

FORECASTS OF NEBRASKA GENERAL FUND TAX RECEIPTS FOR FISCAL YEAR 1979-1980

Once again it is time to look forward to the next fiscal year (the one beginning on July 1, 1979) and attempt to project the flow of tax receipts into Nebraska's general fund. Each year, forecasts of tax receipts are prepared by government analysts for certain tax categories such as individual income tax, sales and use tax, corporation tax, and other miscellaneous taxes. State Legislators and key government officials must possess a reasonably accurate forecast of the number of tax dollars that will end up in the state's coffers during the upcoming fiscal year. Without these forecasts, it would be extremely difficult to effectively plan appropriations or establish tax rates so as to remain within budgetary constraints established by state law. Consequently, revenue forecasting has become an integral part of the planning process of state governments.

The Nebraska Department of Revenue prepares annual forecasts of general fund tax receipts. The forecasts are reviewed by a host of government planners whose primary duty is budget preparation. The responsibility for preparing the forecasts belongs to the research division of the Revenue Department. The research division has access to extensive economic data bases, and modern computing facilities are available to handle the mammoth computational chores. Using advanced mathematical and statistical techniques, revenue forecasts are prepared, reviewed, and continually updated. The forecasts have been remarkably accurate, as indicated by the commendable "track record" established by the research division.

During the past few years, the Bureau of Business Research has become involved in the uncertain venture of revenue forecasting. The Bureau's role is not that of a competitor with the Nebraska Department of Revenue. Rather, the Bureau's efforts are specifically aimed at providing an independent set of revenue forecasts to be used for comparative purposes. The Bureau receives data on state tax receipts from the Revenue Department and has access to many of the same economic data bases used by the Revenue Department. Consequently, any differences in the forecasts prepared by the Bureau of Business Research and by the Nebraska Department of Revenue should exist primarily as a result of independent approaches used to solve the same problem, and not from any differences in the data that are used.

In this article, the revenue forecasting model developed by the Bureau of Business Research will be described. The narrative is not intended to be technical, but will present a general overview of the model. Following the description of the model, independent sets of revenue forecasts will be given. Four categories of

general fund tax receipts are forecast: (1) individual income, (2) sales and use, (3) corporation, and (4) miscellaneous. Each set of forecasts is prepared under different assumptions. These assumptions will be outlined and each forecast will receive a brief comment.

The model used to forecast general fund tax receipts for Nebraska is a recursive model consisting of seventeen economic variables, interrelated by a system of eight equations. Six of the variables are national in scope and are relatively independent of changes that occur in the Nebraska economy. These variables are defined to be "exogenous" variables. The remaining eleven variables are specific to the Nebraska economy and are defined to be "endogenous" variables. Eight of the endogenous variables, including general fund tax receipts, are expressed in equation form as functions of other variables (both exogenous and endogenous). The functional relations of the model are presented in the flow chart of Figure 1 (page 2).

Data used to construct the model were obtained from state and federal agencies. Data on tax receipts were supplied by the Nebraska Department of Revenue, while the Bureau of Economic Analysis of the U.S. Department of Commerce provided most of the remaining data. All unadjusted data series were seasonally adjusted before being used in subsequent analyses. Multiple regression analysis was the principal quantitative tool used to construct the forecasting model.

The Nebraska tax model is a quarterly model and produces seasonally adjusted forecasts on this basis. However, state tax receipts are reported each month and the historical tax series are seasonally adjusted on a monthly basis. This makes it possible for the forecasts to be reported in seasonally unadjusted form as both a quarterly and monthly cash flow. Unlike the seasonally adjusted forecasts, the unadjusted forecasts represent the actual expected cash flow of receipts for any specific quarter or month.

As mentioned previously, the exogenous variables are national in scope and forecasts of these variables are used to "drive" the Nebraska tax model. The national forecasts are revised each month and this necessitates the revision of state revenue forecasts as well. Additional factors that indicate the need for frequent revision of the Nebraska revenue forecasts are changes that occur in the historical data used to construct the forecasting model, the creation of new data due to the passage of time, and changes in the basic assumptions underlying the model. Hence, forecasts of state tax receipts should be a continuing process governed by changes that occur in the model's

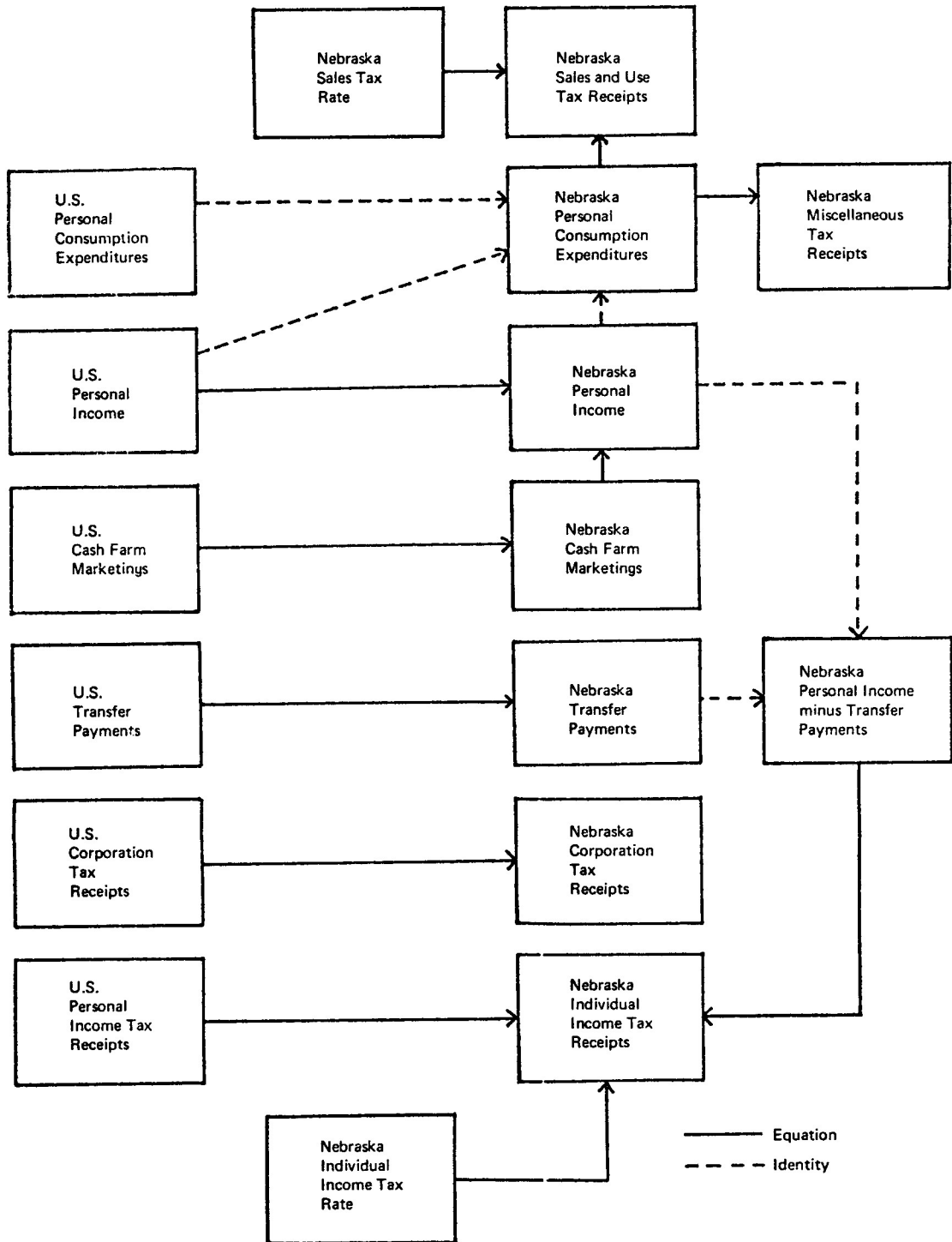
(Continued on page 2)

(Continued from page 1) assumptions and data base.

It is an obvious fact that the Nebraska economy is interrelated with the national economy and the nature of the relationship is in a continual state of change. The national model that provides exogenous inputs to the Nebraska tax model is of major impor-

tance in generating state revenue forecasts. Currently, several state agencies in Nebraska subscribe to the quarterly forecasts of Chase Econometrics Associates, Inc. (CEAI). Although the Chase model is a highly regarded national forecasting model, there exists considerable difference of opinion concerning the probable trend of

Figure 1
NEBRASKA TAX MODEL



the U.S. economy in the latter half of 1979 and during 1980. Many economists believe that the anti-inflationary policies adopted by the present administration will, at the very least, slow down the economy and could possibly cause a decline in real gross national product. The standard forecast scenario of the Chase model predicts the onset of a mild recession sometime during 1979. Recent declines in the federal government's index of leading economic indicators suggests a strong likelihood that an economic slowdown will occur, whether it be in late 1979 or sometime during 1980. Therefore, in order to consider the most probable future economic events, different forecast scenarios will be presented, ranging from "no recession" to "severe recession." A tax-cut scenario will also be presented in light of the recent reintroduction of the Kemp-Roth bill.

Forecasts of Nebraska general fund tax receipts are prepared using four different sets of assumptions, commonly referred to as scenarios. The standard forecast assumes that a mild recession will occur sometime during 1979. Alternate scenario forecasts are prepared for (1) sluggish growth with no recession, (2) severe recession, and (3) Kemp-Roth tax cut. With the exception of the Kemp-Roth scenario, all forecasts incorporate the recently enacted federal tax cut of 1979 and assume that a comparable federal tax cut will occur for 1980. Also, no increases in the present state tax rates are expected for the fiscal year in question.

The standard scenario of a mild recession during 1979 is assigned the greatest probability of occurrence. If this scenario prevails, gross general fund tax receipts for Nebraska are expected to total approximately \$695 million for the fiscal year beginning July 1, 1979. Assuming that total tax refunds will be around \$90 million, net tax receipts are expected to be \$605 million. General fund appropriations were recently established at \$570 million for the upcoming fiscal year. The difference between forecasted net receipts and the appropriations figure is \$35 million. This represents an overlevy of 6 percent of general fund appropriations which is in line with the current overlevy requirements.¹

If a recession occurs, it will more than likely happen in the second half of 1979 or during the first half of 1980. The Nebraska economy usually lags the national economy by one or two quarters. Hence, the occurrence of a recession as indicated by the standard scenario would have a reduced impact on the Nebraska economy during the next fiscal year. However, the carry-over effect would definitely make its presence known during the fiscal year beginning July 1, 1980.

¹ Lower and upper limits for overlevies have been established at 3 percent and 7 percent, respectively.

Additional factors to be considered are the effects of the current harsh winter and depressed farm prices on the agricultural sector of the Nebraska economy. If adverse weather conditions and low farm prices continue to prevail, output in the agricultural sector could be reduced, resulting in a decline in tax receipts. At any rate, forecasting tax receipts based solely on national trends is a risky business, considering the volatility of the Nebraska farm sector. For this scenario, the seasonally unadjusted quarterly flows of tax receipts by category are presented in Table 1.

The forecast scenario with the second greatest probability of occurrence is that of a severe recession, comparable to the recession of 1974 and 1975. Although no one likes to consider this as a possibility, it could happen and the effect on general fund tax receipts should be considered.

If a severe recession occurs, gross general fund tax receipts are forecasted to be \$681 million, considerably less than the amount anticipated with the standard forecast. Using the previous assumption of a \$90 million tax refund, net tax receipts would total \$591 million, which represents an overlevy of 3.7 percent of general fund appropriations. Although this amount still meets the overlevy requirement, it provides a much less comfortable margin than the overlevy predicted in the standard scenario. Considering the lag relationship of the Nebraska economy to the national economy, the implications of a severe national recession should be weighed carefully in relation to the flow of tax receipts in the second half of the upcoming fiscal year and in the fiscal year that follows. The quarterly flows of general fund tax receipts for this scenario are presented in Table 2.

The scenario that is assigned the lowest probability of occurrence is that of no recession but slow economic growth. Many economists and several national forecasting firms will disagree with this assumption, assigning this scenario the highest probability of occurrence. In any event, gross tax receipts are forecasted to be \$704 million. Assuming \$90 million in tax refunds, net tax receipts are expected to be \$614 million. This will yield an overlevy of 7.7 percent of general fund appropriations. As indicated by the size of the overlevy, this is the best of all possible situations considered. However, the low probability of occurrence assigned to this scenario should lead one to be extremely cautious about accepting this forecast. Quarterly cash flows of tax receipts for this scenario are presented in Table 3 (page 6).

The final scenario to be considered is that of a Kemp-Roth tax cut and how such a tax cut would affect Nebraska general fund tax receipts. The standard forecast is compared to the same standard forecast in which a Kemp-Roth (Continued on page 6)

Table 1
FORECASTED GROSS GENERAL FUND TAX RECEIPTS
FOR NEBRASKA
STANDARD FORECAST: MILD RECESSION IN 1979
FY 1979-80
(in thousands of dollars)

Tax Category	1979.3	1979.4	1980.1	1980.2	Total
Individual Income Tax	54,736	50,383	86,992	86,800	278,911
Sales and Use Tax	70,940	73,815	73,338	67,664	285,757
Corporation Tax	13,491	13,278	15,457	18,083	60,309
Miscellaneous Tax	17,105	14,634	13,164	25,110	70,013
Total	156,272	152,110	188,951	197,657	694,990

Table 2
FORECASTED GROSS GENERAL FUND TAX RECEIPTS
FOR NEBRASKA
FIRST ALTERNATIVE FORECAST:
SEVERE RECESSION IN 1979
FY 1979-80
(in thousands of dollars)

Tax Category	1979.3	1979.4	1980.1	1980.2	Total
Individual Income Tax	54,018	49,439	85,019	84,650	273,126
Sales and Use Tax	70,424	72,884	71,993	66,158	281,459
Corporation Tax	13,186	12,731	14,533	16,777	57,227
Miscellaneous Tax	16,999	14,477	12,958	24,632	69,066
Total	154,627	149,531	184,503	192,217	680,878

Review and Outlook

Real output in Nebraska rose sharply in November, with the physical volume index for the state recording a sizable gain of 6.4 percent. This was the fourth consecutive monthly increase in the index. The magnitude of November's increase is emphasized by the fact that it was the largest monthly gain recorded during the current expansion of the economy, which began in April, 1975. The value of the index was 51.2 percent above its 1967 base-period level (see Table 2).

Although November's gain in activity was dominated by an extraordinarily large increase in the agricultural sector, three of the four nonagricultural sectors also registered gains. The level of activity in the agricultural sector was up 41.0 percent in Novem-

ber. The nonagricultural sectors combined for an increase in output of 1.1 percent. The month-to-month percentage changes in those sectors were: manufacturing, +1.5 percent; distributive, +1.2 percent; government, +1.2 percent; and construction (the only declining sector), -2.5 percent.

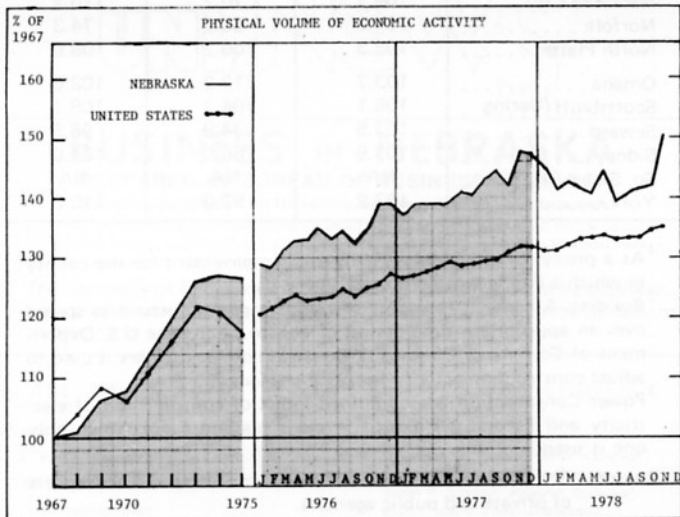
On a year-to-date basis, Nebraska's economy continued to record moderate improvement compared to last year. For the eleven months in 1978, the index of physical output was 1.2 percent above the level for the same period in 1977. This compares to a 3.8 percent year-to-date growth in the U.S. physical volume index (refer to Table 1).

Extreme caution should be exercised when interpreting the size of November's movement in the index, (Continued on page 5)

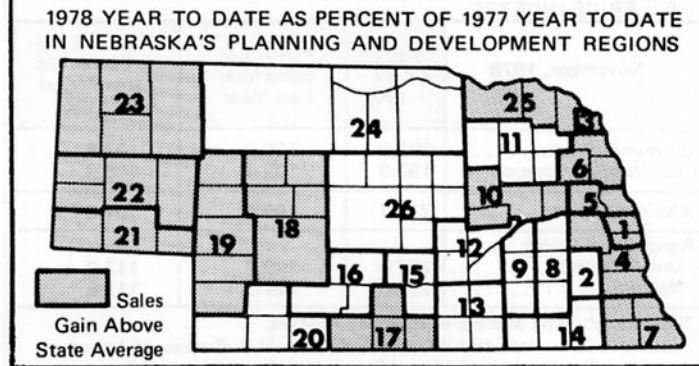
Notes for Tables 1 and 2: (1) The "distributive" indicator represents a composite of wholesale and retail trade; transportation, communication and utilities; finance, insurance, and real estate; and selected services. (2) The "physical volume" indicator and its components represent the dollar volume indicator and its components adjusted for price changes using appropriate price indexes—see Table 5, page 5.

ECONOMIC INDICATORS: NEBRASKA AND UNITED STATES				
1. CHANGE FROM PREVIOUS YEAR				
November, 1978	Current Month as Percent of Same Month Previous Year		1978 Year to Date as Percent of 1977 Year to Date	
	Nebraska	U.S.	Nebraska	U.S.
Indicator	Nebraska	U.S.	Nebraska	U.S.
Dollar Volume	114.0	112.7	110.1	111.6
Agricultural	141.5	111.3	116.8	111.3
Nonagricultural	109.1	112.7	109.1	111.6
Construction	107.2	120.2	109.3	116.3
Manufacturing	120.9	114.7	114.5	112.1
Distributive	106.5	112.5	108.2	111.9
Government	103.0	106.7	104.5	107.7
Physical Volume	102.5	103.4	101.2	103.8
Agricultural	113.3	92.2	98.1	97.7
Nonagricultural	100.4	103.8	101.7	104.0
Construction	94.7	106.2	97.9	104.1
Manufacturing	110.4	105.5	106.3	104.5
Distributive	97.8	103.3	100.7	104.0
Government	99.5	101.4	101.1	102.8
2. CHANGE FROM 1967				
Indicator	Percent of 1967 Average			
	Nebraska	U.S.		
Dollar Volume	316.0	277.2		
Agricultural	402.1	268.8		
Nonagricultural	301.1	277.5		
Construction	316.2	265.3		
Manufacturing	344.2	267.7		
Distributive	291.7	286.8		
Government	273.8	267.0		
Physical Volume	151.2	135.1		
Agricultural	181.9	121.1		
Nonagricultural	145.8	135.6		
Construction	127.0	106.5		
Manufacturing	160.7	127.1		
Distributive	144.4	142.0		
Government	137.7	140.0		

3. NET TAXABLE RETAIL SALES OF NEBRASKA REGIONS AND CITIES (Adjusted for Price Changes)			
Region Number ¹ and City	City Sales ²	Sales in Region ²	
	Nov. 1978 as percent of Nov. 1977	Nov. 1978 as percent of Nov. 1977	Year to date '78 as percent of Year to date '77
<i>The State</i>	107.5	107.4	103.4
1 Omaha	106.1	105.7	105.0
Bellevue	118.0		
2 Lincoln	103.5	102.9	99.2
3 So. Sioux City	103.6	111.0	109.2
4 Nebraska City	101.6	109.5	111.0
5 Fremont	109.8	111.7	103.5
Blair	113.7		
6 West Point	96.5	108.0	107.3
7 Falls City	108.9	118.0	105.5
8 Seward	98.6	104.4	98.9
9 York	108.4	110.8	97.8
10 Columbus	110.1	115.9	103.7
11 Norfolk	111.2	111.9	102.5
12 Grand Island	111.8	110.1	103.0
13 Hastings	108.9	108.8	100.8
14 Beatrice	110.5	107.8	102.6
Fairbury	101.7		
15 Kearney	107.8	113.0	100.6
16 Lexington	94.4	105.4	97.6
17 Holdrege	107.6	106.5	105.4
18 North Platte	107.4	107.4	104.7
19 Ogallala	94.0	94.6	104.7
20 McCook	100.2	103.0	103.4
21 Sidney	111.0	111.5	108.4
Kimball	114.0		
22 Scottsbluff/Gering	106.2	106.3	106.1
23 Alliance	107.8	104.8	111.7
Chadron	98.9		
24 O'Neill	111.4	114.3	98.1
25 Hartington	105.1	106.7	104.9
26 Broken Bow	111.6	118.8	102.5



¹ See region map below.
² Sales on which sales taxes are collected by retailers located in the state. Region totals include motor vehicle sales; city totals exclude motor vehicle sales.
 Compiled from data provided by Nebraska Department of Revenue.



(Continued from page 4) since much of it reflects the volatility of the agricultural component of the physical volume index. In addition to measurement problems and fluctuation in production, which are typical of the agricultural sector, this month's cash farm marketings (the basis for measuring output) are preliminary figures, subject to substantial revision. Despite these caveats, it is apparent that November still experienced a sizable increase in output.

November became the forty-fourth month of the current economic expansion for both the national and state economies. Since there has been considerable discussion lately concerning a possible recession in 1979, activity levels in both the state and national economies warrant close monitoring throughout 1979. When monitoring the performance of the Nebraska economy, particular attention should be placed upon the composite index of the four nonagricultural sectors. This index is perhaps better suited for measuring the underlying strength of the economy, as it is not directly affected by fluctuations in agricultural output. For example, in looking at the chart at the bottom of page four, it is obvious that economic activity in Nebraska fell during much of the first half of 1978. When the index is broken into its agricultural and nonagricultural components, it can be seen that decline in activity was due primarily to the fact that cash farm marketings steadily declined from the peak of November, 1977. Nonagricultural output, however, generally increased during this period.

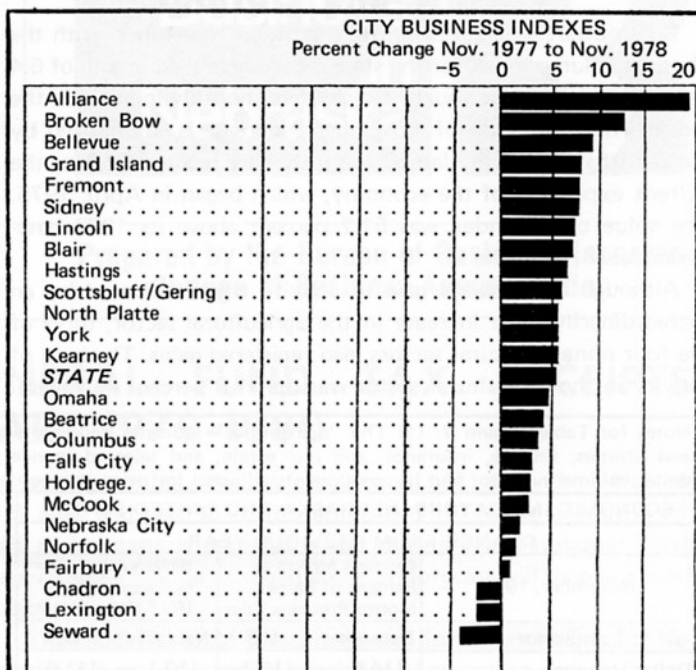
The increase in agricultural output for November was the fourth consecutive monthly increase. Seasonally adjusted prices received by Nebraska farmers were 2.8 percent above October's level and 24.9 percent above the level of November, 1977.

The manufacturing, distributive, and government sectors also recorded increases in real output during the month and contributed to the strong performance of the state economy. Continued growth in the manufacturing sector was especially encouraging. This sector, with a 6.3 percent year-to-date growth in its physical volume index, has spearheaded the moderate growth in the state economy over the first eleven months of 1978.

The November gain in the state's economic activity was reflected in the indicators of city business activity. Led by increases in retail sales and employment, Nebraska cities experienced increases in all indicators of business activity, relative to November, 1977.

In November, twenty-two of the twenty-five reporting cities experienced increases in business activity relative to November, 1977. As has been the case throughout most of the year, Alliance posted the largest gain in activity, with an increase of 19.5 percent. Other cities with November-to-November increases of more than 7 percent were: Broken Bow, Bellevue, Grand Island, Fremont, and Sidney.

J. A. D.



Source: Table 3 (page 4) and Table 4 below.

The State and Its Trading Centers	Percent of Same Month a Year Ago		
	Employment ¹	Building Activity ²	Power Consumption ³
<i>The State</i>	105.0	104.7	100.5
Alliance	136.7	118.9	109.9
Beatrice	104.4	51.0	111.1
Bellevue	103.7	101.3	104.0*
Blair	103.0	82.0	108.5
Broken Bow	103.0	206.0	135.2
Chadron	97.0	90.8	99.9
Columbus	105.2	87.9	80.4
Fairbury	104.3	48.7	113.6*
Falls City	104.3	49.1	109.3
Fremont	105.7	121.0	105.5*
Grand Island	104.4	129.0	100.7
Hastings	104.1	128.6	101.3
Holdrege	103.6	95.9	87.2
Kearney	102.5	117.5	104.4
Lexington	105.3	49.3	110.5
Lincoln	106.9	171.6	102.5
McCook	106.3	78.0	110.8
Nebraska City	104.1	70.7	110.2
Norfolk	104.6	56.2	74.3
North Platte	103.3	106.2	108.0
Omaha	103.7	113.2	103.0
Scottsbluff/Gering ..	105.1	104.7	108.1
Seward	103.5	34.9	96.5
Sidney	103.9	66.0	134.0
So. Sioux City	NA	NA	NA
York	103.2	92.0	110.0

¹As a proxy for city employment, total employment for the county in which a city is located is used.

²Building Activity is the value of building permits issued as spread over an appropriate time period of construction. The U.S. Department of Commerce Composite Construction Cost Index is used to adjust construction activity for price changes.

³Power Consumption is a combined index of consumption of electricity and natural gas except in cases marked * for which only one is used.

Source: Compilation by Bureau of Business Research from reports of private and public agencies.

5. PRICE INDEXES

November, 1978	Index (1967 = 100)	Percent of Same Month Last Year	Year to Date as Percent of Same Period Last Year*
Consumer Prices	202.0	109.0	107.5
Commodity component	192.9	108.4	106.9
Wholesale Prices	215.7	109.4	107.6
Agricultural Prices			
United States	222.0	120.7	113.9
Nebraska	221.0	124.9	118.8

*Using arithmetic average of monthly indexes.

Sources: Consumer and Wholesale Prices: U.S. Bureau of Labor Statistics; Agricultural Prices: U.S. Department of Agriculture.

(Continued from page 3) tax cut has been simulated. The time frame is the fiscal year beginning July 1, 1979.

In the February, 1979, issue of *Business in Nebraska*, the effects of a Kemp-Roth tax cut on the entire Nebraska economy were considered. In what follows, the implications of such a tax cut are limited to the effect on general fund tax receipts. The Kemp-Roth bill is designed to reduce the federal personal income tax rate by approximately 30 percent over a three-year period, with equal reductions each year. The federal corporate tax rate would also be reduced by 3 percentage points over the same time interval. The first Kemp-Roth bill was introduced into Congress in 1978, and defeated. The bill has been reintroduced this year and, if passed, would go into effect in 1980.

General fund tax receipts are estimated to be \$695 million for the standard forecast scenario. If the Kemp-Roth tax cut had been passed and taken effect in 1979, tax receipts would have totaled \$687 million, representing an \$8 million reduction in state taxes paid by Nebraskans. This is not a remarkable reduction in revenues when one considers the magnitude of the Kemp-Roth tax cut. The tax category that would suffer the largest loss is individual income taxes. This would be expected, since state income taxes are figured as a percentage of federal income taxes. Forecasted tax receipts for other categories—sales and use, corporation, and miscellaneous—would increase. This would occur primarily due to an increase in disposable personal income and increased incentives in the work force. Eventually, the loss in state revenue would be

regained. Inflation is expected to increase under such a tax cut. However, a restriction on government spending equal to the rate of inflation has been offered as a possible solution to this problem. Quarterly cash flows for general fund tax receipts, assuming a Kemp-Roth tax cut, are presented in Table 4.

During the past decade, scientific techniques used in economic forecasting have become increasingly sophisticated. However, economists are not dealing with an environment that is governed by the precise laws of mathematics, but are faced with a world that bows to the influence of uncertainty in human behavior. Forecasting models must take into account this unpredictable component of human behavior. Consequently, the mathematical output produced by a model should be accepted as only a first approximation of the final results of any forecast. These preliminary results must be augmented by the judgment of the forecaster, based on experience and knowledge. Also, it is usually the case that future events will occur which require major revisions in the assumptions of the model, or perhaps the relationships among key variables change. In any event, the previous forecast results will no longer be strictly valid and new forecasts will have to be generated implementing the necessary changes to the model.

Nevertheless, if the model has been carefully constructed, its application will provide a considerable improvement to the forecasting efforts of both the public and private sectors. The revenue forecasts that have been presented in this article should be reviewed in light of the previous comments.

C. L. B.

Table 3
FORECASTED GROSS GENERAL FUND TAX RECEIPTS
FOR NEBRASKA
SECOND ALTERNATIVE FORECAST: NO RECESSION,
BUT SLUGGISH ECONOMIC GROWTH IN 1979

FY 1979-80
(in thousands of dollars)

Tax Category	1979.3	1979.4	1980.1	1980.2	Total
Individual Income Tax	55,198	51,058	88,487	88,532	283,275
Sales and Use Tax	71,079	74,101	73,842	68,353	287,375
Corporation Tax	13,713	13,758	16,376	19,462	63,309
Miscellaneous Tax	17,133	14,682	13,242	25,329	70,386
Total	157,123	153,599	191,947	201,676	704,345

Table 4
FORECASTED GROSS GENERAL FUND TAX RECEIPTS
FOR NEBRASKA
THIRD ALTERNATIVE FORECAST: KEMP-ROTH TAX CUT

FY 1979-80
(in thousands of dollars)

Tax Category	1979.3	1979.4	1980.1	1980.2	Total
Individual Income Tax	53,061	48,922	84,608	81,592	268,183
Sales and Use Tax	71,117	74,140	73,785	68,246	287,288
Corporation Tax	13,585	13,457	15,780	18,616	61,438
Miscellaneous Tax	17,136	14,678	13,223	25,266	70,303
Total	154,899	151,197	187,396	193,720	687,212

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UNL News

BUSINESS IN NEBRASKA

PREPARED BY BUREAU OF BUSINESS RESEARCH
Member, Association for University Business & Economic Research

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Publications Services & Control
University of Nebraska-Lincoln
Nebraska Hall—City Campus
Lincoln, Nebraska 68588

Vol. 414 March, 1979

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