

THE IMPORTANCE OF PETROLEUM IN THE ALASKA ECONOMY

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ISER Working Paper 85.1

April 15, 1985

## Introduction

Recent softness in the world oil market has raised concern about what effect lower world oil prices would have on the Alaska economy. Because most of the growth in at least the last four years can be attributed to the petroleum industry either directly or indirectly (see "The Sustainable Level of Economic Activity in Alaska," by Scott Goldsmith, ISER, February 1985), a common perception seems to be that percentage declines in the price of oil will translate directly into equal percentage declines in the level of economic activity in the state.

This paper demonstrates that petroleum is indeed one of the most important industries in Alaska but that the economy is not entirely dependent upon petroleum. Two considerations are important in estimating how big the economy would be today if the petroleum industry suddenly abandoned Alaska.

1. Other basic industries, unrelated to and independent of petroleum, would continue to exist and grow in the absence of the petroleum industry.
2. The petroleum industry has transformed the Alaska economy in the last twenty-five years, and many of the changes which it has brought about are permanent and would not disappear if the petroleum industry were eliminated.

In addition, the sensitivity of petroleum industry activity in Alaska to a decline in the world price of oil is moderated by the nature of costs in the industry. The continued operation of existing fields depends primarily upon field operating costs which

are much less than the current world oil price. Decisions to develop new fields depend upon total exploration, development, and production costs.

#### Recent Economic Growth

Before expanding on these three points, it is useful to review Alaska economic growth over the last four years to dispel the "equal percent change" notion between oil prices and economic activity. Between the fourth quarter of 1978 and the fourth quarter of 1981, the world price of oil increased 166 percent (price of Saudi Arabian crude as reported in the Monthly Energy Review). Table 1 shows the comparable growth and growth rates of some indicators of the Alaska economy. Although Alaska state general fund petroleum revenues and total revenues grew by larger percentages than the oil price, neither employment nor population grew as dramatically. Between 1978 and 1983, employment increased twenty-six percent and population by twenty-four percent.

Two important conclusions can be drawn from this table.

1. Percent changes in employment and population have been much smaller than the percent change in the world oil price since 1978.
2. A reduction of the current world oil price by half would bring it back to its level of 1978, when Alaska employment exceeded 200 thousand and population 400 thousand. Neither the petroleum industry nor the Alaska economy would be eliminated by such a drop.

TABLE 1. INDICATORS OF ALASKA ECONOMIC GROWTH  
IN COMPARISON TO THE WORLD OIL PRICE

	1978	1979	1980	1981	1982	1983
World Oil Price <sup>1</sup>	\$12.66	\$22.72	\$31.21	\$33.58	\$33.72	\$27.88
Percent change from 1978	-	79%	147%	165%	166%	120%
Alaska General Fund Petroleum Revenues (million \$)	\$433.9	823.1	2258	3307.6	3576.7	3029.5
Percent change from 1978		90%	420%	662%	724%	598%
Alaska State General Fund Revenues (million \$)	\$764.9	1133	2501.2	3718.2	4108.4	3631.0
Percent change from 1978	-	48%	227%	386%	437%	375%
State Government Employment (thousand \$)	14.35	14.98	15.37	16.61	17.99	18.86
Percent change from 1978	-	4%	7%	16%	25%	31%
Petroleum Employment <sup>2</sup> (000)	5.56	5.77	6.68	8.91	8.84	8.18
Percent change from 1978		4%	20%	60%	59%	47%
Total Employment (000)	204.31	208.23	212.85	227.54	243.51	257.49
Percent change from 1978	-	2%	4%	11%	19%	26%
Total Population (000)	411.6	413.7	419.7	435.2	460.8	510.6
Percent change from 1978		.5%	2%	6%	12%	24%

<sup>1</sup>Average price of Saudi Arabian crude oil imported into the United States in fourth quarter of year.

<sup>2</sup>Includes mining.

## The Total Contribution of Petroleum to the Alaska Economy

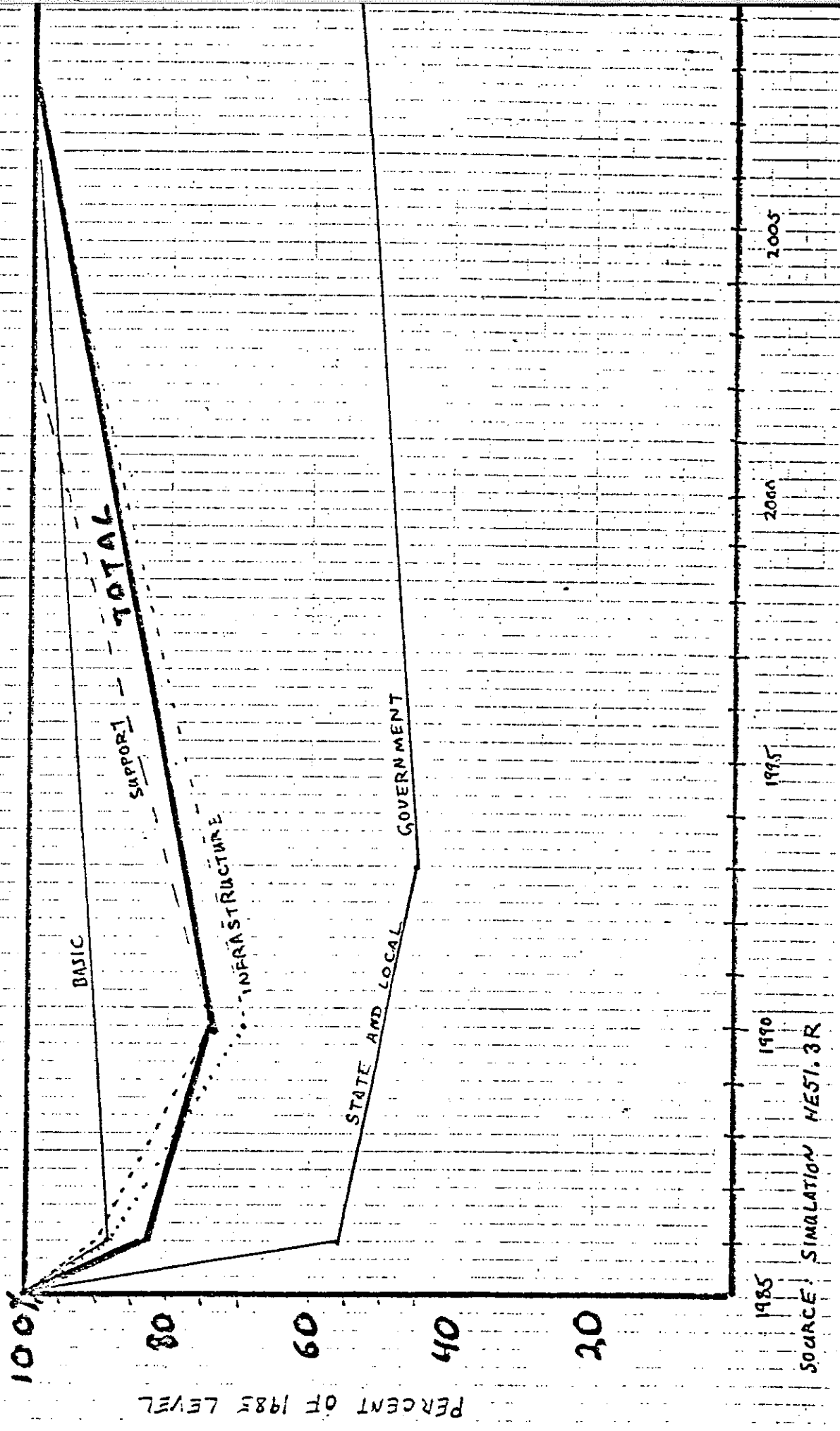
### A. NONPETROLEUM BASIC INDUSTRY

In 1985, about sixteen percent of basic industry in Alaska will be accounted for by petroleum activities (in the following industries: petroleum, heavy construction, and pipeline transportation). Other basic industries, consisting of federal government, mining, fishing, timber, manufacturing, tourism, and agriculture are largely independent of the level of petroleum activity.

Based upon simulations of the Alaska economy using the MAP econometric model, the complete elimination of the petroleum industry in 1986 would reduce basic industry employment by sixteen percent and directly impact total employment by five percent. Because the petroleum industry has a large regional multiplier, employment in the infrastructure and support industries would subsequently decline. In addition, the elimination of petroleum revenues would cause a severe contraction in state and local government activity which would affect infrastructure and support industries via the multiplier. Total employment would fall over a number of years by twenty-six percent. Such a scenario is shown in Figure 1.

Growth in other basic industry activity could not compensate for this severe economic contraction, but, given the assumptions developed by ISER for the current Susitna economic and load forecasting studies resulting in the Alaska Power Authority's base

Figure 1 EMPLOYMENT IMPACT OF ELIMINATING PETROLEUM INDUSTRY FROM MAP MODEL (1985 = 100%)



SOURCE: SIMULATION WEST. 3R

case of December 1984, in about twenty-five years the economy would return to its current level as a result of two factors: (1) slow but continued growth in other basic sectors, and (2) growth in national income and wealth, in which Alaska would share.

The growth and percent changes in projected activity in the basic sectors between 1985 and 2010 are summarized in Table 2. Total basic sector employment growth is eighteen percent.

TABLE 2. PROJECTED BASIC INDUSTRY EMPLOYMENT

	Employment		Percent Change
	1985	2010	
Federal Civilian	17,907	20,285	13%
Military	21,818	19,570	-10
Tourism	5,000	12,500	150
Manufacturing (fish (processing, timber, pulp)	11,129	12,104	9
Fish Harvesting	7,608	8,233	8
Mining	1,169	2,855	144
Agriculture	400	1,223	205
TOTAL	65,000	7,6770	18

Expansion of activity in the infrastructure and support sectors is a necessary complement to this projected basic sector growth. Consistent with both historical trends in Alaska and projected national trends, the ratio of support to basic industry employment will continue to increase so that future additions to basic sector activity will have larger multiplier effects than today.

#### B. THE LEGACY OF OIL ON ALASKA

The Alaska economy would be very different in 1986 if the petroleum industry had never been in the state than it would be if the petroleum industry disappeared in 1986 because of the legacy which it would leave behind of over twenty-five years of activity. The industry has affected every facet of the economy, some in ways which are measurable and others in ways not quantifiable. Much of the sophistication and maturity of the economy, as reflected by such things as the higher level of development of the physical infrastructure of the state, the increased availability and variety of consumer goods and services, the Native Claims Settlement Act and the formation of the Native corporations, the improved quality of the housing stock, and the relative decline in the Alaska cost of living differential, are partially the result of the activities of the petroleum industry. Were the industry to leave, these factors would not disappear overnight.

The Permanent Fund and other smaller state assets are particularly important elements of this legacy. By the end of



FY 1985, it will contain about \$6.4 billion and will produce nominal earnings of over \$600 million which, when adjusted for inflation, equal the level of total state general fund revenues as recently as 1975. It seems likely that a significant decline or the elimination of the petroleum industry would justify the use of Permanent Fund earnings (real or total) to cushion the resulting economic contraction. Other elements of the petroleum legacy would provide additional support to cushion the contraction.

The process at work creating the legacy of the petroleum industry is the transformation of oil wealth into other assets such as the investments of the Permanent Fund. It is important to recognize that the overwhelming majority of Alaska oil wealth originally consisted of the 9-to-10 billion barrels of recoverable Sadlerochit oil. The impact of world oil price changes on the Alaska economy partially depends upon how much of that oil is still in the ground when the price change occurs. Thus, in 1979-1980, the dramatic increase in the world oil price affected almost all of the oil originally in place in the Sadlerochit field. Later this year, the 4 billionth barrel will pass through the pipeline and a change in the world oil price today affects only the 5-to-6 billion barrels left in the ground. The oil that has been converted to other assets is immune from oil price changes.

### Sensitivity of the Petroleum Industry in Alaska to Lower Oil Prices

The level of activity of the petroleum industry in Alaska is affected by the price of oil, but the relationship is far from simple because the industry is extremely capital intensive. Consequently, decisions to explore and develop new fields are based upon total unit costs being less than the long-run price of oil, while production from developed fields occurs if the oil price is at least high enough to cover unit operating costs.

Thus, at the world oil price prevailing in 1977, development of the Kuparak field did not appear profitable to the oil industry. At the higher oil prices of the early 1980s, it did seem profitable, so the field was developed. Now that the capital investment to develop the field has been put into place, production from Kuparak will probably continue even if oil prices fall below their 1977 level, as long as operating costs of the field are covered by the price.

The implication of this observation is that in terms of production there is very little downside sensitivity to oil prices as low as \$10 to \$15, as long as the majority of production comes from the Sadlerochit and Kuparak fields at Prudhoe Bay. Only new exploration, development, and production are price sensitive. Since these activities would largely be on the Outer Continental Shelf (OCS) from which the state would receive little revenues, the primary impact of such activities is employment rather than state revenue.

At a market price of \$10 to \$15, the wellhead price of oil (price minus transportation to market and production cost) will approach zero, and current production could become uneconomic. However, because the oil producers control the tariff on the Alyeska pipeline, which accounts for the majority of transportation costs of the oil, it is possible they would accept a smaller tariff in order to keep the fields producing. Thus, the price at which significant production cutbacks would occur could be much lower than \$10 to \$15.