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ECONOMIC PROFILE OF BILLINGS COUNTY

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ECONOMIC PROFILE OF BILLINGS COUNTY

ABSTRACT

Policies affecting the use of public lands can have direct consequences for industries that rely on outputs from those lands. In recent years, environmental concerns have prompted a revisiting of the policies governing the use of those lands. Subsequently, alternative policies have been proposed that would move the management of some public lands away from the concepts of "multiple use" to those of limited access or wilderness designations, ultimately eliminating many consumptive uses on those lands. Thus, for industries and regional economies relying on public resources, it is necessary to (1) draw attention to the economic importance of those lands, (2) identify the potential consequences of changes in their management and use, and (3) develop plans and options for the future use of those resources.

Billings County, in western North Dakota, is comprised of about 50 percent public land. Natural resource use plays a critical role in the county's economy. Public lands provide important inputs for local industries in Billings County, such as oil and natural gas production, livestock grazing, wildlife production, scenic attractions, and outdoor recreation.

Energy and agriculture are the largest industries, accounting for 88 percent of all "new wealth" in the county. The remaining activity comes from tourism and federal activities. Overall, the size of the county's economic base has been decreasing, paralleling declines in the energy industry.

The economic effect of potential changes in local industries was demonstrated by changing the level of economic base activities in key industries and using input/output analysis to show the subsequent secondary effects on the regional economy. From the information provided, Billings County can determine the economic consequences of changes in the use of the county's natural resources.

Keywords: public land use, economic base analysis, basic sector industries, North Dakota.

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ABSTRACT

Policies affecting the use of public lands can have direct consequences for industries that rely on outputs from those lands. In recent years, environmental concerns have prompted a revisiting of the policies governing the use of those lands. Subsequently, alternative policies have been proposed that would move the management of some public lands away from the concepts of "multiple use" to those of limited access or wilderness designations, ultimately eliminating many consumptive uses on those lands. Thus, for industries and regional economies relying on public resources, it is necessary to (1) draw attention to the economic importance of those lands, (2) identify the potential consequences of changes in their management and use, and (3) develop plans and options for the future use of those resources.

Billings County, in western North Dakota, is comprised of about 50 percent public land. Natural resource use plays a critical role in the county's economy. Public lands provide important inputs for local industries in Billings County, such as oil and natural gas production, livestock grazing, wildlife production, scenic attractions, and outdoor recreation.

Energy and agriculture are the largest industries, accounting for 88 percent of all "new wealth" in the county. The remaining activity comes from tourism and federal activities. Overall, the size of the county's economic base has been decreasing, paralleling declines in the energy industry.

The economic effect of potential changes in local industries was demonstrated by changing the level of economic base activities in key industries and using input/output analysis to show the subsequent secondary effects on the regional economy. From the information provided, Billings County can determine the economic consequences of changes in the use of the county's natural resources.

Keywords: public land use, economic base analysis, basic sector industries, North Dakota.

HIGHLIGHTS

Billings County, in western North Dakota, contains large amounts of public land. Recent policy discussions regarding use of public lands have prompted local entities to develop land use plans to facilitate local involvement in policy and management debates. The purpose of this report is to describe the local economy in Billings County.

Economic base data, information measuring the value of goods and services that produce new wealth (basic income) in a region, were used in the study to measure the relative size and health of the area economies. Regionally, the economy (State Planning Region 8) has nearly equal reliance on agriculture, federal activities, and energy sector activities, whereas Billings County is highly reliant on energy activities (the energy sector has accounted for 80 percent of all economic base activity in recent years). The remaining basic industries (agriculture, tourism, and federal activities) comprise about 11, 6, and 3 percent of the county's economic base, respectively. Billings County has no manufacturing industries or retail trade centers.

In terms of changes in the size of its economic base, Billings County has fared worse than the surrounding region. The county's economic base has declined from $235 million in 1990 to $136 million in 1994 (42 percent decline compared to a 9 percent decrease for the region). Declines in the energy sector (50 percent since 1990) are the underlying force in the county's declining economic base. Although agriculture (comprised of 75 percent livestock and 25 percent crop activity) decreased 10 percent from 1990, recent fluctuations appear typical of historic changes. Real increases since 1990 in tourism (54 percent) and federal activities (7 percent) have had little effect in offsetting decreases in other sectors.

Population changes from 1960 through 1990 were similar to surrounding counties. However, recent population estimates suggest population in Billings County has increased, contrary to regional trends. Employment within the county has continued to decrease, with recent declines diverging from regional averages. Employment in agriculture and government has remained steady since 1980, while employment in private industry (mostly energy related) has decreased. Although overall levels of employment have decreased while population has increased, unemployment within the county has remained low (3 to 4 percent). Measures of income, such as per capita income, persons below poverty levels, and median family income, imply strong connections to energy revenues.

To look at potential future scenarios in Billings County, energy, agriculture, and tourism sector activities within the county were changed. These scenarios illustrate the county and regional effects of hypothetical (yet possible) changes in those industries. The hypothetical scenarios illustrated that the economy-wide effects (measured in terms of state tax revenues, personal income, retail trade, gross business volume, and secondary employment) of small percentage changes in the energy sector overshadow large changes in other industries. Adjustments to livestock activities demonstrated the reliance of the county's livestock industry on public grazing.

Billings County's economy is directly linked to the health of the energy sector.

Continued declines in energy sector activities will place greater emphasis and importance on other industries. Considering trends over the past five years, the county's economy will likely continue to parallel changes in energy activities. Population within the county in the future will remain contingent on employment opportunities within the county and region. All of the major economic base industries in Billings County rely on natural resources (cropland, grazing land, mineral deposits, and scenic attractions).

Economic Profile of Billings County

Dean A. Bangsund and F. Larry Leistritz*

INTRODUCTION

North Dakota, like other Great Plains states, relies heavily upon a few industries for most of its economic activity. The economic contribution of the state's major industries has been repeatedly documented (Coon et al. 1986; Coon and Leistritz 1987; Coon and Leistritz 1989; Leistritz and Coon 1991; Coon et al. 1992; Leistritz et al. 1993; Coon and Leistritz 1994). The importance of any industry can be measured by examining the amount of money that the activity brings into an area, sometimes called the economic base or basic income.

From 1990 through 1994, agriculture and federal activities were the largest components of North Dakota's economic base, accounting for over 70 percent of North Dakota's basic sector industries. Energy, third in economic importance during the period, accounted for about 13 percent of the state's economic base. Tourism and manufacturing, while both exhibiting real growth, combined for only 14 percent of the state's economic base (Figure 1).

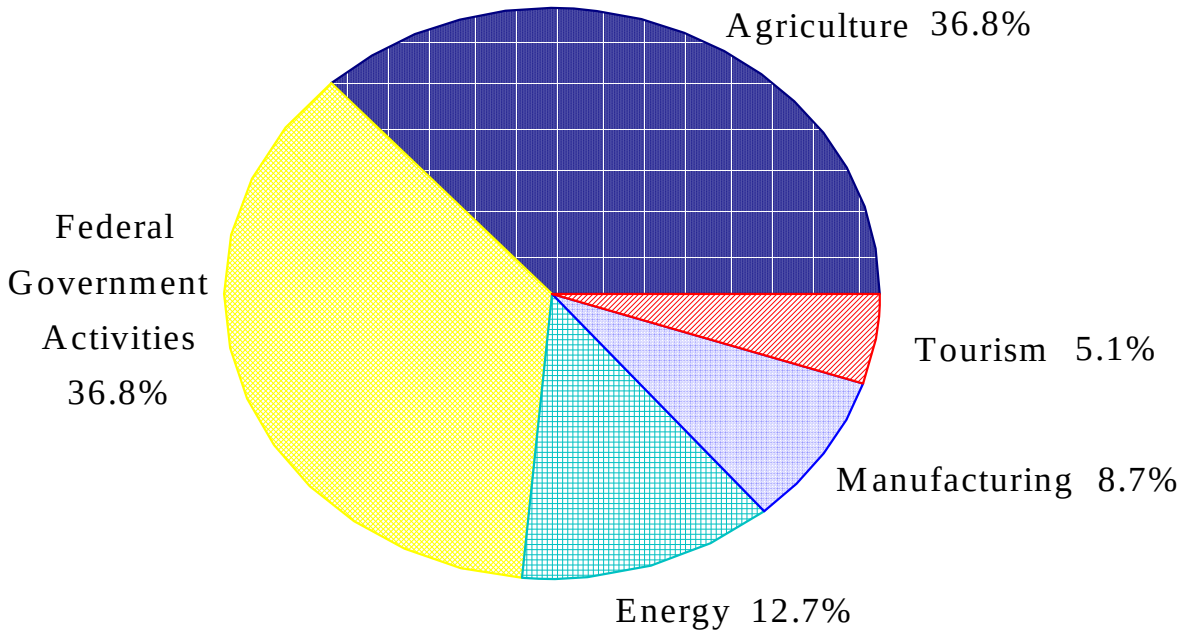


Figure 1. North Dakota's Economic Base, 1990 Through 1994
Source: Coon and Leistritz (1995).

* Research scientist and professor, respectively, Department of Agricultural Economics, North Dakota State University, Fargo.

The overall contribution of agriculture and federal activities to North Dakota's economy overshadows the importance of various industries to specific regions in the state. In the eastern regions of the state (primarily the Red River Valley), agriculture is the dominant industry, followed by federal activities and, to a lesser extent, manufacturing. However, western areas of the state rely primarily on energy and agriculture, and to some extent, federal activities. Generally, agricultural is important in all regions of the state; while energy is of regional importance in western areas of the state.

Particular concerns arise when an area's economic base is extensively reliant on public resources, and as such, can be susceptible to policies affecting the management and use of those resources. This argument could be made for the the southwest region (State Planning Region 8) of North Dakota (Figure 2). The economic base in the southwestern portion of North Dakota from 1990 through 1994 was primarily composed of agriculture (35%), energy (32%), and federal activities (21%). Although the region has a reasonably balanced economic base, some of that base relies on public lands.

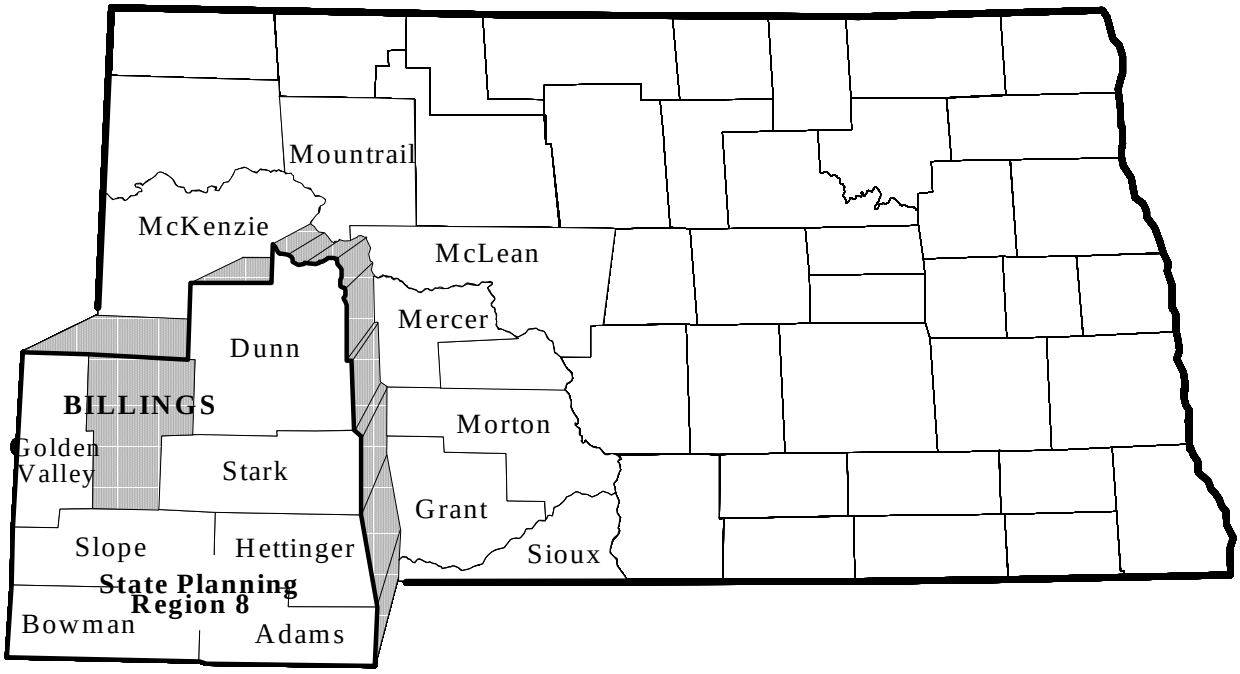


Figure 2. Billings County and State Planning Region 8, North Dakota

Policies affecting the use of public lands can have direct consequences for industries that rely on outputs from those lands. In recent years, environmental concerns have prompted a revisiting of the policies governing the use of those lands. Subsequently, alternative policies have been proposed that would move the management of some public lands away from the

concepts of "multiple use" to those of limited access or wilderness designations, ultimately eliminating many consumptive uses on those lands. Thus, for industries and regional economies relying on public resources, it is necessary to (1) draw attention to the economic importance of those lands, (2) identify the potential consequences of changes in their management and use, and (3) develop plans and options for the future use of those resources.

OBJECTIVES

The purpose of this report is to provide an economic description of Billings County and the surrounding area of North Dakota. Specific efforts include describing the current economic base, charting changes in population, and illustrating changes in economic activity for the county and immediate area given hypothetical changes in current industry activities.

PROCEDURES

This report was designed to provide an illustrative and descriptive look at the economic base and related information of a particular region in North Dakota, (i.e., primarily Billings County). Historical information on the area's economic base was compiled to produce a past and current portrait of the relative economic strength of key industries in the region. Additional information, such as population characteristics, land use statistics, employment, and income statistics, also was gathered to provide an overall view of the current economic situation in the region.

Several scenarios were used to show the potential effects (direct and secondary) of changes in basic sector industries in the area. These alternative economic scenarios were based on changing the current levels of important industries in Billings County. Direct impacts on basic sector industries were quantified and used with input/output analysis to show the overall impacts on local employment, related economic sectors, personal income, tax revenue, and gross business volume.

Data Sources

Information for this study came primarily from secondary data sources (i.e., those already existing) in the Department of Agricultural Economics at North Dakota State University, the *Census of Agriculture*, North Dakota Agricultural Statistics Service, and the U.S. Bureau of Economic Analysis (U.S. Department of Commerce). Additional information was gathered from industry personnel.

Input-Output Analysis

Economic activity from a project, program, or policy can lead to both direct and secondary impacts. Direct impacts are those changes in output, employment, or income that represent the initial or direct effects of the project, program, or policy. Secondary impacts

(sometimes further categorized into indirect and induced effects) result from subsequent rounds of spending and respending within the economy. This process of spending and respending is sometimes termed the multiplier process, and the resultant secondary effects are sometimes referred to as multiplier effects (Leistritz and Murdock 1981).

This process of spending and respending can be explained by using an example. A single dollar from an area wheat producer (**Households** sector) may be spent for a loaf of bread at the local store (**Retail Trade** sector); the store uses part of that dollar to pay for the next shipment of bread (**Transportation** and **Agricultural Processing** sectors) and part to pay the store employee (**Households** sector) who shelved or sold the bread; the bread supplier uses part of that dollar to pay for the grain used to make the bread (**Agriculture-Crops** sector) ... and so on (Hamm et al. 1993).

Input-output (I-O) analysis is a mathematical tool that traces linkages among sectors of an economy and calculates the total business activity resulting from a direct impact in a basic sector (Coon et al. 1985). The North Dakota I-O Model has 17 economic sectors, is closed with respect to households (households are included in the model and represent economy-wide estimates of personal income), and was developed from primary (survey) data from firms and households in North Dakota. Empirical testing has shown the North Dakota Input-Output Model is sufficiently accurate in estimating gross business volume, personal income, retail activity, and economic activity in other major sectors in North Dakota (Coon and Leistritz 1994).

CURRENT ECONOMIC PROFILE

The following sections describe various economic and demographic aspects of Billings County, the surrounding area, and the state of North Dakota. The following sections contain a descriptive view of the state, State Planning Region 8 (SPR8), and Billings County economies.

Physical Indicators

Billings County is in western North Dakota in an area characterized by rugged topography consisting of large expanses of open land combined with buttes and eroded stream beds. The south unit of Theodore Roosevelt National Park (TRNP) is within Billings County and typifies much of the scenic characteristics of the area. In addition to the classic “badlands” features, much of the area consists of rolling grasslands and pockets of tillable farm land. The total land area of Billings County is 1,151.5 square miles or 736,960 acres (Table 1). The largest uses of the county’s land include livestock grazing (76 percent) and crop production (18 percent). The regional average for land use is about 50 percent rangeland and just less than 50 percent cropland.

Although Billings County contains less cropland and more rangeland (as percent of area) than typically found in the region, cropland use parallels the cropping patterns found in the region (Table 2). Traditionally, alfalfa (32 percent) and wheat (23 percent) comprise the greatest

use of cropland in Billings County. State Planning Region 8 averages are somewhat

Table 1. Land Categories, Billings County and Neighboring Counties, North Dakota

County	Land Use			
	Total	Cropland	Rangeland	Other
	acres			
Billings[a]	736,960	130,000	557,960	49,000
Other State Planning Region 8 Counties				
Adams	632,230	379,200	213,600	39,520
Bowman	743,744	343,300	355,600	44,844
Dunn	1,286,400	448,600	808,400	29,400
Golden Valley	641,280	261,200	312,400	67,680
Hettinger	724,672	569,300	113,500	41,872
Slope	779,520	303,000	444,800	31,720
Stark	856,512	544,100	277,800	34,612
Region Totals	6,401,408	2,978,700	3,084,061	338,647
North Dakota	45,225,600	27,436,875	10,284,485	7,504,240
Billings--% of state	1.6%	0.5%	5.4%	0.7%
Region--% of state	14.2%	10.9%	30.0%	4.5%

Acreage for other land consisted of Medora and associated lands, surface water, Theodore Roosevelt National Park, Elkhorn Ranch, and interstate right-of-way.

Sources: North Dakota State Census Data Center (1994) and U.S. Bureau of the Census (1994).

Table 2. Average Cropland Use, Billings County and Neighboring Counties, North Dakota, 1990 Through 1994

Crop	Billings	Adams	Bowman	Dunn	Golden Valley	Hettinger	Slope	Stark	Region Average
	percent of crop acreage								
Wheat	22.7	32.7	29.1	29.9	41.9	41.4	37.7	36.5	35.0
Alfalfa	32.0	12.0	11.6	22.3	5.3	6.3	11.6	14.4	13.2
Oats	5.0	2.0	2.1	4.7	3.0	1.7	1.7	4.4	3.0
Barley	3.2	4.7	5.0	6.4	8.5	4.9	6.0	6.3	5.6
Corn	1.3	2.1	0.9	4.3	0.6	0.8	0.9	2.6	1.8
Rye	0.3	0.1	0.1	0.1	0.0	0.1	0.2	0.1	0.1
Sunflower	0.3	0.6	0.4	0.4	0.1	0.7	0.5	0.4	0.5
Flax	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1
Dry Edible Beans	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.1
CRP	17.7	22.4	25.0	13.8	18.9	17.7	10.2	11.7	16.9
Summer fallow	17.5	23.3	25.6	18.0	21.4	25.9	31.2	23.4	23.7

Source: North Dakota Agricultural Statistics Service (1993, 1994, and 1995).

lower for alfalfa and slightly higher for wheat, yet account for about the same overall percentage of cropland. Other crops in Billings County also are similar in percentage of cropland use found in the region, including summer fallow and Conservation Reserve Program (CRP) acreage. Crop patterns in the area show a high reliance on grain crops (primarily wheat) and some reliance on alfalfa, which is primarily based on feed requirements for livestock operations.

An important aspect of Billings County is land ownership. Unlike most counties in the state and region, Billings County contains large amounts of public land. Federal agencies own about 337,000 acres[1] or 46 percent of all land in the county. This compares to only about 10 percent for the rest of the region (Table 3). In addition to federally controlled land, the State of North Dakota owns over 31,000 acres in the county--more than any other SPR8 county. Billings County is comprised of about 50 percent public land, compared to about 7 percent for the rest of the region (excluding Billings County). Billings County has (as a percentage and in total acres) less private land than the regional average.

Table 3. Land Ownership in Billings County and Surrounding Counties, North Dakota

County	Land Ownership					
	Federal		State		Private	
	---- acres ---	- percent -	--- acres ---	- percent -	--- acres ---	- percent -
Billings	337,082	45.7	31,074	4.2	368,804	50.1
Other SPR8 Counties						
Adams	40	0.0	17,116	2.7	615,164	97.3
Bowman	33,905	4.6	28,774	3.9	681,065	91.3
Dunn	18,585	1.4	30,712	2.4	1,237,103	96.2
Golden Valley	96,262	15.0	28,343	4.4	516,675	80.6
Hettinger	0	0.0	9,881	1.4	714,791	98.6
Slope	138,656	17.8	23,605	3.0	617,259	79.2
Stark	0	0.0	6,095	0.7	850,417	99.3
SPR8 Totals	624,530	9.8	175,578	2.7	5,601,300	87.5

Sources: North Dakota State Census Data Center (1994) and Bangsund and Leistritz (1992).

Economic Base

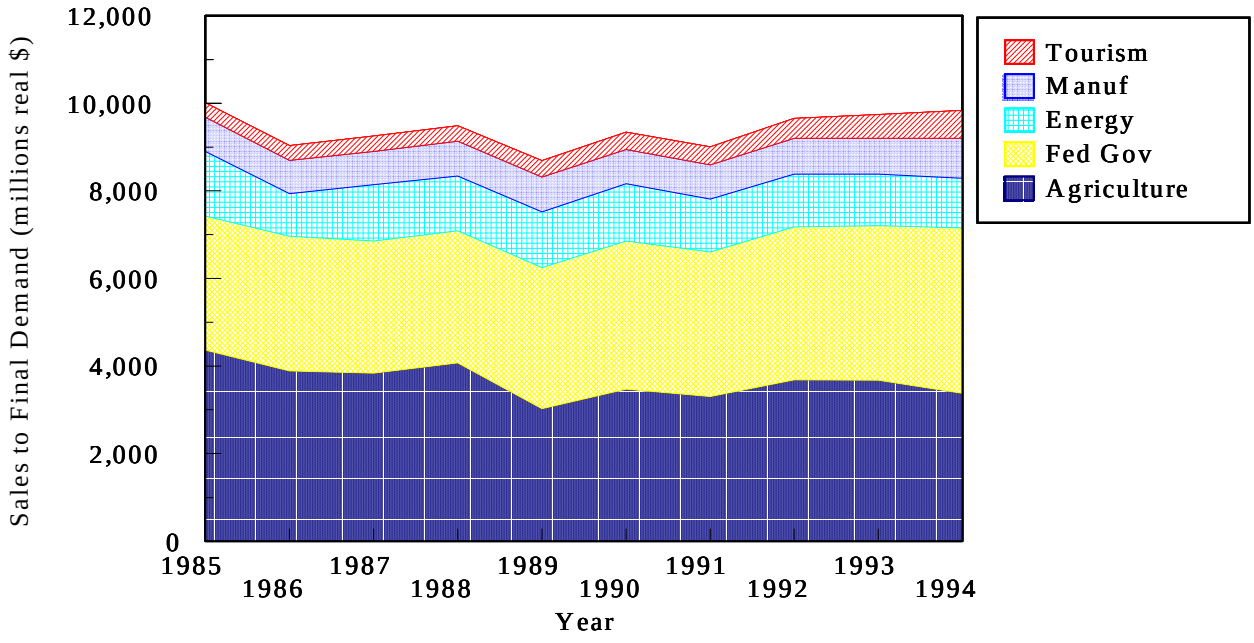
Economic base is the term used to describe the industries, sectors, or common economic activities that bring "new" money into an area. Economic base data represent sales of goods and services produced within an area to entities outside the area. The area in question can be any reasonable geographical unit--county, multi-county region, state, multi-state area, etc. Also, goods and services considered "sales to final demand" vary by area definition.

[1]Federal ownership consists of 290,066 acres of National Grasslands, 640 acres of Bureau of Land Management land, and 47,376 acres in National Parks.

Economic base activities represent only a portion of all economic activity in an area. Other industries (sometimes called derivative or residentiary) are those whose existence derives from the presence of basic (primary sector) industries (Hertsgaard et al. 1984). The spending and respending of economic base or primary sector dollars creates spillover (multiplier) effects, which in turn support other sectors of the economy. Economic base is an important economic measure since the size and composition of an area's economic base says much about the strengths and weaknesses of its economy. Without a strong economic base, or activities producing goods and services for export from an area, overall economic activity reflected by personal income, retail trade activity, and other economic measures becomes largely reliant on spillover effects from economic base activities in other areas.

The economic base in North Dakota has been primarily composed of federal activities, agriculture, energy, manufacturing, and tourism (Figure 3). Federal activities include federal construction, military operations, federal payrolls, and transfer payments to households (e.g., social security). Agriculture includes all livestock and crop production activities, including all farm commodity program payments except CRP payments. Energy activities include petroleum and coal extraction, petroleum refining, and coal conversion activities. Manufacturing includes all miscellaneous manufacturing and agricultural processing activities. Tourism includes expenditures by out-of-state visitors for retail items and sales of business and personal services (tours, motel/hotel accommodations, campgrounds, etc.).

Figure 3. Economic Base in Real (1994) Dollars, North Dakota, 1985 Through 1994



Source: Coon and Leistritz (1995).

Historically, North Dakota's economic base has been dominated by agriculture and federal activities. Until 1994, agriculture was the largest single industry; federal activities now occupy the largest portion of North Dakota's economic base (Table 4). Real growth (i.e., growth after the effects of inflation have been removed) has occurred in several primary sectors of the state's economy. Since 1990, North Dakota's economic base has increased 5 percent. Crop activities, accounting for about three-quarters of all agricultural activity, have increased about 6 percent since 1990, whereas, livestock activities have declined 29 percent since 1990. Federal activities, as a percentage of the state's economic base and in real dollars, have increased steadily since 1985. Federal transfer payments to households have been the largest growth factor in this sector. Real growth also has occurred in manufacturing (16 percent since 1990) and tourism activities (62 percent since 1990).

The economic base in SPR8 is comprised primarily of agriculture, federal, and energy activities (Figure 4). From 1990 to 1994, agriculture comprised about 35 percent of the region's economic base, with federal activities accounting for 21 percent, and energy activities making up one-third (Table 5). Manufacturing and tourism collectively counted for 11 percent of the region's economic base.

Table 4. Economic Base, North Dakota, 1985 Through 1994

Year	Economic Base				
	Agriculture	Federal Activities	Energy	Manufacturing	Tourism
	millions of dollars (real)				
1985	4,361	3,064	1,481	776	336
1986	3.891	3,078	967	763	335
1987	3,840	3,014	1,292	768	347
1988	4,075	3,019	1,247	798	357
1989	3,027	3,226	1,268	804	371
1990	3,470	3,385	1,313	786	395
1991	3,308	3,303	1,208	781	415
1992	3,683	3,498	1,204	821	454
1993	3,675	3,530	1,179	820	543
1994	3,379	3,783	1,131	910	638
	percent of total				
1985	43.5	30.6	14.8	7.7	3.4
1986	43.1	34.1	10.7	8.4	3.7
1987	41.5	32.5	13.9	8.3	3.8
1988	42.9	31.8	13.1	8.4	3.8
1989	34.8	37.1	14.6	9.2	4.3
1990	37.1	36.2	14.0	8.4	4.2
1991	36.7	36.6	13.4	8.7	4.6
1992	38.1	36.2	12.5	8.5	4.7
1993	37.7	36.2	12.1	8.4	5.6
1994	34.3	38.4	11.5	9.2	6.5

Source: Coon and Leistritz (1995).

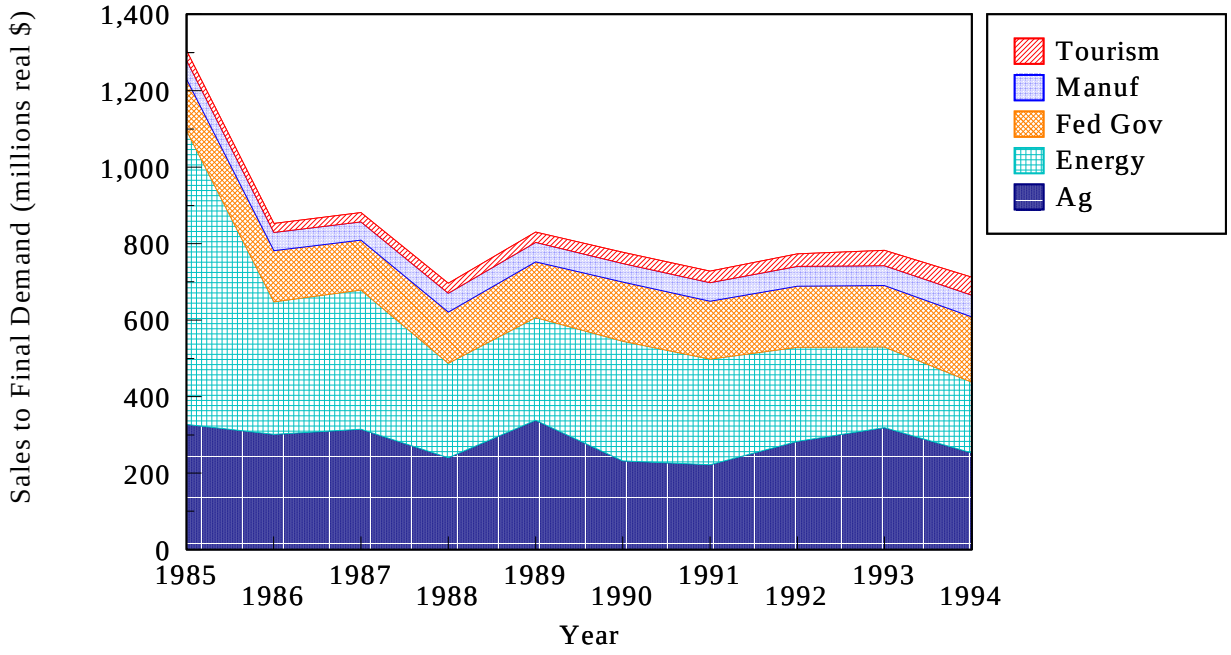


Figure 4. Economic Base of State Planning Region 8 in Real (1994) Dollars, North Dakota, 1985 Through 1994

Source: Coon and Leistritz (1995).

The strength of economic base industries in SPR8 has changed much since 1985 (Table 5). The economic base in the region has decreased in real terms about 9 percent from 1990 and about 45 percent from 1985. Most of the decrease since 1985 can be attributed to large declines in the energy sector. Energy, as a percentage of the region's economic base, decreased over 40 percent ($128 million) from 1990 through 1994 and has dropped 76 percent ($584 million) since 1985. On the other hand, tourism (61 percent), manufacturing (16 percent), federal activities (10 percent), and agriculture (9 percent) all showed positive real growth from 1990 through 1994. Although tourism increased dramatically in percentage terms, the sector only increased by $18 million from 1990 to 1994 and accounted for only 6.5 percent of the region's economic base in 1994. The small increase in the agriculture sector hides the volatility that has occurred in that sector over the period. Livestock activities decreased 26 percent from 1990 through 1994, while crop activities increased 73 percent--largely due to crop production being relatively low in 1990. Crop activities for the region reached a ten-year high in 1989 at $220 million, then dropped the following year to the second lowest level in a decade ($82.6 million) only to increase to over $200 million by 1993, but drop again to $142 million in 1994. Livestock and crop production are nearly equal in their share of the agriculture sector's sales to final demand.

Table 5. Economic Base, State Planning Region 8, North Dakota, 1985 Through 1994

Year	Economic Base				
	Agriculture	Federal Activities	Energy	Manufacturing	Tourism
	millions of dollars (real)				
1985	328	135	769	49	25
1986	301	134	347	48	24
1987	315	131	364	48	25
1988	240	134	247	50	26
1989	338	146	269	51	27
1990	232	155	313	49	29
1991	222	152	276	49	30
1992	283	160	246	52	33
1993	319	161	211	52	40
1994	253	171	185	57	47
	percent of total				
1985	25.1	10.3	58.9	3.7	1.9
1986	35.2	15.7	40.6	5.6	2.9
1987	35.6	14.8	41.2	5.5	2.9
1988	34.4	19.2	35.5	7.2	3.7
1989	40.7	17.6	32.4	6.1	3.3
1990	29.8	19.9	40.2	6.3	3.7
1991	30.4	20.8	37.9	6.7	4.2
1992	36.5	20.7	31.9	6.7	4.3
1993	40.8	20.6	27.0	6.6	5.1
1994	35.6	23.9	25.9	8.0	6.5

Source: Coon and Leistritz (1995).

The economic base in Billings County differs from that of the immediate region and the state in its reliance on one economic sector. In terms of economic base activities, the energy sector in Billings County overshadows all other sectors in the county. Since 1975, energy activities have dominated the economic base in Billings County (Figure 5). Agriculture, while fluctuating since 1960, has maintained its size (Figure 6). More recently, energy activities have accounted for nearly 89 percent of the county's economic base (Figure 7). Agriculture, the second largest primary sector, accounted for 9 percent of the county's sales to final demand. Agriculture has decreased about 15 percent since 1990, fluctuating during the period from $14.5 million to $19.9 million. The tourism sector, comprised of purchases by out-of-state visitors for retail items and business and personal services (Appendix Table 1), increased over 50 percent from 1990 to 1994. Also, federal activities increased (7 percent) during the period. However, overall, the economic base in the region decreased 42 percent from 1990 to 1994 (Table 6).

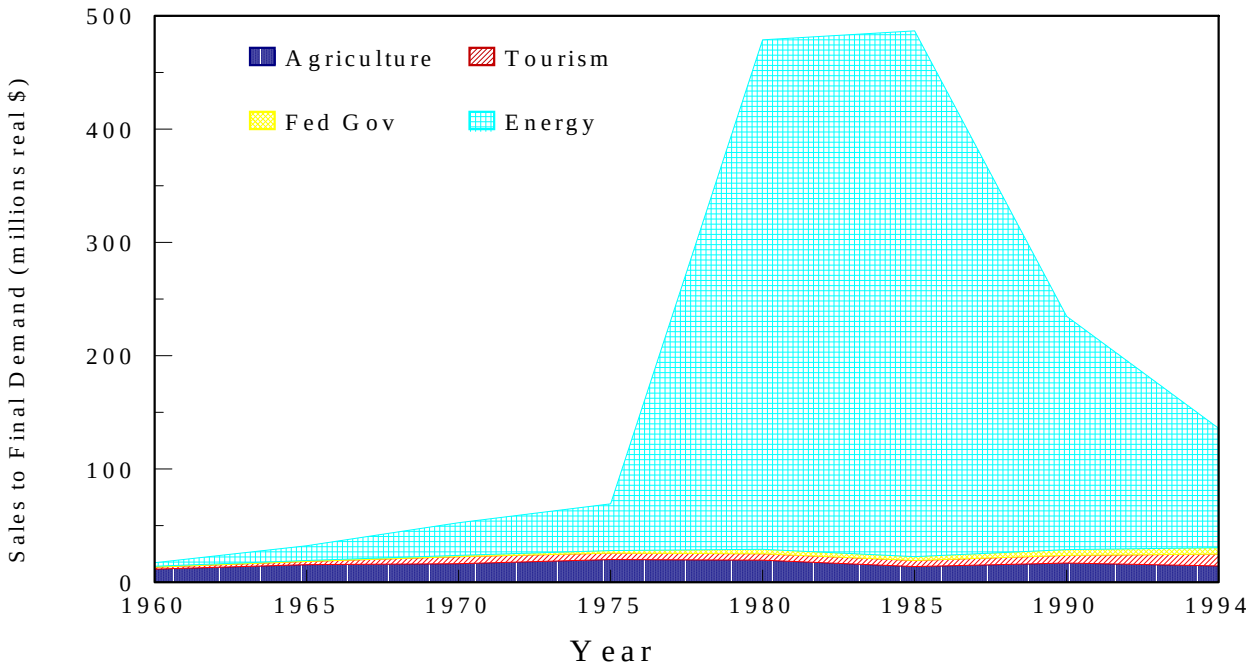


Figure 5. Economic Base of Billings County in Real (1994) Dollars, North Dakota, 1960 Through 1994

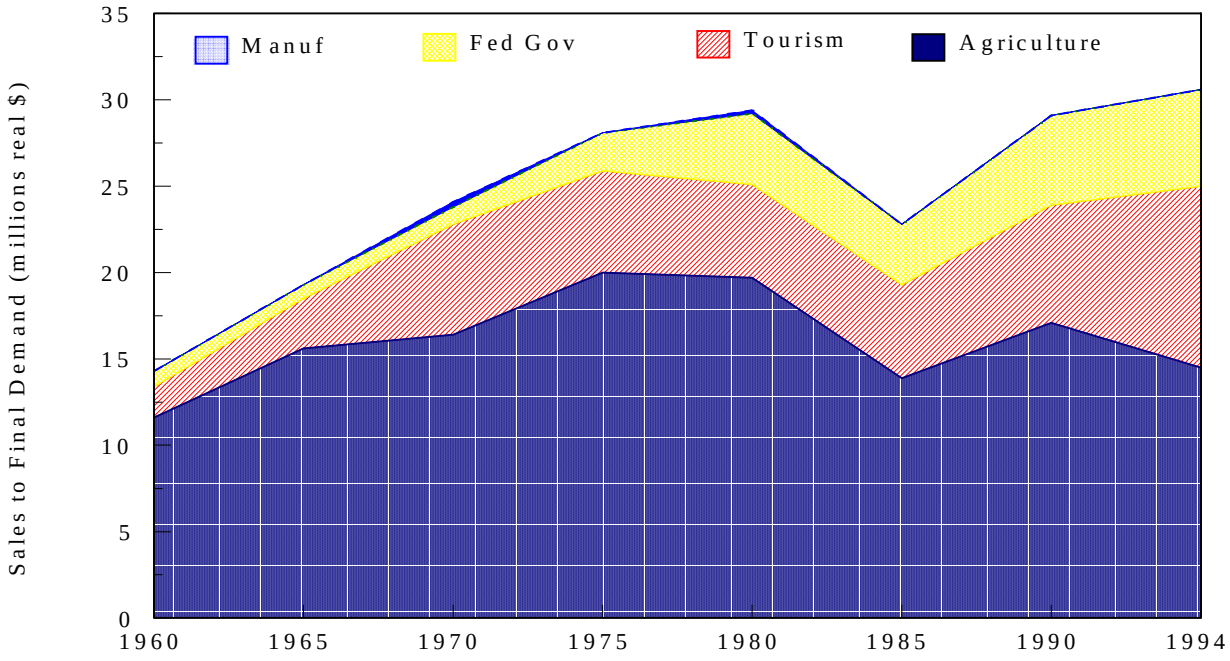


Figure 6. Economic Base of Billings County in Real (1994) Dollars Without Energy Activities, North Dakota, 1960 Through 1994

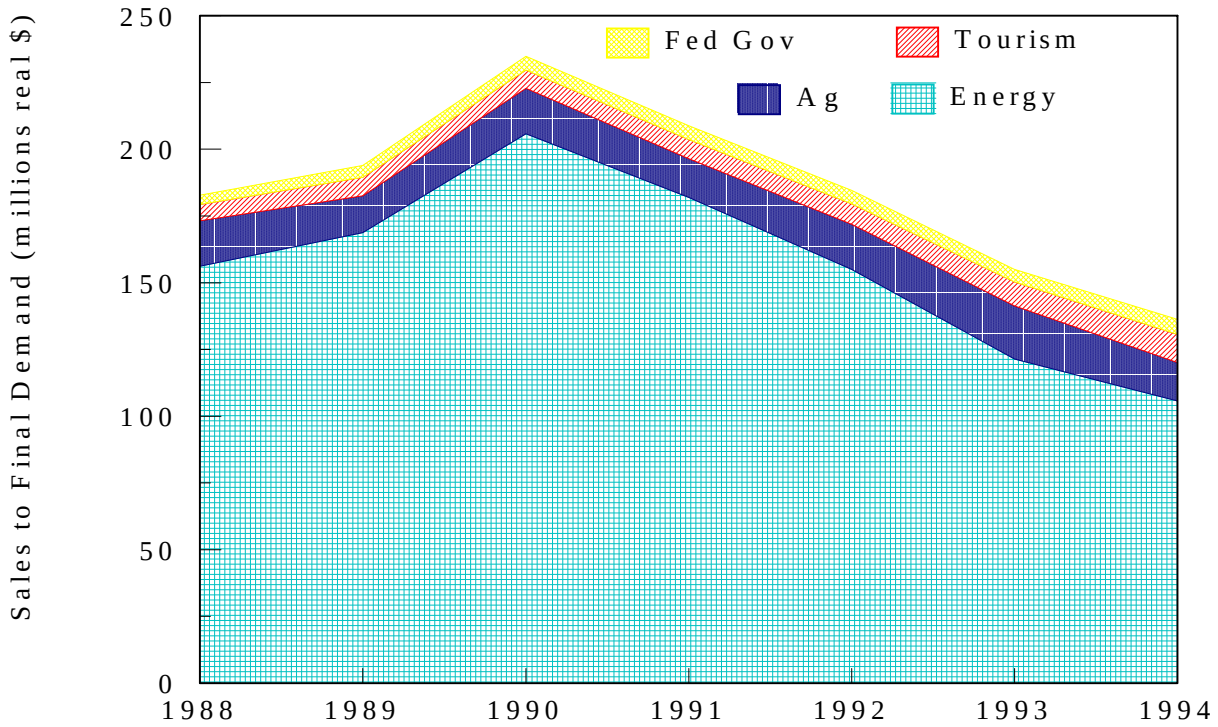


Figure 7. Economic Base of Billings County in Real (1994) Dollars, North Dakota, 1988 Through 1994

Trends in the energy sector and the county's economic base are worse when evaluated since 1985. The county's economic base has decreased 72 percent in real terms since 1985. Correspondingly, the energy sector decreased 77 percent during the period. The large decrease in the energy sector since 1985 overshadows a 93 percent increase in tourism dollars, a 63 percent increase in federal activities, and a 4 percent increase in agriculture activities.

The agriculture sector, comprised of about 75 percent livestock activities, has maintained its size since 1960. In 1960, the agriculture sector had $11.6 million in sales to final demand, reached a peak in 1975 with $20 million, and has since averaged about $16 million annually. Fluctuations within the agriculture sector have been primarily due to weather and market factors. Federal activities and tourism have showed steady and consistent real growth from 1960 to 1994. By contrast, energy activities have been volatile--increasing from a low of $3.1 million in 1960 to a high of $464 million in 1985, only to decrease to $105 million in 1994.

Table 6. Economic Base, Billings County, North Dakota, 1960 Through 1994

Year	Economic Base				
	Agriculture	Federal Activities	Energy	Manufacturing	Tourism
	millions of dollars (real)				
1960	11.6	0.9	3.1	0.0	1.8
1965	15.6	0.8	13.2	0.0	2.9
1970	16.4	1.0	29.1	0.3	6.4
1975	20.0	2.2	41.2	0.0	5.9
1980	19.7	4.1	449.2	0.2	5.4
1985	13.9	3.5	464.4	0.0	5.4
1988	17.0	3.5	156.2	0.0	6.2
1989	13.8	4.4	168.8	0.0	7.0
1990	17.1	5.2	205.8	0.0	6.8
1991	14.5	5.2	182.0	0.0	7.2
1992	16.9	5.0	155.0	0.0	7.8
1993	19.9	4.8	121.4	0.0	9.0
1994	14.5	5.6	105.7	0.0	10.5
	percent of total				
1960	66.7	5.1	17.9	0.0	10.3
1965	48.1	2.5	40.5	0.0	8.9
1970	30.8	1.9	54.7	0.6	11.9
1975	28.9	3.2	59.5	0.0	8.5
1980	4.1	0.9	93.9	0.0	1.1
1985	2.9	0.7	95.3	0.0	1.1
1988	9.3	1.9	85.4	0.0	3.4
1989	7.1	2.3	87.0	0.0	3.6
1990	7.3	2.2	87.6	0.0	2.9
1991	7.0	2.5	87.1	0.0	3.4
1992	9.1	2.7	84.0	0.0	4.2
1993	12.8	3.1	78.3	0.0	5.8
1994	10.6	4.1	77.5	0.0	7.7

Source: Coon and Leistritz (1995).

Demographics

North Dakota is a sparsely populated state in the Upper Great Plains. Like other states in the Upper Great Plains, population levels are relatively low and space is abundant (Table 7). One of the most sparsely populated regions in North Dakota is the southwest portion of the state. Slope, Billings, and Golden Valley Counties are the three least populous counties in the state. Population densities are low in the region (about 4 persons per square mile, but the density would be half the current level if the population of Dickinson was not included) although not uncharacteristic for most of western North Dakota.

Table 7. Population and Population Density, Billings County and State Planning Region 8, North Dakota, 1990

County/Area	Land Area in Square Miles Total	Population	Per Square Mile
Billings	1,151.5	1,108	1.0
Other SPR8 Counties			
Adams	988.0	3,174	3.2
Bowman	1,162.1	3,596	3.1
Dunn	2,010.0	4,005	2.0
Golden Valley	1,002.0	2,108	2.1
Hettinger	1,132.3	3,445	3.0
Slope	1,218.0	907	0.7
Stark	1,338.3	22,832	17.1
SPR8 Totals	10,002.2	41,175	4.1
North Dakota	70,665.0	638,800	9.0
Billings--% of state	1.63	0.17	
SPR8--% of state	14.15	6.45	

Source: North Dakota State Census Data Center (1994).

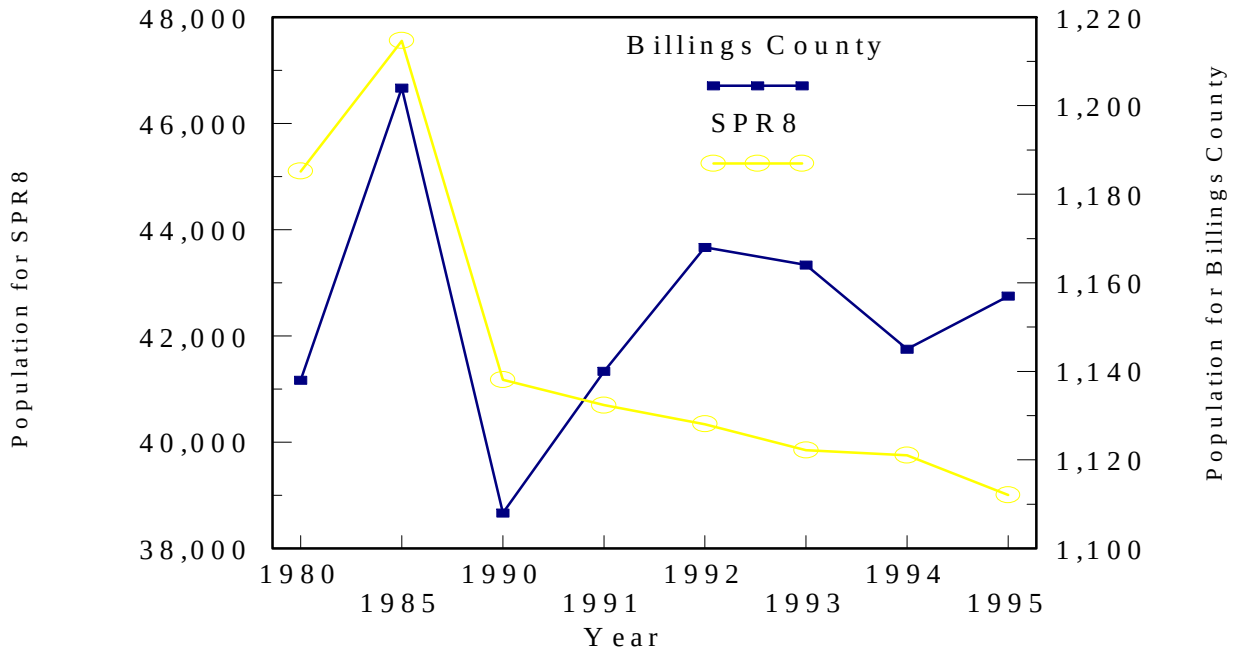


Figure 8. Population, Billings County and State Planning Region 8, North Dakota, 1980 Through 1995

Source: North Dakota State Census Data Center (1996).

Population in the region has generally decreased since 1970 (Appendix Table 2). Population changes in the region are similar to those found throughout North Dakota. The percentage of the state's population in older age segments continues to increase along with increases in the average age--implying an aging population (Appendix Table 3). Along with general aging, substantial portions of the population are already over the age of 65 (about 16 percent for SPR8 and about 14 percent for the state). Thus, the state and SPR8 appear to have aging populations.

The demographic profile for Billings County is somewhat typical of the region (i.e., having a sparse, rural, aging population base). Population in Billings County decreased 5 percent (60 people) from 1970 to 1980 and decreased about 3 percent (30 people) from 1980 to 1990. However, recent population estimates (1990 to 1995) show moderate gains in the county's population (4.4 percent or 49 persons) (Figure 8). Recent trends show Billings County was the only county in SPR8 to increase population since 1980 (Table 8). By comparison, SPR8 experienced a 5 percent decrease in population during the period while the state increased population by only 0.4 percent.

Billings County has a lower average age and a lower percentage of its population over age 65 than most counties in the region (Appendix Table 3). The amount of the population over age 65 in Billings County has increased from 6 percent (10 percent for the region) in 1970 to over 11 percent (16 percent in the region) in 1990. The average age in Billings County has increased from 29 years in 1970 to 33.5 years in 1990. The absence of any trade centers in the county has likely protected the county from experiencing the rapid population changes associated with the rise and decline of energy activities in the region over the last 15 years.

Fiscal Indicators

Other general indicators of a region's economic health can include employment and household income. North Dakota, SPR8, and Billings County from 1990 through 1995 have averaged 3.9 percent, 4.1 percent, and 3.5 percent unemployment, respectively (Job Service North Dakota *various years*). In recent years (1994 and 1995), unemployment in Billings County has exceeded the regional and state rates (Appendix Table 4). Important employment statistics not normally recognizable with unemployment percentages are the size of the labor force and number of jobs. The labor force and overall employment in Billings County has been shrinking since 1980 (Figure 9). The labor force and overall employment in SPR8 and in North Dakota have shown modest increases in recent years (Appendix Table 4).

Table 8. Population Billings County, State Planning Region 8, and North Dakota, 1980 Through 1995

County	1980	1985	1990	1991	1992	1993	1994	1995	Percent Change 1980-95	Percent Change 1990-95
Billings	1,138	1,204	1,108	1,140	1,168	1,163	1,143	1,157	1.7	4.4
State Planning Region 8 Counties										
Adams	3,584	3,578	3,174	3,090	3,022	2,831	2,757	2,593	-27.7	-18.3
Bowman	4,229	4,182	3,596	3,494	3,396	3,350	3,268	3,229	-23.6	-10.2
Dunn	4,627	4,728	4,005	3,926	3,895	3,844	3,819	3,790	-18.1	-5.4
Golden Valley	2,391	2,444	2,108	1,993	1,940	1,923	1,959	1,962	-17.9	-6.9
Hettinger	4,275	3,926	3,445	3,296	3,200	3,129	3,062	3,020	-29.4	-12.3
Slope	1,157	1,095	907	903	884	861	850	821	-29.0	-9.5
Stark	23,697	26,397	22,832	22,851	22,829	22,718	22,851	22,434	-5.3	-1.7
SPR8 Totals	45,098	47,554	41,175	40,699	40,340	39849	39754	39,006	-13.5	-5.3
North Dakota	652,717	676,979	638,800	634,123	635,286	636,842	639,145	641,367	-1.7	0.4

Source: North Dakota State Census Data Center (1996).

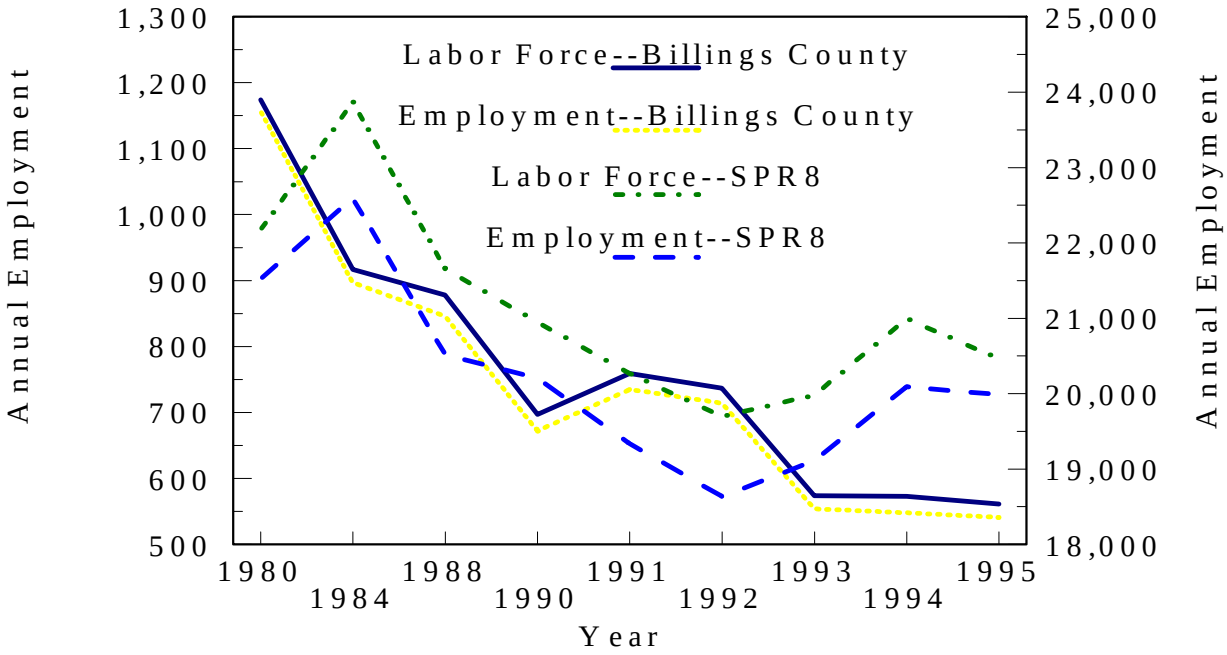


Figure 9. Total Employment and Labor Force, Billings County and State Planning Region 8, North Dakota, 1980 Through 1995

Source: Job Service North Dakota (*various years*).

Although employment in Billings County decreased 43 percent from 1980 to 1993, total employment in agriculture and government has remained mostly steady since 1980. Decreases in employment in private industries (to a large extent energy and associated activities) are largely responsible for the county's employment losses (Figure 10) (see also Appendix Table 5). Similar declines in private industry employment occurred in SPR8 during the late 1980s; however, declines in agriculture also were present, while employment in government remained steady from 1980 through 1993 (Figure 11) (see also Appendix Table 5).

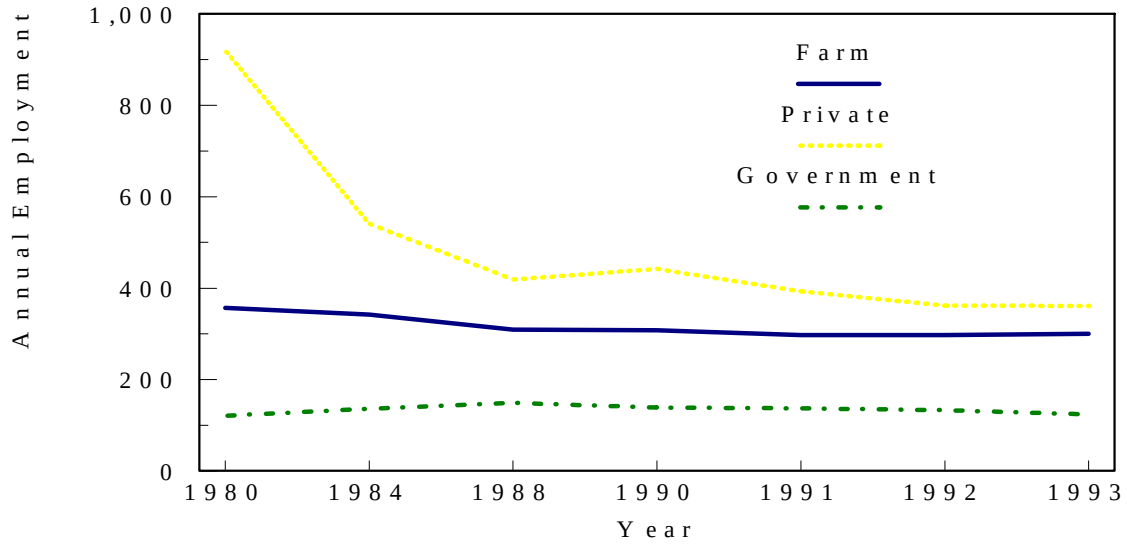


Figure 10. Employment by Industry Group, Billings County, North Dakota, 1980 Through 1993

Source: U.S. Bureau of Economic Analysis (*various years*-a).

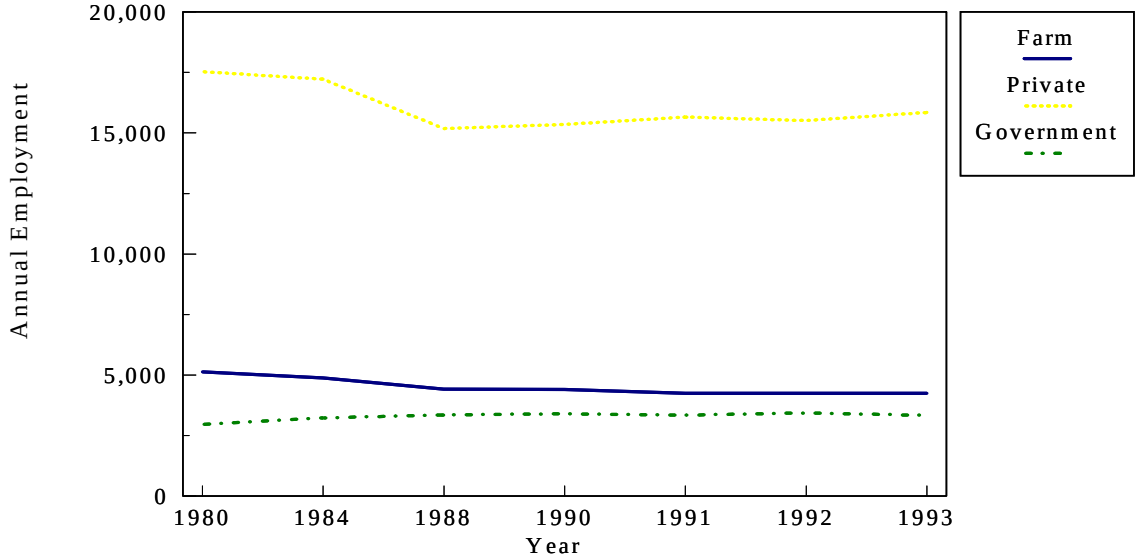


Figure 11. Employment by Industry Group, State Planning Region 8, North Dakota, 1980 Through 1993
Source: U.S. Bureau of Economic Analysis (*various years*-a).

In recent years, employment in agriculture and government activities has been stable. However, as total employment within the county decreased, the share of employment for agriculture and government activities has increased. In recent years, dependence on agriculture for employment within the county has surpassed regional and state averages (Figure 12). Agricultural activities accounted for over one-third of all employment in Billings County from 1990 through 1993, yet only accounted for 18 percent and 11 percent of all employment in SPR8 and North Dakota, respectively. The percentage of employment from government activities during the period was similar for Billings County, SPR8, and North Dakota (Figure 13).

The median family income in Billings County in 1989 was about equal to the average for SPR8; however, median family income in both Billings County and SPR8 lags behind the state average (Appendix Table 6). In real terms (the effects of inflation removed), average family income in Billing County in 1989 represented an increase of over 50 percent from 1960; however, median family income in 1989 had decreased 35 percent from highs obtained in the late 1970s. In 1979, Billings County median family income was 23 percent higher than the state average; however, in 1989 it was 14 percent lower than the state average. Average family incomes in SPR8 have undergone similar fluctuations--increasing to highs in the late 1970s, only to drop to levels somewhat higher than those found in 1969. State Planning Region 8 average family incomes have (in 1969, 1979, and 1989) consistently lagged about 12 percent behind the state average. Only Hettinger County in SPR8 has experienced increases in median family income from 1969 to 1979 and 1979 to 1989; however, the county's average family income has been about 12 percent lower than the regional average.

Per capita income is similar to median family income; however, it is typically estimated more frequently, thus providing a more current assessment of earnings in an area. Per capita income, in real terms, in Billings County, SPR8, and North Dakota increased during the mid 1980s then decreased in the later 1980s, but has since increased to levels higher than those found in the mid 1980s (Figure 13). Since 1990, real per capita income has shown modest increases in North Dakota (1 percent) and positive increases in Billings County (13 percent). In 1993, per capita income in Billings County was higher than the SPR8 average and the state average.

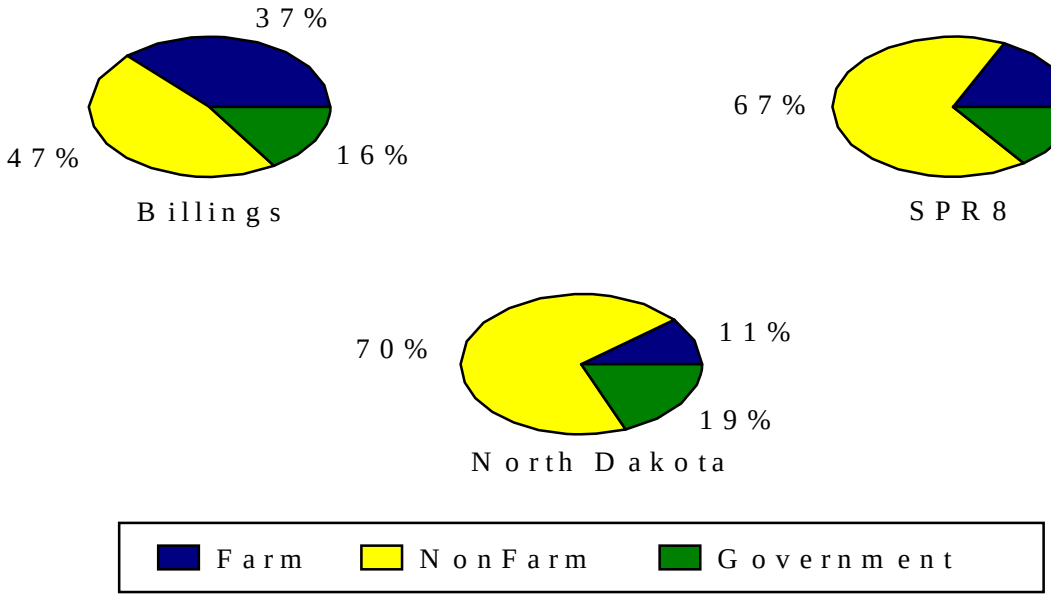


Figure 12. Average Percentage of Employment by Farm, Private, and Government Activities in Billings County, State Planning Region 8, and North Dakota, 1990 Through 1993

Source: U.S. Bureau of Economic Analysis (*various years*-a).

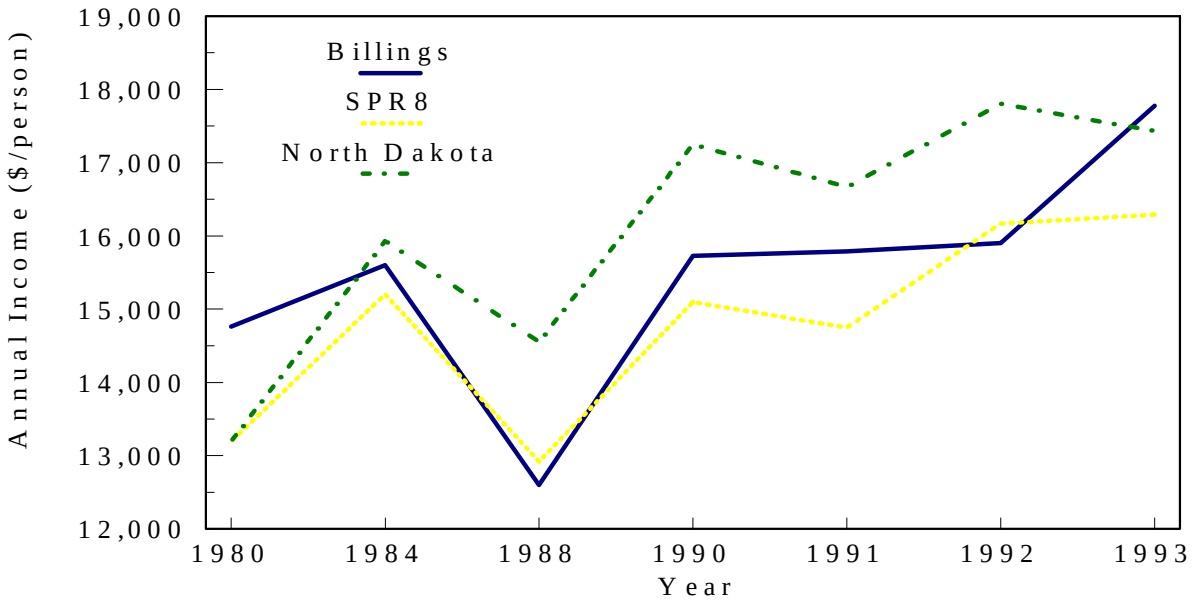


Figure 13. Per Capita Income (in 1994 dollars), Billings County, State Planning Region 8, and North Dakota, 1980 Through 1993.
Source: U.S. Bureau of Economic Analysis (*various years-b).*

Contrary to the trends of increasing per capita income and median family income, the percent of population with incomes below poverty levels for families in Billings County in 1989 was more than twice the state average (26 percent vs 11 percent) (Appendix Table 7). In 1989, nearly 30 percent of persons in Billings County were below the poverty level (Figure 14). The state figure for the same period was 14 percent. With the exception of Dunn County, the other counties in SPR8 had much lower percentages of persons and families below poverty levels. The percentages of persons and families below poverty levels improved from 1969 to 1979, but deteriorated from 1979 to 1989. Since 1969, the percentage of Billings County population below poverty levels has been higher than both neighboring counties and state averages.

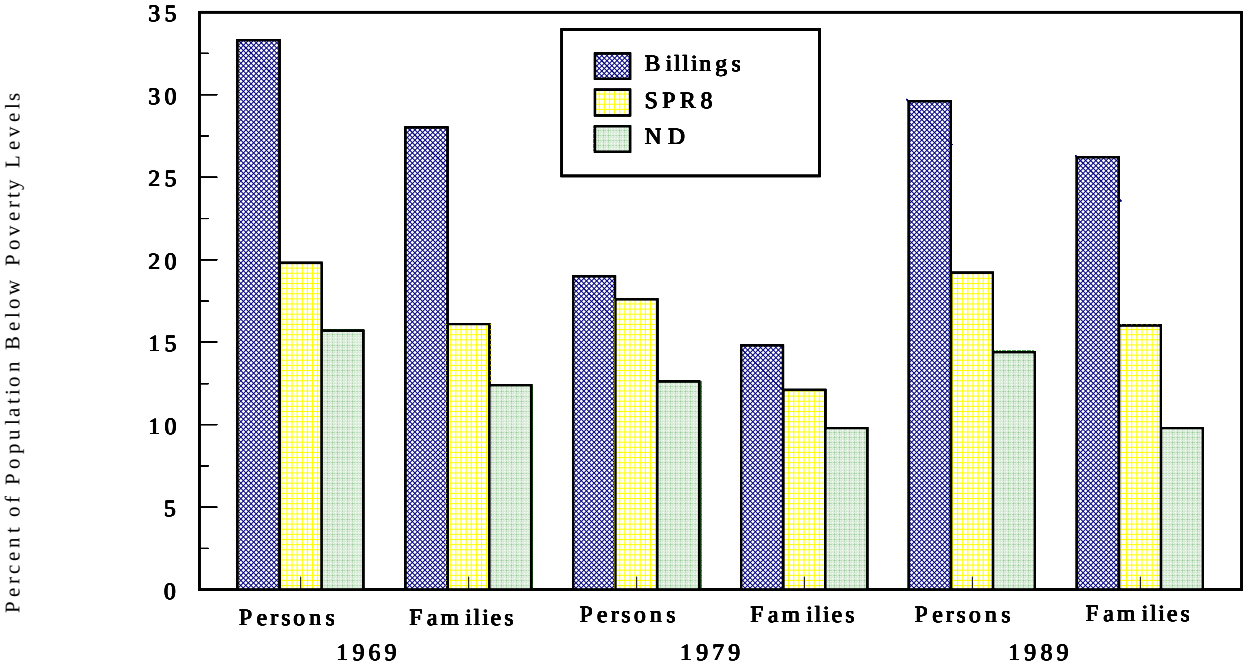


Figure 14. Percent of Population Below Poverty Levels, Billings County, State Planning Region 8, and North Dakota, 1969, 1979, and 1989

Source: U.S. Bureau of the Census (1973, 1982, and 1993).

Summary

From an economic perspective, Billings County has an economic base that relies strongly on natural resources, not unlike surrounding counties in southwest North Dakota. All of the major economic base industries in Billings County rely on activities associated (either directly or indirectly) with some form of natural resource (cropland, grazing land, mineral deposits, or scenic attractions). The economic base in Billings County is dominated by energy activities (i.e., oil and natural gas extraction), which have been decreasing since the mid 1980s. Contributions

(employment and economic base dollars) from agriculture have remained steady over the last decade, while impacts from tourism and government activities have increased. Overall, the economic base in Billings County has been decreasing, largely due to reductions in the energy sector.

Most comparisons of Billings County to neighboring counties reveal similar trends not atypical of conditions found throughout western North Dakota. Some indicators provide mixed interpretations of the economic health of Billings County. Overall, employment has decreased from levels in the early 1980s, but has stabilized in recent years. Regardless of employment levels over the last decade, unemployment within the county remained low during the period. Contrary to overall employment trends, population in Billings County has shown modest gains. Employment and population figures appear inconsistent with each other (i.e., overall employment levels have decreased while population has increased, yet unemployment remains low). However, these trends may be explained by changes in age segments of the population base in Billings County (i.e., the segment of the population over age 65 increased nearly 30 percent and the number of persons aged 5 to 14 increased about 10 percent from 1980 to 1990).

Per capita income and poverty indices indicate a substantial income disparity within the county. County-wide per capita income in Billings County is higher than state and regional averages; however, the percent of population (persons and families) below poverty levels is double the state and regional figures.

Although population estimates would suggest Billings County is doing better than regional benchmarks, economically SPR8 has fared somewhat better (45 percent decline in economic base activities since 1985 compared to 72 percent decline for Billings County). The decrease in Billings County's economic base has been largely due to reductions in the energy sector. The regional economy (SPR8) is more balanced, making it less susceptible than Billings County to fluctuations in energy activities. Outside of a declining energy sector, the other components of Billings County's economic base have maintained and/or expanded their roles.

ALTERNATIVE ECONOMIC PROFILES

This section is designed to provide alternative economic scenarios for Billings County and the surrounding region. Since the area's economic base is almost entirely tied to the use of natural resources, hypothetical changes in levels of economic activity could be used to evaluate potential changes in the use of the area's natural resources. For example, if some restrictions were placed on oil exploration/extraction in a given tract of land that would result in a specified loss in energy activities, those losses could be matched up with one of the "what if" scenarios to quickly understand the economic consequences of that action. The scenarios will not examine the mechanisms or forces causing the change in resource use, but instead will focus on the economic outcomes of those changes.

The scenarios are designed to be illustrative and not judgmental. Scenarios were evaluated by first estimating the change in economic base dollars (sales to final demand). The change (either positive or negative) in economic base activities was then used with input/output analysis to estimate the subsequent impacts to related sectors of the economy. Additional measures included changes in tax collections and effects on economy-wide employment. A separate section contains general discussion on projected county population and potential population effects resulting from a loss of public grazing.

Agriculture

The role of agriculture in the Billings County economy was discussed in earlier sections; however, the structure of agricultural activities within the county and region was not documented. Crop activities accounted for 26 percent of all sales to final demand from agriculture in the county (1990 through 1994--most recent 5-year average). Alternatively, livestock marketings accounted for 72 percent of all agricultural revenues in the county (1990 through 1994) (North Dakota Agricultural Statistics Service 1993, 1994, 1995, and 1996). When combined with government program payments, crop activities accounted for 28 percent of all agricultural marketings during the same period.

Changes in crop activities were not included in the alternative scenarios for the following reasons. First, crops are raised on private land primarily without restrictions from federal agencies (farm program provisions not withstanding). Second, in the absence of a dominant livestock industry, private cropland would likely still be farmed in the county (some shifts in crops raised may occur but the cropland would not be idle). Third, conversion of current cropland into pasture was not considered a widely feasible option, thereby eliminating the need to evaluate the substitution effect of crop versus livestock trade-offs. Finally, factors likely having the greatest impact on crop production are factors well beyond the scope of this study, such as weather, market forces, and domestic/international politics.

The livestock sector in Billings County is not only the largest component of the agriculture sector, but also the most vulnerable to shifting policies governing the use of public lands. The livestock industry in Billings County, measured by inventory, is dominated by cattle activities (Table 9). Of all livestock in the county, averaged from 1993 through 1995, cattle, sheep, and hogs accounted for 95, 2, and 3 percent of total inventories, respectively. Since the economic activity produced from hogs and sheep in the county appears minor in comparison to cattle, changes in cattle activities were assumed to be representative of changes in the livestock sector.

Table 9. Livestock Inventories in Billings County and State Planning Region 8, North Dakota, 1993 Through 1995

	Average Inventory			Percent of All Livestock		
County	Cattle	Sheep	Hogs	Cattle	Hogs	Sheep
Billings	34,000	633	1,100	95	2	3
State Planning Region 8 Counties						
Adams	30,000	11,167	1,767	70	26	4
Bowman	28,667	21,500	4,267	53	39	8
Dunn	95,000	2,767	5,200	92	3	5
Golden Valley	24,000	2,567	3,533	80	9	12
Hettinger	24,333	2,433	11,167	64	6	29
Slope	28,333	3,000	3,133	82	9	9
Stark	60,667	2,700	8,367			
SPR8 Totals	264,333	44,067	30,167	78	13	9
North Dakota	1,856,667	166,000	285,000	81	7	12
Billings--% of region	12.9	1.4	3.6			
Billing--% of state	1.8	0.4	0.4			
SPR8--% of state	14.2	26.5	10.6			

Source: North Dakota Agricultural Statistics Service (1995).

Grazing within the county, measured in animal unit months[2] (AUMs), is predominately organized through the Medora Grazing Association. The Medora Grazing Association (MGA) is a collective organization through which ranchers negotiate with federal agencies to secure/retain permission (permits) to graze cattle on public lands. The MGA's primarily jurisdiction is within Billings County, although some land is grazed in Golden Valley County. The MGA, through its grazing operations, controls roughly 75 percent of all AUM production and about 80 percent of grazing land within the county (Table 10). The MGA, from 1993 through 1995, only grazed about 72 percent (137,847 AUMs used/191,572 potential AUMs) of all AUMs controlled by the association--based on allowable federal AUMs and private grazing land carrying capacities.[3]

[2]An animal unit month is an average figure of the amount of forage needed to feed one animal unit (AU) for one month. An AU is typically considered a mature cow weighing approximately 1,000 pounds or an equivalent grazing animal(s) based on an average feed consumption of 26 pounds of dry matter per day (Shaver 1977).

[3]From 1993 through 1995, the MGA was permitted to graze 125,332 federal AUMs under optimal grazing conditions; however, the MGA only used 111,151 federal AUMs. Likewise, carrying capacities for private deeded land, under MGA control, during the same period would support 48,484 AUMs; however, the MGA only used 26,695 private AUMs.

Table 10. Private, State, and Federal Grazing Acres and Animal Unit Months under Medora Grazing Association and Private Control, Billings County, North Dakota, 1995[a]

	Total County		Controlled by Grazing Association		Controlled by Individuals	
Land	Acres	AUMs	Acres	AUMs	Acres	AUMs
Federal	290,706	99,111	290,706	99,111	0	0
State	30,449	9,386	13,394	3,354	17,055	6,032
Private	236,180	93,790	145,567	48,484	90,613	45,307
Total	557,335	202,287	449,666	150,949	107,668	51,339
	---------- percent of category ----------					
Federal	52.2	49.0	100	100	0	0
State	5.5	4.6	44	36	56	64
Private	42.3	46.4	62	52	38	48
Total	100	100	80.1	74.6	15.4	25.4

Data in table represent potential AUMs produced and controlled based on average land productivity and grazing conditions in Billings County only (does not include activities in Golden Valley County). Actual AUMs grazed (an average of 137,847 annually for the Medora Grazing Association from 1993 through 1995) will differ from AUMs controlled in any particular grazing season. Private AUMs outside of the MGA were based on a carrying capacity of 0.5 AUMs per acre. Private grazing capacity outside of the MGA did not include the grazing of crop aftermath.

Sources: Medora Grazing Association (1995) and Bangsund and Leistritz (1992).

Public lands produce about 54 percent of the estimated grazing output in Billings County (Table 10). Although public grazing land accounts for roughly half of all grazing output in the county, much of the private grazing land in the county is located within tracts of federal land. Private lands intermingled within public tracts of land are dependent upon having access to public land if they are to be used for livestock grazing. In the absence of public grazing, large tracts of private grazing land would become unaccessible or uneconomical to graze (Medora Grazing Association 1995). Fencing, transportation, water, and other requirements needed in the absence of public grazing would effectively eliminate many tracts of private land from livestock grazing. Thus, the influences of access to public lands for grazing extend beyond public land to include much private grazing land within the county.

Considering the nature of the land profiles in Billings County, private grazing activities conducted outside of MGA control were assumed to be relatively unaffected by policies governing public grazing (excluding the private lease of state lands). Thus, several scenarios

were constructed to show the effects of changes in AUMs grazed through MGA. Six scenarios were developed to reflect changes in AUMs available through the MGA. These changes were not prescriptive to public lands only, but include overall changes in grazing output that could be realized by a number of factors affecting the MGA. These scenarios represented long-term adjustments to the resource base in the county--these scenarios were not considered year-to-year fluctuations or one-time effects, but were treated as sustained changes from normal production averages.

The first four scenarios involved 5, 10, 25, and 50 percent changes in available AUMs through the MGA. The first four scenarios, Graz5, Graz10, Graz25, and Graz50, represent hypothetical long-term changes in grazing output that could result from any number of factors (e.g., public grazing policies, noxious weed expansion, or range improvements). Two scenarios examined the effects of eliminating grazing on public lands; GrazNoFed examined the effect of no grazing on federal lands and GrazNoSt examined the loss of grazing on state lands.

The effect of changes in AUM availability was based upon estimating the average number of AUMs per animal per year grazed in the MGA. The number of cows, yearlings, and bulls affected by the change was estimated using the number of affected AUMs and the number of AUMs per animal. Changes in grazing capacity were assumed to have corresponding changes in herd size (e.g., supplemental feed was not substituted for lost grazing as a mechanism to maintain herd size). Livestock sales to final demand were averaged from 1991 through 1994 (average economic base). Average cattle inventories also were estimated for the period (North Dakota Agricultural Statistics Service 1995) (Appendix Table 8). Average sales to final demand were divided by average cattle inventory to arrive at the amount of sales to final demand per head of inventory. Estimated reductions in herd size (cows, replacement heifers, and bulls) were multiplied by the amount of sales to final demand per head to determine overall reductions in the economic base for each scenario (Table 11).

Economic base information (i.e., sales to final demand) represents only the direct economic impacts of changes in economic activity from alternative grazing scenarios. Secondary economic impacts result from subsequent rounds of spending and respending of the direct impacts within an economy. Input-output (I-O) analysis traces linkages (i.e., the amount of spending and respending) among sectors of an economy and calculates the total business activity resulting from a direct impact in a basic sector (Coon et al. 1985). An economic sector is a group of similar economic units (e.g., communications and public utilities, retail trade, construction). Secondary economic impacts were estimated for the regional economy (i.e., effects on surrounding counties and neighboring trade centers) using the North Dakota Input/Output Model.

Impacts on the economic base in Billings County, based on alternative grazing scenarios, varied from $266,000 with the Graz5 scenario to $5.7 million with the GrazNoFed scenario. Changes in gross business volumes for the regional economy varied from $1.2 million with the Graz5 scenario to $25.7 million with the GrazNoFed scenario. The economic sectors of the regional economy with the greatest economic impacts from changes in grazing activities

Table 11. Description of Alternative Grazing Situations, Medora Grazing Association, Billings County, North Dakota

Item	Alternative Grazing Scenarios[a]					
	Graz5	Graz10	Graz25	Graz50	GrazNoFed	GrazNoSt
Change in AUMS[b]	5,431	10,862	27,154	54,308	116,762	9,386
Estimated Change in Cattle Inventories[c]						
Cows	647	1,294	3,236	6,472	13,914	1,118
Yearlings	66	132	329	658	1,414	114
Bulls	17	34	86	172	370	30
Total	730	1,460	3,651	7,301	15,698	1,262

[a] Graz5, Graz10, Graz25, and Graz50 represent hypothetical 5, 10, 25, and 50 percent changes in AUMs grazed through Medora Grazing Association in Billings County only, respectively. GrazNoFed estimates the grazing losses that may result from no livestock grazing on federal lands in Billings County. GrazNoSt estimates the grazing losses that may occur from no livestock grazing on state lands within the county.

[b] Change in grazing capacity based on average of AUMs grazed in Billings County under Medora Grazing Association control from 1993 through 1995. The GrazNoFed scenario included 87,897 federal AUMs, 7,509 state AUMs, and 21,356 private AUMs.

[c] The number of cows, yearlings, and bulls for each scenario was estimated based on the average ratio of cows, yearlings, and bulls to total cattle grazed within the Medora Grazing Association from 1993 through 1995.

included **Agriculture-Livestock**, **Households**, **Retail Trade**, and **Agricultural Processing and Miscellaneous Manufacturing** (Appendix Table 9). With alternative grazing scenarios, each AUM equated to about $220 in gross business volume and $2.54 in tax revenues. Each head of cattle equated to approximately $1,640 in regional impacts and $18.88 in tax revenues.

Secondary economic impacts would largely be felt by businesses and individuals outside of Billings County, since Billings County does not have a trade center. The loss in livestock sales would translate into fewer production inputs and less retained earnings among ranchers/farmers within the county. The expenditures for production inputs take place in neighboring trade centers. Studies of retail trade patterns in North Dakota have revealed the distribution of the retail spending and the purchasing of goods and services within the state (Bangsund et al. 1991). All of Billings County falls into the main trade areas of three cities--Beach, Belfield, and Dickinson (Appendix Figure 1). Each of those cities has some pull on retail trade activity from Billings County. However, the degree of goods and services provided by the three cities varies considerably. Belfield is a minimum convenience center, Beach a full convenience center, and Dickinson a complete shopping center (for a complete discussion of retail trade centers and retail trade patterns in North Dakota see Bangsund et al. [1991]). Based on retail trade patterns, most retail goods and services needed by residents in Billings County are purchased in Dickinson. Beach provides some agricultural inputs and retail items, but lacks the breadth of goods and services offered by Dickinson. Belfield provides only convenience items. Thus, the secondary effects from changes in sales to final demand in Billings County would primarily impact Dickinson, and to a lesser extent Beach.

Primary and secondary employment also were impacted with each of the grazing scenarios. Changes in primary employment in livestock grazing activities were based on information obtained from the Medora Grazing Association. Secondary employment information was obtained from the North Dakota Input/Output Model. Direct employment within the livestock grazing industry was not estimated for the Graz5 through Graz50 scenarios; however, employment was substantially reduced with the GrazNoFed scenario (Table 12). For every $106,000 in economic impacts one secondary FTE job was supported within the regional economy.

Impacts in state-level tax collections from alternative grazing scenarios were included. Changes in tax revenues included collections of sales and use taxes, corporate income taxes, and individual (state) income taxes. Changes in total tax collections varied from $13,700 for the Graz5 scenario to $296,500 for the GrazNoFed scenario (Table 12). Every $100 of economic activity from grazing generated about $1.15 in state tax collections. Effects on local tax collections (e.g., property tax valuations, intergovernmental transfers) were not included. Billings County government does rely heavily on the transfer of revenue from other governments (Appendix Table #) and also energy tax revenues. Some of the state sales tax revenues are redistributed to the counties. Of all the revenue collected for general and special revenue funds in Billings County, 47 percent comes from intergovernmental transfers.

Table 12. Change in Economic Base for Alternative Grazing Situations, Billings County, North Dakota

Item	Alternative Grazing Scenarios					
	Graz5	Graz10	Graz25	Graz50	GrazNoFed	GrazNoSt
Change in Cattle Inventory	730	1,460	3,651	7,301	15,698	1,262
Change in Economic Base ($)[a]	266,000	533,000	1,332,000	2,665,000	5,730,000	461,000
Secondary Economic Impacts ($)	928,000	1,860,000	4,653,000	9,307,000	20,016,000	1,611,000
Gross Business Volume ($)	1,194,000	2,393,000	5,985,000	11,972,000	25,746,000	2,072,000
Primary Employment (FTE)	na	na	na	na	100 to 120	na
Secondary Employment (FTE)	9	18	56	115	249	16
State Tax Collections ($)						
Personal Income	3,600	7,200	18,100	36,200	77,900	6,300
Corporate Income	1,400	2,900	7,200	14,400	31,000	2,500
Sales and Use	8,700	17,500	43,600	87,200	187,600	15,100
Total	13,700	27,600	68,900	137,800	296,500	23,900

[a]Based on sales to final demand of $365 per head of cattle inventory.

Energy

Energy is the largest component of the economic base in Billings County. Energy activities account for three-quarters of all new money coming into the county. Thus, small changes in the county's energy activities have serious economic consequences for both area residents and neighboring trade centers.

Billings County is second in oil production among North Dakota counties (Appendix Table 11). From 1991 through 1995, Billings County accounted for 23 percent of all oil production in the state. Billings County also is a major natural gas producing county in North Dakota, accounting for 16 percent of all natural gas production in the state during the same period (Appendix Table 12). Thus, the importance of oil and natural gas production in billings county extends beyond the county to include much of the oil and natural gas industries in western North Dakota.

The revenue streams (i.e., profile of mineral rights) from energy activities in Billings County are generally less understood than the physical quantities of production. Leases of state-owned mineral rights accounted for about 1 percent of oil and natural gas production in Billings County from 1991 through 1995 (Appendix Table 13). State-owned mineral rights accounted for about 1 percent of oil production and 0.5 percent of natural gas production in the state during the same period. Leases of federally owned mineral rights accounted for about 9.5 percent of oil production and 14 percent of natural gas production in Billings County for 1994 and 1995. Federal owned mineral rights accounted for 20 percent of oil production and 13 percent of natural gas production in North Dakota during the same period. Thus, over last five years, nearly 90 percent of oil and about 85 percent of natural gas production in Billings County has come from private mineral rights (Appendix Table 13). Private mineral leases accounted for 79 percent of oil production and about 87 percent of natural gas production in the state during the same period.

A complete discussion of all the factors affecting supply and demand for oil and natural gas is beyond the scope of this study. Likewise, determining the factors affecting energy sector activities in any single location can be just as complex. Thus, this section was designed to only provide information on the economic impacts of changes in energy sector activities. Predictions or forecasts of likely levels of future energy sector activities were not included. Several hypothetical changes in the level of energy sector sales to final demand were used to illustrate the economic impacts of possible changes in future energy activities in Billings County and the surrounding region.

Five energy scenarios were developed (Table 13). The scenarios examined $5, $10, $15, $20, and $25 million changes in the current level of energy sector activities (Table 13). Considering the most recent (1994 being the most recent year available at time of study) economic base for energy activities in Billings County was near $100 million, the energy scenarios closely approximate 5, 10, 15, 20, and 25 percent changes in the existing energy base.

Table 13. Alternative Energy Sector Scenarios, Billings County, North Dakota

Item	Alternative Energy Scenarios				
	Energy5	Energy10	Energy15	Energy20	Energy25
Change in Sales to Final Demand (000s $)	5,000	10,000	15,000	20,000	25,000
Secondary Impacts (000s $)	4,626	9,245	13,871	18,490	23,113
Gross Business Volume (000s $)	9,626	19,245	28,871	38,490	48,113
State Tax Collections					
Personal Income	20,800	41,700	62,500	83,300	104,200
Corporate Income	24,100	48,200	72,300	96,300	120,400
Sales and Use	42,500	85,100	127,600	170,200	212,700
Total	87,400	175,000	262,400	349,800	437,300

Regional impacts from changes in energy activities in Billings County varied from about $9.6 million to $48.1 million for the 5 to 25 percent changes in current energy sector activities, respectively. Total economic impacts were greatest in the **Petroleum Extraction/Exploration**, **Households**, **Retail Trade**, and **Construction** sectors (Appendix Table 9). Secondary effects would be felt the most in regional trade centers, such as Dickinson and Beach. Each dollar of energy sector activities creates an additional $0.92 in regional impacts. Every $100 of regional energy impacts produced $0.91 in state tax revenue (sales and use, personal income, and corporate income--oil related taxes were not included). Even though the effect of reduced oil revenue collections on local governments was not included, energy revenues, in counties containing energy activities, are an important component in local government funding. Billings County government benefits from energy revenues (Appendix Table 10).

Effects of changes in energy activities on direct employment were not included due to a lack of information on the structure of energy activities within the county (i.e., the number workers residing within the county, the type of jobs affected by energy reductions, and so on). For every $137,000 in regional economic impacts created through energy activities, one secondary FTE job would be supported.

Tourism

The tourism sector in Billings County is composed of a variety of activities either directly or indirectly associated with events in and around Medora, visits to TRNP, outdoor activities (e.g., hunting, backpacking, trail rides, canoeing), and general scenic activities. Tourism sector activities have shown steady real growth since the mid 1980s. Since 1990, tourism sector sales to final demand have increased an average of 8.6 percent annually. Since 1993, tourism activities in Billings County have increased 35 percent.

Paralleling much of the increase in tourism activities is attendance at the Medora Musical (Appendix Table 14). Attendance at the Musical has increased about 7 percent annually since 1991, and attendance since 1993 has increased nearly 20 percent. Correspondingly, taxable sales within Medora have increased proportionally with increased attendance at events in the area (Figure 15).

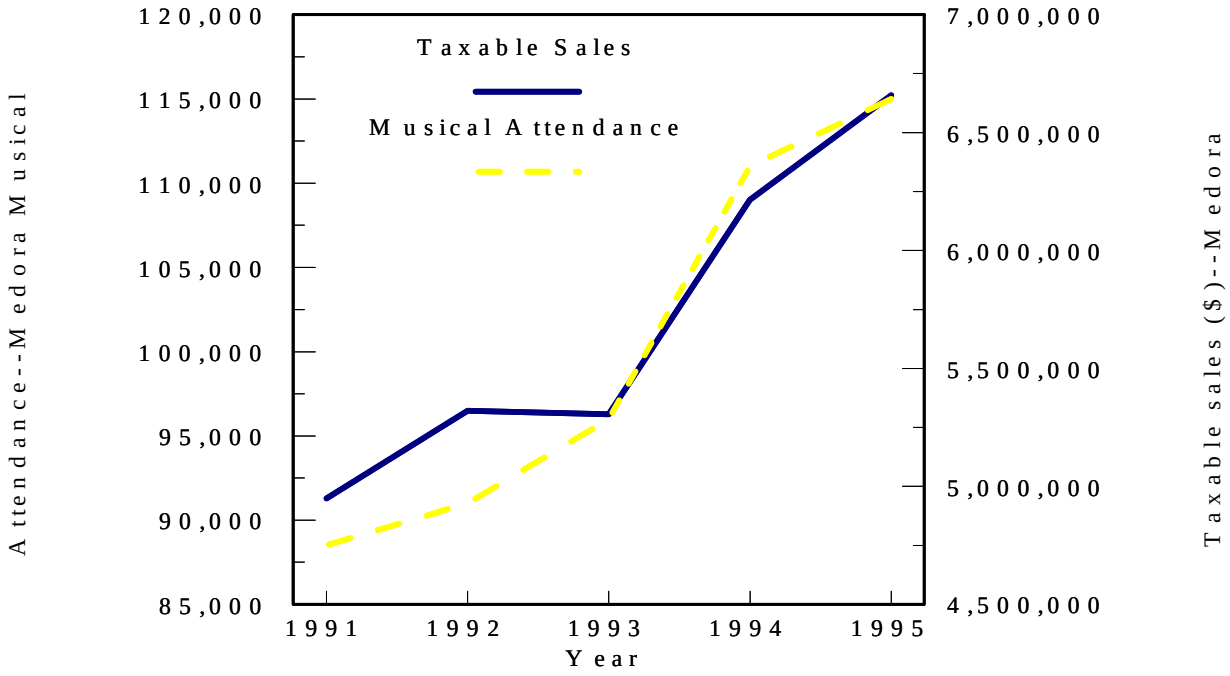


Figure 15. Taxable Sales and Medora Musical Attendance, Medora, North Dakota, 1991 Through 1995

Sources: North Dakota Tax Department (1996) and Theodore Roosevelt Memorial Foundation (1996).

Attendance at TRNP since 1990 has fluctuated between a low in 1995 of 467,000 visitors to a high in 1994 of nearly 512,000 visitors (Appendix Table 15). Thus, increases in county-wide tourism could largely be the effect of greater attendance at Medora sponsored events, although other factors, such as length of average stay, per capita expenditures, correlations between park functions and Medora activities, and other tourism based activities outside of the park and Medora, all play important roles in tourism impacts. Although current information on per capita per day expenditures by activity in Billings County was not available, some expenditure information was obtained.

Wallace et al. (1990) estimated that visitors of TRNP spent (average of 1988 and 1989 expenditures) about $27 per person per day within 50 miles of the park boundary. Similarly, the average park visitor spent $48 per day within the state of North Dakota. The average length of stay was estimated to be about 1.8 days. Expenditures made within 50 miles of the park boundary by visitors not living in the immediate region would represent an influx of new money into the region.

Another source of new money (to a region) can come from expenditures made by sportsmen. The U.S. Fish and Wildlife Service (1992) conducted a national survey of fishing, hunting, and wildlife-associated recreation in 1991. According to survey results, North Dakota had 98,000 individuals (in-state and out-of-state) who collectively spent $51.8 million for hunting activities. Per person expenditures for hunting activities were estimated to be about $41 per day. Total expenditures for fishing activities in the state, according survey results, totaled $69.5 million in 1991. An estimated 99,000 people participated in fishing activities in North Dakota. Per person expenditures for fishing activities were estimated to be about $77 per day. Individuals pursuing nonconsumptive wildlife-related activities generated about $17.8 million. The study estimated about 200,000 people participated in some form of nonconsumptive wildlife-related recreation in North Dakota in 1991.

Baltezore and Leitch (1992) surveyed hunters and anglers in North Dakota to estimate resident and nonresident expenditures associated with hunting and fishing activities. The study estimated that resident and nonresident hunters and anglers spent about $355 million in North Dakota. Resident participants spent $334 million and nonresidents spent $21 million of the total expenditures for hunting and fishing activities. Hunting activities generated about 39 percent of all expenditures, with the remaining expenditures coming from fishing activities. Averaged between rural and nonrural resident and rural and nonrural nonresident sportsmen, about 54 percent of all hunting and fishing expenditures were made in rural areas within the state. Urban resident and nonresident sportsmen spent about 40 percent of their expenditures in rural areas; correspondingly, rural resident and nonresident sportsmen spent about 73 percent in rural areas.

Estimates of expenditures included variable costs (items such as ammunition, film, food, lodging, boat gas, bait, repairs, etc.) and fixed costs (items such boat and motor, vehicle, weapons, binoculars, tackle, clothing, etc.). Total expenditures per season per person for deer, antelope, and upland game were about $550, $670, and $710, respectively. Open water fishing expenditures per season per person were estimated to be $2,300.

Studies of individuals partaking in hunting, fishing, and nonconsumptive wildlife-related activities show that wildlife activities create substantial levels of in-state expenditures. Conclusions about the economic impact of those activities are less clear. The continued availability of in-state wildlife-related activities helps assure that much of the money, which residents spend on those activities, will remain in the state. Resident spending is considered new money to the extent that in-state recreational activities and opportunities reduce resident spending out of the state (Baltezore and Leitch 1992). The money spent by visiting sportsmen (i.e., those not living in the region) can represent an influx of new money into a region. The extent of those impacts depends upon the region's ability to capture wildlife-related expenditures and on the ability of a region to attract outside individuals for wildlife-related activities.

Five alternative tourism scenarios for Billings County were created based on arbitrary changes in the current tourism sector sales to final demand. Changes in the tourism base included $250,000 (Trsm250), $500,000 (Trsm500), $1 million (Trsm1m), $2.5 million, (Trsm2.5m), and $5 million (Trsm5m) (Table 14). The alternative tourism scenarios approximated 2.5, 5, 10, 25, and 50 percent changes in the current tourism base in Billings County. Considering increases in tourism sales to final demand since 1993, future increases in tourism activity may fall somewhere between the Trsm500 and Trsm2.5m scenarios. Increases in tourism can likely come from attendance at Medora, visitation at TRNP, and participation in consumptive and nonconsumptive outdoor and wildlife-related activities.

Regional impacts from hypothetical changes in tourism activity in Billings County varied from $561,000 (for roughly a 2.5 percent change within the county) to $11.2 million (for about a 50 percent change). Total economic impacts from changes in tourism activities had the greatest impact in the **Households**, **Retail Trade**, and **Business and Personal Services** sectors (Appendix Table 9). Each dollar of tourism activity in Billings County creates $1.24 in regional impacts. For every $70,000 in regional impacts, one secondary FTE job would be supported. Every $100 of regional tourism impacts produced $2.70 in state tax revenue (Table 14). Population effects of changes in the tourism sector were not included since the structure of employment within the tourism sector is unknown. Much of the employment in tourism in Billings County is seasonal, with employment related needs met with temporary and part-time workers.

Population

Much of western North Dakota experienced rapid and dramatic population changes as a result of boom and decline in the energy sector during the last three decades. The likelihood of those population shifts recurring appears remote. However, population change will continue to be dynamic, adjusting to various economic and social factors. General population projections were estimated for Billings County, along with estimated regional population impacts from a loss of public grazing within the county.

Table 14. Alternative Tourism Sector Scenarios, Billings County, North Dakota

Item	Alternative Tourism Scenarios				
	Trsm250	Trsm500	Trsm1m	Trsm2.5m	Trsm5m
Change in Sales to Final Demand (000s $)	250	500	1,000	2,500	5,000
Secondary Impacts (000s $)	311	1,156	2,313	5,782	11,567
Gross Business Volume (000s $)	561	1,656	3,313	8,282	16,567
Secondary Employment (FTE)	6	17	43	114	237
State Tax Collections $					
Personal Income	1,600	3,100	6,300	15,700	31,300
Corporate Income	1,200	2,500	5,000	12,500	24,900
Sales and Use	12,400	24,700	49,400	123,600	247,300
Total	15,200	30,300	60,700	151,800	303,500

County-wide Population Projections

Three general population projections for Billings County were estimated. One scenario estimated county population and age-gender distribution with zero migration (this would be considered an optimistic projection). An alternative projection was based on a somewhat more realistic migration rate (i.e., 25 percent of the migration rate experienced from 1980 through 1990). A final projection was developed using a less favorable migration rate for Billings County (i.e., 50 percent of the migration rate experienced from 1980 to 1990). All scenarios were estimated using the North Dakota Demographic Projection Model (DEMOG) (Coon et al. 1988). DEMOG uses past measures of average birth rates, death rates, migration rates (in migration and out migration), and estimates of individuals in age-sex cohorts to project population levels over time.

Projections of population in years 2000, 2005, and 2010 were estimated for three separate migration rates (Figure 16). Under the scenario of zero migration, population increases 6 percent from 1995 to 2010. The other scenarios, based on percentages of historic migration from 1980 through 1990, resulted in population losses of 11.5 percent and 27 percent (Appendix Table 16).

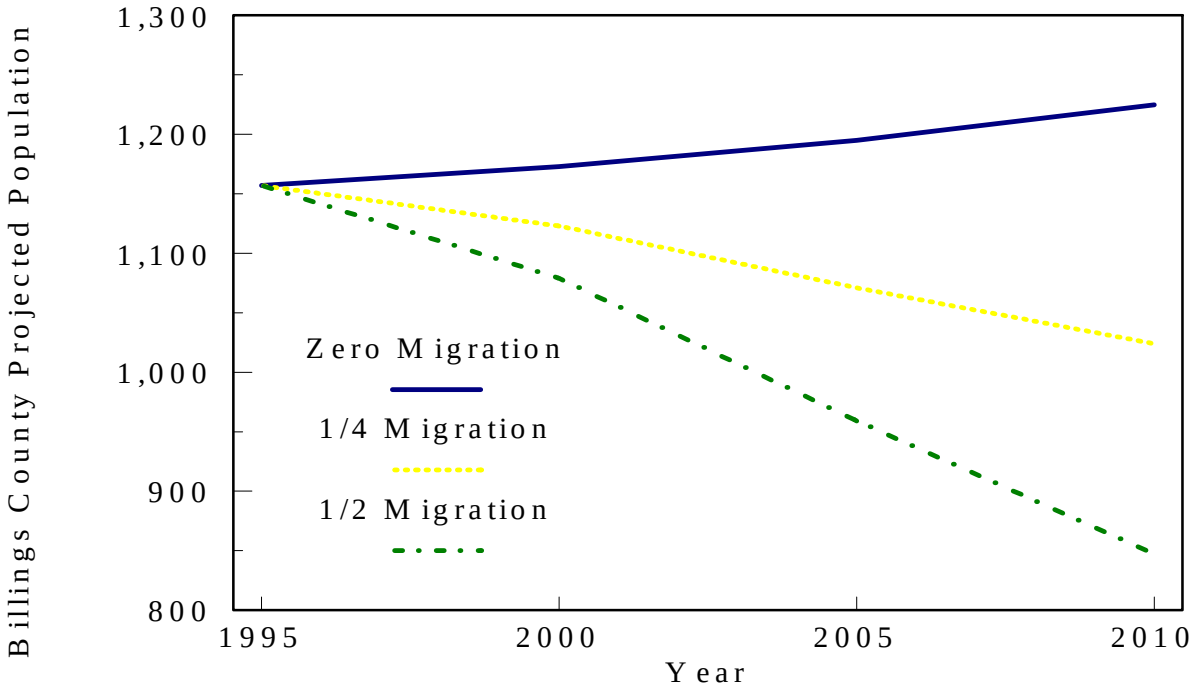


Figure 16. Population Projections, Billings County, North Dakota, 1995 Through 2010

Effects of Public Grazing on Population

Population change occurs from a variety of factors. These factors vary by industry. Small changes in some industries have substantial effects on population, whereas, similar changes in other industries have little or no effect on population. Population impacts were not estimated for energy and tourism scenarios due to lack of employment-specific information for those industries. However, the lack of including estimates in this report does not negate the fact that changes in those industries do have effects on population.

The North Dakota Microcomputer Economic-Demographic Assessment Model (MEDAM) was used to project regional effects on population from a loss of public grazing within Billings County. MEDAM provides an analysis of the likely socioeconomic effects of changes in direct employment and sector-level activity. Two scenarios were evaluated regarding the population effects of public grazing. The first scenario assumed a loss of federal grazing would result in a loss of 100 permittees (100 ranchers) while the second scenario assumed a loss of 120 ranchers. Lost permittees were assumed to leave the region and not take employment in another sector within the region. The combined operational employment losses and economic impacts of a loss of federal grazing (see Table 12) were used to determine the loss of population within Billings County and the surrounding region. Population loss in surrounding trade centers (i.e., assumed to be Beach and Dickinson) were based on secondary economic impacts. Losses in

Golden Valley and Stark Counties were based on losses within their trade centers; however, with the 120 rancher scenario, some ranchers were allocated to residing within Golden Valley County, resulting in additional losses for that county.

Assuming a decrease of 100 ranchers, the surrounding region would experience a decrease of 583 people (Table 15). Billings County would absorb 38 percent of the loss (219 people). Golden Valley and Stark Counties would lose 122 and 247 people, respectively. Beach and Dickinson, major trade centers in Golden Valley and Stark Counties, respectively, would absorb 87 percent and 91 percent of their respective counties' population loss.

Assuming a decrease of 120 ranchers, population loss in the area would equal 618 people. Billings County would lose 231 people, representing 20 percent of the county's current population. Neighboring counties would lose 392 people, with Beach and Dickinson having the greatest losses (Table 15). Averaged across both scenarios, the out migration of each rancher in Billings County would result in an out migration of about 5 people from the region. Overall, regional trade centers and Billings County, under the assumptions in these scenarios, would absorb 55 percent and 37 percent of the population loss in the region, respectively.

Table 15. Estimated Population Effects of a Loss of Federal Grazing in Billings County, North Dakota, 1996

	Population Loss	
Location	100 Ranchers	120 Ranchers
Billings County	219	231
Golden Valley County	122	145
Beach	106	106
Stark County	247	247
Dickinson	226	226
County Totals	583	618

Source: North Dakota Microcomputer Economic-Demographic Model (Coon et al. 1993).

SUMMARY AND CONCLUSIONS

Billings County, North Dakota, in some measures is similar to many counties in western North Dakota, yet in other respects, it differs from regional norms. Ninety-four percent of the county's land area has agricultural uses, with overlapping uses for energy extraction and tourism. In land use patterns, much of Billings County is similar to surrounding counties--heavy emphasis on grazing and crop activities. However, Billings County is approximately 50 percent public land. About 75 percent of the county's grazing industry, which accounts for nearly three-quarters of the agriculture industry, is reliant upon grazing public lands. The reliance on public grazing is shared to a lesser extent in Slope and Golden Valley Counties.

Despite the reliance on public grazing within the county, the economy has a greater reliance on energy activities. Contrasting with the regional balance between federal activities, agriculture, and energy activities, energy plays a crucial role in Billings County. Energy sector sales comprise nearly 90 percent of the county's economic base; as a result, recent declines in energy sector activities have reduced the level of the county's economic base despite gains in federal activities and tourism. Agriculture, while exhibiting year-to-year fluctuations, has maintained the size of its economic base. The economy of Billings County, to compensate for a 10 percent reduction in energy activities, would require that the remaining industries each increase the output of their respective sectors by 35 percent.

Other factors in the county, such as population trends, average incomes, and employment, have produced mixed economic signals. Population in Billings County has shown modest growth in the last five years, which is contrary to trends in many neighboring counties. Yet, while population has grown, the labor force and overall employment within the county have decreased faster than regional averages. Unemployment rates within the county remain low, which is contrary to diverging population and employment trends. Increases in nonworking age sectors of the population (i.e., under 15 and over 65) are likely reasons for the situation.

Other contradictions exist with measures of average incomes within the county. Per capita income in the county is higher than regional and state averages; however, poverty levels also are higher than regional and state averages, suggesting some income disparity exists within the county. This situation may be the result of energy revenues not being shared uniformly by the populace within the county.

The county's population base is almost totally employed in natural resource-based industries (not including commuters to employment in neighboring trade centers) and, as such, the population base is dependent upon those industries to maintain current employment levels. In the event that those employment opportunities dwindle or decrease, population in the county, in the absence of alternative employment opportunities, will likely decrease.

The future of the county's economic base will be greatly affected by changes in energy activities. If the energy sector continues to decline, the relative importance of the remaining industries--agriculture, tourism, and federal activities--will increase. The agricultural base is unlikely, based on historic performance over the last three decades, to expand much beyond current levels. Tourism, while an increasingly important sector in the area, would have to experience unrealistic sustained growth (i.e., somewhere in the neighborhood of 50 percent annually for the next 5 years to match a 10 percent annual reduction in energy activities) to compensate for energy losses. Modest increases in federal activities will likely continue in the future as transfer payments continue to play an important part in an aging population. However, the federal activities sector is relatively small compared to other sectors in the county and not likely, given current federal budget concerns, to increase much faster than historic rates. The likelihood of Billings County developing a manufacturing sector remains remote for numerous reasons. Thus, these factors suggest energy will continue to play a critical role in the county's economic health, and even in the absence of a dominant energy industry, the local economy will continue to rely on natural resource-based industries.

Predictions of the future levels of the economic base industries in Billings County were beyond the scope of this report. However, illustrative assessments of the impacts of changes in the levels of the most important economic sectors were conducted. The importance of energy sector activities was reaffirmed by showing that small changes in the current levels of energy sales to final demand have substantially larger effects than similarly sized (in percentage terms) changes in other economic sectors. Likewise, the dependence of the livestock industry on public grazing was evident in the impacts of losses in the sustained grazing use of public lands. Based on the size of basic sector industries in the mid 1990s, changes (i.e., in percentage terms) in the current levels of tourism activities are not likely to offset changes in the energy and livestock industries. Other sectors, such as agricultural crops and federal activities, are not likely to be influenced greatly by changes in public resource use. Much of the increase in federal activities within North Dakota has been the result of transfer payments, federal road construction, and military operations, not factors on which land use decisions have much influence. Likewise, crop activities within the county are predominately dependent upon private land use decisions, those of which will likely be influenced by factors outside of the county and state (i.e., weather and market factors).

Changes in the economic base within Billings County will affect the residents within the county, as well as neighboring trade centers in the region. Billings County has no trade center, thereby forcing residents to purchase production inputs, supplies, business services, and consumer items outside the county (primarily in Dickinson and to some extent Beach). Thus, when assessing changes in the use of land resources within Billings County, it is important to evaluate those changes in context of a regional economy.

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APPENDIX TABLES

Appendix Table 1. Sales to Final Demand by Economic Sector, Billings County, North Dakota, 1960 Through 1994

Year	Agriculture		Constr-	Ag Proc and	Retail	Bus and	House-	Petroleum	
	Livestock	Crops	uction	Misc Mnfg	Trade	Pers Ser	holds	Extr/Expl	Total
	millions of real (1994) dollars								
1960	8.0	3.6	0.0	0.0	1.3	0.4	0.9	3.1	17.4
1965	9.9	5.8	0.0	0.0	2.1	0.8	0.8	13.2	32.5
1970	11.4	5.0	0.0	0.3	4.7	1.7	1.0	29.1	53.2
1975	13.9	6.1	0.0	0.0	4.4	1.5	2.2	41.2	69.3
1980	18.0	1.7	0.2	0.2	4.0	1.4	4.0	449.6	479.0
1985	11.7	2.3	0.0	0.0	4.1	1.3	3.5	464.2	487.0
1988	15.0	1.9	0.1	0.0	4.7	1.6	3.4	156.2	182.9
1989	10.2	3.6	0.1	0.0	5.3	1.8	4.3	168.8	194.1
1990	14.0	3.1	0.2	0.0	5.1	1.7	5.0	205.8	234.9
1991	10.7	3.9	0.2	0.0	5.4	1.8	4.9	182.0	208.9
1992	12.8	4.1	0.3	0.0	5.9	1.9	4.6	155.0	184.6
1993	13.4	6.5	0.3	0.0	6.7	2.2	4.5	121.4	155.1
1994	10.4	4.1	0.2	0.0	7.9	2.6	5.4	105.7	136.3

Notes: Major industries are classified as groupings of individual sectors. Agriculture is comprised of livestock and crop sectors. Energy is the combination of oil refining, coal mining, coal conversion, and petroleum extraction/exploration sectors. Manufacturing is the agricultural processing and miscellaneous manufacturing sector. Federal activities are the combination of households (transfer payments and federal payrolls) and construction. Tourism includes the retail trade and business and personal services sectors. Since sales to final demand represent new money coming into the state, the construction sector represents federal outlays for roads and other projects. Likewise, retail trade represents the sale of retail goods and services to individuals from outside the state. Business and personal services represent tours, lodging, camping services, etc. Real dollars have the effect of inflation removed.

Source: Coon and Leistritz (1995).

Appendix Table 2. Population, Selected Counties and Cities, North Dakota, 1970 Through 1995

County/City	1970	1980	1990	1991	1992	1993	1994	1995	Percent Change 1980-1995[a]	Percent Change 1990-1995[a]
Billings County	1,198	1,138	1,108	1,140	1,168	1,164	1,145	1,157	1.7	4.4
Fryberg	---	---	---	---	---	---	---	---	---	---
Medora	129	94	101	104	107	106	105	na	11.7	4.0
Golden Valley County	2, 611	2,391	2,108	1,993	1,940	1,943	1,959	1,962	-17.9	-6.9
Beach	1,408	1,381	1,205	1,135	1,100	1,097	1,109	na	-21.2	-8.0
Stark County	19,613	23,697	22,832	22,854	22,832	22,751	22,919	22,434	-5.3	-1.7
Belfield	1,130	1,274	887	883	880	871	874	na	-31.4	-1.5
Dickinson	12,405	15,924	16,097	16,121	16,100	16,066	16,190	na	1.7	0.6
SPR8	42,609	45,098	41,175	40,699	40,340	39,849	39,754	39,006	-13.5	-5.3
North Dakota	617,761	652,717	638,800	634,195	635,339	636,725	637,994	641,367	-1.7	0.4

[a]Population estimates for 1995 were not available for North Dakota cities. Population changes for cities were estimated from 1980 through 1994 and 1990 through 1994.

Source: U.S. Bureau of the Census (*various years*).

Appendix Table 3. Population by Age Group and Median Age, Billings County, State Planning Region 8, and North Dakota, 1970 Through 1990

County	1970	1980	1990	Percent Change 1970-1980	Percent Change 1980-1990	Percent Change 1970-1990
Billings County						
Total	1,198	1,138	1,108	-5.0	-2.6	-7.5
Under 5	77	93	84	20.8	-9.7	9.1
5 - 9	150	99	112	-34.0	13.1	-25.3
10 - 14	155	100	107	-35.5	7.0	-31.0
15 - 19	143	130	81	-9.1	-37.7	-43.4
20 - 24	41	85	39	107.3	-54.1	-4.9
25 - 34	93	160	168	72.0	5.0	80.6
35 - 44	142	123	165	-13.4	34.1	16.2
45 - 54	174	102	110	-41.4	7.8	-36.8
55 - 64	148	149	116	0.7	-22.1	-21.6
65 & Over	75	97	126	29.3	29.9	68.0
Median	28.7	28.7	33.5			
% over 65	6.3	8.5	11.4			
Adams County						
Total	3,832	3,584	3,174	-6.5	-11.4	-17.2
Under 5	299	280	214	-6.4	-23.6	-28.4
5 - 9	368	252	236	-31.5	-6.3	-35.9
10 - 14	452	280	235	-38.1	-16.1	-48.0
15 - 19	364	304	194	-16.5	-36.2	-46.7
20 - 24	226	260	115	15.0	-55.8	-49.1
25 - 34	366	516	391	41.0	-24.2	6.8
35 - 44	391	365	475	-6.6	30.1	21.5
45 - 54	449	369	305	-17.8	-17.3	-32.1
55 - 64	426	375	328	-12.0	-12.5	-23.0
65 & Over	491	583	681	18.7	16.8	38.7
Median	30.6	32.9	39.2			
% Over 65	12.8	18.1	21.5			

Appendix Table 3. Continued

County	1970	1980	1990	Percent Change 1970-1980	Percent Change 1980-1990	Percent Change 1970-1990
Bowman County						
Totals	3,901	4,229	3,596	8.4	-15.0	-7.8
Under 5	311	374	233	20.3	-37.7	-25.1
5 - 9	407	392	293	-3.7	-25.3	-28.0
10 - 14	465	326	300	-29.9	-8.0	-35.5
15 - 19	397	397	247	----	-37.8	-37.8
20 - 24	211	333	126	57.8	-62.2	-40.3
25 - 34	393	601	471	52.9	-21.6	19.8
35 - 44	435	439	520	0.9	18.5	19.5
45 - 54	454	432	352	-4.8	-18.5	-22.5
55 - 64	397	364	390	-8.3	7.1	-1.8
65 & Over	431	571	664	32.5	16.3	54.1
Median	28.5	29.1	37.1			
% over 65	11.0	13.5	18.5			
Dunn County						
Total	4,895	4,627	4,005	-5.5	-13.4	-18.2
Under 5	398	393	330	-1.3	-16.0	-17.1
5 - 9	565	360	366	-36.3	1.7	-35.2
10 - 14	692	435	368	-37.1	-15.4	-46.8
15 - 19	536	478	250	-10.8	-47.7	-53.4
20 - 24	239	364	148	52.3	-59.3	-38.1
25 - 34	411	645	532	56.9	-17.5	29.4
35 - 44	478	479	581	0.2	21.3	21.5
45 - 54	633	441	386	-30.3	-12.5	-39.0
55 - 64	537	513	380	-4.5	-25.9	-29.2
65 & Over	406	519	664	27.8	27.9	63.5
Median	25.5	28.8	35.1			
% Over 65	8.3	11.2	16.6			

Appendix Table 3. Continued

County	1970	1980	1990	Percent Change 1970-1980	Percent Change 1980-1990	Percent Change 1970-1990
Golden Valley County						
Total	2,611	2,391	2,108	-8.4	-11.8	-19.3
Under 5	206	188	135	-8.7	-28.2	-34.5
5 - 9	259	173	189	-33.2	9.2	-27.0
10 - 14	287	215	200	-25.1	-7.0	-30.3
15 - 19	288	241	170	-16.3	-29.5	-41.0
20 - 24	138	150	81	8.7	-46.0	-41.3
25 - 34	225	305	252	35.6	-17.4	12.0
35 - 44	238	239	260	0.4	8.8	9.3
45 - 54	313	230	180	-26.5	-21.7	-42.5
55 - 64	294	264	206	-10.2	-22.0	-30.0
65 & Over	363	386	435	6.3	12.7	19.8
Median	29.7	32.5	35.9			
% over 65	13.9	16.1	20.6			
Hettinger County						
Total	5,075	4,275	3,445	-15.8	-19.4	-32.1
Under 5	457	291	244	-36.3	-16.2	-46.6
5 - 9	561	290	259	-48.3	-10.7	-53.8
10 - 14	674	415	254	-38.4	-38.8	-62.3
15 - 19	521	404	206	-22.5	-49.0	-60.5
20 - 24	207	258	109	24.6	-57.8	-47.3
25 - 34	453	538	407	18.8	-24.3	-10.2
35 - 44	550	385	422	-30.0	9.6	-23.3
45 - 54	584	490	357	-16.1	-27.1	-38.9
55 - 64	581	526	414	-9.5	-21.3	-28.7
65 & Over	487	678	773	39.2	14.0	58.7
Median	27.6	33.6	40.5			
% Over 65	9.6	15.6	22.4			

Appendix Table 3. Continued

County	1970	1980	1990	Percent Change 1970-1980	Percent Change 1980-1990	Percent Change 1970-1990
Slope County						
Total	1,484	1,157	907	-22.0	-21.6	-38.9
Under 5	119	95	63	-20.2	-33.7	-47.1
5 - 9	186	87	80	-53.2	-8.0	-57.0
10 - 14	226	106	85	-53.1	-19.8	-62.4
15 - 19	166	131	65	-21.1	-50.4	-60.8
20 - 24	69	73	41	5.8	-43.8	-40.6
25 - 34	127	156	124	22.8	-20.5	-2.4
35 - 44	170	99	135	-41.8	36.4	-20.6
45 - 54	166	147	83	-11.4	-43.5	-50.0
55 - 64	139	132	118	-5.0	-10.6	-15.1
65 & Over	116	131	113	12.9	-13.7	-2.6
Median	23.3	30.3	34.8			
% over 65	7.3	11.3	12.5			
Stark County						
Total	19,613	23,697	22,832	20.8	-3.7	16.4
Under 5	1,832	2,169	1,790	18.4	-17.5	-2.3
5 - 9	2,166	1,817	2,065	-16.1	13.6	-4.7
10 - 14	2,384	2,002	1,876	-16.0	-6.3	-21.3
15 - 19	2,464	2,614	1,703	6.1	-34.9	-30.8
20 - 24	1,792	2,957	1,497	65.0	-49.4	-16.5
25 - 34	1,997	3,911	3,914	95.8	0.1	96.0
35 - 44	1,841	2,146	3,163	16.6	47.4	71.8
45 - 54	1,797	2,127	1,976	18.4	-7.1	10.0
55 - 64	1,610	1,631	1,835	1.3	12.5	14.0
65 & Over	1,730	2,323	3,013	34.3	29.7	74.2
Median	22.7	25.7	31.7			
% Over 65	8.8	9.8	13.2			

Appendix Table 3. Continued

County	1970	1980	1990	Percent Change 1970-1980	Percent Change 1980-1990	Percent Change 1970-1990
State Planning Region 8						
Total	42,609	45,098	41,175	5.8	-8.7	-3.4
Under 5	3,699	3,883	3,093	5.0	-20.3	-16.4
5 - 9	4,662	3,470	3,600	-25.6	3.7	-22.8
10 - 14	5,335	3,879	3,425	-27.3	-11.7	-35.8
15 - 19	4,879	4,699	2,916	-3.7	-37.9	-40.2
20 - 24	2,923	4,480	2,156	53.3	-51.9	-26.2
25 - 34	4,065	6,832	6,259	68.1	-8.4	54.0
35 - 44	4,245	4,275	5,721	0.7	33.8	34.8
45 - 54	4,570	4,338	3,749	-5.1	-13.6	-18.0
55 - 64	4,132	3,954	3,787	-4.3	-4.2	-8.3
65 & Over	4,099	5,288	6,469	29.0	22.3	57.8
Median	30.7	32.7	35.4			
% over 65	9.6	11.7	15.7			
North Dakota						
Total	617,761	652,717	638,800	5.7	2.1	3.4
Under 5	51,338	54,752	47,961	6.7	-12.4	-6.6
5 - 9	64,220	49,016	51,916	-23.7	5.9	-19.2
10 - 14	70,334	51,043	48,912	-27.4	-4.2	-30.5
15 - 19	64,769	63,977	46,479	-1.2	-27.4	-28.2
20 - 24	48,767	69,393	46,982	42.3	-32.3	-3.7
25 - 34	65,452	104,157	105,010	59.1	0.8	60.4
35 - 44	64,198	63,646	90,912	-0.9	42.8	41.6
45 - 54	63,947	59,128	56,344	-7.5	-4.7	-11.9
55 - 64	58,368	57,160	53,295	-2.1	-6.8	-8.7
65 & Over	66,368	80,445	90,989	21.2	13.1	37.1
Median	26.4	28.1	32.4			
% Over 65	10.7	12.3	14.2			

Sources: U.S. Bureau of the Census (1973, 1982, 1990).

Appendix Table 4. Employment, Labor Force, and Unemployment, Billings County, State Planning Region 8 and North Dakota, Selected Years, 1980 Through 1995

Area/Item	1980	1984	1988	1990	1991	1992	1993	1994	1995[a]	Percent Change 1980-1995	Percent Change 1990-1995
Billings County											
Employment	1,157	897	846	672	735	714	554	548	541	-53.2	-19.5
Labor Force	1,174	917	878	697	759	737	574	573	561	-52.2	-19.5
Unemployment	17	20	32	25	24	23	20	25	20	17.6	-20.0
% Unemployment	1.4	2.2	3.6	3.6	3.2	3.1	3.5	4.4	3.6		
State Planning Region 8											
Employment	21,519	22,594	20,518	20,206	19,337	18,637	19,110	20,092	19,986	-7.1	-1.1
Labor Force	22,175	23,871	21,656	20,948	20,264	19,698	19,981	20,995	20,461	-7.7	-2.3
Unemployment	656	1,277	1,138	742	927	1,052	871	903	475	-27.6	-36.0
% Unemployment	3.0	5.3	5.3	3.5	4.6	5.3	4.4	4.3	2.3		
North Dakota											
Employment	288,000	311,000	316,000	308,000	304,000	299,000	305,000	324,000	325,414	13.0	5.7
Labor Force	303,000	328,000	332,000	321,000	317,000	314,000	319,000	337,000	332,853	9.9	3.7
Unemployment	15,000	17,000	16,000	13,000	13,000	15,000	14,000	13,000	7,439	-50.4	-42.8
% Unemployment	5.0	5.1	4.8	4.0	4.1	4.8	4.4	3.9	2.2		

[a]Values for 1995 are for October 1995, not 1995 annual averages.

Source: Job Service North Dakota (*various years*).

Appendix Table 5. Full-Time and Part-Time Employees by Major Industry, Billings County, State Planning Region 8, and North Dakota, 1980 Through 1993

Item	1980	1984	1988	1990	1991	1992	1993
Adams County							
Employment by Place of Work							
Total Employment	1,941	1,871	1,868	1,953	1,960	1,969	1,951
By Type:							
Wage and salary	1,245	1,167	1,158	1,205	1,198	1,203	1,179
Proprietors	696	704	710	748	762	766	772
Farm	436	421	411	419	406	407	407
Nonfarm 1/	260	283	299	329	356	359	365
By Industry:							
Farm	528	488	461	462	447	446	451
Nonfarm	1,413	1,383	1,407	1,491	1,513	1,523	1,500
Private	1,211	1,183	1,203	1,270	1,296	1,305	1,291
Ag. Serv., For., Fish., and other 2/	30	40	50	61	67	65	64
Mining	26	(L)	(L)	(L)	(L)	(L)	(L)
Construction	114	76	42	51	51	53	56
Manufacturing	75	32	22	15	12	12	15
Transportation and public utilities	84	(D)	117	114	99	95	98
Wholesale trade	166	137	99	93	98	99	78
Retail trade	233	249	253	263	283	295	316
Finance, insurance, and real estate	67	90	94	104	95	96	91
Services	416	(D)	521	565	587	587	570
Government and government enterprises	202	200	204	221	217	218	209
Federal, civilian	33	26	31	30	28	27	25
Military	25	28	33	31	29	30	29
State and local	144	146	140	160	160	161	155

Appendix Table 5. Continued

Item	1980	1984	1988	1990	1991	1992	1993
Billings County							
Employment by Place of Work							
Total Employment	1,398	1,019	877	889	827	792	785
By Type:							
Wage and salary	1,049	680	583	590	535	499	493
Proprietors	349	339	294	299	292	293	292
Farm	304	290	270	274	266	267	266
Nonfarm 1/	45	49	24	25	26	26	26
By Industry:							
Farm	357	342	309	308	297	297	300
Nonfarm	1,041	677	568	581	530	495	485
Private	920	541	419	442	393	362	361
Ag. Serv., For., Fish., and other 2/	12	(D)	(L)	(D)	(L)	(L)	(L)
Mining	629	295	162	137	93	79	44
Construction	83	(D)	34	(D)	(D)	(D)	(D)
Manufacturing	0	0	0	0	0	0	(D)
Transportation and public utilities	(L)	24	13	13	(D)	(D)	(D)
Wholesale trade	(L)	(L)	0	0	0	0	0
Retail trade	61	46	37	41	38	41	40
Finance, insurance, and real estate	(L)	(L)	0	(L)	(L)	(L)	(L)
Services	121	134	167	186	200	187	224
Government and government enterprises	121	136	149	139	137	133	124
Federal, civilian	52	44	44	43	43	47	40
Military	(L)	10	11	11	11	12	12
State and local	61	82	94	85	83	74	72

Appendix Table 5. Continued

Item	1980	1984	1988	1990	1991	1992	1993
Bowman County							
Employment by Place of Work							
Total Employment	2,346	2,397	2,315	2,291	2,268	2,257	2,302
By Type:							
Wage and salary	1,582	1,590	1,452	1,425	1,394	1,380	1,418
Proprietors	764	807	863	866	874	877	884
Farm	441	433	404	413	400	401	401
Nonfarm 1/	323	374	459	453	474	476	483
By Industry:							
Farm	548	552	493	490	472	470	478
Nonfarm	1,798	1,845	1,822	1,801	1,796	1,787	1,824
Private	1,529	1,580	1,528	1,513	1,505	1,499	1,546
Ag. Serv., For., Fish., and other 2/	12	19	33	33	33	33	33
Mining	244	192	111	83	82	88	92
Construction	103	103	91	86	103	94	94
Manufacturing	22	43	53	61	50	44	47
Transportation and public utilities	52	62	57	60	54	57	65
Wholesale trade	177	188	153	159	134	143	147
Retail trade	394	373	402	356	370	368	376
Finance, insurance, and real estate	130	143	144	154	169	160	154
Services	395	457	484	521	510	512	538
Government and government enterprises	269	265	294	288	291	288	278
Federal, civilian	28	24	28	28	29	31	29
Military	30	34	37	36	33	34	34
State and local	211	207	229	224	229	223	215

Appendix Table 5. Continued

Item	1980	1984	1988	1990	1991	1992	1993
Dunn County							
Employment by Place of Work							
Total Employment	2,400	2,154	1,709	1,809	1,823	1,820	1,863
By Type:							
Wage and salary	1,411	1,162	843	937	951	947	988
Proprietors	989	992	866	872	872	873	875
Farm	786	771	718	732	709	711	711
Nonfarm 1/	203	221	148	140	163	162	164
By Industry:							
Farm	1,003	974	869	863	832	829	842
Nonfarm	1,397	1,180	840	946	991	991	1,021
Private	1,106	870	553	650	687	680	718
Ag. Serv., For., Fish., and other 2/	14	24	31	35	29	29	24
Mining	296	135	36	58	50	53	74
Construction	125	123	40	52	32	43	39
Manufacturing	(L)	12	21	33	48	49	65
Transportation and public utilities	102	68	38	41	50	35	41
Wholesale trade	128	83	62	60	61	67	68
Retail trade	229	215	134	126	149	149	152
Finance, insurance, and real estate	44	53	45	42	43	37	38
Services	160	157	146	203	225	218	217
Government and government enterprises	291	310	287	296	304	311	303
Federal, civilian	40	35	41	42	35	36	36
Military	33	40	42	40	37	39	39
State and local	218	235	204	214	232	236	228

Appendix Table 5. Continued

Item	1980	1984	1988	1990	1991	1992	1993
Golden Valley County							
Employment by Place of Work							
Total Employment	1,402	1,289	1,261	1,265	1,140	1,140	1,166
By Type:							
Wage and salary	846	768	771	755	664	661	687
Proprietors	556	521	490	510	476	479	479
Farm	334	297	270	275	266	267	266
Nonfarm 1/	222	224	220	235	210	212	213
By Industry:							
Farm	401	356	314	313	302	301	304
Nonfarm	1,001	933	947	952	838	839	862
Private	844	757	757	765	655	661	684
Ag. Serv., For., Fish., and other 2/	19	15	16	(D)	(D)	17	19
Mining	79	28	49	(D)	(D)	(L)	(L)
Construction	75	75	69	52	29	30	26
Manufacturing	33	43	30	33	35	37	37
Transportation and public utilities	43	42	43	57	55	53	55
Wholesale trade	71	81	69	70	64	62	66
Retail trade	246	173	183	190	174	168	177
Finance, insurance, and real estate	71	80	58	60	64	62	66
Services	207	220	240	256	213	230	237
Government and government enterprises	157	176	190	187	183	178	178
Federal, civilian	21	19	19	20	17	17	17
Military	17	20	22	21	19	19	19
State and local	119	137	149	146	147	142	142

Appendix Table 5. Continued

Item	1980	1984	1988	1990	1991	1992	1993
Hettinger County							
Employment by Place of Work							
Total Employment	2,055	1,979	1,830	1,742	1,728	1,711	1,731
By Type:							
Wage and salary	1,144	1,040	914	868	834	811	822
Proprietors	911	939	916	874	894	900	909
Farm	595	576	538	549	532	534	534
Nonfarm 1/	316	363	378	325	362	366	375
By Industry:							
Farm	748	707	636	634	612	610	619
Nonfarm	1,307	1,272	1,194	1,108	1,116	1,101	1,112
Private	1,030	1,009	922	839	860	842	853
Ag. Serv., For., Fish., and other 2/	(D)	13	28	31)	19	23	29
Mining	(D)	13	(L)	(L)	(L)	(L)	(L)
Construction	116	98	86	72	67	70	70
Manufacturing	(D)	26	25	36	37	33	37
Transportation and public utilities	82	87	87	74	78	75	76
Wholesale trade	117	115	89	75	72	67	64
Retail trade	265	224	202	186	191	186	186
Finance, insurance, and real estate	83	94	103	95	85	78	74
Services	289	339	300	266	306	305	314
Government and government enterprises	277	263	272	269	256	259	259
Federal, civilian	45	39	41	43	38	35	36
Military	30	33	36	34	31	31	31
State and local	202	191	195	192	187	193	192

Appendix Table 5. Continued

Item	1980	1984	1988	1990	1991	1992	1993
Slope County							
Employment by Place of Work							
Total Employment	676	619	543	526	567	534	526
By Type:							
Wage and salary	293	226	170	155	180	145	136
Proprietors	383	393	373	371	387	389	390
Farm	335	322	303	309	299	300	300
Nonfarm 1/	48	71	70	62	88	89	90
By Industry:							
Farm	427	402	363	361	348	347	352
Nonfarm	249	217	180	165	219	187	174
Private	187	149	105	93	154	131	119
Ag. Serv., For., Fish., and other 2/	(L)	(L)	(D)	(D)	(L)	(L)	(L)
Mining	110	(D)	(D)	(D)	(D)	(D)	(D)
Construction	(L)	(D)	26	16	(D)	(D)	(D)
Manufacturing	0	0	0	0	0	0	(L)
Transportation and public utilities	(L)	(L)	13	16	15	13	13
Wholesale trade	(L)	(L)	(L)	(L)	(L)	(L)	(L)
Retail trade	35	28	26	18	38	46	43
Finance, insurance, and real estate	(L)	(L)	0	0	0	0	0
Services	30	41	23	29	37	38	36
Government and government enterprises	62	68	75	72	65	56	55
Federal, civilian	10	(L)	11	10	(L)	(L)	(L)
Military	(L)	(L)	10	(L)	(L)	(L)	(L)
State and local	44	50	54	53	47	38	38

Appendix Table 5. Continued

Item	1980	1984	1988	1990	1991	1992	1993
Stark County							
Employment by Place of Work							
Total Employment	13,405	14,004	12,555	12,685	12,942	12,962	13,156
By Type:							
Wage and salary	10,709	10,908	9,741	9,841	10,111	10,111	10,276
Proprietors	2,696	3,096	2,814	2,844	2,831	2,851	2,880
Farm	883	882	844	861	834	836	836
Nonfarm 1/	1,813	2,214	1,970	1,983	1,997	2,015	2,044
By Industry:							
Farm	1,115	1,060	976	976	942	940	951
Nonfarm	12,290	12,944	11,579	11,709	12,000	12,022	12,205
Private	10,704	11,133	9,694	9,781	10,110	10,030	10,277
Ag. Serv., For., Fish., and other 2/	58	75	79	86	105	103	107
Mining	776	1,051	637	597	722	588	626
Construction	1,061	753	547	473	511	518	560
Manufacturing	656	573	576	680	663	671	721
Transportation and public utilities	879	922	765	663	673	680	692
Wholesale trade	727	761	665	626	651	649	639
Retail trade	2,701	2,575	2,420	2,513	2,622	2,684	2,720
Finance, insurance, and real estate	621	696	707	691	591	587	592
Services	3,225	3,727	3,298	3,452	3,572	3,550	3,620
Government and government enterprises	1,586	1,811	1,885	1,928	1,890	1,992	1,928
Federal, civilian	170	173	190	200	177	171	166
Military	173	213	273	298	280	289	230
State and local	1,243	1,425	1,422	1,430	1,433	1,532	1,532

Appendix Table 5. Continued

Item	1980	1984	1988	1990	1991	1992	1993
State Planning Region 8							
Employment by Place of Work							
Total Employment	25,623	25,332	22,958	23,160	23,255	23,185	23,480
By Type:							
Wage and salary	18,279	17,541	15,632	15,776	15,867	15,757	15,999
Proprietors	7,344	7,791	7,326	7,384	7,388	7,428	7,481
Farm	4,114	3,992	3,758	3,832	3,712	3,723	3,721
Nonfarm 1/	3,230	3,799	3,568	3,552	3,676	3,705	3,760
By Industry:							
Farm	5,127	4,881	4,421	4,407	4,252	4,240	4,297
Nonfarm	20,496	20,451	18,537	18,753	19,003	18,945	19,183
Private	17,531	17,222	15,181	15,353	15,660	15,510	15,849
Ag. Serv., For., Fish., and other 2/	145	186	237	246	253	270	276
Mining	2,160	1,714	995	875	947	808	836
Construction	1,677	1,228	935	802	793	808	845
Manufacturing	786	731	727	858	845	846	922
Transportation and public utilities	1,242	1,205	1,133	1,038	1,024	1,008	1,040
Wholesale trade	1,386	1,365	1,137	1,083	1,080	1,087	1,062
Retail trade	4,164	3,883	3,657	3,693	3,865	3,937	4,010
Finance, insurance, and real estate	1,016	1,156	1,151	1,146	1,047	1,020	1,015
Services	4,843	5,075	5,179	5,478	5,650	5,627	5,756
Government and government enterprises	2,965	3,229	3,356	3,400	3,343	3,435	3,334
Federal, civilian	399	360	405	416	367	364	349
Military	308	378	464	471	440	454	394
State and local	2,242	2,473	2,487	2,504	2,518	2,599	2,574

Appendix Table 5. Continued

Item	1980	1984	1988	1990	1991	1992	1993
North Dakota							
Employment by Place of Work							
Total Employment	354,093	364,228	365,648	374,869	379,722	387,089	396,223
By Type:							
Wage and salary	269,387	277,279	279,541	286,605	290,725	297,973	306,389
Proprietors	84,706	86,949	86,107	88,264	88,997	89,116	89,834
Farm	42,599	39,648	35,769	36,488	35,336	35,445	35,440
Nonfarm 1/	42,107	47,301	50,338	51,776	53,661	53,671	54,394
By Industry:							
Farm	51,890	48,135	42,084	41,972	40,484	40,392	40,934
Nonfarm	302,203	316,093	323,564	332,897	339,238	346,697	355,289
Private	235,275	246,653	250,752	260,087	267,090	273,141	281,394
Ag. Serv., For., Fish., and other 2/	2,358	2,853	3,574	3,762	4,130	4,122	4,283
Mining	8,190	8,273	4,829	4,884	4,774	4,380	4,282
Construction	22,171	19,749	15,825	15,701	15,886	17,033	17,970
Manufacturing	16,661	16,387	17,187	18,204	18,792	19,248	20,431
Transportation and public utilities	18,783	19,296	19,811	20,319	20,525	20,699	21,198
Wholesale trade	21,575	21,594	20,545	20,522	20,488	20,977	20,802
Retail trade	58,342	58,632	59,895	62,441	64,848	66,517	68,776
Finance, insurance, and real estate	17,885	19,629	21,934	21,711	21,927	21,822	22,236
Services	69,310	80,240	87,152	92,543	95,720	98,343	101,416
Government and government enterprises	66,928	69,440	72,812	72,810	72,148	73,556	73,895
Federal, civilian	9,946	9,300	10,310	10,552	10,066	10,054	9,767
Military	15,308	17,171	17,345	16,584	15,842	15,973	16,070
State and local	41,674	42,969	45,157	45,674	46,240	47,529	48,058

1/ Excludes limited partners.
2/ "Other" consists of the number of jobs held by U.S. residents employed by international organizations, foreign embassies, and consulates in the United States.
(D) Not shown to avoid disclosure of confidential information.
(L) Less than 10 jobs. Estimates are included in totals.

Source: U.S. Bureau of Economic Analysis (*various years*-a).

Appendix Table 6. Median Family Income, Billings County, State Planning Region 8, and North Dakota, 1969 Through 1989

County	Nominal Dollars			Real Dollars			Numeric Difference				Percent Difference			
							Nominal Dollars		Real Dollars		Nominal Dollars		Real Dollars	
	1969	1979	1989	1969	1979	1989	'69 - 89	'79 - 89	'69 - 89	'79 - 89	'69 - 89	'79 - 89	'69 - 89	'79 - 89
	dollars										percent			
Billings	4,767	22,241	24,688	16,105	37,986	24,688	19,921	2,447	8,583	-13,298	417.9	11.0	53.3	-35.0
Other SPR8 Counties														
Adams	7,613	16,271	26,925	25,720	27,790	26,925	19,312	10,654	1,205	-865	253.7	65.5	4.7	-3.1
Bowman	7,388	17,342	25,577	24,959	29,619	25,577	18,189	8,235	618	-4,042	246.2	47.5	2.5	-13.6
Dunn	6,602	14,271	23,546	22,304	24,374	23,546	16,944	9,275	1,242	-828	256.6	65.0	5.6	-3.4
Golden Valley	7,373	17,818	25,703	24,909	30,432	25,703	18,330	7,885	794	-4,729	248.6	44.3	3.2	-15.5
Hettinger	6,763	13,489	23,201	22,848	23,038	23,201	16,438	9,712	353	163	243.1	72.0	1.5	0.7
Slope	7,932	13,606	20,682	26,797	23,238	20,682	12,750	7,076	-6,115	-2,556	160.7	52.0	-22.8	-11.0
Stark	7,370	19,222	28,290	24,899	32,830	28,290	20,290	9,068	3,391	-4,540	275.3	47.2	13.6	-13.8
SPR8 (averages)	6,976	16,783	24,827	23,568	28,664	24,827	17,851	8,044	1,259	-3,837	255.9	47.9	5.3	-13.4
North Dakota	7,838	18,023	28,707	26,480	30,782	28,707	20,869	10,684	2,227	-2,075	266.3	59.3	8.4	-6.7

Source: U.S. Bureau of the Census (1973, 1982, 1993).

Appendix Table 7. Percent of Population With Incomes Below Poverty Levels for Persons and Families, Billings County, State Planning Region 8, and North Dakota, 1969 Through 1989

Area	1969		1979		1989	
	Persons	Families	Persons	Families	Persons	Families
	percent					
Billings County	33.3	28.0	19.0	14.8	29.6	26.2
Other SPR8 Counties						
Adams	15.7	12.3	17.1	13.4	13.7	10.1
Bowman	13.4	9.8	13.4	10.5	15.6	10.9
Dunn	23.6	20.0	21.1	16.1	25.0	22.8
Golden Valley	15.1	14.4	14.4	11.1	15.9	14.0
Hettinger	24.2	18.3	20.9	17.1	18.5	16.1
Slope	15.5	11.2	22.9	19.3	20.9	16.5
Stark	17.8	14.6	11.8	9.0	14.3	11.3
North Dakota	15.7	12.4	12.6	9.8	14.4	10.9

Source: U.S.Bureau of the Census (1973, 1982, 1993).

Appendix Table 8. Livestock Inventories, Billings County, State Planning Region 8, and North Dakota, 1991 Through 1995

County	Livestock Inventories 1991	1992	1993	1994	1995	1993-95 Avg
			Cattle			
Billings	26,000	30,000	30,000	36,000	36,000	34,000
Adams	31,000	33,000	29,000	31,000	30,000	30,000
Bowman	29,000	27,000	24,000	29,000	33,000	28,667
Dunn	83,000	85,000	85,000	100,000	100,000	95,000
G. Valley	26,000	24,000	23,000	24,000	25,000	24,000
Hettinger	25,000	25,000	22,000	23,000	28,000	24,333
Slope	28,000	28,000	25,000	29,000	31,000	28,333
Stark	55,000	53,000	57,000	63,000	62,000	60,667
SPR8	248,000	252,000	238,000	272,000	283,000	264,333
N. D.	1,700,000	1,750,000	1,750,000	1,900,000	1,920,000	1,856,667
Billings County--% of region						12.9
Billings County--% of state						1.8
SPR8--% of state						14.2
			Sheep			
Billings	800	800	800	700	400	633
Adams	12,400	12,000	12,000	12,500	9,000	11,167
Bowman	24,600	24,000	24,500	21,000	19,000	21,500
Dunn	4,500	4,000	3,500	3,000	1,800	2,767
G. Valley	4,500	3,500	3,000	2,700	2,000	2,567
Hettinger	2,300	2,700	3,200	2,500	1,600	2,433
Slope	4,900	4,000	3,500	3,000	2,500	3,000
Stark	4,500	4,000	4,000	2,600	1,500	2,700
SPR8	54,000	51,000	50,500	45,400	36,300	44,067
N. D.	222,000	214,000	205,000	166,000	127,000	166,000
Billings County--% of region						1.4
Billings County--% of state						0.4
SPR8--% of state						26.5
			Hogs			
Billings	1,000	1,000	1,200	1,500	600	1,100
Adams	1,600	1,500	1,800	2,200	1,300	1,767
Bowman	2,800	4,500	3,700	4,800	4,300	4,267
Dunn	3,700	5,000	4,200	5,900	5,500	5,200
G. Valley	2,700	3,300	3,400	4,000	3,200	3,533
Hettinger	8,600	11,000	11,000	13,000	9,500	11,167
Slope	1,800	2,500	2,700	4,000	2,700	3,133
Stark	5,500	8,200	9,200	9,500	6,400	8,367
SPR8	22,200	28,800	28,000	35,400	27,100	30,167
N. D.	265,000	290,000	290,000	320,000	245,000	285,000
Billings County--% of region						3.6
Billings County--% of state						0.4
SPR8--% of state						10.6

Appendix Table 9. Regional Impacts by Economic Sector, Alternative Economic Scenarios in Billings County, North Dakota, 1996

Economic Sector	Alternative Economic Scenarios					
	Graz5	Graz10	Graz25	Graz50	GrazNoFed	GrazNoSt
	000s $					
Agriculture Livestock	321	643	1,608	3,217	6,917	557
Agriculture Crops	105	210	525	1,049	2,256	182
Nonmetal Mining	2	4	11	22	48	4
Construction	19	38	96	192	414	33
Transportation	4	8	20	40	87	7
Communications and Public Utilities	24	49	123	245	528	42
Agricultural Processing and Misc Manufacturing	152	305	763	1,527	3,283	264
Retail Trade	188	377	942	1,884	4,052	326
Finance, Insurance, and Real Estate	41	81	203	407	874	70
Business and Personal Service	15	30	75	150	322	26
Professional and Social Service	19	38	95	189	407	33
Households	278	557	1,393	2,787	5,992	482
Government	26	53	131	263	566	46
Coal Mining	0	0	0	0	0	0
Electricity Generation	0	0	0	0	0	0
Petroleum Extraction/Exploration	0	0	0	0	0	0
Petroleum Refining	0	0	0	0	0	0
Total	1,194	2,393	5,985	11,972	25,746	2,072

Notes: Graz5, Graz10, Graz25, and Graz50 represent 5, 10, 25, and 50 percent change in average (1993-1995) grazing output in Billings County, respectively. GrazNoFed represents the impacts of no federal grazing in Billings County. GrazNoSt represents the impacts of no state grazing in Billings County.

Appendix Table 9. Continued

Economic Sector	Alternative Economic Scenarios					
	Ener5	Ener10	Ener15	Ener20	Ener25	Trsm250
	---------- 000s $ ----------					
Agriculture Livestock	80	159	239	318	398	19
Agriculture Crops	31	62	93	124	155	7
Nonmetal Mining	23	45	68	90	113	1
Construction	574	1,148	1,722	2,296	2,870	10
Transportation	90	180	270	360	450	3
Communications and Public Utilities	255	510	765	1,020	1,275	17
Agricultural Processing and Misc Manufacturing	49	97	146	194	243	10
Retail Trade	919	1,838	2,757	3,676	4,595	267
Finance, Insurance, and Real Estate	194	388	582	776	970	18
Business and Personal Service	70	139	209	278	348	69
Professional and Social Service	105	210	315	420	525	8
Households	1,603	3,205	4,808	6,410	8,013	120
Government	140	280	420	560	700	12
Coal Mining	2	3	5	6	7	0
Electricity Generation	0	0	0	0	0	0
Petroleum Extraction/Exploration	5,491	10,981	16,472	21,962	27,453	0
Petroleum Refining	0	0	0	0	0	0
Total	9,623	19,245	28,868	38,490	48,113	561

Notes: Ener5, Ener10, Ener15, Ener20, and Ener25 represent changes of $5, $10, $15, $20, $25 million in energy sector output in Billings County, respectively. Trsm250 represents $250,000 change in tourism activities in Billings County.

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Appendix Table 9. Continued

Economic Sector		Alternative Economic Scenarios			
		Trsm500	Trsm1m	Trsm2.5m	Trsm5m
		---------- 000s $ ----------			
Agriculture Livestock		38	76	191	381
Agriculture Crops	14	28	69	138	
Nonmetal Mining		1	3	7	14
Construction		20	40	99	198
Transportation		5	11	27	54
Communications and Public Utilities		34	67	168	336
Agricultural Processing and Misc Manufacturing		20	40	100	199
Retail Trade		534	1,068	2,670	5,341
Finance, Insurance, and Real Estate		35	70	176	352
Business and Personal Service		139	277	693	1,386
Professional and Social Service		17	33	83	166
Households		241	482	1,204	2,408
Government		24	49	122	245
Coal Mining		0	0	0	0
Electricity Generation		0	0	0	0
Petroleum Extraction/Exploration		0	0	0	0
Petroleum Refining		0	0	0	0
Total		1,122	2,244	5,609	11,218

Notes: Trsm500, Trsm1m, Trsm2.5m, and Trsm5m represent changes of $500,000, $1 million, $2.5 million, and $5 million in tourism activities in Billings County, respectively.

Appendix Table 10. County Revenues and Expenditures, General and Special Revenue Funds, Billings County, North Dakota, 1987 Through 1994

Item	General Fund							
	1994	1993	1992	1991	1990	1989	1988	1987
	nominal dollars							
Revenues								
Taxes	196,819	185,921	150,835	136,983	113,613	152,381	132,890	151,898
Licenses, Permits, Fees	715	655	630	960	1,405	1,203	1,082	490
Intergovernmental Revenue	936,542	1,068,301	1,265,754	1,464,560	1,354,529	1,187,938	936,579	1,269,586
Charges for Services	58,940	31,348	31,367	317,781	47,453	75,218	48,314	39,875
Miscellaneous Revenue	122,653	305,157	126,617	19,893	22,589	36,914	151,976	923,561
Totals	1,315,669	1,591,382	1,575,203	1,940,177	1,539,589	1,453,654	1,270,841	2,385,410
Expenditures								
General Government	437,059	434,894	446,054	414,898	412,010	419,316	405,907	479,306
Public Safety	181,269	171,338	171,944	173,993	159,025	160,365	142,572	123,238
Highways	0	0	0	0	0	0	0	0
Health and Welfare	8,924	17,962	15,692	4,154	12,321	3,500	8,818	8,459
Cons. of Natural Resources	6,000	3,500	18,642	13,644	10,000	3,502	1,092	2,640
Economic Development	3,686	2,700	0	0	0	0	0	0
Culture and Recreation	52,898	78,136	37,472	38,263	31,616	25,695	20,218	0
Capital Outlays	32,116	4,467	4,868	10,783	40,844	0	0	0
Other	6,666	0	3,399	30,120	5,970	1,964	1,760	0
Debt Service	0	30,072	8,744	7,689	7,775	6,749	6,643	0
Totals	728,618	743,069	706,815	693,544	679,561	621,091	587,010	613,643

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Appendix Table 10. Continued

Item	Special Revenue Fund							
	1994	1993	1992	1991	1990	1989	1988	1987
	nominal dollars							
Revenues								
Taxes	217,154	230,034	207,524	249,141	272,258	242,089	240,571	290,901
Licenses, Permits, Fees	51,032	66,502	60,469	76,898	70,298	54,056	64,182	62,964
Intergovernmental Revenue	322,481	1,338,672	1,524,944	1,101,485	810,467	1,622,198	1,499,583	1,048,932
Charges for Services	20,523	18,516	40,218	15,496	19,523	10,531	27,166	10,889
Miscellaneous Revenue	502,856	2,720,875	2,024,360	493,278	183,535	77,199	70,267	80,724
Totals	1,114,046	4,374,599	3,857,515	1,936,298	1,356,081	2,006,073	1,901,769	1,494,410
Expenditures								
General Government	54,736	52,365	55,020	55,130	457,422	54,217	54,436	52,765
Public Safety	5,792	3,598	0	0	0	0	0	0
Highways	1,940,174	1,563,758	2,219,982	2,163,733	2,195,550	3,515,989	5,233,521	5,069,945
Health and Welfare	56,225	47,648	51,200	57,279	74,616	81,710	79,112	72,171
Cons. of Natural Resources	77,224	71,817	64,360	79,550	70,388	69,513	47,753	51,513
Economic Development	0	0	0	0	0	0	0	0
Culture and Recreation	0	0	0	0	0	8,573	8,906	23,615
Capital Outlays	0	0	0	0	0	0	0	0
Other	64,354	551,581	651,003	0	1,184	0	0	0
Debt Service	0	0	0	0	0	0	0	0
Totals	2,198,505	2,290,767	3,041,565	2,355,692	2,799,160	3,730,002	5,423,728	5,270,009

Source: Office of the State Auditor (1996).

Appendix Table 11. Crude Oil Production in North Dakota, by County, 1980 Through 1995

County	1980	1984	1988	1990	1991	1992	1993	1994	1995
	barrels								
Billings	14,458,733	15,526,788	8,535,573	7,933,152	8,510,968	7,756,517	7,084,165	6,551,321	6,305,898
Other SPR8 Counties									
Adams	--	--	--	--	--	--	--	337	170
Bowman	1,532,850	1,810,232	1,317,208	1,307,603	1,300,373	1,320,772	1,264,014	1,276,254	1,957,647
Dunn	2,755,447	3,762,457	1,902,201	1,526,019	1,797,760	1,953,622	1,707,577	1,358,468	1,233,420
Golden Valley	450,165	545,673	660,705	556,649	494,554	490,006	494,464	473,038	487,831
Hettinger	36,920	23,518	84	–	–	95	31	--	59
Slope	41,691	83,504	38,206	20,847	18,106	17,041	24,810	23,795	34,296
Stark	1,574,162	1,811,219	1,218,748	877,866	827,105	726,253	1,092,381	829,065	3,058,317
Other Counties									
Bottineau	2,662,066	2,375,371	2,531,047	2,435,382	2,370,365	2,211,231	2,044,688	1,980,503	2,172,075
Burke	718,143	1,457,422	977,482	829,890	787,508	783,825	702,896	657,616	682,335
Divide	271,999	1,018,118	717,045	1,219,347	1,190,506	1,134,955	1,047,383	867,878	766,122
McHenry	13,650	26,561	43,034	47,082	51,350	46,325	45,232	40,249	39,633
McKenzie	8,988,573	16,137,295	12,689,393	10,811,182	9,957,526	9,243,113	8,866,860	7,821,951	7,218,012
McLean	--	--	--	43,070	505,693	358,787	268,774	193,666	146,055
Mercer	1,052	--	--	–	–	–	--	--	--
Mountrail	604,944	571,271	958,264	2,047,254	1,389,941	975,151	778,503	592,979	487,327
Renville	1,394,243	1,688,689	1,566,558	1,714,199	1,683,244	1,424,015	1,197,065	1,052,255	1,106,703
Ward	166,398	85,082	376,012	318,243	221,722	197,670	200,309	177,190	158,423
Williams	4,688,054	5,740,225	5,825,414	5,032,611	4,788,557	4,260,793	4,099,521	3,793,847	3,481,601
North Dakota	40,354,030	52,663,425	39,356,974	36,720,396	35,895,278	32,900,171	30,918,673	27,690,412	29,335,924

Source: North Dakota Industrial Commission (*various years*).

Appendix Table 12. Natural Gas Production in North Dakota, by County, 1990 Through 1995[a]

County	1990	1991	1992	1993	1994	1995
	millions of cubic ft.					
Billings	9,822,641	10,685,977	11,124,146	10,305,951	9,076,147	8,237,446
Other SPR8 Counties						
Adams	----	-----	----	----	----	----
Bowman	1,199,845	1,196,574	1,249,664	1,538,469	1,687,618	2,427,061
Dunn	3,794,347	3,640,495	2,952,708	2,712,929	2,305,552	2,216,055
Golden Valley	333,270	293,106	330,032	272,316	246,797	250,522
Hettinger	----	----	31	----	----	----
Slope	24,038	22,776	13,622	4,740	4,757	4,813
Stark	584,571	470,080	497,609	700,680	597,639	1,704,300
Other Counties						
Bottineau	119,878	261,706	408,504	403,035	331,212	238,146
Burke	2,753,039	2,748,116	2,460,856	2,423,997	2,420,698	2,524,842
Divide	3,127,028	3,760,675	4,171,707	4,075,047	3,989,514	4,003,605
McHenry	496	531	489	469	3,433	3,553
McKenzie	28,085,819	25,898,397	23,165,013	24,002,797	21,609,343	19,065,184
McLean	23,519	311,199	262,729	203,124	140,127	98,853
Mercer	----	----	----	----	----	----
Mountrail	1,670,428	1,330,514	1,071,023	1,238,636	955,828	618,028
Renville	520,204	525,690	381,365	313,494	244,431	240,905
Ward	101,032	98,765	84,190	64,561	57,810	42,367
Williams	13,823,853	11,992,363	11,807,058	16,691,039	17,071,913	15,164,325
North Dakota	65,984,008	63,236,964	59,980,746	64,951,284	60,742,819	56,840,005

[a]Natural gas production records prior to 1990 were incomplete.

Source: North Dakota Industrial Commission (various years).

Appendix Table 13. Public Owned Share of Oil and Natural Gas Extraction, North Dakota, 1991 Through 1995

	Total Extractions				State Owned Extraction				Federal Owned Extraction			
	Oil		Natural Gas		Billings County		North Dakota		Billings County		North Dakota	
Year	Billings County	North Dakota	Billings County	North Dakota	Oil	Nat Gas	Oil	Nat Gas	Oil	Nat Gas	Oil	Nat Gas
	--- 000s bbls ---		--- 000s mcf ---		--- bbls ---	--- mcf ---	--- bbls ---	--- mcf ---	---- bbls ----	---- mcf ----	- 000s bbls -	- 000s mcf -
1991	8,511	35,895	10,686	63,237	62,369	92,071	330,016	379,683	na	na	6,994	7,689
1992	7,757	32,900	11,124	59,981	72,859	91,000	314,401	392,170	na	na	6,772	8,524
1993	7,084	30,919	10,306	64,951	77,487	76,008	313,559	397,897	na	na	6,324	8,378
1994	6,551	27,690	9,076	60,742	43,242	51,677	273,465	359,887	639,528	971,297	5,945	7,435
1995	6,306	29,336	8,237	56,840	39,835	43,943	259,873	347,602	579,600	821,331	5,465	6,855
Billings--% of North Dakota	23.1		16.2									
Public leases--% of Billings County Production					0.84	0.95			9.5	13.9		
Public leases--% of North Dakota Production							0.95	0.61			20.1	12.7

Sources: North Dakota Industrial Commision (*various years*), Mineral Management Services (1995a, 1995b, 1996a, 1996b), and North Dakota State Land Department (1996).

Appendix Table 14. Taxable Sales and Purchases, Medora, North Dakota, and Attendance at Medora Musical, 1991 Through 1995

Year	Taxable Sales and Purchases	Taxable Sales Only	Attendance Medora Musical
	---------- dollars ----------		-- persons --
1991	5,023,833	4,949,137	88,500
1992	5,370,987	5,320,631	91,000
1993	5,332,542	5,305,342	96,000
1994	6,325,154	6,214,948	111,000
1995	6,818,549	6,658,810	115,000

Sources: North Dakota Tax Department (1996) and Theodore Roosevelt Memorial Foundation (1996).

Appendix Table 15. Attendance and Use Statistics, Theodore Roosevelt National Park, 1991 Through 1995

Month/Area		1991	1992	1993	1994	1995
January						
Medora Entrance	1,490	768	571	672	573	
Painted Canyon		0	0	0	0	0
North Unit		331	248	284	329	486
Walk-in/Misc		0	0	0	0	0
Total[1]		1,821	1,326	1,165	1,311	1,476
February						
Medora Entrance	1,427	805	532	656	1,474	
Painted Canyon		0	0	0	0	0
North Unit		469	328	389	384	214
Walk-in/Misc		0	0	0	0	0
Total[1]		1,896	1,443	1,231	1,350	2,105
March						
Medora Entrance	3,179	1,806	1,750	2,279	1,352	
Painted Canyon		715	1,318	0	0	0
North Unit		872	646	569	712	668
Walk-in/Misc		0	0	0	0	0
Total[1]		4,766	4,135	2,684	3,356	2,492
April						
Medora Entrance	3,800	2,642	2,355	3,201	2,244	
Painted Canyon		8,790	11,240	10,580	10,715	8,865
North Unit		1,534	1,235	1,187	2,953	1,328
Walk-in/Misc		0	0	0	0	0
Total[1]		14,124	15,674	14,664	17,504	13,059
May						
Medora Entrance	10,867	10,351	10,896	13,396	10,697	
Painted Canyon		18,756	20,263	20,669	20,090	21,859
North Unit		5,713	4,463	4,838	7,946	4,584
Walk-in/Misc		0	0	0	0	0
Total[1]		35,336	36,041	38,316	42,055	37,763
June						
Medora Entrance	29,095	28,022	27,524	28,493	15,072	
Painted Canyon		42,310	42,295	40,822	40,704	32,933
North Unit		11,381	10,169	10,279	15,256	12,807
Walk-in/Misc		1,200	1,200	1,200	1,200	1,200
Total[1]		83,986	82,692	80,963	86,276	62,635
July						
Medora Entrance	48,949	52,085	49,620	55,267	50,697	
Painted Canyon		65,789	68,446	62,263	72,631	60,221
North Unit		12,409	11,398	11,348	12,277	13,990
Walk-in/Misc		1,200	1,200	1,200	1,200	1,200
Total[1]		128,347	135,146	125,799	141,997	126,730

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Appendix Table 15. Attendance and Use Statistics, Theodore Roosevelt National Park, 1991 Through 1995

Month/Area		1991	1992	1993	1994	1995
August						
Medora Entrance	50,445	50,773	51,082	52,082	34,901	
Painted Canyon		68,275	67,693	73,712	66,794	78,739
North Unit		10,039	9,321	9,609	10,310	10,492
Walk-in/Misc		1,200	1,200	1,200	1,200	1,200
Total[1]		129,959	131,139	137,140	131,007	125,953
September						
Medora Entrance	14,042	14,487	14,835	16,521	13,594	
Painted Canyon		25,488	26,618	27,706	27,761	35,122
North Unit		6,079	5,529	5,602	10,889	9,851
Walk-in/Misc		900	900	900	900	900
Total[1]		46,509	48,139	49,987	56,695	60,091
October						
Medora Entrance	5,237	4,308	4,963	4,767	4,447	
Painted Canyon		13,563	14,391	15,962	15,033	16,797
North Unit		2,449	1,572	1,686	2,376	3,821
Walk-in/Misc		0	0	0	0	0
Total[1]		21,249	20,658	22,938	22,658	25,547
November						
Medora Entrance	2,076	1,242	1,242	1,538	1,480	
Painted Canyon		2,544	2,788	2,758	3,284	4,170
North Unit		1,034	512	896	845	2,169
Walk-in/Misc		0	0	0	0	0
Total[1]		5,654	4,907	5,261	6,139	8,291
December						
Medora Entrance	1,496	558	637	730	434	
Painted Canyon		0	0	0	0	0
North Unit		314	181	477	434	119
Walk-in/Misc		0	0	0	0	0
Total[1]		1,810	1,049	1,424	1,581	970
Total For Year						
Medora Entrance	172,103	167,847	166,007	179,602	136,965	
Painted Canyon		246,230	255,052	254,472	257,012	258,706
North Unit		52,624	45,602	47,164	64,235	60,529
Walk-in/Misc		4,500	4,500	4,500	4,500	4,500
Total[1]		475,457	482,349	481,572	511,761	467,112

[1]Total includes nonrecreational visits.

Source: Theodore Roosevelt National Park (1996).

Appendix Table 16. General Population Projections, Billings County, North Dakota, 1995 Through 2010

Age	1995		2000		2005		2010	
	Male	Female	Male	Female	Male	Female	Male	Female
				zero migration[a]				
0-9	71	74	61	58	71	66	83	78
10-19	116	109	99	101	71	74	62	58
20-29	55	68	98	94	116	109	99	101
30-39	88	84	49	57	55	68	98	94
40-49	93	76	104	95	88	84	49	57
50-59	59	51	73	56	90	74	100	92
60-69	59	51	41	50	51	48	62	52
70-79	32	33	47	46	44	46	31	45
over 79	22	17	20	20	14	28	26	36
Sum	595	562	593	580	600	611	611	614
Total	1,157		1,173		1,195		1,225	
				¼ migration[a]				
0-9	68	74	56	57	60	59	67	66
10-19	120	109	95	98	62	69	52	53
20-29	54	61	94	82	106	91	82	49
30-39	86	91	39	50	35	46	65	62
40-49	96	78	109	110	87	95	39	52
50-59	61	50	75	51	93	68	105	96
60-69	60	50	39	47	48	42	58	43
70-79	30	31	47	38	39	36	26	34
over 79	21	17	19	17	14	21	20	24
Sum	596	561	574	549	544	527	514	510
Total	1,157		1,123		1,071		1,024	
				½ migration[a]				
0-9	66	75	53	55	52	52	53	54
10-19	123	110	90	95	54	66	43	48
20-29	53	56	90	69	92	75	60	60
30-39	84	99	31	43	18	27	34	35
40-49	101	82	115	128	88	109	33	47
50-59	61	49	77	48	97	65	109	100
60-69	59	46	36	43	45	37	56	37
70-79	27	30	43	32	31	27	22	25
over 79	21	15	16	14	10	16	14	16
Sum	595	562	551	528	485	474	424	423
Total	1,157		1,079		959		847	

[a]The migration rate for Billings County was a net loss of 18.7 persons per 100 population from 1980 through 1990. Three migration rates were used for the projections: zero migration, 25 percent of the 1980-1990 rate, and 50 percent of the 1980-1990 rate.

Source: North Dakota Demographic Projection Model (Coon et al. 1988).

Appendix Table 17. Number of Farms, Billings County, State Planning Region 8, and North Dakota, 1900 Through 1992

County	1900	1910	1920	1930	1935	1940	1945	1950	1954	1959	1964	1969	1974	1978	1982	1987	1992
Billings	163	1,708	603	531	597	471	381	380	359	315	304	292	271	295	257	267	242
Other SPR8 Counties																	
Adams	--	1,344	897	929	970	753	660	603	555	500	457	498	481	420	371	410	353
Bowman	--	942	788	815	765	659	577	545	537	450	421	418	380	414	377	390	343
Dunn	--	1,461	1,461	1,407	1,564	1,359	1,286	1,157	1,059	944	852	821	792	748	697	733	650
Golden Valley	--	--	777	571	590	507	466	468	424	353	308	305	287	331	288	261	219
Hettinger	--	1,326	1,131	1,087	1,235	1,055	957	868	887	784	652	663	609	548	502	525	427
Slope	--	--	778	737	753	589	513	456	447	391	347	324	330	333	295	299	270
Stark	846	1,456	1,301	1,337	1,390	1,320	1,264	1,232	1,169	1,047	946	909	889	826	769	822	788
North Dakota	44,039	74,360	77,690	77,975	84,606	73,962	69,520	65,401	61,520	54,928	48,836	46,381	42,710	40,357	36,431	35,289	31,123

Source: U.S.Bureau of the Census (1994).

Appendix Table 18. Personal Income by Major Source and Earnings by Industry, Billings County, State Planning Region 8, and North Dakota, 1980 Through 1993

Item	1980	1984	1988	1990	1991	1992	
Adams County							
Income by place of residence							
Total personal income ($000)	24,531	40,722	35,402	44,275	43,190	50,357	48,647
Nonfarm personal income	29,338	37,041	36,299	41,196	41,801	43,646	44,781
Farm Income 1/	-4,807	3,681	-897	3,079	1,389	6,711	3,866
Population (thousands) 2/	3.6	3.6	3.4	3.2	3.1	3.0	2.8
Per capita personal income (dollars)	6,854	11,432	10,549	14,024	13,977	16,663	17,184
Derivation of total personal income	----------$000----------						
Earnings by place of work	12,084	22,015	19,257	25,743	25,143	31,487	29,375
Less: Personal cont. for social insur. 3/	1,073	1,286	1,839	2,123	2,228	2,259	2,369
Plus: Adjustment for residence 4/	1,203	1,481	196	-292	-352	-404	-383
Equals: Net earn. by place of residence	12,214	22,210	17,614	23,328	22,563	28,824	26,623
Plus: Dividends, interest, and rent 5/	7,660	11,237	9,255	10,569	10,049	10,078	10,028
Plus: Transfer payments	4,657	7,275	8,533	10,378	10,578	11,455	11,996
Earnings by place of work							
Components of Earnings:							
Wages and salaries	12,840	14,026	16,297	18,052	18,852	19,399	19,739
Other labor income	1,089	1,181	1,272	1,516	1,707	1,866	1,958
Proprietors' income 6/	-1,845	6,808	1,688	6,175	4,584	10,222	7,678
Farm	-5,425	3,175	-1,458	2,477	836	6,193	3,329
Nonfarm	3,580	3,633	3,146	3,698	3,748	4,029	4,349
Earnings by Industry:							
Farm	-4,807	3,681	-897	3,079	1,389	6,711	3,866
Nonfarm	16,891	18,334	20,154	22,664	23,754	24,776	25,509
Private	14,915	15,716	17,091	19,122	20,113	20,982	21,731
Ag. serv., For., Fish., and other 7/	301	405	603	820	882	883	912
Mining	400	61	(L)	(L)	(L)	(L)	(L)
Construction	2,146	901	776	723	553	557	619
Manufacturing	1,222	490	352	181	157	167	240
Nondurable goods	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Durable goods	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Transportation and public utilities	1,035	(D)	1,943	2,997	2,936	3,181	3,534
Wholesale trade	3,259	3,167	1,753	1,854	1,825	1,882	1,690
Retail trade	1,913	2,371	2,517	2,788	2,826	2,944	3,321
Finance, insurance, and real estate	606	800	853	999	937	1,034	1,056
Services	4,033	(D)	8,251	8,740	9,966	10,293	10,317
Government and government enterprises	1,976	2,618	3,063	3,542	3,641	3,794	3,778
Federal, civilian	501	469	643	711	734	755	726
Military	74	136	194	204	189	207	211
State and local	1,401	2,013	2,226	2,627	2,718	2,832	2,841

Appendix Table 18. Continued

Item	1980	1984	1988	1990	1991	1992	
Billings County							
Income by place of residence							
Total personal income ($000)	9,904	13,968	11,834	15,285	16,813	17,836	20,266
Nonfarm personal income	7,564	10,302	8,921	10,051	10,276	10,827	11,152
Farm Income 1/	2,340	3,666	2,913	5,234	6,537	7,009	9,114
Population (thousands) 2/	1.2	1.2	1.1	1.1	1.1	1.2	1.2
Per capita personal income (dollars)	8,545	11,375	10,326	13,972	14,748	15,271	17,411
Derivation of total personal income	----------	----------	----------	$000	----------	----------	----------
Earnings by place of work	22,178	16,763	13,435	16,734	16,696	17,130	18,117
Less: Personal cont. for social insur. 3/	1,121	815	771	846	737	702	636
Plus: Adjustment for residence 4/	-13,657	-6,751	-4,480	-5,096	-3,637	-3,208	-2,005
Equals: Net earn. by place of residence	7,400	9,197	8,184	10,792	12,322	13,220	15,476
Plus: Dividends, interest, and rent 5/	1,749	3,666	2,412	2,978	2,943	2,879	2,786
Plus: Transfer payments	755	1,105	1,238	1,515	1,548	1,737	2,004
Earnings by place of work							
Components of Earnings:							
Wages and salaries	18,167	11,642	9,261	10,417	9,085	8,949	7,871
Other labor income	1,647	984	743	894	857	882	808
Proprietors' income 6/	2,364	4,137	3,431	5,423	6,754	7,299	9,438
Farm	1,979	3,342	2,669	4,973	6,295	6,782	8,878
Nonfarm	385	795	762	450	459	517	560
Earnings by Industry:							
Farm	2,340	3,666	2,913	5,234	6,537	7,009	9,114
Nonfarm	19,838	13,097	10,522	11,500	10,159	10,121	9,003
Private	18,579	11,084	7,911	8,827	7,382	7,155	6,171
Ag. serv., For., Fish., and other 7/	67	(D)	53	(D)	51	53	57
Mining	15,248	7,988	4,940	4,923	3,930	3,629	2,375
Construction	1,920	(D)	551	(D)	(D)	(D)	(D)
Manufacturing	0	0	0	0	0	0	(D)
Nondurable goods	0	0	0	0	0	0	(D)
Durable goods	0	0	0	0	0	0	0
Transportation and public utilities	-172	787	749	351	(D)	(D)	(D)
Wholesale trade	160	95	0	0	0	0	0
Retail trade	448	390	264	299	291	346	316
Finance, insurance, and real estate	(L)	(L)	(L)	(L)	(L)	(L)	(L)
Services	907	1,185	1,346	1,693	1,869	2,088	2,190
Government and government enterprises	1,259	2,013	2,611	2,673	2,777	2,966	2,832
Federal, civilian	789	788	1,039	1,096	1,188	1,323	1,208
Military	(L)	(L)	66	71	69	80	86
State and local	447	1,178	1,506	1,506	1,520	1,563	1,538

Appendix Table 18. Continued

Item	1980	1984	1988	1990	1991	1992	
Bowman County							
Income by place of residence							
Total personal income ($000)	33,617	51,806	52,313	56,961	59,240	63,636	67,796
Nonfarm personal income	35,402	47,199	49,174	53,675	54,086	54,341	56,422
Farm Income 1/	-1,785	4,607	3,139	3,286	5,154	9,295	11,374
Population (thousands) 2/	4.3	4.2	3.8	3.6	3.5	3.4	3.3
Per capita personal income (dollars)	7,908	12,294	13,695	15,920	16,950	18,739	20,286
Derivation of total personal income	----------	----------	----------	$000	----------	----------	----------
Earnings by place of work	21,198	32,440	29,513	31,754	34,297	39,416	43,301
Less: Personal cont. for social insur. 3/	1,426	1,898	2,451	2,738	2,835	2,842	3,044
Plus: Adjustment for residence 4/	-726	-1,020	-886	-1,011	-575	-1,072	-1,204
Equals: Net earn. by place of residence	19,046	29,522	26,176	28,005	30,887	35,502	39,053
Plus: Dividends, interest, and rent 5/	10,011	15,520	17,459	18,544	17,339	16,205	16,180
Plus: Transfer payments	4,560	6,764	8,678	10,412	11,014	11,929	12,563
Earnings by place of work							
Components of Earnings:							
Wages and salaries	16,400	20,023	19,301	20,319	20,534	20,817	21,757
Other labor income	1,693	2,085	1,871	2,101	2,354	2,479	2,690
Proprietors' income 6/	3,105	10,332	8,341	9,334	11,409	16,120	18,854
Farm	-2,466	3,617	1,723	1,768	3,765	7,999	10,031
Nonfarm	5,571	6,715	6,618	7,566	7,644	8,121	8,823
Earnings by Industry:							
Farm	-1,785	4,607	3,139	3,286	5,154	9,295	11,374
Nonfarm	22,983	27,833	26,374	28,468	29,143	30,121	31,927
Private	20,458	24,306	22,393	23,980	24,412	25,278	27,005
Ag. serv., For., Fish., and other 7/	125	195	266	286	339	346	373
Mining	5,802	6,272	3,933	3,718	4,092	4,169	4,438
Construction	1,994	1,945	1,796	1,372	1,517	1,342	1,459
Manufacturing	217	476	554	765	711	651	602
Nondurable goods	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Durable goods	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Transportation and public utilities	1,021	1,426	465	1,144	1,214	1,321	1,493
Wholesale trade	2,652	3,304	3,586	3,948	3,404	3,588	3,866
Retail trade	3,479	4,359	4,465	4,253	4,337	4,409	4,703
Finance, insurance, and real estate	1,175	1,414	1,681	1,620	1,728	1,829	1,804
Services	3,993	4,915	5,647	6,874	7,070	7,623	8,267
Government and government enterprises	2,525	3,527	3,981	4,488	4,731	4,843	4,922
Federal, civilian	400	447	602	700	750	828	804
Military	87	161	221	230	214	235	241
State and local	2,038	2,919	3,158	3,558	3,767	3,780	3,877

Appendix Table 18. Continued

Item	1980	1984	1988	1990	1991	1992	
Dunn County							
Income by place of residence							
Total personal income ($000)	32,207	44,706	30,684	42,580	43,715	50,891	53,331
Nonfarm personal income	31,819	41,044	31,075	37,672	39,530	41,120	44,092
Farm Income 1/	388	3,662	-391	4,908	4,185	9,771	9,239
Population (thousands) 2/	4.7	5.1	4.3	4.0	3.9	3.9	3.8
Per capita personal income (dollars)	6,897	8,853	7,161	10,709	11,135	13,062	13,874
Derivation of total personal income	----------	----------	----------	$000	----------	----------	----------
Earnings by place of work	21,054	21,565	10,230	18,513	18,525	24,733	26,209
Less: Personal cont. for social insur. 3/	1,267	1,221	939	1,204	1,318	1,323	1,510
Plus: Adjustment for residence 4/	85	1,937	2,115	1,581	1,825	1,915	1,494
Equals: Net earn. by place of residence	19,872	22,281	11,406	18,890	19,032	25,325	26,193
Plus: Dividends, interest, and rent 5/	7,835	15,389	11,527	14,184	14,493	14,102	14,288
Plus: Transfer payments	4,500	7,036	7,751	9,506	10,190	11,464	12,850
Earnings by place of work							
Components of Earnings:							
Wages and salaries	16,944	14,127	9,346	11,895	11,947	12,040	13,621
Other labor income	1,341	1,112	769	1,120	1,251	1,360	1,601
Proprietors' income 6/	2,769	6,326	115	5,498	5,327	11,333	10,987
Farm	-722	2,595	-1,381	3,849	3,204	8,846	8,278
Nonfarm	3,491	3,731	1,496	1,649	2,123	2,487	2,709
Earnings by Industry:							
Farm	388	3,662	-391	4,908	4,185	9,771	9,239
Nonfarm	20,666	17,903	10,621	13,605	14,340	14,962	16,970
Private	17,943	13,944	6,374	9,043	9,467	9,787	11,695
Ag. serv., For., Fish., and other 7/	108	230	285	329	283	293	252
Mining	6,782	3,721	587	1,728	1,823	2,038	2,930
Construction	2,034	2,146	620	993	450	559	553
Manufacturing	73	163	182	356	573	654	897
Nondurable goods	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Durable goods	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Transportation and public utilities	2,043	1,977	621	924	1,018	700	870
Wholesale trade	3,269	1,806	1,242	1,285	1,335	1,427	1,651
Retail trade	1,938	2,093	1,239	1,445	1,586	1,620	1,809
Finance, insurance, and real estate	505	499	424	404	462	504	554
Services	1,191	1,309	1,174	1,579	1,937	1,992	2,179
Government and government enterprises	2,723	3,959	4,247	4,562	4,873	5,175	5,275
Federal, civilian	550	602	749	828	770	790	848
Military	96	193	248	256	240	268	279
State and Local	2,077	3,164	3,250	3,478	3,863	4,117	4,148

Appendix Table 18. Continued

Item	1980	1984	1988	1990	1991	1992	
Golden Valley County							
Income by place of residence							
Total personal income ($000)	18,241	29,059	22,816	29,767	27,883	32,059	29,315
Nonfarm personal income	18,804	26,912	24,874	27,830	26,946	27,767	29,478
Farm Income 1/	-563	2,147	-2,058	1,937	937	4,292	-163
Population (thousands) 2/	2.4	2.6	2.2	2.1	2.0	1.9	1.9
Per capita personal income (dollars)	7,525	11,378	10,250	14,188	13,990	16,525	15,252
Derivation of total personal income	----------	----------	----------	$000	----------	----------	----------
Earnings by place of work	10,238	14,495	10,849	15,695	13,427	17,497	14,352
Less: Personal cont. for social insur. 3/	692	865	1,169	1,295	1,230	1,274	1,402
Plus: Adjustment for residence 4/	(L)	(L)	-902	-865	69	223	143
Equals: Net earn. by place of residence	9,568	13,628	8,778	13,535	12,266	16,446	13,093
Plus: Dividends, interest, and rent 5/	5,106	10,585	8,234	9,664	8,838	8,315	8,279
Plus: Transfer payments	3,567	4,846	5,804	6,568	6,779	7,298	7,943
Earnings by place of work							
Components of Earnings:							
Wages and salaries	8,153	9,687	10,775	11,272	9,992	10,117	11,107
Other labor income	616	747	790	906	854	893	1,020
Proprietors' income 6/	1,469	4,061	-716	3,517	2,581	6,487	2,225
Farm	-1,035	1,519	-2,916	1,015	96	3,507	-975
Nonfarm	2,504	2,542	2,200	2,502	2,485	2,980	3,200
Earnings by Industry:							
Farm	-563	2,147	-2,058	1,937	937	4,292	-163
Nonfarm	10,801	12,348	12,907	13,758	12,490	13,205	14,515
Private	9,294	9,964	10,074	10,745	9,432	10,059	11,222
Ag. serv., For., Fish., and other 7/	116	160	139	(D)	(D)	166	205
Mining	1,512	736	1,371	(D)	(D)	153	165
Construction	1,158	1,306	1,059	930	527	447	451
Manufacturing	335	649	376	512	760	1,063	1,142
Nondurable goods	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Durable goods	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Transportation and public utilities	899	987	920	1,423	1,561	1,657	1,797
Wholesale trade	1,127	1,357	1,287	1,328	1,264	1,366	1,527
Retail trade	1,933	1,744	1,580	1,625	1,552	1,604	1,784
Finance, insurance, and real estate	672	865	692	739	772	785	1,007
Services	1,542	2,160	2,650	2,878	2,579	2,818	3,144
Government and government enterprises	1,507	2,384	2,833	3,013	3,058	3,146	3,293
Federal, civilian	292	334	396	458	415	444	456
Military	(L)	98	129	135	122	132	136
State and local	1,166	1,952	2,308	2,420	2,521	2,570	2,701

Appendix Table 18. Continued

Item	1980	1984	1988	1990	1991	1992	
Hettinger County							
Income by place of residence							
Total personal income ($000)	16,334	49,824	29,991	45,031	41,572	52,295	51,217
Nonfarm personal income	26,746	36,791	33,708	37,911	37,499	39,521	41,116
Farm Income 1/	-10,412	13,033	-3,717	7,120	4,073	12,774	10,101
Population (thousands) 2/	4.2	4.1	3.7	3.4	3.3	3.2	3.1
Per capita personal income (dollars)	3,844	12,041	8,123	13,148	12,605	16,337	16,353
Derivation of total personal income	----------	----------	----------	$000	----------	----------	----------
Earnings by place of work	3,522	28,472	9,885	21,227	18,115	27,339	25,239
Less: Personal cont. for social insur. 3/	927	1,149	1,309	1,385	1,426	1,431	1,519
Plus: Adjustment for residence 4/	-518	147	163	429	483	517	518
Equals: Net earn. by place of residence	2,077	27,470	8,739	20,271	17,172	26,425	24,238
Plus: Dividends, interest, and rent 5/	8,612	13,484	11,132	12,757	11,852	12,205	12,166
Plus: Transfer payments	5,645	8,870	10,120	12,003	12,548	13,665	14,813
Earnings by place of work							
Components of Earnings:							
Wages and salaries	10,032	11,018	11,040	11,354	11,132	11,266	11,567
Other labor income	765	871	936	1,095	1,169	1,246	1,333
Proprietors' income 6/	-7,275	16,583	-2,091	8,778	5,814	14,827	12,339
Farm	-11,456	12,026	-4,723	6,041	3,081	11,845	9,138
Nonfarm	4,181	4,557	2,632	2,737	2,733	2,982	3,201
Earnings by Industry:							
Farm	-10,412	13,033	-3,717	7,120	4,073	12,774	10,101
Nonfarm	13,934	15,439	13,602	14,107	14,042	14,565	15,138
Private	11,267	11,910	9,556	9,787	9,763	10,048	10,320
Ag. serv., For., Fish., and other 7/	(D)	121	144	152	184	199	213
Mining	(D)	256	(L)	(L)	(L)	(L)	(L)
Construction	1,718	1,567	1,389	1,270	1,078	1,182	1,364
Manufacturing	(D)	231	240	464	480	368	432
Nondurable goods	(D)	(D)	(D)	(D)	(D)	127	117
Durable goods	(D)	(D)	(D)	(D)	(D)	241	315
Transportation and public utilities	1,749	2,104	954	1,512	1,598	1,671	1,656
Wholesale trade	2,091	2,154	1,612	1,371	1,355	1,373	1,349
Retail trade	2,053	2,331	1,937	1,821	1,726	1,686	1,585
Finance, insurance, and real estate	947	1,165	979	957	892	932	875
Services	1,672	1,981	2,280	2,209	2,409	2,601	2,834
Government and government enterprises	2,667	3,529	4,046	4,320	4,279	4,517	4,818
Federal, civilian	671	792	878	917	899	934	989
Military	87	158	214	220	200	218	222
State and local	1,909	2,579	2,954	3,183	3,180	3,365	3,607

Appendix Table 18. Continued

Item	1980	1984	1988	1990	1991	1992	
Slope County							
Income by place of residence							
Total personal income ($000)	3,082	13,607	7,323	11,447	11,722	16,682	13,415
Nonfarm personal income	5,967	7,996	6,759	6,894	7,883	7,403	7,404
Farm Income 1/	-2,885	5,611	564	4,553	3,839	9,279	6,011
Population (thousands) 2/	1.2	1.1	1.0	0.9	0.9	0.9	0.9
Per capita personal income (dollars)	2,655	12,063	7,472	12,776	12,981	18,871	15,599
Derivation of total personal income	----------	----------	----------	$000	----------	----------	----------
Earnings by place of work	568	8,635	2,443	6,797	7,336	11,802	8,375
Less: Personal cont. for social insur. 3/	218	228	204	261	366	295	293
Plus: Adjustment for residence 4/	-640	(L)	357	430	-59	505	601
Equals: Net earn. by place of residence	-290	8,437	2,596	6,966	6,911	12,012	8,683
Plus: Dividends, interest, and rent 5/	2,395	3,868	3,389	2,823	3,121	2,833	2,819
Plus: Transfer payments	977	1,302	1,338	1,658	1,690	1,837	1,913
Earnings by place of work							
Components of Earnings:							
Wages and salaries	3,083	2,392	1,841	1,847	2,905	1,849	1,615
Other labor income	263	202	160	182	264	190	183
Proprietors' income 6/	-2,778	6,041	442	4,768	4,167	9,763	6,577
Farm	-3,504	4,924	-378	3,542	2,915	8,415	5,117
Nonfarm	726	1,117	820	1,226	1,252	1,348	1,460
Earnings by Industry:							
Farm	-2,885	5,611	564	4,553	3,839	9,279	6,011
Nonfarm	3,453	3,024	1,879	2,244	3,497	2,523	2,364
Private	3,136	2,554	1,255	1,562	2,814	1,859	1,717
Ag. serv., For., Fish., and other 7/	(L)	(L)	(D)	(D)	(L)	(L)	(L)
Mining	2,209	(D)	(D)	(D)	(D)	(D)	(D)
Construction	(L)	(D)	336	406	(D)	(D)	(D)
Manufacturing	0	0	0	0	0	0	(L)
Nondurable goods	0	0	0	0	0	0	(D)
Durable goods	0	0	0	0	0	0	(D)
Transportation and public utilities	69	250	(L)	410	413	444	464
Wholesale trade	79	113	103	90	90	96	100
Retail trade	225	143	200	87	103	136	130
Finance, insurance, and real estate	(L)	(L)	0	0	0	0	0
Services	505	631	366	382	396	427	453
Government and government enterprises	317	470	624	682	683	664	647
Federal, civilian	108	132	182	185	191	209	181
Military	(L)	(L)	57	58	56	61	65
State and local	186	295	385	439	436	394	401

Appendix Table 18. Continued

Item	1980	1984	1988	1990	1991	1992	
Stark County							
Income by place of residence							
Total personal income ($000)	211,972	292,876	266,923	305,850	316,640	342,018	349,337
Nonfarm personal income	220,103	289,966	270,201	304,370	315,496	333,663	343,736
Farm Income 1/	-8,131	2,910	-3,278	1,480	1,144	8,355	5,601
Population (thousands) 2/	24.2	26.5	23.7	22.8	22.9	22.8	22.7
Per capita personal income (dollars)	8,749	11,048	11,272	13,435	13,855	14,980	15,357
Derivation of total personal income	----------	----------	----------	$000	----------	----------	----------
Earnings by place of work	153,595	202,684	176,772	193,936	206,107	225,094	229,131
Less: Personal cont. for social insur. 3/	9,560	12,829	14,477	16,064	17,009	17,315	18,151
Plus: Adjustment for residence 4/	10,171	5,713	4,049	6,787	5,686	4,867	4,494
Equals: Net earn. by place of residence	154,206	195,568	166,344	184,659	194,784	212,646	215,474
Plus: Dividends, interest, and rent 5/	35,947	58,827	51,205	61,056	58,424	58,676	59,188
Plus: Transfer payments	21,819	38,481	49,374	60,135	63,432	70,696	74,675
Earnings by place of work							
Components of Earnings:							
Wages and salaries	126,897	159,255	150,021	157,943	168,805	177,108	180,211
Other labor income	11,295	14,296	12,698	14,185	15,737	17,422	18,771
Proprietors' income 6/	15,403	29,133	14,053	21,808	21,565	30,564	30,149
Farm	-9,453	1,898	-4,347	334	86	7,362	4,569
Nonfarm	24,856	27,235	18,400	21,474	21,479	23,202	25,580
Earnings by Industry:							
Farm	-8,131	2,910	-3,278	1,480	1,144	8,355	5,601
Nonfarm	161,726	199,774	180,050	192,456	204,963	216,739	223,530
Private	143,937	172,426	148,050	157,459	168,815	178,561	185,366
Ag. serv., For., Fish., and other 7/	599	966	507	636	751	805	842
Mining	17,504	25,454	16,645	17,505	20,941	19,895	19,917
Construction	19,795	15,710	9,625	8,660	9,073	9,606	10,753
Manufacturing	9,746	10,888	12,443	14,824	14,839	15,295	16,915
Nondurable goods	6,067	6,770	6,012	6,374	4,078	4,127	4,406
Durable goods	3,679	4,118	6,431	8,450	10,761	11,168	12,509
Transportation and public utilities	19,381	24,666	19,066	18,023	19,311	20,714	21,808
Wholesale trade	12,685	15,164	12,901	12,997	14,324	14,443	14,724
Retail trade	24,543	28,028	26,655	28,338	29,915	31,581	32,805
Finance, insurance, and real estate	7,150	8,720	7,013	7,693	7,656	8,862	9,496
Services	32,534	42,830	43,195	48,783	52,005	57,360	58,106
Government and government enterprises	17,789	27,348	32,000	34,997	36,148	38,178	38,164
Federal, civilian	3,189	4,371	5,247	5,682	5,679	5,713	5,781
Military	501	1,023	2,184	2,986	2,904	3,078	1,665
State and local	14,099	21,954	24,569	26,329	27,565	29,387	30,718

Appendix Table 18. Continued

Item	1980	1984	1988	1990	1991	1992	
State Planning Region 8							
Income by place of residence							
Total personal income ($000)	349,888	536,568	457,286	551,196	560,775	625,774	633,324
Nonfarm personal income	375,743	497,251	461,011	519,599	533,517	558,288	578,181
Farm Income 1/	-25,855	39,317	-3,725	31,597	27,258	67,486	55,143
Population (thousands) 2/	45.8	48.4	43.2	41.1	40.7	40.3	39.7
Per capita personal income (dollars)	7,639	11,086	10,585	13,411	13,778	15,528	15,953
Derivation of total personal income	----------	----------	----------	$000	----------	----------	----------
Earnings by place of work	244,437	347,069	272,384	330,399	339,646	394,498	394,099
Less: Personal cont. for social insur. 3/	16,284	20,291	23,159	25,916	27,149	27,441	28,924
Plus: Adjustment for residence 4/	-4,082	1,507	612	1,963	3,440	3,343	3,658
Equals: Net earn. by place of residence	224,093	328,313	249,837	306,446	315,937	370,400	368,833
Plus: Dividends, interest, and rent 5/	79,315	132,576	114,613	132,575	127,059	125,293	125,734
Plus: Transfer payments	46,480	75,679	92,836	112,175	117,779	130,081	138,757
Earnings by place of work							
Components of Earnings:							
Wages and salaries	212,516	242,170	227,882	243,099	253,252	261,545	267,488
Other labor income	18,709	21,478	19,239	21,999	24,193	26,338	28,364
Proprietors' income 6/	13,212	83,421	25,263	65,301	62,201	106,615	98,247
Farm	-32,082	33,096	-10,811	23,999	20,278	60,949	48,365
Nonfarm	45,294	50,325	36,074	41,302	41,923	45,666	49,882
Earnings by Industry:							
Farm	-25,855	39,317	-3,725	31,597	27,258	67,486	55,143
Nonfarm	270,292	307,752	276,109	298,802	312,388	327,012	338,956
Private	239,529	261,904	222,704	240,525	252,198	263,729	275,227
Ag. serv., For., Fish., and other 7/	1,316	2,077	1,997	2,223	2,490	2,745	2,854
Mining	49,457	44,488	27,476	27,874	30,786	29,884	29,825
Construction	30,765	23,575	16,152	14,354	13,198	13,693	15,199
Manufacturing	11,593	12,897	14,147	17,102	17,520	18,198	20,228
Nondurable goods	6,067	6,770	6,012	6,374	4,078	4,254	4,523
Durable goods	3,679	4,118	6,431	8,450	10,761	11,409	12,824
Transportation and public utilities	26,025	32,197	24,718	26,784	28,051	29,688	31,622
Wholesale trade	25,322	27,160	22,484	22,873	23,597	24,175	24,907
Retail trade	36,532	41,459	38,857	40,656	42,336	44,326	46,453
Finance, insurance, and real estate	11,055	13,463	11,642	12,412	12,447	13,946	14,792
Services	46,377	55,011	64,909	73,138	78,231	85,202	87,490
Government and government enterprises	30,763	45,848	53,405	58,277	60,190	63,283	63,729
Federal, civilian	6,500	7,935	9,736	10,577	10,626	10,996	10,993
Military	845	1,769	3,313	4,160	3,994	4,279	2,905
State and local	23,323	36,054	40,356	43,540	45,570	48,008	49,831

Appendix Table 18. Continued

Item	1980	1984	1988	1990	1991	1992	
North Dakota							
Income by place of residence							
Total personal income ($000)	5,002,1455	7,903,800	7,815,823	9,764,940	9,875,882	10,862,9599	10,870,381
Nonfarm personal income	5,373,926	7,383,757	7,831,815	8,983,232	9,256,083	9,864,947	10,342,436
Farm Income 1/	-371,781	520,043	-15,992	781,708	619,799	998,012	527,945
Population (thousands) 2/	654.7	680.6	655.4	637.4	634.2	635.3	636.7
Per capita personal income (dollars)	7,641	11,614	11,925	15,321	15,572	17,098	17,072
Derivation of total personal income	------	----------	----------	----------	$000----------	----------	----------
Earnings by place of work	3,519,522	5,484,364	5,332,063	6,751,743	6,915,878	7,765,645	7,691,217
Less: Personal cont. for social insur. 3/	227,945	314,738	420,467	483,691	508,108	523,088	559,431
Plus: Adjustment for residence 4/	-142,697	-170,902	-169,512	-180,934	-189,442	-209,482	-226,658
Equals: Net earn. by place of residence	3,148,880	4,998,724	4,742,084	6,087,118	6,218,328	7,033,075	6,905,128
Plus: Dividends, interest, and rent 5/	1,080,531	1,745,226	1,620,227	1,920,833	1,815,907	1,812,113	1,825,114
Plus: Transfer payments	772,734	1,159,850	1,453,512	1,756,989	1,841,647	2,017,771	2,140,139
Earnings by place of work							
Components of Earnings:							
Wages and salaries	3,196,973	4,102,959	4,501,693	4,953,782	5,200,809	5,548,700	5,830,634
Other labor income	255,658	344,413	366,913	436,901	490,422	550,580	607,456
Proprietors' income 6/	66,891	1,036,992	463,457	1,361,060	1,224,647	1,666,365	1,253,127
Farm	-449,668	443,382	-94,182	697,856	542,845	926,047	453,347
Nonfarm	516,559	593,610	557,639	663,204	681,802	740,318	799,780
Earnings by Industry:							
Farm	-371,781	520,043	-15,992	781,708	619,799	998,012	527,945
Nonfarm	3,891,303	4,964,321	5,348,055	5,970,035	6,296,079	6,767,633	7,163,272
Private	3,094,583	3,867,428	4,043,570	4,541,128	4,788,158	5,168,841	5,519,855
Ag. serv., For., Fish., and other 7/	19,453	32,726	41,358	48,167	59,841	63,312	68,877
Mining	199,429	228,842	142,134	156,792	163,162	164,166	171,377
Construction	403,921	399,633	315,709	335,598	334,598	361,002	403,172
Manufacturing	264,903	322,973	371,973	420,357	457,060	496,506	543,396
Nondurable goods	123,657	175,224	186,263	192,919	208,479	222,172	238,260
Durable goods	141,246	147,749	185,710	227,438	248,581	274,334	305,136
Transportation and public utilities	395,296	528,501	506,047	597,831	630,975	668,179	712,326
Wholesale trade	412,515	470,416	496,236	543,617	552,759	589,232	606,123
Retail trade	491,516	606,517	636,507	686,703	722,152	774,780	828,509
Finance, insurance, and real estate	192,524	251,247	285,640	304,995	321,268	368,914	394,263
Services	715,026	1,026,573	1,247,966	1,447,068	1,546,343	1,682,750	1,791,812
Government and government enterprises	796,720	1,096,893	1,304,485	1,428,907	1,507,921	1,598,792	1,643,417
Federal, civilian	169,037	201,015	256,433	285,830	297,981	319,191	328,073
Military	157,346	234,528	267,280	281,933	306,365	310,521	307,183
State and local	470,337	661,350	780,772	861,144	903,575	969,080	1,008,161