.9	8,403,240	587	4.71	11.17
11.0 to 11.9	16,501,799	832	7.17	13.47
less than 11.0	4,826,522	632	6.65	17.50
<b>Farm Income</b>				
(percent)				
25% or more	1,398,126	454	3.72	12.15
20 to 24	2,874,904	569	4.40	9.63
15 to 19	3,951,822	600	5.02	11.16
10 to 14	9,596,731	857	6.95	13.49
less than 10%	30,867,114	777	6.69	12.96
<b>Population</b>				
(thousands)				
50.0 or more	59,625,123	812	6.64	10.88
12.5 to 49.9	18,014,072	1,006	8.55	16.79
6.5 to 12.0	5,237,191	609	4.86	10.42
3.6 to 6.4	2,688,381	573	4.98	11.67
less than 3.6	1,440,431	492	3.76	9.84
<b>State Planning Region</b>				
1	6,978,009	530	3.73	9.92
2	8,903,580	628	4.98	9.88
3	6,354,610	711	6.32	14.54
4	31,154,25	1,172	9.75	17.53
5	19,323,842	686	5.26	9.07
6	6,878,147	687	5.62	11.05
7	8,045,632	558	5.24	13.31
8	4,030,387	530	4.10	10.95
<b>Location</b>				
West	4,834,284	530	4.00	10.67
West Central	8,398,905	587	5.13	11.89
East Central	6,668,732	697	5.90	12.44
East	24,056,006	880	7.05	12.46

TABLE 13. TOTAL BENEFITS RECEIVED EXCLUDING ENERGY, HIGHER EDUCATION, AND OTHER EXPENDITURES, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Annual Benefits Received Per County	Average Per Capita Annual Benefits Received	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars		percent	
Total Personal Income (millions)				
\$750 or more	37,647,354	518	4.15	6.81
150 to 749	16,645,083	912	7.22	13.57
90 to 14	5,674,278	582	5.06	11.27
50 to 89	2,952,923	566	4.61	9.43
less than 50	1,598,984	512	4.48	13.26
Federal Adjusted Gross Income (millions)				
\$180 or more	37,647,354	518	4.15	6.81
80 to 179	14,435,689	825	6.54	11.95
35 to 79	4,999,622	610	5.35	11.10
20 to 34	2,676,183	561	4.45	9.56
	1,633,479	508	4.43	13.60
Per Capita Income (thousands)				
\$14.0 or more	3,860,776	542	3.65	7.85
13.0 to 13.9	10,627,282	601	4.49	8.76
12.0 to 12.9	7,502,103	564	4.52	10.83
11.0 to 11.9	10,880,065	716	6.14	11.76
	4,807,522	630	6.63	17.45
Farm Income (percent)				
25% or more	1,398,126	454	3.72	12.15
20 to 24	2,874,904	569	4.40	9.63
15 to 19	3,449,404	553	4.67	10.52
10 to 14	8,669,955	808	6.54	12.80
	22,427,549	652	5.64	11.19
Population (thousands)				
50.0 or more	37,647,354	518	4.15	6.81
12.5 to 49.9	16,218,150	909	7.76	15.35
6.5 to 12.0	4,757,536	558	4.48	9.77
3.6 to 6.4	2,688,381	573	4.98	11.67
less than 3.6	1,440,431	492	3.76	9.84
State Planning Region				
1	6,978,009	530	3.73	9.92
2	7,610,920	580	4.60	9.15
3	6,326,110	709	6.29	14.47
4	19,416,859	1,003	8.21	14.98
5	12,551,427	500	3.81	6.75
6	6,459,556	655	5.37	10.57
7	7,463,397	549	5.17	13.19
8	3,436,246	507	3.92	10.61
Location				
West	4,402,181	513	3.87	10.42
West Central	7,524,142	561	4.93	11.53
East Central	6,406,177	677	5.74	12.13
East	15,297,600	701	5.57	10.04

as a percentage of total personal income than the other population county groups. Remaining population county groups received similar levels of benefits. State planning region 4 received more benefits per capita and as a percentage of total personal income than any other region. The east and east central areas of the state received more benefits per capita and as a percentage of total personal income than the west or west central locations.

Tables containing total benefits received excluding energy tax distributions, higher education expenditures, agricultural and industrial development expenditures, and other expenditures and total benefits received excluding energy tax distributions, higher education expenditures, agricultural and industrial development expenditures, health and welfare expenditures, and other expenditures are presented in Appendix C (Tables C1 and C2).

### State Spending

State spending by county was examined to show where state government revenues are spent. Counties were ranked by per capita total personal income so that state expenditures within counties and county income could be compared. Regression equations were estimated for each state spending category to judge if there was a significant trend in county per capita benefits received based on county per capita total personal income.

### Total Benefits

Total per capita benefits received were generally proportional among counties (Figure 17). Exceptions were Walsh County and Billings County. Walsh County received a considerable amount of state expenditures to support the Grafton State School. (However, the school actually benefits citizens from other counties who also use the facility.) Billings County received state expenditures from energy tax distributions.

A regression equation representing county per capita total benefits received (Figure 17) was:

$$Y = -1.0X + 795 \quad (F = 0.08)$$

where,

Y = total per capita benefits received and

X = county per capita income ranking.

The equation was not significant at a 90 percent significance level. There was not a significant trend in benefits received based on county per capita total personal income. County residents received per capita total state expenditures of \$768 on average.

### Total Benefits Excluding Energy Tax Distributions

County per capita total benefits received excluding energy tax distributions were generally proportional across counties (Figure 18). Some counties appeared to receive more than their fair share of state provided goods and services. These counties contained either health facilities (Rolette, Walsh, and Stutsman counties) or higher education institutions (Grand Forks, Barnes, and Traill counties). Ramsey County receives state money to support the district highway office.

A regression equation representing county per capita total benefits received excluding energy tax distributions (Figure 18) was:

$$Y = -1.63X + 712 \quad (F = 0.33)$$

where,

Y = total per capita benefits received excluding energy tax distributions and

X = county per capita income ranking.

The equation was not significant at a 90 percent significance level. There was not a significant trend in county per capita benefits received based on county per capita income. The average county resident received \$668 in state government goods and services.

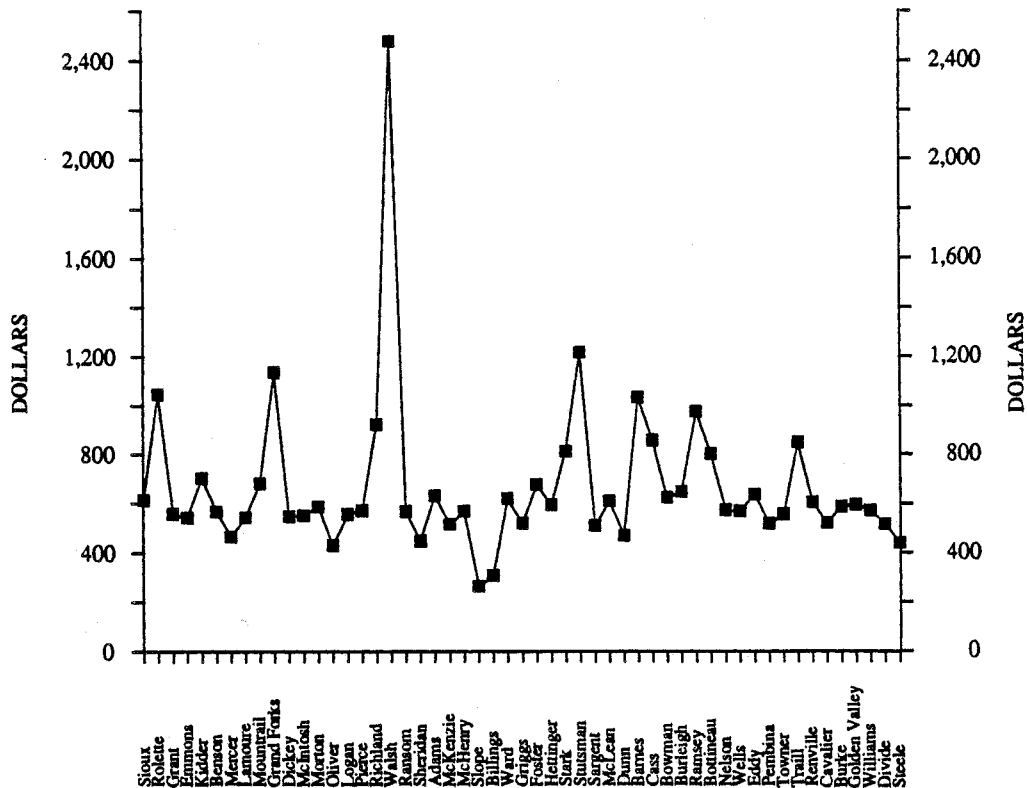


Figure 18. County Per Capita Total Benefits Received Excluding Energy Tax Distributions, by County, North Dakota, 1986

#### Total Benefits Excluding Energy Tax Distributions, Higher Education Expenditures, and Other Expenditures

Benefits received were proportional among counties based on benefits received excluding energy tax distributions, higher education expenditures, and other expenditures (Figure 19). Counties which received more benefits contained state health facilities or district highway offices. Slope and Billings counties received less than their share of benefits. Generally, counties received proportionate levels of state government goods and services.

A regression equation representing per capita benefits received (Figure 19) was:

$$Y = -1.6X + 659 \quad (F = 0.33)$$

where,

Y = total per capita benefits received excluding energy tax distributions, higher education expenditures, and other expenditures and

X = county per capita income ranking.

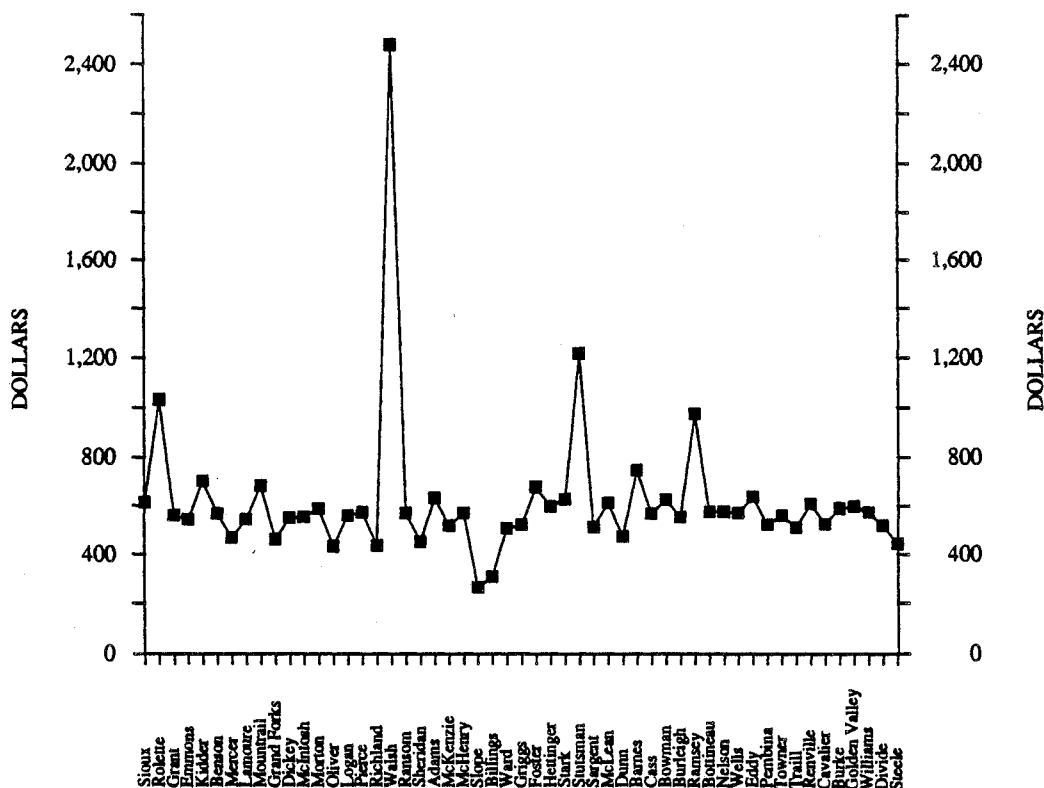


Figure 19. County Per Capita Total Benefits Received Excluding Energy Tax Distributions, Higher Education Expenditures, and Other Expenditures, by County, North Dakota, 1986

The equation was not significant at a 90 percent significance level. There was not a significant relationship between per capita benefits received and per capita county total personal income. Residents received \$617 of benefits per capita on average.

#### Education Appropriations

Counties with high total personal and federal adjusted gross incomes received more education appropriations per capita and as a percentage of total personal income than low income counties (Table 14). The second per capita income county group (\$13.0 to \$13.9 thousand) received considerably more money per capita than the others. Counties with a high percentage of total personal income from farming received the least education appropriations per capita and as a percentage of total personal income. Urban counties received more education appropriations than rural counties both per capita and as a percent of income. State planning regions 4 and 5 received more education appropriations per capita and as a percentage of total personal income than the other regions. Regions 1 and 8 received the least. The east received the most state appropriations per capita and as a

TABLE 14. EDUCATION APPROPRIATIONS, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Annual Education Appropriation Per County	Average Per Capita Annual Education Appropriation	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars		percent	
Total Personal Income (millions)				
\$750 or more	40,862,547	556	4.61	7.60
150 to 749	8,579,697	457	3.60	6.67
90 to 149	3,925,572	414	3.39	7.14
50 to 89	1,903,223	368	2.99	6.12
less than 50	981,058	311	2.72	7.75
Federal Adjusted Gross Income (millions)				
\$180 or more	40,862,547	556	4.61	7.60
80 to 179	7,864,384	458	3.60	6.37
35 to 79	3,086,428	386	3.27	6.61
20 to 34	1,754,934	368	2.92	6.26
less than 20	1,015,360	311	2.71	8.04
Per Capita Income (thousands)				
\$14.0 or more	2,333,385	356	2.40	5.15
13.0 to 13.9	8,317,340	937	3.26	6.28
12.0 to 12.9	4,598,206	329	2.65	6.18
11.0 to 11.9	10,604,458	448	3.90	7.22
less than 11.0	2,712,407	374	3.85	10.00
Farm Income (percent)				
25% or more	874,821	272	2.22	6.91
20 to 24	1,750,252	350	2.70	5.88
15 to 19	2,640,939	401	3.34	7.30
10 to 14	4,424,137	435	3.49	6.83
less than 10%	19,350,509	437	3.73	6.95
Population (thousands)				
50.0 or more	40,862,547	556	4.61	7.60
12.5 to 49.9	8,146,130	439	3.69	7.05
6.5 to 12.0	3,573,958	411	3.26	6.94
3.6 to 6.4	1,745,831	371	3.21	7.44
less than 3.6	904,254	304	2.32	5.78
State Planning Region				
1	4,118,715	325	2.31	6.21
2	6,069,465	437	3.44	6.84
3	3,053,978	360	3.07	6.97
4	19,076,866	488	4.08	6.95
5	13,154,073	492	3.79	6.51
6	3,049,685	373	3.08	6.11
7	4,689,664	360	3.37	8.40
8	2,533,425	335	2.57	6.44
Location				
West	2,965,777	332	2.50	6.38
West Central	5,257,818	391	3.40	7.75
East Central	3,051,402	367	3.08	6.45
East	15,523,190	490	3.91	6.68

percentage of total personal income while other locations received proportional education appropriations.

### Human Services Appropriations

The second and third total personal and federal adjusted income county groups received more state appropriations per capita on average and as a percentage of income than the other income groups (Table 15). Low per capita income and farm income counties received more human services expenditures than high income counties. The second population county group (\$12.5 to \$49.9 thousand) received considerably more human services expenditures than the remaining groups. State planning regions 3, 4, and 6 received more appropriations than the rest of the state. The east and east central locations received considerably more state health and welfare appropriations than the west or west central areas of the state.

### Net Benefits Received

Average and average per capita net benefits received per county were estimated for each county group. Average benefits as a percentage of total personal and federal adjusted income are also provided. Average net benefits received was the difference between benefits received and taxes paid. Net benefits received categories were:

<u>Benefits Received Categories</u>	<u>Taxes Paid Categories</u>	<u>Net Benefits Received Categories</u>
(1) Total benefits received	(A) Total taxes paid	1 minus A 1 minus B 1 minus C 1 minus D
(2) Total benefits received excluding energy tax distributions	(B) Total taxes paid excluding energy taxes	2 minus B 2 minus C
(3) Total benefits received excluding energy tax distributions, higher education, and other expenditures	(C) Total taxes paid excluding energy and property taxes	3 minus B 3 minus C
(4) Total benefits received excluding energy tax distributions, higher education, agricultural and industrial development, and other expenditures	(D) Total taxes paid excluding property taxes	4 minus B 4 minus C

TABLE 15. HUMAN SERVICES APPROPRIATIONS, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Annual Human Svcs. Appropriations Per County	Average Per Capita Annual Human Svcs. Appropriations	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars		percent	
<b>Total Personal Income</b> (millions)				
\$750 or more	5,712,718	79	0.63	1.04
150 to 749	6,996,625	392	3.18	6.02
90 to 149	1,411,343	128	1.31	3.21
50 to 89	466,544	83	0.69	1.42
less than 50	227,973	68	0.64	2.08
<b>Federal Adjusted Gross Income</b> (millions)				
\$180 or more	5,712,718	79	0.63	1.04
80 to 179	5,805,478	329	2.97	5.00
35 to 79	1,288,027	136	1.34	3.03
20 to 34	369,609	73	0.59	1.32
less than 20	223,974	65	0.62	2.08
<b>Per Capita Income</b> (thousands)				
\$14.0 or more	407,848	44	0.30	0.64
13.0 to 13.9	1,607,254	93	0.69	1.36
12.0 to 12.9	2,231,461	121	0.96	1.97
11.0 to 11.9	4,282,126	283	2.39	4.56
less than 11.0	1,410,809	151	1.73	5.01
<b>Farm Income</b> (percent)				
25% or more	115,597	35	0.93	0.93
20 to 24	507,685	98	0.77	1.78
15 to 19	481,945	77	0.69	1.78
10 to 14	3,908,785	289	2.40	4.65
less than 10%	5,250,745	196	1.80	3.83
<b>Population</b> (thousands)				
50.0 or more	5,712,719	79	0.63	1.04
12.5 to 49.9	7,043,870	409	3.60	7.34
6.5 to 12.0	768,428	92	0.75	1.68
3.6 to 6.4	379,075	80	0.74	1.96
less than 3.6	173,045	55	0.42	1.03
<b>State Planning Region</b>				
1	917,967	71	0.51	1.37
2	1,141,057	78	0.65	1.26
3	1,946,638	199	2.03	5.06
4	9,324,752	575	4.78	9.07
5	1,822,506	65	0.51	0.86
6	2,603,425	169	1.35	2.59
7	1,178,658	76	0.76	2.33
8	501,431	55	0.43	1.04
<b>Location</b>				
West	615,031	60	0.45	1.13
West Central	1,163,176	77	0.71	1.89
East Central	2,340,710	181	1.62	3.58
East	4,823,404	269	2.22	4.15

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 was estimated by dividing benefits received by taxes paid. The index represents the amount of state expenditures returned to a county compared with the average state county. Net benefit ratio indexes greater than one imply that the county receives 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.

Net benefits received is a measure of total state expenditures in a county less the state taxes paid in the county. Energy and property taxes were not included initially. Property taxes are assumed to be collected and spent within each county. The amount of property taxes collected in a county is exactly equal to the benefits the county receives. Energy taxes were not included because they are not paid by county residents.

#### Total Benefits Received Less Total Taxes Paid Excluding Energy and Property Taxes

Net benefits were positive among county groups for average per capita net benefits received (Table 16). 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 total personal and federal adjusted income counties received more net benefits per capita and as a percentage of total personal income than relatively low income counties. High total personal and federal adjusted gross income county groups had net benefit ratio indexes greater than one. This implies that relatively high total personal and federal adjusted gross income counties received more net benefits than the average county. High per capita income counties generally received less net benefits than low income counties. This suggests that the state government was redistributing wealth from high per capita income counties to low per capita income counties. Counties with low farm income percentages received more net benefits than high farm income counties. Urban areas received more net benefits than rural areas. The west and east received more per capita net benefits than the west central or east central locations.

Comparing benefits received and taxes paid shows they were similar (Figure 20). Generally, the state tax system seems to conform with the benefits received principle. Initially, benefits received exceeded 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.

TABLE 16. TOTAL BENEFITS RECEIVED LESS TOTAL TAXES PAID, EXCLUDING ENERGY AND PROPERTY TAXES, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Annual Net Benefit Received Per County	Average Per Capita Annual Net Benefit Received	Net Benefit Ratio Index	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars			percent	
Total Personal Income (millions)					
\$750 or more	22,854,121	307	1.13	2.59	4.25
150 to 749	8,845,839	508	1.35	4.09	7.64
90 to 149	2,233,322	198	1.01	1.97	4.83
50 to 89	527,922	101	0.83	0.82	1.82
less than 50	459,146	204	0.85	1.87	6.75
Federal Adjusted Gross Income (millions)					
\$180 or more	22,854,121	307	1.13	2.59	4.25
80 to 179	7,456,495	433	1.26	3.51	6.44
35 to 79	1,472,896	136	0.92	1.39	3.24
20 to 34	638,689	117	0.84	0.92	2.19
less than 20	552,676	224	0.97	2.01	7.28
Per Capita Income (thousands)					
\$14.0 or more	428,209	56	0.76	0.39	0.79
13.0 to 13.9	3,988,806	178	0.91	1.34	2.67
12.0 to 12.9	2,951,324	240	0.96	1.93	5.80
11.0 to 11.9	9,080,412	405	1.26	3.47	6.56
less than 11.0	2,054,260	223	1.10	2.51	7.16
Farm Income (percent)					
25% or more	423,849	226	0.90	1.90	7.72
20 to 24	233,511	55	0.76	0.43	1.03
15 to 19	870,235	132	0.89	1.18	3.12
10 to 14	5,306,713	423	1.24	3.45	6.88
less than 10%	12,115,231	317	1.17	2.89	5.77
Population (thousands)					
50.0 or more	22,854,121	307	1.13	2.59	4.25
12.5 to 49.9	9,020,612	536	1.45	4.67	9.32
6.5 to 12.0	1,155,584	128	0.86	1.05	2.50
3.6 to 6.4	473,976	107	0.86	1.00	3.02
less than 3.6	390,232	196	0.90	1.60	5.31
State Planning Region					
1	1,896,404	180	0.91	1.39	4.17
2	2,161,773	165	0.90	1.28	2.52
3	2,489,579	203	1.05	2.17	5.30
4	19,063,880	626	1.57	5.39	10.02
5	6,388,821	122	0.85	1.02	1.43
6	2,638,891	173	0.92	1.38	2.63
7	1,888,692	177	0.98	1.73	4.71
8	1,701,883	322	1.03	2.55	8.55
Location					
West	1,755,014	283	1.00	2.23	7.35
West Central	2,001,137	172	0.94	1.54	3.81
East Central	2,579,166	185	0.97	1.69	3.70
East	11,458,845	324	1.14	2.77	4.87

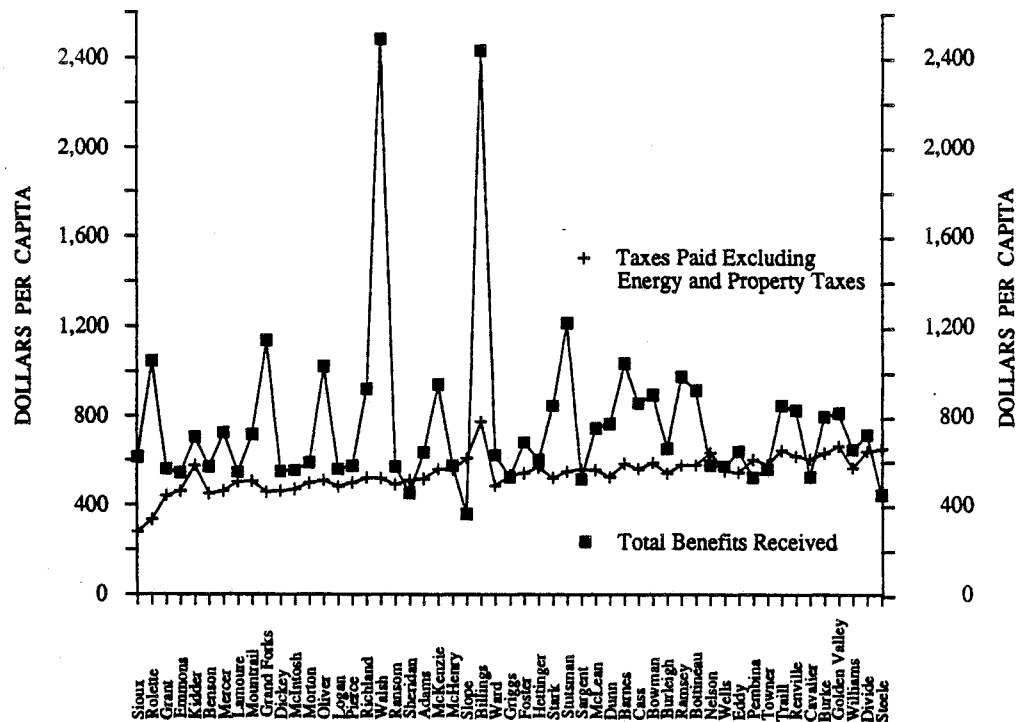


Figure 20. Per Capita Total Taxes Paid Excluding Energy and Property Taxes and Per Capita Total Benefits Received, by County, North Dakota, 1986

#### Total Benefits Received Excluding Energy Tax Distributions Less Total Taxes Paid Excluding Energy and Property Taxes

Relatively high county total personal and federal adjusted income county groups received more benefits per capita on average than relatively low total personal and federal adjusted income county groups (Table 17). Lower total personal and federal adjusted gross income counties received considerably less net benefits both per capita and as a percentage of total personal and federal adjusted income. High per capita income counties received less net benefits per capita than low per capita income counties. High per capita income counties had net benefit ratio indexes less than one, implying that these counties received less net benefits than the average county. Counties with a high percentage of total personal income from farming received less net benefits than low farm income counties. High population counties received more net benefits than low population counties. The east and east central areas of the state received more net benefits per capita than the west or west central locations.

Generally, those counties paying taxes received proportionate benefits (Figure 21). Counties appearing to receive more than others contained either state health facilities or higher education institutions.

TABLE 17. TOTAL BENEFITS RECEIVED EXCLUDING ENERGY TAX DISTRIBUTIONS LESS  
TOTAL TAXES PAID EXCLUDING ENERGY AND PROPERTY TAXES, BY COUNTY GROUP,  
NORTH DAKOTA, 1986

County Group	Average Annual Net Benefit Received Per County	Average Per Capita Annual Net Benefit Received	Net Benefit Ratio Index	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars			percent	
Total Personal Income (millions)					
\$750 or more	22,506,481	302	1.27	2.55	4.18
150 to 749	8,240,691	476	1.49	3.85	7.14
90 to 149	1,261,101	102	1.00	1.16	2.87
50 to 89	212,492	26	0.83	0.27	0.51
less than 50	65,194	-34	0.80	-0.07	-0.96
Federal Adjusted Gross Income (millions)					
\$180 or more	22,506,481	302	1.28	2.55	4.18
80 to 179	6,767,841	394	1.36	3.18	5.87
35 to 79	1,184,668	107	1.00	1.16	2.78
20 to 34	67,895	7	0.80	0.11	0.20
less than 20	49,509	-37	0.79	-0.10	-1.05
Per Capita Income (thousands)					
\$14.0 or more	-301,115	-84	0.69	-0.55	-1.22
13.0 to 13.9	3,511,476	113	0.94	0.85	1.45
12.0 to 12.9	2,326,473	27	0.85	0.19	-1.61
11.0 to 11.9	8,853,928	342	1.32	2.92	5.36
less than 10.9	1,597,572	186	1.19	2.17	6.58
Farm Income (percent)					
25% or more	-191,872	-136	0.63	-1.03	-5.56
20 to 24	90,204	17	0.82	0.16	0.50
15 to 19	620,402	63	0.91	0.64	1.97
10 to 14	4,497,546	307	1.25	2.56	4.66
less than 10%	11,343,946	278	1.27	2.56	5.19
Population (thousands)					
50.0 or more	22,506,481	302	1.28	2.55	4.18
12.5 to 49.9	8,276,125	494	1.57	4.31	8.70
6.5 to 12.0	506,736	57	0.87	0.48	0.98
3.6 to 6.4	231,413	51	0.90	0.58	1.95
less than 3.6	-154,121	-96	0.68	-0.73	-3.51
State Planning Region					
1	-275,760	-59	0.71	-0.41	-1.04
2	1,675,777	75	0.91	0.63	1.21
3	2,436,219	196	1.18	2.11	5.17
4	18,925,123	619	1.77	5.34	9.93
5	6,250,812	115	0.96	0.96	1.34
6	2,600,125	168	1.03	1.34	2.55
7	1,161,612	76	0.94	0.84	2.93
8	808,918	-65	0.73	-0.53	-4.09
Location					
West	513,097	-63	0.72	-0.49	-3.26
West Central	1,373,327	76	0.93	0.76	2.22
East Central	2,534,563	179	1.09	1.65	3.60
East	11,320,537	317	1.28	2.72	4.77

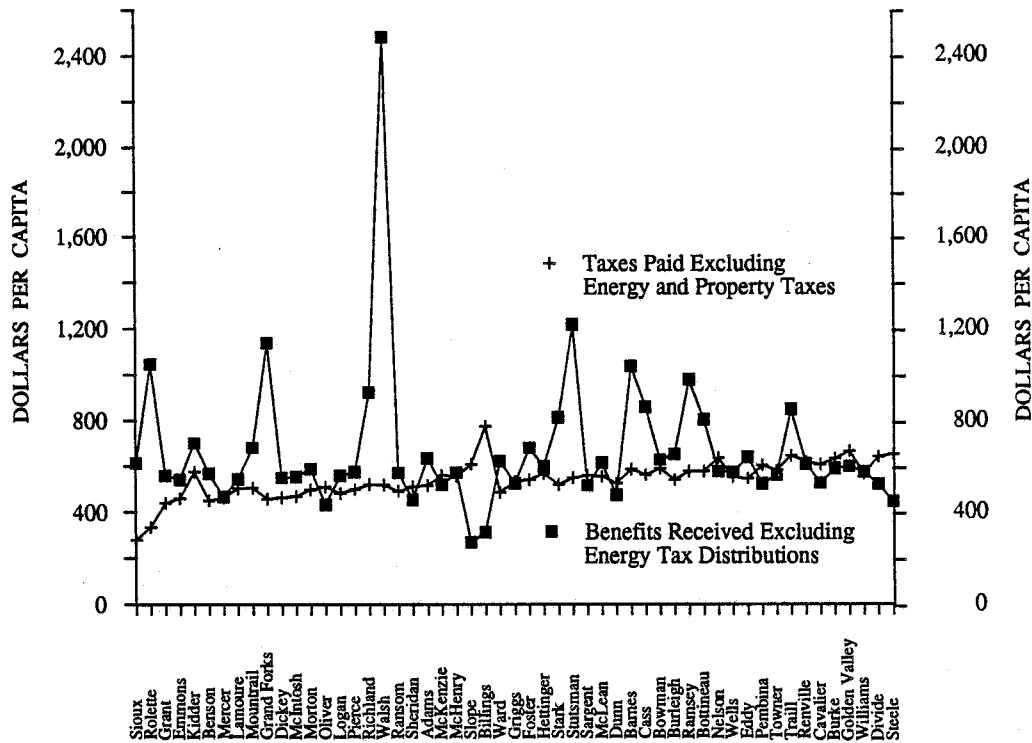


Figure 21. Per Capita Total Taxes Paid Excluding Energy and Property Taxes and Per Capita Total Benefits Received Excluding Energy Tax Distributions, by County, North Dakota, 1986

Accounting for these anomalies indicated that the state tax system generally conforms with the benefits received principle.

The remaining net benefit analyses are provided in Appendix D (Tables D1 through D8 and Figures D1 through D8). Results reiterate the findings presented above. Generally, the state tax system conforms with the benefits received principle.

#### Study Cautions

Counties and county groups were used as proxies for taxpaying and benefiting units. This assumes that counties pay taxes and receive benefits. However, people within each county actually pay taxes and receive benefits. Therefore, estimating tax liabilities and benefits received on an individual taxpayer basis would be more revealing. Individual data would give more precise estimates of taxes and benefits so that the ability to pay and benefits received principles could be applied for each person or for homogenous groups of taxpayers and would provide a better estimate of the tax system's fairness. However, data do not facilitate this type of approach.

Taxes paid were allocated among counties using a number of procedures. For example, sales tax collections are reported for the county where sales taxes were collected. However, sales tax collected within a county includes taxes paid by persons residing outside of the county. To alleviate this problem, taxes were allocated based on total personal income by county. This makes it less than revealing to compare sales taxes paid as a percentage of total personal income.

Human services, agricultural and industrial development, and higher education benefits received were allocated to counties assuming residents in the counties where facilities are located received all benefits. This is not entirely true because some people receive services from health facilities outside of their county of residence. For example, a north central county resident may go to Grafton for medical treatment. Grafton bills the state for services provided. The state in turn pays Grafton for services rendered. The transaction appears as if Walsh county received the benefit when actually the resident from the north central county received the benefit. Therefore, human services provided should be identifiable by the county where the recipient of the services resides rather than the county where the medical facility is located. Agricultural and industrial development and higher education expenditures were attributed assuming that only the counties where the institutions are located received the benefits. This again is not entirely true since these programs benefit people all across the state.

Finally, while the values of most variables used in this analysis are consistently defined across counties and economic sectors, the income variable may not be homogenous across all economic sectors. Because of this, the results as they relate to income should be viewed cautiously, but at the same time they represent an important first step at analyzing the equity issue.

Taxes and benefits are for the 1986 calendar year. Therefore, they may not be representative of tax liabilities and benefits received over a longer time period. Including more years in the analysis may provide a more realistic long-term picture of the state's tax system equity. However, data for the 1986 calendar year are representative of both economic conditions and tax situations in North Dakota at the time.

## CONCLUSIONS

The purpose of this project was to assess the equity or fairness of the North Dakota tax system. The ability to pay and benefits received principles were applied to aggregate and individual tax, benefit, and net benefit categories for various county groups and individual counties. This provided the basis for analyzing equity associated with individual taxes and benefits, and the entire state tax system.

Some counties appeared to pay or receive more than their fair share of either taxes or benefits. This was especially true of energy counties or counties which contained state health facilities or higher education

institutions. These counties appeared to pay or benefit disproportionately based on the ability to pay and benefits received principles. However, as stated above, actual taxes paid and benefits received by these counties were misrepresented to some degree. More precise accounting for these tax and expenditure anomalies would provide a more accurate reflection of actual taxes paid and benefits received by counties.

When county anomalies were accounted for, the state tax system generally followed the benefits received principle. In other words, those who received state government goods and services paid for them. The state tax system seemed to be fair based on the benefits received principle.

However, there appeared to be some potential for taxing according to the ability to pay principle, an equally compelling principle of tax fairness. Tax liabilities of low per capita income counties were often greater than those of high per capita income counties. This implies the tax system may be regressive. High per capita income counties paid a smaller portion of their income in the form of taxes than low per capita income counties. According to the ability to pay principle, counties should pay taxes which are progressive relative to their income levels. High income counties appeared to pay less than their fair share of taxes in North Dakota in 1986. Therefore, the state tax system in 1986 appeared to be less than equitable based on the ability to pay principle.

The sales and income tax liabilities generally did not follow the ability to pay principles based on county per capita income. This was consistent with ACIR (1987) findings indicating that North Dakota tax collections from the general sales and personal income taxes were considerably less than the average state. Income tax liabilities of counties do not increase relative to increases in county per capita income. Income tax rates could be increased for higher income individuals in the state making the system more progressive and thus improve the system's fairness according to the ability to pay principle. Sales tax liabilities were generally lower for high per capita income counties. This implies that the sales tax base may be too narrowly defined or tax rates are not consistent across economic sectors. Changing the tax base or increasing the tax rates on some items could improve sales tax equity. Such changes could provide a progressive tax structure for income and sales taxes and also bring North Dakota up to par with the "average" state. These two tax categories are potential areas for adjustment in the current tax system.

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, these two fundamental principles--ability to pay and benefits received--should help to provide an overall tax system which is equitable and thus supported by taxpayers.

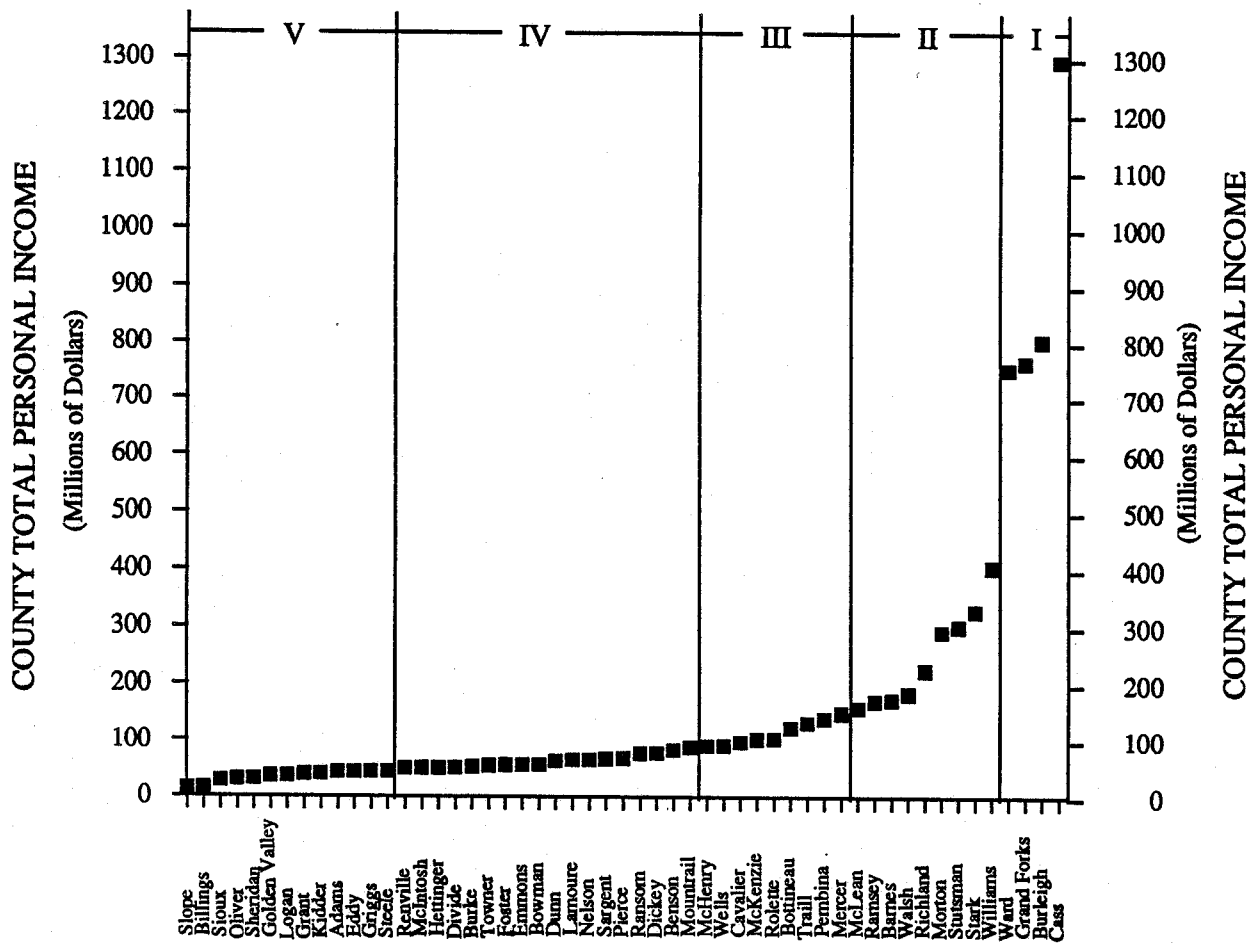
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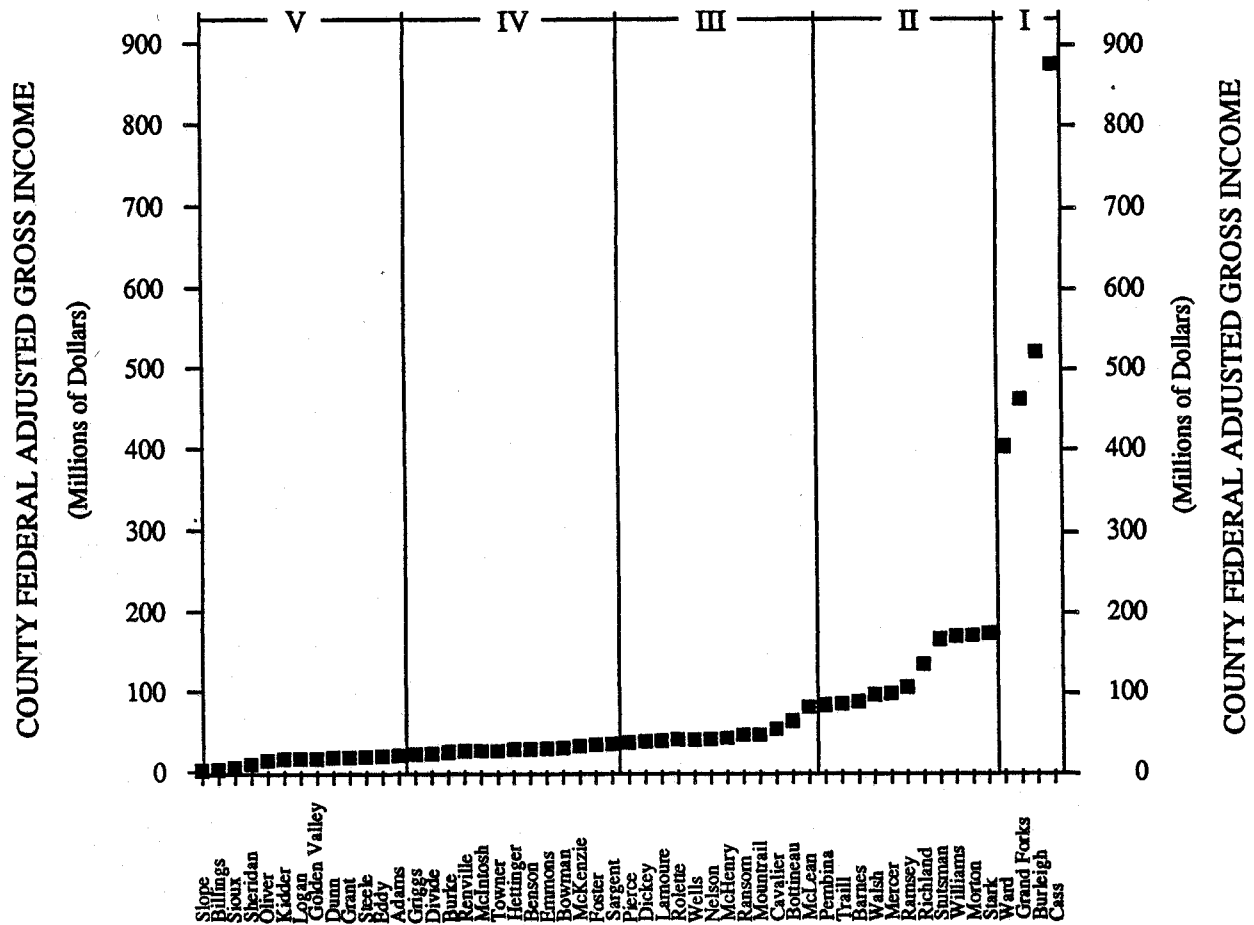
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APPENDIX A  
County Rankings and Counties  
in Each County Group

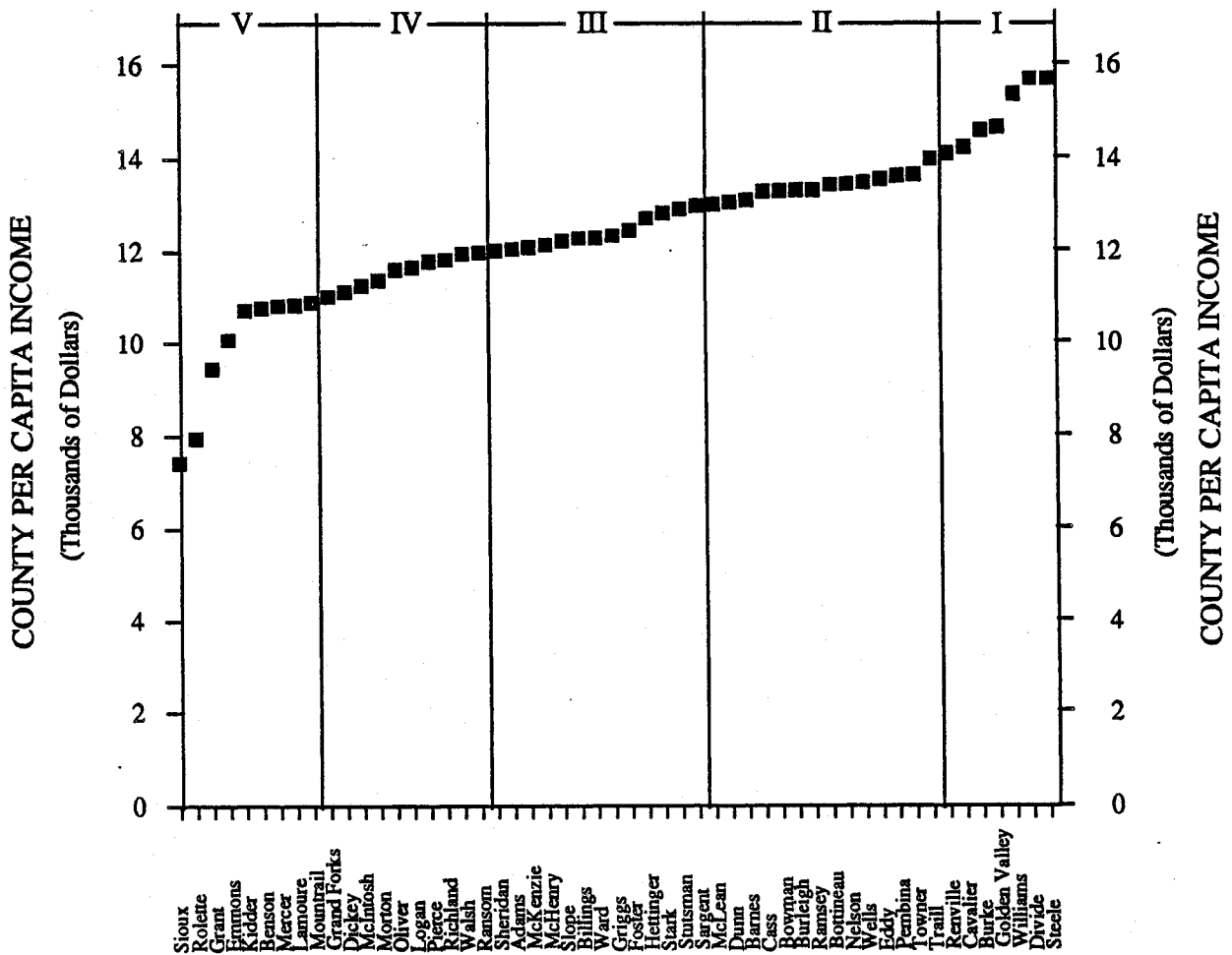




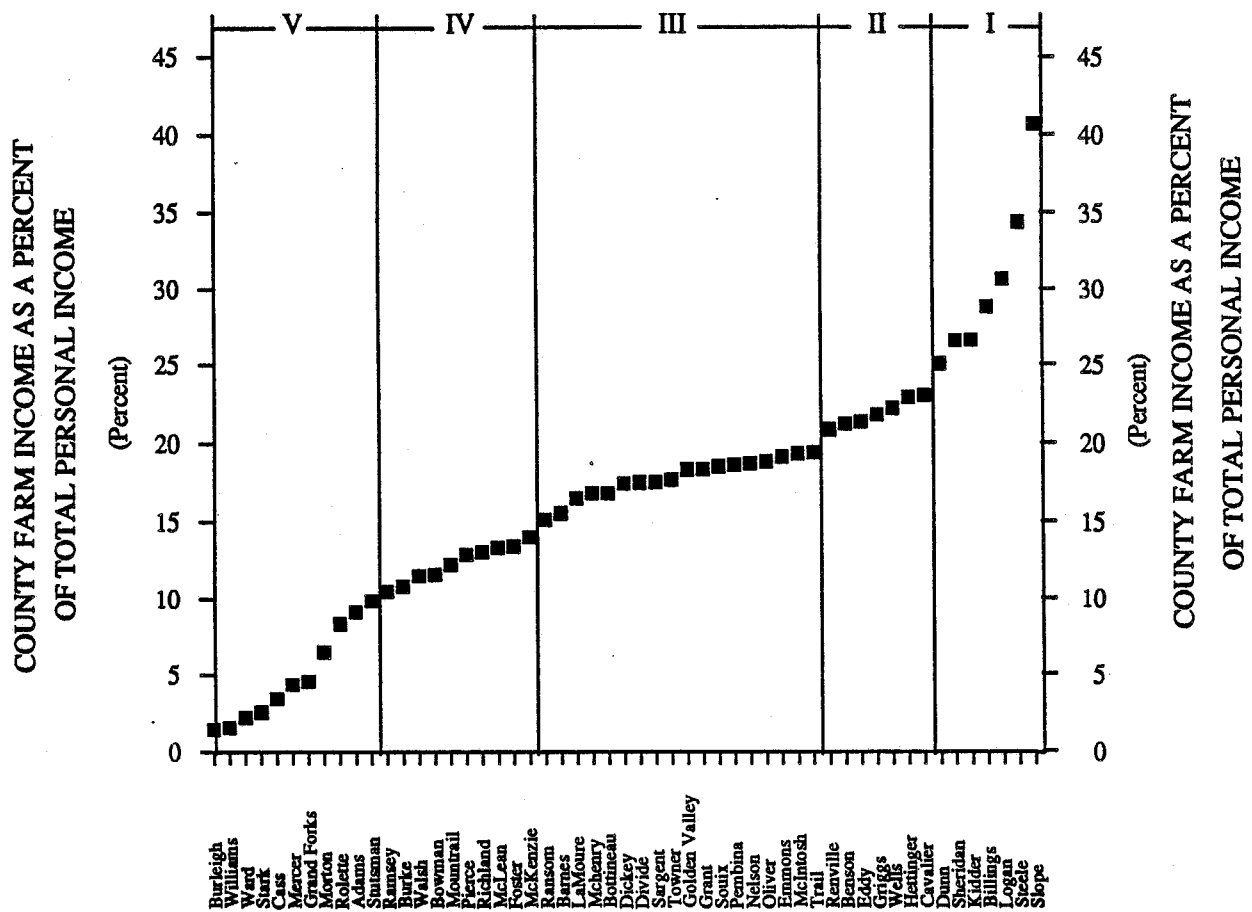
Appendix Figure A1. Counties in Each County Total Personal Income Group  
And Counties Ranked By County Total Personal Income, North Dakota, 1986



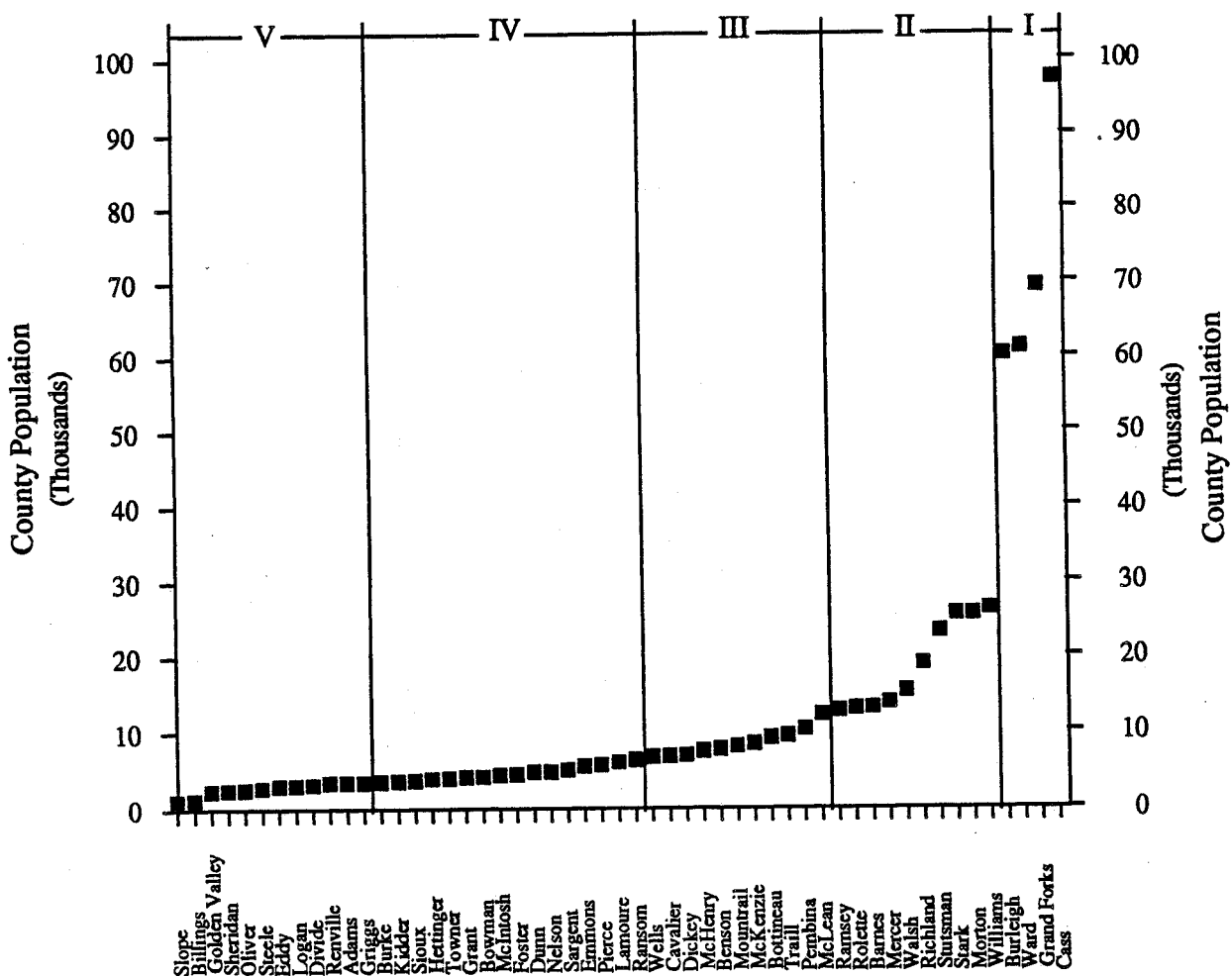
Appendix Figure A2. Counties in Each County Federal Adjusted Gross Income Group and Counties Ranked By County Federal Adjusted Gross Income, North Dakota, 1986



Appendix Figure A3. Counties in Each County Per Capita Income Group and Counties Ranked By County Per Capita Income, North Dakota, 1986



Appendix Figure A4. Counties in Each County Farm Income Group and Counties Ranked By County Farm Income, North Dakota, 1986



Appendix Figure A5. Counties in Each County Population Group and Counties Ranked By County Population, North Dakota, 1986



APPENDIX B

**Tax Liabilities**



APPENDIX TABLE B1. TAX LIABILITY, ALL TAXES, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Annual Tax Liability Per County	Average Per Capita Annual Tax Liability	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars		percent	
Total Personal Income (millions)				
\$750 or more	65,032,324	896	7.18	11.74
150 to 749	20,895,923	1,090	8.46	16.12
90 to 149	14,501,412	1,540	12.56	29.31
50 to 89	6,094,365	1,247	9.82	21.12
less than 50	5,259,260	2,611	21.42	80.22
Federal Adjusted Gross Income (millions)				
\$180 or more	65,032,324	896	7.18	11.74
80 to 179	19,990,350	1,143	9.05	16.14
35 to 79	8,014,879	1,022	8.41	16.62
20 to 34	8,025,207	1,536	11.99	27.99
less than 20	5,864,990	2,712	22.16	83.92
Per Capita Income (thousands)				
\$14.0 or more	10,434,694	1,615	10.85	23.44
13.0 to 13.9	19,608,636	1,282	9.60	20.16
12.0 to 12.9	14,867,372	2,617	21.27	80.07
11.0 to 11.9	14,765,272	1,202	10.39	20.62
less than 11.0	7,586,882	927	9.15	20.60
Farm Income (percent)				
25% or more	7,097,347	3,758	30.32	130.05
20 to 24	5,517,686	1,130	8.62	18.33
15 to 19	6,886,829	1,238	10.01	20.96
10 to 14	13,571,166	1,566	12.50	28.64
less than 10%	37,163,132	1,045	8.67	16.03
Population (thousands)				
50.0 or more	65,032,324	896	7.81	11.74
12.5 to 49.9	20,443,836	1,085	8.98	16.78
6.5 to 12.4	12,185,602	1,403	11.20	26.88
3.6 to 6.4	5,378,424	1,149	9.47	21.40
less than 3.6	6,009,183	2,949	23.32	85.49
State Planning Region				
1	27,447,629	2,611	19.59	56.66
2	13,702,065	1,234	9.51	19.01
3	6,982,335	952	7.66	16.94
4	22,148,844	1,006	8.02	13.86
5	22,998,147	1,071	8.01	14.65
6	7,790,112	961	7.95	15.79
7	15,617,157	1,335	11.91	26.22
8	10,469,509	3,627	28.87	115.81
Location				
West	15,099,905	3,350	26.34	99.68
West Central	14,828,590	1,293	10.93	23.25
East Central	7,467,002	956	7.83	16.25
East	22,658,426	1,045	8.02	14.33

APPENDIX TABLE B2. TAX LIABILITY, EXCLUDING PROPERTY TAXES, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Annual Tax Liability Per County	Average Per Capita Annual Tax Liability	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars		percent	
Total Personal Income (millions)				
\$750 or more	37,148,881	511	4.09	6.70
150 to 749	13,000,488	683	5.25	10.13
90 to 149	10,986,658	1,151	9.50	23.02
50 to 89	3,861,621	808	6.28	13.82
less than 50	3,997,950	2,185	17.94	70.24
Federal Adjusted Gross Income (millions)				
\$180 or more	37,148,881	511	4.09	6.70
80 to 179	12,618,743	722	5.75	10.22
35 to 79	5,099,639	624	5.13	10.20
20 to 34	5,981,436	1,093	8.49	20.57
less than 20	4,585,104	2,294	18.76	73.70
Per Capita Income (thousands)				
\$14.0 or more	7,272,868	1,112	7.49	16.12
13.0 to 13.9	11,897,278	835	6.27	13.56
12.0 to 12.9	10,461,140	2,205	17.95	71.31
11.0 to 11.9	8,446,053	793	6.85	13.87
less than 11.0	5,337,229	603	5.93	13.20
Farm Income (percent)				
25% or more	5,766,946	3,301	26.73	117.60
20 to 24	3,179,805	664	5.03	10.66
15 to 19	4,223,591	807	6.52	13.89
10 to 14	9,895,206	1,183	9.41	22.60
less than 10%	22,578,037	671	5.60	10.29
Population (thousands)				
50.0 or more	37,148,881	511	4.09	6.70
12.5 to 49.9	13,086,187	703	5.85	10.87
6.5 to 12.4	8,789,291	1,000	18.02	20.12
3.6 to 6.4	3,357,813	726	5.92	13.85
less than 3.6	4,674,814	2,484	19.80	75.72
State Planning Region				
1	22,590,494	2,206	16.81	49.51
2	8,729,349	850	6.48	12.97
3	3,918,391	516	4.21	9.37
4	12,229,130	553	4.40	7.60
5	13,073,030	571	4.29	7.74
6	4,278,022	519	4.28	8.50
7	10,318,765	984	8.74	19.03
8	8,066,320	3,211	25.64	105.98
Location				
West	12,027,458	2,937	23.23	90.58
West Central	9,664,299	929	7.81	16.53
East Central	4,134,170	518	4.25	8.85
East	12,735,470	563	4.34	7.68

**Appendix C**  
**Benefits Received**



APPENDIX TABLE C1. BENEFITS RECEIVED EXCLUDING ENERGY, HIGHER EDUCATION, AGRICULTURAL AND INDUSTRIAL DEVELOPMENT, AND OTHER EXPENDITURES, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Annual Benefits Received Per County	Average Per Capita Annual Benefits Received	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars		percent	
<b>Total Personal Income</b>				
(millions)				
\$750 or more	34,707,878	487	3.92	6.46
150 to 749	16,562,401	909	7.20	13.52
90 to 149	5,642,956	577	5.03	11.21
50 to 89	2,929,929	561	4.57	9.36
less than 50	1,548,098	498	4.35	12.97
<b>Federal Adjusted Gross Income</b>				
(millions)				
\$180 or more	34,707,878	487	3.92	6.46
80 to 179	14,368,040	822	6.52	11.91
35 to 79	4,976,130	606	5.33	11.06
20 to 34	2,644,347	554	4.39	9.46
less than 20	1,582,594	494	4.31	13.30
<b>Per Capita Income</b>				
(thousands)				
\$14.0 or more	3,786,340	535	3.60	7.75
13.0 to 13.9	9,811,955	592	4.43	8.66
12.0 to 12.9	7,386,746	550	4.41	10.61
11.0 to 11.9	10,880,065	716	6.14	11.76
less than 11.0	4,760,403	617	6.51	17.16
<b>Farm Income</b>				
(percent)				
25% or more	1,337,546	437	3.57	11.77
20 to 24	2,834,633	563	4.36	9.55
15 to 19	3,449,404	553	4.67	10.52
10 to 14	8,628,567	799	6.47	12.67
less than 10%	21,269,413	632	5.49	10.91
<b>Population</b>				
(thousands)				
50.0 or more	34,707,878	487	3.92	6.46
12.5 to 49.9	16,143,736	906	7.74	15.31
6.5 to 12.0	4,731,909	554	4.46	9.73
3.6 to 6.4	2,636,009	560	4.87	11.42
less than 3.6	1,420,643	486	3.71	9.74
<b>State Planning Region</b>				
1	6,898,290	527	3.71	9.88
2	7,561,874	579	4.60	9.14
3	6,279,127	702	6.25	14.38
4	19,416,859	1,003	8.21	14.98
5	10,648,997	480	3.66	6.53
6	6,413,569	645	5.29	10.43
7	7,420,991	537	5.06	12.93
8	3,343,442	496	3.83	10.42
<b>Location</b>				
West	4,312,946	505	3.80	10.27
West Central	7,479,002	554	4.87	11.37
East Central	6,359,792	668	5.67	12.01
East	14,156,142	689	5.48	9.91

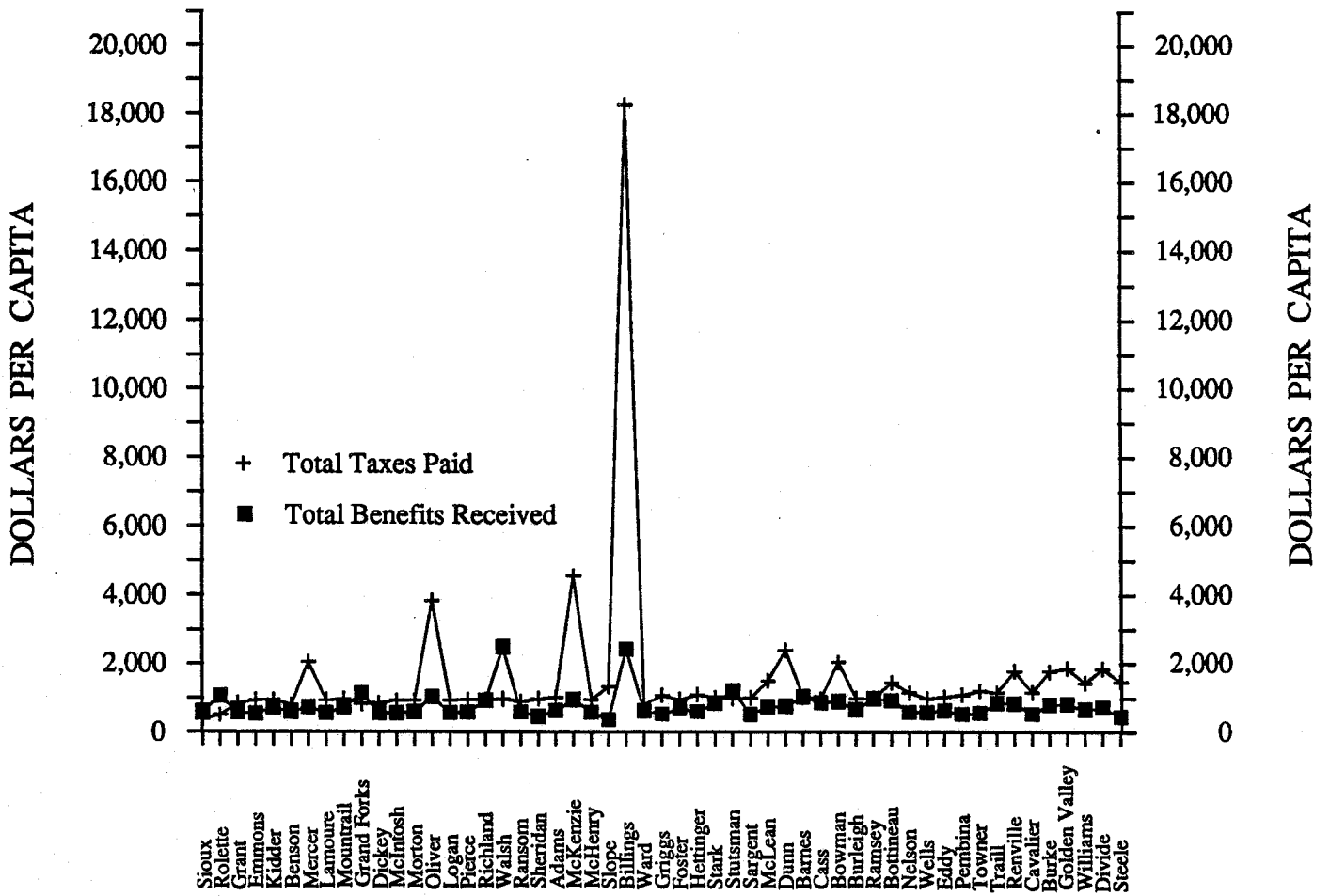
APPENDIX TABLE C2. BENEFITS RECEIVED EXCLUDING ENERGY, HIGHER EDUCATION, AGRICULTURAL AND INDUSTRIAL DEVELOPMENT, HEALTH AND WELFARE, AND OTHER EXPENDITURES, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Annual Benefits Received Per County	Average Per Capita Annual Benefits Received	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars		percent	
Total Personal Income (millions)				
\$750 or more	28,995,159	408	3.29	5.42
150 to 749	9,565,776	516	4.02	7.50
90 to 149	4,231,613	449	3.72	8.00
50 to 89	2,463,386	478	3.88	7.94
less than 50	1,320,125	430	3.72	10.89
Federal Adjusted Gross Income (millions)				
\$180 or more	28,995,159	408	3.29	5.42
80 to 179	8,562,562	493	3.85	6.91
35 to 79	3,688,103	470	3.99	8.03
20 to 34	2,274,738	481	3.80	8.14
less than 20	1,358,619	429	3.69	11.22
Per Capita Income (thousands)				
\$14.0 or more	3,378,491	491	3.31	7.11
13.0 to 13.9	8,204,701	500	3.73	7.31
12.0 to 12.9	5,155,285	428	3.45	8.64
11.0 to 11.9	6,597,939	433	3.75	7.20
less than 11.0	3,349,595	467	4.78	12.15
Farm Income (percent)				
25% or more	1,221,949	402	3.27	10.84
20 to 24	2,326,948	465	3.59	7.77
15 to 19	2,967,459	465	3.98	8.74
10 to 14	4,719,782	510	4.06	8.02
less than 10%	16,018,669	436	3.69	7.08
Population (thousands)				
50.0 or more	28,995,159	408	3.29	5.42
12.5 to 49.9	9,099,866	497	4.13	7.96
6.5 to 12.0	3,963,481	462	3.70	8.05
3.6 to 6.4	2,256,934	479	4.13	9.46
less than 3.6	1,247,598	431	3.29	8.71
State Planning Region				
1	5,980,324	456	3.20	8.51
2	6,420,816	501	3.95	7.88
3	4,332,490	504	4.21	9.32
4	10,092,108	428	3.43	5.91
5	8,826,491	415	3.15	5.67
6	3,810,144	476	3.94	7.83
7	6,242,333	461	4.30	10.60
8	2,842,011	441	3.40	9.38
Location				
West	3,697,914	445	3.35	9.14
West Central	6,315,826	477	4.16	9.48
East Central	4,019,082	487	4.05	8.43
East	9,332,738	420	3.26	5.76

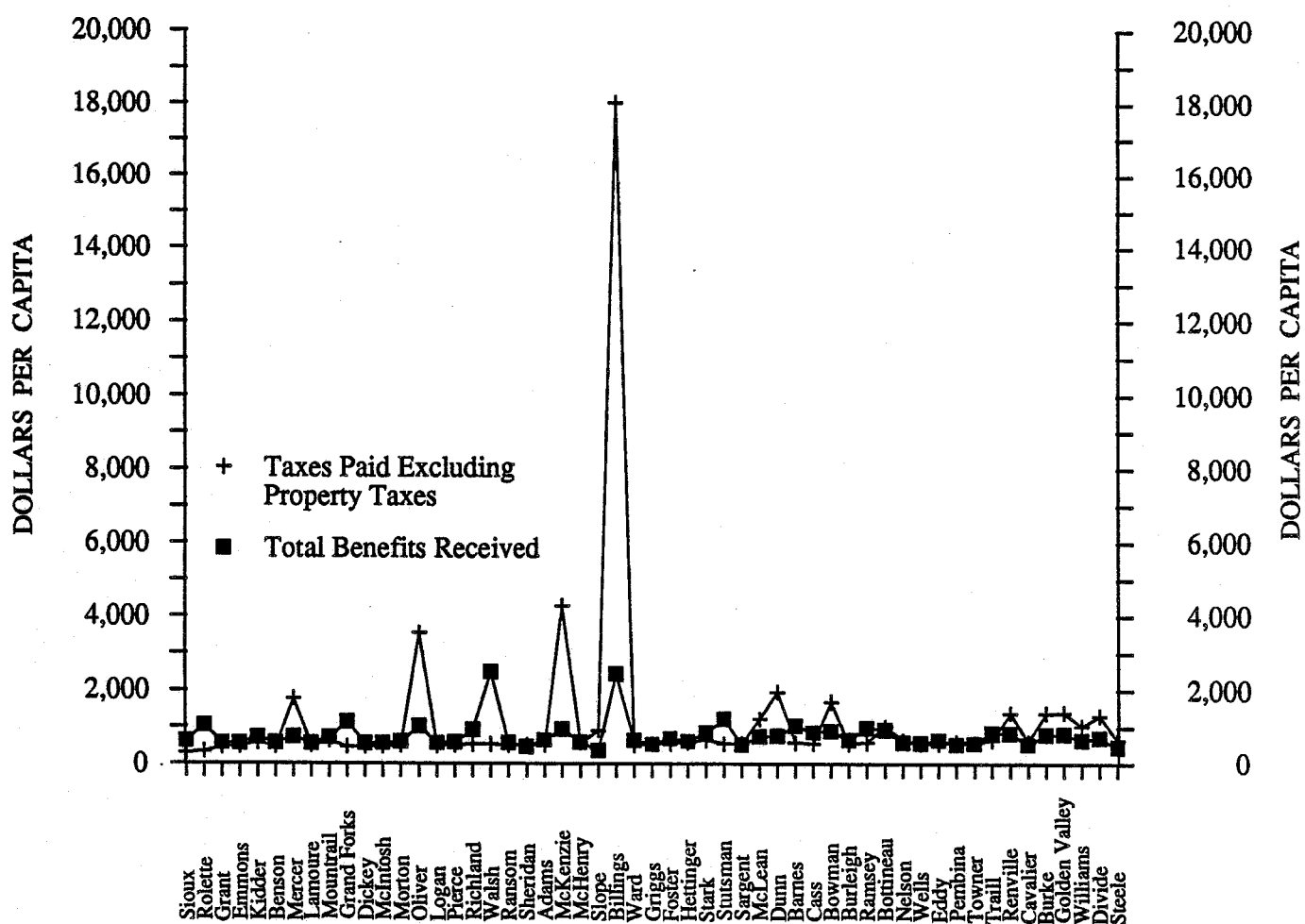
## Appendix D

### Net Benefits Received

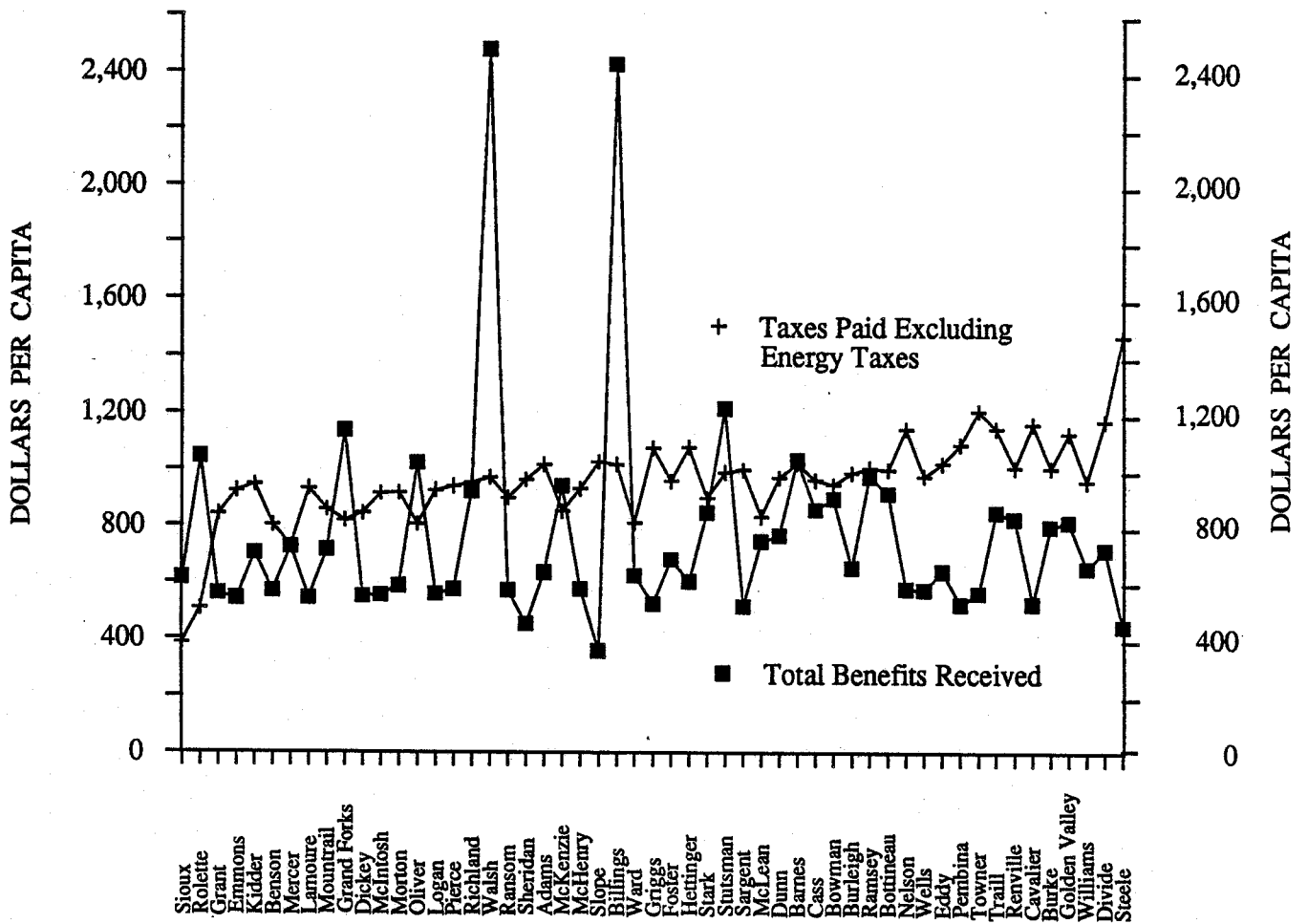




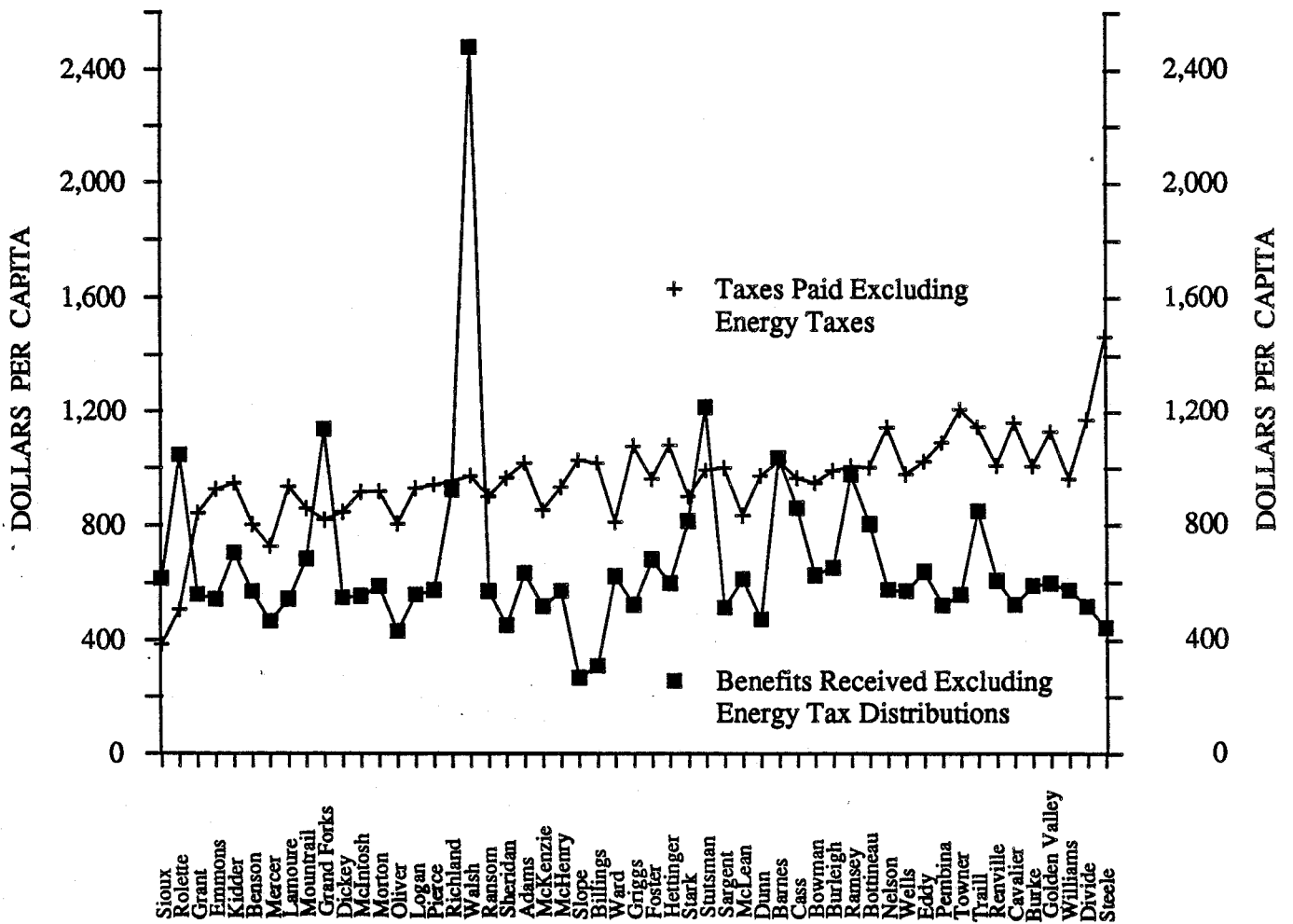
Appendix Figure D1. Total Taxes Paid and Total Benefits Received, By County, North Dakota, 1986



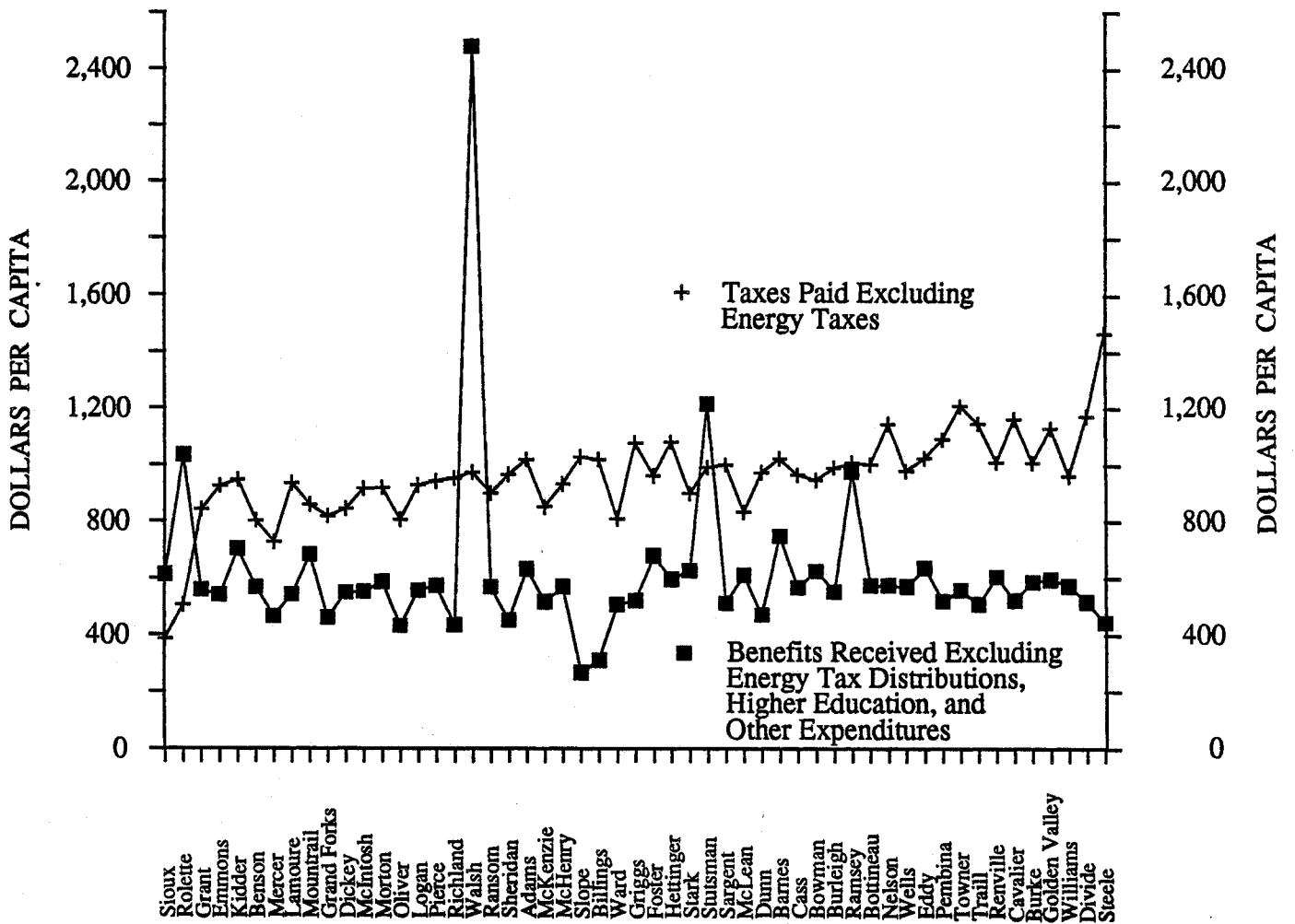
Appendix Figure D2. Taxes Paid Excluding Property Taxes and Total Benefits Received, By County, North Dakota, 1986



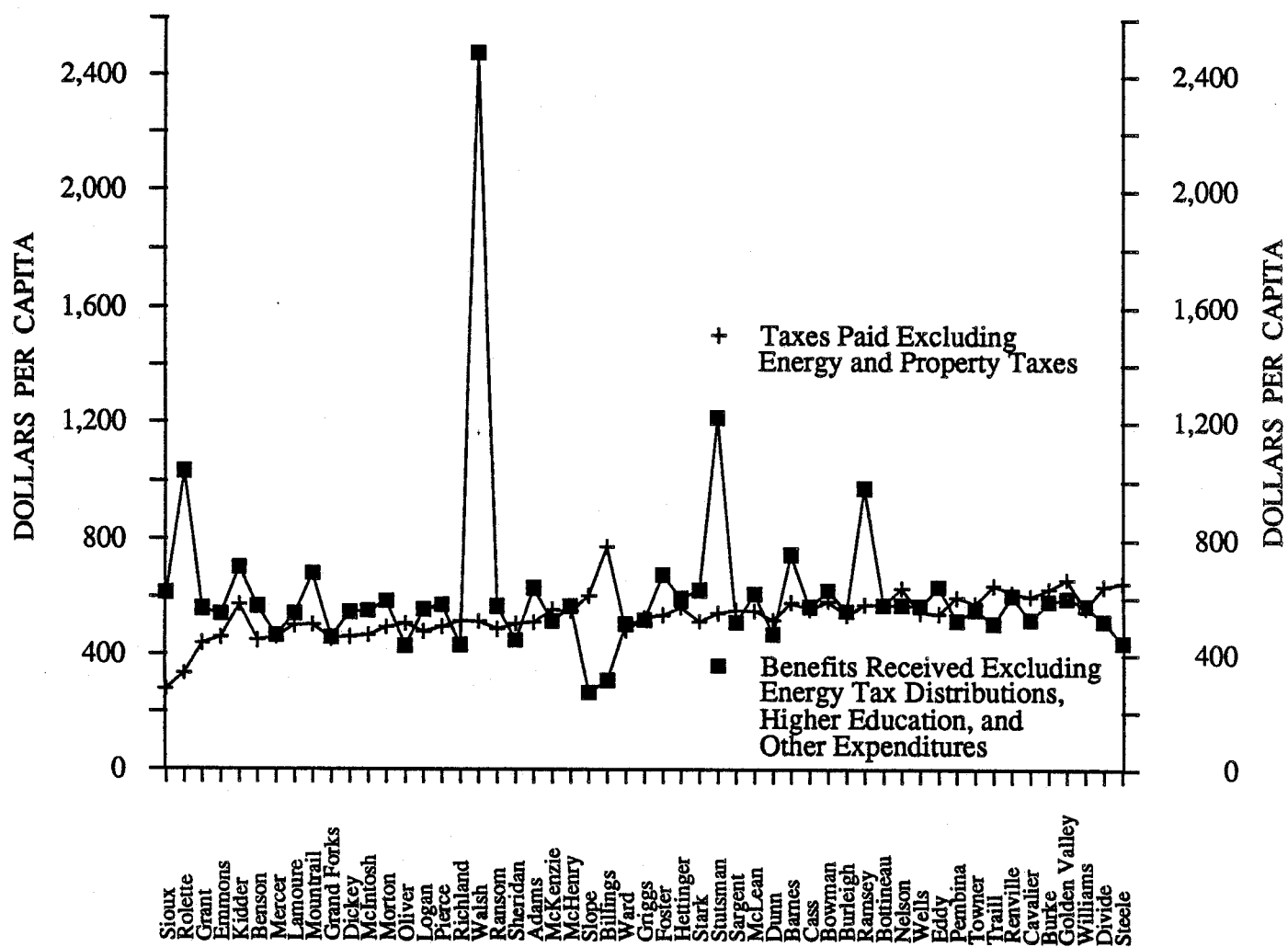
Appendix Figure D3. Taxes Paid Excluding Energy Taxes and Total Benefits Received, By County, North Dakota, 1986



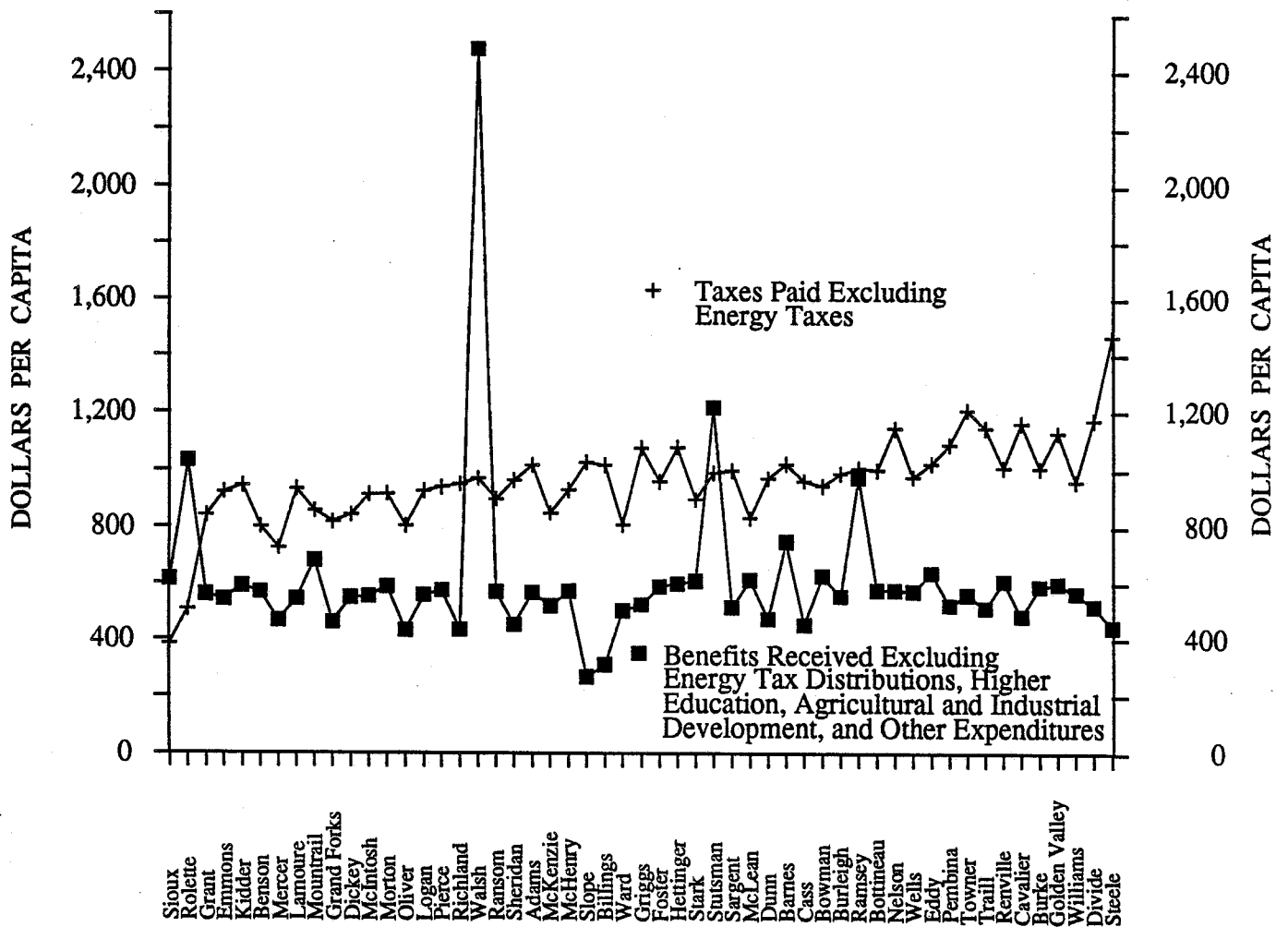
Appendix Figure D4. Taxes Paid Excluding Energy Taxes and Benefits Received Excluding Energy Tax Distributions, By County, North Dakota, 1986



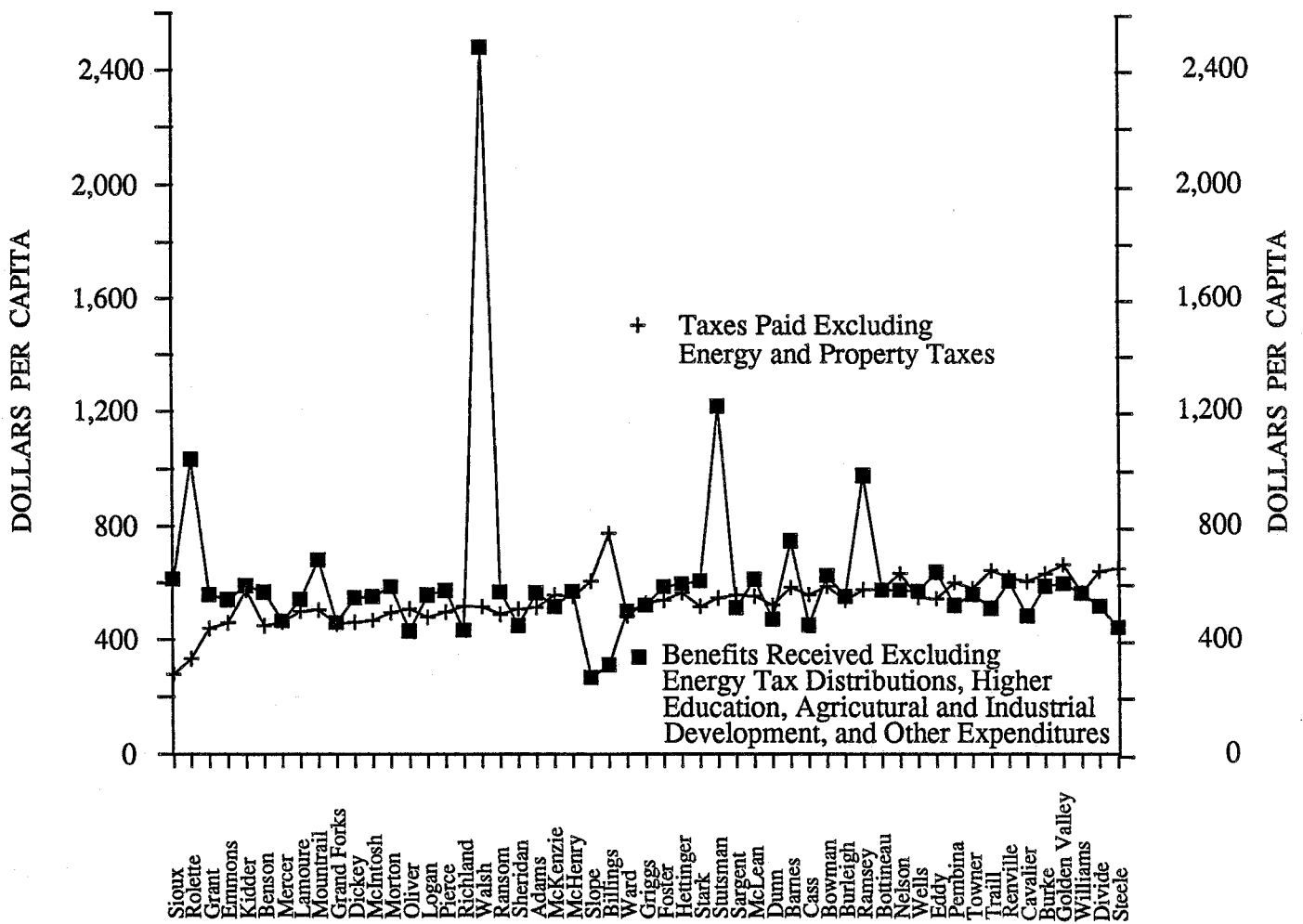
Appendix Figure D5. Taxes Paid Excluding Energy Taxes and Benefits Received Excluding Energy Tax Distributions, Higher Education Expenditures, and Other Expenditures, By County, North Dakota, 1986



Appendix Figure D6. Taxes Paid Excluding Energy and Property Taxes and Benefits Received Excluding Energy Tax Distributions, Higher Education Expenditures, and Other Expenditures, By County, North Dakota, 1986



Appendix Figure D7. Taxes Paid Excluding Energy Taxes and Benefits Received Excluding Energy Tax Distributions, Higher Education Expenditures, Agricultural and Industrial Development Expenditures, and Other Expenditures, By County, North Dakota, 1986



Appendix Figure D8. Taxes Paid Excluding Energy and Property Taxes and Benefits Received Excluding Energy Tax Distributions, Higher Education Expenditures, Agricultural and Industrial Development Expenditures, and Other Expenditures, By County, North Dakota, 1986

APPENDIX TABLE D1. TOTAL BENEFITS RECEIVED LESS TOTAL TAXES PAID BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Annual Net Benefit Received Per County	Average Per Capita Net Annual Benefit Received	Net Benefit Ratio Index	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars			percent	
Total Personal Income (millions)					
\$750 or more	-5,059,561	-79	1.37	-0.50	-0.80
150 to 749	-1,669,223	-40	1.50	-0.13	-0.50
90 to 149	-7,249,668	-799	1.00	-6.22	-15.24
50 to 89	-2,826,013	-606	0.81	-4.67	-10.38
less than 50	-3,266,324	-1,861	0.81	-15.00	-59.24
Federal Adjusted Gross Income (millions)					
\$180 or more	-5,059,561	-79	1.37	-0.50	-0.80
80 to 179	-2,958,967	-161	1.37	-1.25	-2.00
35 to 79	-2,538,865	-363	1.04	-2.67	-4.75
20 to 34	-4,778,229	-865	0.75	-6.72	-16.45
less than 20	-3,728,344	-1,944	0.79	-15.62	-62.00
Per Capita Income (thousands)					
\$14.0 or more	-5,844,594	-934	0.62	-6.26	-13.58
13.0 to 13.9	-5,429,497	-528	0.93	-3.96	-9.05
12.0 to 12.9	-5,839,281	-1,818	0.84	-14.83	-61.38
11.0 to 11.9	1,973,011	-306	1.31	-2.67	-5.94
less than 11.0	-2,303,673	-259	1.31	-2.16	-2.52
Farm Income (percent)					
25% or more	-5,083,500	-2,942	0.60	-23.67	-104.62
20 to 24	-2,499,475	-523	0.81	-3.94	-8.17
15 to 19	-2,685,175	-569	0.93	-4.46	-8.65
10 to 14	-3,165,267	-594	1.19	-4.65	-12.93
less than 10%	-5,524,734	-230	1.32	-1.64	-2.49
Population (thousands)					
50.0 or more	-5,059,561	-79	1.37	-0.50	-0.80
12.5 to 49.9	-1,685,277	-37	1.63	-0.07	0.63
6.5 to 12.0	-6,299,564	-723	0.84	-5.78	-14.93
3.6 to 6.4	-2,447,481	-521	0.91	-4.08	-8.67
less than 3.6	-4,024,400	-2,165	0.62	-17.23	-66.83
State Planning Region					
1	-18,297,455	-1,842	0.51	-14.06	-41.53
2	-4,312,489	-516	0.90	-3.89	-7.83
3	-574,365	-233	1.29	-1.28	-2.26
4	9,144,166	172	1.81	1.78	3.76
5	-3,536,296	-379	0.99	-2.70	-5.48
6	-873,199	-269	1.06	-2.29	-4.66
7	-6,844,445	-674	0.96	-5.79	-11.14
8	-5,546,047	-2,710	0.66	-21.69	-92.22
Location					
West	-9,023,704	-2,473	0.62	-19.61	-78.39
West Central	-5,801,875	-609	0.93	-5.01	-9.78
East Central	-753,666	-255	1.15	-1.89	-3.70
East	1,535,889	-159	1.32	-0.91	-1.78

APPENDIX TABLE D2. TOTAL BENEFITS RECEIVED LESS TOTAL TAXES PAID EXCLUDING PROPERTY TAXES, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Annual Net Benefit Received Per County	Average Per Capita Net Annual Benefit Received	Net Benefit Ratio Index	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars			percent	
<b>Total Personal Income</b> (millions)					
\$750 or more	22,823,883	306	1.41	2.59	4.24
150 to 749	6,226,211	368	1.53	3.07	5.49
90 to 149	-3,734,914	-410	0.94	-3.16	-8.95
50 to 89	-593,269	-167	0.82	-1.13	-3.08
less than 50	-2,005,014	-1,435	0.81	-11.52	-49.27
<b>Federal Adjusted Gross Income</b> (millions)					
\$180 or more	22,823,883	306	1.41	2.59	4.24
80 to 179	4,412,640	261	1.41	2.05	3.92
35 to 79	376,376	34	1.01	0.60	1.67
20 to 34	-2,734,459	-422	0.75	-3.22	-9.03
less than 20	-2,448,458	-1,525	0.77	-12.21	-51.77
<b>Per Capita Income</b> (thousands)					
\$14.0 or more	-2,682,768	-430	0.55	-2.89	-6.26
13.0 to 13.9	2,281,861	-81	0.91	-0.63	-2.45
12.0 to 12.9	-1,433,049	-1,406	0.85	-11.51	-52.62
11.0 to 11.9	8,292,230	103	1.41	0.87	0.81
less than 11.0	-54,020	66	1.24	1.06	4.89
<b>Farm Income</b> (percent)					
25% or more	-3,753,100	-2,485	0.59	-20.83	-92.17
20 to 24	-161,594	-57	0.85	-0.36	-0.50
15 to 19	-21,937	-139	0.91	-0.97	-1.57
10 to 14	510,692	-210	1.19	-0.16	-6.89
less than 10%	9,060,361	145	1.30	1.43	3.25
<b>Population</b> (thousands)					
50.0 or more	22,823,882	306	1.41	2.59	4.24
12.5 to 49.9	5,672,372	346	1.63	3.06	6.55
6.5 to 12.0	-2,903,253	-321	0.82	-2.60	-8.18
3.6 to 6.4	-426,870	-98	1.92	-0.52	-1.12
less than 3.6	-2,690,031	-1,700	0.62	-13.71	-57.06
<b>State Planning Region</b>					
1	-13,440,320	-1,437	0.40	-11.28	-34.37
2	660,227	-132	0.83	-0.85	-1.79
3	2,489,579	203	1.30	2.17	5.30
4	19,063,880	626	1.95	5.39	10.02
5	6,388,821	122	1.06	1.02	1.43
6	2,638,891	173	1.14	1.38	2.63
7	-1,546,053	-324	0.90	-2.61	-3.95
8	-3,142,858	-2,294	0.60	-18.46	-82.40
<b>Location</b>					
West	-5,951,257	-2,060	0.55	-16.50	-69.30
West Central	-637,585	-245	0.87	-1.89	-3.06
East Central	2,579,166	185	1.21	1.69	3.70
East	11,458,845	324	1.41	2.77	4.87

APPENDIX TABLE D3. TOTAL BENEFITS RECEIVED LESS TOTAL TAXES PAID EXCLUDING ENERGY TAXES, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Annual Net Benefit Received Per County	Average Per Capita Net Annual Benefit Received	Net Benefit Ratio Index	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars			percent	
<b>Total Personal Income</b> (millions)					
\$750 or more	-5,029,323	-78	1.12	-0.49	-0.79
150 to 749	950,404	100	1.33	0.88	1.65
90 to 149	-1,281,432	-192	1.06	-1.09	-1.46
50 to 89	-1,704,822	-337	0.79	-2.72	-5.48
less than 50	-802,164	-222	1.00	-1.61	-3.22
<b>Federal Adjusted Gross Income</b> (millions)					
\$180 or more	-5,029,323	-78	1.12	-0.49	-0.79
80 to 179	84,888	11	1.22	0.21	0.52
35 to 79	-1,442,345	-261	0.95	-1.89	-3.18
20 to 34	-1,405,082	-326	0.81	-2.58	-5.23
less than 20	-727,211	-195	1.03	-1.39	-2.95
<b>Per Capita Income</b> (thousands)					
\$14.0 or more	-2,733,617	-448	0.74	-2.98	-6.53
13.0 to 13.9	-3,722,552	-269	0.90	-1.99	-3.94
12.0 to 12.9	-1,454,908	-172	1.00	-1.39	-2.86
11.0 to 11.9	2,771,193	-4	1.19	-0.07	-0.20
less than 11.0	-195,393	-101	1.16	-0.70	-0.24
<b>Farm Income</b> (percent)					
25% or more	-906,552	-231	0.96	-1.69	-4.73
20 to 24	-2,104,369	-411	0.72	-3.15	-6.64
15 to 19	-1,793,003	-298	0.87	-2.31	-3.95
10 to 14	1,630,754	40	1.25	0.37	0.83
less than 10%	-2,469,864	-57	1.19	-0.18	0.03
<b>Population</b> (thousands)					
50.0 or more	-5,029,323	-78	1.11	-0.49	-0.79
12.5 to 49.9	1,662,963	153	1.44	1.54	3.40
6.5 to 12.0	-2,240,726	-274	0.87	-2.13	-4.25
3.6 to 6.4	-1,546,635	-316	0.85	-2.55	-4.54
less than 3.6	-944,138	-269	0.92	-1.92	-4.46
<b>State Planning Region</b>					
1	-2,960,731	-226	0.96	-1.40	-2.98
2	2,810,943	-219	2.11	-1.75	-3.52
3	-574,465	-233	1.05	-1.28	-2.26
4	9,144,166	172	1.47	1.78	3.76
5	-3,536,296	-379	0.80	-2.70	-5.48
6	-873,199	-269	0.86	-2.29	-4.66
7	-3,409,701	-173	1.12	-1.45	-2.49
8	-701,196	-94	1.09	-0.69	-1.28
<b>Location</b>					
West	-1,317,433	-130	1.05	-0.88	-1.74
West Central	-3,163,154	-192	0.97	-1.58	-2.91
East Central	-753,666	-255	0.93	-1.89	-3.70
East	1,535,889	-159	1.08	-0.91	-1.78

APPENDIX TABLE D4. TOTAL BENEFITS RECEIVED EXCLUDING ENERGY TAX DISTRIBUTIONS LESS TAXES PAID EXCLUDING ENERGY TAXES, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Annual Net Benefit Received Per County	Average Per Capita Net Annual Benefit Received	Net Benefit Ratio Index	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars			percent	
<b>Total Personal Income</b>					
(millions)					
\$750 or more	-5,376,963	-83	1.28	-0.53	-0.85
150 to 749	345,257	68	1.47	0.64	1.16
90 to 149	-2,253,653	-287	1.07	-1.90	-3.43
50 to 89	-2,020,252	-413	0.82	-3.27	-6.79
less than 50	-1,196,116	-460	0.82	-3.55	-10.93
<b>Federal Adjusted Gross Income</b>					
(millions)					
\$180 or more	-5,376,962	-83	1.28	-0.53	-0.85
80 to 179	-603,766	-29	1.35	-0.12	-0.05
35 to 79	-1,730,573	-290	1.03	-2.12	-3.64
20 to 34	-1,975,876	-436	0.79	-3.39	-7.21
less than 20	-1,230,378	-456	0.82	-3.50	-11.28
<b>Per Capita Income</b>					
(thousands)					
\$14.0 or more	-3,462,941	-588	0.68	-3.92	-8.54
13.0 to 13.9	-4,199,882	-334	0.94	-2.49	-5.15
12.0 to 12.9	-2,079,760	-385	0.85	-3.13	-10.37
11.0 to 11.9	2,534,709	-67	1.26	-0.62	-1.39
less than 11.0	-652,081	-138	1.28	-1.05	-0.82
<b>Farm Income</b>					
(percent)					
25% or more	1,522,272	-593	0.63	-4.62	-18.01
20 to 24	22,247,677	-449	0.79	-3.42	-7.17
15 to 19	12,042,836	-367	0.94	-2.85	-5.11
10 to 14	21,587	-76	1.26	-0.53	-1.38
less than 10%	-3,241,149	-96	1.31	-0.51	-0.55
<b>Population</b>					
(millions)					
50.0 or more	-5,376,963	-83	1.28	-0.53	-0.85
12.5 to 49.9	918,476	111	1.60	1.18	2.78
6.5 to 12.0	-2,889,574	-345	0.89	-2.70	-5.78
3.6 to 6.4	-1,789,198	-372	0.90	-2.97	-5.60
less than 3.6	-1,488,490	-562	0.67	-4.25	-13.28
<b>State Planning Region</b>					
1	-5,132,894	-464	0.75	-3.19	-8.19
2	-3,296,939	-309	0.93	-2.40	-4.83
3	-627,725	-240	1.22	-1.34	-2.39
4	9,005,409	166	1.69	1.72	3.67
5	-3,674,305	-386	0.93	-2.76	-5.57
6	-911,965	-274	0.99	-2.33	-4.74
7	-4,136,780	-275	1.00	-2.34	-4.27
8	-1,594,271	-481	0.74	-3.76	-13.91
<b>Location</b>					
West	-2,559,350	-476	0.74	-3.61	-12.35
West Central	-3,790,963	-289	0.97	-2.36	-4.50
East Central	-798,269	-261	1.08	-1.93	-3.80
East	1,397,581	-165	1.24	-0.96	-1.88

APPENDIX TABLE D5. TOTAL BENEFITS RECEIVED EXCLUDING ENERGY TAX DISTRIBUTIONS, HIGHER EDUCATION, AND OTHER EXPENDITURES LESS TOTAL TAXES PAID EXCLUDING ENERGY TAXES, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Annual Net Benefit Received Per County	Average Per Capita Net Annual Benefit Received	Net Benefit Ratio Index	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars			percent	
<b>Total Personal Income (millions)</b>					
\$750 or more	-27,354,732	-377	0.87	-3.02	-4.93
150 to 749	-1,631,212	-39	1.42	-0.22	-0.40
90 to 149	-2,858,898	-351	1.06	-2.37	-4.27
50 to 89	-2,020,252	-413	0.88	-3.27	-6.79
less than 50	-1,196,116	-460	0.88	-3.55	-10.93
<b>Federal Adjusted Gross Income (millions)</b>					
\$180 or more	-27,354,733	-377	0.87	-3.02	-4.93
80 to 179	-2,510,806	-146	1.27	-1.05	-1.67
35 to 79	-1,918,737	-310	1.07	-2.27	-3.95
20 to 34	-1,975,876	-436	0.85	-3.39	-7.21
less than 20	-1,230,378	-456	0.88	-3.50	-11.28
<b>Per Capita Income (thousands)</b>					
\$14.0 or more	-3,462,941	-377	0.73	-3.02	-4.93
13.0 to 13.9	-7,274,409	-423	0.88	-3.14	-6.28
12.0 to 12.9	-2,980,897	-408	0.87	-3.31	-10.72
11.0 to 11.9	-3,087,025	-184	1.16	-1.64	-3.10
less than 11.0	-671,081	-140	1.37	-1.07	-0.87
<b>Farm Income (percent)</b>					
25% or more	-1,522,272	-593	0.67	-4.62	-18.01
20 to 24	-2,247,677	-449	0.85	-3.42	-7.17
15 to 19	-2,545,254	-414	0.91	-3.20	-5.75
10 to 14	-105,190	-125	1.28	-0.94	-2.08
less than 10%	-11,680,714	-221	1.18	-1.56	-2.32
<b>Population (thousands)</b>					
50.0 or more	-27,354,732	-377	0.87	-3.02	-4.93
12.5 to 49.9	-877,446	13	1.57	0.39	1.34
6.5 to 12.0	-3,369,228	-397	0.89	-3.07	-6.43
3.6 to 6.4	-1,789,198	-372	0.97	-2.97	-5.60
less than 3.6	-1,488,490	-562	0.72	-4.25	-13.28
<b>State Planning State</b>					
1	-5,132,894	-464	0.81	-3.19	-8.19
2	-4,589,599	-357	0.93	-2.78	-5.55
3	-656,225	-243	1.30	-1.37	-2.46
4	-2,731,985	-4	1.52	-0.19	-1.12
5	-10,446,720	-572	0.72	-4.21	-7.90
6	-1,330,557	-306	1.01	-2.57	-5.22
7	-4,719,015	-285	1.06	-2.41	-4.38
8	-2,188,412	-504	0.76	-3.94	-14.26
<b>Location</b>					
West	-2,991,453	-493	0.76	-3.74	-12.60
West Central	-4,665,726	-315	1.01	-2.56	-4.86
East Central	-1,060,824	-281	1.13	-2.09	-4.12
East	-7,360,826	-344	1.04	-2.45	-4.29

APPENDIX TABLE D6. TOTAL BENEFITS RECEIVED EXCLUDING ENERGY TAX DISTRIBUTIONS, HIGHER EDUCATION, AND OTHER EXPENDITURES LESS TOTAL TAXES PAID EXCLUDING ENERGY AND PROPERTY TAXES, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Annual Net Benefit Received Per County	Average Per Capita Net Annual Benefit Received	Net Benefit Ratio Index	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars			percent	
<b>Total Personal Income</b> (millions)					
\$750 or more	528,711	8	0.87	0.06	0.11
150 to 749	6,264,223	369	1.44	2.98	5.59
90 to 149	655,856	38	1.00	0.69	2.03
50 to 89	212,492	26	0.91	0.27	0.51
less than 50	65,194	-34	0.87	-0.07	-0.96
<b>Federal Adjusted Gross Income</b> (millions)					
\$180 or more	528,711	8	0.87	0.06	0.11
80 to 179	4,860,801	276	1.30	2.25	4.25
35 to 79	996,503	87	1.06	1.01	2.47
20 to 34	67,895	7	0.87	0.11	0.20
less than 20	49,509	-37	0.86	-0.10	-1.05
<b>Per Capita Income</b> (thousands)					
\$14.0 or more	-301,115	-84	0.74	-0.55	-1.22
13.0 to 13.9	436,949	25	0.90	0.19	0.32
12.0 to 12.9	1,425,336	4	0.88	0.01	-1.96
11.0 to 11.9	3,232,194	225	1.23	1.90	3.65
less than 11.0	1,578,572	185	1.29	2.15	6.53
<b>Farm Income</b> (percent)					
25% or more	-191,872	-136	0.69	-1.03	-5.56
20 to 24	90,204	17	0.89	0.16	0.50
15 to 19	117,984	16	0.92	0.29	1.33
10 to 14	3,570,770	259	1.27	2.14	3.97
less than 10%	2,904,382	153	1.16	1.51	3.42
<b>Population</b> (thousands)					
50.0 or more	528,711	8	0.87	0.06	0.11
12.5 to 49.9	6,480,203	396	1.56	3.52	7.25
6.5 to 12.0	27,082	6	0.88	0.11	0.33
3.6 to 6.4	231,413	51	0.97	0.58	1.95
less than 3.6	-154,121	-96	0.74	-0.73	-3.51
<b>State Planning Region</b>					
1	-275,760	-464	0.77	-3.21	-8.24
2	383,117	27	0.91	0.26	0.49
3	2,407,719	193	1.27	2.08	5.10
4	7,187,729	450	1.61	3.81	7.38
5	-521,603	-71	0.76	-0.49	-0.99
6	2,181,534	136	1.08	1.09	2.06
7	579,377	66	1.02	0.77	2.82
8	214,776	-88	0.75	-0.71	-4.43
<b>Location</b>					
West	80,994	-80	0.76	-0.63	-3.51
West Central	498,564	50	0.97	0.56	1.86
East Central	2,272,008	159	1.15	1.49	3.28
East	2,562,130	138	1.09	1.23	2.36

APPENDIX TABLE D7. TOTAL BENEFITS RECEIVED EXCLUDING ENERGY TAX DISTRIBUTIONS, HIGHER EDUCATION, AGRICULTURAL AND INDUSTRIAL DEVELOPMENT, AND OTHER EXPENDITURES MINUS TOTAL TAXES PAID EXCLUDING ENERGY TAXES, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Annual Net Benefit Received Per County	Average Per Capita Net Annual Benefit Received	Net Benefit Ratio Index	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars			percent	
Total Personal Income (millions)					
\$750 or more	-30,294,208	-408	0.83	-3.26	-5.28
150 to 749	-1,713,894	-42	1.44	-0.24	-0.45
90 to 149	-2,890,220	-356	1.06	-2.40	-4.33
50 to 89	-2,043,245	-418	0.88	-3.31	-6.85
less than 50	-1,247,002	-474	0.86	-3.68	-11.23
Federal Adjusted Gross Income (millions)					
\$180 or more	-30,294,208	-408	0.83	-3.26	-5.28
80 to 179	-2,578,455	-149	1.29	-1.07	-1.71
35 to 79	-1,942,229	-313	1.09	-2.29	-4.00
20 to 34	-2,007,713	-443	0.85	-3.45	-7.31
less than 20	-1,281,264	-469	0.86	-3.62	-11.58
Per Capita Income (thousands)					
\$14.0 or more	-3,537,378	-595	0.74	-3.97	-8.64
13.0 to 13.9	-8,089,736	-431	0.88	-3.20	-6.38
12.0 to 12.9	-3,096,253	-422	0.86	-3.42	-10.94
11.0 to 11.9	-3,087,025	-184	1.18	-1.64	-3.10
less than 11.0	-718,199	-152	1.38	-1.18	-1.17
Farm Income (percent)					
25% or more	-1,582,852	-609	0.65	-4.77	-18.39
20 to 24	-2,287,948	-455	0.85	-3.47	-7.25
15 to 19	-2,545,254	-414	0.92	-3.20	-5.75
10 to 14	-146,578	-134	1.29	-1.01	-2.20
less than 10%	-12,838,849	-241	1.17	-1.72	-2.60
Population (thousands)					
50.0 or more	-30,294,208	-409	0.83	-3.26	-5.28
12.5 to 49.9	-951,860	11	1.59	0.37	1.30
6.5 to 12.0	-3,394,855	-400	0.89	-3.10	-6.47
3.6 to 6.4	-1,841,569	-385	0.95	-3.08	-5.84
less than 3.6	-1,508,278	-567	0.71	-4.29	-13.38
State Planning Region					
1	-5,212,614	-467	0.82	-3.21	-8.24
2	-4,638,646	-358	0.94	-2.78	-5.56
3	-703,208	-250	1.30	-1.42	-2.55
4	-2,731,985	-4	1.54	0.19	1.12
5	-12,349,150	-591	0.70	-4.35	-8.12
6	-1,376,543	-316	1.02	-2.65	-5.36
7	-4,761,422	-296	1.60	-2.51	-4.64
8	-2,281,216	-515	0.74	-4.03	-14.45
Location					
West	-3,080,688	-502	0.77	-3.81	-12.75
West Central	-4,710,867	-321	1.02	-2.62	-5.02
East Central	-1,107,209	-289	1.14	-2.16	-4.24
East	-8,502,284	-356	1.03	-2.54	-4.42

APPENDIX TABLE D8. TOTAL BENEFITS RECEIVED EXCLUDING ENERGY TAX DISTRIBUTIONS, HIGHER EDUCATION, AGRICULTURAL AND INDUSTRIAL DEVELOPMENT, AND OTHER EXPENDITURES LESS TOTAL TAXES PAID EXCLUDING ENERGY AND PROPERTY TAXES, BY COUNTY GROUP, NORTH DAKOTA, 1986

County Group	Average Annual Net Benefit Received Per County	Average Per Capita Net Annual Benefit Received	Net Benefit Ratio Index	Percent of Total Personal Income	Percent of ND Federal Adjusted Income
	dollars			percent	
Total Personal Income (millions)					
\$750 or more	-2,410,765	-23	0.83	-0.17	-0.24
150 to 749	6,181,541	366	1.46	2.96	5.54
90 to 149	624,534	34	1.00	0.66	1.97
50 to 89	189,499	21	0.91	0.23	0.44
less than 50	14,308	-48	0.85	-0.20	-1.26
Federal Income (millions)					
\$180 or more	-2,410,765	-23	0.83	-0.17	-0.24
80 to 179	4,793,152	273	1.31	2.23	4.21
35 to 79	973,012	84	1.06	0.98	2.42
20 to 34	36,058	0	0.87	0.05	0.11
less than 20	-1.377	-50	0.85	-0.22	-1.35
Per Capita Income (thousands)					
\$14.0 or more	-375,552	-91	0.74	-0.60	-1.32
13.0 to 13.9	-378,378	16	0.89	0.13	0.22
12.0 to 12.9	1,309,979	-10	0.87	-0.10	-2.17
11.0 to 11.9	3,232,194	225	1.24	1.90	3.65
less than 11.0	1,531,454	172	1.28	2.03	6.24
Farm Income (percent)					
25% or more	-252,452	-152	0.67	-1.18	-5.94
20 to 24	49,933	11	0.89	0.12	0.42
15 to 19	117,984	16	0.93	0.29	1.33
10 to 14	3,529,382	250	1.28	2.07	3.84
less than 10%	1,746,246	134	1.14	1.35	3.14
Population (thousands)					
50.0 or more	-2,410,765	-23	0.83	-0.17	-0.24
12.5 to 49.9	6,405,789	393	1.57	3.50	7.21
6.5 to 12.0	1,455	2	0.88	0.08	0.28
3.6 to 6.4	179,042	39	0.97	0.47	1.71
less than 3.6	-173,908	-102	0.73	-0.78	-3.61
State Planning Region					
1	-355,479	-62	0.76	-0.43	-1.09
2	334,070	26	0.91	0.25	0.48
3	2,360,736	187	1.28	2.03	5.01
4	7,187,729	450	1.62	3.81	7.38
5	-2,424,033	-90	0.73	-0.64	-1.21
6	2,135,547	126	1.07	1.01	1.93
7	536,970	55	1.01	0.66	2.55
8	121,973	-99	0.74	-0.80	-4.62
Location					
West	-8,241	-89	0.75	-0.70	-3.66
West Central	453,423	43	0.97	0.50	1.70
East Central	2,225,623	150	1.16	1.42	3.16
East	1,420,672	126	1.09	1.14	2.23