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ECONOMIC FORECASTING IN A REMOTE NORTHERN REGION: LESSONS FROM ALASKA

by

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1. INTRODUCTION

For more years than I care to admit, I have been a student of the Alaska economy and as such, often called upon to make projections and forecasts of the direction the economy will take in the future, both short and long term. It has been a fascinating, if frustrating, experience, and this forum offers me an opportunity to step back and reflect on the challenges associated with this task.

By reviewing the problems I have encountered over the years in my little corner of the world I may be able to offer some suggestions or guidelines for others who are called upon to look into their own crystal balls and forecast what they see for their own economies.

2. A FEW WORDS ABOUT ALASKA

Purchased for $7.2 million from Russia in 1867, Alaska did not attain equal status with the other states until it became the 49th state in 1959. (See attached map for location of Alaska.) One of the reasons statehood was slow in coming was the fear that with no visible means of support, the new governmental structure would be an instant ward of the federal government. There was an economic base, but it was composed primarily of military spending and total spending by the federal government accounted for 75% of the jobs in the market economy. Most of the other jobs were found in the fishing, timber, and mining industries or in businesses providing those industries with supplies and services. The 25 thousand jobs represented by private basic activity did little to inspire confidence about the future of the state. (Table 1.)

There was, and continues to be, another economy in the state--the subsistence economy--practiced not only by the Alaska Natives who had little contact with the market economy, but also by an unknown number of non-Native Alaskans lured to the state by its vastness, beauty, and opportunity. The existence Of this "underground" economy, largely hidden from view, presents challenges for the forecaster because of the difficulties in predicting its interactions with the market economy. For example it provides a reserve to augment the labor force, but the determinants of labor force behavior for members of this "underground" economy are not well understood.

Markets were small, the cost of living, as measured by the cost of goods and services delivered from Seattle, was high, and gross migration into and out of

the state was high. The skills of the thinly spread population did not necessarily match those required for the type of jobs that could bring development to the economy. Income came almost entirely from wages paid on the job. There was little economic surplus to provide the investment necessary for economic growth and development to proceed. Government activities produced no profits while the surplus from the production of fish, timber, and minerals quickly fled south to the warmer climates where the owners of these businesses chose to live.

Today, after 35 years of statehood, the picture has changed dramatically. A few statistics, presented in Table 2. summarize the transformation.

The driving force behind the economic transformation of Alaska has been petroleum development. Exploitation of this resource has created an extraordinary surplus of which a large portion has been retained within the region and used for growth and development. The importance of this surplus--oil company profits, federal taxes, and state-local taxes--can be seen in a comparison of the components of value added in Alaska with the US as a whole. (Value added is a measure of the value of all the goods and services produced for final demand in an economy and is similar to Gross Product.) For the US as a whole employee compensation (wages paid and benefits to workers) is the largest component of value added and its share has remained almost constant over time at about 57%. In contrast, in Alaska employee compensation, originally 68% of value added, had fallen to 37% of value added by the late 1980s. The other components of value added, payments to other factors and profits, increased from 32% to 63% of the total. Most of this increase reflects the value of oil production above its cost. (Figure 1.)

It is this surplus, more than any other factor which has challenged economists attempting to forecast the direction of the economy. But some of the more traditional aspects of the economy have also made it difficult to forecast.

3. TRADITIONAL FACTORS CHALLENGING THE ECONOMIC FORECASTER

In spite of the dramatic growth that has occurred in Alaska since statehood, projections of the long term growth for the economy have systematically overshot the target. (Figure 2.) One might reasonably expect such a result from forecasters using the straight line extrapolation method favored by engineers in a hurry (but not without its value in appropriate situations). But the same general overestimation has been evident in more sophisticated approaches to the question, including early efforts at my own Institute using an econometric model of the economy linked to population and fiscal models. I can happily report however that our early efforts have performed better than most other forecasts, and were also

clearly stated to be contingent upon some political assumptions quite popular at the time they were prepared which we did not necessarily agree with.

What accounts for this systematic excess of exuberance by the forecasting community? Some of it can easily be directly linked to the excess optimism and boosterism normally evident when those promoting economic development projects are also the people preparing the forecasts providing the support for the analyses of need.

I think a more important factor is the nature of commodity production-for-export in a remote region. This is the economic base which Alaska had at the time of statehood, the economic base it still has today in spite of vigorous efforts to diversify, and the economic base of most remote regions of this planet. Forecasters lost sight of the market realities of commodity production economics in the first decades of statehood. (Figure 3.)

Primary commodity producers are always at a disadvantage compared to businesses further along the production process in a free market. In a free market quantity sold and price are determined at the point of final consumption of the product. The price in this market in turn determines what the value of the raw commodity is in every location where it is being produced or could be produced. Commodity production near the market has an advantage and can command a higher price than the same commodity produced at a greater distance from the market. When consumer demand, and thus price is high, the producer close to the market enjoys large profits while the producer at a greater distance earns a normal rate of return. When consumer demand, and thus price is lower, the producer close to the market earns a normal rate of return while the producer at a greater distance shuts down to avoid operating at a loss. Furthermore a given percent change in price in the final market becomes magnified as it is transmitted back to the commodity market.

The other businesses adding value to the commodity on the way to market, for example the transportation provider, are not normally subject to this type of fluctuation in their share of the value of the product. If transportation of this good is profitable they will take the business and make a normal return, and if not they will turn their resources to the transportation of some other product and earn a similar return. Generally their profit level does not depend on the price of the finished good in the retail market to the same extent as the profit of the primary producer.

This description of the process highlights two points. First, economies dependent on primary commodity production are more cyclical, in terms of income and employment, than are economies based on fabrication or tertiary activities. Second, remote economies dependent on primary commodity production are more

subject to periods of recession, than are less remote economies producing the same primary commodities.

Some additional elements are important when considering this market over time. For many goods the trend over time is for an increase in the amount of processing of commodities before they reach the consumer. This both reduces the "net back" price received by the producer and increases the exposure of the commodity producer to price fluctuations in the final market. Second transportation costs have been falling. This increases the pool of competitors which a commodity producer must face when attempting to serve a market. Finally productivity gains in commodity production can have the same effect of increasing the pool of competitors.

This is certainly not new information, even in Alaska which has been a prime example of the "boom and bust" economy from the time of the first harvests of fur seals by Russians two centuries ago to the current exploitation of petroleum. However somewhere along the way shortly after becoming a state we lost sight of this basic information about how economies in remote regions operate. This blind spot is most noticeably evident at this moment in the Alaska fishery and having some significant negative repercussions for the economy.

Alaskans lost sight of this information for several reasons. First the rhetoric for the statehood movement included the notion that the heavy hand of the federal government and other outside interests were preventing the territory from developing its storehouse of natural resources. Under this view the lack of development of more extensive fishing, timber, and mining activities was not due to the uncertain economic viability of these projects but rather to other forces that were either "locking up" the resources or simply neglecting the development possibilities out of ignorance. Local control could break through these barriers, and release the forces that would bring Alaska's resources to market.

Second, soon after statehood it became apparent that the rhetoric seemed to be correct for at least one commodity--petroleum. A combination of forces came together in the 1960s to create a tremendous economic boom for Alaska driven by petroleum development. The price of oil was projected to increase in real terms for as long as anyone might imagine, making any and all petroleum related development projects economically attractive. The actual and projected success of the oil sector would serve as a model for other commodity producing sectors of the economy, particularly those parts of the story about rising commodity prices and the large number of prospects for development. The level of confidence was such that at one point in the early 1980s a leading economist in the state declared that the "boom-bust" cycle, the basic fact of life for the economy for 200 years, was dead in Alaska. The impression was that the world

was knocking on the door of Alaska to beg for resources. Alaskans could set the price and set the terms of development.

Third, commodity markets were not as global as they are today and this fact along with a good dose of federal government protection, sheltered many industries from the forces of the competitive market. People saw this and began to believe it to be the normal course of events, at least in Alaska.

Fourth, the wealth created from petroleum, or surplus as I am calling it in this paper, lured many to the state who came with no understanding of the fragile structure of an economy based in commodity production. For these individuals it was easy to become convinced by what they saw and heard from those already in Alaska that growth of the state was predestined by the vastness of its resources.

Finally, some analysts looked abroad, particularly Scandinavia, for a model of remote region economic development. There they saw economic success based on the use of cheap hydroelectric power to fuel primary processing as well as manufacturing. The physical similarities between regions convinced some that similar economic structures could be created.

All of these factors led people to ignore or underestimate the difficulties involved in the expansion of commodity production for export as well as primary processing. The early successes in petroleum and in cases where government intervention or less than perfectly competitive markets created an advantage were interpreted as the norm. Forecasts for growth of the economy were based on the rapid development of the basic sector--commodity production and primary processing. As a example, a projection done in 1980 was based largely on growth stemming from the series of projects listed in Table 3.

Not one of these projects has come to pass. Furthermore employment in the private basic industries of Alaska, with the exception of petroleum, has increased very little since statehood. Resource production has not been the driving force behind the growth and development of the Alaska economy. (Figure 4.)

But the fact remains that Alaska has grown rapidly, grown in fact as though driven by resource development. The reasons for this relate back to the surplus from petroleum, but before turning to a discussion of some of the complications that presents the forecaster, there are some other factors which have complicated the task of long term economic forecasting in Alaska, and will continue to do so which I should mention.

First, the importance of the surplus as a cushion for the economy is declining and this means commodity production is reasserting its importance.

These markets are increasingly competitive and increasingly global. Thus the task of understanding the market forces influencing commodity production in a region becomes more difficult, and in fact sometimes appears to be impossible.

The recent swing in the price of oil is a good example of the difficulty of understanding a market. Shortly after the price of oil bottomed out in December of last year analysts became convinced that the fall in price signaled a structural change in the market caused by an increase in supply relative to demand and that the lower price could be expected to continue for several years. Suddenly in early spring the rising price led to a reevaluation of the market based upon an increase in world demand relative to supply. Most recently they has been speculation about increased supplies reaching the world market from the former Soviet Union which would again lead to a softening of price. Forecasting in such an environment is nearly impossible, or when done tends to be way off base, driven by the short term swings in the price rather than the longer trend. This seems to be a case where more information leads to forecasts which are of less value that forecasts using less information.

Second, Alaska is a "smallish" economy and idiosyncratic factors can have a marked and yet difficult to predict effect on the economy. In contrast in very small places forecasting is likely to be easiest since small places have fewer forces acting upon them and it is easier to keep track of them. For example small communities in Alaska such as Cordova, a fishing community, or Sitka, a timber processing center, may be easier to forecast in the sense of being more stable, that the state as a whole. In contrast larger economies are easier to forecast because their size prevents any single factor out of the many which influence growth from dominating.

Third, public ownership of resources I have already mentioned as a factor blurring the economic realities of commodity production. The public sector does not always base their resource allocation decisions on the same economic criteria as a private investor and predicting what they will do is not easy.

Finally, the combination of an economy grounded in commodity production, natural and unnatural disasters, and public ownership of resources has resulted in a series of economic "surprises" over the years which have, almost without exception, caused economic stimulus to the economy. The 1964 Good Friday earthquake and 25 years later the Exxon Valdez oilspill are two of the more prominent examples of disasters which have created economic booms for the state. The uncanny cyclical recurrence of these "unpredictable" events humbles even the most self assured of forecasters. Incidently if enough of these unpredictable events can be strung together long term growth is the result.

4. THE FURTHER CHALLENGE OF THE SURPLUS

After having admitted that the record of economic forecasting for the long term has not been a very good one for Alaska, you might think I would redeem the reputation of economists by saying that we have at least done well in short term economic forecasting. Unfortunately I am unable to make that statement. We have not done a particularly good job either in estimating the change from year to year or in forecasting the timing and amplitude of the regional business cycle. (Table 4.)

The most important reason for this is the presence of the substantial economic surplus in the economy and the discretion which that introduces into the composition and timing of consumption spending.

In the simple economic base model, the size of the economy is determined by the size of the economic base and the value of the multiplier, which is a measure of the number of jobs in the economy which each basic job can support. The value of the multiplier is relatively stable in most economies since it reflects two processes unlikely to change rapidly over time. The first is the local purchase of inputs for the production represented by the basic job. The second is the local purchase of goods and services by the worker employed to produce the basic good. If the number of basic sector jobs and the economic multiplier are known, it is relatively easy to forecast the size of the economy, and changes in basic sector activity are the most important variable to understanding growth of the economy. (Figure 5.)

In Alaska this relationship was true at the time of statehood, but now the size of the multiplier depends importantly on a third factor not present in most economies--expenditures out of the surplus. The importance of this surplus is not generally recognized, and this leads to problems in understanding the structure of the economy and in forecasting. There is a general presumption that the entire support economy must be driven by changes in basic employment, a presumption fostered by the advocates of the basic sectors, but this is not the case. Figure 4. shows the evolution of that relationship over time.

Furthermore the source of the surplus is obscure to a large portion of the population. The petroleum industry directly employs a tiny workforce. Output is about the same as the state of Texas while employment at about 10 thousand is probably only 10 percent as large. Many oil industry employees wear suits and ties on the job which further obscures their function to the casual observer. In addition the location of production and the associated impressive infrastructure is the middle of a wilderness few Alaskans have ever seen. Consequently few Alaskans have any direct contact with the industry that provides the economic

surplus either through employment or knowing an oil worker, or even simply seeing the activity which produces the oil.

This situation is in sharp contrast to the seafood industry, the largest private basic industry in the state after petroleum in terms of value of output and value added, yet only about 10 percent as large. The number of workers directly employed in the industry is probably three times that of oil, although a majority of the jobs are seasonal. Commercial fishing and fish processing takes places in most Alaskan communities and is highly visible to the casual observer. Finally virtually every fisherman is a small business owner and consequently an advocate for his industry creating an impression of size against a small number of albeit large oil companies operating in the state.

Population turnover means there is always a new crop of Alaskans who both have neither an understanding of the surplus nor of its source. The misperception is perpetuated.

This leads to an overestimate of the importance of non-petroleum private basic activity in the economy in terms of job and income creation which has had some unfortunate consequences when businesses, consumers, and the public sector have acted on the basis of those misconceptions. The severe recession in 1986 when employment and population dropped an unprecedented 10% was largely the result of misplaced attribution of the source of the growth of the preceding 5 years.

However even with the advantage of complete information on the origin and size of the surplus, the task of forecasting is difficult. A large part of the surplus each year is pumped back into the economy through a variety of public programs, obviously only one of many ways of dealing with the surplus. In a small regional economy it is difficult, time consuming, and expensive for an economist to try to monitor the variety and variation in these programs with sufficient detail to identify cause and effect and use the results to assist in forecasting.

An example of a program for recycling the surplus is the Alaska Permanent Fund Dividend. This is an annual payment made to each Alaska resident from the earnings of the Permanent Fund. The Permanent Fund contains a portion of the revenues collected by the state government from the production of petroleum. Over time this Fund has grown to be quite large and the Dividend payment now represents about 5 percent of total personal income collected by Alaska residents each year. It is a significant addition to purchasing power of Alaska consumers.

In spite of its significance however there is little beyond speculation upon which an economist can base an estimate of the program's economic effect. It is a program unique among the states so there is no information from other regions

for making inferences. Neither is there information collected within the state as part of the delivery of the program that could be used to gauge its economic effect. What makes the program hard to evaluate is the fact that the distribution includes children as well as adults so about one third of the distribution goes to consumers below the age of 18. The most important question for measuring economic impact is how those underage consumers allocate this cash between savings and spending. Another interesting but less important question is the extent to which recipients of this distribution view it as a windfall rather than regular income and consequently allocate a larger share to savings than they would of regular income.

Interestingly when researchers have attempted to estimate the economic impact of the dividend program in terms of job and income creation, the results are met with considerable skepticism. There is a perception among many knowledgeable people that giving money to people to spend as they wish does not create jobs within the regional economy.

The problem with tracing the surplus and determining its importance for job and income creation for the regional economy is more difficult for most programs than the high profile Permanent Fund Dividend Program where the size of the dividend is eagerly awaited each year and announced in the press. Most programs produce much less readily available information for analysis, vary in form from year to year, and have impacts that are more challenging to try to sort out from all the other things simultaneously impacting the economy. A typical example is a home mortgage subsidy program in existence for several years in the early 1980s. Part of the question was to determine how the demand for housing varied with the size of the subsidy. The other part was to determine how consumers receiving the subsidy chose to spend this supplement to their discretionary income.

Even more difficult have been programs aimed at assisting new business formation or expansion. The challenge is to determine the extent to which such programs are simply providing a subsidy to an existing business and the extent to which they are actually encouraging new business activity.

Anticipating behavioral responses becomes more complex when private business activity responds, appropriately or not, to surplus spending. A recent example in the retail trade sector illustrates the problem. At the end of 1992 the forecast for the economy for 1993 was no change--stable if you were an optimist, or stagnant if you were a pessimist. Employment growth in 1993 was actually over 2%, an unexpected pleasant surprise for the business community. An important component of this growth was the mass invasion of Alaska by a number of large retail companies who simultaneously decided that the time was right to locate their giant stores in this market.

This type of decision is very difficult to forecast for a number of reasons, but making it particularly hard to anticipate is the fact that the surplus makes it difficult for an outside observer to understand the economic structure. Consequently it is difficult to anticipate the decisions an outsider may make which may have a significant impact on the economy.

Also associated with the presence of a surplus is the phenomenon known to economists as rent seeking behavior. This is economic activity the purpose of which is to reallocate the economic surplus. This is in contrast to economic activity which directly creates a good or provides a service. Lawyers of course tend to be heavily involved in this activity and it is probably no coincidence that at one time Anchorage, the largest city in Alaska, had more lawyers per capita than any other city in the US with the exception, of course, of Washington D.C. This is not an industry that has received much economic analysis and monitoring their activity level is a challenge.

The general lack of appropriate data for monitoring the activities of the various sectors of the economy is such a pervasive problem in a remote region that it hardly needs repeating. In Alaska entire important industries--tourism and fish harvesting--fall through the cracks because the federal government data collection methods are not designed to catch this information. Other important pieces of information, such as components of personal income are estimates, or are conceptually inappropriate for use in regional analysis. The rental value of owner occupied housing as a component of personal income is one example, and the treatment of private pension income as received at the time the employee is working rather than when the employee retires is another.

The lack of good information tracking population is another problem because the age distribution of the population and consequently aggregate labor force participation rate, household formation rate, unemployment rate, and dependency ratio can and do change from year to year due to migration. These changes effect the demand for public services as well as aggregate private consumption patterns and the population which a given level of employment can support.

5.CONCLUDING OBSERVATIONS

I have just a few general concluding observations.

First, formal models are essential for structuring information, but it is easy to become overly dependent upon them. Many important factors influencing the economy cannot be formally modeled. Ignoring them because they cannot be modeled is a mistake but a real danger because professionals like to use the most

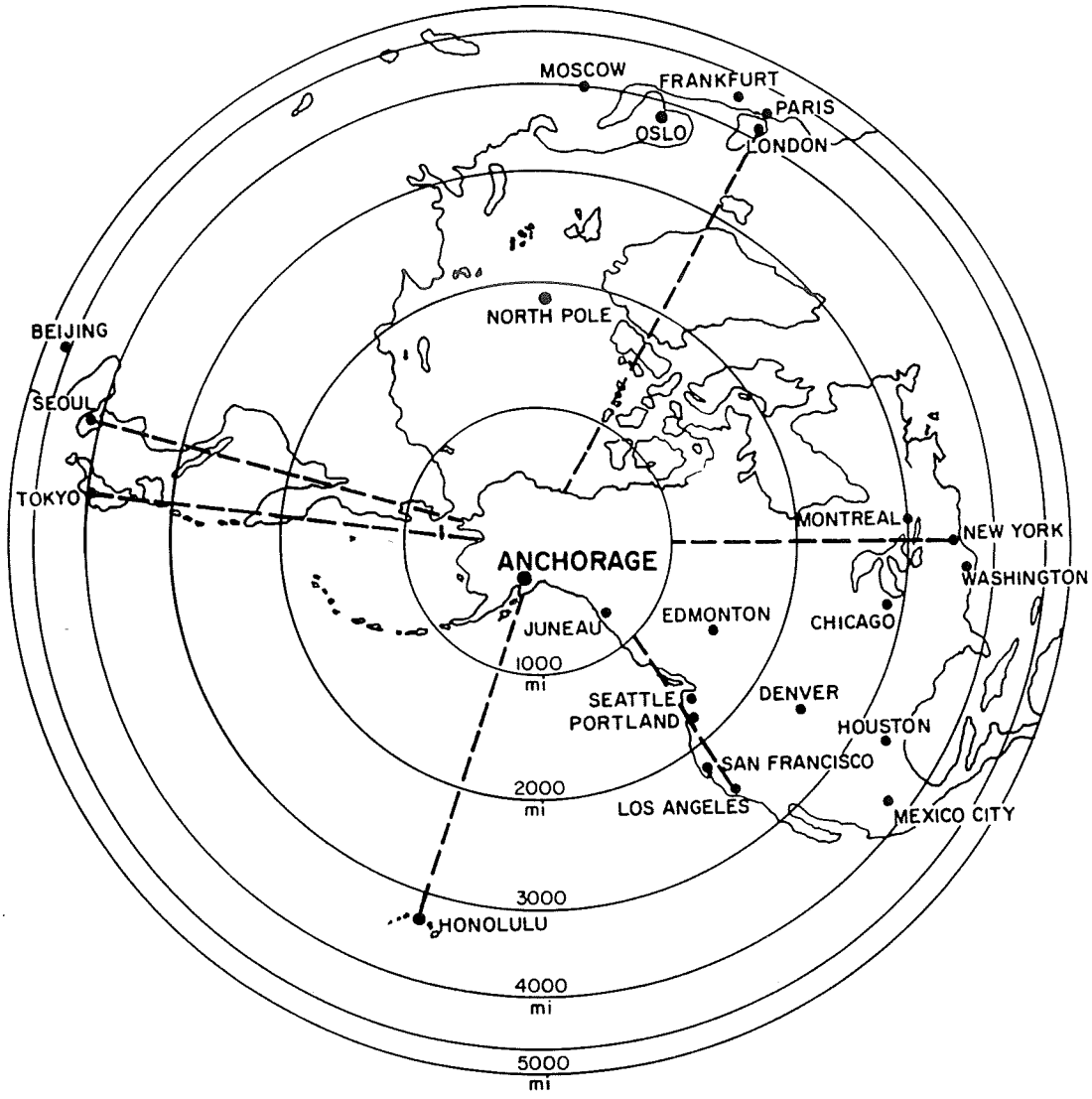
sophisticated tools of their profession. Furthermore they do not like to admit that they do not have sophisticated tools to analyze some important questions.

Second, strive to get the all the data you can, but do not become obsessed with data collection. Know how the data is gathered and what it measures. Date will be unavailable for many of the things you will want to quantify. Use professional judgement and your imagination to make estimates.

Even though the forecasting track record has not been very good the process has had tremendous heuristic value. Total emersion in the data can yield unexpected insights.

Even if prediction remains difficult there is a useful role for the forecaster in giving meaning to what has happened and in explaining what might happen under various circumstances. This both reassures and educates the public that there is a rational structure behind economic events.

Anchorage's Strategic Location for International Distribution



Air Distances/Travel Time from Anchorage to:

Domestic Destinations

City	Miles	Kilom.	Hours
Chicago	2,857	4,598	5:35
Houston	3,275	5,271	7:30
New York	3,371	5,425	8:00
San Francisco	2,007	3,230	4:25
Seattle	1,438	2,315	3:08

International Destinations

City	Miles	Kilom.	Hours
Frankfurt	4,669	7,514	8:40
London	4,487	7,222	8:30
Seoul	3,778	6,080	8:30
Teipei	4,677	7,527	8:45
Tokyo	3,461	5,570	7:00

Source: Direct line distances, Gary L. Fitzpatrick, 1986.

Figure 1.

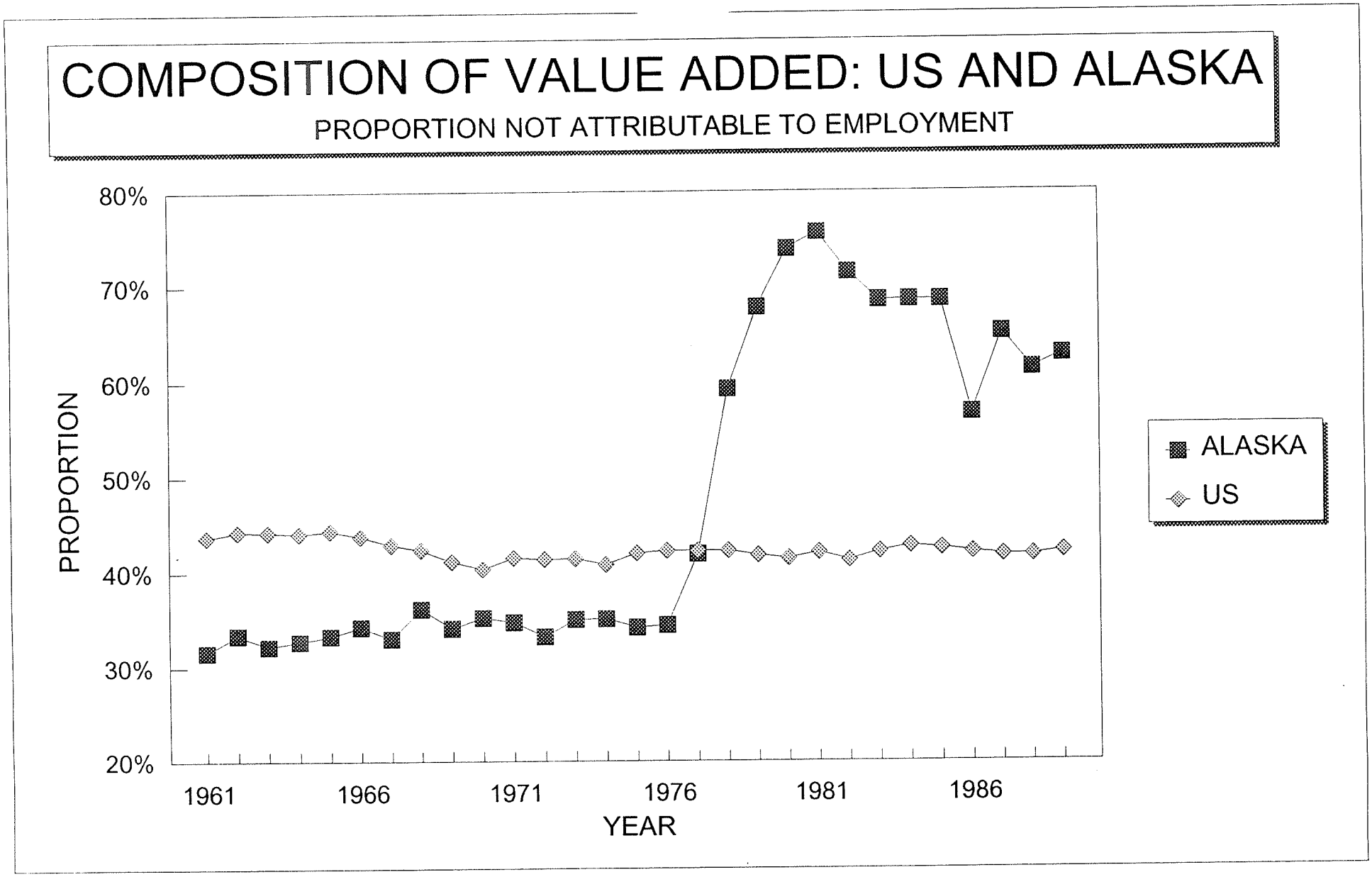

COMPOSITION OF VALUE ADDED: US AND ALASKA
PROPORTION NOT ATTRIBUTABLE TO EMPLOYMENT
80%
70%
60%
50%
40%
30%
20%
PROPORTION
1961
1966
1971
1976
1981
1986
YEAR
ALASKA
US

Figure 2.

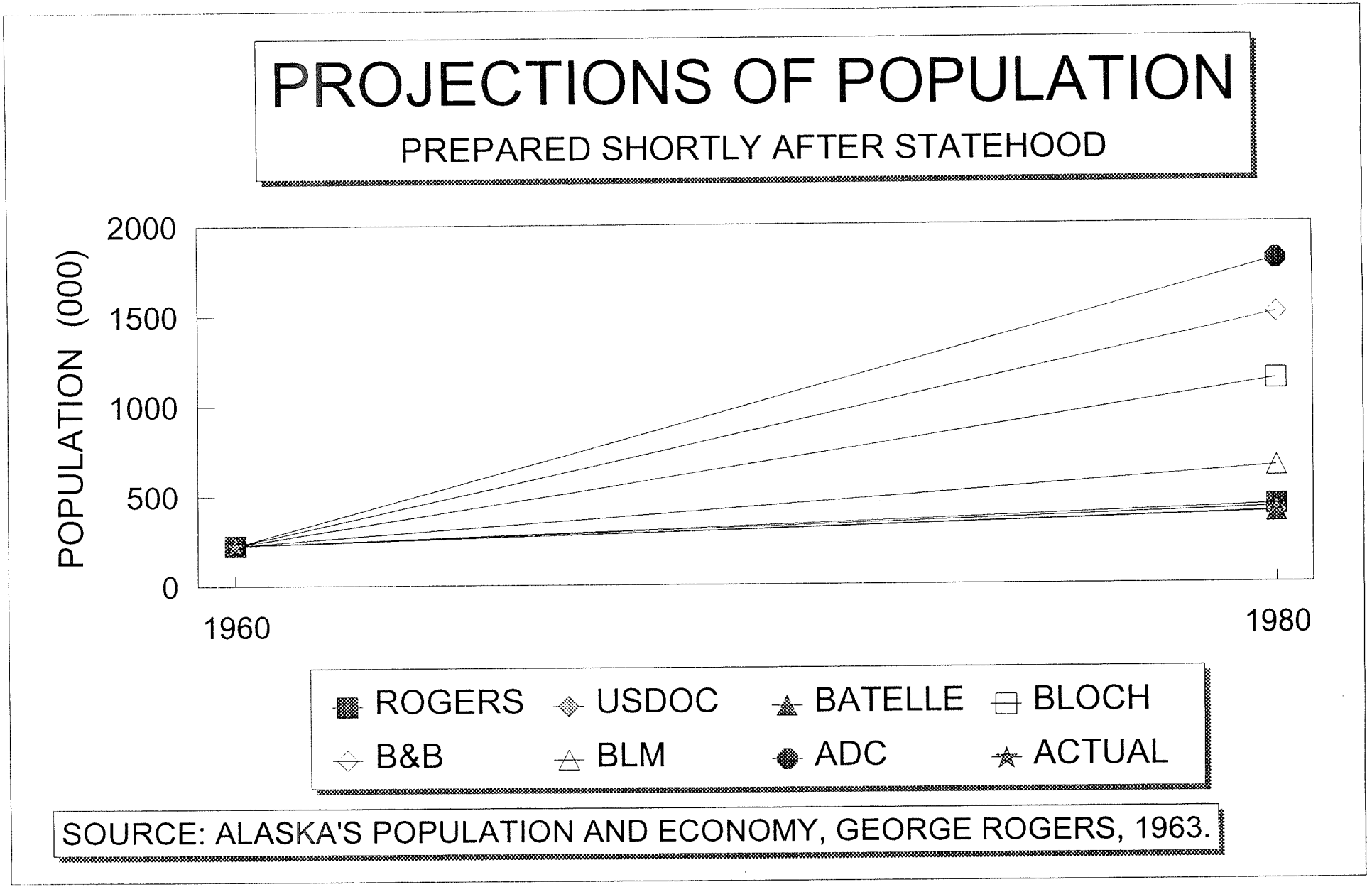
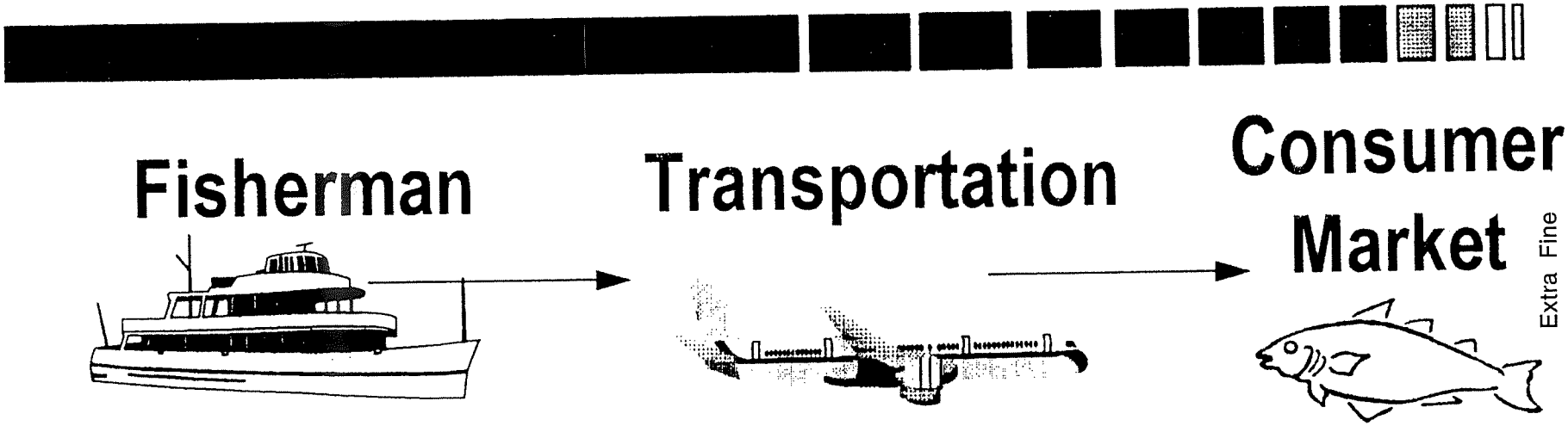

PROJECTIONS OF POPULATION
PREPARED SHORTLY AFTER STATEHOOD
POPULATION (000)
2000
1500
1000
500
0
1960
1980
ROGERS
USDOC
BATELLE
BLOCH
B&B
BLM
ADC
ACTUAL
SOURCE: ALASKA'S POPULATION AND ECONOMY, GEORGE ROGERS, 1963.

Figure 3.

The Simple Economics of Commodity Production



	Gross Receipts	Transport Margin	Consumer Price
Initial	$7	$3	$10
New	$2	$3	$5
Change	$5	0	$5
% Change	-71%	0%	-50%

Figure4.

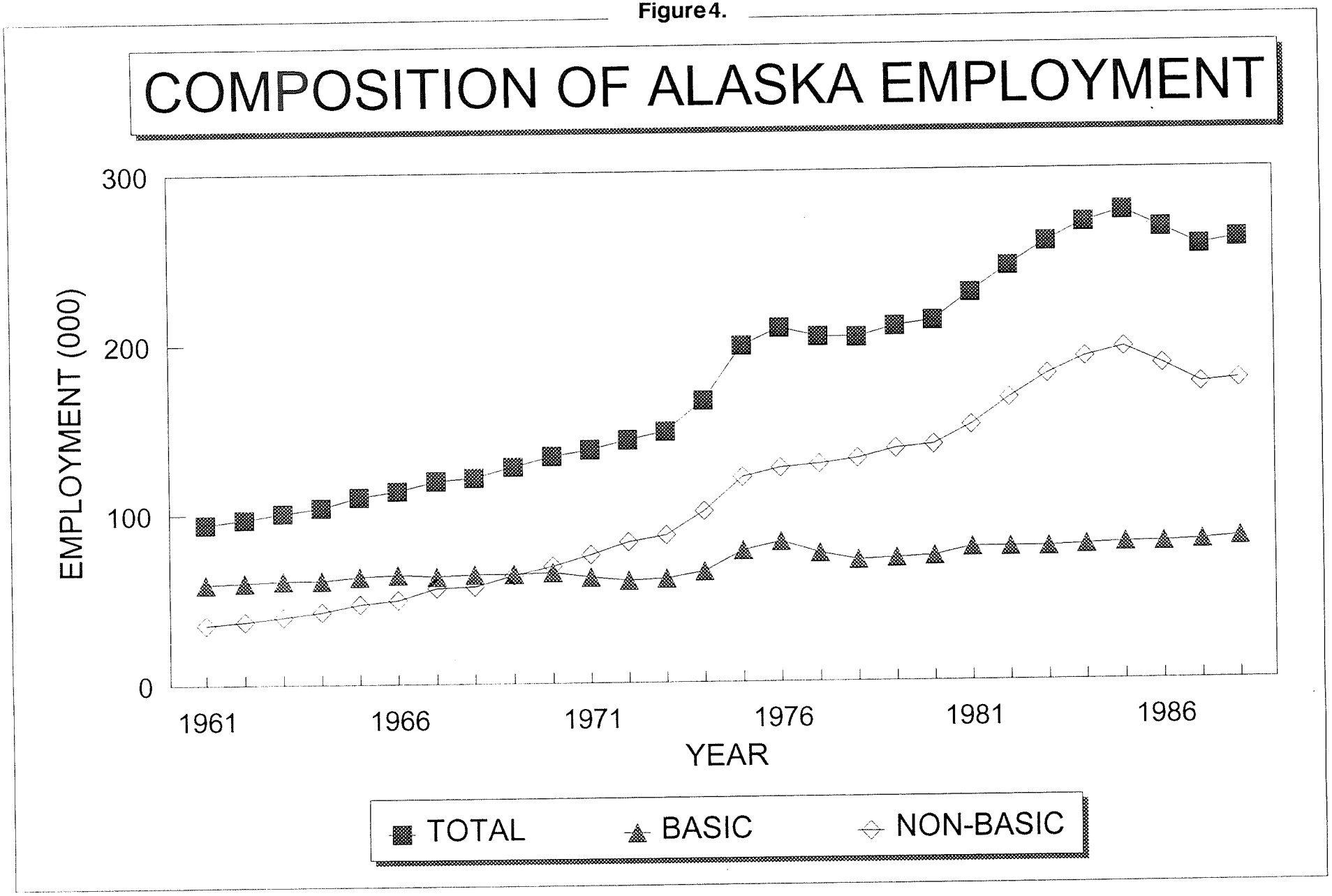

COMPOSITION OF ALASKA EMPLOYMENT
EMPLOYMENT (000)
300
200
100
0
1961
1966
1971
1976
1981
1986
YEAR
TOTAL
BASIC
NON-BASIC

Figure 5.

The Economic Base Model

Structural Model

$$\frac{\text{Total Jobs}}{\text{Basic Jobs}} = \text{Multiplier}$$

Projection Model

$$\text{Forecasted Basic Jobs} \times \text{Multiplier} = \text{Forecasted Total Jobs}$$

Components of Multiplier

1. Jobs supplying inputs to basic production.
2. Jobs providing consumer goods and services.
3. *Jobs associated with surplus.*

Table 1.

ALASKA JOBS BY SECTOR IN 1961
(THOUSAND)

TOTAL JOBS	94.32
FEDERAL GOVERNMENT--MILITARY	44.30
FEDERAL GOVERNMENT--CIVILIAN	25.94
FISHING	10.05
MINING	4.54
TIMBER	3.11
PETROLEUM	2.55
TOURISM	1.57
MISCELLANEOUS INCOME	1.43
ENTREPOT	0.82
AGRICULTURE	0.01

INSTITUTE OF SOCIAL AND ECONOMIC RESEARCH, UNIVERSITY OF ALASKA ANCHORAGE

Table 2.

ALASKA ECONOMIC GROWTH INDICATORS

	1961	1992
POPULATION (000)	237	587
EMPLOYMENT (000)	94	295
PER CAPITA INCOME (93 000$)	$10.20	$23.10
PER CAPITA PUBLIC SPENDING (93 000$)	UNDER $1.00	$6.00
COST OF LIVING (% ABOVE US AVG)	46%	15%
LABOR FORCE PARTICIPATION RATE	UNDER 60%	75%
WAGES SHARE OF HOUSEHOLD INCOME	90%	73%
PER CAPITA DISPOSABLE INCOME ALASKA % OF US AVG	78%	100%

Table 3.

PROJECTS IN BASE CASE PROJECTION OF ALASKA POPULATION PREPARED IN 1980

NORTHWEST GAS PIPELINE

NATIONAL PETROLEUM RESERVE PRODUCTION

OUTER CONTINENTAL SHELF PETROLEUM PRODUCTION

BELUGA COAL PRODUCTION

ALPETCO PETROLEUM REFINERY

PACIFIC LNG GAS EXPORT PROJECT

SOURCE: ELECTRIC POWER CONSUMPTION FOR THE RAILBELT, ISER, 1980.

Table 4.

ANCHORAGE EMPLOYMENT: ANNUAL CHANGE

FORECAST VS. ACTUAL

PERIOD	FORECAST % CHANGE	ACTUAL % CHANGE	PERCENT ERROR
86 - 87		-5.0	
87 - 88	-1.0	-0.6	60%
88 - 89	0.8	4.5	563%
89 - 90	3.0	5.7	190%
90 - 91	3.4	1.5	44%
91 - 92	0.7	1.5	214%
92 - 93	1.9	3.0	158%
93 - 94	0.9	2.6	289%
94 - 95	0.8		

SOURCE: ALASKA DEPARTMENT OF LABOR, ALASKA ECONOMIC TRENDS.