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ALASKA ECONOMIC GROWTH, 1961-1972

Introduction

Even the most casual observation makes it apparent that the Alaska economy has grown vigorously since statehood. The precise dimensions of this growth are, however, quite difficult to specify because of the scarcity of relevant data and because economic growth is too complex a process to describe with a single summary statistic. To deal with the difficulty, this review presents several varied measures of economic activity and uses them to put together a comprehensive picture of Alaska economic growth over the period 1961 to 1972. Further, it puts this growth in perspective by comparing it with U.S. growth over the same period.

After discussing the general measures of economic growth, this study goes on to examine in greater detail the pattern of economic growth in Alaska. It uses estimates of production in the major industrial sectors to identify the sources of growth since 1961. Particular attention is given to the distinction between industries whose outputs are determined by outside forces and industries whose growth is tied to the Alaska economy. This latter sector includes trade, finance, services, and similar industries that support economic development.

The growth of this support sector is shown to be closely linked to personal income in Alaska. Finally, the role of price movements is examined in terms of their effects on the development of the Alaska economy.

* * *

A summary of findings precedes each major section in this article. Read in sequence, these summaries will give the reader a comprehensive outline of study results.

Summary Measures of Economic Growth

Summary

On the basis of the data presented in Figure 1, the economic development process in Alaska since 1961 can be summarized as follows:

- Production of goods and services in Alaska has grown rapidly. This holds whether output is valued at current market prices or constant prices.
- Personal income has grown along with production, but the rapid growth in population has held down the rate of increase in per capita personal income.
- Price movements have played an important role in the development process, with output prices increasing rapidly and consumer prices increasing slowly in Alaska.

See the April 1974 issue of the Review, "Estimated Gross State Product for Alaska," for definitions of "gross state product" and "price deflators," explanations of how they were derived, and detailed procedures for estimating gross state product by industry.

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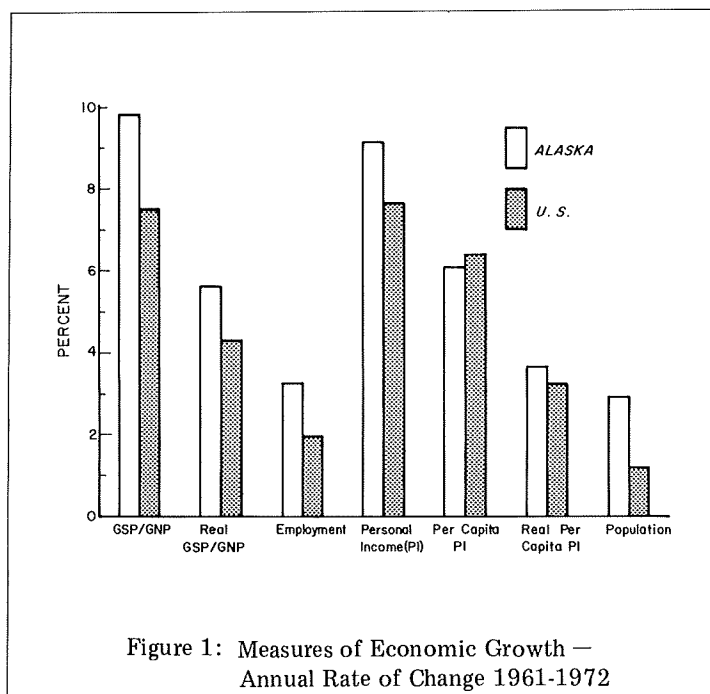
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The complex process of economic growth is inherently multi-dimensional. There is no single measure of economic growth adequate for all purposes, either in principle or in practice. The relevance of any particular measure is determined by the interests of the observer and the nature of the questions being asked. In general, several different measures are required to give even the most cursory summary of economic growth.

Figure 1 (and the various text tables) offers a selected set of summary measures of economic growth in Alaska. The information is offered with the understanding that it is indeed a summary and, for many purposes, would need to be augmented with considerably more detailed data. On the other hand, for some purposes, just two or three of the measures may be sufficient.



The data cover the period 1961 to 1972. The most recent year for which complete data are available is 1972; 1961 is the earliest year for which comparable information can be constructed. Figure 1 shows the average annual rate of change over the period 1961 to 1972 for each of the measures. Comparable information for the U.S. as a whole is also given. The average annual rate of change is a rough estimate of the long-run or trend growth rate over the period. In most cases, there are individual years in which the annual rate of change deviates substantially from the trend rate.

Gross state product (GSP) in Alaska increased at an average annual rate of 9.8 percent between 1961 and 1972.¹ GSP measures the current market value of all goods and services produced within the Alaska economy. As such, GSP is probably the single most comprehensive measure of economic activity. However, because GSP is so comprehensive, it represents the net effect of many separate, and possibly divergent, growth trends. For example, an increase in GSP may be due to an increase in the production of real goods and services, or it may simply represent an increase in prices. It is even possible for a decline in production to be more than offset by a rise in prices so that GSP increases while production is falling.

To distinguish changes in production levels from changes in prices, a price index is constructed for each major industrial sector in Alaska. These price indexes are then used to adjust the gross product estimates to eliminate the effects of price changes.² The result is an estimate of gross state product in which output is valued at constant prices rather than at current market prices. To be consistent with the national economic accounts, Alaska GSP is valued at 1958 prices. The prices used are average 1958 prices for the U.S. as a whole. Thus, by valuing GSP at constant 1958 U.S. prices, the effects of price changes are eliminated and the estimated constant dollar Alaska GSP is directly comparable to constant

¹The complete set of gross state product data appears in David T. Kresge and Monica E. Thomas, "Alaska Gross Product Estimates," *Alaska Review of Business and Economic Conditions*, Vol. XI, No. 1, Fairbanks: Institute of Social, Economic and Government Research, University of Alaska, 1974.

²A more complete description of the price adjustment process is given in Kresge and Thomas, "Alaska Gross Product Estimates."

dollar U.S. gross product. For convenience, the estimate of gross product at constant prices is often referred to as "real gross product."

As shown in figure 1, real GSP in Alaska grew at an annual rate of 5.7 percent between 1961 and 1972. The difference between the growth in GSP and the growth in real GSP was due to the increase in prices of 3.9 percent per year. Whether measured in current or constant prices, Alaska gross product has been growing more rapidly than the national economy. The U.S. gross national product (GNP) grew at 7.5 percent a year and real GNP grew at 4.3 percent a year.

Employment in the Alaska economy increased at 3.3 percent a year and at 2.0 percent in the U.S. In both cases, real gross product grew more rapidly than employment because of the rise in labor productivity; that is, in the average output produced by each worker. The implied gain in productivity was roughly 2.3 percent a year both in Alaska and in the U.S.

Underlying Factors

The factors underlying the growth in gross product can be summarized as shown in table 1. The increase in gross product is split into the three components discussed above: (1) increases in prices received by producers, (2) productivity gains, and (3) increases in the number of persons employed. In Alaska, the largest single component of growth was the increase in prices. This accounted for about 40 percent of the total increase in GSP. The 3.3 percent rate of increase in employment accounted for roughly one-third of the gain in GSP. In contrast, employment in the U.S. grew at 2.0 percent and accounted for only one-fourth of the growth in GNP. The relatively rapid growth in employment in Alaska is to be expected in a region experiencing accelerated economic development. The expansion in employment opportunities induced a substantial immigration of workers from other parts of the country.

Growth in Personal Income

As output and employment expanded, there was an accompanying growth in the personal income received by Alaskans. Between 1961 and 1972, personal income in Alaska grew at an annual rate of 9.3 percent, compared to 7.6 for the U.S. As new workers moved to Alaska, the population grew by 2.9 percent a year,

Table 1
COMPONENTS OF GROWTH IN GROSS PRODUCT
Annual Rate of Change, 1961-1972
(percent)

	Alaska	U.S.
Gross Product	9.8	7.5
Price of Output	3.9	3.1
Output per worker	2.3	2.3
Employment	3.3	2.0

which held the increase in per capita personal income to just 6.2 percent a year. Population increased so rapidly that per capita personal income in Alaska actually grew less rapidly than in the rest of the U.S. (see figure 1). However, taking into account changes in the cost of living, the real (price adjusted) per capita personal income grew at 3.6 percent a year in Alaska as compared with 3.2 percent for the U.S. This reflects the fact that, although prices in Alaska were and still are much higher than in the rest of the U.S., they have been increasing less rapidly.

It should be pointed out that the prices used in adjusting personal income are not the same ones used in the discussion of gross product. In computing real personal income, the prices used are those paid by consumers in Alaska, while in computing real gross product, the prices used are those received by producers in Alaska. Obviously the two sets of prices are quite different and may move in different ways.

Growth in the Major Industrial Areas

Summary

The industrial pattern of economic development in Alaska from 1961 to 1972 can be summarized as follows:

- The major source of sustained growth in Alaska has been the support industries: transportation, communication, public utilities, trade, finance, and services. This sector accounted for 40 to 55 percent of the increase in output and employment. The trade, finance, and service industries grew particularly rapidly and generated most of the growth in the support sector.
- State and local government also expanded rapidly and added significantly to the level of employment in Alaska.

Summary (continued)

- Mining, which consists almost entirely of petroleum, expanded its real output dramatically, but due to the nature of the industry, its direct impact on income and employment was quite limited.
- Real output and employment in the federal government sector declined because of reductions in military personnel. Increases in wage rates caused a moderate increase in current price output.
- Fisheries and forest products showed almost no growth in real output but there were modest gains in wage employment and wage income generated.

Industrial Output Valued at Current Prices

As shown in figure 2,³ all of the major industrial sectors in Alaska grew between 1961 and 1972, but there was wide variation in the sectoral growth rates (see table 2 also). The mining industry grew explosively due to the development of the Cook Inlet oil field and the exploration on the North Slope. Mining gross product rose from \$37 million in 1961 to a peak of \$334 million in 1969. Nonetheless, the mining sector accounted for only 12 percent of the increase in Alaska GSP between 1961 and 1972, and mining was just 9 percent of total GSP in 1972. Thus, although oil development was an important force underlying the growth in the Alaska economy, the growth in the petroleum industry itself was not a major component of the economic expansion. Rather, it was the indirect effects of oil exploration and the revenues generated by oil production which promoted the growth in other industries.

Much of the recent growth in Alaska economic activity has centered in the so-called "support sector." As the name indicates, the industries in this sector provide the facilities and services required to support economic development. The major support industries are transportation, communication, public utilities, trade, finance, and services. Of these, trade is the largest industry, making up about 31 percent of the support sector. Between 1961 and 1972, the support sector grew at 10

percent a year (see table 2) and accounted for nearly 40 percent of the total growth in Alaska GSP. Trade, finance, and services grew quite rapidly, and they alone generated 30 percent of the increase in GSP.

Another major source of growth was state and local government. Because of its extremely rapid expansion, the state and local government sector generated 16 percent of the increase in GSP. In contrast, the federal government grew quite slowly and contributed relatively little to the expansion of the Alaska economy. At the start of the period, the federal government sector in Alaska was about four and one-half times as large as state and local government; despite this, the federal sector accounted for a slightly smaller fraction of total growth than did state and local government.

Taken as a group, the commodity-producing industries (excluding mining) grew slowly. This was attributable to the very limited growth in the fisheries and

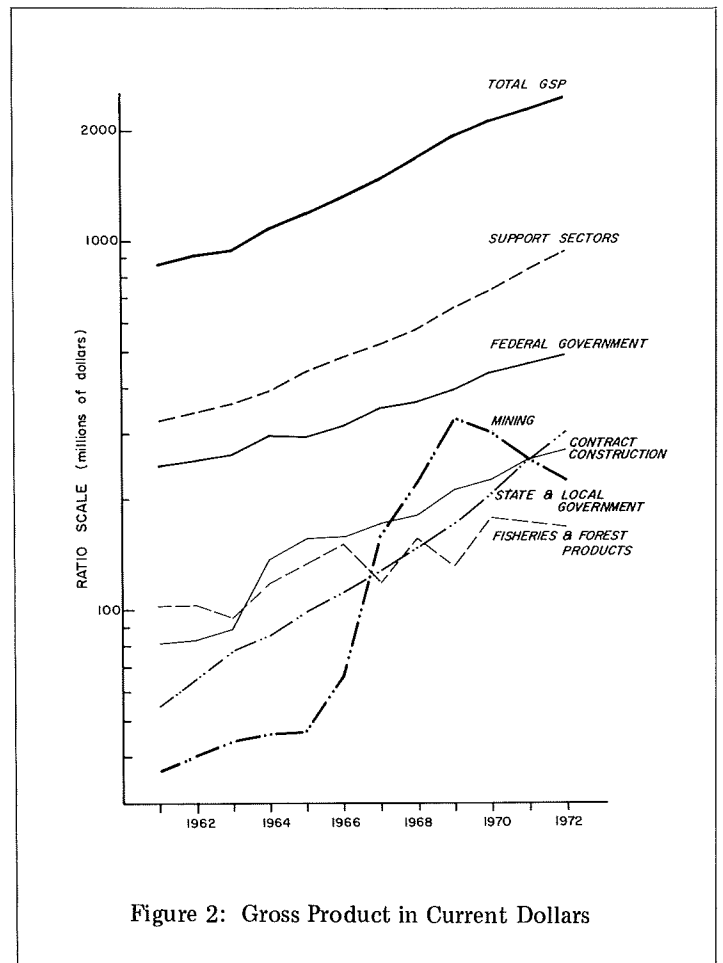


Figure 2: Gross Product in Current Dollars

³Figure 2 is plotted using a ratio scale. With this scale, the slope of each line in the figure represents the growth rate for the pertinent industrial sector; the steeper the slope, the more rapid the growth rate.

forest products industries (see table 2). The fisheries industry in particular, including both commercial fishing and fish processing, increased only slightly between 1961 and 1972. Furthermore, as illustrated in figure 2, the year-to-year fluctuations in the size of catch introduced substantial variations in the output of Alaska's renewable resource-based industries. Some of the variation was also attributable to the policies and world market conditions governing the output of the forest products industry.

Contract construction, the other major commodity-producing industry, has grown quite rapidly, although much of its growth came in a spurt following the 1964 earthquake (see figure 2). The growth in the years since 1964 has been at a more modest pace than the rate for the 1961 and 1972 period as a whole. The construction industry has nonetheless played an important role in Alaska's economic expansion and has directly accounted for more than 12 percent of the increase in GSP. In fact, between 1961 and 1972 the increase in gross product in contract construction slightly exceeded that in mining.

The discussion to this point has been in terms of industrial output as valued at current market prices. This means that the observed growth in output in a sector may have been generated by an increase in price or it may have been due to an increase in real (physical) production. Of course, it may also have been due to a combination of both factors.

Industrial output valued at current market prices is perhaps most accurately viewed as a measure of the income generated by production in Alaska. The gross product estimates used here measure the amount of value which is *added* by the production carried out in Alaska. For each industry, the cost of materials purchased from other industries have been deducted from the value of final sales. The resulting "value-added" estimate is necessarily equivalent to the total income generated by the industry. In fact, an alternative method for estimating an industry's gross product is to add together all the income payments made by the industry. It should be noted that the income payments are those generated by production in Alaska, but they are not necessarily payments made to residents of Alaska. For example, the profits earned by many firms, particularly those in the oil industry, are components of Alaska gross product, but the bulk of this profit income goes outside the state.

Table 2
GROSS PRODUCT IN SELECTED INDUSTRIAL SECTORS
Average Annual Growth Rate 1961-1972
(Percent)

	Current Price Gross Product	Real Gross Product
All Industries	9.8	5.7
All Industries Except Mining	9.3	4.2
Commodity Producing Industries	10.5	7.8
Mining	17.8	17.6
Commodity Producing Industries Except Mining	8.3	2.4
Contract Construction	11.5	5.6
Fisheries and Forest Products	4.5	0.4
Other Manufacturing	11.2	7.3
Support Sector	10.0	7.4
Transportation, Communications, and Public Utilities	7.4	6.3
Trade, Finance, and Services	11.3	8.2
Government	9.1	1.4
Federal	6.4	-0.5
State and Local	16.6	9.7

Real Industrial Output

When output was adjusted to eliminate the effects of price changes, the pattern of industrial growth for the period 1961-72 was as shown in figure 3. Both the level and the rate of increase for real gross product were, of course, lower than for current gross product. In addition, there were some significant differences in the pattern of development. The federal government sector, for example, actually showed a decline in real output over the period. This reflects a drop in the number of military personnel in Alaska and an essentially constant level of federal civilian employment. Thus, the observed increase in current dollar output of the federal government was due entirely to an increase in the average wages paid to federal employees. In fact, the increase in federal wage rates was large enough to more than offset the decline in real output.

The real output of the fisheries and forest products industry has fluctuated erratically, but in general, has

shown no sustained growth since 1961. The output of forest products has increased but commercial fishing has declined. On balance, Alaska's renewable resource industries have made no net contribution to the real growth of the economy.

The outstanding growth sector, as clearly illustrated in figure 3, was mining (petroleum). Real gross product rose from \$37 million in 1961 to a peak of \$363 million in 1969. The mining industry produced only 5 percent of the total Alaska output in 1961, but it ac-

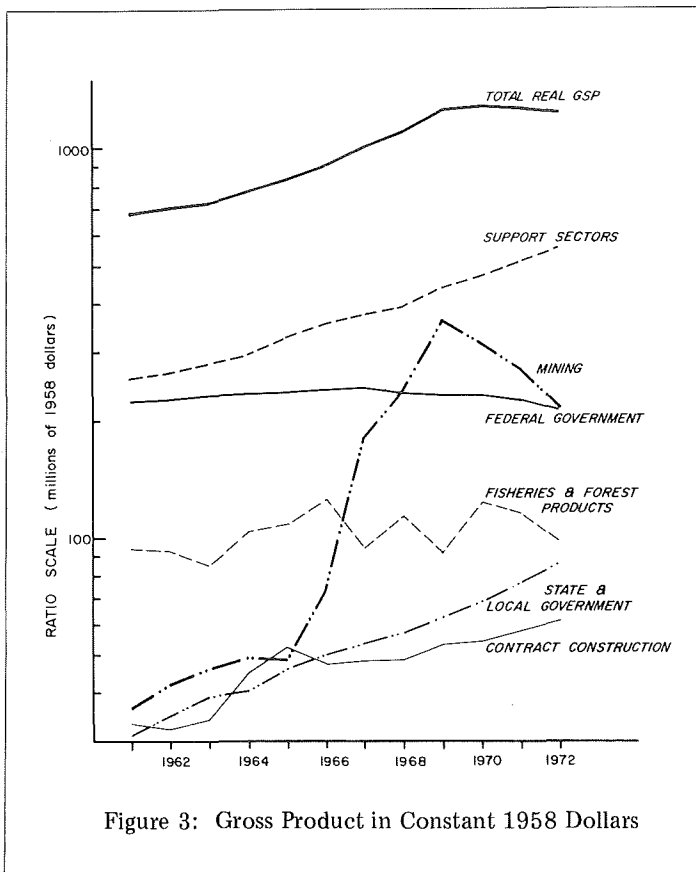


Figure 3: Gross Product in Constant 1958 Dollars

counted for one-third of the increase in real GSP between 1961 and 1972.

The support sector also showed strong growth, but unlike mining, its growth was sustained throughout the period. Between 1961 and 1972, the support sector grew at an average annual rate of 7.4 percent (see table 2), and it accounted for more than half of the real growth in the Alaska economy. The trade, finance, and service industries grew quite rapidly; these three industries contributed over a third of the increase in real GSP.

Although much smaller than the support sector, state and local government also showed a strong, sustained expansion in output. Apart from mining, state and local government had the most rapid growth in output of any major sector of the economy (see table 2). State and local government contributed about 10 percent of the increase in total real GSP between 1961 and 1972.

The remaining industrial sector, contract construction, increased output substantially over the period as a whole, but its rate of expansion was quite erratic. Following the 1964 earthquake, real output shot up from \$34 million in 1963 to \$53 million in 1965. Real output then declined to about \$48 million in 1966 and remained at that level until the acceleration in North Slope oil activity started in 1969. Since that time, contract construction has expanded output at about 6 percent a year.

Employment

The number of persons employed in an economy is generally quite closely linked to the level of real output since an increase in production usually requires that additional workers be hired. This relationship will tend to be particularly close over long periods of time and in an economy with a broad industrial base. Employment will, however, grow more slowly than real output since part of the increase in production is attributable to gains in productivity (average real output per worker).

In the Alaska economy, however, the relationship between employment and real output is quite variable, particularly in the short-run. This occurs primarily because the Alaska economy is not broadly based but is instead dominated by a small number of distinct industries. As these industries grow at different rates, there will be changes in the aggregate relationship between employment and output.

In addition, the production process in one of the most important industries, petroleum, requires very few workers. An enormous increase in the production of oil may generate only a slight increase in the demand for labor. As shown in figure 4 and table 3, employment in mining follows the same pattern as real output in mining, but the level of employment is very low. Even during the peak year of 1969, only 3,400 workers were

employed in mining; that was just 2.6 percent of total employment. Mining accounted for even less (2.2 percent) of the growth in employment between 1961 and 1972. In contrast, the real output of mining was 29 percent of Alaska GSP in 1969, and mining accounted for 32 percent of the growth in real GSP from 1961 to 1972.

The major source of growth in employment was the support sector, especially the trade, finance, and service industries. Those three industries provided nearly half of the total increase in employment, and the support sector as a whole generated 55 percent of the total gain in employment. Several of the important support industries are inherently quite limited with respect to increases in labor productivity. Therefore, the strong demand in recent years for the output of the support sec-

tor could be met only by increasing employment. By 1972, employment in the support sector had risen to 45 thousand, slightly exceeding employment in federal government, the next largest sector.

State and local government was another rapidly growing sector which had to expand employment in order to provide the services being demanded. Because of the way in which government output is measured, the productivity of government workers is implicitly assumed to remain constant.⁴ Therefore, employment must increase at the same pace as real output in the government sector. With real output increasing at nearly 10 percent a year, employment in state and local government rose from 8 thousand in 1961 to 23 thousand in 1972. That increase of 15 thousand employees accounted for over a third of the increase in total employment in Alaska.

Although the fisheries and forest products sector was not a major source of growth, the employment figures are of interest because they followed a different pattern from real output in the industry. In particular, the sharp fluctuations in real output were not reflected in the employment numbers (see figures 3 and 4). Figure 4 shows that additional workers were drawn into the industry during peak fishing years such as 1966 and 1970, and those workers remained in the industry even when output declined in subsequent years. Employment rose to 5,700 in the peak year of 1966 and then stayed at that level through 1969 even though real output was 27 percent lower in 1969 than in 1966. Then, 1970 was another strong year and employment increased to 6,500. It remained at that level through 1972 while real output dropped by 21 percent. Thus, in the renewable resource industry as a whole, the output per worker has been declining and the income generated has been spread among a larger number of employees.

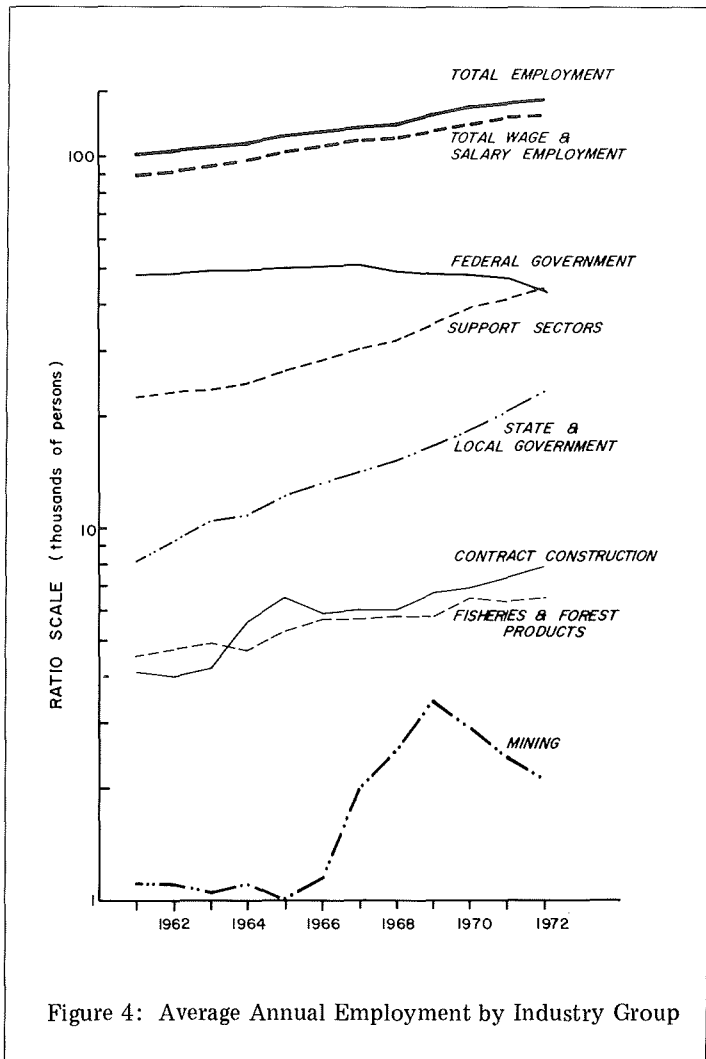


Figure 4: Average Annual Employment by Industry Group

⁴There is no direct measure of output in the government sector. The conceptual difficulties involved in defining and measuring the "output" of government have proved insurmountable. Instead, government output is simply defined as being equal to the compensation of government employees. The price deflator for the government sector is then based on the average wage rate for government employees. Real output is estimated by dividing government output in current prices (employee compensation) by the price deflator (average wage rate). This procedure guarantees that, with only minor deviations, real output and employment in government must follow the same pattern.

Table 3
EMPLOYMENT BY INDUSTRY GROUP
Annual Average Employment

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
Total Employment	100.2	102.5	106.0	109.0	115.1	117.6	121.7	123.6	130.8	136.4	140.7	144.0
Nonwage and Salary Employment	10.9 ^a	10.8 ^a	11.0 ^a	11.3 ^a	11.6 ^a	11.2 ^a	11.2 ^a	11.2 ^a	11.9 ^a	12.5 ^a	13.0 ^a	13.4 ^b
Total Wage and Salary Employment	89.3 ^a	91.7 ^a	95.0	97.8	103.5	106.4	110.5	112.4	118.9	123.9	127.7	130.6
Wage and Salary Employment												
All Industries	89.3 ^a	91.7 ^a	95.0	97.8	103.5	106.4	110.5	112.4	118.9	123.9	127.7	130.6
<u>Commodity Producing Industries</u>	10.6	10.9	11.3	12.6	14.0	14.1	14.8	15.5	17.4	17.9	17.8	18.9
Mining	1.2	1.2	1.2	1.1	1.1	1.4	2.0	2.5	3.5	3.0	2.4	2.1
Commodity Producing Industries Except Mining	9.4	9.7	10.1	11.5	12.9	12.7	12.8	13.0	13.9	14.9	15.4	16.8
Contract Construction	4.1	4.0	4.3	5.8	6.5	5.9	6.0	6.0	6.7	6.9	7.4	7.9
Fisheries and Forest Products	4.5	4.9	5.0	4.8	5.4	5.9	5.8	5.9	5.9	6.7	6.6	7.4
Other Manufacturing	.8 ^a	.8 ^a	.8	.9	1.0	.9	1.0	1.1	1.3	1.3	1.4	1.5
<u>Support Sector</u>	21.9	22.9	23.8	24.6	27.0	28.3	30.3	32.1	35.9	39.0	41.7	44.8
Transportation, Communications, and Public Utilities	7.1	7.0	6.9	6.9	7.3	7.3	7.5	7.8	8.8	9.1	9.8	10.0
Trade, Finance, and Services	14.8	15.9	16.9	17.7	19.7	21.0	22.8	24.3	27.1	29.9	31.9	34.8
<u>Government</u>	56.3	58.0	60.0	60.5	62.7	64.1	65.5	64.8	65.6	66.9	68.1	66.9
Federal	48.1	48.7	49.6	49.7	50.4	50.7	51.1	49.5	48.8	48.5	47.3	43.6
State and Local	8.2 ^a	9.3 ^a	10.5	10.8	12.2	13.4	14.4	15.3	16.9	18.4	20.7	23.3

^aTaken from Alaska Department of Economic Development, Division of Economic Enterprise, Statistical Review, December 1972.

^bTaken from National Bank of Alaska, A Performance Report of the Alaskan Economy, 1973.

Source (except as otherwise indicated): Alaska Department of Labor, Statistical Quarterly, various issues.

Personal Income and Industrial Activity in Alaska

Summary

- The support sector has expanded in response to the demand generated by increases in real personal income. In general, a \$100 increase in real personal income in Alaska has produced a \$60 increase in support sector real gross product.
- State and local government also seems to have been responsive to change in real personal income. The real output of state and local government services increased by \$10 in response to a \$100 increase in real personal income.

- The commodity producing industries and the federal government were not significantly influenced by income in Alaska. The output in these sectors was determined by autonomous forces and outside policies.

In any economic system, personal income is both a cause and an effect of economic activity. The production process requires the employment of labor, capital, and other factors of production. These factors must then be paid for their services. Thus, production generates personal income in the form of such things as wages, dividends, interest, and rent. Looked at in this way, personal income is an *effect* of economic activity. On the other hand, an increase in personal income will in-

crease the demand for certain types of goods and services. This will induce an increase in the production of those goods and services, and in this case, personal income is a *cause* of economic activity.

In Alaska, the output of the support sector seems to have been very closely related to the level of personal income. This relationship is particularly important because, as was shown above, the support industries have been the major growth sector in Alaska since 1961. Figure 5 has been plotted to show how the real output in the support sector was associated with the different levels of real personal income observed during the 1961-1972 period.⁵ It is clear from the diagram that there was a close link between personal income and support sector output, and this relationship remained stable over time. Statistical analysis of the data in figure 5 indicates that an increase of \$100 in real personal income, in general, produced an increase of roughly \$60 in support sector output.

The relationship shown in figure 5 is based on the fact that a major portion of the demand for support sector output comes from the household or consumer sector. The trade, finance (including real estate), and service industries are very closely linked to the spending decisions of Alaska households. The spending decisions in turn directly depend upon the real personal income available to the households. Thus, there is a clear causal mechanism producing an increase in support sector output in response to an increase in real personal income. Any action, public or private, which adds to personal income will induce an expansion in support sector output.

In Alaska, unlike more broadly based economies, the support sector contains the only important consumer-oriented industries in the private sector. Virtually all consumer *goods* (as opposed to services) are imported from the outside. The manufacturing sector in Alaska produces a few consumer goods but this activity is of minor magnitude. As a result, Alaska's commodity-producing industries are not significantly influenced by changes in personal income. Instead, the output of the commodity-producing industries is determined primarily by the availability of natural resources, conditions on world markets, and other autonomous factors.

⁵Personal income was deflated by an estimated consumer price index for Alaska. The consumer price index is discussed in more detail in the next section.

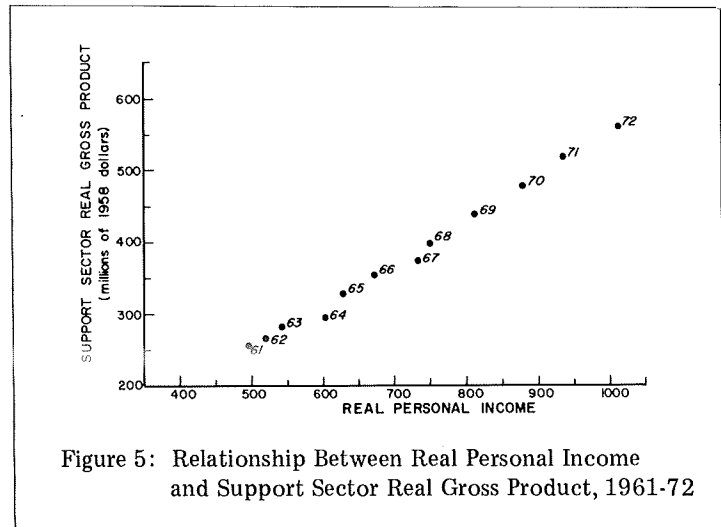


Figure 5: Relationship Between Real Personal Income and Support Sector Real Gross Product, 1961-72

The activities of the federal government in Alaska are largely determined by factors and decisions outside Alaska. The federal government influences but is not influenced by the economic development in Alaska.

On the other hand, the activities of state and local governments do seem to be responsive to changes in general economic activity. In fact, the behavior of state and local government is quite similar to that of a private consumer-oriented industry.

As figure 6 shows, there was, from 1961 to 1972, a close correlation between the movements in real personal income and real gross product in state and local government. It is likely that the mechanism which produced that result was similar to the one discussed in connection with the support sector. An increase in real personal income and the accompanying increase in population tended to raise the demand for the services provided by state and local governments. At the same time, the increase in income expanded the governments' revenue bases and thus provided the funds with which to finance the additional services. The data in figure 6 indicate that an increase of \$100 in real personal income led to an increase of about \$10 in real gross product of state and local governments.

Personal Income and Prices in Alaska

Summary

- Consumer prices in Alaska, as indicated by an Alaska relative price index (RPI), increased at 2.4 percent a year between 1961 and 1972; that compared favorably to an increase of 3.1 percent a year in the U.S. consumer price index.

Summary (continued)

- The GSP deflator, which is a rough indicator of the prices received for output produced in Alaska, increased at 3.9 percent a year between 1961 and 1972. The comparable measure for the U.S. is the GNP deflator which increased at the slower rate of 3.1 percent a year.
- Personal income in Alaska was \$1,728 million in 1972, a gain of 9.3 percent a year since 1961.
- Per capita personal income was \$5,329 in 1972. Although the 6.2 percent rate of increase since 1961 was slightly lower than the U.S. growth rate, per capita personal income in Alaska was about 20 percent above the average U.S. level in 1972.
- After making adjustment for changes in consumer prices, real per capita income (in 1967 dollars) in Alaska was \$3,136 in 1972.
- An unusually high proportion (80 to 85 percent) of Alaska personal income was derived from wages and salaries.
- Wage rates have been increasing rapidly in Alaska, and in 1972, average real annual earnings (in 1967 dollars) were \$6,519, nearly equal to the U.S. average.

Sources of Personal Income

As shown in table 4, most personal income in Alaska has come in the form of wages and salaries. Nonwage income has generally made up 15 to 20 percent of total personal income. The government sector is by far the largest source of wage payments, and in the period since 1961, it has accounted for about half of the total wages in Alaska. Although the fraction of wages coming from the government sector has remained constant, wage payments by state and local governments have increased much more rapidly than payments by the federal government (see table 5). The wage bill in state and local government has been growing at 17 percent a year and in federal government at only 6 percent a year. Since employment in federal government has been declining, the increase in federal wage payments was due solely to the relatively rapid rise in the average annual wage paid to federal employees (see table 5). The increase in total wages paid by state and local governments was due both to a rise in average wages and to a rapid expansion in

employment. Wage payments in state and local government went from 18 percent of total government wages in 1961 to 38 percent in 1972.

The trade, finance, and service industries also showed a substantial increase in wage payments. The rate of increase was about 11 percent a year, and the three industries accounted for 24 percent of the rise in total wage income between 1961 and 1972. The increase in wages primarily resulted from an increase in employment, since average wages paid by the trade, finance, and service industries rose slowly, less than 4 percent a year.

Wage income in contract construction also grew at 11 percent a year and accounted for 12 percent of the total growth in wages between 1961 and 1972. In contract construction, there was strong growth both in the level of employment and in the average wage paid to employees. Because of its small size in terms of employment, the mining industry accounted for only 3 percent of the increase in wage income, even though wage payments in mining grew at nearly 12 percent a year.

The fisheries and forest products industries made relatively small contributions to the growth in Alaska wage income. Employment and wage rates grew slowly

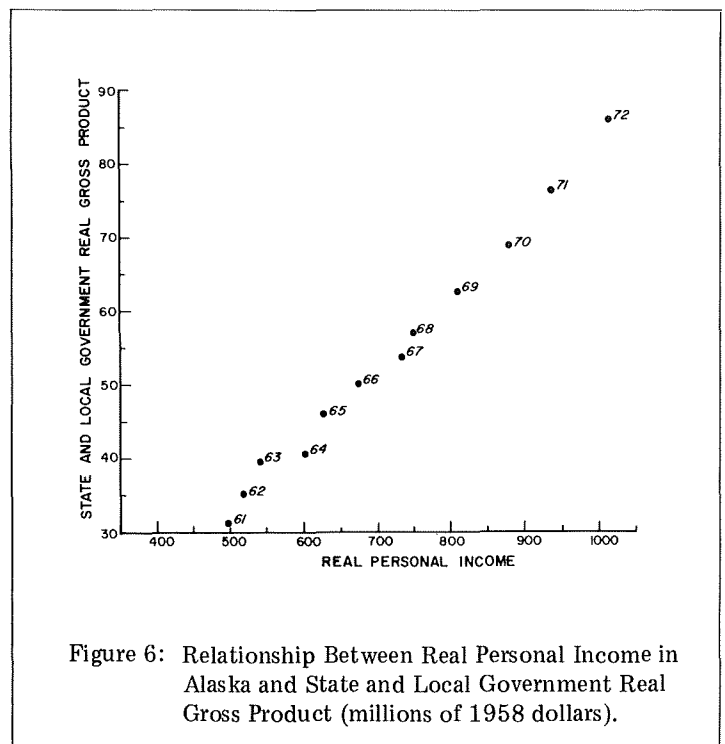


Figure 6: Relationship Between Real Personal Income in Alaska and State and Local Government Real Gross Product (millions of 1958 dollars).

Table 4
ALASKA PERSONAL INCOME BY MAJOR SOURCES
1961-1972
(Millions of Dollars)

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
<u>Personal Income</u>	651.3	679.1	710.3	797.4	864.1	934.3	1042.2	1126.3	1265.9	1442.7	1573.2	1728.1
<u>Wage and Salary Disbursements</u>	538.3	557.1	589.3	670.4	722.1	777.3	867.2	947.3	1080.9	1217.7	1315.2	1447.1
Mining	11.5	12.5	12.5	12.5	13.1	17.5	28.4	38.0	56.3	52.0	43.7	39.1
Metal Mining	2.8	2.6	2.1	1.4	1.8	2.0	1.6	1.5	1.6	2.7	2.1	1.5
Oil and Gas	6.2	7.3	8.1	8.5	8.3	12.5	24.2	34.3	52.7	47.1	38.9	34.6
Other	2.4	2.6	2.4	2.6	3.0	3.0	2.6	2.3	2.1	2.1	2.8	3.0
Contract Construction	47.1	47.6	51.1	77.8	88.0	88.8	95.2	100.1	117.9	125.8	143.0	153.4
Manufacturing	40.1	41.6	44.0	46.0	54.7	56.2	56.4	63.3	69.3	83.9	86.5	89.8
Food and Kindred Products	20.1	18.6	18.5	18.2	24.0	24.2	20.1	23.2	23.7	31.3	31.1	30.0
Lumber, Wood, Paper & Allied Prod.	14.1	16.2	18.4	19.8	21.8	23.2	27.6	29.2	31.6	36.7	37.8	40.9
Other	5.8	6.8	7.1	8.0	8.9	8.8	8.7	10.8	13.9	15.9	17.6	18.9
Transportation	30.9	32.2	33.5	35.3	37.8	39.2	46.3	49.2	65.1	70.9	67.2	74.2
Trucking and Warehousing	6.1	6.6	7.0	8.4	10.1	8.0	11.0	11.7	17.1	19.2	17.5	18.7
Water Transportation	7.1	7.9	7.8	7.5	6.9	9.0	9.3	8.4	8.2	8.5	8.1	9.9
Air Transportation	14.9	14.9	15.8	16.8	17.8	18.9	22.1	24.7	35.0	37.4	34.9	39.2
Other Transportation	2.8	2.8	2.8	2.7	3.0	3.2	3.9	4.3	4.9	5.8	6.6	6.4
Communications and Public Utilities	31.4	29.4	29.0	29.2	30.9	33.4	32.7	34.9	37.1	40.6	52.8	57.2
Trade	54.2	53.5	56.7	61.3	71.4	79.1	89.6	99.0	116.6	132.0	142.2	157.5
Wholesale Trade	16.6	14.8	15.3	17.3	19.5	22.9	26.0	28.4	35.6	40.8	41.8	46.0
Retail Trade	37.6	38.7	41.5	44.0	52.0	56.2	63.6	70.6	81.0	91.2	100.4	111.5
Finance, Insurance, and Real Estate	9.3	10.5	12.0	13.6	15.8	17.3	17.5	19.7	22.4	27.6	31.1	37.7
Services	33.5	36.5	36.4	40.7	45.7	49.2	57.0	66.3	77.8	88.9	99.4	117.8
Hotels, Motels, and Lodges	NA	NA	3.6	4.1	5.3	6.1	6.8	6.8	7.8	8.5	9.7	11.0
Personal Services	NA	NA	3.3	3.4	3.7	3.9	4.1	4.7	4.9	5.3	5.7	5.9
Business Services	NA	NA	8.0	10.0	11.1	11.6	14.1	18.9	22.1	18.8	18.2	17.4
Medical Services	NA	NA	5.8	6.6	6.9	7.8	8.5	9.3	11.9	15.8	20.4	28.5
Other Services	NA	NA	15.7	16.5	18.7	19.8	23.4	26.6	31.1	40.4	45.3	55.1
Government	279.6	292.5	313.3	353.0	363.5	395.0	442.9	475.0	516.3	593.6	646.6	708.6
Federal Government	228.5	231.9	241.2	274.9	271.6	291.1	324.6	339.1	359.7	404.7	416.6	438.0
State and Local Government	51.1	60.6	72.2	78.2	91.9	103.9	118.3	135.9	156.6	188.9	230.0	270.6
Other Industries (Agriculture Forestry, and Fisheries)	0.8	1.0	0.8	0.9	1.1	1.5	1.2	1.9	2.0	2.5	2.8	11.8
<u>Other Labor Income</u>	15.0	16.0	18.0	20.0	23.0	26.0	29.0	33.0	33.0	38.0	44.0	40.0
<u>Proprietors' Income</u>	47.0	51.0	53.0	50.0	56.0	66.0	71.0	67.0	68.0	74.0	86.0	90.0
<u>Property Income</u>	39.0	44.0	38.0	47.0	52.0	53.0	61.0	62.0	70.0	82.0	89.0	95.0
<u>Transfer Payments</u>	28.0	28.0	30.0	32.0	34.0	38.0	42.0	52.0	58.0	79.0	100.0	114.0
<u>Less Personal Contribution to Social Ins.</u>	16.0	17.0	18.0	22.0	23.0	26.0	28.0	35.0	44.0	48.0	61.0	67.0

Sources: Alaska Department of Labor, Statistical Quarterly, various issues; U.S. Department of Commerce, Survey of Current Business, various issues.

compared to the increase in other industrial sectors. The restricted wage income growth in the combined renewable resource-based industries resulted from the extremely small increase in fishery wages. The forest products industry showed strong growth, but it was not enough to compensate for fisheries. On balance, the wage income in the renewable resource-based industries had the slowest growth rate of any of the major private sectors. The only sector with a slower growth in wage income was the federal government.

Prices and Wages

To put the personal income statistics in proper perspective, the relative level and rate of change in consumer prices must also be taken into account. It is obvious that prices are generally much higher in Alaska than in the "lower forty-eight." However, it is not at all obvious whether prices in Alaska have been increasing

more or less rapidly than in the rest of the U.S. Unfortunately, the price data for Alaska are extremely sparse and much of the information which is available refers only to Anchorage, not to the state as a whole.⁶ To make maximum use of the available data, the Alaska relative price index (RPI) shown in table 6 has been constructed as a composite measure combining several different sources of price information.

The first source of price information used in deriving the Alaska RPI is the consumer price index (CPI) for

⁶The most complete compilations of price data for Alaska can be found in Arlon Tussing and Monica E. Thomas, "Prices and Cost of Living in Urban Alaska," *Alaska Review of Business and Economic Conditions*, Vol. VIII, No. 3, Fairbanks: Institute of Social, Economic and Government Research, University of Alaska, September, 1971; and "Consumer Prices, Personal Income, and Cost of Living in Alaska," forthcoming, *Alaska Review of Business and Economic Conditions*.

Table 5
GROWTH IN ALASKA WAGE INCOME 1961-1972
Average Annual Rate of Change

	Average Annual Wages Per Employee	Wage and Salary Employment	Total Wage and Salary Income
All Industries	5.69	3.52	9.28
Commodity Producing Industries	4.63	5.40	10.36
Mining	6.13	5.22	11.77
Commodity Producing Except Mining	4.41	5.42	10.17
Contract Construction	4.78	6.14	11.33
Fisheries and Forest Products	2.92	4.63	8.13
Other Manufacturing	5.09	5.88	11.34
Support Sector	3.07	6.72	9.78
Transportation, Communication and Public Utilities	3.66	3.16	7.02
Trade, Finance, and Services	3.27	8.08	11.24
Government	7.13	1.58	8.82
Federal Government	7.04	-.89	6.09
State and Local Government	5.83	9.96	16.36

Anchorage. This is shown in the first column of table 6. This index has the two major advantages of being quite comprehensive and having been continuously maintained over a long period of time. The principal shortcomings of the CPI are that it applies only to Anchorage and it only measures *changes* in prices; it provides no information about the *level* of prices in Alaska relative to the rest of the U.S. To compensate for the first weakness, a second source of information is drawn upon: the estimates of food costs compiled by the Alaska Agricultural Experimental Station. These estimates are currently prepared for thirteen Alaska cities.⁷ The statewide food

costs shown in table 6 were calculated by taking a weighted average of the food costs in the thirteen cities.⁸ As expected, the statewide food costs were appreciably higher than those in Anchorage. In recent years, the state average has been about 7 to 9 percent higher than the food cost in Anchorage.

It was assumed that the higher food prices throughout the state, as compared to Anchorage, were also re-

⁷ For food cost data see Tussing and Thomas, "Prices and Cost of Living in Urban Alaska," September 1971, Appendix Table 7.

⁸ The weights used in computing the average were the total payrolls in each of the thirteen cities. Since nearly half of the statewide payroll is in Anchorage, food costs in that city will be the dominant factor in determining the statewide average food costs.

Table 6
PRICES AND WAGES, 1961-1972

	Alaska					U.S.			
	Anchorage Consumer Price Index (1967 = 100)	Statewide Food Costs*	Anchorage Food Costs	Alaska Relative Price Index (1967 US = 100)	GSP Deflator (1958 US = 100)	Annual Earnings Per Employee	Consumer Price Index (1967 - 100)	GNP Deflator (1969 = 100)	Annual Earnings Per Employee
1961	92.3	\$23.04	\$22.17	131.4	126.3	\$6,028	89.6	104.6	\$5,091
1962	92.5	23.10	22.27	131.5	128.1	6,074	90.6	105.8	5,266
1963	93.1	23.46	22.67	131.9	130.2	6,197	91.7	107.2	5,427
1964	93.4	23.57	22.68	133.0	139.6	6,856	92.9	108.8	5,663
1965	94.2	22.24	20.80	138.0	142.8	6,975	94.5	110.9	5,845
1966	97.9	23.13	22.26	139.3	145.0	7,306	97.2	113.9	6,114
1967	100.0	22.92	22.03	142.5	146.2	7,849	100.0	117.6	6,371
1968	102.6	23.56	22.00	150.6	150.5	8,428	104.2	122.3	6,790
1969	105.9	24.81	23.05	156.2	152.7	9,093	109.8	128.2	7,195
1970	109.6	25.13	22.97	164.3	164.0	9,831	116.3	135.2	7,612
1971	112.9	26.47	24.31	168.4	175.3	10,300	121.3	141.6	8,056
1972	115.9	26.79	25.03	169.9	192.8	11,076	125.3	146.1	8,551
Average Annual Rate of Change 1961-1972 (%)	2.1	—	—	2.4	3.9	5.7	3.1	3.1	4.8

*The food items used in estimating food costs were changed in 1965 so the estimates prior to 1965 are not comparable to those in later years.

Sources: U.S. Department of Labor, Consumer Price Index - Pacific Cities and U.S. Average Retail Prices of 45 Food Items in Thirteen Alaskan Cities; Palmer, Alaska; Economic Report of the President, 1974, U.S. Government Printing Office.

representative of general consumer prices. On the basis of this assumption, the Anchorage consumer price index was increased in the same proportion as food costs to produce a state consumer price index. That is, if state-wide food costs were 5 percent higher than food costs in Anchorage, then the state CPI was computed by increasing the Anchorage CPI by 5 percent.

The final step in deriving the Alaska relative price index was to estimate the difference between price levels in Alaska and in the U.S. as a whole. This was based on the family budget surveys carried out by the U.S. Bureau of Labor Statistics. The cost of family consumption for a middle income family was estimated to be 37 percent higher in Anchorage than in the rest of the U.S. in 1967.⁹ The consumer price index was increased by this percentage to reflect the higher price levels in Alaska in the base year of 1967.

When all the above pieces of information are combined, the result is the Alaska relative price index shown in table 6. To maintain comparability with the U.S. consumer price index, the Alaska RPI uses 1967 as the base year. As shown in table 6, the U.S. CPI in 1967 was (by definition) 100.0 and the Alaska RPI was 142.5. Thus, in 1967 consumer prices in Alaska were estimated to be 42.5 percent higher than average U.S. consumer prices. Between 1961 and 1972, the Alaska RPI went from 131.4 to 169.9, for a 2.4 percent average annual rate of increase. That was substantially slower than the U.S. inflation rate of 3.1 percent a year over the same period.

Another general measure of price movements in Alaska is the gross state product deflator shown in table 6. The GSP deflator is an index of the price at which Alaska output is sold. This is conceptually quite different from the Alaska RPI which is an index of the prices paid by consumers in Alaska. Thus, the GSP deflator and the Alaska RPI are not alternative measures of the same thing, but instead are complimentary measures of different aspects of price behavior.

The average price received for Alaska output, as indicated by the GSP deflators, increased by 3.9 percent

a year between 1961 and 1972.¹⁰ That was a substantially more rapid rate of increase than the rise in prices paid by consumers. The increase was also more rapid than the 3.1 percent rate shown by the GNP deflator, the comparable price indicator for the U.S. Since the GSP deflator was estimated by indirect methods, it is not a very precise measure, and modest fluctuations should not be given undue significance. However, it seems clear that over time the value received per unit of output has been increasing rapidly in Alaska.

The Alaska wage rates, or average annual earnings, have also been rising rapidly (see table 6). Between 1961 and 1972, annual earnings per employee in Alaska rose at 5.7 percent a year as compared to 4.8 percent a year in the U.S. as a whole. The average annual wage in Alaska went from \$6,028 in 1961 (18 percent above the U.S. average) to \$11,076 in 1972 (30 percent above the U.S. average).

Growth in Personal Income

Total personal income in Alaska is estimated to have increased from \$651 million in 1961 to \$1,728 million in 1972, an average annual increase of 9.3 percent (see table 7). However, part of the increase in personal income was due simply to the growth of population in Alaska. On a per capita basis, Alaska personal income went from \$2,752 in 1961 to \$5,329 in 1972. The annual rate of increase of 6.2 percent was slightly lower than the rate of gain in U.S. per capita personal income, but income in Alaska remained about 20 percent above the U.S. average.

Since there have been continuous increases in prices and wages since 1961, only part of the gain in personal income represents an increase in real purchasing power. If the Alaska RPI is used to adjust for price movements, *real* per capita personal income is estimated to have increased by 3.7 percent a year between 1961 and 1972 (see table 7). The comparable figure for the U.S. as a whole is only 3.2 percent. However, it is important to note that in 1972 real per capita income in

⁹See Tussing and Thomas, "Prices and Cost of Living in Urban Alaska" (especially Table 2) for a more complete discussion of the family budget data.

¹⁰Because of the way in which GSP is computed, the GSP deflator reflects the price of Alaska output minus the price paid for materials used in production. The GSP deflator implicitly takes into account the cost of production materials purchased outside Alaska.

Alaska was still only \$3,136, nearly 13 percent lower than the U.S. average. The higher money incomes in Alaska have been more than offset by the higher prices, resulting in lower real incomes or real purchasing power. Real incomes in Alaska have been catching up, but a significant gap still remains.

As shown in table 7, real wages in Alaska have been increasing very rapidly in comparison to the U.S. average, 3.2 percent a year compared to 1.7 percent. By 1972, real wages in Alaska had reached \$6,519, almost 96 percent of the U.S. average. Thus, wage earners were

very nearly on a par with the U.S. average, even after allowing for the higher cost of living in Alaska. Furthermore, Alaska has a relatively high labor force participation rate; that is, a relatively high proportion of the population is in the labor force. As a result, real wage income per capita is quite high in Alaska. In fact, on a per capita basis in 1972, the wage component of real personal income was nearly 10 percent higher in Alaska than in the rest of the U.S., \$2,627 compared to \$2,399. It was the sources of income other than wages which caused the gap between Alaska real income and U.S. real income. In the U.S. as a whole, real nonwage

Table 7
TOTAL AND PER CAPITA PERSONAL INCOME
IN CURRENT AND 1967 PRICES

	Alaska Personal Income				U.S. Personal Income		Avg. Annual Earnings Per Employee In 1967 Dollars		Alaska Population
	Total		Per Capita		Per Capita		Alaska	U.S.	
	Current Prices (Millions of Dollars)	1967 U.S. Prices	Current Prices (Dollars)	1967 U.S. Prices (Dollars)	Current Prices (Dollars)	1967 U.S. Prices (Dollars)			
1961	651.3	495.7	2,752	2,094	2,269	2,532	4,588	5,682	236,669
1962	679.1	516.4	2,797	2,127	2,373	2,619	4,619	5,812	242,817
1963	710.3	538.5	2,842	2,155	2,460	2,683	4,698	5,918	249,904
1964	797.4	599.5	3,149	2,368	2,593	2,791	5,155	6,096	253,204
1965	864.1	626.2	3,258	2,361	2,774	2,935	5,054	6,185	265,192
1966	934.3	670.7	3,441	2,470	2,987	3,073	5,245	6,290	271,505
1967	1,042.2	731.4	3,750	2,632	3,167	3,167	5,508	6,371	277,906
1968	1,126.3	747.9	3,954	2,625	3,432	3,294	5,596	6,516	284,880
1969	1,265.9	810.4	4,298	2,751	3,705	3,374	5,821	6,553	294,560
1970	1,442.7	878.1	4,771	2,904	3,935	3,383	5,984	6,545	302,361
1971	1,573.2	934.2	5,027	2,985	4,171	3,439	6,116	6,641	312,930
1972	1,728.1	1,017.1	5,329	3,136	4,497	3,589	6,519	6,824	324,281
Average Annual Rate of Increase 1961-1972 %	9.3	6.8	6.2	3.7	6.4	3.2	3.2	1.7	2.9

Source: Alaska Department of Labor, Current Population Estimates by Census Division; also, see sources for Tables 4 and 6.

income¹¹ averaged \$1,190 per capita in 1972 while in Alaska it was only \$510. This shortfall in nonwage in-

come more than offset Alaska's advantage in real wage income. This serves to emphasize just how dependent the Alaska economy is upon the flow of wage income. Since there are no other major sources of income, fluctuations in wages and salaries have a pronounced impact on the pace of economic activity.

¹¹Nonwage personal income consists of proprietors' income, rent, dividends, and interest.

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