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College of Business Administration

INFLATION: WHICH PRICES MATTER?

The U. S. economic recovery is now established, but prospects for renewed inflation temper the optimism of some forecasters. Most expect at least a small acceleration in the near term. This outlook—combined with recent change in the construction of the nation's most widely-reported inflation measure, the Consumer Price Index (CPI)—prompts this article.

Following an explanation of the CPI, the first section analyzes the recent inflation experience by examining price movements of the goods and services components comprising the CPI. In the second section, these movements are combined with weights to show each component's actual contribution to the overall CPI change. The next section explains the recent revision in the measurement of home ownership in the CPI and compares performance of the old and new measures during the January-to-June 1983 overlap period when both were calculated. The early sections are useful not only for understanding the past inflation experience but also provide part of the basis for assessing prospects for future inflation. This is briefly covered in the last section.

CONSUMER PRICE INDEX

The Consumer Price Index (CPI) measures average change in prices, over time, in a fixed market basket of goods and services. Major components of this fixed market basket consist of food and beverages, housing, apparel and upkeep, transportation, medical care, entertainment, and other goods and services.

The market basket is fixed, in the following sense. The relative importance (Table 1) of a component is its expenditure weight expressed as a percentage of total expenditures for all items. When collected, the weights represent average annual expenditures, and their relative importance ratios show approximately how the index population distributes expenditures among components.

In January 1978, the Bureau of Labor Statistics (BLS) began publishing CPIs for two population groups: the CPI-U for 'All Urban Consumers,' which covers about 80 percent of the total non-institutional civilian population; and the revised CPI-W for 'Urban Wage Earners and Clerical Workers,' which represents about half the population covered by the CPI-U. Relative importances differed in the two indexes and reflected the respective population's expenditure patterns. Table, text, and graphs in this article refer to the CPI-U.

In January 1983, BLS changed the method of measuring homeowner costs in the CPI-U (now identified as Old Series—OS) to rental equivalence (CPI-U). This new approach calculates homeowner costs of the shelter component, based on the implicit

rent that owners would have to pay to rent the homes they own.

The old method (CPI-U [OS]) calculated homeowner costs as home purchase, mortgage interest costs, property taxes, property insurance, and maintenance and repair. This change in concept resulted in a change in the relative importances, as can be seen in Table 1, and will be discussed later.

COMPONENT PRICE MOVEMENTS

Graph 1 shows the changes in prices over 12-month periods ending with the points along the horizontal axis (e.g., the left end of the solid line shows the trend in the all items index and indicates that the January 1978 to January 1979 overall price increase was just more than 9 percent). Plotting 12-month changes, rather than month-to-month changes, smooths the curves and makes trends easier to identify. When analyzing the graph, it is important to keep in mind that the curves map changes in prices and that downward sloping curves mean that prices were still increasing, but at slower rates.

The peak for transportation in March 1980 clearly stands out. The refiner acquisition cost of imported crude oil rose from \$16.41 per barrel to \$33.42 per barrel during the previous 12 months [1]. This change was quickly translated into retail gaso-

(Continued on page 2)

TABLE I
Relative Importance, CPI-U and
CPI-U (Old Series), December 1982

| Index Title | CPI-U | CPI-U |
|--------------------------------------|---------------------|----------------------------------|
| | Relative Importance | Relative Importance (Old Series) |
| All Items | 100.000 | 100.000 |
| Food and beverage | 20.069 | 17.418 |
| Housing | 37.721 | 45.948 |
| Shelter | 21.339 | 31.472 |
| Renters' costs | 6.932 | 6.016 |
| Homeowners' costs | 13.881 | 21.885 |
| Maintenance and repairs | 0.526 | 3.570 |
| Fuel and other utilities | 8.377 | 7.270 |
| Household furnishings and operations | 8.005 | 7.206 |
| Apparel and upkeep | 5.205 | 4.517 |
| Transportation | 21.791 | 18.912 |
| Medical care | 5.995 | 5.203 |
| Entertainment | 4.206 | 3.651 |
| Other goods and services | 5.014 | 4.351 |

(Continued from page 1)

line price increases that were responsible for the peak 23 percent 12-month increase in transportation costs shown in Graph 1. Although gasoline prices moved the transportation index in 1979 and 1980, more than half of the price gains in this component in 1981 were due to hikes in new and used car prices. In 1982, actual decreases in gasoline prices partially offset the effect of additional car price increases on the transportation index.

The housing component followed a similar pattern, but not quite as volatily. The 1979 and 1980 trends in the housing index were due to both increases in home purchase prices and finance costs, with the latter contributing more to the increase. During 1981, the component was driven almost entirely by increases in finance costs, but, by 1982, these costs were actually declining and offsetting home purchase prices that were increasing more rapidly than in 1981.

The price movements of the medical and food components appear to move somewhat independently from the all items index. While the transportation and housing component increases were

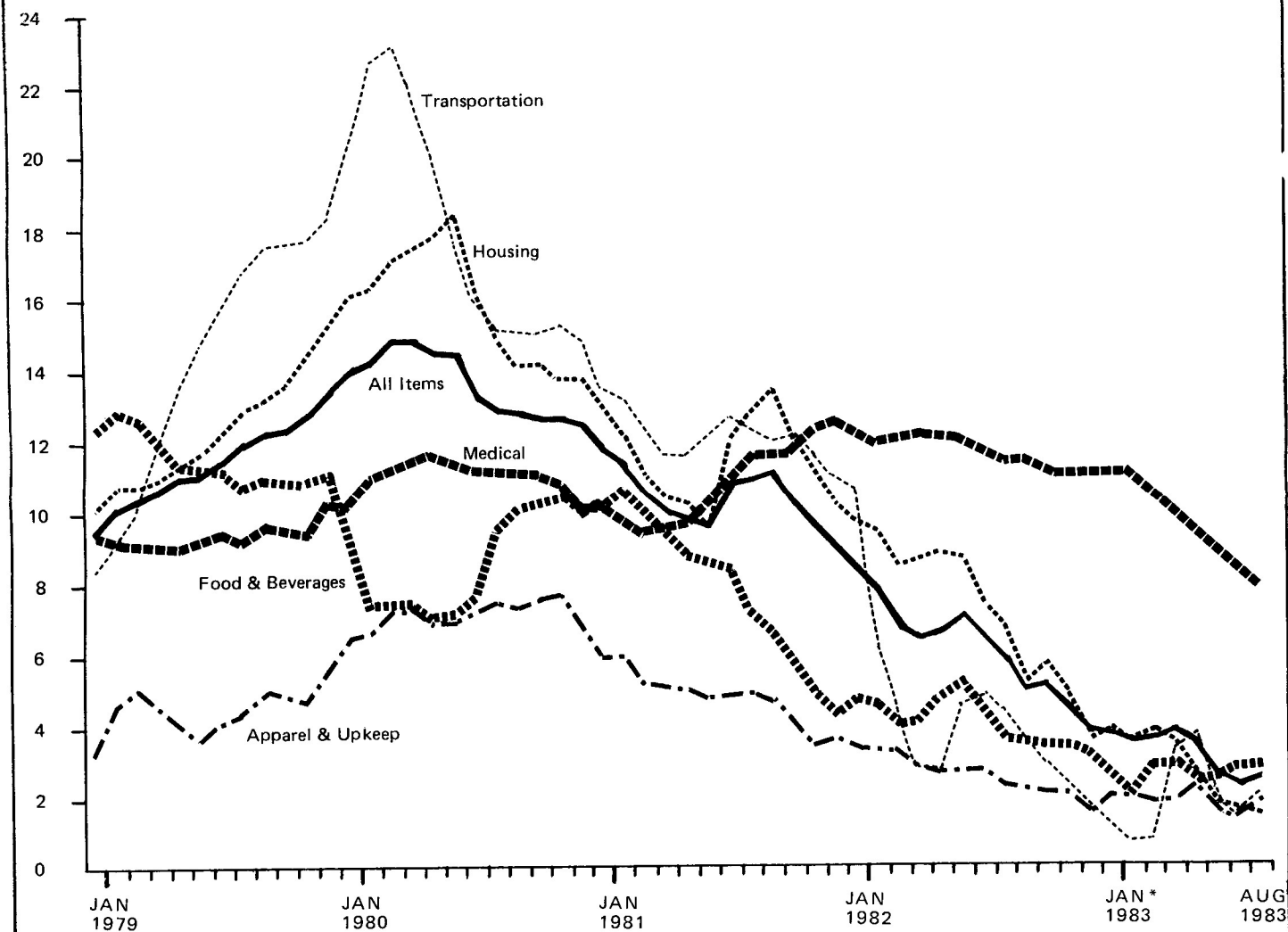
reaching peaks in 1980, increases in food prices were slowing down. During the last two years, however, the trend in food prices has more closely followed changes for the all items CPI-U. Medical costs have increased at about the same rate over the five-year period and show little relationship to the overall index.

Apparel and upkeep prices have followed the trend of the all items price increases during the whole period. The increases were much smaller, though, remaining below any other component, nearly all of the period.

COMPONENT CONTRIBUTIONS TO INFLATION

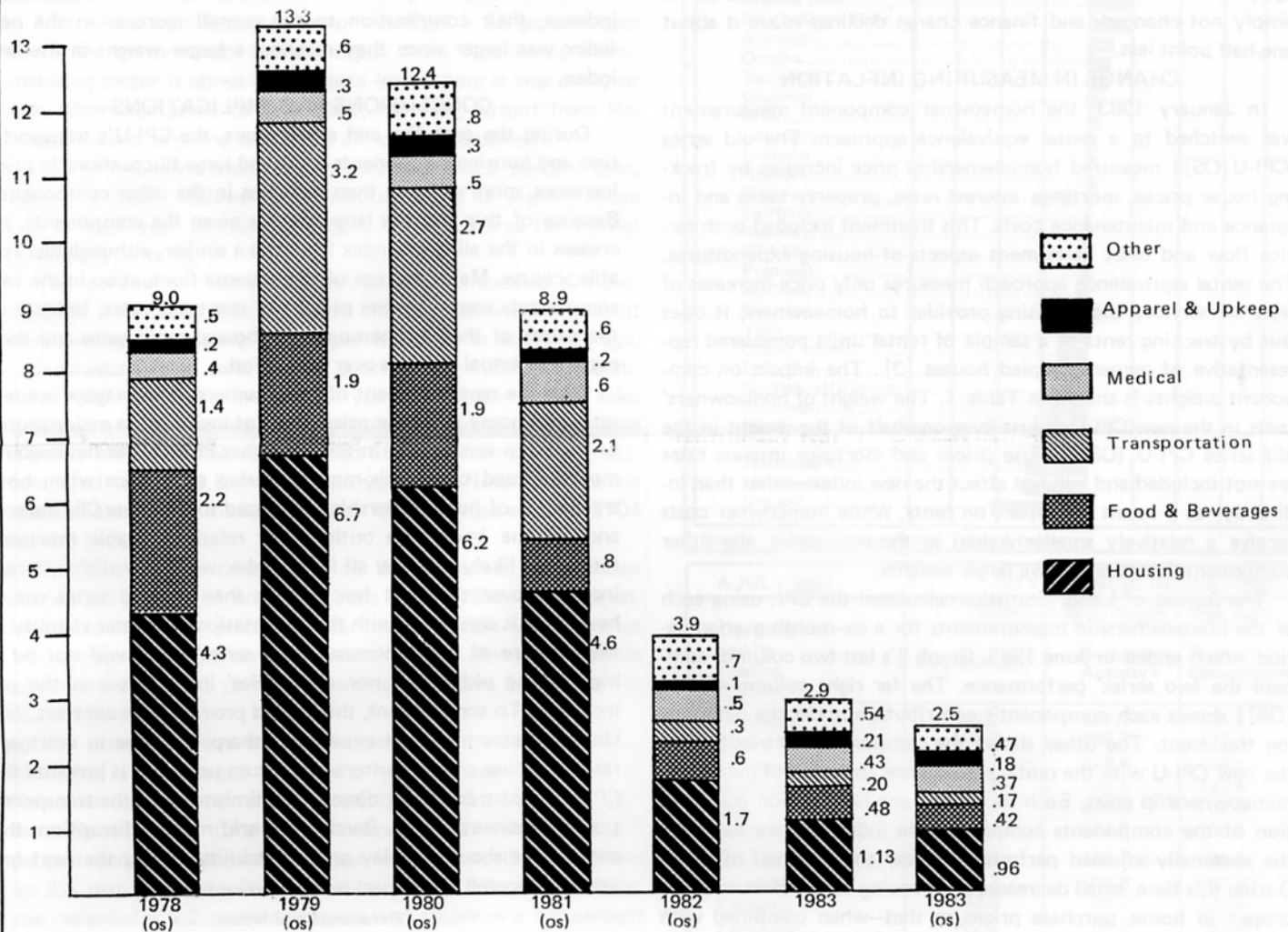
Because the 'all items' CPI index is comprised of components, its movement depends both on the price increases for each component, as well as the relative weights given each when calculating the index. The same is true of the movement of each component, which is, in turn, made up of subcomponents (e.g., transportation comprised of new car, used car, gasoline maintenance, and public transportation prices, each having a different weight). Graph 2 combines relative weights shown in Table 1, with price change

GRAPH 1
TWELVE-MONTH CHANGES IN CPI-U COMPONENTS (PERCENT)



*CPI-U with rental equivalence measure of homeownership after December 1982.

GRAPH 2
COMPONENT CONTRIBUTION TO THE INCREASE IN THE ALL ITEMS CONSUMER PRICE INDEX (CPI-U)



(Continued from page 2)
information shown in Graph 1 to show component contributions to the increase in the overall price level.

Price movements for the housing component were given 38 percent of the weight (Table 1) in calculating the all items CPI-U (OS). Food and beverage received just over 20 percent, as did transportation. Each of the others received about 5 percent (entertainment is combined with 'other goods and services').

Transportation costs increased 18 percent in 1979, and housing costs increased 15 percent. Because of the difference in weighting, however, transportation contributed 3.2 percentage points to the 13.3 percent increase in the all items index, whereas housing was responsible for half of the overall increase, contributing 6.7 percentage points. Gasoline hikes were responsible for more than two of the transportation percentage points. For the housing component, finance costs (actually finance, taxes, and insurance) contributed more than two and one-half points, home purchase more than one and one-half points, and all other housing subcomponents [2] the rest. The pattern of price increases in 1980 was a virtual repeat of the 1979 record, although

hikes in car prices (both new and used) contributed relatively more and gasoline somewhat less than in the previous year.

Price increases were less in 1981, but their pattern was again similar to the two previous years. By 1981, gasoline price increases were responsible for only one-half of a percentage point contribution to the overall 8.9 percent increase in the all items index. However, the transportation component still contributed 2.1 percentage points, due to price increases in the other subcomponents (car price increases made up about one-half of the transportation increase after accounting for gasoline). The housing component was responsible for more than half of the overall increase, with finance, insurance, and tax increases contributing more than 2 points.

The inflation experience in 1982 represented a dramatic departure from the previous three years—both in overall level and also in relative contribution. While gasoline price increases had boosted the transportation component and finance costs moved the housing component, these two subcomponents showed actual price decreases in 1982. These declines offset the contribution of

(Continued on page 6)

Review and Outlook

Nebraska's net physical volume index improved 1.1 percent in July 1983, compared with the previous month. The increase was led by the nonagriculture sector which recorded a 2.8 percent increase on a month-to-month basis.

The agriculture component of Nebraska's economy recorded a 9.5 percent decrease, according to the Bureau of Business Research's net physical volume index. July's cash farm marketings totaled \$368 million in Nebraska, down \$88 million from July 1982. On a seasonally-adjusted basis, Nebraska cash farm marketings were down \$185 million, when compared with

June of 1983. Nebraska cash farm marketings have followed a national trend. The July 1983 marketings nationally were the lowest since February 1978.

Prices received by Nebraska agriculture producers improved 1.3 percent on a month-to-month seasonally-adjusted basis. When compared with one year previous, agriculture prices were down 3.2 percent.

All sectors of Nebraska's nonagriculture economy improved in July. Construction recorded a 4.1 percent gain on a month-to-month basis. Nebraska's construction industry has gained steadily since February 1983. (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 | | | | |
|------------------------------|--|-------|---|-------|
| JULY 1983 | Current Month as Percent of Same Month Previous Year | | 1983 Year to Date as Percent of 1982 Year to Date | |
| | Nebraska | U.S. | Nebraska | U.S. |
| Indicator | Nebraska | U.S. | Nebraska | U.S. |
| Dollar Volume | 103.6 | 105.8 | 101.8 | 104.4 |
| Agricultural | 87.4 | 71.0 | 94.5 | 96.0 |
| Nonagricultural | 105.9 | 106.8 | 102.9 | 104.6 |
| Construction | 130.5 | 116.0 | 109.6 | 110.2 |
| Manufacturing | 99.4 | 102.5 | 91.0 | 95.7 |
| Distributive | 105.8 | 108.0 | 105.0 | 107.4 |
| Government | 108.5 | 105.9 | 107.8 | 106.8 |
| Physical Volume | 100.9 | 103.2 | 98.5 | 101.0 |
| Agricultural | 90.3 | 74.3 | 95.9 | 97.5 |
| Nonagricultural | 102.6 | 104.1 | 99.0 | 101.1 |
| Construction | 127.4 | 113.2 | 107.7 | 108.3 |
| Manufacturing | 98.7 | 101.6 | 90.0 | 95.0 |
| Distributive | 103.3 | 105.4 | 101.6 | 104.0 |
| Government | 100.5 | 101.0 | 99.4 | 99.4 |

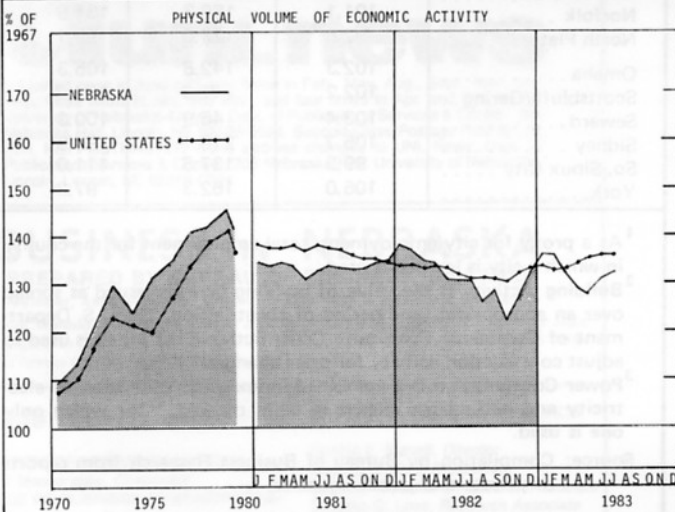
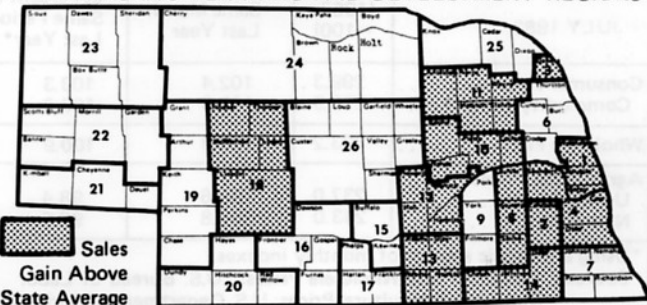
| 2. CHANGE FROM 1967 | | |
|---------------------|-------------------------|-------|
| Indicator | Percent of 1967 Average | |
| | Nebraska | U.S. |
| Dollar Volume | 371.3 | 385.6 |
| Agricultural | 295.8 | 225.9 |
| Nonagricultural | 382.5 | 390.8 |
| Construction | 276.1 | 356.4 |
| Manufacturing | 317.7 | 297.5 |
| Distributive | 413.1 | 443.8 |
| Government | 401.5 | 399.6 |
| Physical Volume | 132.0 | 136.3 |
| Agricultural | 121.7 | 95.3 |
| Nonagricultural | 133.5 | 137.7 |
| Construction | 81.7 | 105.5 |
| Manufacturing | 131.2 | 119.9 |
| Distributive | 138.0 | 148.3 |
| Government | 144.1 | 147.2 |

3. NET TAXABLE RETAIL SALES OF NEBRASKA REGIONS AND CITIES

| Region Number and City | Sales in Region* | | |
|------------------------|--|-----------------------------------|---|
| | City Sales* July 1983 as percent of July 1982 | July 1983 as percent of July 1982 | year-to-date '83 as percent of year-to-date '82 |
| <i>The State</i> | 95.0 | 96.9 | 102.8 |
| 1 Omaha | 101.2 | 103.0 | 105.0 |
| Bellevue | 97.8 | | |
| Blair | 87.8 | | |
| 2 Lincoln | 98.3 | 99.0 | 105.7 |
| 3 So. Sioux City | 107.9 | 110.6 | 104.5 |
| 4 Nebraska City | 90.9 | 91.7 | 103.1 |
| 6 Fremont | 94.2 | 94.8 | 102.0 |
| West Point | 97.1 | | |
| 7 Falls City | 95.8 | 91.7 | 101.0 |
| 8 Seward | 82.1 | 91.5 | 103.3 |
| 9 York | 84.0 | 89.8 | 101.1 |
| 10 Columbus | 89.9 | 93.1 | 103.9 |
| 11 Norfolk | 97.5 | 98.2 | 104.5 |
| Wayne | 94.7 | | |
| 12 Grand Island | 92.8 | 95.2 | 103.7 |
| 13 Hastings | 92.0 | 96.1 | 103.5 |
| 14 Beatrice | 92.0 | 96.5 | 105.7 |
| Fairbury | 103.4 | | |
| 15 Kearney | 95.7 | 94.9 | 101.9 |
| 16 Lexington | 96.8 | 94.9 | 100.5 |
| 17 Holdrege | 78.0 | 83.2 | 97.4 |
| 18 North Platte | 92.4 | 95.0 | 104.8 |
| 19 Ogallala | 92.1 | 92.6 | 98.8 |
| 20 McCook | 84.1 | 83.6 | 101.6 |
| 21 Sidney | 88.8 | 90.9 | 94.1 |
| Kimball | 86.6 | | |
| 22 Scottsbluff/Gering | 93.7 | 92.6 | 98.6 |
| 23 Alliance | 85.8 | 90.2 | 101.1 |
| Chadron | 89.1 | | |
| 24 O'Neill | 90.9 | 95.8 | 96.8 |
| 25 Hartington | 76.2 | 88.0 | 101.2 |
| 26 Broken Bow | 92.6 | 93.9 | 102.1 |

*State totals include sales not allocated to cities or regions. The year-to-year ratios for city and region sales may be misleading because of changes in the portion of unallocated sales. Regional totals include, and city totals exclude, motor vehicle sales. Sales are those on which sales taxes are collected by retailers located in the state. Compiled from data provided by Nebraska Department of Revenue.

1983 YEAR TO DATE AS PERCENT OF 1982 YEAR TO DATE IN NEBRASKA'S PLANNING AND DEVELOPMENT REGIONS



(Continued from page 4) The Bureau of Business Research's index for construction in July 1983 was well above July 1982's reading, and almost identical to that recorded in 1981.

Nebraska's manufacturing sector recorded a 2.0 percent gain on a month-to-month basis. Output from Nebraska's manufacturing sector is about at the same level where it was one year ago. When compared to July 1981, however, output from Nebraska's manufacturing sector was off almost 20 percent.

The distributive trade sector recorded a 2.6 percent gain, June-July 1983. Nebraska's distributive trade is slightly above one or two year ago levels. Output from this area has moved up steadily since April 1983.

The government component of the index increased 4.0 percent on a month-to-month basis. The government component of the index is virtually unchanged from one or two years ago.

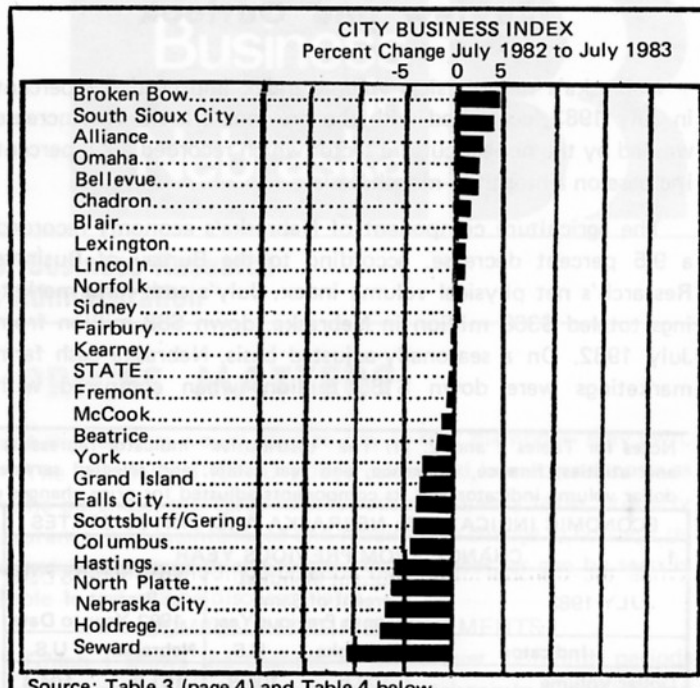
Nebraska's retail sales slipped a bit in July 1983, when compared with the same month one year ago. Motor vehicle sales recorded a strong increase, but nonmotor vehicle sales declined slightly. Motor vehicle sales totaled \$82.6 million in July 1983, compared with \$79.9 million one year ago. Nonmotor vehicle sales totaled \$668 million in July 1983, compared with \$704 million in July 1982.

The commodity component of the consumer price index was up 2.3 percent on an annual basis in July 1983. When adjustments are made for price changes, motor vehicle sales were up 14.0 percent (16.6 percent in current dollars). Nonmotor vehicle sales were down 7.1 percent in real terms (down 5.0 percent in current terms).

The economic recovery which appears to be taking hold in Nebraska is widespread across the state. Broken Bow led all Nebraska communities with its city business index up 4.1 percent. South Sioux City's city business index recorded a 3.8 percent increase. Across the state at Alliance, the index was up 2.4 percent, while Omaha's index was up 2.3 percent. Bellevue recorded a 2.2 percent increase and Chadron a 1.8 percent increase in their city business indexes.

Economic conditions are expected to slowly improve through mid-1984 in Nebraska. Personal income could increase as much as 3 to 5 percent in real terms during this interval.

D.E.P.



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> | 102.2 | 137.7 | 104.4 |
| Alliance | 103.9 | 505.7 | 152.2 |
| Beatrice | 102.7 | 123.4 | 100.4 |
| Bellevue | 102.5 | 186.6 | 122.4 |
| Blair | 105.2 | 305.2 | 102.0 |
| Broken Bow | 104.7 | 364.9 | 106.5 |
| Chadron | 100.6 | 448.7 | 81.0 |
| Columbus | 102.7 | 91.8 | 101.6 |
| Fairbury | 102.8 | 66.3 | 103.0 |
| Falls City | 102.2 | 64.2 | 90.0 |
| Fremont | 107.7 | 86.3 | 90.9* |
| Grand Island | 104.0 | 78.1 | 105.7 |
| Hastings | 97.8 | 81.4 | 95.1 |
| Holdrege | 106.5 | 102.1 | 101.3 |
| Kearney | 104.6 | 111.3 | 100.6 |
| Lexington | 105.0 | 121.9 | 76.1 |
| Lincoln | 98.9 | 185.5 | 100.8 |
| McCook | 110.4 | 152.3 | 98.9 |
| Nebraska City | 102.8 | 47.3 | 104.1 |
| Norfolk | 101.1 | 156.3 | 131.9 |
| North Platte | 92.5 | 123.0 | 99.1 |
| Omaha | 102.3 | 142.8 | 105.3 |
| Scottsbluff/Gering .. | 102.2 | 72.3 | 101.3 |
| Seward | 103.4 | 46.9 | 100.3 |
| Sidney | 105.7 | 215.1 | 94.9 |
| So. Sioux City | 99.5 | 137.6 | 111.0 |
| York | 105.0 | 162.3 | 97.3 |

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

² Building 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.

³ Power 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

| JULY 1983 | Index (1967 = 100) | Percent of Same Month Last Year | Year to Date as Percent of Same Period Last Year* |
|---------------------------|--------------------|---------------------------------|---|
| Consumer Prices | 299.3 | 102.4 | 103.3 |
| Commodity component | 272.5 | 102.3 | 103.0 |
| Wholesale Prices | 303.2 | 100.9 | 100.9 |
| Agricultural Prices | | | |
| United States | 237.0 | 95.6 | 98.4 |
| Nebraska | 243.0 | 96.8 | 98.5 |

*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 4)

the respective components and tempered the increase in the overall price level. Gasoline price declines made the index .4 percentage points less than what it would have been had gasoline prices simply not changed, and finance charge declines made it about one-half point less.

CHANGE IN MEASURING INFLATION

In January 1983, the homeowner component measurement was switched to a rental equivalence approach. The old series (CPI-U [OS]) measured homeownership price increases by tracking house prices, mortgage interest rates, property taxes and insurance and maintenance costs. This treatment included both service flow and asset investment aspects of housing expenditures. The rental equivalence approach measures only price increases of flow of services that housing provides to homeowners; it does this by tracking rents of a sample of rental units considered representative of owner-occupied houses [3]. The impact on component weights is shown in Table 1. The weight of homeowners' costs in the new CPI-U is just over one-half of the weight in the old series CPI-U (OS). House prices and mortgage interest rates are not included and will not affect the new index—other than indirectly—as a result of impact on rents. While homeowner costs receive a relatively smaller weight in the new series, the other components necessarily have larger weights.

The Bureau of Labor Statistics calculated the CPI, using each of the homeownership measurements for a six-month overlap period which ended in June 1983. Graph 2's last two columns compare the two series' performance. The far right column (CPI-U [OS]) shows each component's contribution under the old housing treatment. The other shows the component contribution to the new CPI-U with the rental equivalence approach of measuring homeownership costs. Each shows the annual inflation contribution of the components comprising the index and are based on the seasonally-adjusted performance over the first half of 1983. During this time, small decreases in financing costs offset small increases in house purchase prices so that—when combined with other housing subcomponents—net housing contribution was less than one percentage point added to the all items increase in the CPI-U (OS).

The price level of the homeownership subcomponent of housing in the new CPI-U showed seasonally-adjusted annual gains during the first half of 1983 that were about twice as large as those of the corresponding subcomponent in the old series.

Because of the smaller weight, these price increases — combined with other housing subcomponents — added 1.13 percentage points to the new index. Although the price changes for each of the nonhousing components were the same in the old and new indexes, their contribution to the overall increase in the new index was larger since they received a larger weight in the new index.

CONCLUSIONS AND IMPLICATIONS

During the past five and a half years, the CPI-U's transportation and housing components displayed large fluctuations in price increases, more extreme than increases in the other components. Because of this and the large weights given the components, increases in the all items index followed a similar, although less volatile, course. Major sources of the extreme fluctuation in the two components were gasoline prices and mortgage rates. Indexes of the prices of these subcomponents showed rapid gains and then registered actual declines over the period.

With the new treatment of homeownership (mortgage interest rates and home purchase prices are not included), a major source of the steep fluctuation in the Consumer Price Index has been removed. Based on the six-month overlap experience when both treatments of homeownership were used to calculate CPI indexes and on the immediate outlook for relatively stable mortgage rates, it is likely the new all items index will show slightly larger increases over the next few months than the old series would have. This is consistent with the expectation of greater stability in the measure of price increases—new series' highs will not be as high as the old series, nor new series' lows as low as the old increases. To some extent, this should provide little comfort. The United States may still experience sharp increases in mortgage rates or house prices during some future period; it is just that the CPI will not track them directly. Optimism about the transportation component is real. Barring a world market disruption, this component should display greater stability during the next few years, compared to the past record shown here.

References and Notes

1. Energy Information Administration, U. S. Department of Energy, *Monthly Energy Review* (Washington, D. C.: GPO, August 1980), p. 72.
2. Maintenance and repairs, fuel and other utilities, household furnishing and operations.
3. For a more detailed discussion of this change, see R. Gillingham and W. Lane, 'Changing the Treatment of Homeownership in the CPI,' *Monthly Labor Review* 105, No. 6 (June 1982), p. 9.

D. O. L.

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