

Comparison of Personal Income 1969-1984: United States, West North Central Census Region and North Dakota

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How do North Dakotans' personal income compare with the rest of the region or with the rest of the United States? Conventional wisdom suggests that they are lower but relatively less volatile. Many people think that North Dakotans' personal incomes have been fairly stable over the years due to the state's agriculturally based economy. Personal income in North Dakota is actually more erratic than the rest of the United States, and the rate of change in personal income for North Dakota is not stable.

In fact, the evidence indicates that for six of the past eight years (1977-1984) the personal income growth rate for North Dakota has been above the growth rate of both the West North Central (WNC)* region and the United States. In short, North Dakota's rate of change in economic income has been above the rest of the nation.

Measurement of personal income for a geographical area makes it possible to assess the economic health of that area. This account captures the aggregate economic welfare of people. By examining personal income over a period of time, one can detect growth or decline in economic welfare for the area. For example, personal income indicates the ability of a population to pay income taxes. Further, by comparing variations in personal income over the same period of time, one can describe relative growth or decline of various geographic areas.

Personal income is a flow of money income received by people within a specified area. This is the income received before personal taxes are paid. Personal income is defined as income received from active participation in production, from transfer payments, and from public interest payments. This account includes the incomes of individuals, nonprofit institutions, private welfare and trust funds, and sole proprietors.¹ Personal income defined in this manner is not adjusted for price changes over time.

This article presents and analyzes the relative changes in personal income. Historical data are used to make comparisons of changes in personal income for the United States, the West North Central Region and for North Dakota. The primary purpose of this article is to present information. Therefore, limited attention is devoted to explaining the causes for these changes or differences in personal income growth rates.

*West North Central Census Region includes Iowa, Kansas, Minnesota, Missouri, Nebraska, North and South Dakota.

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Overview

Personal income for the United States (U.S.) increased from \$723 billion in 1969 to \$2,971 billion in the second quarter of 1984 (Table 1). This increase is 311 percent and yields a 9.88 percent annual compounded growth rate. The WNC census region's personal income increased from \$55 billion to \$217 billion over the same time period (Table 1). This change is 295 percent and produces a annual compounded growth rate of 9.58 percent. For the state of North Dakota, personal income increased from \$1.8 billion to \$8.3 billion over the 15-year period (Table 1). This is a 361 percent increase and indicates a 10.73 percent annual compounded growth rate.

Nationally, the average annual growth rate in personal income slowed down during 1974-75, 1980 and 1982 (Chart 1). The WNC census region followed the national trend during each time period. North Dakota's average annual growth rate dropped dramatically and was negative for 1975 and 1976. During 1979 and 1980 North Dakota's personal income was increasing but at a relatively slow rate (Chart 1).

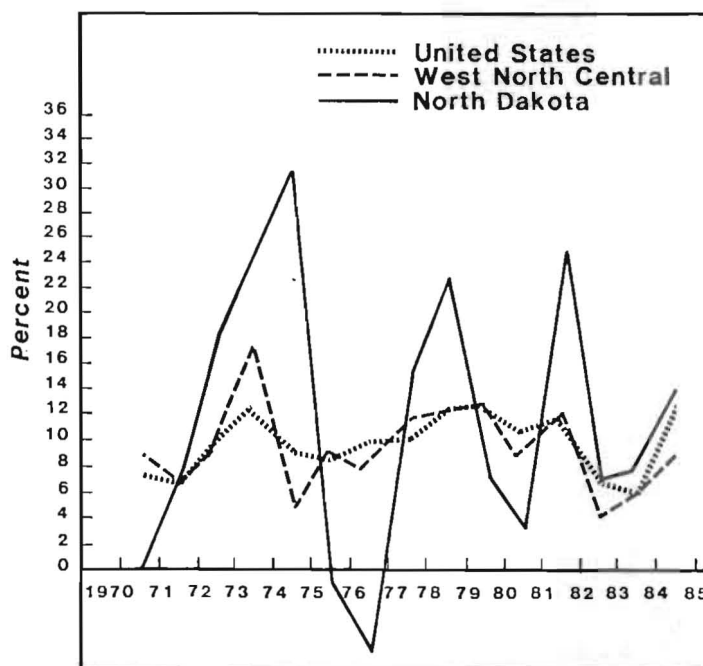


Chart 1. Average Annual Rate of Change in Personal Income: United States, West North Central Region and North Dakota (1970I-1984II)

Table 1. Quarterly Personal Income: 1969I-1984II.

Year/ Quarter	United States (Billion \$)	Percentage Change From Previous Year	West North Central (Billion \$)	Percentage Change From Previous Year	North Dakota (Billion \$)	Percentage Change From Previous Year
1969 1	723	—	55	—	1.8	—
2	740	—	55	—	1.8	—
3	757	—	57	—	1.9	—
4	770	—	59	—	1.9	—
1970 1	781	8.0	60	9.1	1.9	5.6
2	803	8.5	61	10.9	1.9	5.6
3	812	7.3	62	8.7	1.8	(5.3)
4	820	6.5	62	5.1	1.8	(5.3)
1971 1	838	7.3	64	6.6	1.9	0.0
2	857	6.8	65	6.5	2.0	5.3
3	868	6.9	67	8.1	2.0	10.0
4	884	7.8	67	8.1	2.1	14.3
1972 1	913	9.0	69	7.8	2.3	21.1
2	928	8.2	70	7.7	2.3	15.0
3	951	9.5	72	7.5	2.3	15.0
4	988	11.8	76	13.4	2.5	19.0
1973 1	1018	11.5	80	15.9	2.6	13.0
2	1044	12.5	82	17.1	2.7	17.4
3	1072	12.7	87	20.1	3.0	30.4
4	1102	11.5	89	17.1	3.4	36.0
1974 1	1118	9.9	85	6.3	4.0	53.8
2	1149	10.1	88	7.3	4.3	59.3
3	1181	10.2	90	3.5	3.4	13.3
4	1200	8.9	89	0.0	3.4	0.0
1975 1	1208	8.0	91	7.0	3.4	(15.0)
2	1241	8.0	95	8.0	3.6	(16.3)
3	1277	8.2	99	10.0	3.8	11.7
4	1308	9.0	101	12.4	3.9	14.7
1976 1	1342	11.1	100	9.9	3.4	0.0
2	1368	10.2	103	8.4	3.5	(2.7)
3	1398	9.5	104	5.1	3.4	(10.5)
4	1432	9.5	109	7.9	3.5	(10.2)
1977 1	1471	9.6	112	12.0	3.7	8.1
2	1509	10.3	113	9.7	3.8	8.6
3	1555	11.2	117	14.4	3.9	14.7
4	1603	11.9	122	11.9	4.5	28.6
1978 1	1639	11.4	124	10.7	4.5	21.6
2	1697	12.4	128	13.3	4.7	23.7
3	1756	12.9	132	12.8	4.7	20.5
4	1815	13.2	139	13.9	5.7	26.6
1979 1	1865	13.8	141	13.7	5.0	11.1
2	1909	12.5	146	14.1	5.1	8.5
3	1974	12.4	150	13.6	5.3	12.8
4	2027	11.7	153	10.1	5.6	(1.7)
1980 1	2080	11.5	154	9.2	5.3	6.0
2	2103	10.2	154	5.5	5.3	3.9
3	2179	10.4	160	6.6	5.4	1.9
4	2252	11.1	164	7.1	5.6	0.0
1981 1	2322	11.6	171	11.0	6.4	20.8
2	2372	12.8	175	13.6	6.6	24.5
3	2449	12.4	180	12.5	6.9	27.7
4	2484	10.3	182	11.0	7.1	26.8

Year/ Quarter	United States (Billion \$)	Percentage Change From Previous Year	West North Central (Billion \$)	Percentage Change From Previous Year	North Dakota (Billion \$)	Percentage Change From Previous Year
1982 1	2528	8.9	181	5.8	7.0	9.4
2	2563	8.1	183	4.6	7.0	9.1
3	2591	5.8	186	3.3	7.3	5.8
4	2632	6.0	189	3.8	7.5	5.6
1983 1	2647	4.7	189	4.4	7.7	7.1
2	2763	5.5	193	5.5	7.6	8.6
3	2753	6.3	196	5.4	7.6	4.1
4	2824	7.3	204	7.9	8.3	10.7
1984 1	2910	9.9	216	14.3	9.0	16.9
2	2971	9.9	217	12.4	8.3	9.2
3 ^P	3033	10.2	221	12.8	8.7	14.5

Source: Survey of Current Business, Bureau of Economic Analysis, U.S. Department of Commerce, monthly publication.

^PTable 1 includes preliminary estimates by the U.S. Bureau of Economic Analysis for the third quarter of 1984. Preliminary data are subject to revision. Hence these preliminary data are for additional reader information but they are not included in the analysis for this article.

Personal Income Comparisons

Table 2 indicates the average annual percentage growth (decline) rate in personal income for the three areas. These percentage changes were calculated by comparing a particular year with the previous year. The quarterly data in Table 1 were averaged for each year and this was used as the base for each year's calculation. The annual rate of change in personal income is a way to examine the state's economic well being. It indicates shifts in the level of income relative to itself over time.

Data for the past 15 years indicate that North Dakota's personal income varies far more than does either the United

States or the WNC personal income. Table 2 and Chart 1 clearly show, in relative terms, the dramatic volatility of North Dakota's personal income.

During the periods of increasing economic activity, North Dakota's personal income grows more rapidly than the nation's or WNC region's. However, the reverse is also true. That is, during periods of decreasing economic activity, North Dakota's income declines more rapidly and farther than either the nation's or the WNC region's personal income.

The fluctuation of North Dakota's personal income during the period of 1974-76 and the subsequent recovery through

Table 2. Average Annual Rate of Change in Personal Income: United States, West North Central Region and North Dakota (1970I-1984II).

Year	United States (Percentage Change)	West North Central (Percentage Change)	North Dakota (Percentage Change)
1970	7.6	8.5	0.2
1971	7.2	7.3	7.4
1972	9.6	9.1	17.5
1973	12.1	17.6	24.2
1974	9.8	4.3	31.6
1975	8.3	9.4	(1.2)
1976	10.1	7.8	(5.9)
1977	10.8	12.0	15.0
1978	12.5	12.7	23.1
1979	12.6	12.9	7.7
1980	10.8	7.1	3.0
1981	11.8	12.0	24.9
1982	7.2	4.4	7.5
1983	6.0	5.8	7.6
1984	9.9	13.4	14.6
(thru 2nd Quarter)			

National Recessions: I (December 1973-March 1975)
 II (January 1980-June 1980)
 III (October 1981-December 1982)

1978 illustrates dramatic variation. Personal income in North Dakota is capable of expanding and contracting rapidly (see Chart 1). North Dakota's growth rate in personal income peaked during 1974 at 31.6 percent (see Table 2). Two years later, in 1976, the trough in personal income occurred with a negative annual rate of 5.9 percent.

The peak in the growth rate for personal income for the WNC region occurred during 1973 at an annual rate of 17.6 percent. This region's trough occurred during 1974 with a rate of 4.3 percent.

Table 2 shows that for the nation, 1976 through 1981 was a period of relatively high stable growth for personal income. For the nation, growth in personal income slowed to 7.2 in 1971. In 1982 the growth rate dropped to 6.0 percent.

In terms of percentage change in personal income, it appears that the national recession of 1974-1975 was relatively more severe for North Dakota than for the WNC region or the nation. However, the 1982 recession impacted the WNC region and the nation more severely, in absolute terms, than it affected North Dakota.

For 10 of the 15 years (1970-1984) North Dakota's growth rate in personal income was larger than the WNC region's and larger than the nation's. Also, for 10 of these 15 years, the WNC's growth rate in personal income was above the nation's personal income growth rate.

On the average, North Dakota's increase in personal income is relatively even from quarter to quarter (Table 3). During the third quarter it decreases by just over one percentage point to 10.86. For both the WNC region and the U.S. the slowest average quarterly growth rate occurs during the fourth quarter. As might be expected, the quarterly variation is relatively minor for the WNC region and almost nonexistent for the United States. It appears that size and economic diversity tends to eliminate quarterly variation.

Conclusion

Changes in personal income - either up or down - were more violent in North Dakota than for the nation. To a lesser extent, changes in personal income for the WNC were also larger than for the nation. This conclusion is to be expected because there would usually be more variability for a single state than for the region or nation. Chart 1 clearly demonstrates that North Dakota's personal income rises more rapidly during economic growth periods than that of either the WNC region or the nation. Also, during periods of contracting economic activity, North Dakota's personal in-

come declines more rapidly than either the WNC region's or the nation's personal income.

The annual compounded growth rate in personal income over the past 15 years for the United States was 9.88 percent. For the WNC region this growth rate was 9.58 percent. The difference is only 0.3 percent. Also, personal income for the WNC region moves up and down nearly simultaneously with the national level. North Dakota's annual compounded growth rate in personal income over the same period of time was 10.73 percent. This growth rate is 0.85 percentage points above the nation's and about 1.2 percentage points above the WNC region.

Possible Explanations

Differences in personal income growth rates between regions can be caused by numerous market forces. A major cause may simply be economic diversification of the area. By using the second quarter data for 1984 we can show relative size of the respective geographic areas. North Dakota had about 0.3 percent of national personal income and the WNC region had about 7 percent.

Energy development in western North Dakota during the mid-1970's caused an increase in the level of economic activity. National and international markets which impact the production of energy or agricultural commodities in North Dakota can have a dramatic effect upon personal income.

The highest percentage increase in personal income in North Dakota occurred during 1973 and 1974 (Chart 1). This period offered relatively high grain prices which can partially be explained by the so called "Russian Grain Deal." For a detailed review of the changing structure of the North Dakota agricultural sector see the July-August 1984 issue of *Farm Research*.²

Farm income is a relatively more important element for North Dakota and the WNC region than it is for the rest of the country. Commodity and livestock prices increased and decreased dramatically over the past 15 years. Fluctuations in marketing and storing of farm products can contribute to erratic changes in personal income. Fluctuations in farm income, in turn, may cause oscillating effects for support industries. Farm income in North Dakota accounted for 9.7 percent of total personal income in 1983. For the nation as a whole, farm income was 0.9 percent of total personal income. Within the WNC region farm income accounted for 2.1 percent of total income.³ It is not surprising that North Dakota's percentage of personal income accounted for by farm income is about 10 times larger than the nation's. However, it is surprising to discover that North Dakota's

Table 3. Average Quarterly Rate of Change in Personal Income: United States, West North Central Region and North Dakota (1970I-1984II).

Quarter	United States (Percentage Change)	West North Central (Percentage Change)	North Dakota (Percentage Change)
I	9.75	9.65	11.97
II	9.73	9.64	11.98
III	9.69	9.44	10.86
IV	9.75	9.26	11.79

percentage of personal income accounted for by farm income is more than four and one half times that of the WNC region. This suggests that North Dakota continues to rely much more on agriculture than its neighboring states do.

References

¹**Survey of Current Business**, Bureau of Economic Analysis, U.S. Department of Commerce, monthly publication.

²**North Dakota Farm Research**, Agricultural Experiment Station, North Dakota State University, Vol. 42, No. 1, (July-August, 1984).

³**Survey of Current Business**, Bureau of Economic Analysis, U.S. Department of Commerce, Vol. 64, No. 8 (August, 1984).

Continued from page 8

Related Literature

1. ASAE Yearbook, 1983. ASAE Standard 5386.1, pp. 252-254. American Society of Agricultural Engineers, St. Joseph, MI 49085.
2. Huitink, Gary. 1980. "Pattern Your Ag. Spray Plane," Bulletin No. MP-183. Cooperative Extension Service, University of Arkansas, Fayetteville, AR 72701.
3. Rester, D. May 1982. "Calibrate Your Ag. Spray Plane," Bulletin DCR1. Cooperative Extension Service, Louisiana State University, Baton Rouge, LA 70803.
4. Kuhlman, D.K., D.C. Cress. December 1981. "Aerial Application Handbook for Applicators," Cooperative Extension Service, Kansas State University, Manhattan, KS 66502.
5. Thomasson, G. 1984. Personal correspondence, Cooperative Extension Service, Washington State University, Pullman, WA 99163.