ALASKA'S ECONOMY AND HOUSING MARKET

Final Report

prepared by

O. Scott Goldsmith
Matthew Berman
Lee Huskey
Linda Leask
Teresa Hull

Institute of Social and Economic Research
University of Alaska Anchorage

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CHAPTER I. INTRODUCTION

We'll know the Alaska recession is over when we can open a newspaper and see no mention of layoffs or banks on the brink of failure; when we can go to a store we haven't been to in six months and find it still in business; when we can drive around and find no notices for garage sales that say: Everything Must Go--Leaving the State.

No one is more eager for the recession to end than the homeowners, mortgage lenders, insurers, and realtors who have watched sales plummet, prices slide, and foreclosures rise in the Alaska housing market over the past year and a half. The Alaska Housing Finance Corporation (AHFC) is by far the biggest residential mortgage holder in Alaska: in mid-1987 it held more than 60 percent of the outstanding residential mortgages in the state, with a value of $4.3 billion. Most AHFC mortgages were written after 1980. The large number and relative newness of AHFC mortgages mean that AHFC has been particularly hard hit by the effects on the housing market of the current Alaska recession. In June 1987 AHFC was holding nearly 3,000 houses, condominiums, and mobile homes in its inventory of foreclosed properties.

Given its large property holdings and its prominence in Alaska's residential housing market, the corporation may be able to help stabilize the market and has compelling reasons to try. Not only does AHFC have its balance sheets to consider; it is also a public corporation with a big stake in the health and future of Alaska's housing market.[1] AHFC hopes to minimize future defaults and foreclosures and stabilize the market as soon as possible. It asked the Institute of Social and Economic Research (ISER) to provide information it needs to plan future policies.

This report provides a wide range of relevant information: descriptions of current economic and housing market conditions; forecasts of economic recovery between now and 1995; and descriptions and analyses of housing policy options available to AHFC.

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[1]As a public corporation of the State of Alaska, AHFC is a quasi-state agency but has more independence than traditional state agencies. It is a secondary mortgage lender: it does not write mortgages directly but rather buys them from banks and other primary Alaska lenders, using mostly money raised through bond sales but also some state appropriations. The Alaska Legislature created AHFC in 1971.

Research Methods

Information on some aspects of the Alaska economy and housing market is incomplete or lacking. We collected available information from a wide variety of sources referenced in notes to tables and other appropriate points in the text and appendixes. The economic forecasts and analyses of housing market policies were made through the use of computer models developed by ISER.

The accuracy of the economic forecasts of course depends on the information and assumptions that go into the model. Because of the difficulties of forecasting in an economy as volatile as Alaska's, we made sets of forecasts that cover the likely range of future economic change rather than single forecasts. These low, medium, and high forecasts are based on different assumptions about the future price of oil, levels of state revenues, and other factors that will strongly influence Alaska's economy through the mid-1990s. Appendixes A and B of this report provide documentation of the economic model.

The housing market model used to analyze potential housing policies is linked to the economic model; it is described in the text of Chapter IV and model documentation is in Appendixes C and D.

Together the models provide a reliable picture of likely economic change in the coming years and of the effects of various housing policies.

Organization of the Report

The rest of this chapter sets the stage for Chapter II by describing Alaska's economy in general and outlining the causes of the current recession.

Chapter II provides economic forecasts for Alaska from now through 1995. It first describes current economic conditions and the effects of the recession on various regions of the state. Then, through three scenarios that involve different assumptions about the future price of oil and other factors important to Alaska's economy, it traces the probable range of economic change between now and 1995. We place most emphasis on projections from the base case, which we consider the most likely representation of future growth.

Chapter III describes recent conditions in the Alaska housing market and contrasts them with conditions during the economic boom of the early 1980s. It reports numbers of new mortgages written in Alaska in recent years; market shares of AHFC and other secondary lenders; mortgages holdings of the big lenders in 1987; liabilities of various lenders and insurers in the event of foreclosures; and numbers of Alaska properties in foreclosure as of June 1987.

Chapter IV analyzes how various AHFC policies might influence prices, foreclosures, and other aspects of the Anchorage housing market through 1992, given the economic forecasts in Chapter II.

Appendixes A through D document the economic forecast and housing market models.

Background: Alaska's Economy

In Alaska in recent years, talk about the economy has mostly meant talk about oil. High oil prices in the early 1980s brought Alaska billions of dollars and tens of thousands of new jobs. Collapsing oil prices pitched the state into the current recession. And oil prices will play a key part in determining how fast Alaska's economy recovers over the next several years, although growth in other basic industries will also be important.

Why has oil had such a pervasive influence on Alaska's economy in recent times? Before the huge Prudhoe Bay oil field was developed, Alaska was a state of relatively modest means. Military and other government spending and a handful of resource industries--fishing, mining, logging, and some oil production in Cook Inlet--formed the economic base. Alaska's cold climate, rugged terrain, and isolation historically made it an expensive and difficult place to do business; high costs and other factors restricted economic development. In recent years, improved transportation and communications have begun to alter those historical limitations, but many kinds of economic activities can still be carried out for less in other places.

Alaska's main draw--aside from its strategic military location--has been and continues to be its many natural resources. But in a number of past resource developments, little of the income from development actually made its way into Alaska's economy: entrepreneurs came in, harvested the resources, and left with most of their profits.

Unlike some earlier developments, Prudhoe Bay oil has been a bonanza for the state government and for Alaska's economy. A lucky set of circumstances made this development different. First, the state government owns the Prudhoe Bay field--which means it not only collects taxes on but also royalties from production. Second, the Prudhoe Bay field and adjacent fields produce very large amounts of oil--currently about 1.9 million barrels per day. Finally, in 1979--soon after oil began flowing from Prudhoe Bay--the world price of oil tripled and stayed high for several years.

All these circumstances taken together meant that the State of Alaska came into billions of dollars in petroleum revenues in the 1980s. But at the same time, the state became extremely vulnerable

to changes in the price of oil: throughout this decade petroleum revenues have made up 80 to 90 percent of the general revenues of the State of Alaska.

The Boom

The state government spent most of its huge petroleum revenues in ways that reached throughout the economy in the first half of the 1980s--building new roads, community centers, harbors, and hundreds of other capital projects; subsidizing loans for homebuyers, students, and others; and boosting aid to local governments, among many other things. As a result, Alaska experienced five years of unprecedented economic growth.

Stimulated by the surge in oil prices that began in 1979 and took prices above $30 a barrel by 1981, the value of oil production from Alaska grew from $5.3 billion in 1979 to a peak of $14 billion in 1981. The number of Alaska jobs in the petroleum industry itself increased 60 percent during that time, and the oil companies operating on the North Slope increased their exploration and development budgets several fold. Continuing development of the Prudhoe Bay field and the opening of smaller adjacent fields increased North Slope oil production from 1.4 million barrels per day in 1979 to 1.9 million barrels per day in 1986.

State revenues from oil production quadrupled between 1979 and 1982, growing from $825 million to nearly $4 billion. After 1982 the price of oil began to drop, and so did state petroleum revenues--but through 1985 those revenues remained high enough to support multi-billion dollar state spending. That spending tripled in the early 1980s, and both operating and capital expenditures continued to grow through 1985.

State spending averaged about $4 billion annually during the peak years of 1981 through 1983, and was the impetus for most of the growth in employment, income, and population in the state between 1980 and 1985. During that short period, the number of wage jobs in Alaska increased 36 percent, growing from 167,000 to 227,000; total personal income in the state grew 70 percent, from $5.6 billion to $9.5 billion; per capita incomes of Alaskans went from $13,830 to $18,444. Alaska's booming economy attracted tens of thousands of new residents: in just five years Alaska's population jumped 30 percent, increasing from 414,000 to 539,000.

The Recession

The recession currently gripping Alaska actually began in the last quarter of 1985. It was precipitated by the softening of oil prices that had begun as early as 1982 and the consequent slowdown in government spending. The 1986 price crash--which brought prices

down to $10 a barrel--exacerbated the economic slowdown that had already begun.

The petroleum industry cut back on spending for both operations and capital projects on the North Slope. The state government lost more than $1 billion in anticipated revenues in just six months, and was forced to make larger budget cuts earlier than anyone had expected. Those cuts in spending not only cost the economy jobs and income but also made businesses and individuals lose confidence. And that loss of confidence cost the economy more jobs and income: businesses and individuals began spending and investing less because they were worried about economic conditions.

We will look in detail in Chapter II at jobs, population, and income lost so far in the recession, how much more loss there is likely to be, and how and when the economy will turn around. Here we will just say that we expect the economy to begin recovering in 1988. Alaska will not lose all the employment and income gains made in the early 1980s. For example, when employment is at its projected low point in 1988, Alaska will still have in the neighborhood of 20 percent more jobs than it had in 1980. We project that in 1988 per capita income of Alaskans will still be 25 percent above the national average.

The recession Alaska is going through is certainly severe--but in part it has been so severe because economic growth in the immediately preceding years was so extraordinary. By no means will the economy come down as much in the late 1980s as it went up at the start of the decade.

CHAPTER II. ECONOMIC FORECAST FOR ALASKA, 1987-1995

Source of Forecasts

This chapter forecasts economic change in Alaska from now through 1995. We made these economic forecasts with a computer model developed by ISER. Documentation of the model is included in Appendixes A and B. The forecasts cover what we consider the potential range of economic change in the state in the coming years through three economic scenarios; the scenarios include different assumptions about the future price of oil and other factors that will influence economic change. Tables and figures throughout the chapter show the projected range of change under the low, medium, and high scenarios. In all cases we assume that there will be no major governmental initiative to try to further stimulate the economy--for example, no extraordinary use of undistributed Permanent Fund earnings or floating of public works bonds to finance large capital projects.

We use the medium scenario as our base case--the case we consider most likely. That case assumes an oil price close to $18 a barrel; we consider this the most likely average real price of oil in the next few years. We mainly discuss the base case projections, but at the end of the chapter we analyze what would likely happen if oil prices rose much higher or fell much further than we anticipate. The low case represents a "worst-case" scenario that we consider extremely unlikely; it is included to illustrate what could happen if there were a prolonged collapse of oil prices.

The accuracy of the forecasts of course depends on the accuracy of our assumptions. Those assumptions are reasonable, given what we know now. But we all know the Alaska economy can be volatile. Big unexpected changes that promote or impair growth could make the future economic picture significantly different from what we foresee in our base case.

Summary of Findings

We expect the current Alaska recession to end and the economy to begin growing again in the second half of 1988. The worst of the recession--as measured by job loss--is now behind us. Under our base case projections, the number of jobs in the state will grow by an average 1.4 percent annually through 1995, driven by continued strength in fishing, timber, tourism, mining, and federal government employment as well as by recovery of the petroleum industry (Table 2.1). Growth in infrastructure, support, and state and local government employment, which has accounted for most of the increase in jobs in the past two decades, will be below historical averages.

TABLE 2.1. GROWTH RATES UNDER THREE SCENARIOS: 1988-1995

(average annual percentages)

	Low Scenario			Medium Scenario			High Scenario		
	EMP	POP	HH	EMP	POP	HH	EMP	POP	HH
STATEWIDE	0%	-.3%	.1%	1.4%	.8%	1.2%	2.3%	1.5%	1.9%
ANCHORAGE/ MAT-SU	-.4	-.6	-.3	1.2	.6	.9	2.2	1.6	1.9
INTERIOR	.7	.3	.7	1.8	1.1	1.5	2.5	1.7	2.1

EMP = Employment
POP = Population
HH = Households

NOTE: Assumptions and other documentation of scenarios are in Appendixes A and B.

The world price of oil will continue to be important to Alaska's economy, influencing when the recession ends and how fast the economy recovers. Moderate fluctuations in oil prices during the next two years would have relatively little effect on when the recession ends. If the price of oil were to fall below $15 a barrel (official OPEC price) for the next two years and then return to its current level, the negative impact on the petroleum industry, state and local government spending, and business and consumer confidence would extend the recession for another year but increase its severity only modestly. On the other hand, a significantly higher oil price would improve business and consumer confidence in the short run but would not end the recession much sooner.

The rate of economic recovery between now and 1995 is also linked to petroleum prices. Within a band $2 above or below the current official OPEC price of $18 a barrel, the projected timing and rate of recovery would vary little. However, if the price were to fall immediately and remain at $15 a barrel (in inflation-adjusted dollars) throughout the next decade, the combination of continued decline in petroleum development and

state-local government activities would slow the subsequent recovery. Under prolonged lower oil prices, the number of Alaska jobs would be no higher in 1995 than in 1988. If oil prices jumped to and remained at $26 a barrel, significant increases in petroleum exploration and government spending would speed economic recovery. Employment growth in that case would average 2.3 percent annually through 1995.

Regions where basic industries are expanding will recover most rapidly. In particular, the Fairbanks economy will benefit from the thousands of additional soldiers the military plans to station at Ft. Wainwright over the next several years. Anchorage will share only indirectly in most basic industry growth, and its recovery will consequently lag behind recovery in much of the rest of the state.

Alaska's population and numbers of households have declined as the recession forced some people to leave the state. We estimate the total decline from the peak in 1985 to the trough in 1988 will be 16 thousand. The population loss has been less severe than the job loss, because a number of factors offset population loss--including a reduction in the labor force participation rate, rise in the unemployment rate, reduction in the proportion of the population of working age (those 16 to 64), and a reduction in the nonresident proportion of the labor force. We expect that the historical trend toward decreasing average household size will mean that numbers of households will decline proportionately less than population declines.

During the recovery, employment will grow faster than population or households as the unemployment rate falls and the labor force participation rate increases. Our base case projects population growth to average slightly less than 1 percent annually and household growth slightly more over the forecast period. If economic growth is faster than we expect, population could grow by as much as 1.5 percent annually; if conditions are significantly worse, population could continue to decline slightly (.3 percent annual average). Under worse or better economic conditions than we expect, numbers of households could remain virtually unchanged or increase by 2 percent a year over the next several years.

Current Economic Situation: The State Economy

The Alaska Employment Index (Figure 2.1) stood at 125 in June 1987. On this index the level of employment in January 1980 is the base (1980=100). So the June 1987 figure represented a 25 percent gain over the January 1980 level of wage and salary employment, but a decline from the peak of 38 percent above in September 1985. Between early 1980 and the peak of the "Petrodollar Boom," 60 thousand jobs were created in Alaska. In the 21 months since the start of the recession, we've lost 21 thousand jobs--a loss of 1 thousand jobs per month, but still a net gain of nearly 40 thousand jobs since early 1980.

Figure 2.1

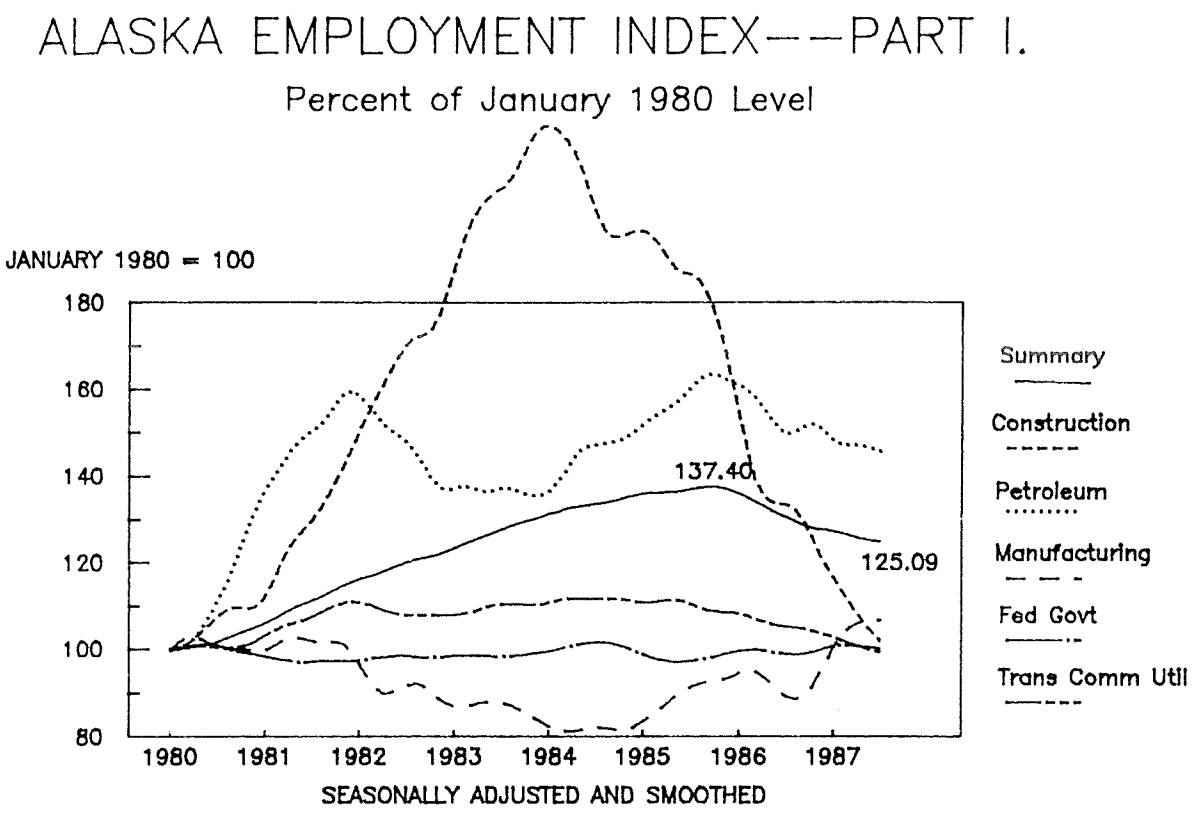
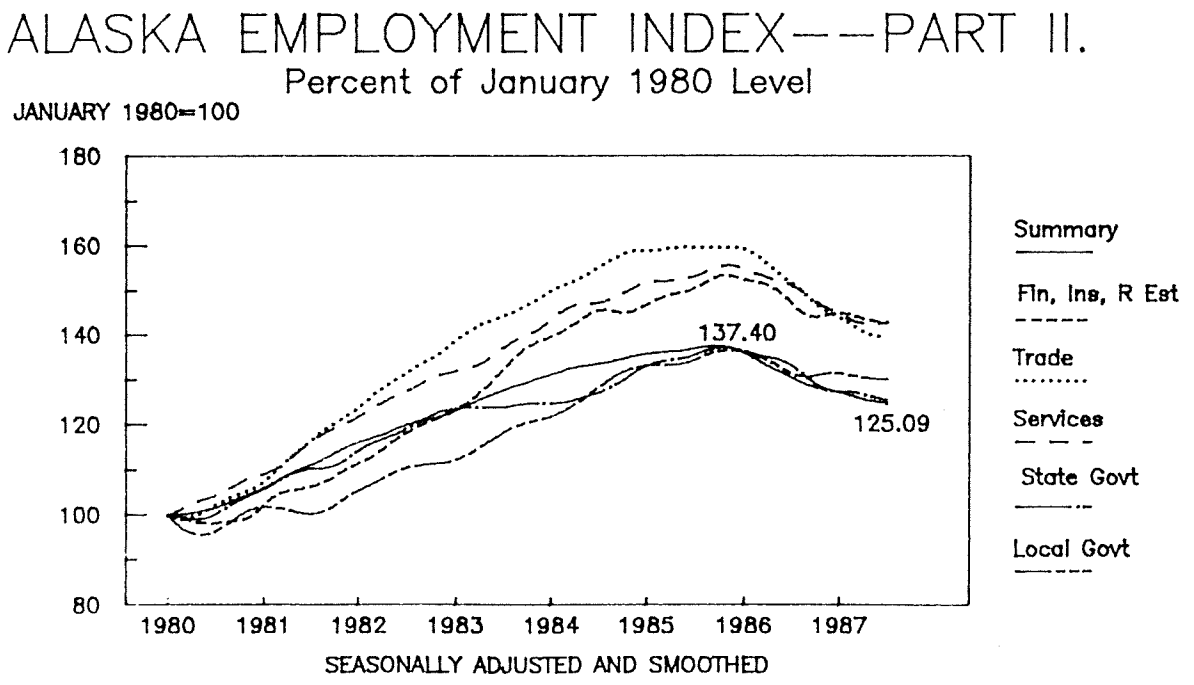


Figure 2.1



Job loss has been concentrated in the construction and support--trade, service, and finance--industries (Table 2.2). Construction has experienced the largest absolute and relative declines in jobs--12 thousand and 55 percent, respectively. There are currently 10 thousand construction jobs in Alaska--about the same number as in early 1980 when the cycle began.[1] The combined loss of 10 thousand jobs in trade and service industries accounts for the bulk of the rest of the job loss in the economy. Transportation/communications/public utilities and finance industries together have lost about 3 thousand jobs. The petroleum industry (mining) has lost about one thousand. Finally, the combined losses in employment in state and local government have, until now, been less than 3 thousand. Employment in other industries has remained constant or has increased.

The construction industry began losing jobs in early 1984, about 18 months before the start of the recession. The recession began when the economy as a whole began losing jobs; that happened when the numbers of jobs being created in support industries could no longer offset the large losses of construction jobs--so the overall number of jobs in the state began to shrink.

This pattern reflects the causes of the recession. The recession was initiated by (1) the contraction of construction activity following its very rapid expansion in the early 1980s; and (2) the overextension of business in anticipation of continued stimulus to the economy from increases in state and local government spending. These factors explain the general deterioration in the annual employment growth rate from its peak of 12 percent in early 1981 (Figure 2.2).

The recession clearly began before the precipitous drop in the price of oil beginning in December 1985 and continuing through the first six months of 1986. But the crash in oil prices made the recession longer and more severe. First, it led to a dramatic reduction of petroleum industry spending for exploration and development activities as well as a modest reduction of jobs in the industry itself. Second, it led to significant reductions in state and local government budgets--particularly capital budgets--and a lowering of expectations about the ability of government to maintain current levels of real expenditures. Finally, it significantly undermined business and consumer confidence in the economy.

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[1]All employment figures used in this study are annual averages. Monthly figures have been seasonally adjusted and smoothed to facilitate comparisons with annual figures.

TABLE 2.2. JOB LOSS FROM THE CYCLICAL PEAK
(seasonally adjusted annual average in thousands)

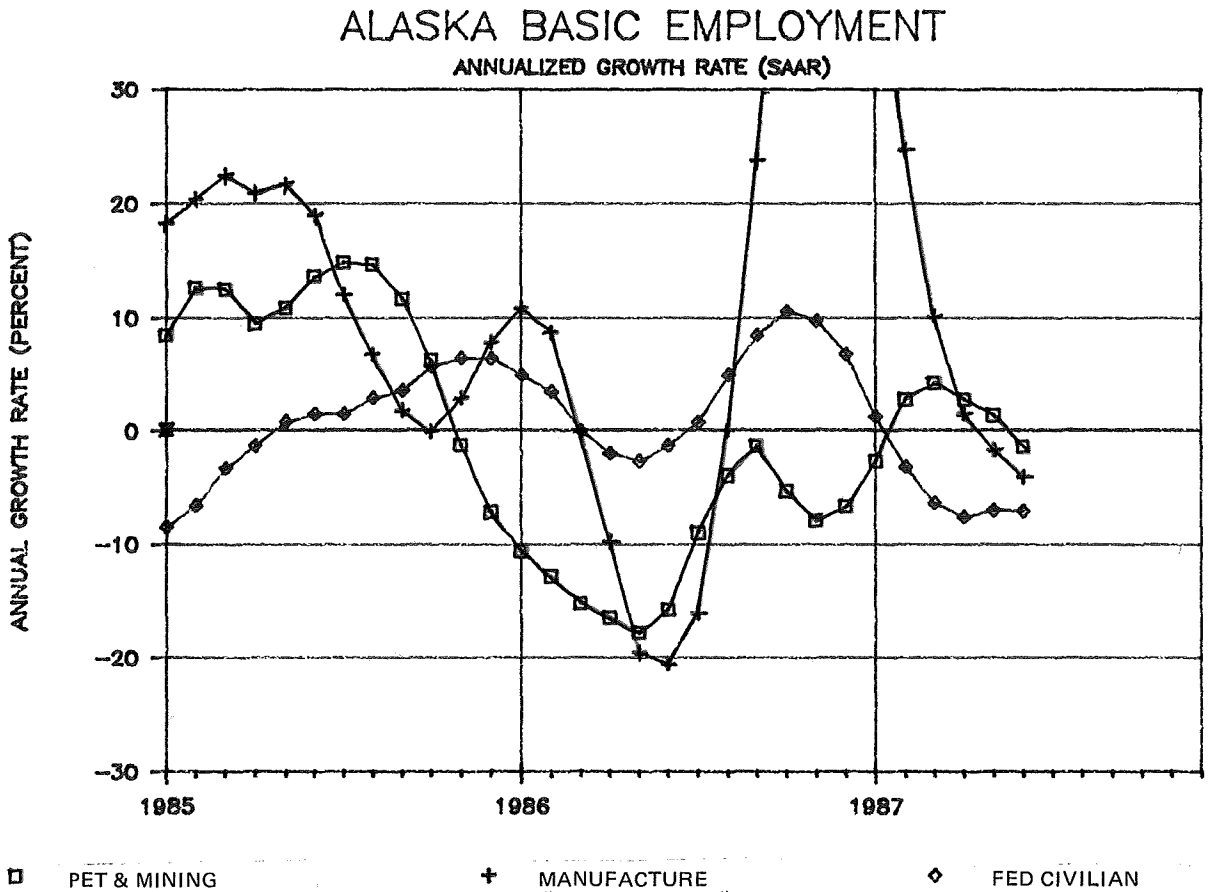
	Job Peak	Employment			
	Sept. 1985	June 1987	Loss from Peak	June 1988	Estimated Further Loss
Total Wage and Salary	230	209	21	202	7
Mining	9.8	8.8	1	9	-
Manufacturing[a]	-	14.8	-	14	1
Federal Civilian[a]	-	18	-	18	
Transportation, Communications, Public Utilities	19	17	2	17	
Construction[b]	22	10.2	11.8	8	2
Finance	11.8	11.2	.6	11	
Trade	45.9	39.9	6	39	1
Services	45.6	41.4	4.2	40	1
State Government	20.7	19.3	1.4	18	1
Local Government	29.5	28.2	1.3	27	1

[a]No significant loss from peak to date. These industries are experiencing a cyclical peak.

[b]Peak month--January 1984.

Figure 2.2

Figure 2.3



But in spite of the loss of jobs, Alaska still had 25 percent more jobs in mid-1987 than it had in 1980. The increase has been concentrated in petroleum, the support industries, and state-local government. Petroleum employment is 50 percent higher than it was in 1980; trade, service, and finance employment at least 40 percent higher; and state and local government employment about 30 percent higher. Basic industries other than petroleum are within 10 percent of their 1980 employment levels.

Alaska has lost about 1 thousand jobs per month since the recession began, but job loss is now slowing (Figure 2.2.) About 75 percent of the projected decline from the 1985 peak has already occurred. It is typical during a recession that job loss is rapid at first and then gradually slows down until employment becomes static. The annual rate of job loss is now 4 percent, as compared with 8 percent in early 1986. So the trend is clearly positive.

Our base case projects some job loss to continue into the middle of 1988 and reach bottom at a level of 202 thousand[2]. Those losses, as shown in Table 2.2, will be concentrated in the construction, trade, service, and state-local government sectors. There are several reasons why we expect more job loss in these sectors.

Construction employment is normally the most volatile over the business cycle. Employment in this industry has already fallen 55 percent from its peak, but it is still at a level equal to that of early 1980, when the economy was beginning to expand. Although the current number of construction jobs would not be inconsistent if Alaska's economy were experiencing normal growth, further contraction is likely because demand for construction services in the near term will be relatively low.

There are four sources of demand for construction services in Alaska--state and local government, the petroleum industry, other basic industries, and private capital formation (primarily real estate). Among these, basic industries other than petroleum are the only strong sources of demand right now, with expansion of military operations the most significant. Construction of residential and commercial real estate has come to a virtual halt because we have more housing and office space than we need right now. Petroleum industry demand has declined since 1986, which was a strong year in spite of the low oil price; final-phase construction of a number of large North Slope development projects took place that year. Next year will likely see less petroleum industry activity than this year. No major development projects have been announced to take up the slack that will be left this year when development of the

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[2]Annual employment will average 205 thousand for the year because of higher employment levels at the beginning and end of the year.

Endicott Field--the first offshore field developed on the North Slope--is complete. State-local government demand is also still contracting. A number of projects authorized in years past when capital appropriations were at all-time highs are nearing completion, with no projects of comparable size to replace them. As a consequence, the level of employment in the construction industry will continue to drop until next year, when it will bottom out at 8 thousand.

There are also reasons why numbers of trade and service jobs will likely continue to decline until next year. The latter phase of the rapid expansion in Alaska's trade and service sector was based on the expectation that the market would continue to grow. Consequently, some of the job loss in these sectors so far has been the result not of a shrinking market but rather of a market that stopped growing. The trade and service market grew in the early 1980s not only because of fast population growth but also because of growth in real per capita disposable income. Furthermore, direct government purchases of materials and contractual services were important sources of demand for local businesses. Those sources of market expansion are gone.

Part of the decline in these sectors is the result of a loss of business and consumer confidence in the economy. That loss of confidence will continue to hurt the trade and service sectors through this winter and into the spring of next year; continuing losses of construction and government jobs will reinforce the perception of businesses and households that the economy has not yet started to recover. As in any period of economic restructuring, adjustments in the trade and service sectors will lag behind changes in the basic sectors. For example, in the early 1980s growth in petroleum and construction employment led the economy, and it was only later that the support sectors responded.

State and local government employment will also continue to contract during the next twelve months as governments continue to adjustment to permanently lower revenues and the elimination of certain functions. The decline in state and local government jobs so far has been relatively modest in relation to the decline in expected petroleum revenues. Expenditure cutbacks to date have been concentrated in capital budgets and other areas not involving loss of state and local government jobs.

The recent pattern of employment growth by industry supports our base case projections of job loss. Basic employment growth has been strong through most of the recession and has recently stabilized (Figure 2.3, page 2-7). Infrastructure employment, with the exception of construction employment, has trended modestly downward (Figure 2.4). Support employment is still contracting, particularly in the trade sector (Figure 2.5).

Figure 2.4

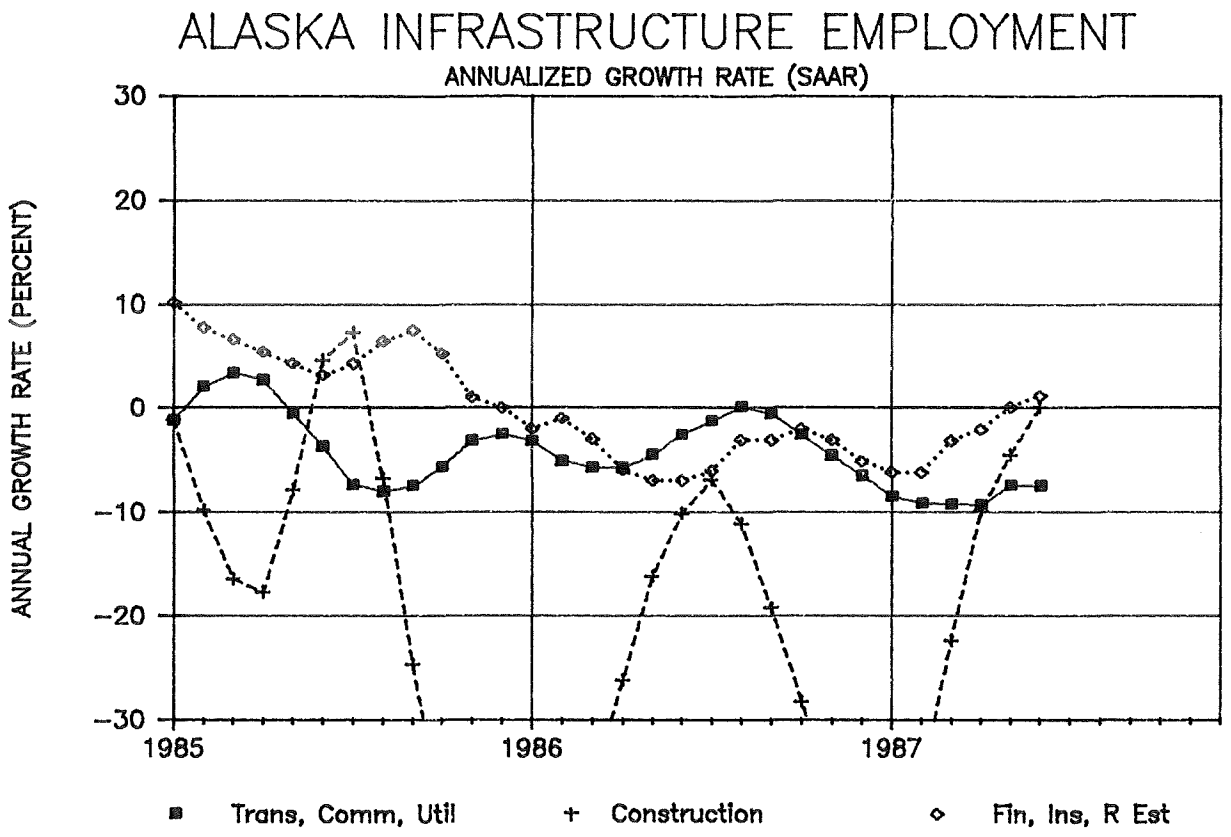
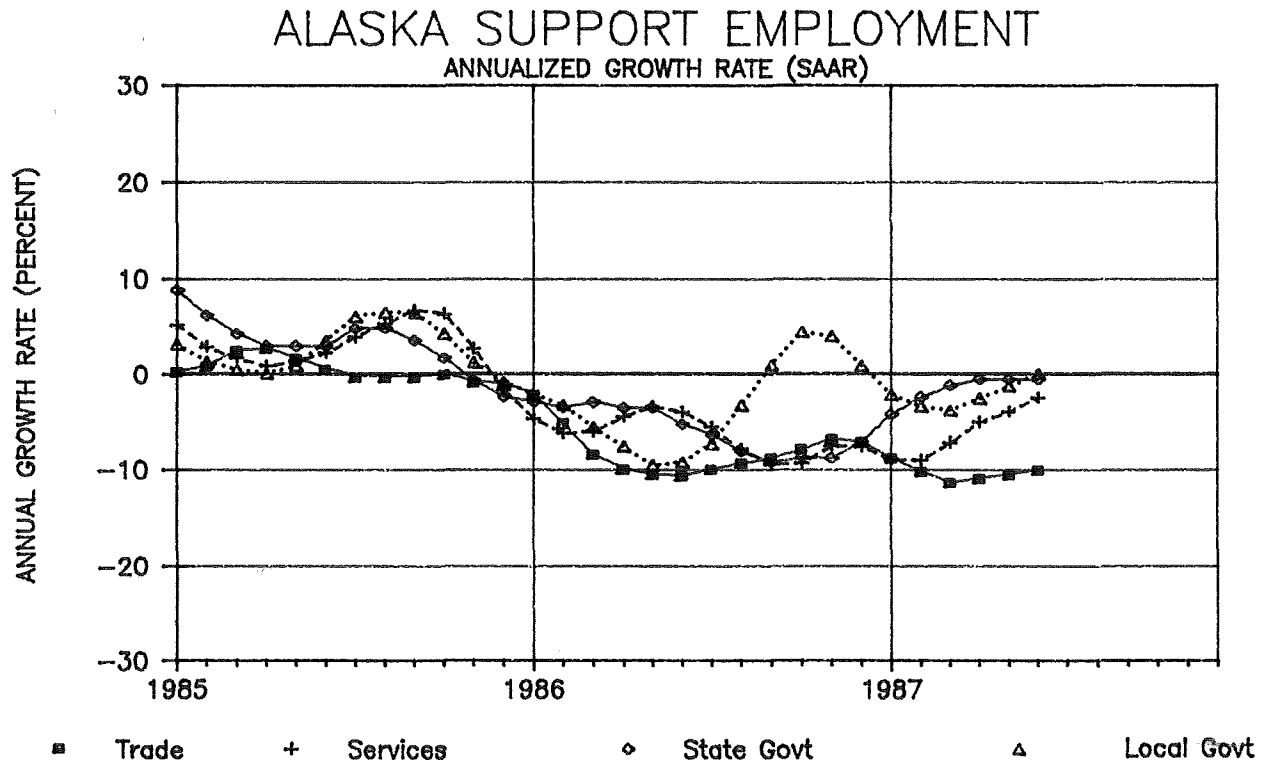


Figure 2.5



Real personal income (income adjusted for inflation) grew faster during the expansion than did either population or employment, and as a consequence real per capita personal income increased. That growth in income reflects relatively rapid growth in high-wage industries, as well as increases in transfer payments such as the Permanent Fund Dividend. Significantly, that income growth occurred early in the expansion: we reached the approximate current level of real income in the final quarter of 1982, with fluctuations within 5 percent since that time.

According to official income statistics published by the federal government, Alaska personal income and disposable personal income have contracted much more slowly than wage and salary employment has. Real personal income (in 1986 dollars) in Alaska in the first quarter of 1987 was $9.2 billion--only 5 percent less than its peak of $9.7 billion in the third quarter of 1985. Two factors may have limited income loss among Alaskans: a disproportionate share of job loss in industries--particularly construction--with many nonresident workers, and less contraction in nonwage sources of income than in wages and salaries. Although these other sources of income--transfers and interest/dividends/rent--contribute a relatively small proportion to total Alaska personal income, their strength may have helped buoy up personal income.

But the federal figures showing such a modest decline in personal income during the recession are misleading for at least two reasons. First, the statistics are probably not adequately picking up the severity of the decline in either dividend/interest/rent or proprietor income, since accurate data on these sources of income is available only after a considerable delay. Second, the concept of personal income does not measure the capital gains and losses associated with fluctuating property values and is thus an incomplete measure of both consumer purchasing power and economic well-being, particularly in times of rapid economic change.

Real per capita income (in 1986 dollars) grew rapidly in the early part of the cycle, peaking at over $19.5 thousand in 1983 and falling close to its 1980 level by 1986--$17.7 thousand. We expect the decline in real income to continue at least through 1988 as the average real wage rate falls, the unemployment rate increases, the labor force participation rate falls, and the adult proportion of the population falls. The fall in the average wage rate will be partially offset by a projected moderate rate of local inflation at least through 1987. The pattern of growth in disposable income is expected to follow closely that of personal income.

Total population and the number of households in Alaska grew through 1985 and are now declining as job opportunities decline. We anticipate a drop in population from 540 thousand in 1985 to 524 thousand in 1988, and a decline in the number of households

from 183 thousand to 179 thousand over the same period.[3] The percent decline in population and households will be much smaller than that of employment for several reasons.

First, as we noted earlier, a large share of job loss has been in those industries--like construction--with many nonresident workers. Second, although many workers who have lost their jobs have left the state, some have remained--either continuing to look for jobs or dropping out of the labor market to pursue other activities. Third, natural increase among Alaskans and the composition of the families who have left the state are tending to decrease the proportion of working-age adults (those 16 to 64) in the population as a whole. Finally, some Alaskans--particularly those over 65 and Alaska Natives--do not base their decisions about staying in Alaska on job opportunities.

Current Economic Situation: Regional Economies

Neither the current recession nor the boom that preceded it have affected all Alaska's regions equally. Both have been concentrated in those regional economies where petroleum, support industries, and government are most important.

Anchorage's economy is the largest in the state, and it has experienced most of the growth and most of the decline in the 1980s. Employment expanded more rapidly in Anchorage between 1980 and 1985--about 43 percent--than in any other major area of the state (Figure 2.6). The growth was led by expansion in the petroleum and construction industries in direct response to the increase in the price of oil. About half of Alaska's petroleum industry jobs are in Anchorage, and a large share of construction and petroleum industry employees who work on the North Slope live in Anchorage and commute.

Growth in state government and the support sectors followed growth in construction and petroleum. State government employment in the Anchorage area increased by nearly 50 percent, since half the new state government jobs created since 1980 were located in Anchorage and the nearby Mat-Su region. By 1985, 39 percent of state government jobs were in Anchorage and the Mat-Su Borough, an increase from 35 percent in 1980. In contrast, the proportion of government employment in Southeast Alaska fell from 30 to 27 percent and in Interior from 23 to 22 percent. Clearly a significant shift toward Anchorage and away from these other centers occurred (Table 2.3).

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[3]This decline appears small in relation to decline in employment. However, if there were no net migration over this three-year period, natural increase would add about 30 thousand to the population of the state.

Figure 2.6

ANCHORAGE EMPLOYMENT INDEX--PART I.

Percent of January 1980 Level

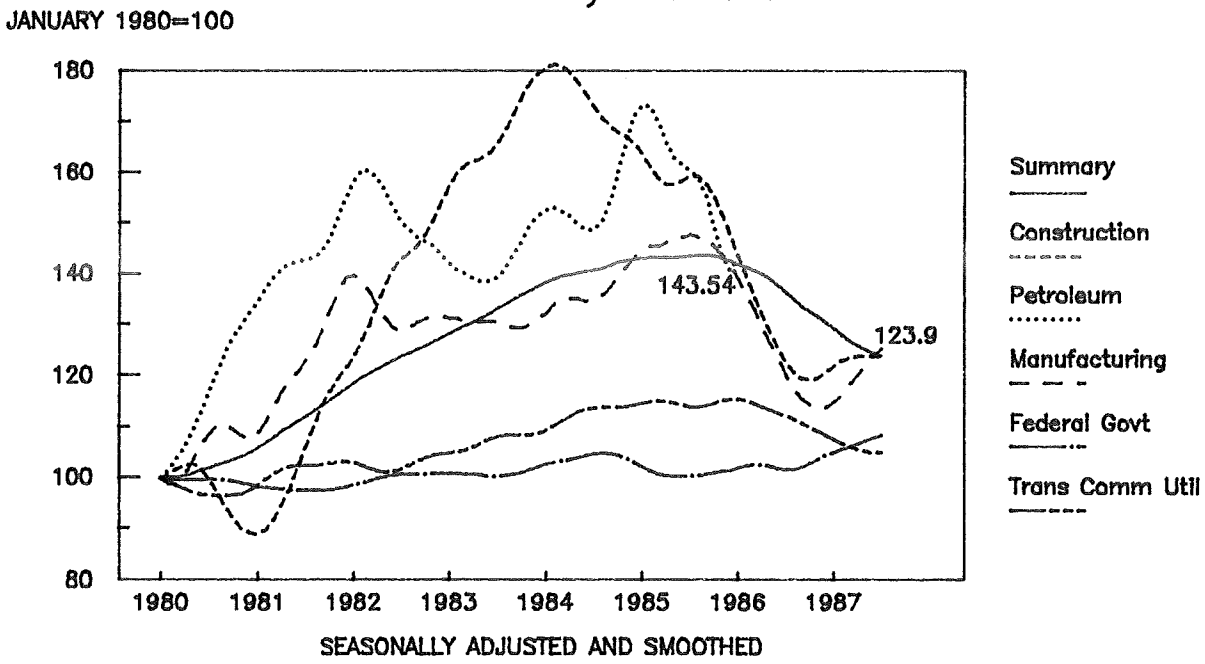


Figure 2.6

ANCHORAGE EMPLOYMENT INDEX--PART II.

Percent of January 1980 Level

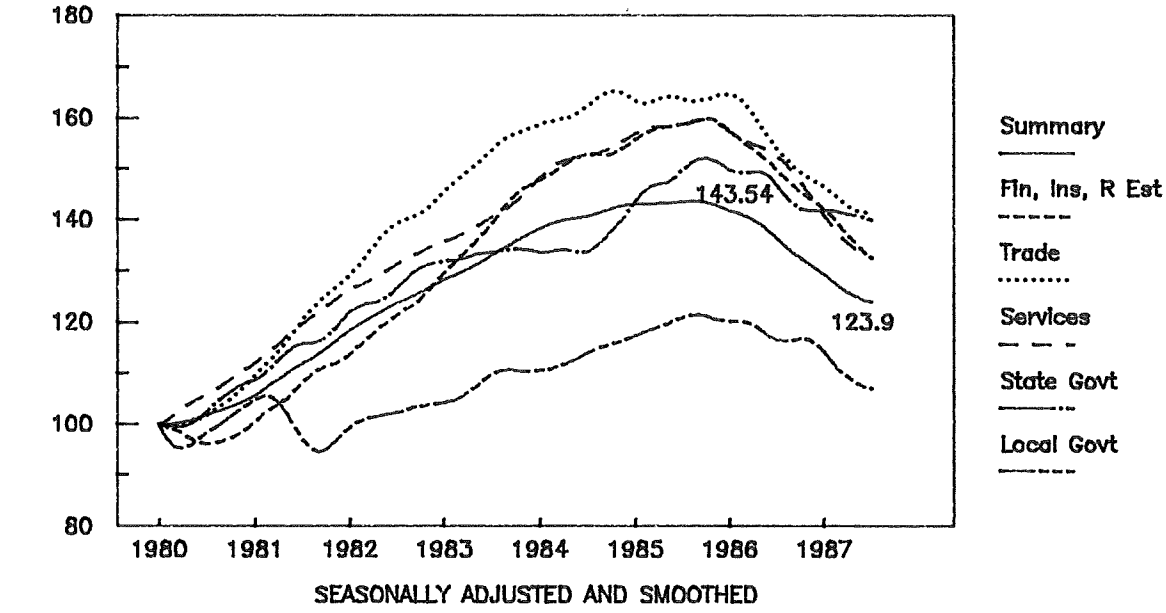


TABLE 2.3. REGION DISTRIBUTION OF STATE GOVERNMENT EMPLOYEES: LEVELS AND PROPORTIONS

	Anchorage/ Mat-Su	Southeast	Gulf Coast	Interior	Southwest	North	State
1980	5,368	4,669	1,228	3,469	349	278	15,361
1985	7,994	5,519	1,631	4,415	490	374	20,423
1980	34.9%	30.4%	08.0%	22.6%	02.3%	01.8%	100%
1985	39.1%	27.0%	08.0%	21.6%	02.4%	01.8%	100%

In contrast, local government employment in Anchorage grew only 20 percent between 1980 and 1985, lagging growth in other areas of the state. During this period, the share of local employment in Anchorage and the Mat-Su Borough fell from 37.7 percent to 34.5 percent. The greatest increases in local government jobs were in the rural parts of the state, which increased their share from 29 to 32 percent.

A large portion of the employment growth in Anchorage in the first half of the 1980s is attributable to expansion of the trade, finance, and service sectors. Trade employment in particular grew during that period--by about 60 percent between 1980 and 1985.

The smallest labor market area of the state is in the extreme north, where the North Slope oil fields are. That area also grew rapidly in the early 1980s in response to petroleum development activities and the availability of state government revenues. Employment in Southeast Alaska grew little more than 10 percent between 1980 and 1985, even though the state capital is in that labor market area. As noted above, Southeast's share of the growth in government employment--a disproportionately important element of that regional economy--was quite small. Employment growth in the other regions--Interior (Fairbanks), Gulf Coast, and Southwest--fell between the extremes of Anchorage and Southeast.

Anchorage/Mat-Su and the North Slope have been hardest hit by job loss during the recession--although all regions have seen job opportunities shrink, personal income decline, and unemployment increase. The employment level in Anchorage in 1987 has fallen to that of early 1983--or a loss of about 14 thousand jobs, two-thirds of all the job loss in the state. Since Anchorage has a disproportionate share of the jobs in petroleum, construction, and the trade, finance, and service industries, we would expect a large

share of the job loss to be in Anchorage. During the worst phase of the recession, Anchorage was losing jobs at a rate of 1 percent per month (Figure 2.7). Basic industry employment in Anchorage is dominated by strength in federal government employment (Figure 2.8). Construction employment has shown recent strength but can be expected to contract further through this summer and fall (Figure 2.9). Numbers of support jobs in Anchorage are continuing to drop, but rates of decline are beginning to moderate (Figure 2.10).

Regions less dependent than Anchorage on petroleum and statewide support activities and more dependent on other basic industries have been less severely impacted by the downturn in the economy.

Economic Projection: The State

Our base case projects the loss of jobs to continue until the middle of 1988 and then a slow recovery to begin. Statewide wage and salary employment at that time will be 202 thousand, a loss of 28 thousand jobs from peak 1985 levels. That loss will put employment at the level of the last quarter of 1982 and 20 percent above the level of early 1980. Alaska's population will be 524 thousand, representing a loss of 16 thousand from the peak but an increase of 25 percent over 1980. Real personal income for 1988 will be down $800 million for a loss of 8 percent from 1985, but about 35 percent above the 1980 level.

Growth during the recovery will be slow by Alaska's historical standards. Our base case projects employment growth to average 1.4 percent annually between 1988 and 1995, household growth to average 1.2 percent, and population growth to average .8 percent. Employment will grow faster than either the number of households or the total population because the recession has created excess capacity in the labor force.

Job loss will end when the excess capacity in the construction, state-local government, and support sectors has been eliminated. Numbers of Alaska jobs will then begin to grow in response to growth in the basic sectors of the economy, including petroleum, as well as a stabilization in the level of state and local government activity.

Petroleum is the dominant basic industry in the state, as measured by its contribution to gross state product and its potential for expanding rapidly and stimulating the economy. The recovery of the petroleum industry in Alaska is at least two years away because of the long lead time required for developing major fields on the North Slope and because the world oil price has not yet stabilized at a level that justifies significant new North Slope development. We expect oil prices over the next four years to fluctuate within a band of about $2 on either side of the current world price of $18 a barrel (the current official OPEC posted

Figure 2.7

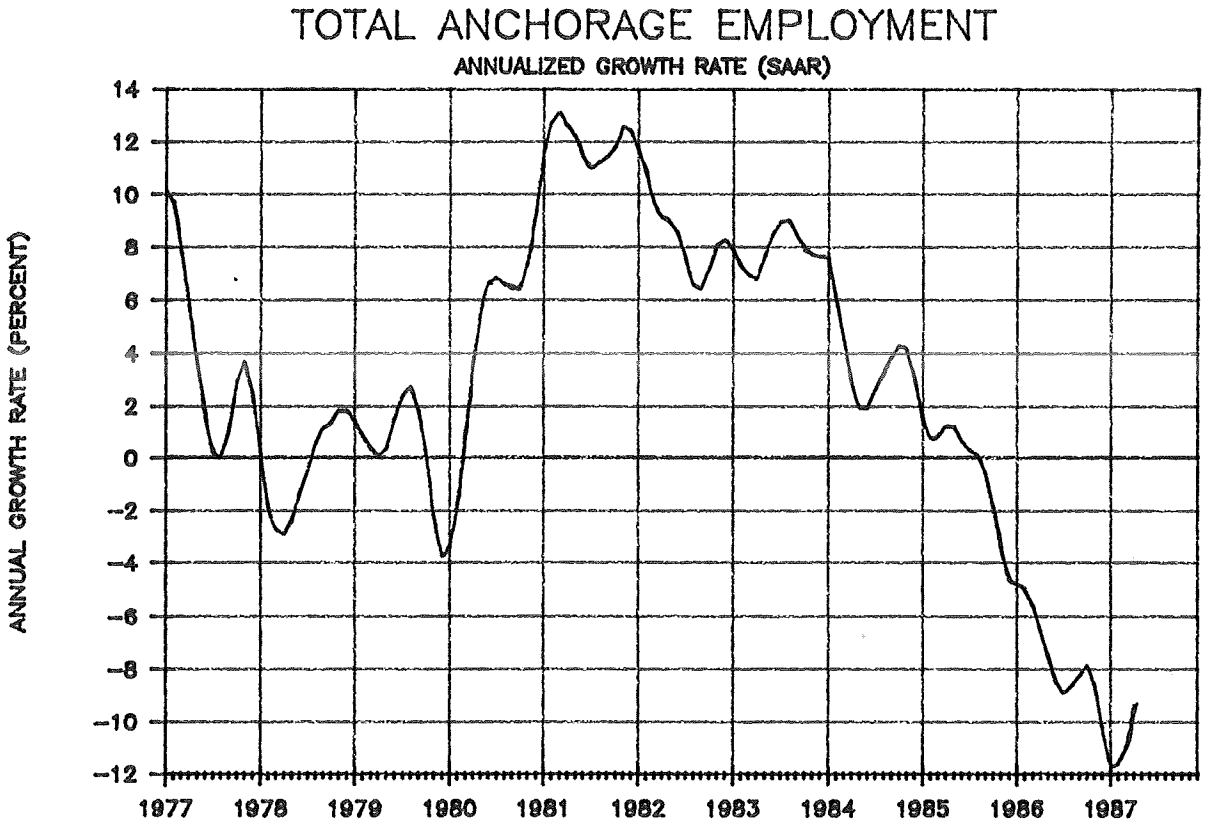


Figure 2.8

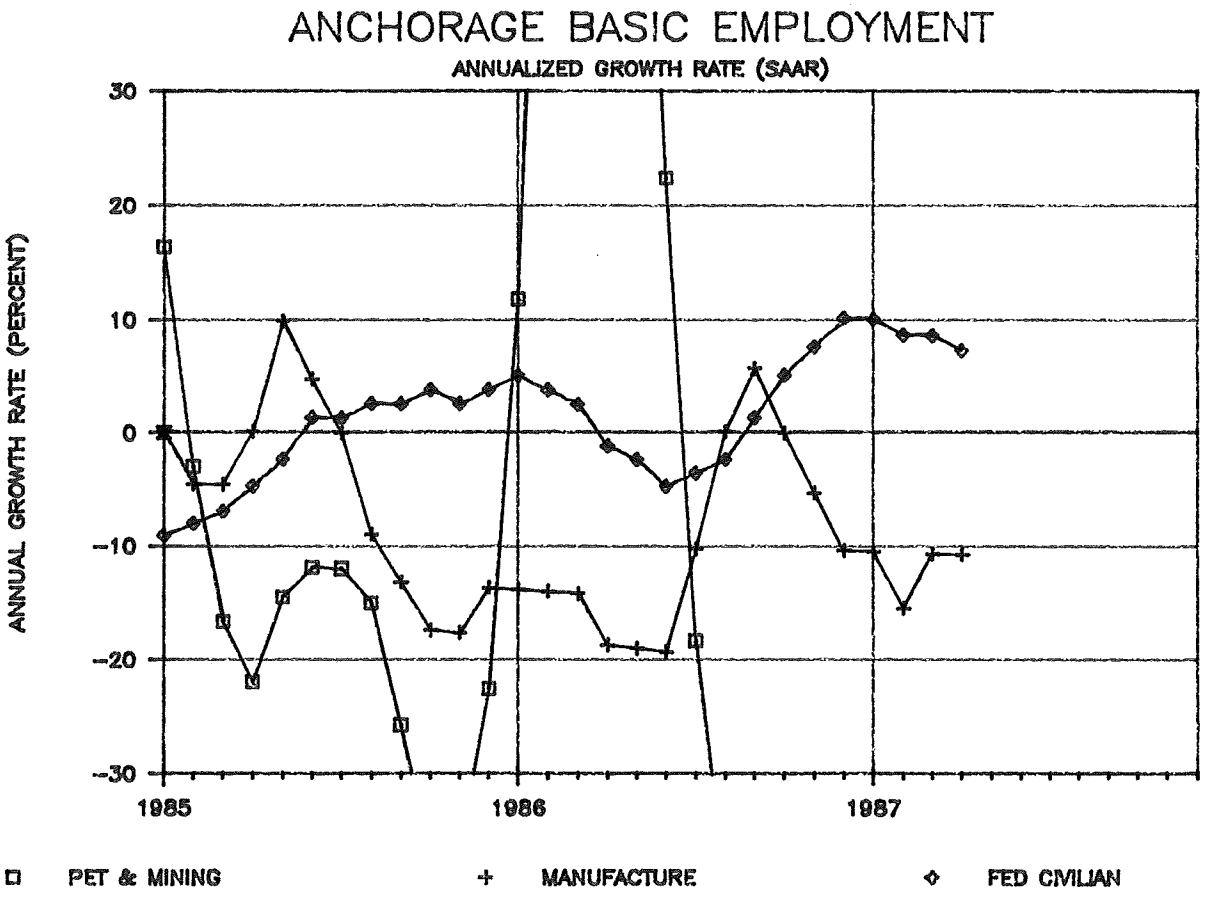


Figure 2.9

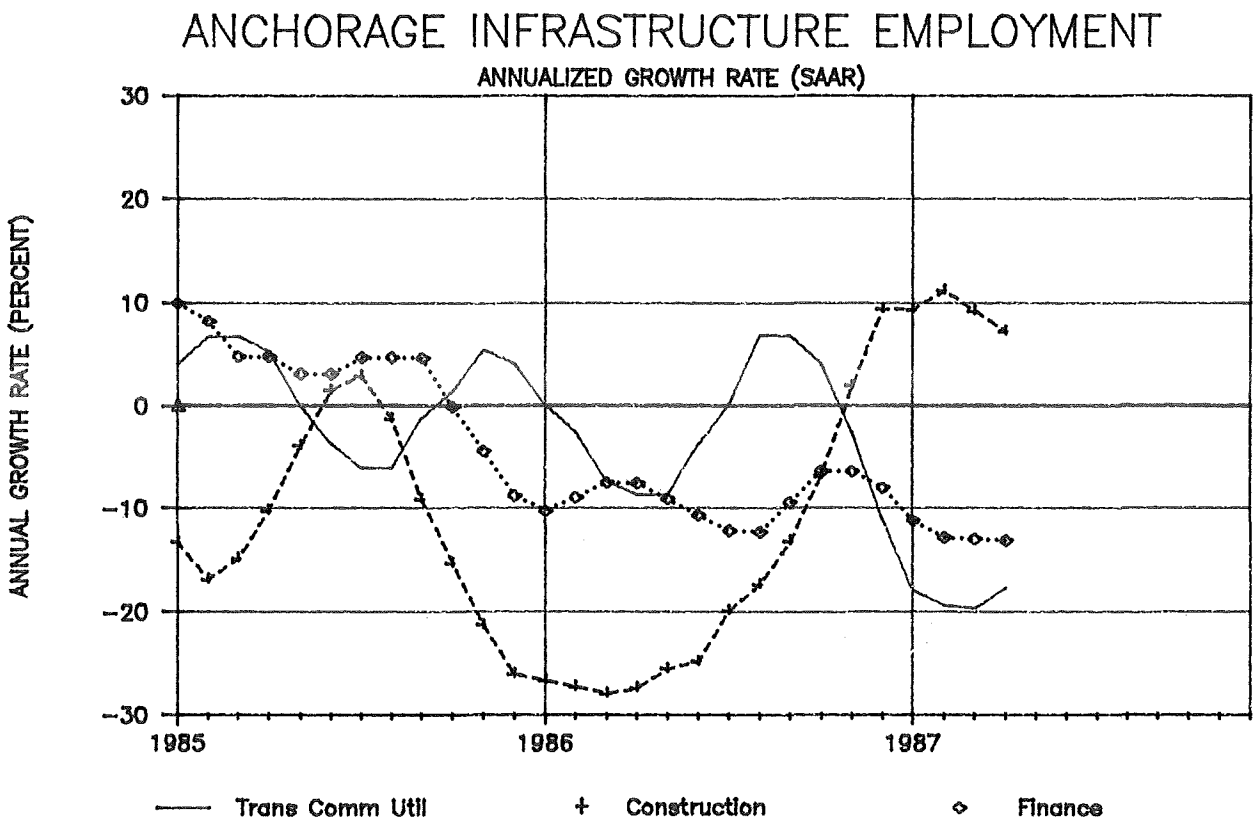
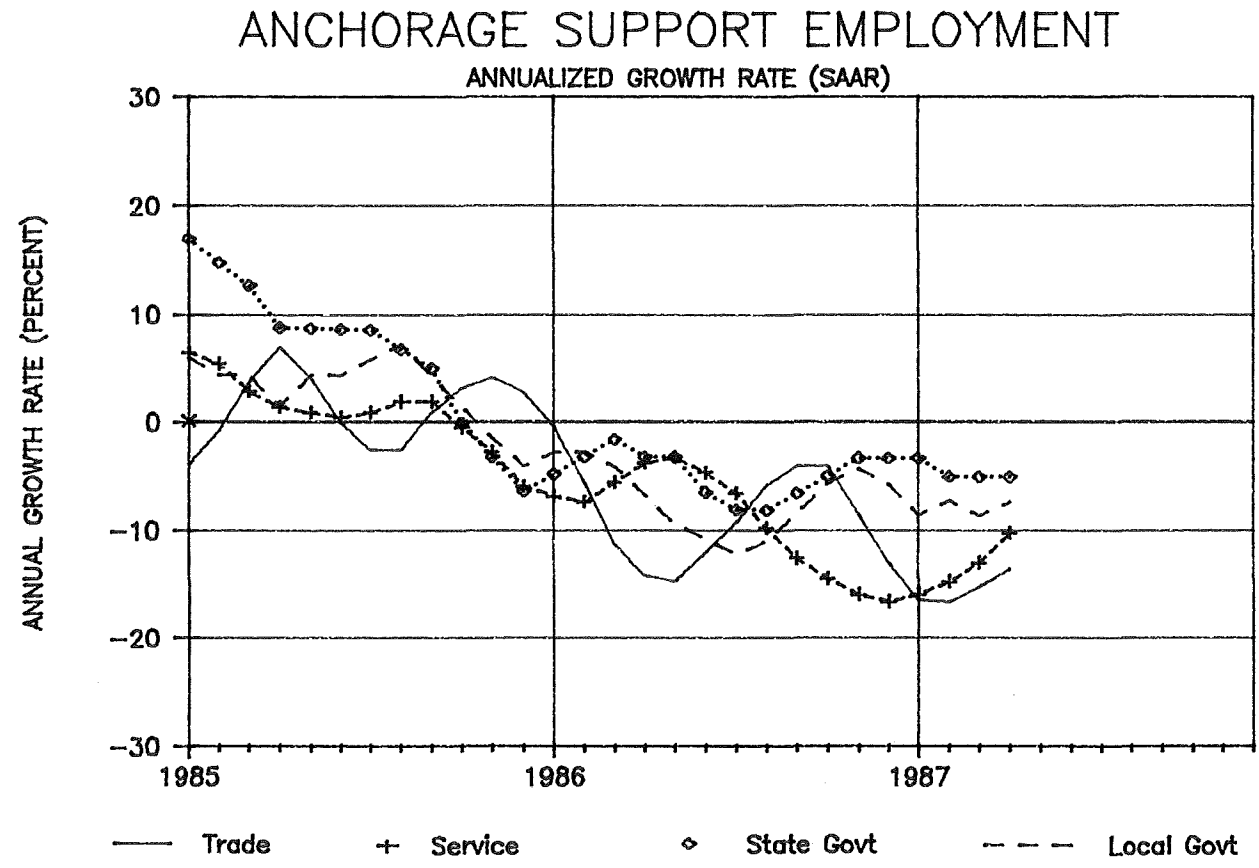


Figure 2.10



price). Within that range, the industry will begin a slow recovery and will cautiously undertake carefully selected development activities.[4]

After 1990 the price of oil will firm and more exploration and development will take place. Any petroleum leasing allowed within the Arctic National Wildlife Refuge (ANWR) will not have an appreciable effect on industry employment or industry demand for construction services for a number of years because of the time needed to carry out exploration drilling--an activity with much less economic impact than field development.

We assume that the initial thrust for economic recovery will come from growth in Alaska's other basic industries, all of which are relatively healthy and have opportunities for expansion.[5] During the recession, these industries have been strong and have helped moderate the overall economic decline (Figure 2.11 and Table 2.4). Mining, fishing, timber, tourism, and federal government combined do not generate as much gross state product as does the petroleum industry--but they directly contribute about 70 thousand jobs to the economy, and growth in the number of these jobs will clearly benefit the economy.

The expansion of the mining industry will, in the short run, be based primarily on development of the Red Dog Mine in Northwest Alaska and the Greens Creek Mine in the Southeast. A number of smaller mines are currently in the early stages of development in the Southeast and Interior.

The fishing industry is benefiting from strong demand for fish products and recent legislation restricting more fisheries to U.S. fishing boats. Opportunities for expansion exist in mariculture, bottomfishing, and specialty markets. This is a dynamic and highly competitive industry, and Alaska producers and processors will have to adapt to changing technologies and market conditions to remain competitive. We assume that the number of jobs in this industry will grow moderately.

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[4]As a rule of thumb, the OPEC posted price is roughly equivalent to a West Texas intermediate crude price. The price of North Slope crude delivered to the Gulf Coast will be $1 to $1.50 per barrel below these often-quoted prices. When the Persian Gulf and U.S. Gulf prices are not in equilibrium, this relationship will not hold. For example, in the summer of 1987, the West Texas spot price rose to $22 while the OPEC posted price remained at $18.

[5]The assumptions used in the projections presented in this chapter are listed in Appendix A. Detailed tables of projection values are presented in Appendix B.

The timber industry has been enjoying a boom in Alaska recently, particularly in the Southeast, because Native corporations are harvesting more timber from their lands. We anticipate that increased harvesting will continue into the early 1990s and that employment in the industry will then stabilize. No additional processing of timber--beyond what is already being done--is likely to take place in Alaska.

We expect tourism to continue to grow. Among the large projects under discussion are construction of new visitor facilities at Denali National Park and development of a large winter resort in the Eagle River valley just north of Anchorage. Anchorage is also making a bid to host the 1994 Winter Olympics. More efforts are being made to market Alaska to foreign tourists--a prospect made easier by the fall in the value of the dollar. We expect the trend in the number of tourist visitors to Alaska to continue its historical pattern.

Civilian federal government employment has historically been the most stable component of basic sector employment in the state, and we project that it will continue to provide a stable base for the economy. Numbers of federal civilian jobs in Alaska have increased slightly over the last 18 months, even though the Alaska Railroad was transferred from federal to state ownership, and the Gramm-Rudman initiative limiting federal expenditures has been in effect. We expect federal employment to remain stable until 1990 and then resume its slow historical growth pattern.

Military employment in Alaska is expected to grow rapidly through 1989, with the assignment of a new light infantry division to the state; most of that division will be in Fairbanks. That division will add nearly 4,000 military and federal civilian jobs directly to the economy.

That military expansion accounts for most of the basic industry employment growth we expect over the next 3 to 4 years. Figure 2.11 shows the pattern of growth in basic sector employment historically from 1980 and projected to 1995. We expect seven thousand new jobs to be added to Alaska's basic sector between 1987 and 1995--an increase of 9 percent that will be concentrated in military, mining (including petroleum), and to a lesser extent other basic sectors.

Figure 2.11

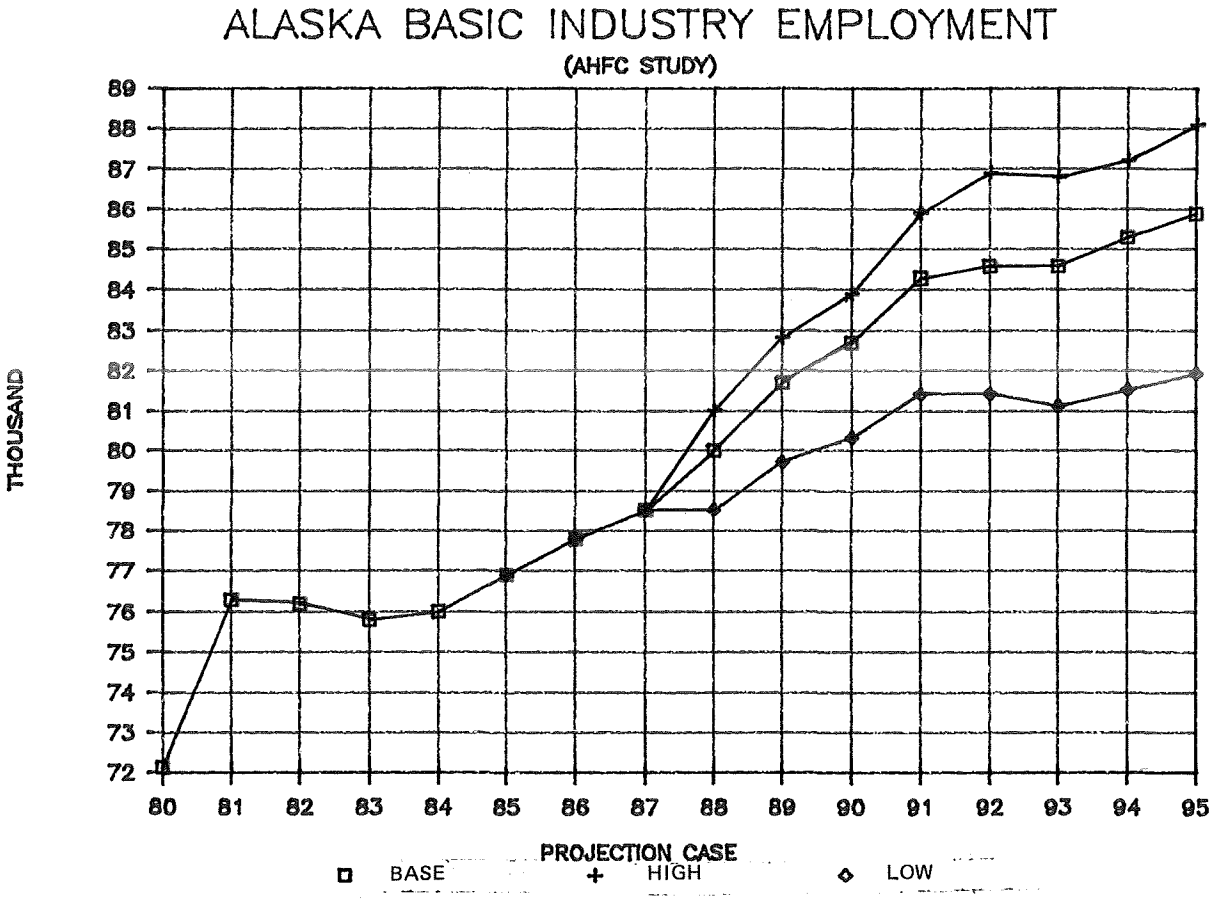

Figure 2.12

TABLE 2.4. INDICATORS OF BASIC INDUSTRY ACTIVITY
(values in nominal dollars)

P E T R O L E U M

	Value of Production ($ million)	Volume		Pipeline Employment (thousands)	Industry Employment (thousands)
		Oil (million bbls)	Gas (bill cubic ft)		
1960	$1	0.6	0.2	0	-
1965	36	11.1	7.3	0	.7
1970	279	83.6	111.6	0	2.6
1975	369	69.8	160.3	0	3.4
1980	9,825	591.6	174.5	0.9	6.2
1981	14,023	587.8	190.4	0.9	8.1
1982	12,576	618.5	201.8	0.9	8.1
1983	11,367	628.9	212.7	0.9	7.4
1984	11,440	626.9	212.7	0.9	8.0
1985	11,467	665.6	223.9	0.9	8.9
1986	-	681.3	-	0.9	8.0

	TIMBER HARVESTING		FISH PROCESSING**	TIMBER PROCESSING	PETROLEUM PROCESSING
	Volume (million* board feet)	Employment (thousands)	Employment (thousands)	Employment (thousands)	Employment (thousands)
1960	367.2	-	-	-	-
1965	440.0	1.1	3.0	1.2	0.0
1970	628.0	1.7	3.7	1.0	0.1
1975	468.4	2.2	4.3	1.2	0.1
1980	589.1	2.5	7.8	1.0	0.2
1981	564.3	2.2	8.1	1.0	0.2
1982	593.2	2.1	6.9	0.8	0.2
1983	525.7	1.8	6.3	0.8	0.2
1984	491.6	1.7	5.8	0.6	0.2
1985	543.0	1.7	6.4	0.6	0.2
1986	-	-	6.6	0.6	0.2

*Harvest on public lands only.
**Includes some other food processing.

TABLE 2.4 (continued)

	MILITARY	FEDERAL CIVILIAN	TOURISM		AGRICULTURE
	Employment (thousands)	Employment (thousands)	No. of Tourists (thous.)	Employment (thousands)	Value of Production ($ millions)
1960	32.7	-	-	-	-
1965	33.0	17.4	70	.7	$5.6
1970	31.4	17.1	129	1.3	5.3
1975	25.3	18.3	285	2.9	5.2
1980	22.0	17.7	439	4.4	9.2
1981	22.5	17.5	447	4.5	9.7
1982	22.1	17.6	467	4.7	12.2
1983	22.3	17.7	485	4.9	12.6
1984	22.6	18.1	519	5.2	15.4
1985	23.1	17.6	555	5.5	16.2
1986	-	18.0	590	5.8	15.1

	FISH HARVESTING			MINING		
	Value ($ million)	Volume (million lbs.)	Employment (thousands)	Coal Volume (million tons)	Total Value* ($ million)	Employment (thousands)
1960	-	-	-	0.7	$19.8	-
1965	-	-	4.6	0.7	46.8	0.4
1970	-	-	4.7	0.8	54.3	0.6
1975	$127.8	444.3	4.4	0.8	146.6	0.4
1980	562.8	994.4	7.6	0.8	152.6	0.5
1981	646.1	1,001.9	7.8	0.8	188.6	0.8
1982	578.5	907.3	8.3	0.8	196.3	0.8
1983	549.8	990.2	7.9	0.8	212.2	0.8
1984	510.8	1,004.1	8.2	0.8	199.4	0.7
1985	604.8	1,105.4	-	1.4	226.6	0.6
1986	-	-	-	1.5	198.5	-

*Including all minerals and sand/gravel.

State and local government spending was the primary driver behind Alaska's economic expansion of the early 1980s. Reduced revenues have necessitated significant spending cutbacks at all levels in all regions of the state. State and local governments have been reluctant--understandably--to lay off workers, and most of the cuts so far have been in capital expenditures, loan programs, procurement, and wage rates. Because of the unprecedented economic contraction the state has experienced, we believe state and local governments will be under tremendous political pressure to maintain expenditure levels while at the same time holding the line on household and business taxes. Evidence of this pressure are the modest cuts the 1987 Alaska Legislature made in the state operating budget, even though deficits of several hundred million dollars were at the time projected for fiscal 1987 and beyond (Figure 2.12, page 2-20).

At a world oil price of approximately $18 a barrel (the current official OPEC posted price), state petroleum revenues augmented by a quarter of the earnings of the Permanent Fund and one-time settlements of oil price and ownership disputes with the federal government and the oil companies will be sufficient to support the current level of state government spending through 1990 (Figures 2.13 and 2.14).[6] After 1990, reimposition of the personal income tax could provide sufficient funds to keep state spending at $2 billion (in 1986 dollars) until 1994--when it would be necessary to eliminate the Permanent Fund Dividend. Other combinations of the timing for these revenue-enhancing measures could produce the same levels of new revenues with slightly different economic impacts. Either reimposing the income tax or eliminating the dividend would cause the economy to contract because private purchasing power would be reduced. But these measures would also stimulate economic expansion because of the increase in public sector purchasing power they would produce.

Slightly higher or lower oil prices will not significantly affect the level of petroleum production in Alaska in the next few years but will be reflected in state petroleum revenues as changes in revenue per barrel of production. Within this range of slightly higher or slightly lower oil prices, the state government could maintain its current level of spending with some combination of use of Permanent Fund earnings, reimposition of the personal income tax, reduction of the Permanent Fund Dividend, or increase in petroleum tax rates.

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[6]We assume the state will receive these settlements incrementally; large lump sum settlements could create short-term fluctutations in state spending.

Figure 2.13

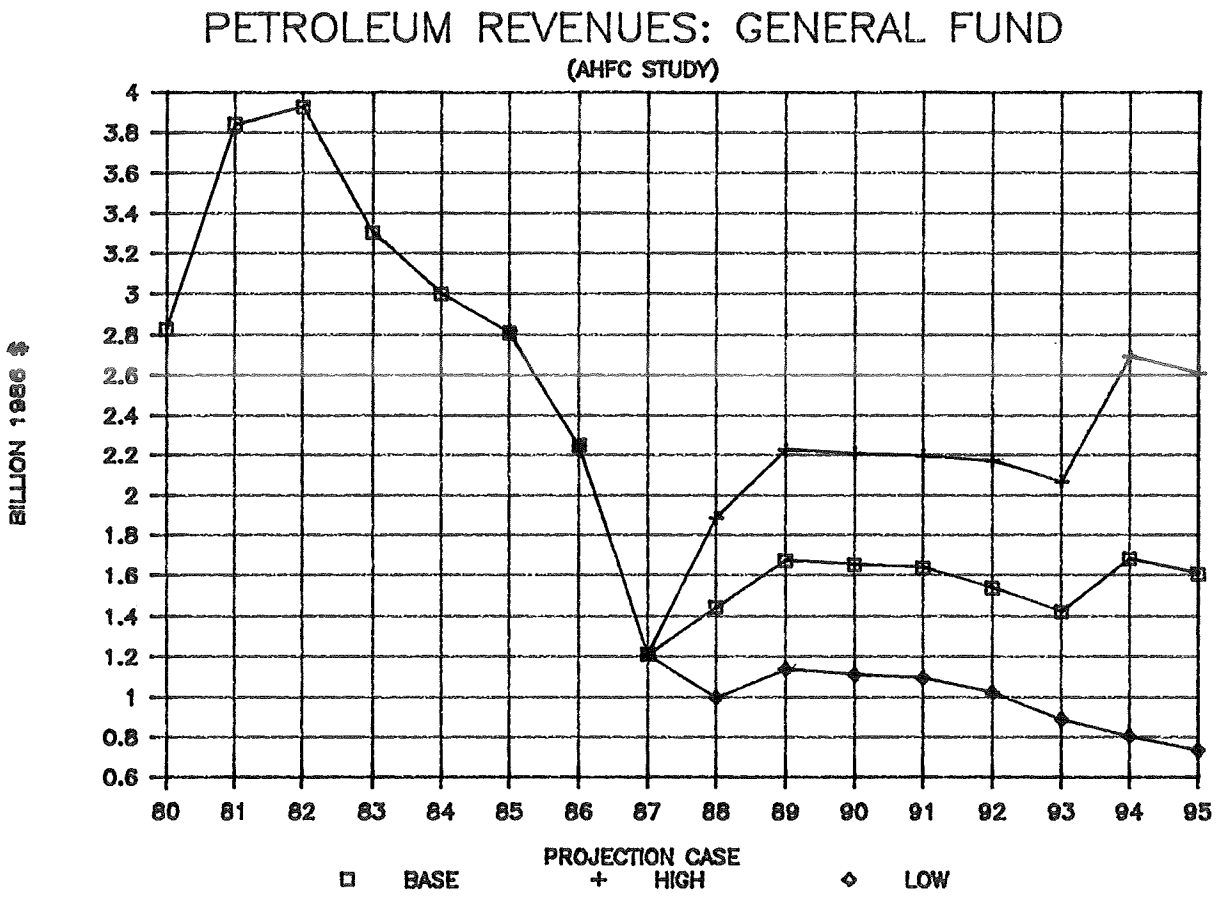
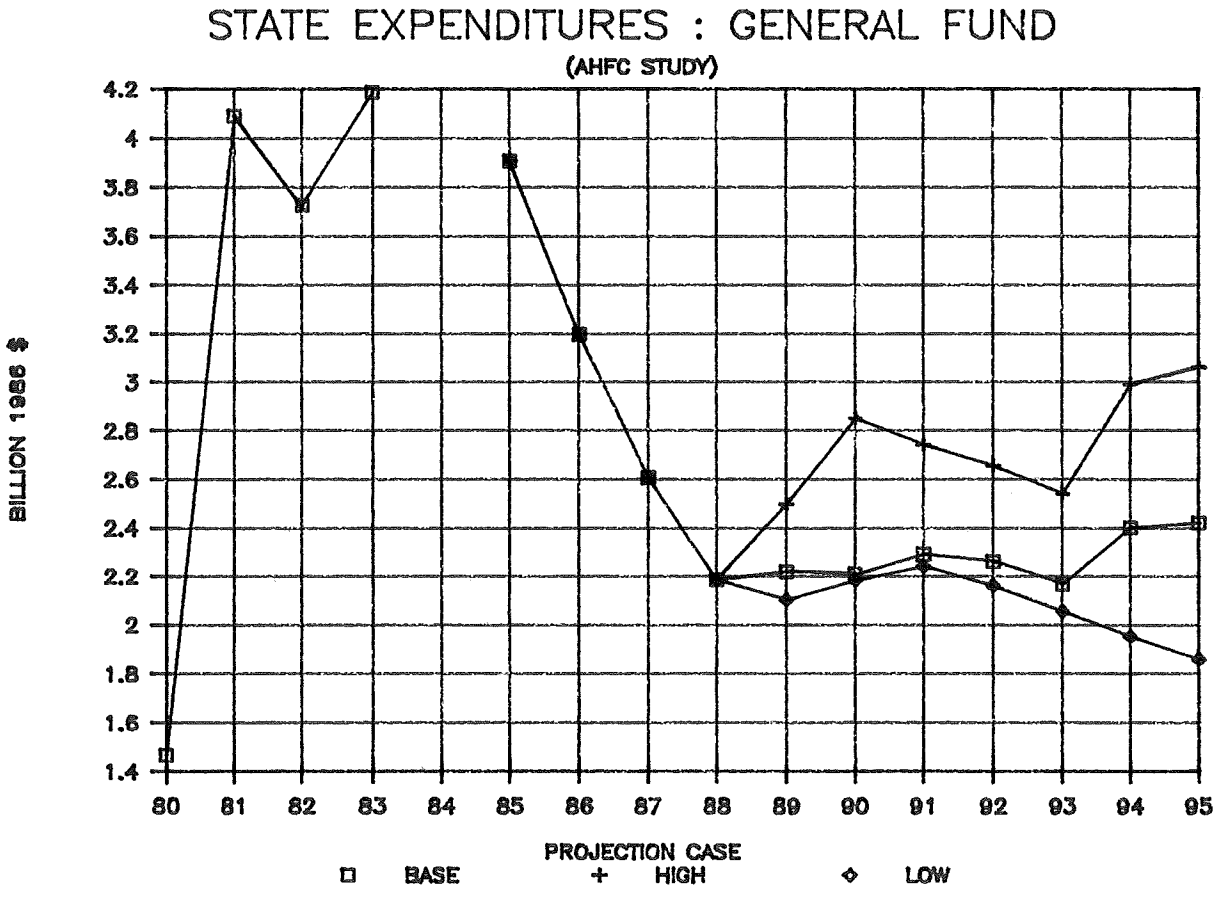


Figure 2.14



We assume there will continue to be downward pressure on state and local government wage rates so that more people can have jobs--particularly at the local level. As a consequence of lower wage rates, numbers of government jobs will slowly recover and begin to grow over the forecast period.

The infrastructure and support sectors will be the slowest to recover because of excess capacity, lower real income, and less government spending for capital goods, services, and procurement (Figures 2.15 and 2.16). The construction industry will remain below its equilibrium level until excess capacity in residential and commercial real estate has been absorbed. Slow recovery in these sectors will keep wage and salary employment below the 1985 peak until 1994 (Figure 2.17).[7]

Personal income will increase with employment (Figure 2.18), but per capita disposable personal income will change little between now and 1995 if personal income taxes are reimposed or Permanent Fund Dividends are eliminated. Those kinds of measures would keep real per capita disposable personal income at least $1,000 below the peak 1983 figure of $16 thousand (Figure 2.19).

Slow growth in population will keep income and other per capita variables from falling further. Our base case projects population growth to average slightly less than 1 percent annually between 1988 and 1995 (Figure 2.20). As new jobs become available in the economy, they will be taken by those currently unemployed or not in the work force. More people will likely leave Alaska than come in from other states through 1995, because the number of jobs created will be smaller than the number of new entrants into the labor market. (Population growth in the state in the next few years will be primarily through natural increase rather than immigration.) Nonresident employment will continue to fall as a percentage of total employment because of an abundant supply of local labor and less attractive wage rates.

The number of households will increase slightly more than 1 percent annually--faster than the population will grow because the average household size will continue to decline. By 1991, the number of households will exceed the previous high in 1985 (Figure 2.21). The composition of Alaska households will change as the number and proportion of Native and military households increase relative to civilian non-Native households. The number of civilian non-Native households will likely decline into 1989 and regain its 1985 level only in 1993.

These patterns of economic recovery and growth as projected in the base case are summarized in four figures showing important economic and demographic variables relative to their peak 1985

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[7]Military employment is not a component of wage and salary employment.

levels. Of the aggregate variables, employment contracts most sharply--10 percent--and takes the longest to recover (Figure 2.22). Households and population decline much less--2 percent to 3 percent--and recover more quickly. Real disposable personal income per capita contracts 5 percent. Household composition will be changed by increases in Native and military households relative to total households (Figure 2.23). Because of both decreasing nonresident employment and falling unemployment after 1988, job openings will be filled without immigration of workers from other states (Figure 2.24). Finally, we see that economic recovery will be led by basic sector growth and held back by excess capacity in the infrastructure and support sectors (Figure 2.25).

Economic Projection: Regional Economies

The rate of economic recovery as projected in the base case will be most rapid in those regional economies--primarily the Interior (Fairbanks) and the Southeast--where we expect expansion in the basic sectors. In contrast, the Anchorage area and the North Slope will be the slowest to return to previous highs because of their dependence on the petroleum industry and state revenues. Excess capacity in the support sectors will also slow Anchorage's recovery, since it is the support center for the state; it will take time for the market to absorb the excess (Figure 2.26).

Population growth will follow employment growth (Figure 2.27). Anchorage will be slow to recover the population it lost during the recession because there will be excess capacity in the local labor market and job opportunities will recover slowly.(Figure 2.28). Fairbanks will enjoy a strong recovery due to military expansion (Figure 2.29). Other regions of the state will either remain at stable levels or resume growth in 1989.

Figure 2.15

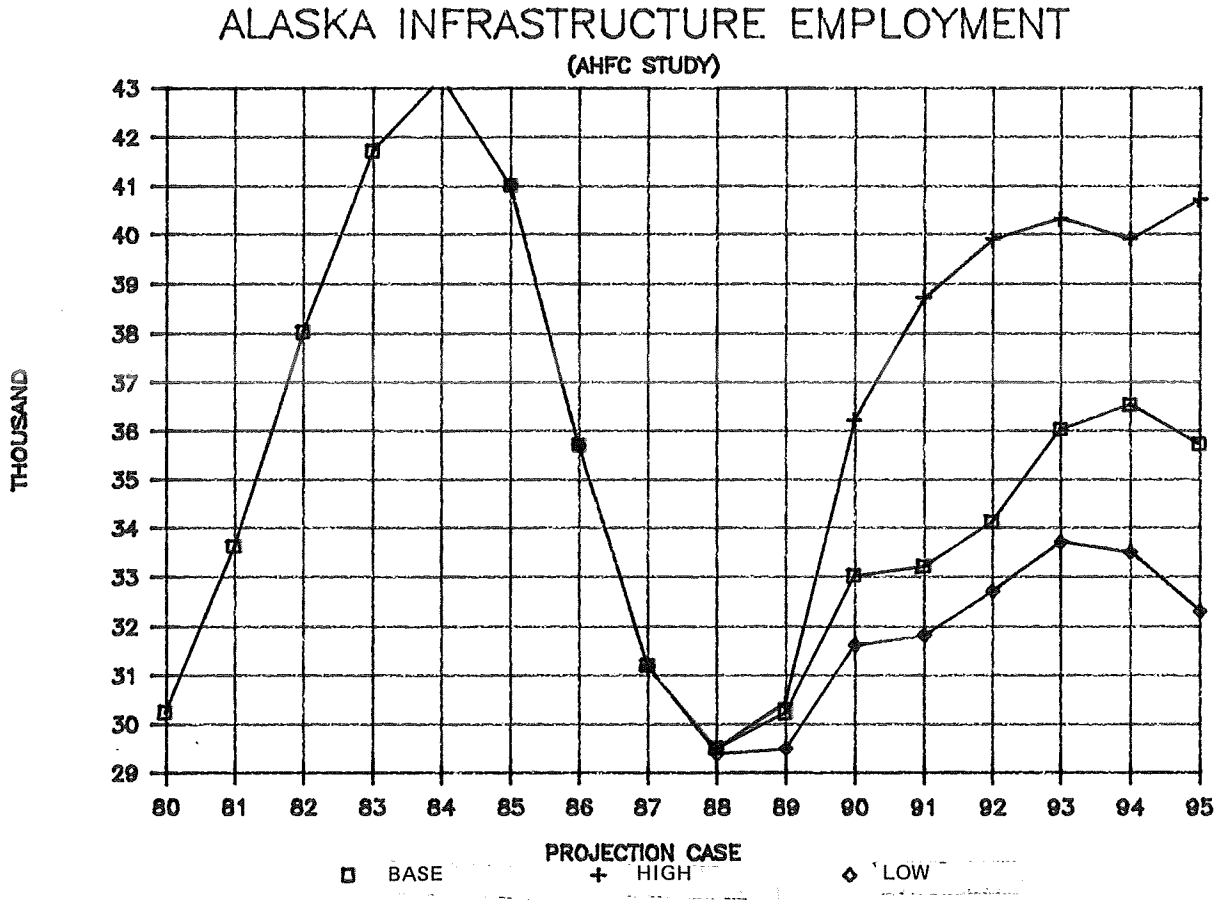


Figure 2.16

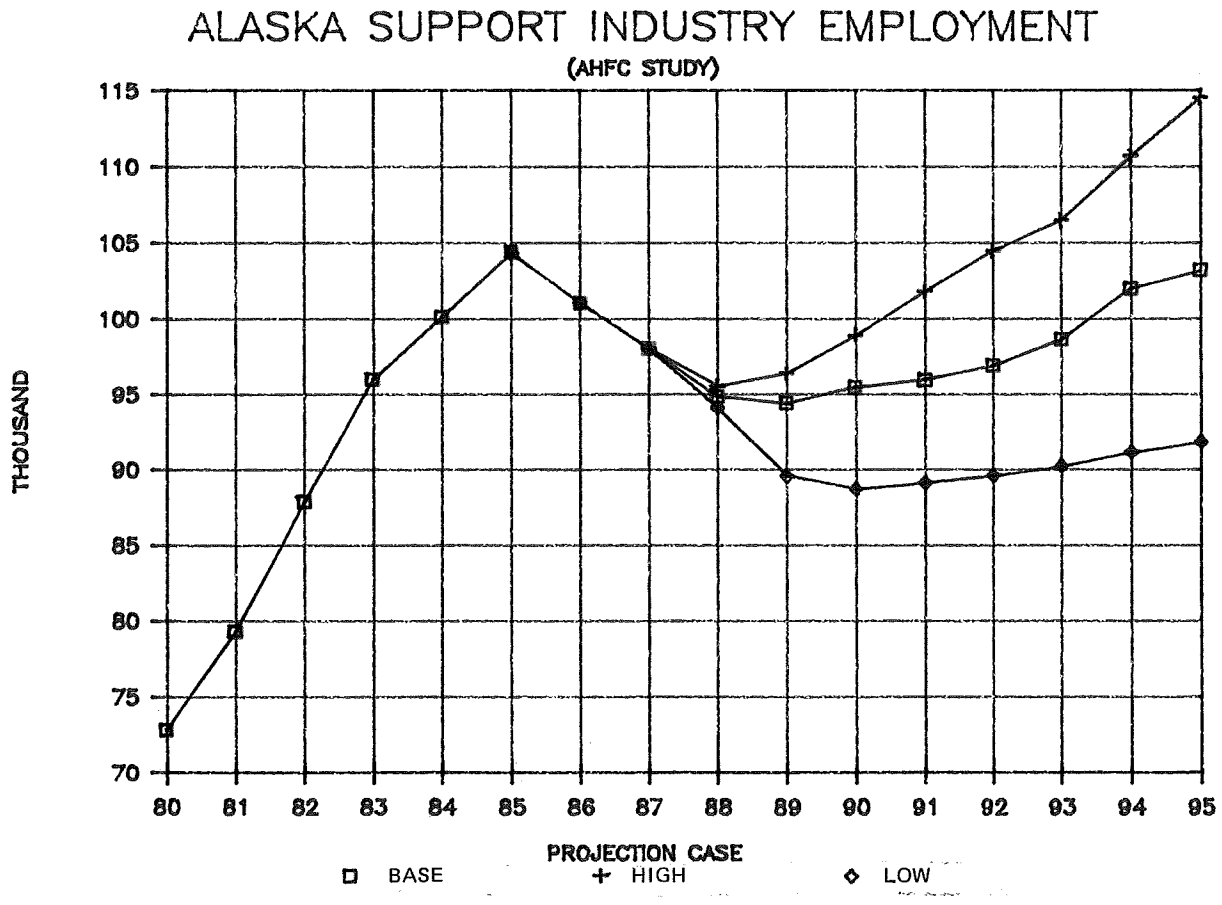


Figure 2.17

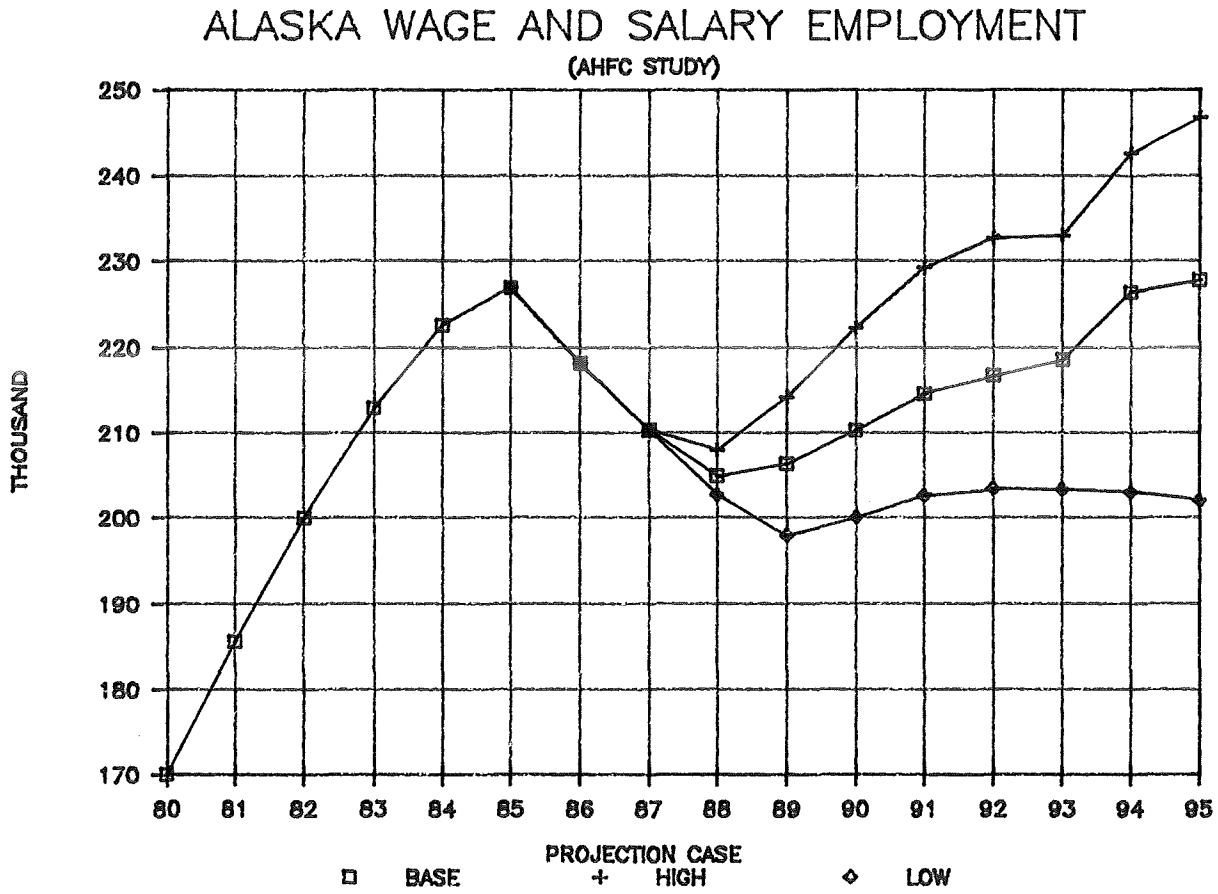


Figure 2.18

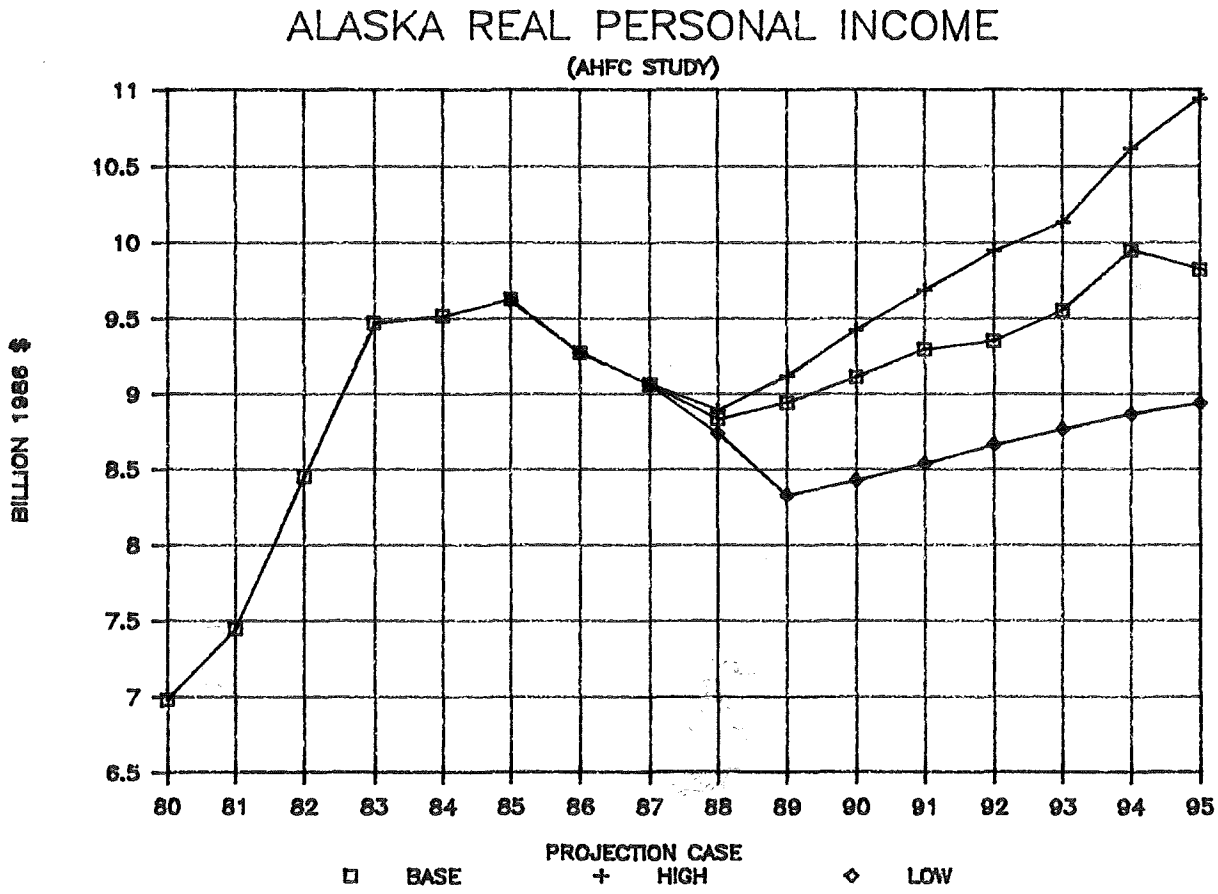
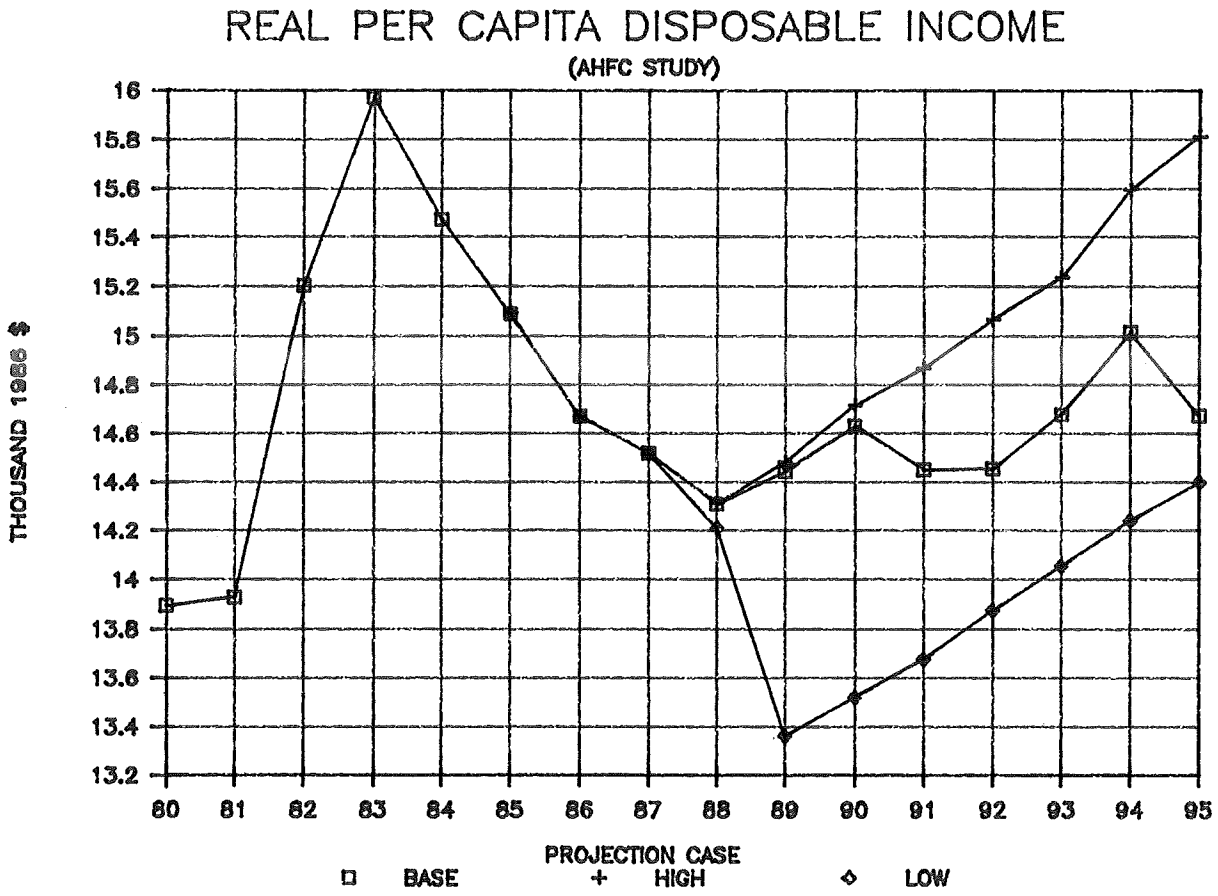


Figure 2.19


REAL PER CAPITA DISPOSABLE INCOME
(AHFC STUDY)
THOUSAND 1986 $
16
15.8
15.6
15.4
15.2
15
14.8
14.6
14.4
14.2
14
13.8
13.6
13.4
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80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95
PROJECTION CASE
BASE
HIGH
LOW

Figure 2.20

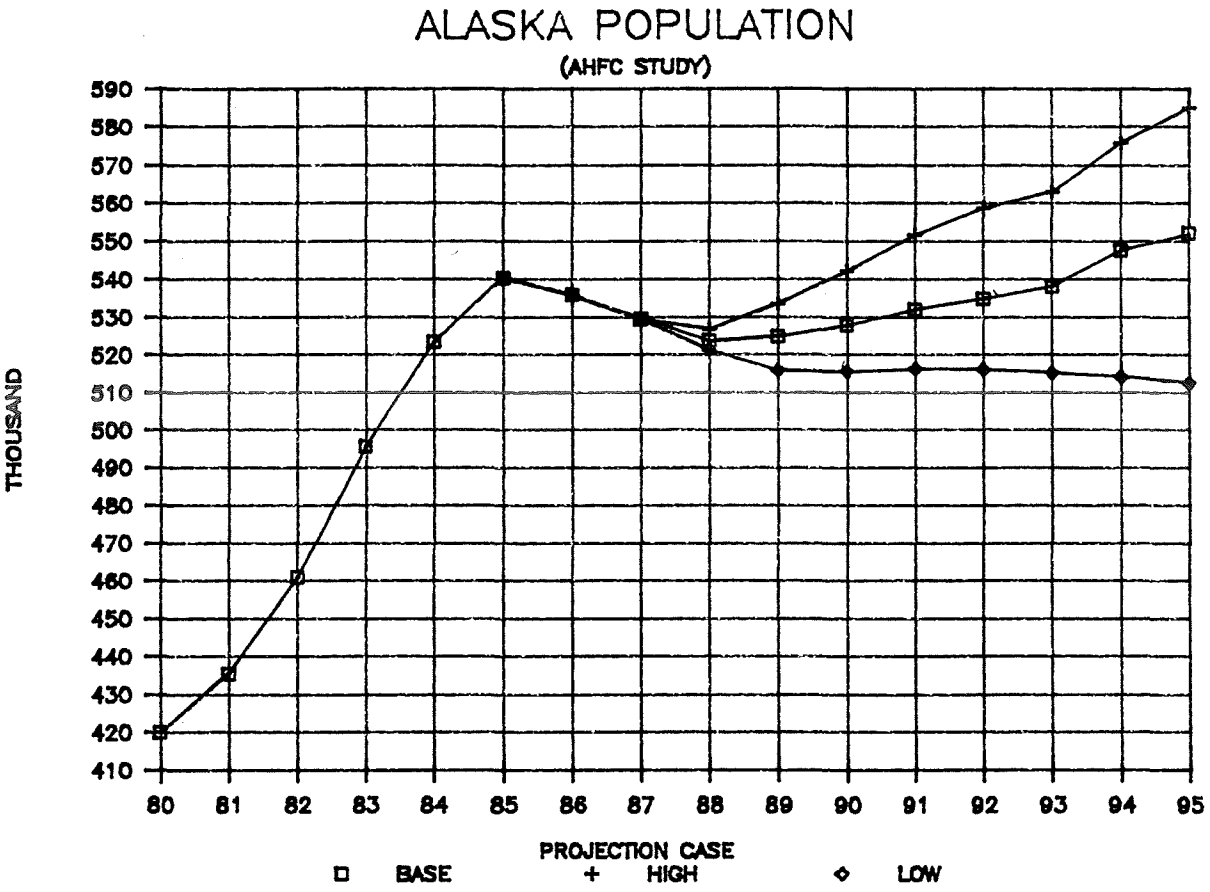


Figure 2.21

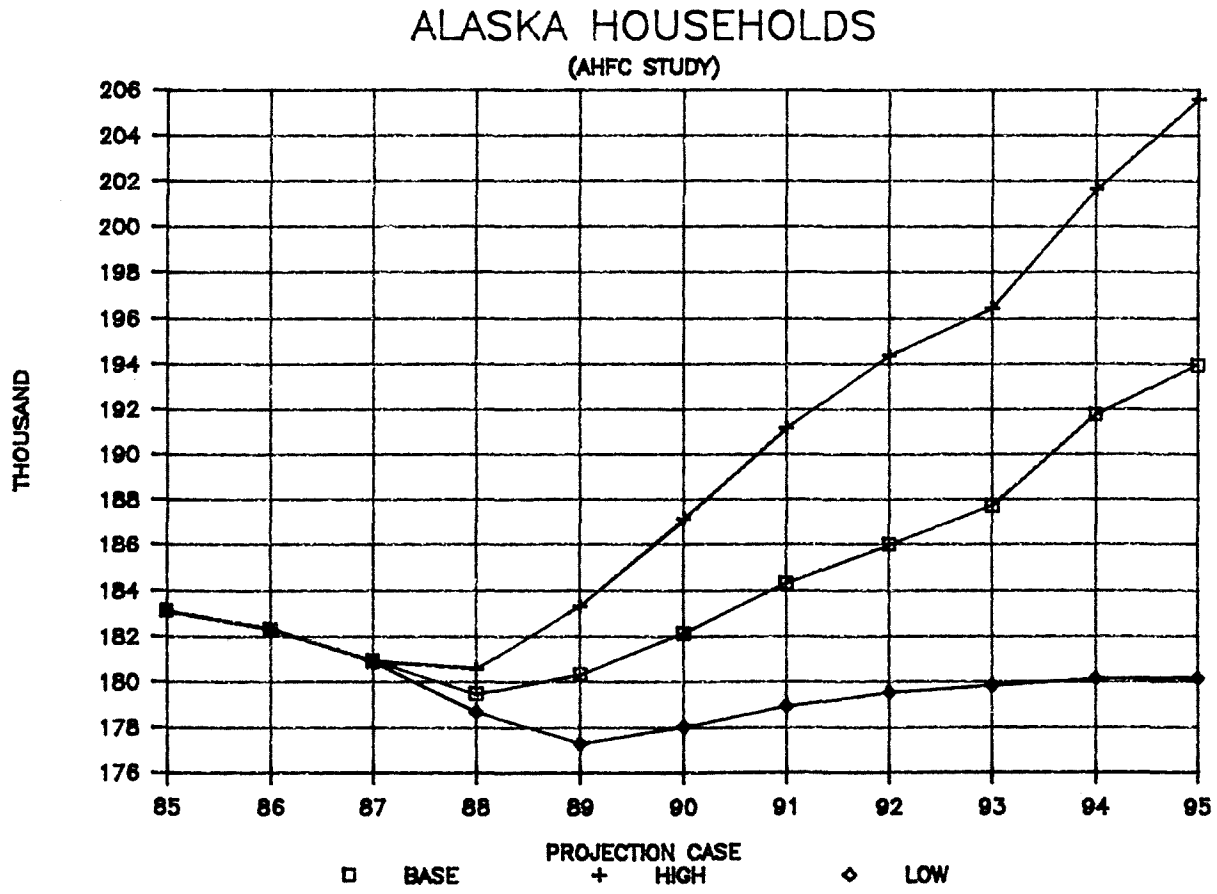


Figure 2.22

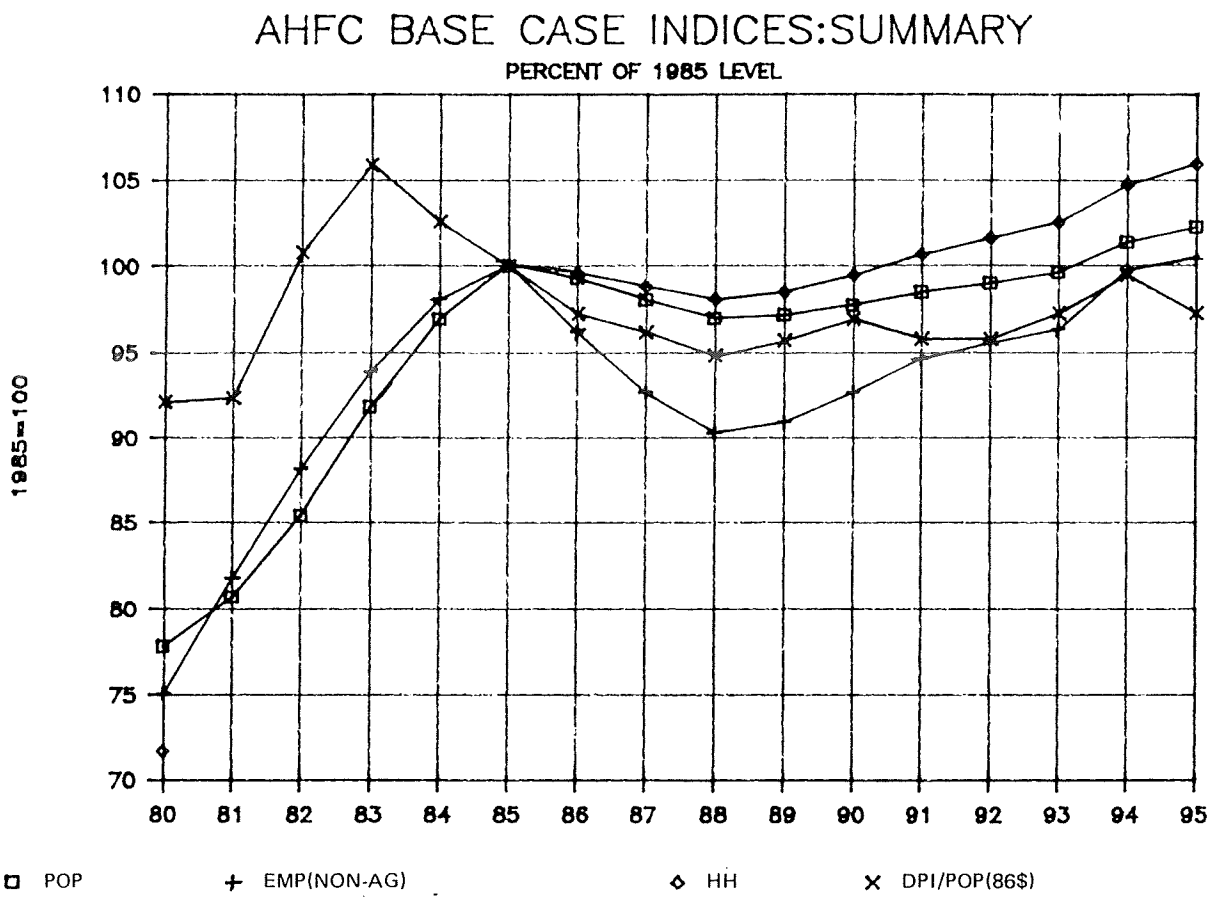


Figure 2.23

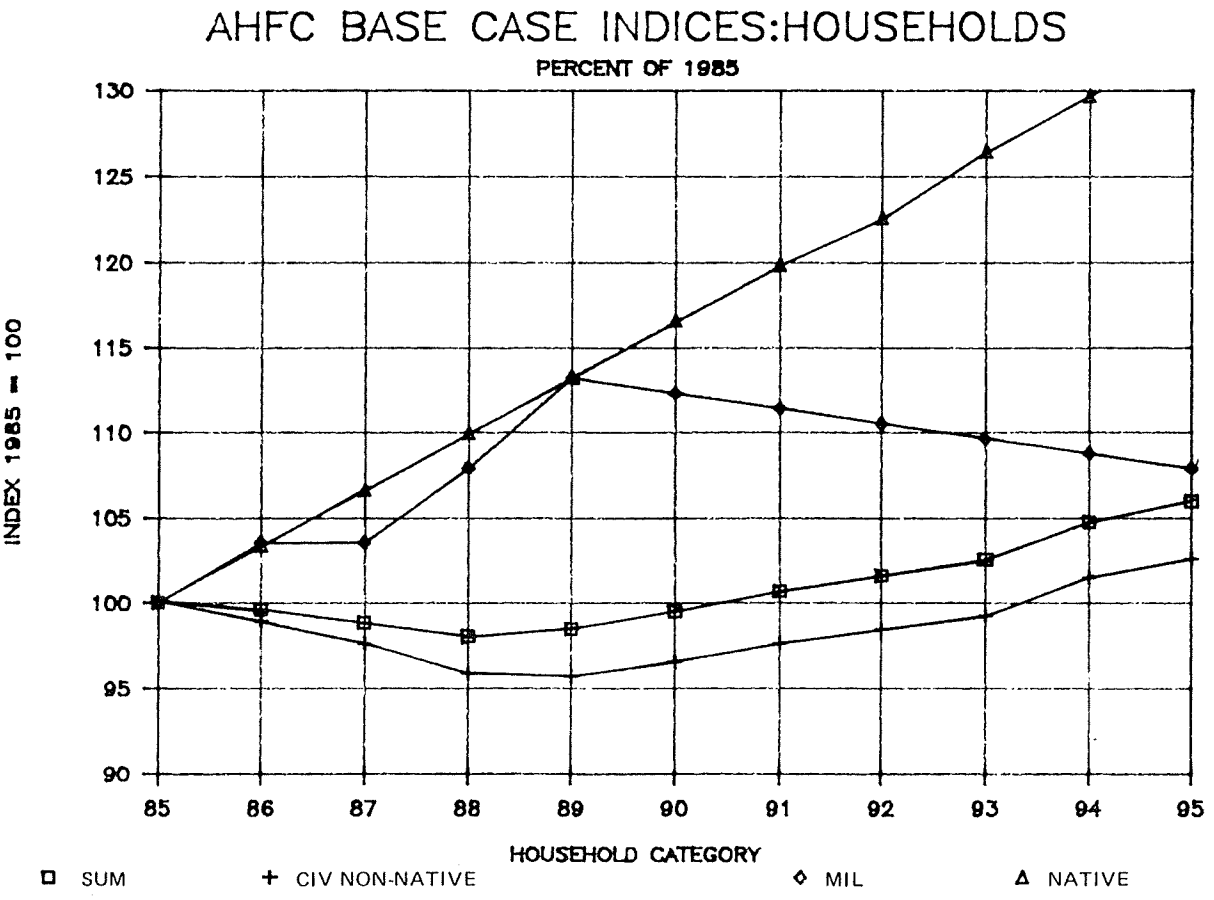


Figure 2.24

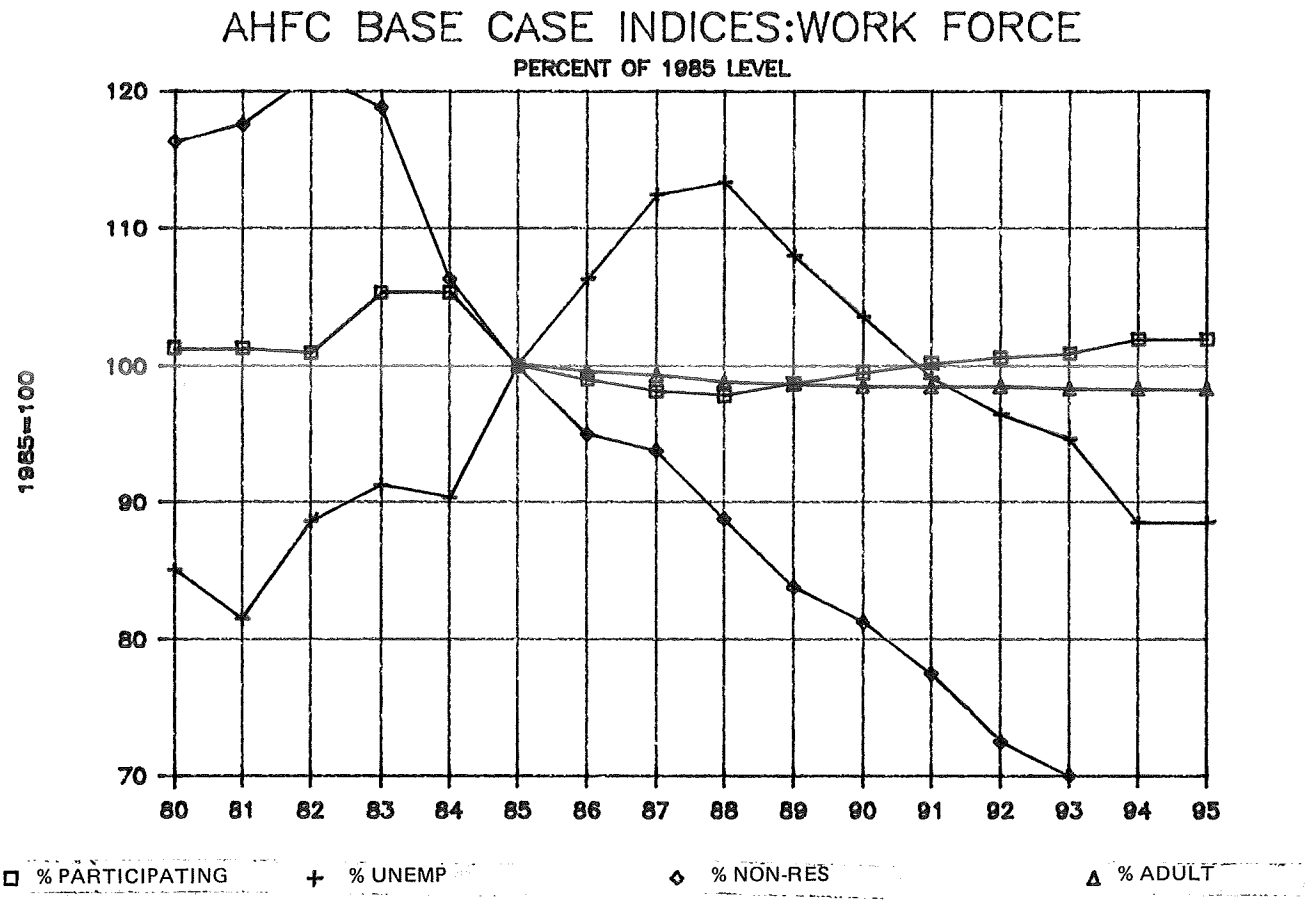


Figure 2.25

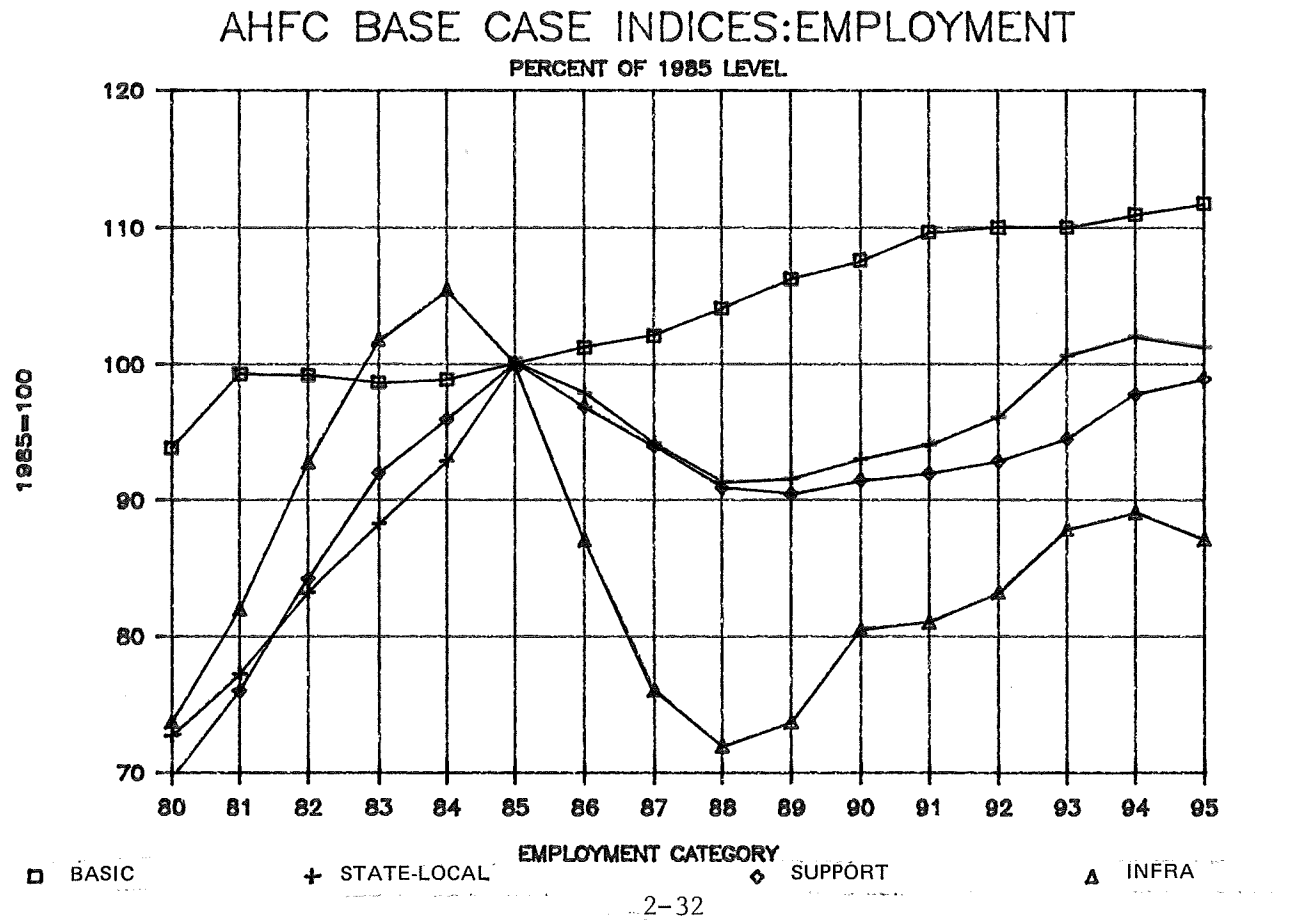


Figure 2.26

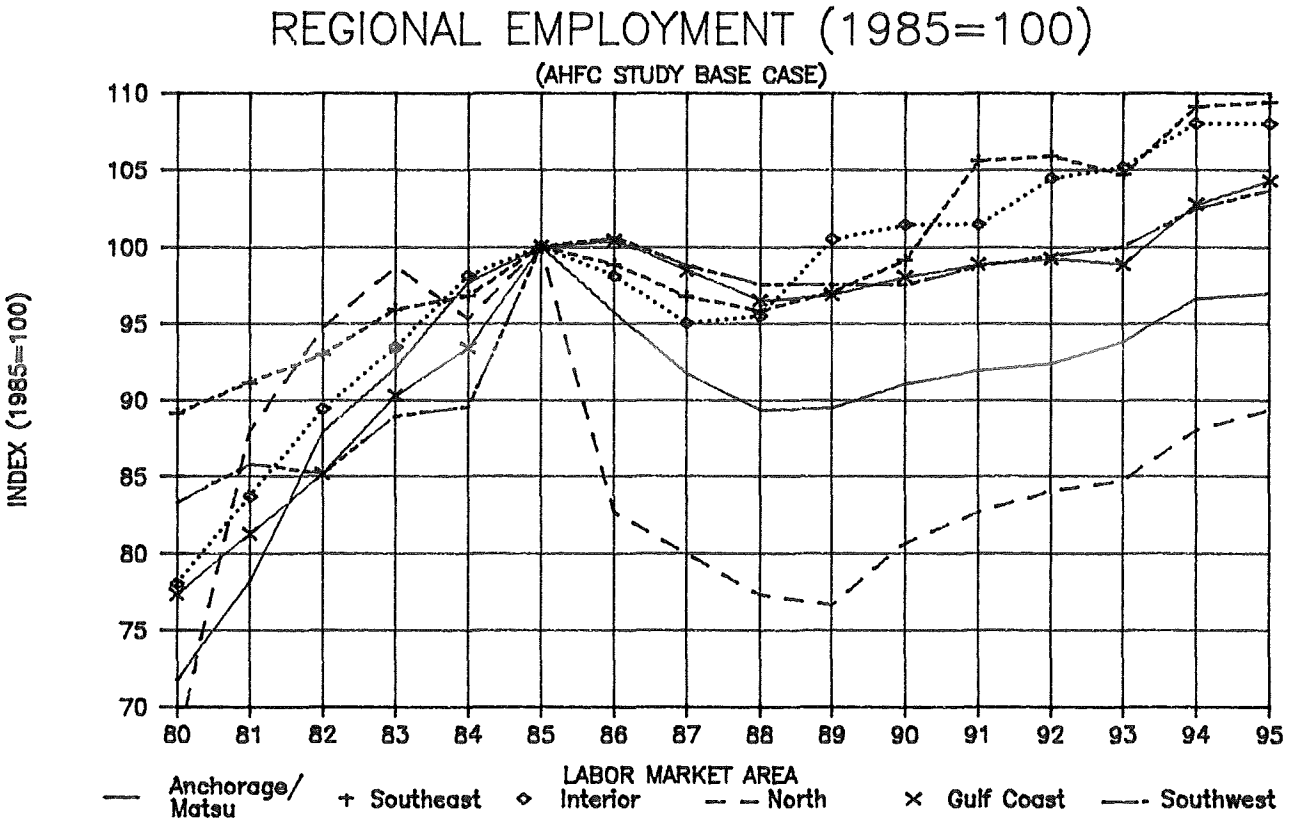


Figure 2.27

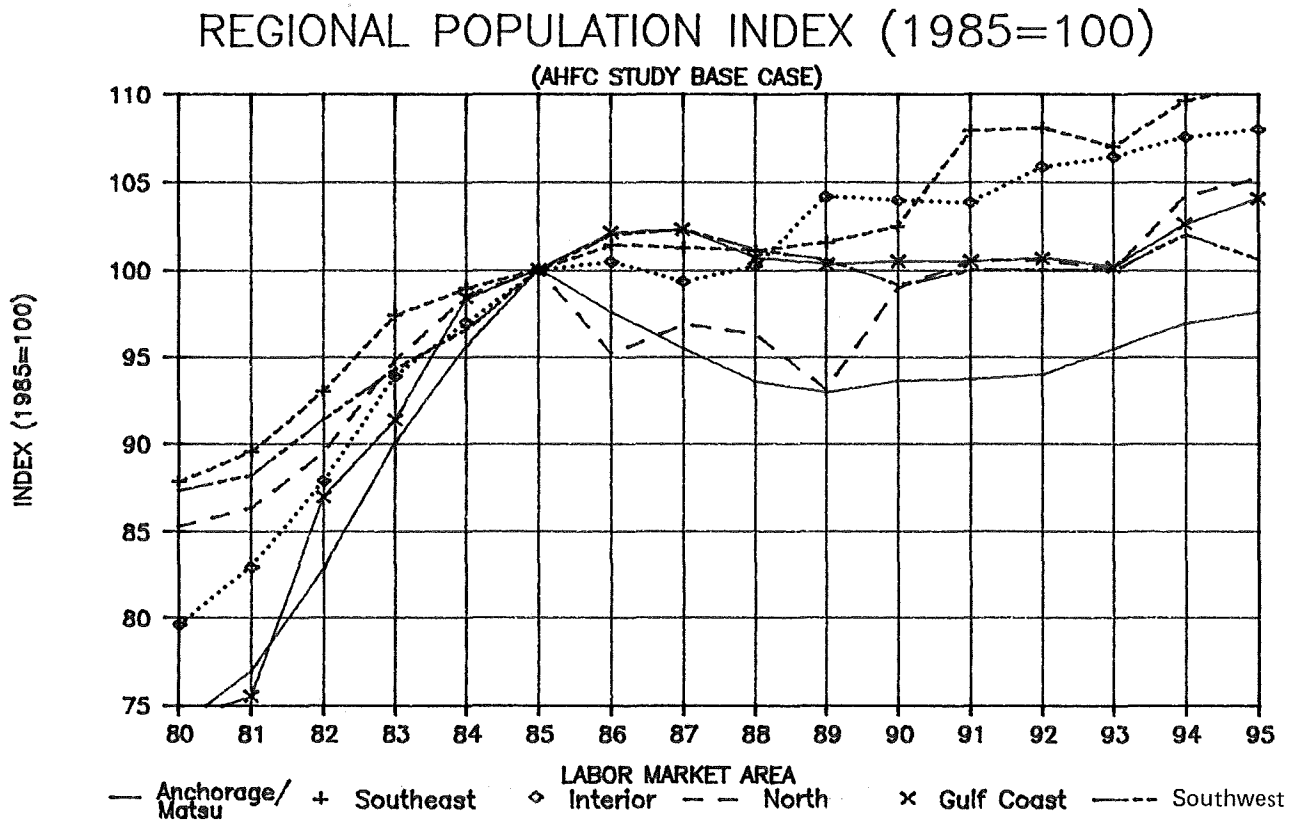


Figure 2.28

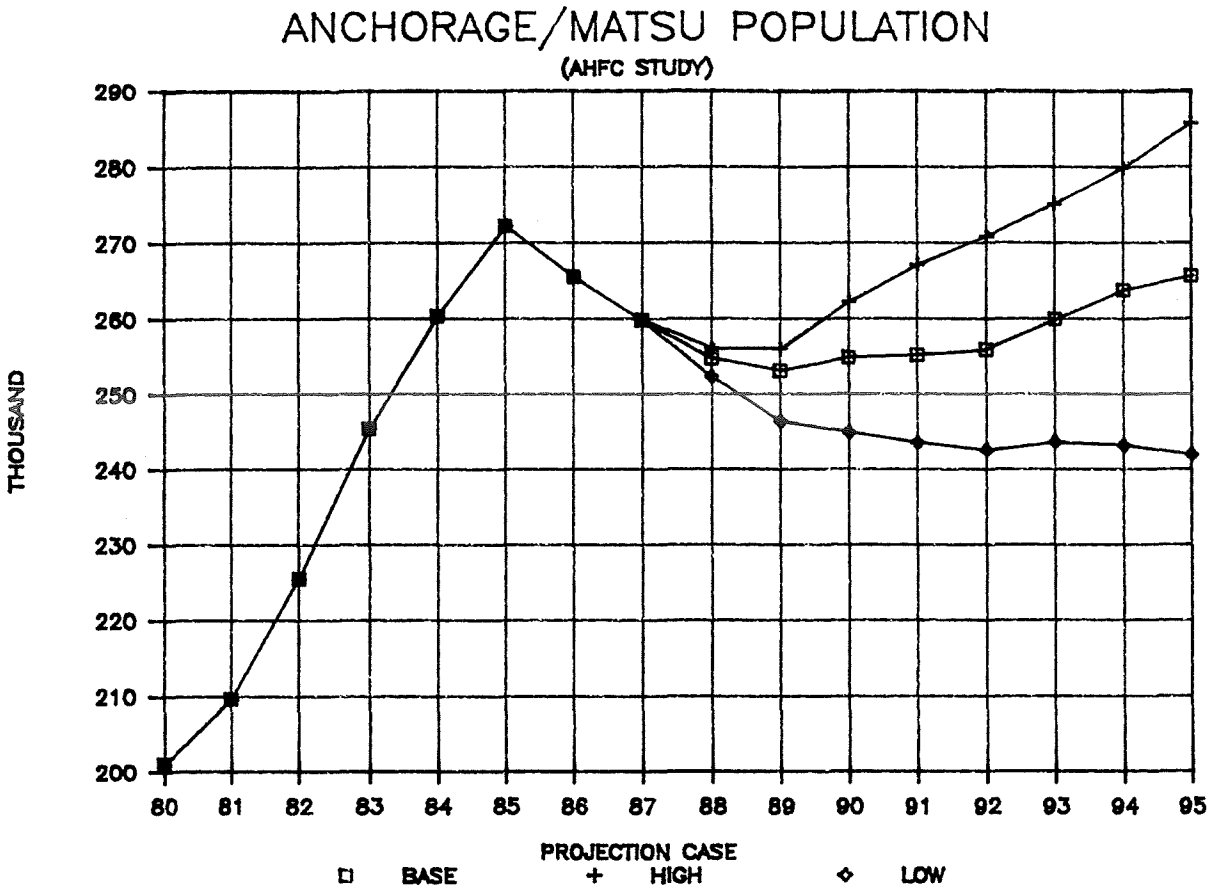
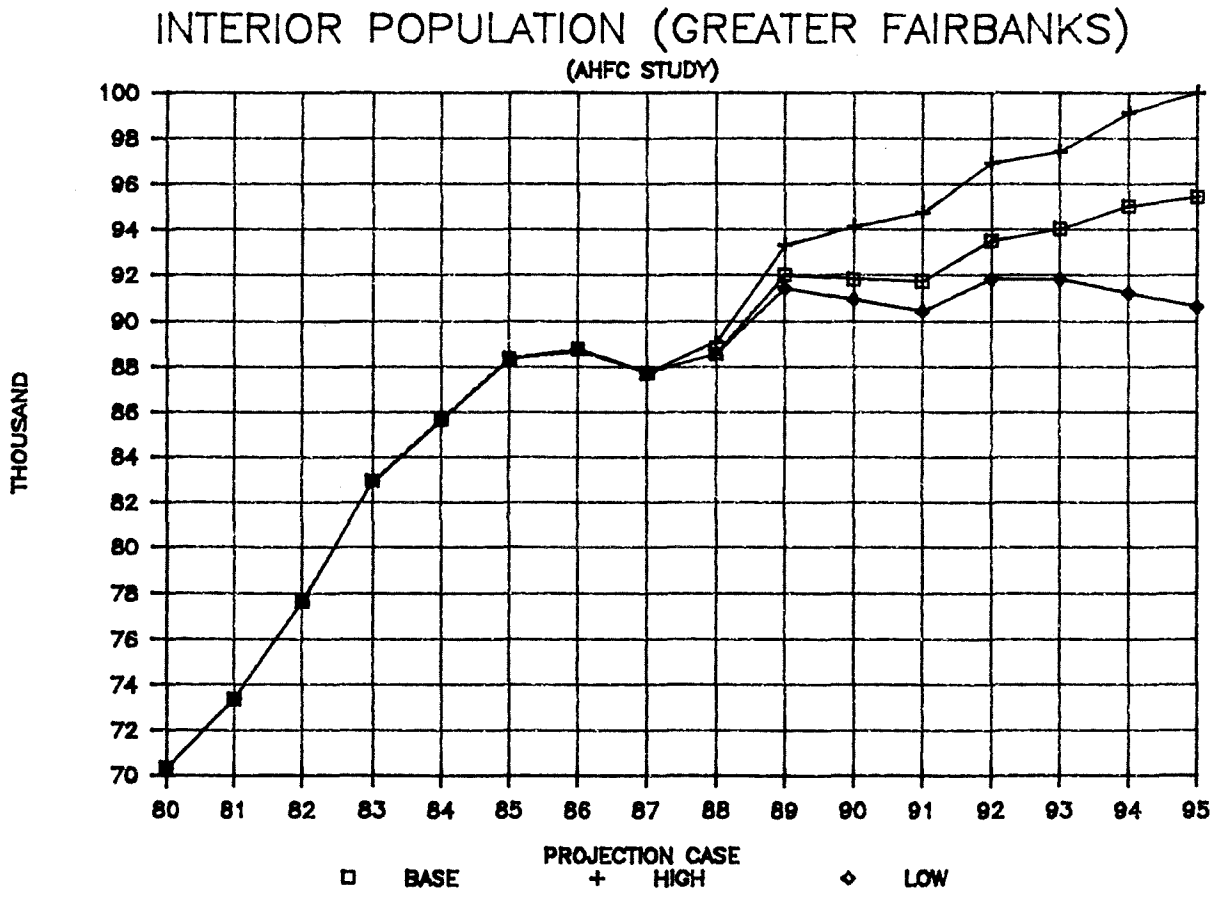


Figure 2.29



A Rapid Recovery

Moderately higher petroleum prices than we assumed in the base case will not have a significant impact on the pace of economic recovery. If prices were higher, the petroleum industry would be less cautious about undertaking new exploration and development, and that increased optimism would be reflected in some employment growth in Anchorage and on the North Slope. The somewhat higher petroleum revenues state and local governments would collect if oil prices were higher would likely be spent for larger capital budgets and for holding down personal and business taxes. These actions would have a small impact on economic growth.

Alaska's regional economies rely on various basic industries that can grow at different rates, depending on the health of the resource industries in the region. Many regional economies are small, and single events such as the development of a large mine or a change in federal regulations could affect the health of a region while having little impact on statewide economic statistics, which are dominated by Anchorage and Fairbanks. We can be certain that unanticipated events will affect the fortunes of regional economies in unexpected ways. However, the sheer magnitude of exogenous events necessary to significantly alter the pattern of growth for the state economy as a whole suggests that only big changes in the petroleum industry could make a substantial difference in the next few years.

A dramatic and sustained jump in the price of oil into the mid-$20 per barrel range is the single event that would do the most to get the economy growing rapidly in the near future. Although the economy has a history of serendipitious surprises and such an event other than in the petroleum industry could conceivably stimulate rapid growth, the most likely impetus would be oil. There are at least two reasons why. First, the value-added contribution of petroleum to the economy dominates that of every other basic industry. Because of the excess capacity we now have in many support industries, it will take very significant growth to stimulate renewed growth in the support sector. Second, growth in Alaska's economy since statehood has been led by petroleum; because of the continuing potential for new discoveries and production, it is primarily to the petroleum industry that we must look for serendipitous surprises in the coming years.

If the price of oil quickly rose to $26 a barrel (in 1986 dollars) and stayed at that level, this higher price would result in more rapid recovery from the low point of the economy in 1988. Employment growth would average 2.3 percent annually between 1988 and 1995, population growth would average 1.5 percent, and household growth would average 1.9 percent. Employment would regain its 1985 level by 1991, led by a strongly rebounding infrastructure sector--primarily construction driven by petroleum development and public spending. Support employment would also recover rapidly.

The higher petroleum price would both stimulate development in the oil patch and significantly increase state and local revenues so that public employment could return to its 1985 level by the early 1990s.

A Worst-Case Scenario

A number of factors will prevent further contraction of the economy beyond 1988. Most of the excess capacity will have been eliminated from the economy through the loss of 28 thousand jobs. The support sector will be in a much stronger position to withstand fluctuations in basic sector activity. Second, state government spending could be augmented by more complete use of the Permanent Fund earnings, if the price of oil were to fall for an extended period. Third, the petroleum industry is currently at a relatively low level of operations and further reductions in staffing or production levels would not be likely if the price of oil fell by just a few dollars.

Still, the possibility of a sustained collapse in the price of oil must be considered as a "worst-case" scenario (our low case scenario). We consider the collapse of oil prices to represent a worst-case scenario for our economy because of the importance of petroleum to state gross product and because simultaneous collapse of the markets for all the state's other natural resources is quite unlikely.

The case we consider is one in which the price of oil falls to $15 and remains at that level for the foreseeable future. The likelihood of this scenario's coming to pass is extremely small, because it assumes that the petroleum industry would undertake no new activities in the state and that nothing would occur over the next 15 years to reverse that trend. There will probably be periods during the next 15 years when the petroleum industry will be cautious about expanding operations in Alaska. But it is difficult to conceive of a situation in which the availability of a domestic supply of petroleum would not be a high priority of this country--or that Alaska would not remain the most likely source for a large portion of that supply.

If, however, such a calamitous price collapse did occur, petroleum industry employment would gradually decline and the level of state petroleum revenues would fall dramatically--requiring immediate reimposition of the personal income tax, repeal of the Permanent Fund Dividend, and use of the earnings of the Permanent Fund to bolster government spending. These conditions would result in a flat economy for the state. The current contraction would continue through 1989 and be more severe. Recovery would be extremely slow. Employment would not grow between 1988 and 1995. Population would decline at an annual rate of .3 percent. Numbers of households would increase very slightly--.1 percent annually.

The economy would enter a protracted period of adjustment as its major basic industry contracted, and that process of restructuring would extend into the late 1990s. Petroleum employment would gradually decline with declining production from existing fields. Construction associated with new development would cease. The growth of employment in other basic industries would more than offset this gradual phasing out of petroleum jobs, but the smaller value-added contribution per employee in these other industries could not compensate for the loss in contributions from petroleum. State and local government employment would continue to contract through the decade of the 1990s as government revenues from petroleum and new sources proved insufficient to maintain current staffing levels. Eventually the petroleum industry would become small enough and the public sector contraction would cease so that other basic industry growth could dominate, and slow growth would then resume.

In conclusion we want to reiterate that we consider this scenario extremely unlikely; we present it to illustrate the worst that could happen to the economy.

CHAPTER III. ALASKA MORTGAGES AND FORECLOSURES

The grim effects of the recession on Alaska's housing market are reported daily in the newspapers: homes going unsold; local governments cutting appraised property values; homeowners owing more on their properties than they are worth; borrowers defaulting on their mortgages; lenders offering free trips and prizes to buyers who take foreclosed properties off their hands.

The economic scenarios in Chapter II project the end of the recession and the beginning of a gradual recovery in 1988. But today depressed prices and large numbers of defaults are serious problems for all Alaska lenders and homeowners--but particularly for AHFC, which holds more than 60 percent of outstanding residential mortgages in Alaska. In this chapter we describe conditions in the Alaska housing market as of mid-1987, and contrast current conditions with those during the economic boom of the early 1980s. This description sets the stage for the next chapter, which analyzes policies AHFC might try for stabilizing the housing market.

We look first at numbers of new residential mortgages written in the state in recent years and at AHFC's share of those mortgages. Then we discuss the mortgage holdings of Alaska's biggest lenders as of mid-1987, leading into a broad depiction of mortgage liability of those lenders. Next we show numbers of foreclosed properties held by various lenders and insurers in June 1987, and additional properties foreclosed on and sold in the preceding 18 months.

Lenders and Insurers

The mortgage lending system, the big secondary lenders, and AHFC's history, programs, and methods of raising money are described in Chapter II of ISER's March 1986 report, The Effect of Changes in the Alaska Housing Finance Corporation Mortgage Programs, Interim Report. We will not repeat those descriptions here, but before we discuss our findings we'll briefly characterize the major lenders and insurers listed in Table 3.1.

The Alaska Housing Finance Corporation (AHFC), the Federal National Mortgage Association (FNMA), and the Federal Home Loan Mortgage Corporation (FHLMC) are all secondary mortgage lenders--that is, they do not make loans directly but rather buy them from primary lenders like banks and mortgage companies. Almost all the mortgages originated by banks and other primary lenders are sold on the secondary market. Selling mortgages reduces the risks of long-term loans for banks and frees money for other uses--so it is in fact the secondary lenders who put up most of the mortgage money in the United States. FNMA and FHLMC are national secondary lenders created by the federal government, with FNMA by far the largest.

TABLE 3.1. NEW RESIDENTIAL MORTGAGE LOANS, 1979-1987[a]
(in numbers and millions of dollars)

Lenders	1979		1980		1981		1982		1983	
	Number	Amount	Number	Amount	Number	Amount	Number	Amount	Number	Amount
Alaska Housing Finance Corp.[b]										
New Sales										
Mobile Homes	0	$0	265	$6	892	$22	1,668	$48	1,896	$64
Other	2,940	$190	5,025	$401	9,706	$856	7,532	$661	12,097	$1,198
Total	2,940	$190	5,290	$407	10,598	$878	9,200	$709	13,993	$1,262
Refinances[c]										
Mobile Homes	0	$0	0	$0	0	$0	0	$0	0	$0
Other	0	$0	0	$0	0	$0	0	$0	0	$0
Total	0	$0	0	$0	0	$0	0	$0	0	$0
Total	2,940	$190	5,290	$407	10,598	$878	9,200	$709	13,993	$1,262
Federal Nat'l Mortgage Assn.[b,d]										
New Sales	820	$70	100	$9	19	$2	NA	NA	1,043	$126
Refinances	0	$0	0	$0	0	$0	0	$0	0	$0
Total	820	$70	100	$9	19	$2	NA	NA	1,043	$126
Federal Home Loan Mortgage Corp.[b,e]										
New Sales	432	$37	3	$0.2	2	$0.2	4	$0.3	82	$10
Refinances	0	$0	0	$0	0	$0.0	0	$0.0	0	$0
Total	432	$37	3	$0.2	2	$0.2	4	$0.3	82	$10
Federal Housing Admin.-Insured[f]										
New Sales	238	$18	138	$10	66	$6	40	$3.5	677	$79
Refinances	0	$0	0	$0	0	$0	0	$0.0	0	$0
Total	238	$18	138	$10	66	$6	40	$3.5	677	$79
Veterans' Admin.-Guaranteed[g]										
New Sales	515	$29	0	$0	0	$0	0	$0	0	$0
Refinances	0	$0	0	$0	0	$0	0	$0	0	$0
Total	515	$29	0	$0	0	$0	0	$0	0	$0
Alaska Dept. of Community and Regional Affairs[h,i]	0	$0	0	$0	74	$5	288	$21	445	$37
Farmers' Home Admin.[j]	343	$24	244	$15	165	$8	171	$12	201	$15
Alaska Permanent Fund[h]	0	$0	0	$0	69	$10	126	$22	67	$12
Alaska Pension Fund[h,k]	180	$15	175	$15	170	$15	116	$20	125	$23
SUMMARY										
New Sales	5,468	$359	5,950	$457	11,163	$924.2	9,945	$788	16,633	$1,565
Refinances										
TOTAL	5,468	$359	5,950	$457	11,163	$924.2	9,945	$788	16,633	$1,565

See pages 3-4 and 3-5 for notes.

TABLE 3.1. NEW RESIDENTIAL MORTGAGE LOANS
(Continued)

Lenders	1984 Number	1984 Amount	1985 Number	1985 Amount	1986 Number	1986 Amount	January - June 1987 Number	January - June 1987 Amount
Alaska Housing Finance Corp.[b]								
New Sales								
Mobile Homes	1,116	$45	370	$15	143	$6	25	$1
Other	9,741	$1,029	4,834	$510	2,327	$265	748	$82
Total	10,857	$1,074	5,204	$525	2,470	$271	773	$83
Refinances[c]								
Mobile Homes	0	$0	0	$0	2	$0.1	0	$0
Other	0	$0	0	$0	3,644	$429	830	$93
Total	0	$0	0	$0	3,646	$429	830	$93
Total	10,857	$1,074	5,204	$525	6,116	$700	1,603	$176
Federal Nat'l Mortgage Assn.[b,d]								
New Sales	775	$78	378	$43	112	$16	34	$4
Refinances	0	$0	252	$29	262	$38	80	$9
Total	775	$78	630	$72	374	$54	114	$13
Federal Home Loan Mortgage Corp.[b,e]								
New Sales	592	$56	395	$46	585	$74	137	$16
Refinances	0	$0	263	$31	1,364	$173	319	$39
Total	592	$56	658	$77	1,949	$247	456	$55
Federal Housing Admin.-Insured[f]								
New Sales	721	$84	1,495	$175	1,234	$148	376	$42
Refinances	0	$0	1,304	$153	4,932	$592	1,504	$170
Total	721	$84	2,799	$328	6,166	$740	1,880	$212
Veterans' Admin.-Guaranteed[g]								
New Sales	0	$0	0	$0	111	$12	186	$20
Refinances	0	$0	0	$0	28	$3	46	$5
Total	0	$0	0	$0	139	$15	232	$25
Alaska Dept. of Community and Regional Affairs[h,i]	450	$38	558	$47	301	$29	167	$17
Farmers' Home Admin.[j]	173	$13	212	$17	25	$2.3	10	$0.8
Alaska Permanent Fund[h]	104	$17	57	$11	40	$8.6	11	$3
Alaska Pension Fund[h,k]	185	$31	125	$24	78	$10.6	2	$0.2
SUMMARY								
New Sales	13,857	$1,391	8,424	$888	4,956	$572	1,696	$186
Refinances	-	-	1,819	$213	10,232	$1,235	2,779	$316
TOTAL	13,857	$1,391	10,243	$1,101	15,188	$1,807	4,475	$502

NOTES FOR TABLE 3.1

[a]As of June 1987, unless otherwise noted. Although there may have been a handful of refinances before 1985, we assume no refinances until 1985.

[b]Figures by calendar years.

[c]AHFC was not authorized to do refinancing until 1986.

[d]Excludes AHFC loans financed by FNMA; includes just loans FNMA purchased from Alaska banks and other primary lenders. Shares of FNMA loans that were refinances throughout this period are estimates. FNMA itself does not keep state by state records of which loans are refinances. The 1985 figure is based on FHLMC's estimate of shares of its loans nationwide that were refinances that year.The 1986 and 1987 estimates are based on estimates of Alaska primary lenders.

[e]Shares of FHLMC loans that were refinances throughout this period are estimates. FHLMC does not keep records of refinances by state. The 1985 figure is based on FHLMC's estimate of its loans nationwide that were refinances that year. The 1986 and 1987 estimates are based on estimates of Alaska primary lenders.

[f]Figures by federal fiscal year from 1979-1984; 1985-1987 figures are by calendar year. FHA-insured loans purchased by AHFC are excluded. Although FHA is an insurer rather than a lender, it is a proxy for a lender in determining numbers of mortgages written in Alaska. Almost all FHA-insured loans in Alaska that are not purchased by AHFC go into mortgage-backed securities issued by the Government National Mortgage Association (GNMA) and purchased by various investors. The shares of loans that were refinances in 1986 and early 1987 are estimates, based on estimates of Alaska primary lenders. Dollar values of FHA-insured mortgages are estimates, based on average loan sizes in specific years. There can be a lag of several months between the time a loan is closed and the FHA insurance is processed.

[g]Excluding VA-guaranteed loans purchased by AHFC. Although the VA does not make loans but rather guarantees a portion of them, the VA is (like FHA) a proxy for a lender in determining numbers of mortgage loans in Alaska because almost all VA-guaranteed loans that are not purchased by AHFC go into mortgage-backed securities issued by GNMA and purchased by various investors. VA representatives estimate that virtually all VA-guaranteed mortgages written in Alaska from 1981 to 1985 were purchased by AHFC. Share of loans that were refinances are based on VA estimates. Figures for 1987 are as of March 31, 1987. Numbers of VA-guaranteed loans actually closed in the first quarter of 1987 are probably overstated because it can take several months after a loan is closed for the VA guarantee to be processed.

[h]Figures by state fiscal year, July 1 - June 30.

[i]After fiscal 1985 includes just loans under DCRA's rural owner-occupied loan program. Before that, DCRA also administered the nonconforming loan program; the state legislature transferred that program to AHFC in fiscal 1986.

[j]Figures by federal fiscal year, October 1 - September 30.

[k]Includes residential mortgage loans purchased by the Alaska Public Employees Retirement System and the Teachers Retirement System. Numbers of loans and dollar values in all years are estimates. The pension funds purchase both commercial and residential loans inside and outside Alaska; separate figures on just residential mortgages in Alaska are not available.

SOURCES: Alaska Housing Finance Corporation; Federal National Mortgage Association; Federal Home Loan Mortgage Corporation; Federal Housing Administration; Veterans' Administration; Alaska Department of Community and Regional Affairs; Farmers' Home Administration; Alaska Permanent Fund managers; Alaska Department of Revenue.

AHFC is a public corporation created by the state government; it buys mortgages under a variety of programs only in Alaska. The corporation raises most of its loan money through bond sales.

The Federal Housing Administration (FHA) and the Veterans Administration (VA) are federal agencies that do not actually buy mortgage loans but rather insure or guarantee them. The secondary lenders listed above buy some of these government-insured mortgages, but most go onto the secondary market through mortgage-backed securities that are issued by the Government National Mortgage Association (GNMA)--yet another entity of the federal government--and sold to various investors. So in this table FHA and VA are proxies for lenders.

The Alaska Department of Community and Regional Affairs is a state agency that also acts as a secondary mortgage lender, but it buys loans only in the most remote areas of Alaska. Its operations are small as compared with AHFC's, and it gets its loan money through state appropriations.

The Farmers' Home Administration is a federal agency that makes loans in farm country and to low-income Americans living in certain rural areas; it holds its own mortgages.

The managers of the Alaska Permanent Fund and the state pension funds (the Public Employees Retirement System and the Teachers Retirement System) also buy some residential mortgage loans, frequently loans that exceed the limits of other lenders. Neither agency has ever bought many loans, as compared with purchases of other lenders listed in Table 3.1, and in recent times the pension fund managers in particular have bought very few residential mortgage loans.

There are a variety of others who hold some Alaska mortgage loans. For example, some individuals finance the sale of their homes themselves, and credit unions hold some mortgages. But the number of such mortgages are small and precise figures--or even good estimates--are not available.

New Alaska Residential Mortgages, 1979-1987

Table 3.1 tells us how many new residential mortgages were written in Alaska each year from 1979 through June 1987, how much they were worth, how mortgage activity was divided among the big lenders, and how many mortgages were for sales of homes and how many were for refinances by existing owners. Some mortgages written during the early 1980s were probably for refinancing by existing homeowners, but figures for refinances during that period are very difficult to get. By and large, interest rates through 1984 were still too high to make refinancing attractive, and we have assumed that virtually all Alaska mortgages written during the early 1980s

were for home sales. Lenders other than AHFC do not keep complete--and in some cases no--records of which mortgages are for home sales and which for refinances. We have estimated refinancing by other lenders from 1985 through June 1987, based on figures from and estimates of a number of banks, mortgage companies, and government agencies.

Mortgage activity in Alaska in 1979 was slow as compared with what was to come: the economic boom created by construction of the trans-Alaska pipeline was over; some people were leaving the state; and mortgage interest rates were on their way up. About 5,400 new mortgages worth $383 million were written in Alaska in 1979.

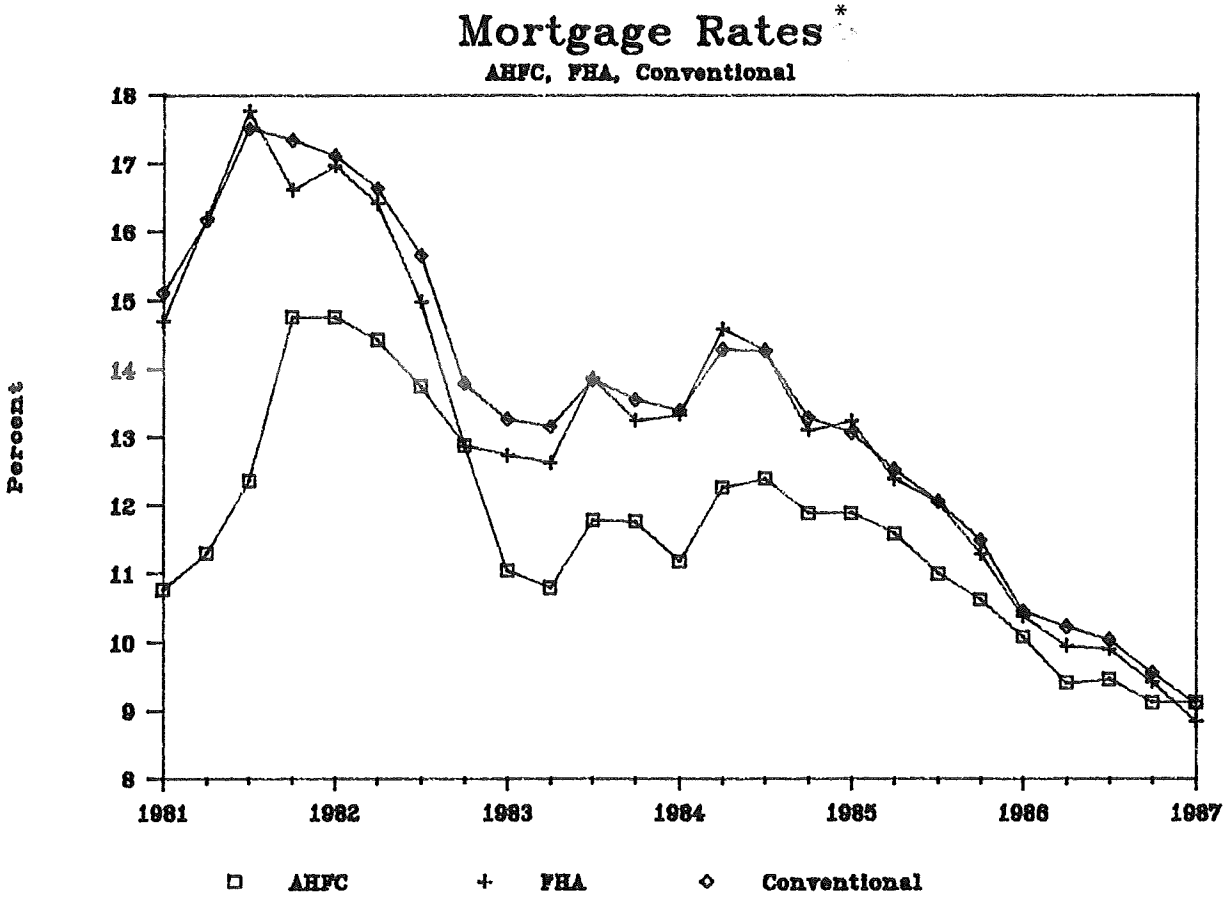
In 1980 mortgage activity was just somewhat higher--nearly 6,000 mortgages worth $457 million were created--but in that year the stage was set for the boom years to follow. A huge jump in the price of oil meant that the state government's income from the Prudhoe Bay oil field was moving into the billions of dollars. The state began spending that money in many ways that reached throughout the economy. One of these ways was making subsidized mortgage interest rates available to almost all Alaska home buyers.

Before 1980, AHFC's programs were open only to Alaskans with incomes below a specified level, and AHFC raised virtually all its mortgage money by selling bonds. But in 1980 market interest rates were up to 15 percent and still rising. The Alaska Legislature directed AHFC to begin subsiding interest rates on the first $90,000 of each loan--with the balance above $90,000 to be at the rate AHFC paid to borrow money on the bond market. At the same time, the legislature removed the income restrictions on AHFC programs.

Over the next several years, the legislature appropriated about $1 billion to subsidize interest rates. (AHFC has not received any legislative subsidies since 1984; it has a revolving loan fund that allows it to use mortgage payments, bond proceeds, and other money to make new loans.) Figure 3.1 shows comparative interest rates from 1981 through early 1987 for the same size loans under AHFC's taxable mortgage program, the Federal Housing Administration's insured loan program, and conventional mortgage programs.

The economic boom brought on by high oil prices also drew tens of thousands of people into the state in the early 1980s. The combination of a burgeoning population and subsidized interest rates pushed housing sales up far and fast. From 1981 through 1984, 10,000 or more new mortgages for home sales were written each year--and in the peak year of 1983 more than 16,000 new mortgages were created.

Figure 3.1



*Interest rates for a 30-year, $135,000 loan under AHFC's taxable mortgage program, FHA's insured-loan program, and FNMA's conventional program.

In 1985 the Alaska mortgage market began changing in two ways: the number of new mortgages began dropping sharply, and a significant share of those mortgages were now for refinances rather than for sales. Alaska's economy was moving into recession by the end of 1985, as world oil prices and state government spending dropped. Also, market interest rates declined sharply in the last months of 1985--and Alaska homeowners began taking advantage of the lower rates by taking out new mortgages. About 8,400 mortgages for homes sales were created in 1985--as compared with nearly 14,000 the previous year--and roughly 1,800 for refinances.

By 1986 Alaska was in the full grip of the recession as oil prices plummeted and took state income down with them. As Alaska lost jobs, income, and residents, the number of new mortgages written for sales of homes dropped abruptly. Just 4,800 mortgages for home sales were written in 1986--about half the mortgages for sales the previous year and less than one-third the number written as recently as 1983. And the number of mortgages for home sales in 1986 was also more than 10 percent below the 1979 figure.

Thousands of Alaska homeowners took advantage of still declining interest rates in 1986 and refinanced their homes at lower rates: an estimated 10,000 new mortgages for refinances were written that year.

The pace at which new Alaska mortgages for home sales were created in the first half of 1987 was even slower than in 1986: only about 1,600 mortgages for sales were written during those six months. Interest rates in late 1986 and early 1987 reached their lowest point in this decade, keeping the pace of refinancing much more brisk than the pace of home sales. Interest rates did climb again in the second quarter of the year. About 2,700 mortgages for refinances were created in the first half of 1987.

The sharp rise and precipitous fall of new mortgages for Alaska home sales in the past seven years are graphed in Figure 3.2. Figure 3.3 shows mortgages written for refinances as a proportion of total new mortgages in 1985, 1986, and the first half of 1987.

Figure 3.2

NUMBER OF MORTGAGES FOR NEW SALES

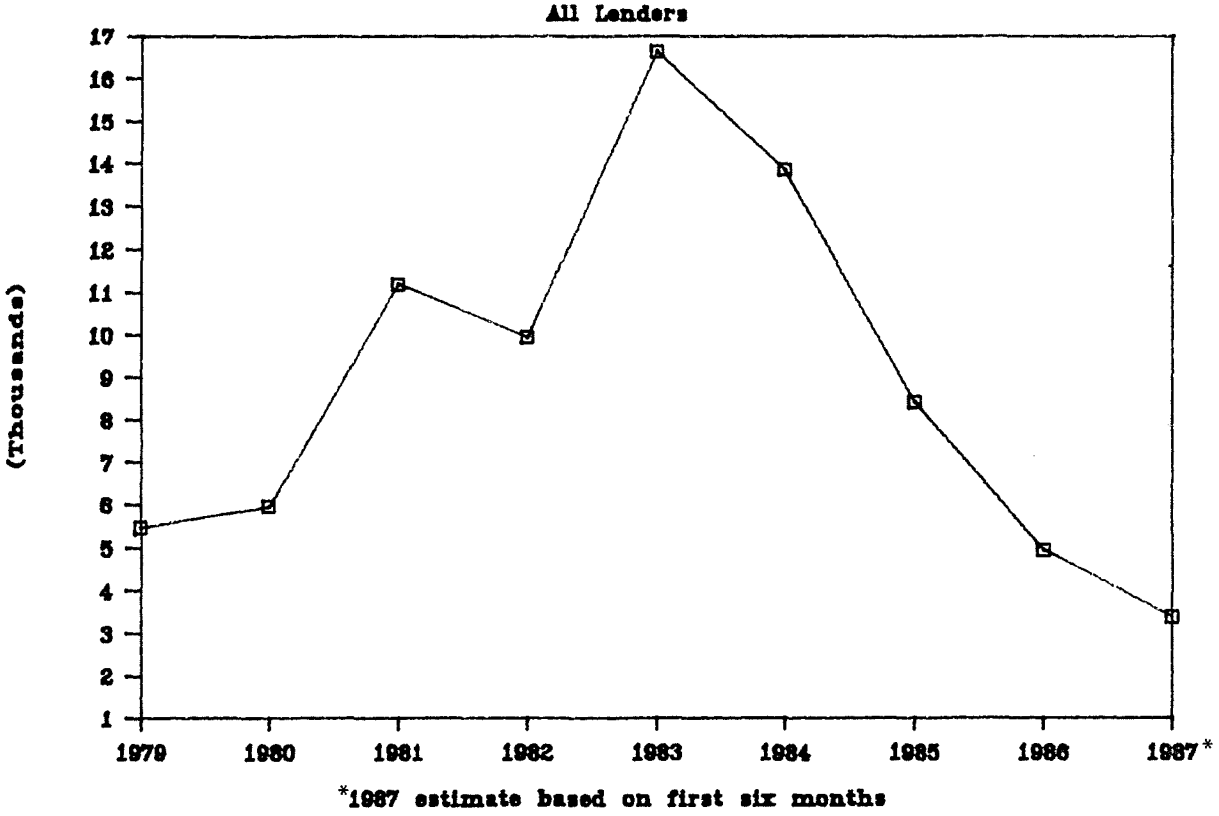
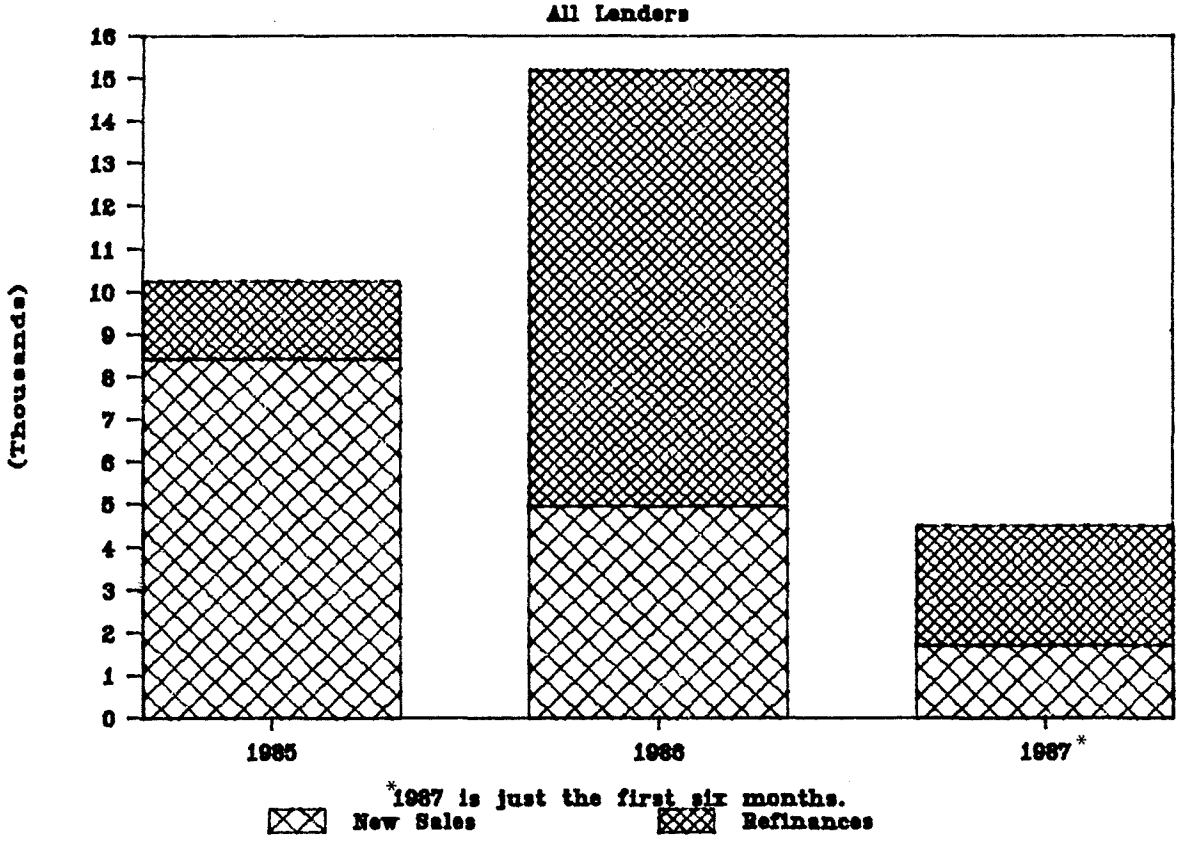


Figure 3.3

NUMBER OF NEW SALES vs REFINANCES



AHFC's Market Share

AHFC's share of the Alaska residential mortgage market in the 1980s has been influenced mainly by the difference between AHFC's rates and those of other lenders, but also by loan terms and other factors. Table 3.2 and Figure 3.4 show AHFC's market share since 1979. That share has ranged from a high of 95 percent to a low of 36 percent.

In 1979, when AHFC's programs were still closed to many Alaskans, AHFC nevertheless had about half the residential mortgage market. Before 1980, AHFC raised almost all its loan money by selling tax-exempt bonds; it was able to offer its borrowers interest rates somewhat below market rates because rates on tax-exempt bonds were lower. (In 1980, more or less coincident with the time AHFC began subsidizing interest rates, the federal government restricted the amount of tax-exempt bonds AHFC could sell and the corporation was forced to move into the more expensive taxable bond market.) FNMA and FHLMC together bought about 23 percent of the new mortgages in Alaska in 1979. Federally insured or guaranteed loans made up another 14 percent of mortgage loans in Alaska that year, with the remaining loans scattered among other lenders.

For the next five years, through 1984, AHFC had 80 percent or more of the mortgage market. Its share was so high mainly because it was offering bargain rates. In 1981, when AHFC's subsidized rate was as much as 5 percentage points below those of other lenders for the same size loans--see Figure 3.1--AHFC had 95 percent of the residential mortgage market. The number of loans purchased by FNMA and FHLMC and insured by FHA increased somewhat by 1983 and 1984, but taken together made up only 10 to 15 percent of the market.

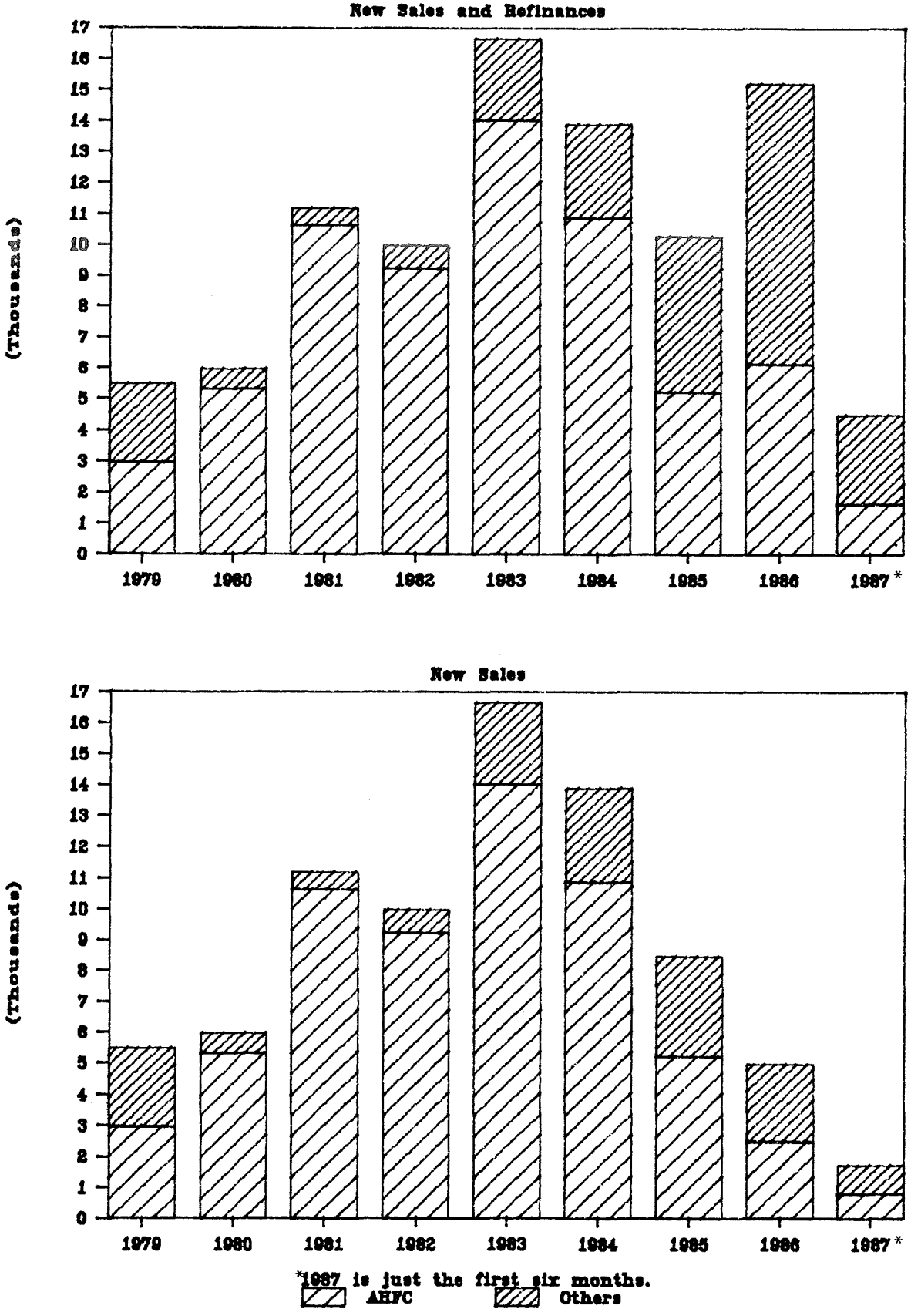
AHFC's share of the mortgage market has dropped steadily since 1985. Ever-declining interest rates from late 1985 through early 1987 meant less and less difference between AHFC's rates and those of other lenders. Without the interest rate bargain AHFC offered when rates were at their peak, borrowers shop around for various terms and conditions offered by different lenders. For example, most AHFC mortgages since 1982 have included a provision that increases monthly payments five percent a year from the fourth through the ninth year of the mortgage; under this Alaska Building Equity (ABE) provision, the increased payment is applied to the loan principal, so borrowers build up equity faster and can pay off a 30-year loan in 17 years with a lot less cumulative interest. But few borrowers actually hold their mortgages that long, and weigh the advantages of having 30-year mortgages with constant monthly payments, as offered by other lenders. Terms of refinancing vary among the major lenders. FNMA and FHLMC offer adjustable rate mortgages, while AHFC does not. Terms of loan assumptions vary. And so on.

TABLE 3.2. AHFC MARKET SHARE, 1979-1987
(in numbers of residential mortgages)

	1979	1980	1981	1982	1983	1984	1985	1986	Jan-June 1987
NEW SALES									
All Lenders	5,468	5,950	11,163	9,945	16,633	13,857	8,424	4,956	1,696
AHFC	2,940	5,290	10,598	9,200	13,993	10,857	5,204	2,470	773
AHFC Share	54%	89%	95%	93%	84%	78%	62%	50%	46%
REFINANCES									
All Lenders	0	0	0	0	0	0	1,819	10,232	2,779
AHFC	0	0	0	0	0	0	0	3,646	830
AHFC Share	0%	0%	0%	0%	0%	0%	0%	36%	30%
TOTAL MORTGAGES									
All Lenders	5,468	5,950	11,163	9,945	16,633	13,857	10,243	15,188	4,475
AHFC	2,940	5,290	10,598	9,200	13,993	10,857	5,204	6,116	1,603
AHFC Share	54%	89%	95%	93%	84%	78%	51%	40%	36%

Figure 3.4

AHFC MARKET SHARE OF MORTGAGES



In 1985, AHFC bought 62 percent of the mortgages written for home sales, but its overall share of new mortgages was 51 percent because it was not authorized to do refinancing until 1986. Its share of mortgages for home sales was 50 percent and its share of refinances 36 percent in 1986. In the first half of 1987, AHFC bought about 46 percent of the mortgages for home sales and 30 percent of refinances, to make its overall share of new mortgages 36 percent.

FHA has insured a growing share of Alaska mortgages since 1985, particularly mortgages for refinancing. In 1986 it had the lion's share of the refinancing market, writing an estimated 4,900 mortgages for refinancing, or nearly half of all such mortgages. And in the first half of 1987, it wrote more than half the mortgages for refinances. FHLMC also did a substantial share of refinancing in Alaska in 1986, with an estimated 14 percent of that market. The Alaska Department of Community and Regional Affairs and the Farmers' Home Administration do not refinance loans.

Mortgage Holdings of Major Alaska Lenders

Table 3.3 shows residential mortgage holdings of big Alaska lenders as of June 1987: 84,200 mortgages with a balance of more than $7.1 billion.

Alaska's state government, through the public corporation of AHFC and other state entities, is far and away the biggest residential mortgage holder in Alaska: together various state corporations and agencies held more than 55,200 mortgages in mid-1987. Most of those were AHFC loans. The corporation alone had 52,168 loans worth $4.3 billion in its portfolio. That represented about 62 percent of total outstanding Alaska residential mortgage loans.

We would expect AHFC's share of mortgage holdings to be very large, since it bought about 8 out of 10 new mortgages written in Alaska during the first half of the 1980s. Of the loans in AHFC's portfolio as of mid-1987, 4,760--9 percent--were mobile home loans. Of the remaining 47,408 loans, about 10,700 were loans AHFC made between 1984 and 1986 with money it borrowed from FNMA through collateralized notes. AHFC is liable for principal and interest payments to FNMA on those notes, but FNMA takes any losses not covered by private mortgage insurance if individual borrowers default.

Among other state entities, the Alaska Industrial Development Authority (AIDA) and the Division of Investments in the Alaska Department of Commerce and Economic Development together held 1,565 mortgage loans with a balance of $68 million in mid-1987. These are loans that were made years ago under a state veterans' loan program that no longer exists. The Alaska Department of Community and Regional Affairs held another 1,194 mortgages worth $123 million,

TABLE 3.3. RESIDENTIAL MORTGAGE HOLDINGS OF MAJOR ALASKA LENDERS, JUNE 1987[a]

	Number of Loans Outstanding	Unpaid Principal Balance ($ millions)
AHFC		
Mobile Home	4,760	$151
AHFC/FNMA[b]	10,722	$1,170
AHFC/Other	36,686	$2,967
Total	52,168	$4,288
FNMA[c]	5,471	$400
FHLMC[d]	5,152	$479
FHA-Insured[e]	8,437	$844
VA-Guaranteed[f]	8,602	$763
Alaska Dept. of CRA[g]	1,194	$123
Farmers' Home Admin.[h]	1,322	$106
Alaska Permanent Fund	300	$42
Alaska Pension Funds[i]	NA	NA
AIDA and Div. of Invest.[j]	1,565	$68
Total	84,211	$7,113

[a]As of June 1987, unless otherwise noted.

[b]These are loans financed with FNMA money from early 1984 through 1986; AHFC makes principal and interest payments to FNMA on collateralized notes. FNMA is, however, liable for any losses not covered by private mortgage insurance if borrowers default.

[c]Excluding loans cited in note b; these are loans financed through banks and other primary Alaska lenders.

[d]Figures are for FHLMC loans serviced by Alaska lenders as of June 1987; they may include some loans on homes outside the state but serviced by Alaska lenders and exclude some loans on Alaska homes that are serviced by lenders outside the state.

[e]Outstanding loans as of December 31, 1986, excluding AHFC loans insured by FHA. The unpaid principal balance is an estimate, based on average size of outstanding loan. Although FHA is an insurer rather than a lender, FHA-insured loans are included here because most of those loans go to lenders other than those listed in this table. Most FHA-insured loans go into mortgage-backed securities (MBSs) issued by the Government National Mortgage Association (GNMA) and sold to various investors.

[f]Figures as of March 31, 1987, excluding VA-guaranteed loans held by AHFC. A very large share of new VA-guaranteed loans in Alaska in the first half of the 1980s were purchased by AHFC. Most VA-guaranteed loans not purchased by AHFC go into MBSs issued by GNMA and sold to various investors.

[g]As of March 1987.

[h]Outstanding loans as of May 1987. Unpaid principal balance is an estimate based on average size of outstanding loan.

[i]Good estimates of cumulative Alaska residential mortgage holdings of the pension funds are not available because figures on such holdings are combined with figures on other mortgage holdings of the funds.

[j]These are mortgage loans made under a state veterans' loan program that no longer exists; it was replaced in the early 1980s by the state veterans' program administered by AHFC. Most of these loans are now held by the Alaska Industrial Development Authority (AIDA); the Division of Investments in the Alaska Department of Commerce and Economic Development holds a few and services those held by AIDA.

SOURCES: See sources, Table 3.1, and Alaska Department of Commerce and Economic Development, Division of Investments.

and the Permanent Fund Corporation an additional 300 mortgages with a balance of $42 million. The state's pension funds also held some residential mortgages, but it is difficult to separate those particular holdings from the funds' cumulative residential and commercial mortgage holdings inside and outside Alaska.

Numbers of outstanding federally insured or guaranteed mortgages in Alaska are also substantial. AHFC holds some of those mortgages, and to avoid double counting we have eliminated FHA-insured and VA-guaranteed loans from these figures; they are counted in AHFC's portfolio. FHA-insured loans outside AHFC totalled about 8,400 at the beginning of 1987 and had a balance of $844 million. VA-guaranteed loans not held by AHFC were around 8,600 with a balance of $763 million in March 1987. Together those federally backed loans made up about 20 percent of outstanding residential loans in Alaska in 1987. Another federal agency, the Farmers' Home Administration, held 1,322 loans worth $106 million.

The two national secondary lenders held about 12 percent of outstanding mortgages in Alaska in mid-1987. FNMA held 5,400 mortgages, with a principal balance of $400 million, that it had purchased from Alaska banks and other primary lenders. (These mortgages are in addition to AHFC loans financed by FNMA.) FHLMC, the other big national secondary lender in Alaska, held roughly 5,150 mortgages with a balance of $479 million.

Mortgage Liabilities

In recent months Alaska's economic recession has led to thousands of foreclosures on houses, condominiums, and mobile homes. Before we look at foreclosed properties held by various Alaska lenders and insurers as of mid-1987, we will broadly outline liability on mortgage loans when borrowers default. Table 3.4 summarizes insurance requirements and liabilities of Alaska lenders. Table 3.5 looks more specifically at AHFC's potential liability under different kinds of loans.

We want to emphasize that when we say "mortgage liabilities" we are talking only about who takes any losses on individual loans when borrowers default. There are of course other liabilities--for example, AHFC is liable for payment of principal and interest on the billions of dollars worth of bonds it has sold to finance mortgage loans. We do not discuss that or other potential liabilities here.

The first step mortgage lenders--whether private or government-backed--take to protect themselves from losses in case borrowers default is to require down payments. Those down payments can vary; they are typically at least 10 percent but sometimes as little as 5 percent of the purchase price. The chief exception is the VA-guarantee program, under which qualified veterans can borrow up to a specified amount with no money down because the federal government agrees to assume liability for a portion of the loan.

TABLE 3.4. LIABILITY* IN FORECLOSURES

Lender	Insurance Requirements	Liability of Borrower in Foreclosure	Liability of Lender in Foreclosure
Conventional Loans FNMA/FHLMC	Borrowers required to carry private mortgage insurance on loan amounts above 80% of the house price.		Lender liable for any losses not covered by PMI.
FHA-Insured Loans	Borrowers pay premium for government insurance, either in lump sum or as part of monthly payments.		FHA liable for all losses.
VA-Guaranteed Loans	The federal Veterans Administration guarantees up to $27,500 on mortgage loans to veterans as a benefit of military service; this guarantee takes the place of private mortgage insurance.	Borrowers in all cases lose their down payments, which can be as low as 0-5% but are generally 10% or more of the purchase price.	VA liable for losses up to $27,500 on each loan; additional liability falls on primary or secondary lender.
Farmers' Home Administration	This federal agency makes loans to low-income households in rural areas; no private mortgage insurance.	Also forfeited is any amount subsequently paid on the loan principal. And, in some cases, lenders will undertake judicial foreclosures, in which they go to court to make borrowers who default liable for losses on resale of the properties.	Farmers' Home Administration liable for all losses.
STATE OF ALASKA			
AHFC	Most borrowers required to carry private mortgage insurance on loan amounts above 75% to 80% of the house price; on mobile home loans, borrowers must carry private credit insurance on 40% of the loan amount.		Varies substantially among different types of loans; see Table 5.
DCRA	Loans in rural areas; no private mortgage insurance required (because it is not available in many cases).		DCRA takes all losses.
AK Permanent Fund	Borrowers required to carry private mortgage insurance on loan amounts over 70% of the house price.		Permanent Fund bears any losses not covered by PMI.
Division of Investments and AIDA	These loans were made to veterans before 1981 through the former Division of Veterans Affairs; no private mortgage insurance required.		Losses accrue either to Veterans' Revolving Loan Fund or AIDA.

*Includes just losses the various parties may be liable for when individual loans go into foreclosure.

TABLE 3.5. AHFC LIABILITY* IN FORECLOSURES

Types of Loans by Insurance Coverage	AHFC Liability
ALL LOANS EXCEPT MOBILE HOMES	
Loans with private mortgage insurance and pool insurance; include most loans made from 1981 to early 1984.	None, until bonds carrying pool insurance provision are paid off; then AHFC liable for any losses not covered by PMI.
Loans with private mortgage insurance that were financed by FNMA, 1984-1986; include most loans made during that period.	None. FNMA is liable for any losses not covered by PMI on loans it financed for AHFC during this period.
Loans with just private mortgage insurance; include some loans made throughout AHFC history and almost all loans made since January 1987.	AHFC is liable for any losses not covered by PMI.
Loans with no insurance; include loans made under several special programs that no longer exist.	AHFC liable for all losses.
Loans with federal government insurance or guarantee; include loans made throughout most of AHFC's history.	FHA takes all losses on FHA-insured loans; VA takes liability only up to $27,500 on each VA-guaranteed loan; AHFC liable for additional losses.
MOBILE HOME LOANS	
Loans before 1983 with no insurance.	AHFC liable for all losses.
Loans since 1983 with private credit insurance.	AHFC liable for losses not covered by PCI.

*Includes just losses AHFC is liable for when individual borrowers default.

The next line of protection for the lender is mortgage insurance. Conventional mortgage lenders--FNMA and FHLMC in Table 3.4--require borrowers to carry private mortgage insurance on loan amounts above 80 percent of the value of the property--with value most often defined as the purchase price of the property. AHFC also requires private mortgage insurance on loan amounts above 75 to 80 percent of the purchase price on most of its loans, with exceptions as noted in Table 3.5. The Permanent Fund managers require mortgage insurance on loan amounts above 70 percent of the purchase price.

Borrowers who take out FHA-insured loans pay an insurance premium either in a lump sum or as part of their monthly payments. The Veterans' Administration guarantees up to $27,500 on loans to qualified veterans; that guarantee replaces mortgage insurance.

The Farmers' Home Administration and the Alaska Department of Community and Regional Affairs make loans in remote areas where private mortgage insurance is generally not available, so those loans carry no insurance. Likewise, mortgage loans held by AIDA and the Division of Investments carry no mortgage insurance; none was required by the old state veterans program under which these loans were made.

So--given the above--what happens when an Alaska borrower defaults and the property goes into foreclosure? First, borrowers who default lose their down payments and any amount they may have subsequently paid on the loan principal. (Damage that defaulting on a loan does to the borrower's future ability to get credit is also certainly a loss, although a less direct one.) Also, if a lender believes that a borrower who defaulted actually could have made his payments but chose--for one reason or another--not to, the lender can go to court in what is known as a judicial foreclosure and try to make the borrower liable for any losses when the property is re-sold.

What losses insurers and lenders may face in foreclosures is a complicated question, influenced by many things, but primarily by the condition of the housing market.

When a property with private mortgage insurance goes into foreclosure, the private insurer tries to keep his costs to a minimum. He can let the lender re-sell the property and simply pay a claim to the lender--for any losses up to the maximum covered by insurance. Or he can take title to the property and sell it himself. In a healthy housing market, where property values are rising or at least holding steady, the insurer might elect to try to sell the property himself--because he could hope to sell the property for more (or at least as much) as the outstanding mortgage, accumulated interest payments, and any other costs associated with foreclosing.

But property values in Alaska today are not rising but falling; average assessed values in Anchorage in 1987, for instance, were down 20 percent. And values of mobile homes and some condominiums have dropped much more. When property values are sliding, insurers generally elect to pay claims and leave properties to lenders to re-sell--because they might sell for significantly less than the outstanding mortgage and foreclosure costs. This is particularly true of mortgages that were written in the early and mid-1980s, when prices were at their peak.

What costs do lenders then face when borrowers default? Again, in a market where property values are rising, lenders who require private mortgage insurance generally do not incur losses. But in today's market lenders are taking losses--because so many of the properties now in foreclosure originally sold when prices were so much higher than today.

FNMA and FHLMC are liable for any losses on their loans not covered by private mortgage insurance. FHA takes possession of and re-sells FHA-insured properties, taking any losses. The VA has the option of either taking title to VA-guaranteed properties and re-selling them, or simply paying claims of up to $27,500 to lenders. In most cases recently, the VA has decided it could limit its liability by simply paying off the lenders.

On mortgages with no insurance, the lenders take any losses. This means that of the lenders listed in Table 3.4, the Alaska Department of Community and Regional Affairs, AIDA, and the Farmers' Home Administration directly take any losses on loans they make.

AHFC's potential liability in case of defaults varies substantially for loans it made at different times and under different terms, as described in Table 3.5. Most AHFC loans made on houses and condominiums between 1981 and the present carry private mortgage insurance on amounts above 75 to 80 percent of the value of the property.

In addition to private insurance, the bulk of loans AHFC made between 1981 and early 1984 also carry pool insurance--insurance that covers any losses beyond those covered by private insurance. This pool insurance was provided by Mortgage Guarantee Insurance Company (MGIC) as a provision of the bonds AHFC sold to finance these loans. So AHFC's liability for losses on these specific loans is virtually zero--but only until the bonds financing the loans are paid off; when the bonds are paid off, the pool insurance is no longer in effect.

From early 1984 through 1986, the national secondary lender FNMA financed a large share of AHFC loans. If borrowers default on those loans, FNMA is liable for any losses not covered by private mortgage insurance. So AHFC has essentially no liability on default losses on those particular loans. (AHFC is, of course, liable for payment of principal and interest to FNMA on the notes that financed the loans.)

AHFC also holds several thousand VA-guaranteed loans and a few FHA-insured loans. On the VA-guaranteed loans, as we described earlier, the VA has the option of taking title to the properties and re-selling them, or paying claims up to a maximum of $27,500 for each loan. In cases where the VA judges that its liability would exceed $27,500 if it took the property itself--and that includes many cases today--the VA simply pays the claim and leaves AHFC with the property and any additional losses. On FHA-insured loans that go into default, FHA takes possession and re-sells them itself.

Some AHFC loans carry no insurance. These are by and large loans that were made under special programs that no longer exist. They include some loans made under the old state veterans program; the legislature directed AHFC to take on some of these loans when the Division of Veterans Affairs was abolished. They also include loans the Department of Community and Regional Affairs made under the nonconforming loan program, which the legislature transferred to AHFC in fiscal 1986. Also, AHFC had a rural loan program in the early 1980s; loans made under that program carry no insurance.

A large share of AHFC's mobile home loans likewise carry no insurance: before 1983 AHFC did not require insurance on mobile home loans. AHFC takes all losses when such loans go into default. On mobile home loans since 1983, AHFC has required private credit insurance to cover 40 percent of the value of the loan; AHFC takes any losses not covered by that private insurance.

Alaska Properties in Foreclosure

Having looked at mortgage holdings and liabilities of lenders and insurers, we now turn to the strongest evidence of the condition of Alaska's housing market today: properties in foreclosure.

Table 3.6 shows numbers of foreclosed properties held by major lenders and insurers as of June 1987, and numbers of properties they had sold from their inventories in the previous year and a half. The table tells us that all lenders are being hit with loan defaults. But as we would expect, given that AHFC holds more than 60 percent of the outstanding residential mortgages in the state, including most of those made in recent years, AHFC is taking the hardest hit.

As of the end of June, the big lenders and insurers in Alaska were holding 4,254 foreclosed properties; 2,758 of those--65 percent--were AHFC properties. FNMA, FHA, and VA were each holding close to 400 properties--or about 9 percent each--of the total inventory. Many of the properties in FNMA's inventory were financed with AHFC loans that FNMA had backed.

TABLE 3.6. INVENTORY OF FORECLOSED PROPERTIES HELD BY MAJOR ALASKA LENDERS AND INSURERS, JUNE 1987

	Held in Inventory June 1987	Foreclosed Properties Sold 1986 - June 1987
AHFC		
Mobile Home	965	143
Other	1,793	1,075
Total	2,758	1,218
FNMA	394	160 [e]
FHLMC[b]	78	-
FHA-Insured	385	87
VA-Guaranteed[c]	366	80
MGIC	105	25 [f]
Alaska Dept. of CRA	40	1
Farmers' Home Admin.	100	30
Alaska Perm. Fund	23	11
AIDA and Div. of Invest.	5	6
Others[d]	NA	NA
Total	4,254	1,618

[a]Properties "held by" each lender or insurer include just those to which each already held title or was in the process of acquiring title to as of June 1987.

[b]Includes both completed and nearly completed foreclosures.

[c]Includes both properties the VA has already acquired title to and pending title acquisitions. Excluded are properties that the VA paid claims on but did not take possession of. Most such properties probably went into AHFC's inventory of foreclosed properties; some ended up in the hands of mortgage companies, banks, or other primary lenders.

[d]Some foreclosed properties are held by a wide range of Alaska banks, other primary lenders, and private mortgage insurance companies. Figures on such holdings are extremely difficult to get, and the numbers are small compared with the holdings of the secondary lenders and largest insurers.

[e]Properties sold 1986 - May 1, 1987.

[f]Estimated sales from November 1986 - June 1987.

SOURCES: See Sources, Table 3.1.

MGIC, as we discussed earlier, provided pool insurance for thousands of AHFC loans in the early 1980s. Many of the properties in AHFC's inventory of foreclosures are covered by MGIC pool insurance; MGIC is working with AHFC to market those properties, but AHFC holds title to them. MGIC also provided private mortgage insurance for a large number of Alaska homeowners. The 105 properties MGIC had in June 1987--about 2 percent of total foreclosures--were largely properties it had taken title to as a primary rather than a pool insurer.

The remaining mortgage holders in the table together held about 250 foreclosed properties, or 6 percent of the total inventory.

The second column of Table 3.6 gives us another piece of information about the volume of foreclosures in Alaska: properties that lenders took into foreclosure but re-sold from the start of 1986 through the middle of 1987. Foreclosed properties that were re-sold during that period totaled more than 1,600. Again the lion's share was AHFC's: 1,218, or 75 percent of the total, were AHFC properties.

Taken together, the foreclosed properties held in inventory and those sold during the previous 18 months totalled 5,872. That represents 7 percent of outstanding residential mortgages in Alaska in mid-1987. And there were no doubt other foreclosures that are not recorded on this table--those held by banks and private mortgage insurance companies (other than MGIC), for instance. Reliable figures on such foreclosures are very difficult to get.

Table 3.7 looks in more detail at AHFC foreclosures, showing numbers of mobile homes and other properties taken in foreclosure each year since 1984, numbers sold, and remaining inventory in June 1987. What the table shows most clearly is the snowballing rate of foreclosures during that period. In 1984, AHFC foreclosed on 169 properties; in 1985 on 630; in 1986 on 1,792; and in just the first six months of 1987 on 1,676--for a total of 4,267 foreclosures in three and a half years. It re-sold 1,509 of those properties, mostly during 1986 and the first half of 1987, and in June was left with 2,758 properties. Of those, 965 were mobile homes and the rest were almost all condominiums and single-family houses. (AHFC does finance duplexes and triplexes, but the numbers are small.)

The table also makes clear the difficulties of re-selling mobile homes; of the 1,153 AHFC foreclosed on during this period, it re-sold just 188, or about 16 percent. By contrast, it re-sold about 42 percent of the other kinds of properties it took under foreclosure. And foreclosures continue to climb: in the month after this table was compiled AHFC took in roughly 200 more properties.

TABLE 3.7. AHFC INVENTORY OF FORECLOSED PROPERTIES AND SALES, 1984 - JUNE 1987

	1984	1985	1986	June 1987	Cumulative 1984 - June 1987
Total Properties Taken Under Foreclosures Each Year					
Mobile Homes	48	183	509	413	1,153
Other	121	447	1,283	1,263	3,114
All	169	630	1,792	1,676	4,267
Foreclosed Properties Sold Each Year					
Mobile Homes	10	35	85	58	188
Other	30	216	544	531	1,321
All	40	251	629	589	1,509
Remaining Inventory of Properties (Cumulative)					
Mobile Homes	38	186	610	965	965
Other	91	322	1,061	1,793	1,793
All	129	508	1,671	2,758	2,758

SOURCE: AHFC

Summary

Taken together, the tables and figures in this chapter tell much of the story of the rise and fall of Alaska's housing market in the 1980s, and of AHFC's major role in that market in the past seven years.

During Alaska's economic boom of the early 1980s, houses were bought and sold at a record pace and at record prices. AHFC played an important part in boosting housing sales, because it was subsidizing mortgage interest rates and offering special programs for lower income Alaskans. At the same time, the economic good times were drawing tens of thousands of new residents to the state. The combination of below-market interest rates and growing demand for housing pushed housing construction and sales up: in 1983, the peak year of activity, more than 16,500 new mortgages for homes sales were written. And in those boom years between 1981 and 1984, AHFC bought about eight out of ten new mortgages in the state.

The pace of housing sales began dropping in 1985--coincident with the economic slowdown that that became a severe recession in 1986. At the same time, market interest rates began dropping, and by the end of 1986 were at their lowest point in the 1980s. A combination of declining interest rates and different loan terms offered by various lenders brought AHFC's share of mortgages for home sales to about 60 percent in 1985; its inability to do refinancing in that year brought its overall share of mortgages for sales and refinances to around 50 percent.

The recession began making itself felt in earnest in the housing market in 1986, when only about half as many mortgages for homes sales were written as in the previous year, and less than a third as many as had been written as recently as 1983.

Two-thirds of the new mortgages written in 1986 were for refinances by existing owners rather than for sales. The state legislature gave AHFC authority to refinance mortgages in 1986, and its overall share of mortgages for sales and for refinances was about 40 percent that year. In the first half of 1987, home sales were even slower than in 1986, with only about 1,700 mortgages for homes sales written. Refinancing continued brisk in early 1987, with about twice as many mortgages written for refinances as for sales. AHFC had about a third of the overall mortgage market through mid-1987.

Another sign of the growing recession was the growing number of Alaska properties in foreclosure in 1986 and the first half of 1987. The big lenders and insurers were holding more than 4,200 foreclosed properties in June 1987, and had sold an additional 1,600 properties that had been taken in foreclosure in the preceding 18 months. Taken together, those sold and unsold properties represented 7 percent of

outstanding residential mortgages in Alaska in 1987. That rate compares, for instance, with a national foreclosure rate for FHLMC-financed properties of less than 1 percent.

The lion's share of foreclosed properties were AHFC's--not surprising, given AHFC's 60-percent share of outstanding residential mortgages and given that most of the loans were written when prices were at their peak. With property values sliding, many AHFC mortgage holders find themselves unable to sell their homes for even as much as they still owe on the mortgage--let alone for the prices they paid for the properties. And the pace of foreclosures accelerated in 1987, with AHFC taking in nearly as many properties in the first six months of 1987 as it had in the entire previous year.

We projected in Chapter II that the economic conditions that have forced down property values, slashed home sales, and put thousands of properties into foreclosure will begin to improve in 1988. The next chapter looks at what AHFC and other lenders might do to help the housing market recover.

Chapter IV. THE HOUSING MARKET AND POLICY OPTIONS

In earlier chapters we described the grim effects of the recession on Alaska's economy and housing market. We believe that the recession will end in 1988 and a gradual recovery begin. But some of the effects of the recession, including effects on the housing market, will not disappear overnight. A crucial question for AHFC and other major lenders is whether they can do anything that will speed the recovery of--or at least stabilize--the housing market.

This chapter assesses how a number of different policies that AHFC might try would influence the Anchorage housing market over the next five years. We don't have enough information to make such assessments for housing markets in other areas of the state, but movements in the Anchorage market will reflect general trends in housing markets throughout Alaska--with some obvious regional differences.

To project the effects of different policies we use a housing market model developed by ISER. These projections are of likely change in the Anchorage housing market, based on certain assumptions about future economic activity and specific housing policies. They are not "forecasts" of what is going to happen in the housing market. Chapter II assesses the likely range of economic activity in Alaska through the mid-1990s. The level of economic activity will of course be the most important influence on the housing market during the coming years. But the next most important influence on the housing market will be the housing policies that AHFC and other lenders choose. We could only forecast the path of the housing market if we knew for certain the state economic future and the policies lenders will choose.

The crucial policy choice AHFC and other lenders must make is how fast and at what prices to sell the thousands of foreclosed properties they have acquired and continue to acquire. As Table 3.6 in Chapter III shows, AHFC and other lenders were holding more than 4,000 houses, condominiums, and mobile homes as of June 1987, and in the preceding 18 months they had sold an additional 1,600 foreclosed units. Under what we consider the most likely level of economic activity, sales of foreclosed properties (particularly condominiums) will strongly influence the stability of the Anchorage housing market--including the numbers of future foreclosures--in the next few years.

More than 60 percent of the foreclosed properties in Alaska in mid-1987 belonged to AHFC, and most were concentrated in Anchorage and nearby areas. Of the state's major mortgage lenders, AHFC will continue to be hardest hit by defaults until the recession ends, because it holds about eight out of ten new mortgages written in Alaska in the first half of the 1980s. Decisions of AHFC about how to handle its inventory of foreclosed properties will therefore be

critical to Anchorage's housing market in the next few years, as will decisions of other lenders whose foreclosure holdings are smaller but still substantial.

Below we briefly explain why sales of foreclosed units will so strongly influence the condition of the Anchorage housing market over the next few years. Next we outline the structure of housing markets in general, discuss our model, and then assess the relative effects of selected housing policies.

Sliding Prices and Rising Defaults: A Vicious Circle

The faster AHFC and other lenders and insurers put foreclosed properties on the market--at the extreme, through auctions similar to one a major lender held in Anchorage last fall--the more prices will be depressed and the more defaults will persist, if not increase. The result will be that the lenders will end up holding more properties through foreclosures.

Why selling large numbers of foreclosed properties in a short period results in more borrowers defaulting is easy to explain. Putting a great many foreclosed properties on the market quickly pushes prices down. As prices go down, more and more homeowners find themselves with negative equity--that is, their mortgages are larger than the market prices of their properties. When owners with negative equity are forced to sell, they will likely default because they are unable or unwilling to make up the sometimes substantial difference between what they owe and what the properties will sell for.

Holding foreclosed properties off the market is of course also expensive for lenders and insurers: they pay in the neighborhood of $18 to $30 per day for each unit, depending on the size of the outstanding mortgage and the interest rate. What AHFC and others must weigh are the relative costs: what choices will turn out to be most costly and the most beneficial in the next few years and in the longer term?

Sliding property values and rising defaults have already cost Alaska lenders, insurers, and borrowers tens of millions of dollars. In addition to the costs we've already noted, the foreclosure process that follows default can cost thousands of dollars in administrative and legal fees that are borne by borrowers, lenders, and taxpayers. Costs of judicial foreclosures--in which the lender goes to court to try to have the borrower declared liable for losses when the property is re-sold--are particularly high. And falling property values also have other social costs; for example, some homeowners who could find better jobs elsewhere don't move because they can't sell their houses for what they owe on them and they don't want to default.

A continuing cycle of dropping prices and growing defaults will also make national lenders and insurers and bond investors less willing to put money into the Alaska housing market in the future. That lack of confidence will translate into higher costs for AHFC and other lenders and therefore higher costs for Alaska homeowners in general--higher costs for insurance, for instance, or higher interest rates on bonds AHFC sells to finance mortgages.

As a government entity, AHFC is also justified in intervening to limit the effects of falling prices on the quality of Alaska housing. When there is more housing than there is demand, some houses sit vacant or may be rented at rates that aren't adequate to pay maintenance costs. Deterioration sets in. If just the poorest quality stock deteriorated, government intervention might not be justified, because we could assume that the poorest stock was being eliminated and Alaskans in general were moving into better quality housing.

But there are two reasons why deterioration might spread to better housing. First, when poor-quality houses deteriorate, that deterioration may reduce the value of nearby higher quality housing. Second, even though declining prices mean buyers can afford better quality housing, many potential buyers are also borrowers who already own lower quality housing with negative equity--and therefore they can't sell their current homes and buy better ones. So again, better housing might sit vacant and deteriorate. Nonetheless, refined AHFC policies might be able to limit the extent of such deterioration.

Given the situation we've just described, public policies that could stabilize prices and decrease both present and future defaults and foreclosures merit serious consideration. Below we describe housing markets in general and how we have modeled this market.

Structure of Housing Markets

The housing market, like all markets, can be described in terms of supply and demand. In fact the housing market is not a single market but rather a number of markets with similar but not identical goods: housing varies in size, location, and construction type; it may be occupied by owners or renters. While at any given moment a person can live in only one type of housing--for instance, an owner living in a single-family house--the various markets are related and the price in one market affects demand in all the others.

The market clearing process for housing--the process by which supply and demand come into balance--is complicated by imperfect

information, price floors imposed by mortgages, and costs associated with moving. These market imperfections make it hard to observe the housing market in equilibrium, where prices clear the market. Buyers and sellers have only limited information about what price houses will sell for. They may know what specific houses sold for in the recent past, but they may know little of overall market adjustments since those sales. Also, because there are so many different types of houses, information about the selling price of one particular house may not be relevant to the selling price of others. Over time, as many buyers and sellers adjust their asking and offering prices, the market moves toward a market clearing price.

Two other elements hinder movements toward a market clearing price, particularly in a market where prices are falling. Prices might not fall as low as they otherwise would because loan amounts limit how low they can go: a seller who accepts a price that is less than what he still owes on the property would have to make up the difference--so the mortgage amount may set a floor for the selling price. Also, there are other monetary and social costs involved in moving from one type of house to another. These moving and transaction costs may make families or individuals less willing to move to houses that might be better for them, even in the face of declining prices.

These complexities notwithstanding, the housing market still operates like most other markets. The demand for housing in a given community depends mainly on how many households there are in the region. The demand for particular types of housing determines how households are distributed among the various types. The most important determinants of housing demand are household income, wealth, family size, mortgage rates and terms, and prices.

At any given time there will be a supply of newly constructed houses and older houses up for sale. When builders can construct a house and sell it for more than the building and selling costs, they will build any type of house. Thus builders respond to the expected price of homes and the construction costs. They also consider how long it would take to sell or rent a new house. Another important element affecting the supply of housing is the number of sellers who are either leaving the state or moving into a different type of housing. Generally such changes are tied to changes in the economic positions or the demographic characteristics of households. Thus, the overall level of economic activity affects the supply of housing.

Modeling the Housing Market

Our housing market model, and other housing models developed in the U.S. over the past 25 years, are described in detail in Chapters II and III of ISER's November 1986 report, The Effect of Changes in the Alaska Housing Finance Corporation Mortgage Programs, Final

Report. Appendixes C and D of this report provide model documentation. Below we briefly discuss some of the difficulties inherent in modeling the housing market.

Housing markets are extremely complex. Our housing market model reflects this complexity; it is designed to take into account relationships between dozens of variables, and it is built on hundreds of assumptions about future economic activity and about how housing markets work. The three major economic variables we use in the housing market model are (1) the number of Alaska households; (2) the per capita income of Alaskans; and (3) the Alaska cost of living. The number of households and per capita incomes affect the demand for housing, while changes in the cost of living affect the costs of construction and the supply of housing. The housing model incorporates the economic assumptions and projections presented in Chapter II.

Our model provides a good picture of how the Anchorage market may react to different policies. But it is after all a computer simulation model--not a crystal ball. It is impossible for a model to capture all aspects of a market as complicated and as subject to so many forces as the housing market. Furthermore, it is limited by lack of information about some aspects of the economy and the housing market. We can not, for instance, project the effects of various policies on Alaska housing markets other than Anchorage.

Projections made with the model are of course only as accurate as what goes into the model. We believe our assumptions about likely economic activity between now and 1992 are good ones, but we all know the Alaska economy is volatile: no one can be entirely sure what will happen. To create a computer model, we have to build in relationships between many variables--and we have constructed those relationships by looking at what they have been historically. In the future those relationships could be different from what they have been in the past. The fact that most of our historical data is from a period when the Anchorage housing market was on the upswing posed a particular difficulty--although we were able to incorporate some historical information from the early part of the decline. Another complexity is that computer models do not generally reflect changes immediately; changes often show up only after some time lag.

Finally, no computer model can ever precisely incorporate people's expectations. What Alaskans believe is going to happen to the economy will affect their spending and investment decisions and therefore influence what does happen in the economy. This is not to say that Alaskans can end the recession by spending and investing more, but rather that Alaskans' perceptions about the economy can have some effect on just when the economy begins turning around: Alaskans acting on their beliefs about the future might end the recession a bit sooner or somewhat later than we expect.

General Policy Options

This section talks broadly about what options AHFC has for influencing the Anchorage housing market, and some of the ways those policies might be implemented. Any policy AHFC undertook that increased or decreased housing prices would have broad effects on other lenders, insurers, homeowners, renters, landlords, and others with interests in the Alaska housing market. Our computer model can't project specific effects of different policies on all those groups, but we can talk in general terms about how AHFC policy choices could affect others, and about some other broad policy considerations that the model can't capture. In the next section we use our housing market model to look more narrowly at how some specific policies would affect housing prices and other market variables.

Policies can affect either the supply or demand side of the housing market. In addition, policies may improve the market adjustment process. Five possible strategies are: allowing prices to adjust to clear the market; increasing the demand for owner-occupied housing; reducing the stock of housing; using market power to maintain a floor price; and limiting mortgage liability. Each of these general strategies would be implemented differently, would have effects on several housing objectives, and would have various costs and benefits.

Allow Prices to Adjust to Clear the Market

Under this policy, AHFC would auction off its foreclosed units. If auctions were held regularly, AHFC could clear its inventory of foreclosed properties and the prices paid would provide information for the rest of the sellers in the market. An important consideration in this type of program would be the rate at which foreclosed properties were auctioned. If all properties were auctioned at one time, prices would drop sharply. To prevent that, AHFC could clear its accrued properties over a period of time.

Such a program would lower the price of homes offered for sale and reduce the number of private (non-auctioned) homes sold. The price decline required to clear the foreclosures would depend on the relative elasticities of demand and supply for the various types of housing and the rate at which houses were auctioned. Since owner and rental housing are substitutes, this policy would also result in a decline in the price of rental housing.

This policy would increase the default rate. Reducing the price of owned homes would increase the number of households at risk of default, since it would increase the number of homes with negative equity.

How much prices would fall and how many new defaults would be created by auctions would depend on the economy. The demand for housing will depend on future population and income growth. The number of those at risk who actually default will also depend on economic conditions.

By auctioning foreclosed properties, AHFC and other mortgage holders would be trading potential losses on the mortgages--selling at prices lower than the mortgage amounts--for reductions in holding costs. Whether selling at depressed prices would be more or less costly than holding on to the properties would depend on expectations about future price changes. If prices were expected to rise enough so that holding costs would be less than loan losses, it would pay to hold the units. If price declines encouraged future defaults, auctioning properties could increase both future loan losses and holding costs.

Mortgage insurers would also be affected by auctions of foreclosed properties. The liability of mortgage holders depends on the extent to which their mortgages are covered by insurance. If the mortgage on an auctioned property were fully insured, the insurer would bear the losses described above. If the mortgage were not fully insured, the loss might be shared by the lender and the insurer, although the insurer would be liable for the first portion of the loss.

Property owners would see a decline in their home equity if such auctions took place. For certain home owners, this decline would result in negative equity. Homeowners wouldn't realize actual losses unless they were forced to sell.

Owners of rental property would suffer a decline in rents paid and in the value of their properties, because owning and renting are substitutes. Renters, on the other hand, would gain from this program, since it would reduce their rents and make it cheaper to buy houses.

By reducing the cost of housing, an auction program would allow buyers to get better quality housing for less money.

Increasing the Demand for Owner-Occupied Housing

In periods of limited population growth or even decline, stabilization policies can be aimed at increasing the rate of homeownership. Homeownership can increase in a stable population as the population ages, household income grows, and family size increases. In declining markets, uncertainty about future economic status or expectations of future price declines may keep people from buying homes. Additional factors that may limit housing demand are required down payments, restrictions on AHFC loans, and the level of

interest rates. AHFC and Mortgage Guarantee Insurance Company (MGIC)--the insurer for a large number of AHFC loans--have recently undertaken condominium marketing programs that reduce down payments, loosen loan restrictions, and offer interest rates that are generally below those of other lenders.

Lower mortgage rates in general increase the demand for owner-occupied housing. Both the overall number of houses bought and the types purchased will change with changes in the mortgage rates. But any nonproportional offer of subsidies may simply shift the demand between types and not increase the overall demand. In addition to the lower interest rates AHFC and MGIC are now offering through their condominium sales program, AHFC also has a program (the HOF program) that effectively subsidizes interest rates for lower income buyers.

Some Alaskans who might want to buy homes may be able to meet the monthly payment on a loan but not make the required down payment--and AHFC and other lenders have recognized that by reducing required down payments in some cases. A variation on these reduced down payments would be a lease option program. AHFC could establish this program with its foreclosed properties; the corporation could lease these units with an option to buy. A portion of the lease payment each month could go toward the down payment. Such a program would counter the effects of uncertainty on the housing market; lease holders would not suffer the long-term risks of a change in their economic status or a decline in the price of housing.

AHFC's 70 percent ownership rule for condominium complexes may have limited demand until recently; that rule says that AHFC loans will be available only in complexes where 70 percent of the units are occupied by owners rather than renters. By loosening that ownership share requirement, AHFC has increased the portion of condominium stock eligible for AHFC loans. AHFC might also consider replacing the ownership requirement with long-term leases that included an agreement to pay the condominium association fee; these lease agreements could be enforced by the condominium association.

AHFC's recent policy changes sharply increased the number of condominiums AHFC sold in Anchorage in the summer of 1987, and the other kinds of actions described above might increase demand more. Increased demand should tend to shore up prices. AHFC and MGIC are of course bearing extra costs for these new marketing measures, and any additional measures would mean more costs. For example, additional rate subsidies would require funds from either AHFC's reserve or additional state appropriations to buy down market interest rates. Additional funds might also be necessary if reducing the ownership requirement in condominium projects results in increases in the rates AHFC pays on bonds. Second, AHFC may have to establish an insurance fund to support the lower down payment

program. The cost of a lease option program with foreclosed units would be the lost capital gains if housing prices rose in the future.

But if these measures help stabilize prices, AHFC and others will also benefit. The rate of defaults and therefore foreclosures should be reduced, reducing future loan losses and holding costs.

Property owners should also ultimately benefit from these types of programs, if the programs help increase the value of their homes and improve their chances of selling them. Owners of rental property, however, could be made worse off. By reducing the costs of owning and increasing the access to homeownership, these programs could reduce the demand for rental units. That in turn would reduce rents and the value of rental property.

By reducing the costs of both renting and owning homes, these programs could also improve the quality of housing Alaskans live in and increase the rate of homeownership. One general problem with programs that reduce the value of rental property is that this reduction could result in long-term declines in the quality of the stock, because landlords are more likely to defer maintenance.

The total effects and costs of such programs would depend on the future level of population. If the economy grows faster than expected, the cost of the programs would increase and add to the upward pressure on prices.

Removing Housing Stock

The most direct strategy for stabilizing the housing market in the face of "excess" supply is simply removing a portion of the supply. This reduction in supply would put upward pressure on prices. Two types of housing would lend themselves to removal: mobile homes and poor quality multi-family housing.

Mobile homes could be shipped to other markets; at some price, it would pay to export at least some of the newer mobile homes. Removing other types of units would be more difficult. The state's urban areas have few poor-quality units, and most that exist are rental units. Taking those poor-quality units out of the housing stock would require the state to buy them--or trade for foreclosed units--and tear them down. If AHFC traded foreclosed units with private owners, a number of steps would be involved. First, the remaining condominium owners in the selected complexes would have to be relocated (this would require refinancing) to foreclosed units in other complexes. Second, the condominium complex would have to be traded for the apartment unit; the trade might involve additonal cash. Finally, the tenants of the rental unit would have to be relocated and the building demolished. One variant of this strategy would be to trade foreclosed property with the Alaska State Housing Authority (ASHA). On a smaller scale, single-family units on lots zoned for other uses might be removed through trade.

Removing stock in this manner should help stabilize prices in the owner-occupied market and have a limited effect on the rental market. The extent of the increase in prices would depend on the proportion of excess stock removed; the smaller the share removed, the smaller the effect. The small quantity of poor-quality housing available for use in such a program suggests that the effects would be limited.

The costs of such trades to AHFC would be the market value of the traded property, the relocation costs of renters and condominium owners, and the demolition costs. There would be a number of benefits for AHFC, including a reduction in the loan loss and holding costs of foreclosed properties and a reduction in the rate of future foreclosures.

Depending on their level of participation, the insurers would have to be paid market values of the properties. Their participation might be based on how much they would benefit if their future losses were limited.

Property owners would be better off to the extent that this program stabilized housing prices. Owners of rental property would be no worse off, since the rental stock would remain the same and owner stock would be reduced. Renters should likewise see no change, since the amount of rental stock would be the same.

The overall quality of the housing stock would be improved through this program, because it would concentrate renters and owners in better quality housing and limit deterioration of the stock.

The costs of this program would depend on the economic future; further declines in the value of the housing stock would reduce the costs of improving the quality of the stock. Eliminating stock would also increase inflationary pressure should there be a surprise rapid turnaround in the economy.

Using Market Power to Maintain a Floor Price

AHFC's stock of foreclosed properties makes it, as we have noted, a major seller in the housing market. This control of a large share of the market gives AHFC power to influence prices. AHFC could act to prevent a decline in prices simply by establishing a floor price for its units and holding them until they could be sold for that price. The floor price could be established to minimize the average loan loss on foreclosed properties.

If AHFC were able to stabilize prices by establishing a floor price, there would be various costs and benefits. AHFC and its mortgage holders would see two benefits: reduced loan losses on

sales of foreclosed property, and fewer defaults in the future. However, holding costs would be higher, since maintaining the price above the market clearing level would increase the length of time foreclosed properties were held. But as we noted earlier, AHFC and its insurers face large expenses in holding foreclosed properties off the market--in the range of $18 to $30 per day for each unit. Whether the holding costs would outweigh other benefits would be the critical issue for AHFC and its insurers. The policy would save money overall if the holding costs up until the time of the sale were less than the loan losses would have been if a property had been sold earlier at a lower price.

For those loans completely covered by mortgage insurance, the costs and benefits outlined above would accrue to the insurers. On loans only partially covered by insurance, the costs and benefits would be distributed between the insurers and the lenders.

Owners of both homes and rental units would benefit if this program stabilized prices. Homeowners who wanted to sell would have a better chance of doing so simply by offering their houses below AHFC's floor price. Renters could be hurt by this program, because it would increase the costs of buying and renting.

Limiting Mortgage Liability

Falling prices over the past eighteen months have left many Anchorage homeowners--particularly those who bought when prices were at their peak--with negative equity: that is, they owe more on their houses than the houses can be sold for. That negative equity is a market barrier with serious consequences. First, it pushes many borrowers into default if they are forced to try to sell and are unwilling or unable to make up the sometimes substantial difference between what they owe on their houses and what the houses will sell for. Second, it prevents some homeowners from taking advantage of lower prices and buying better quality houses--because they are unable to sell their existing houses for what they owe on them.

AHFC and other lenders might mitigate the market barrier posed by negative equity--and thereby reduce defaults and increase demand--if they limited borrowers' mortgage liability in some circumstances. There are a number of ways lenders could go about limiting mortgage liability.

One way would be for AHFC and its insurers to negotiate write-downs of loan liability for borrowers who had to sell. Such write-downs would be similar to the pre-foreclosure sale agreements currently being used by mortgage insurers. Steps involved in such a process might include having the home appraised by a certified appraiser approved by AHFC; forgiving the borrower some percentage or all of the amount owed above the appraised value (or

the sale price); having the seller pay closing costs; and splitting the loan losses between AHFC and its insurers, in shares proportionate to their total liability on each loan.

Of course the lenders would establish guidelines for determining when they would write down mortgage liability rather than pursue foreclosure: a blanket policy of writing down liability for borrowers unable to sell their houses for what they owed on the houses would encourage more defaults. And, such a blanket policy of not pursuing foreclosures could in turn make mortgage insurers and bond investors reluctant or even unwilling to buy or insure mortgage loans in Alaska in the future.

But in some circumstances mortgage write-downs could save lenders and insurers money, if the alternative were going through foreclosure proceedings, taking possession of the house, holding it for re-sale, and taking a loss on the re-sale. A single judicial foreclosure can cost the state in the range of $5,000 to $10,000--plus costs of holding foreclosed units ($18 to $30 per day for each unit). In addition, potential losses on re-sale of a property could be as great as the amount of a loan write-down. AHFC would have to weigh the relative costs and benefits in making its decisions about whether and when to write-down mortgage liability.

Another possible method of limiting mortgage liability in some circumstances would be to allow homeowners who wanted to sell their existing houses and move into better ones in Alaska to defer a part of their mortgage liability until prices went back up. These homeowners would, in a manner of speaking, be taking their negative equity along with them. A homeowner with negative equity on his current house would be allowed to sell that house for less than the outstanding mortgage and buy another house in Alaska, with the proviso that he had to repay the lender later, when property values and incomes increased. That repayment could be handled in a number of ways--the borrower could, for instance, carry the negative equity to the new house in the form of a second mortgage, or repay the lender out of his capital gains when he sold the second house. Still another way the lender could recoup the loan loss on the first house would be to build a graduated payment schedule into the mortgage on the second house--so that after a few years, a portion of the borrower's higher payments would be used to repay the lender his loss on the first loan. However the transfer was handled, it would be a means of helping stabilize the Anchorage market by increasing sales.

Effects of Selected Policies

We now use our housing market model to assess the relative effects of specific policy options on the Anchorage housing market between now and 1992. All the policy cases discussed below assume

the level of economic activity projected in the medium (base) case in Chapter II. We believe that case represents the most likely rate of economic growth over the next five years, but it is always possible that the economy will grow faster or slower than we expect. In the final section of the chapter we discuss how faster or slower economic growth would affect the Anchorage housing market.

Aside from the assumptions about future economic activity, the crucial variable in all the policy cases is the rate of sale of foreclosed condominiums and single-family houses--but particularly of condominiums.

It is much easier to re-sell single-family houses than condominiums. Most buyers prefer single-family houses when they can afford them, and when prices are down more buyers can afford houses. Buyers are scarce in the Anchorage market today, but more of those fewer buyers are choosing houses over condominiums. As we noted earlier, we anticipate that the existing stock of condominiums and other multi-family units (including rental units) will likely exceed the projected demand for multi-family housing in Anchorage through 1992. Condominiums are more difficult to re-sell because they are the second choice of many buyers and because there are so many of them out there.

We do not attempt to project future prices for mobile homes under the different policies; we don't have enough information on the mobile home market to make such price projections. We expect that the existing supply of mobile homes will more than meet demand from now through 1992, and that AHFC may in fact ship some mobile homes outside the state for sale.

We can group the policy cases this way: the three main cases (base, hold-all, auction) assume different rates of sale of the total inventory (AHFC's and other lenders') of foreclosed houses and condominiums in Anchorage. Three additional cases (limit liability, remove, and subsidy) assume the same rate of sale of foreclosed inventory as in the base case, but also look at the effects of additional policy changes. The limit liability case looks at how limiting mortgage liability of borrowers or allowing them to defer a portion of mortgage liability until later would affect defaults and the lenders' inventory of foreclosures. The remove case assesses the effects of simply removing--not re-selling--some condominiums from the inventory of foreclosed condominiums. Finally, we also assess how subsidizing mortgage interest rates would affect some aspects of the Anchorage condominium market, which is much more depressed and where re-sales are much more difficult than in the market for single-family houses. We present results from these last three cases only when they are significantly different from base case results.

Variables and Their Relationships

We examine the relative effects of the various policies on prices, private sales, inventory of foreclosed properties, and construction of condominiums and single-family houses between now

and 1992. We also assess how each is likely to affect equity of homeowners and rental rates. We will of course use some numbers in discussing these various effects, but what we consider most important is not the specific numbers--which are approximations--but rather what the numbers show about the relative effects of different policies. For instance, we don't pretend to know that the average price of single-family houses would be precisely $139,265 in 1989 if the lenders sold a given number of foreclosed units--but we can say whether prices would tend to be higher or lower if the lenders sold more of fewer houses.

The housing market variables we examine are of course related, and change in one affects the others. In general, our housing market model says that higher prices tend to reduce defaults, increase equity, encourage construction, and increase private sales. Conversely, lower prices mean more defaults, lower equity, less construction, and fewer private sales.

Base Case: We use this case as a benchmark against which to assess the effects of the auction and hold-all cases, where we assume that more or fewer foreclosed units are sold. This is not a "forecast" case in the sense that we consider it the most likely to actually happen; it incorporates a rate of sales that is neither extremely fast nor extremely slow.

In this case we assume that AHFC and other lenders sell 1,000 houses per year from their inventories of foreclosed single-family houses until the inventory falls below 1,000, and then sell off whatever is left in the next year. For condominiums the case assumes that lenders sell a constant percentage of their stock of foreclosures in any given year; in this case that amounts to between 400 and 700 condominiums annually from 1988 through 1992.

Auction Case: The title essentially describes the case: here we examine the effects of lenders selling a very large percentage of their stock of foreclosed condominiums each year--three to four times as many condominiums (between 1,000 and 2,800 per year) through 1992 as under the base case. The case assumes roughly double the number of sales of single-family houses as under the base case--from 1,000 to 2,200 annually until the stock is exhausted.

Hold-All Condominiums Case: Under this case we assess what would happen in the housing market if the lenders sold no foreclosed condominiums at all between 1988 and 1992, and restricted sales of foreclosed single-family houses to just 400 per year during the same period.

Limit Mortgage Liability Case: Here we look at how future defaults and other market variables would be affected if lenders or insurers limited or deferred mortgage liability of property owners who were forced to sell or wanted to move to better homes in Alaska but were constrained by having negative equity in their current houses. The

borrower's liability in such cases would be limited to the sale price of the property, even if the outstanding mortgage were higher. (Assumptions about rates of sale of foreclosed inventories are the same as in the base case.) This case represents an extreme: it shows the results if lenders limited mortgage liability of all those with negative equity who wanted to sell.

Remove Condominiums: This case differs from the base case only in that we look at what would happen if AHFC or other lenders simply took 400 units out of their inventory of foreclosed condominiums in each of the years 1988, 1989, and 1990; these 1,200 units would not be sold but would be demolished or otherwise removed from the market.

Subsidize Interest Rates: This case examines the effects on just the condominium market of subsidizing interest rates and holding rates of sale of foreclosed units the same as in the base case.

Policy Effects on Prices

A key measure of market stability is price. Figures 4.1 through 4.4 show the effects that faster or slower sales of foreclosed properties would have on house and condominium prices--both nominal (not adjusted for inflation) and real (adjusted for inflation) prices--in Anchorage over the next several years. The figures also compare the projected prices with historical prices from 1980 through 1986. Under all the cases, prices of condominiums and houses reach lows in 1987 or 1988 and then begin climbing--but condominium prices drop much further than house prices and take much longer to recover to their historic highs.

Base Case Prices: Under the base case nominal and real average prices of houses would bottom out in 1987 and average prices of condominiums in 1988. Nominal house prices would reach a low of around $109 thousand in 1987 and then begin to rise steadily, rebounding to their nominal 1985 levels by 1989. Real prices--prices in 1986 dollars to account for projected future inflation--would also rise beginning in 1988, but their course would be more jagged: real prices by 1992 would be about 13 percent higher than in 1987.

Average nominal condominium prices under the base case would reach a low of about $73 thousand in 1988 and then begin slowly rebounding, but not reaching their 1985 levels until 1992. Real condominium prices would bottom out at around $68 thousand in 1988 and increase about 19 percent by 1992.

Auction Case Prices: High sales of condominiums in this case would push nominal prices to a low of $58 thousand in 1988--20 percent below projected base case prices in that year. Average condominium prices in 1992 would still be below their nominal 1985 levels. Real condominium prices in this case would also bottom out in 1988 before beginning a slow recovery that would still leave real prices by 1992 about 5 percent lower than they would have been under the base case.

Figure 4.1 Nominal Prices, Anchorage Condominiums, Under Five Cases, 1980-1992
(In Thousands of Dollars)

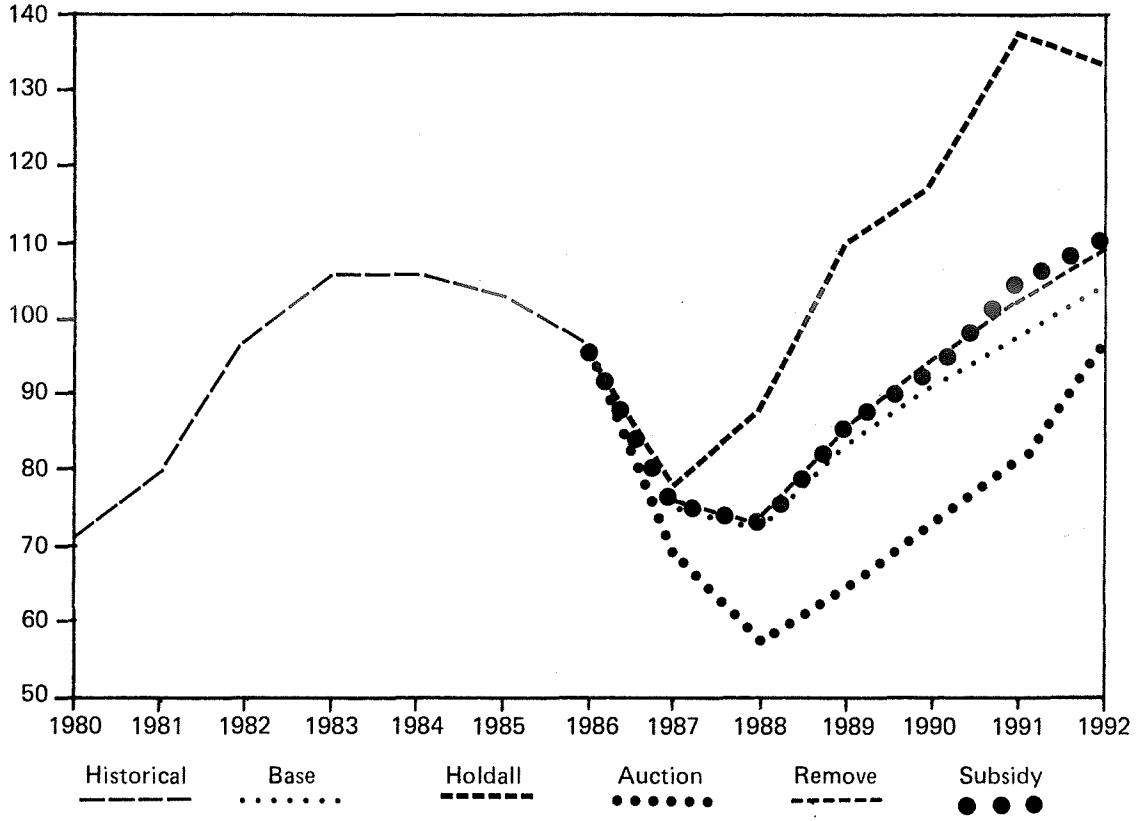


Figure 4.2 Real Prices, Anchorage Condominiums, Under Five Cases, 1980-1992
(In Thousands of 1986 Dollars)

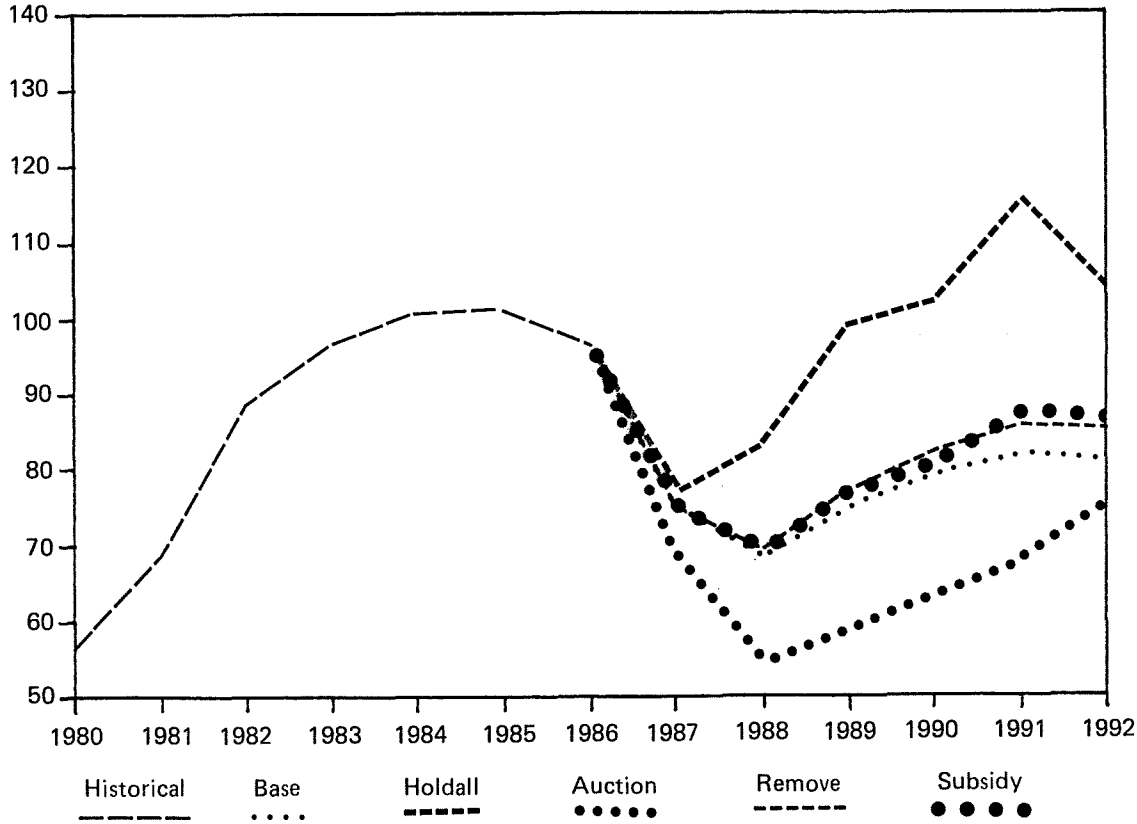


Figure 4.3 Nominal Prices, Anchorage Single-Family Houses
Under Three Cases, 1980-1992
(In Thousands of Dollars)

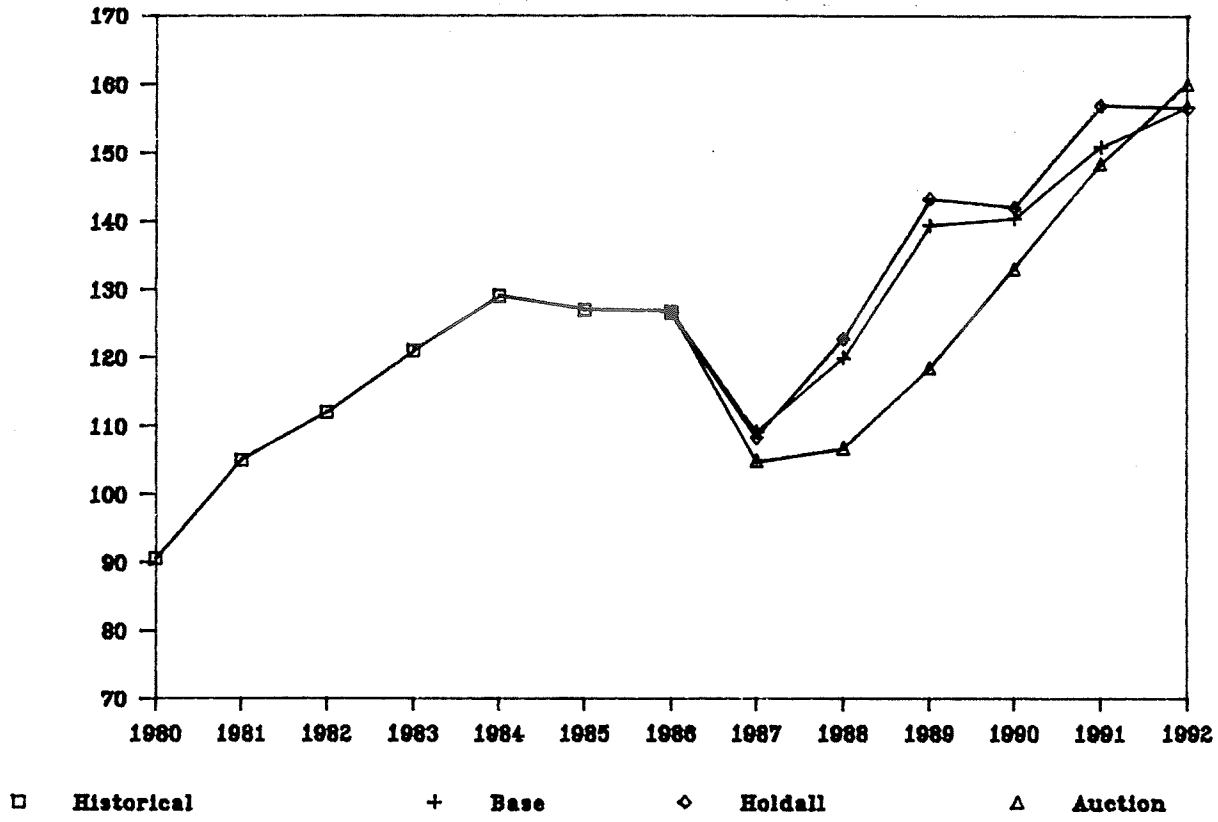
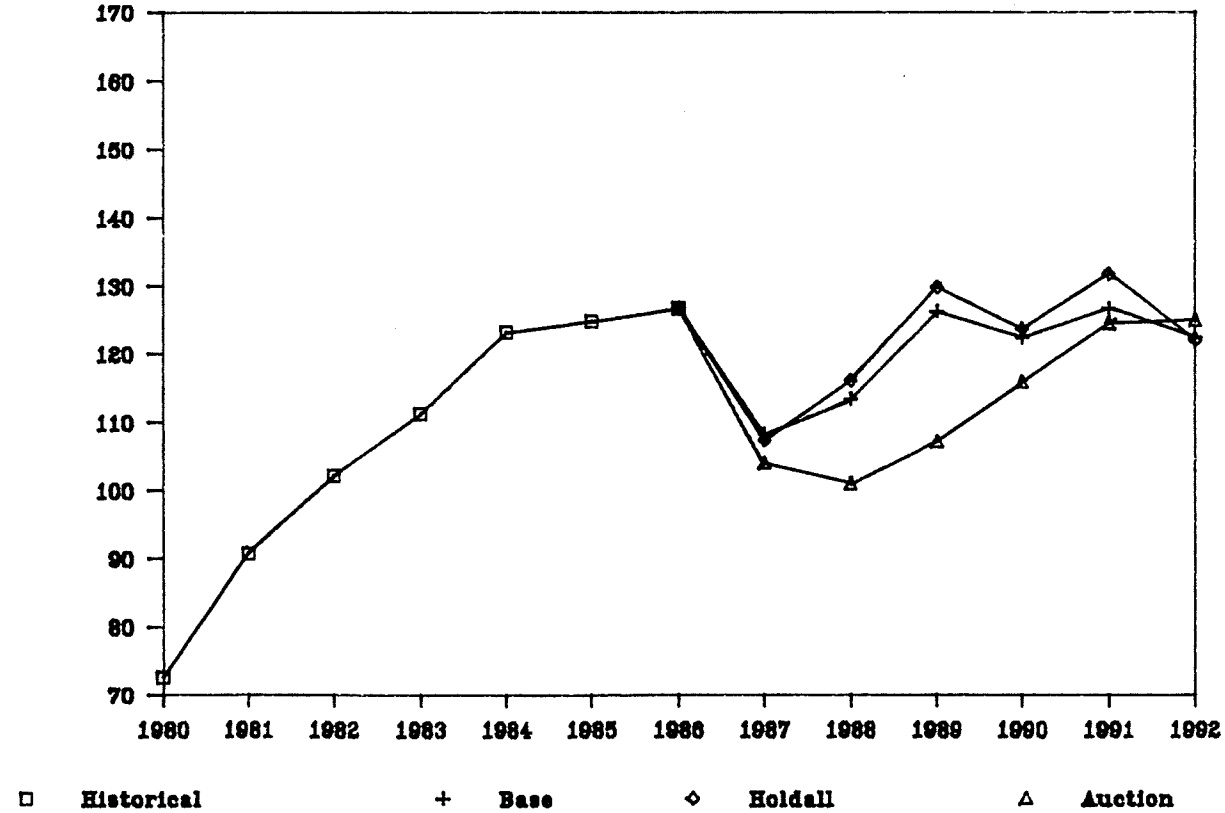


Figure 4.4 Real Prices, Anchorage Single-Family Houses
Under Three Cases, 1980-1992
(In Thousands of 1986 Dollars)



Prices of single-family houses would also be pushed down in the late 1980s by faster sales of foreclosed houses, though not as much as condominium prices; house prices would also rebound more quickly. Under this case average nominal house prices would be around $104 thousand in 1987 and would change little in 1988--but by 1990 they would reach their nominal 1985 levels. Real prices (in 1986 dollars) of houses would hit bottom in 1988 and increase about 23 percent by 1992. So in the short run (through 1989) auctioning houses would depress prices, but clearing that inventory quickly would make house prices slightly higher than they would be under the base case by 1992.

Hold-All Case Prices: This case assumes that lenders simply hold onto (or even, at the extreme, demolish) all their stock of foreclosed condominiums, selling none between 1988 and 1992, and reduce sales of single-family houses through the period. Keeping all foreclosed condominiums off the market would have a dramatic effect on both nominal and real prices: prices would bottom out sooner, fall much less, and recover faster. Nominal prices under this case would reach a low of around $78 thousand in 1987, rebound to their 1985 levels by 1989, and continue to well above their historic highs by 1992. Real prices would increase 35 percent between 1987 and 1992.

The effect of holding more single-family houses off the market would be relatively small; prices would increase slightly faster than under the base case in the next few years, but would be about the same by 1992. We assume that the Anchorage market could readily absorb more than 400 houses from the inventory of foreclosures each year, because the supply of single-family houses--unlike the supply of condominiums--will not exceed the projected demand in the next five years.

Subsidize Case: Subsidizing mortgage interest rates would increase prices of condominiums just slightly over base case levels; for instance, in 1989 nominal average prices of Anchorage condominiums would be about $85 thousand as compared with $83 thousand in the base case--or about two percent higher.

Remove Condominiums and Limit Liability Cases: The results of taking some condominiums out of the inventory of foreclosures or limiting liability of sellers are not shown in Figures 4.1 through 4.4; those measures would have little effect on prices as projected under the base case.

Policy Effects on Inventory of Foreclosures

The thousands of defaults and foreclosures in Anchorage and other areas of Alaska in 1986 and 1987 have been the most visible signs of distress in the housing market. Figures 4.5 through 4.8 show the effects of various policies on the inventory of foreclosures in the hands of lenders and insurers over the next five years in Anchorage. Projecting future defaults and foreclosures is particularly difficult and risky--so please keep in mind that what

is significant in these figures is not the precise numbers but rather the relative ways that different policies would affect foreclosures.

Base Case Inventories: Under this case--which assumes moderate rates of sale of condominiums and houses--the inventory of foreclosed condominiums would build until it reaches about 2,400 in 1989 and then begin to fall, but still stand at around 1,000 by 1992. The inventory of foreclosed single-family houses would peak at just under 2,000 in 1988 and then decline briskly--so that the inventory would disappear by the end of 1991.

Auction Case Inventories: In this case lenders try to reduce their inventories quickly by selling condominiums and houses much faster than under the base case. But the short-run effect of such rapid sales would be to increase rather than to decrease inventories--because auctioning off so many units would increase defaults, as we noted above. After 1988, however, such large sales would bring the inventories down much faster than under the base case. So in 1988 the inventory of condominiums would be at around 2,800 (as compared with 2,200 in the base case) but in 1989 would begin dropping sharply so that there would be no inventory of foreclosed condominiums by 1992--as compared with an inventory of 1,000 under the base case.

The inventory of foreclosed single-family houses would also be higher in this case in 1988 (more than 2,000) than under the base case, but the difference is not large--and the inventory would disappear by 1990, a year sooner than under the base case. Selling houses at a faster rate does not have as marked an effect on defaults and foreclosures as does selling condominiums rapidly--because, as we noted before, we believe the Anchorage market can more easily absorb houses than condominiums.

Hold-All Case Inventories: Keeping all foreclosed condominiums and a large share of foreclosed houses off the market would reduce defaults in 1988, but the inventory of foreclosures would become extremely large if none or few of them were re-sold. By 1992 there would be about 3,300 condominiums and almost as many houses still in the inventory of foreclosures.

Limit Liability Case Inventories: This case combines a moderate rate of foreclosure sales with limiting mortgage liability of sellers with negative equity to the market value of their properties. The figures show that this combination would reduce inventories of both condominiums and single-family houses far below their base case levels: in 1988 the inventory of condominiums would be only 60 percent as large as under the base case and by 1992 it would be roughly one-third as large. The inventory of houses would be only 30 percent as large in 1988 as under the base case, and would have almost disappeared by 1989.

Figure 4.5 Inventory of Foreclosed Anchorage Condominiums, Under Six Cases, 1987-1992

(In Thousands)

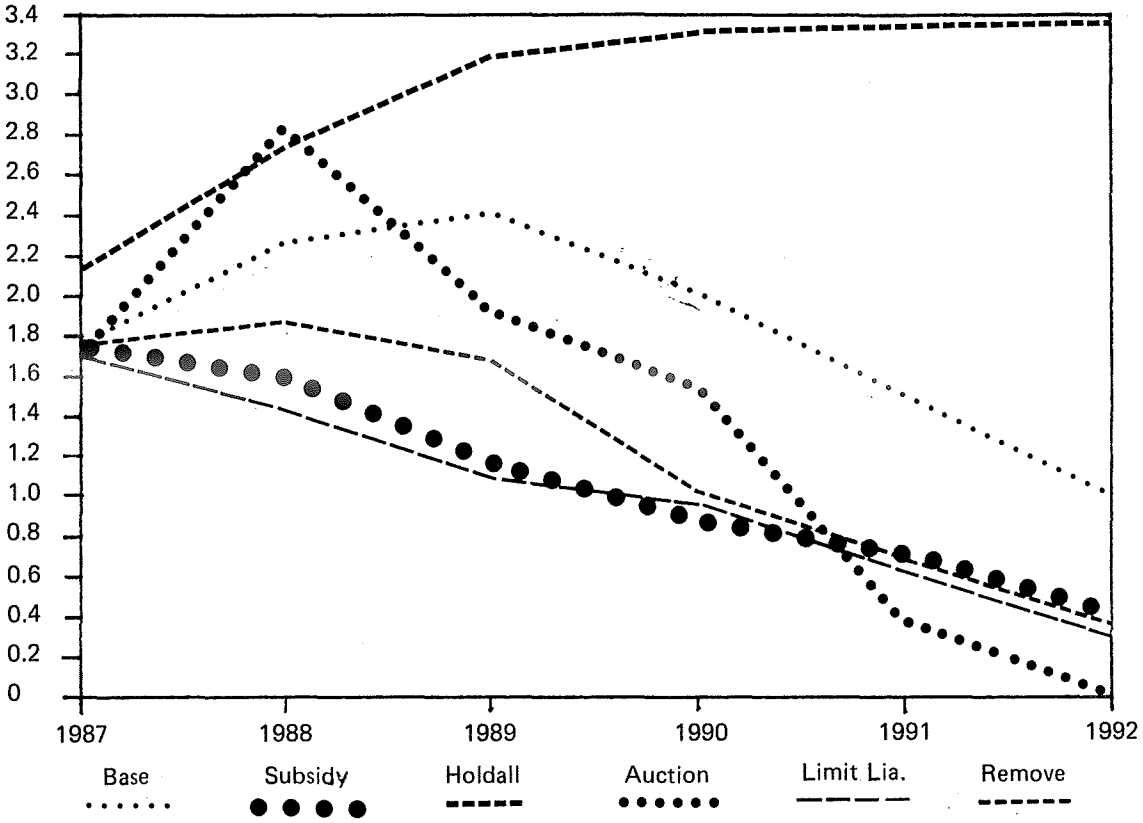


Figure 4.6 Inventory of Foreclosed Condominiums, Under Six Cases, 1988 and 1992

(In Thousands)

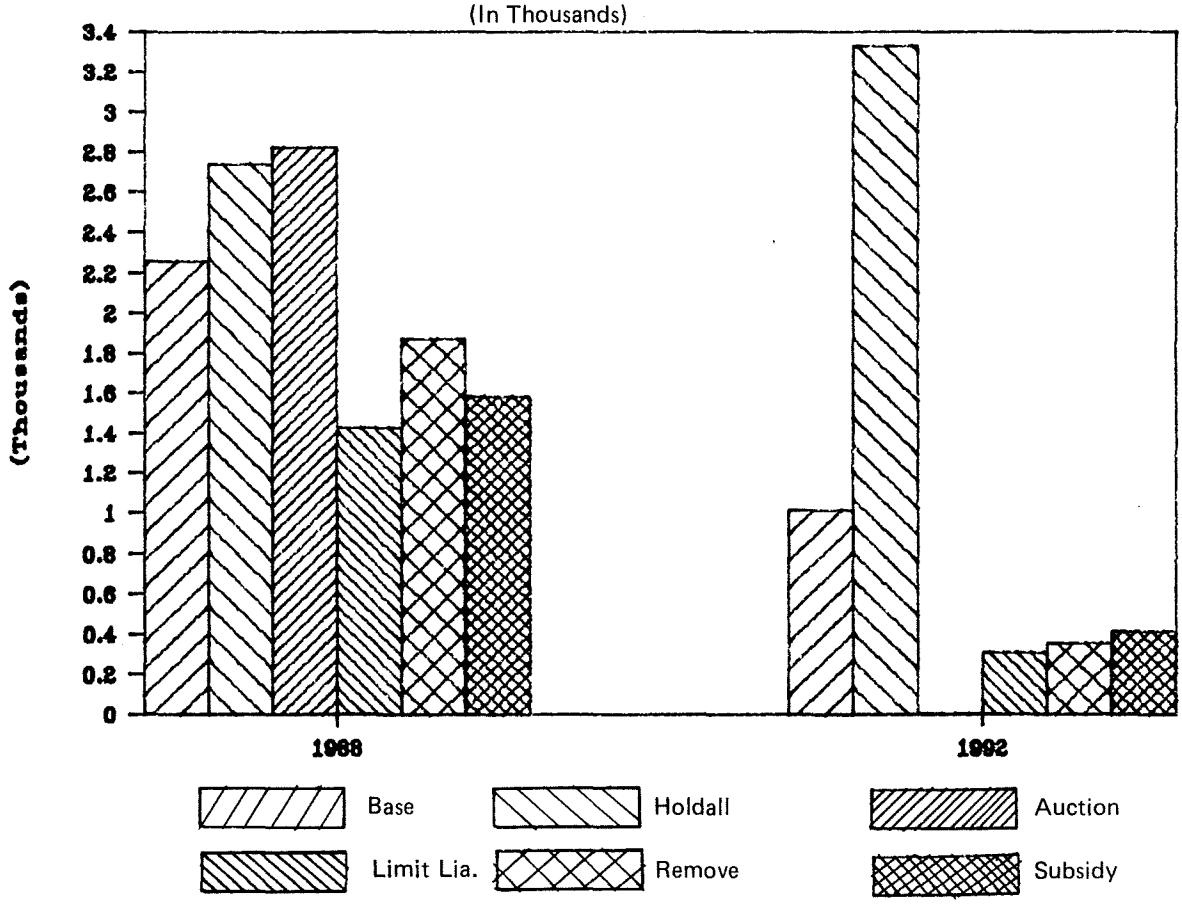


Figure 4.7 Inventory of Foreclosed Anchorage Single-Family Houses Under Four Cases, 1987-1992

(In Thousands)

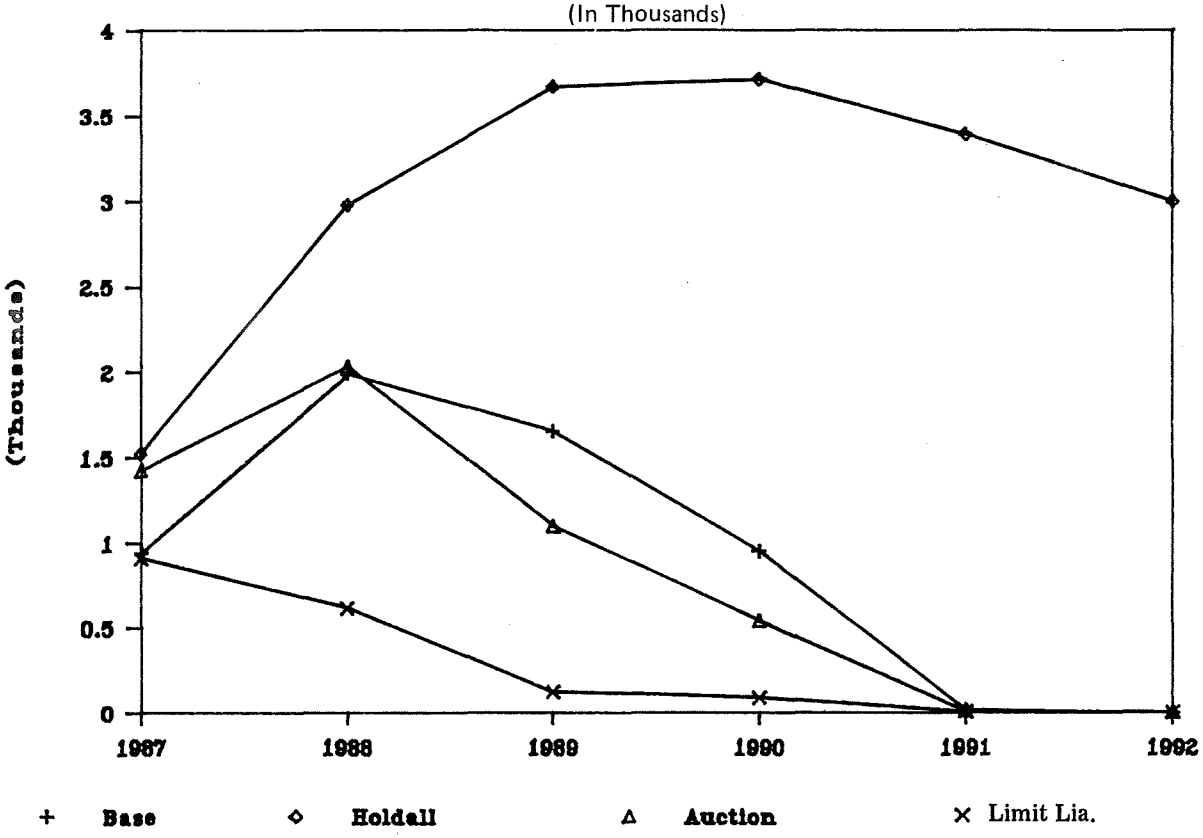
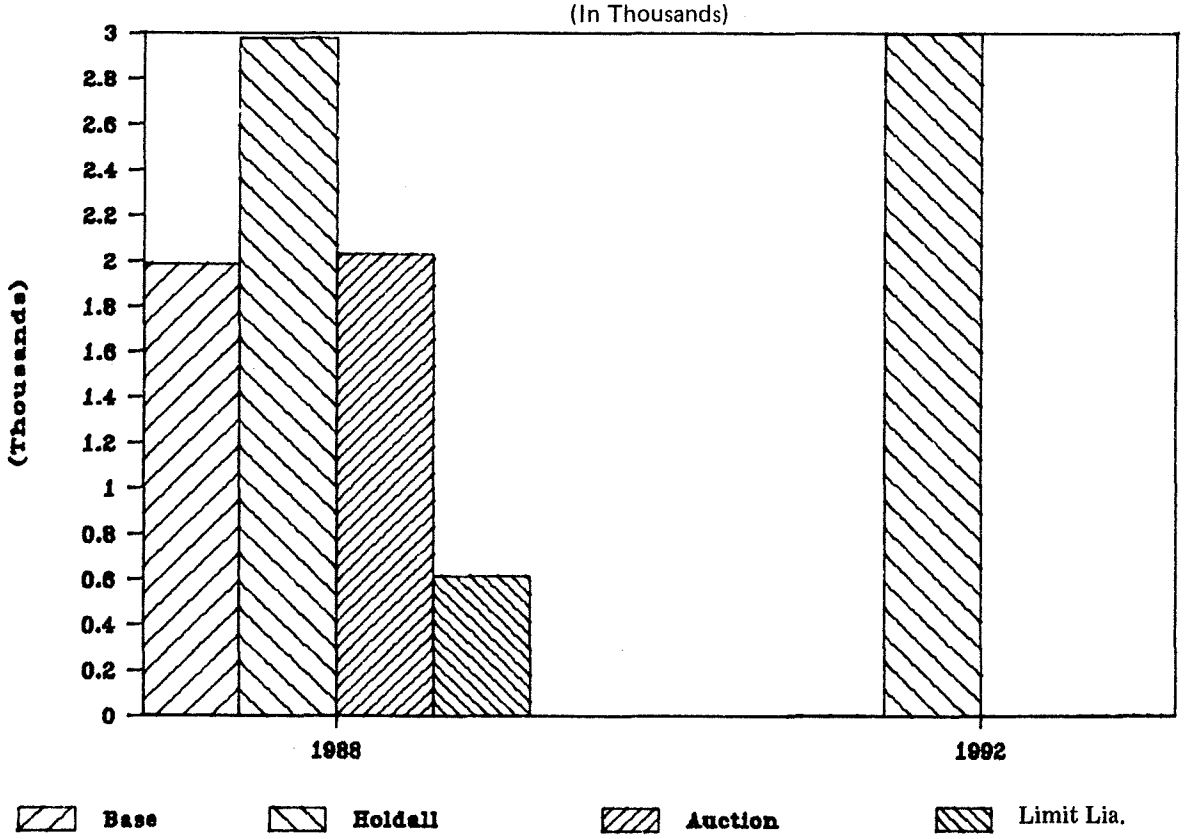


Figure 4.8 Inventory of Foreclosed Anchorage Single-Family Houses Under Four Cases, 1988 and 1992

(In Thousands)



Remove Case Inventories: Removing 1,200 condominiums from the foreclosed inventory would of course reduce that inventory--so that by 1992 it would be about one-third the size projected under the base case. Taking condominiums out of the foreclosed inventory would have no effect on the inventory of foreclosed single-family houses.

Subsidy Case: By increasing demand, subsidizing interest rates for condominiums would have the effect of reducing defaults and therefore the inventory of foreclosures. Figures 4.5 and 4.6 show that the inventory of foreclosed condominiums would be substantially smaller under the subsidy than the base case; for example, in 1988 the inventory would be 30 percent smaller under the subsidy than under the base case and in 1992 60 percent smaller.

Policy Effects on Private Sales

How are sales of foreclosed units under the various policy options likely to affect private owners trying to sell their condominiums and houses in Anchorage in the next few years? Figures 4.9 and 4.10 show historical and projected total sales (both private sales and foreclosure sales) of condominiums and houses in Anchorage under the base, hold-all and auction cases; figure 4.9 also shows projections under the subsidy case. Keep in mind that these projected total sales assume that specific numbers of condominiums and houses are sold each year--so they do not represent projections of likely housing demand, but rather show how prominent a role sales of foreclosed units will play in the market in the next several years. Sales would of course be highest under the auction case, because that case assumes fast sales of foreclosed houses and condominiums.

Figures 4.11 and 4.12 show how the projected total sales of condominiums and single-family houses would be divided between institutional and private sellers under the base case, auction, and hold-all cases in 1988 and 1992; Figure 4.11 also shows subsidy case projections.

Base Case Sales: Total condominium sales under this case would be between 350 and 700 annually through 1992. Few private owners (at best, fewer than 100 in any year) would sell their condominiums through 1992: sales by institutional sellers are projected to dominate the market throughout the period. For owners of single-family houses, the picture would be brighter: of total projected annual sales of between 1,700 and more than 2,000 houses, private owners would have about half the market through 1990 and virtually all by 1992, when the stock of foreclosed houses would be exhausted.

Hold-All Case Sales: If lenders kept most foreclosed condominiums off the market in the balance of 1987 and all off the

Figure 4.9 Historical and Projected Total Sales of Anchorage Condominiums, Under Four Cases, 1980-1992

(In Thousands)

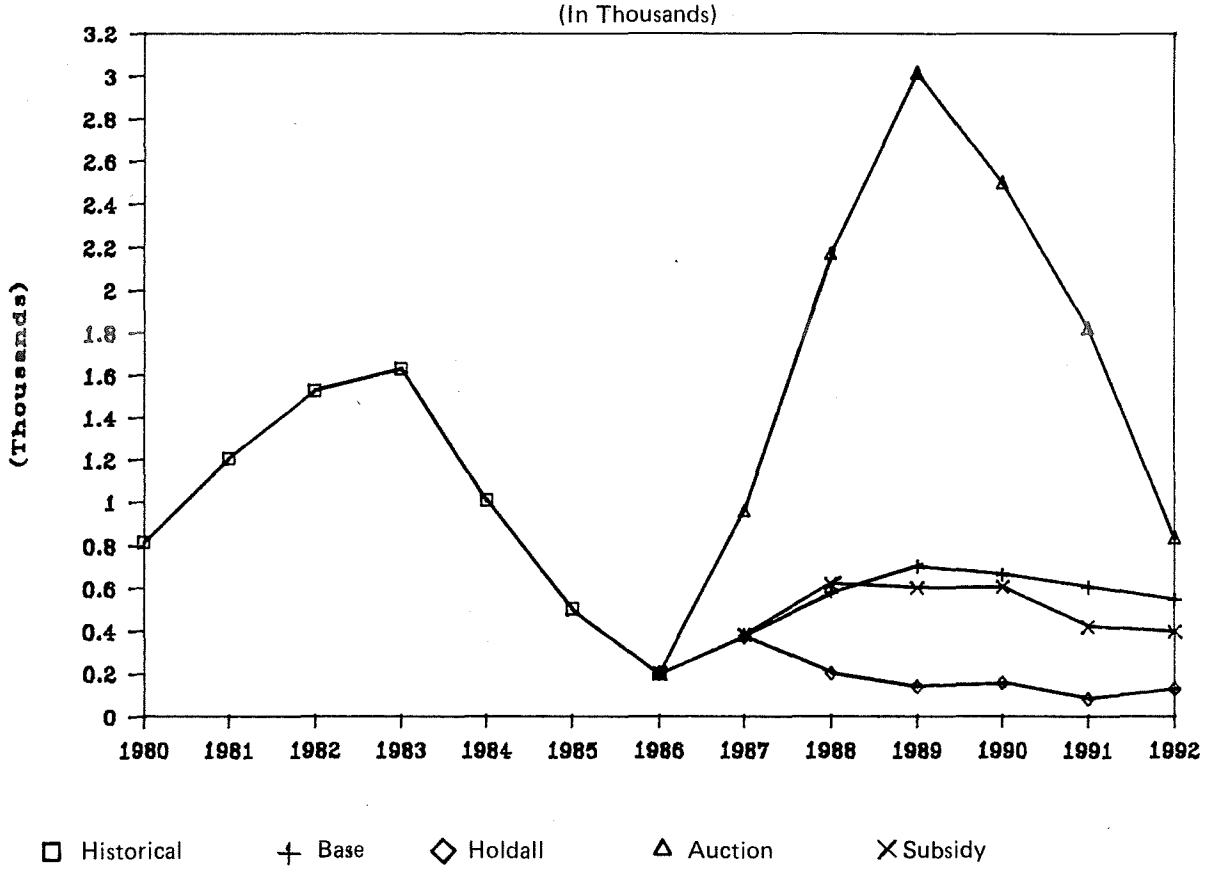


Figure 4.10 Historical and Projected Sales of Anchorage Single-Family Houses Under Three Cases, 1980-1992

(In Thousands)

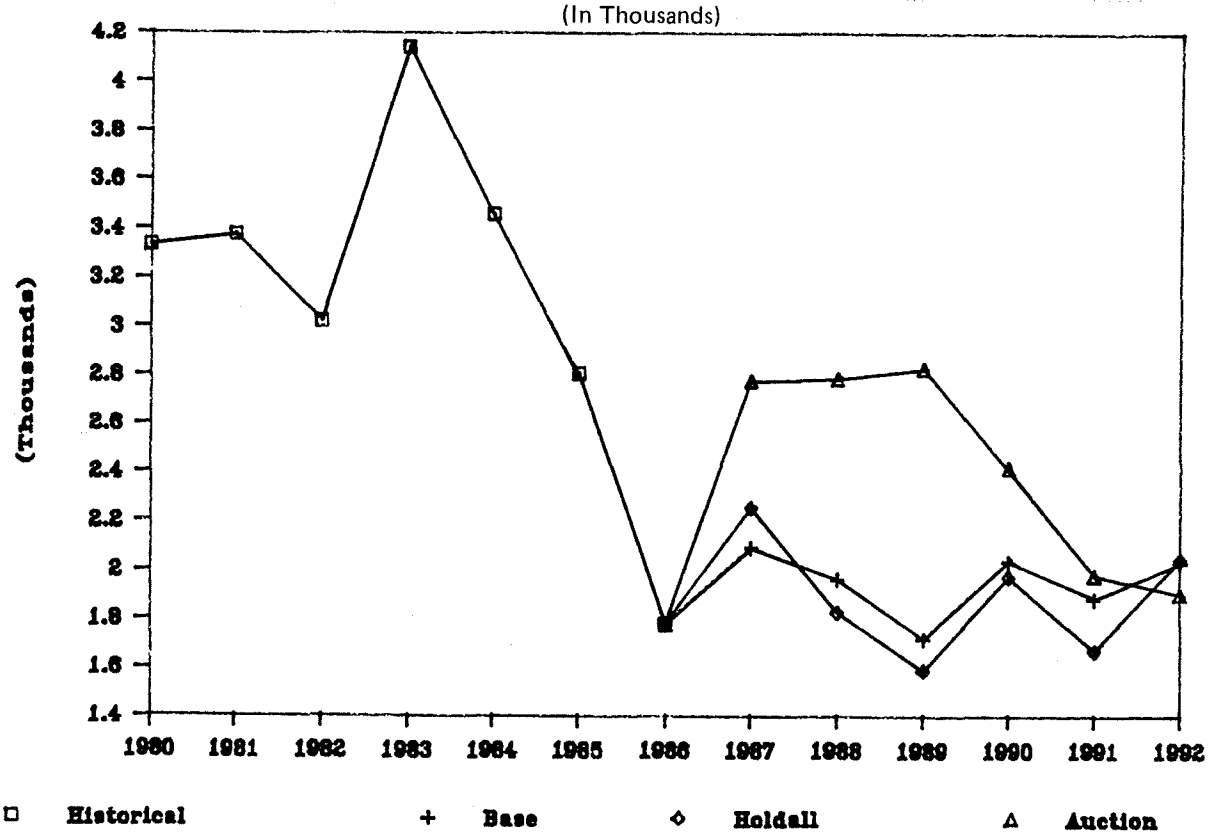


Figure 4.11 Projected Private and Institutional Sales, Anchorage Condominiums Under Four Cases, 1988 and 1992

(In Thousands)

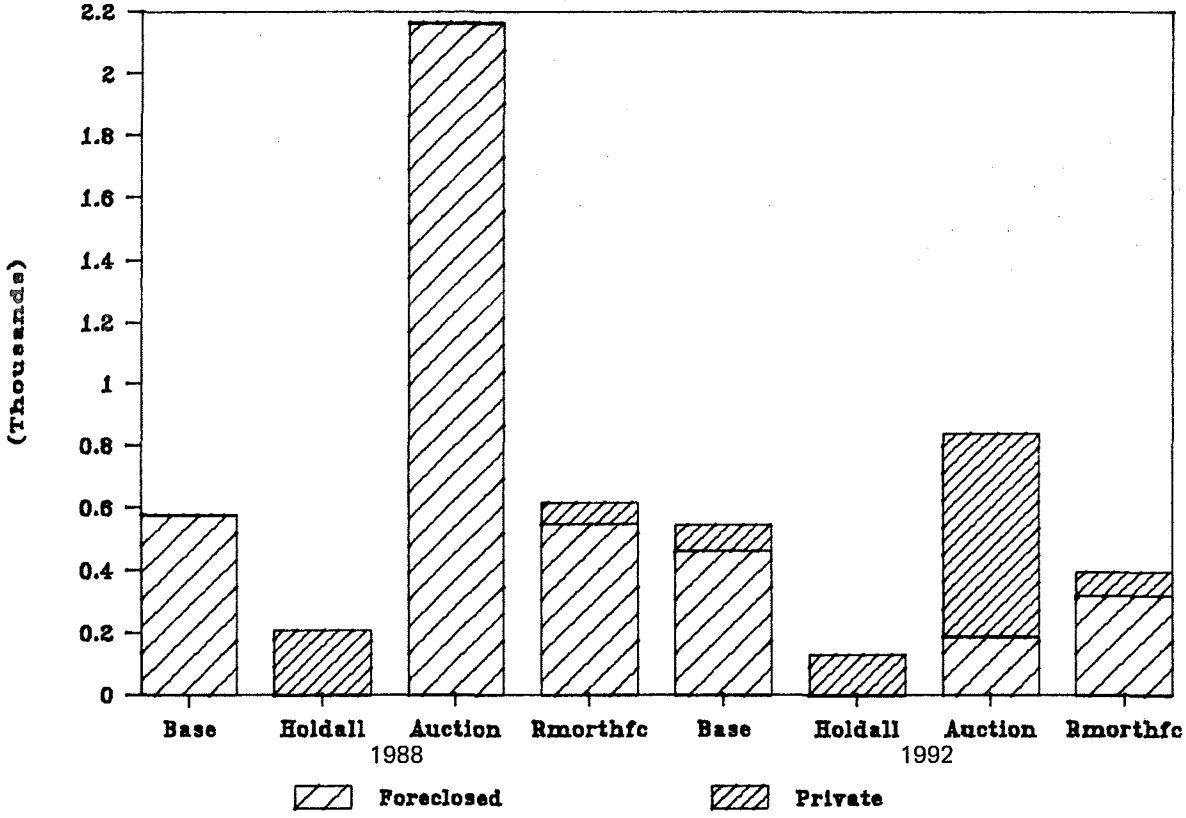
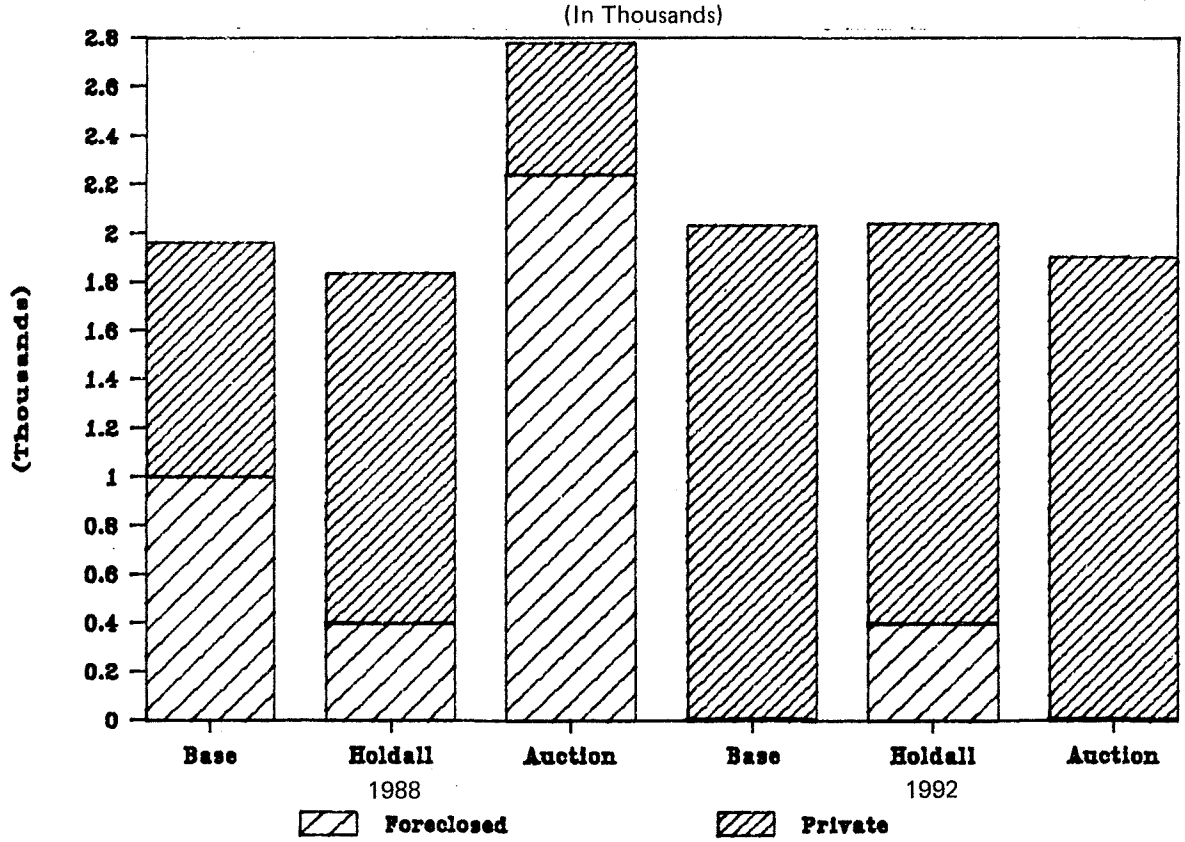


Figure 4.12 Projected Private and Institutional Sales, Anchorage Single-Family Houses, Under Three Cases, 1988 and 1992

(In Thousands)



market from 1988 through 1992, leaving the field open for private owners, private sales in the late 1980s would be substantially higher than if they were competing with institutional sellers--but still very low as compared with sales in the first half of the 1980s. Private owners would sell a projected 500 total units in 1987 and 1988 and roughly from 100 to 150 per year through 1992. By contrast, in the base case, private sellers would sell only a handful of condominiums in the whole five-year period.

Total sales of single-family houses are projected to be lower under this case than under the base case--because less than half as many foreclosed houses are sold--but private sellers have a bigger share of the market: at least 75 percent of sales in each year through 1992.

Auction Case Sales: Total sales under this case would be higher than under the base case, because lenders would be putting more units on the market--but private sellers of condominiums would be largely squeezed out of the market until 1992, when the inventory of foreclosed condominiums would be gone. Likewise, private owners would be able to sell few houses until 1990, when they would regain about half the market; by 1992 private sellers would have the whole market.

Notice that such very large hypothetical auction sales would put more condominiums on the market than were actually sold in Anchorage during the boom years of the early 1980s; as we noted in the section on prices, such large sales of condominiums could only be made at much lower prices.

Subsidy Case: Private sales of condominiums in Anchorage would be substantially higher under the subsidy than under the base case; between 1987 and 1992, cumulative private sales under the base case would be just 180 as compared with about 550 under the subsidy case. Figure 4.11 shows that in 1988 roughly 65 condominiums would be sold by private owners as compared with virtually none in the base case; by 1992 the number of private sales of condominiums would be about the same under the two cases.

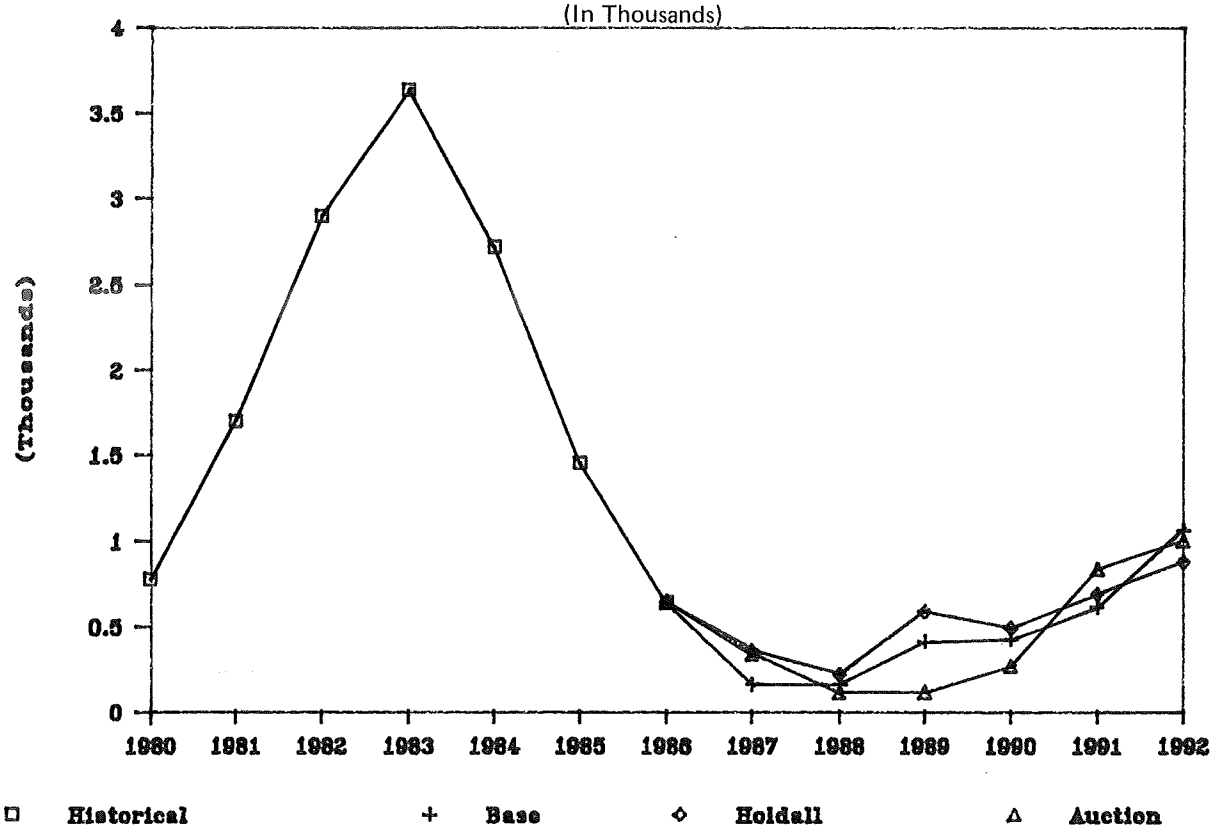
Limit Liability and Remove Case Sales: Limiting mortgage liability of sellers with negative equity and taking some condominiums out of the inventory of foreclosures would have relatively little effect on private sales of condominiums or single-family houses through 1992.

Policy Effects on Construction

We project that under any of the policy options, there will be very little construction of condominiums in Anchorage through 1992. This is true because under any of the options we examine, the existing supply of condominiums will meet expected demand. If the

Figure 4.13 Historical and Projected Building Permits, Anchorage Single-Family Houses, Under Three Cases, 1980-1992

(In Thousands)



economy grows faster than we anticipate, demand would be higher. Figure 4.13 shows historical numbers of building permits issued and projected numbers of permits for single-family houses in the Anchorage area under the various cases.

Base Case Construction: Under this case about 165 permits for new single-family houses would be issued in 1987 and about the same number in 1988. Numbers of permits would pick up sharply to around 400 in 1989 and build steadily to about 1,000 in 1992. By comparison, in the peak construction year of 1983, more than 3,500 new houses were built in Anchorage and in 1984 about 2,700.

Hold-All Case Construction: Under this policy, with fewer foreclosed units coming onto the market, total construction of new houses from 1987 through 1989 would be substantially higher than in the base case--with in the neighborhood of 1,200 new houses built over that three-year period--about 40 percent more than in the base case. But numbers of new units would still be small when compared with even 1985 totals, when more than 1,400 houses were built in one year.

Auction Case Construction: This policy would slightly reduce the number of new houses built from 1988 through 1990, because larger numbers of foreclosed houses would be on the market in those years. But after that, foreclosures sales would be smaller and more houses would be built.

Limit Liability and Remove Case Construction: Taking some condominiums out of the stock of foreclosures would have no effect on numbers of new single-family houses built throughout the period, and limiting mortgage liability of sellers with negative equity would have only a slight effect.

Policy Effects on Equity

Throughout this report we've talked about the problem of homeowners with negative equity--homeowners owing more on their properties than their market value. Figures 4.14 and 4.15 show the projected effects of the various policy cases on equity of condominium and house owners. We also include figures on historical levels of equity. (These are nominal equity figures--meaning they have not been adjusted for the effects of future inflation.)

Base Case Equity: In this case, the average equity of condominium owners in Anchorage would hit bottom in 1987 and 1988, when the average owner would owe $20 thousand more than his condominium was worth. Rising prices would begin increasing equity by 1989, but the average equity would not be positive until 1991. For owners of single-family houses the outlook is better: average equity of homeowners would hit a low in 1987, when homeowners on

Figure 4.14 Historical and Projected Average Equity of Anchorage Condominium Owners, Under Three Cases, 1980-1992

(In Thousands of Dollars)

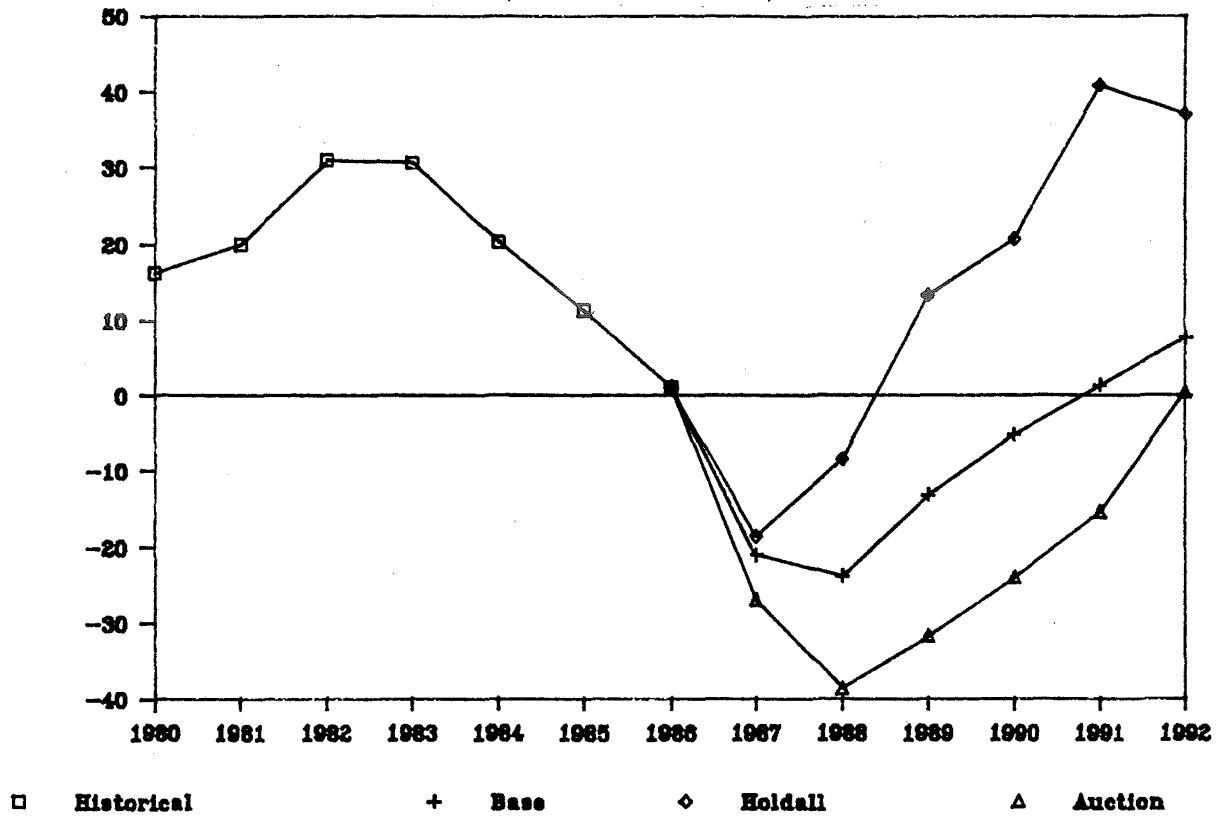
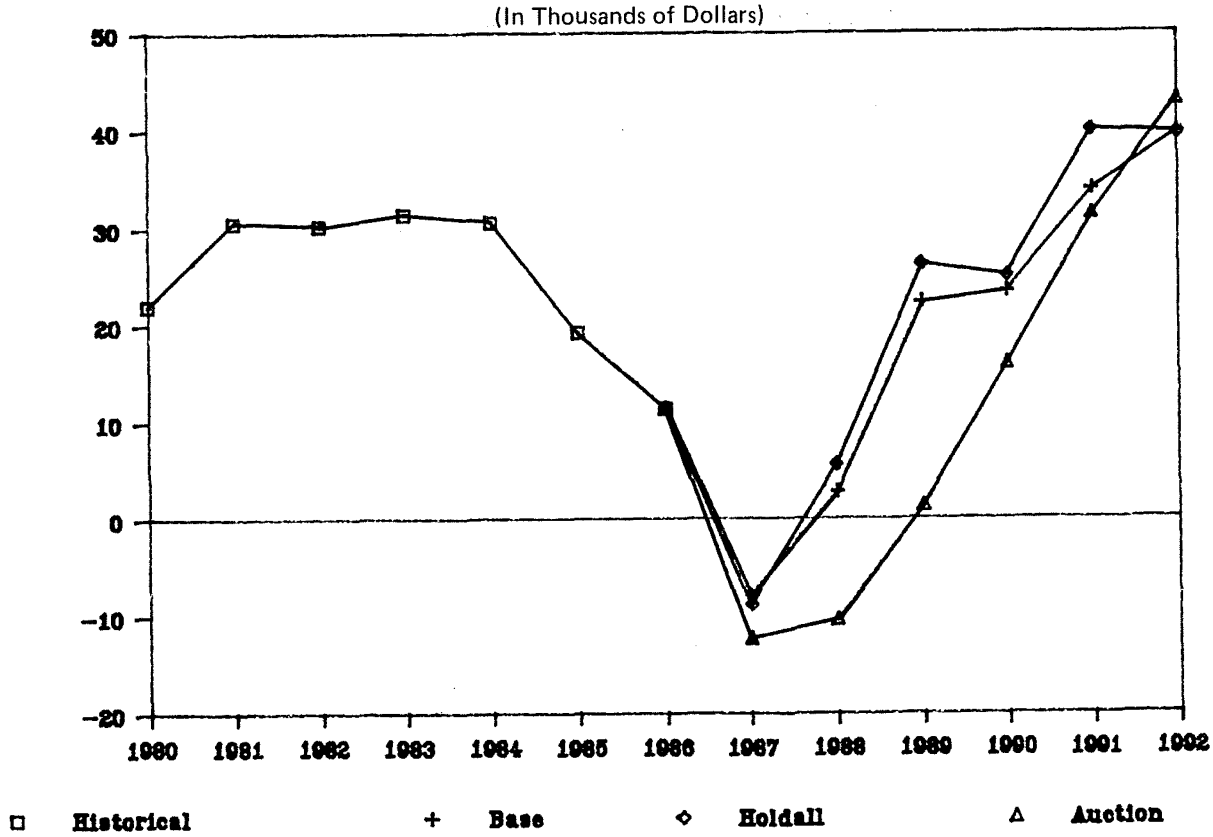


Figure 4.15 Historical and Projected Average Equity of Owners of Anchorage Single-Family Houses Under Three Cases, 1980-1992

(In Thousands of Dollars)



average would owe $7,000 more than their properties were worth. But in this case equity would begin improving in 1988, and would have reached more than $20,000 by 1989 and nearly $40,000 by 1992.

Auction Case Equity: Auctioning houses and condominiums off rapidly has a clear effect on equity of house owners and condominium owners alike, although the effect is larger on condominium owners: such sales would push equity much further into negative territory in the late 1980s. Average equity of condominium owners would drop to minus $38,000 in 1988; it would rebound very gradually, but would just be around zero by 1992. Homeowners would fare better: average equity of single-family houses would drop to around minus $12,000 in 1987, stay at roughly that level in 1988, and become just barely positive in 1989. After that it would rebound briskly, to reach around $40,000 by 1992.

Hold-All Case Equity: Under this policy condominium owners would see their average equity bottom out at minus $18 thousand in 1987 and be a positive $13 thousand by 1989--climbing upward to around $35 to $40 thousand by the early 1990s. This policy would improve equity of owners of single-family houses just slightly over what it is projected to be in the base case.

Limit Liability Case Equity: Allowing sellers to take market prices for their homes, even if their mortgages were larger, would help improve average equity, particularly for condominium owners, but the differences under this policy and under the base case are not large.

Subsidy Case: Subsidizing interest rates for condominiums would improve average equity of condominium owners slightly over base case levels; by 1992 average equity under the subsidy case would be roughly $13 thousand as compared with $8 thousand under the base case.

Remove Case Equity: Taking some condominiums out of the foreclosed inventory in the late 1980s would help improve average equity of all condominium owners somewhat but not a great deal over projected base case levels. It would have no effect on equity of those who own houses.

Policy Effects on Rental Rates

We project that none of the policy options we assess here would have significantly different effects on rental rates in Anchorage over the next few years. What will have a substantial effect--and what will likely keep real rents below their 1986 levels throughout the period--is the fact that the existing supply of multi-family housing will probably exceed the projected demand through 1992.

Figure 4.16 Projected Anchorage Real Rent Index
1987-1992
(1986 = 100)

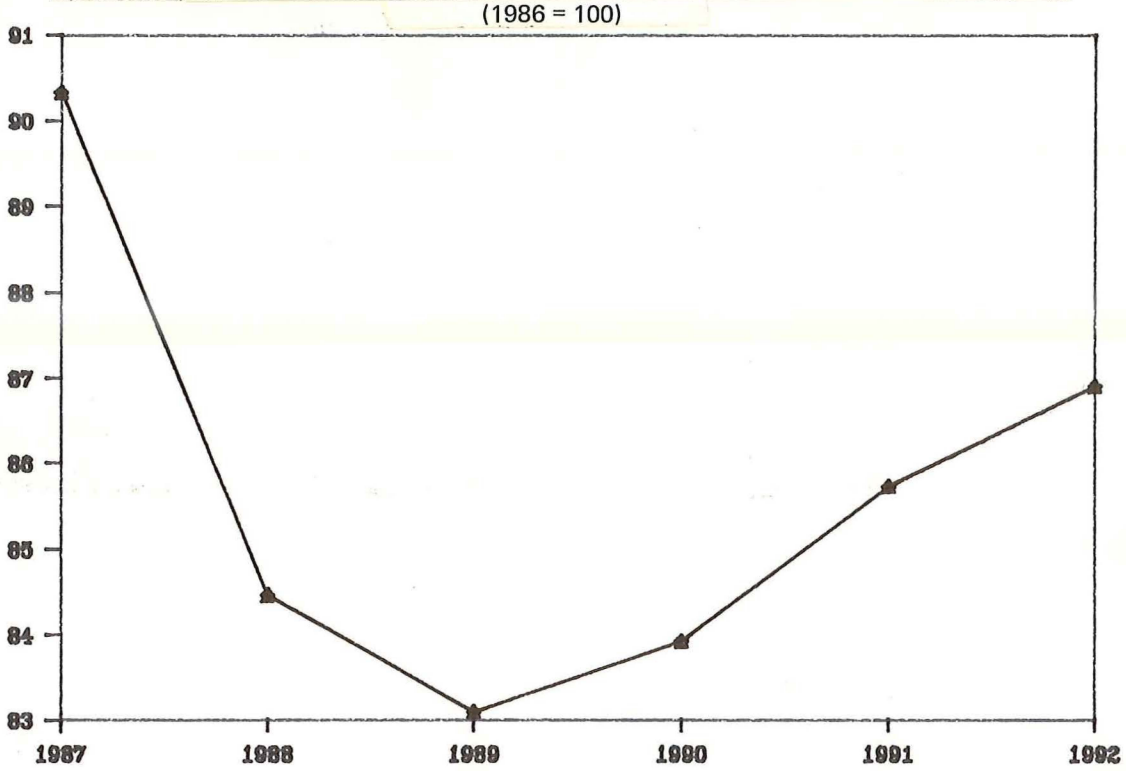


Figure 4.16 shows a projected real rent index through 1992. This is an index that measures real rents in Anchorage--rents adjusted for inflation--with 1986 rents as a base. Under any of the policies we examined, rents would bottom out at about 83 percent of the 1986 level in 1989 and then begin a very slow rise--but by 1992 they would still be (once adjusted for inflation) just 87 percent of their 1986 levels. If the economy grows faster than we project under our base case in Chapter II, rents would rise faster.

Summary of Policy Effects

Overall what our housing market model tells us is straightforward: if lenders sold large numbers of foreclosed condominiums very quickly over the next few years, prices would drop substantially, defaults would remain high, foreclosures would continue to beset the market, equity of the average condominium owner would be pushed further into negative territory, and prices would be slow to recover.

The same general findings also apply to rapid sales of foreclosed houses, but house prices and equity would not be depressed nearly so much as would condominium prices and equity--because the demand for houses in Anchorage is greater. And house prices would recover and exceed their historic highs much more quickly than would condominium prices.

How much difference might different policies for re-sale of foreclosed properties make in average prices over the next several years? Our model projects the extreme cases for condominiums--selling none and selling all quickly. We project that 1988 average prices for a standard condominium, for instance, could go as low as $58 thousand or as high as $87 thousand--a difference of 50 percent. Condominium prices in 1988 under a more moderate rate of sale (our base case) could be 20 percent higher than under the case where condominiums are auctioned rapidly. Again, the dollar values we refer to are less important than relative price levels.

The potential range of house prices under the various cases is much smaller; for example, 1988 prices under the case where houses are sold most quickly could be about 15 percent below prices in the case where houses are sold much more slowly. Still, 15 percent is a significant difference.

But what about the longer-term effects of getting rid of the inventory of foreclosures quickly? Might prices in the 1990s rebound faster if the inventory of foreclosures were cleared faster? Our model runs indicate that very fast sales of foreclosed condominiums would depress prices well into the 1990s; real

prices--prices adjusted for inflation--in 1992 would still be about 5 percent below projected base case prices. At the other extreme, keeping all foreclosed condominiums off the market would boost real prices by 35 percent between 1987 and 1992.

For single-family houses the story is different. Rapid clearing of foreclosed properties would depress prices in the late 1980s, but by 1992 prices would be as high or higher than they would have been if the houses had been sold more slowly. House prices would recover faster because the demand for single-family houses over the next several years will exceed the existing stock--unlike the case with condominiums.

Quick sales of large numbers of condominiums would also substantially increase defaults in the short run--increasing rather than decreasing the inventory of foreclosures. As we showed in Figure 4.6, auctioning thousands of condominiums could actually make the inventory of foreclosed condominiums bigger by the end of 1988 than it would be under any of the other options we examined. But by 1992 the inventory would have been eliminated by quick sales--while under the more moderate rate of sale assumed in the base case there might still be 1,000 foreclosed condominiums in 1992.

Subsidizing mortgage interest rates for condominiums would sharply reduce defaults, as would limiting mortgage liability of homeowners who are forced to sell and find that their houses are worth less than what they owe on them. As Figure 4.6 shows, the projected inventory of foreclosed condominiums would be much smaller in 1988 and 1992 under either the limit liability or the subsidy cases than under the base case.

Many homeowners in Anchorage today do owe more on their properties than they can be sold for. Our model projections show that quick sales of condominiums and houses--but particularly of condominiums--would push prices and therefore average equity of homeowners even lower. Under all the cases we examined, average equity of condominium owners in Anchorage would be negative in 1988--but the negative numbers could be nearly twice as large (minus $38 thousand as compared with minus $20 thousand) if lenders auctioned off condominiums rapidly. And prices and equity would be very slow to recover after large-scale auctions: equity would barely move out of negative territory by 1992. Average equity for those who own houses would not go nearly as low and would improve much faster after 1990--under all the options we examined, average equity among house owners could be as much as $40 thousand by 1992.

How will private property owners fare in the market place against the big institutional owners of foreclosed properties over the next few years? Under all policy options we examined except the case where all foreclosed condominiums are kept off the market,

private owners trying to sell condominiums in Anchorage through 1992 will find few opportunities: they will be hard-pressed to compete against the prices and the incentives the big lenders will be able to offer in a market with limited demand and an ample supply.

Private owners of single-family houses will fare better; under slow or moderate sales of foreclosed houses, private sellers would be able to capture half or more of the sales market in the late 1980s and more in the early 1990s.

We expect little construction of multi-family housing in Anchorage over the next five years--under any policy option--because we think the existing stock will meet the likely demand. Some new single-family houses will be built over the next few years, but not nearly as many as were built during the early 1980s. For example, the base case projects that in the neighborhood of 2,700 new single-family houses might be built in Anchorage between now and 1992--about the same number as were built in Anchorage in 1984 alone.

Another effect of the ample supply of multi-family housing will be to keep down rents in Anchorage over the next several years. Our real rent index--an index adjusted for inflation and keyed to 1986 rents--projects that real rents by 1992 will be about 10 percent below 1986 levels. Faster economic growth than we expect would push rents up faster.

Policy Considerations

We've seen that the thorniest problem for lenders and insurers is their inventory of foreclosed condominiums. The market for single-family houses has not been depressed as much, and we expect it to recover much faster. We know that Alaska lenders are not going to keep the condominiums they own off the market for years. We know that it costs lenders and insurers in the neighborhood of $20 a day in holding costs for each unit they own. We know it is not reasonable to propose a policy that leaves AHFC and other lenders sitting on hundreds of vacant properties so that other property owners can enjoy higher prices. We know that in Anchorage today some lenders want to get rid of foreclosed properties even if they have to take very substantial losses on re-sales. Lenders and insurers are offering prizes, reduced down payments, lower interest rates, and more to lure buyers.

Our policy case that looks at the effects of keeping all the foreclosed condominiums off the market is intended not as a policy proposal but as an illustration of the powerful effects foreclosure sales will have on the Anchorage market in the next few years. The case at the other extreme--in which we assume lenders auction off their thousands of properties at the cost of much lower prices--also

illustrates that power. That case not only shows that lenders have the power to push prices further down but that they could in the process bring even more foreclosures into their inventories.

In reality of course lenders don't just pick some fixed number of units to sell, without regard to market conditions. Demand ultimately determines how many properties lenders can sell, particularly if they attempt to maintain some price floor. The economic forecasts in Chapter II say that after mid-1988 the recession will likely end and an economic recovery begin. Figures 4.17 through 4.19 show how reducing the number of condominiums sold in the short run--from now through 1988--would change prices, equity, and inventories of foreclosed condominiums from base case levels. After 1988 numbers of units sold would be the same as under the base case. What these figures show is that this short-run change in selling policies (labeled the "sell fewer" case in the figures) would prop up prices and equity for the balance of the recession and that in the longer run inventories of foreclosed units would be at roughly the same level--because selling fewer units through 1988 would reduce defaults.

Lenders in a down market face many costs. Figures 4.20 through 4.22 compare some of those kinds of costs. The relationship between numbers of foreclosed condominiums sold and real average prices of standard condominiums in 1988 and 1989 is shown in Figures 4.20 and 4.21. With price and sales figures from the six policy cases analyzed earlier, we plotted the relationship between the two. As the figures show, high sales are linked with lower prices, low sales with higher prices, and moderate sales with prices between the extremes. At the extremes, prices vary by more than 50 percent and numbers of units sold by more than 2,000.

Figure 4.22 weighs estimated costs of holding a single foreclosed condominium against projected average price increases under the base and the auction cases. We assume that the hypothetical condominium in this figure was taken under foreclosure at the start of 1987, so that holding costs accrued all year. The bottom line on each half of the figure represents holding costs, estimated at $7 thousand per year for each year the lender holds the unit. The top line is the average price for a standard condominium, with 1986 prices as a benchmark--so for example in 1987, the average condominium price under the base case was about $20 thousand below 1986 prices. The third line is the sum of the first two, and where the holding cost line and the third line cross is the point at which prices have risen enough to offset holding costs.

The figure shows a grim picture for the lenders. Under either case, 1987 prices are tens of thousands of dollars below 1986 prices--so lenders begin with a substantial loss. On top of that loss are holding costs estimated at $7 thousand per year for this single condominium. Prices are slow to recover in either case: in

Figure 4.17 Real Prices, Anchorage Condominiums
Under Two Cases, 1988 and 1992
(In Thousands of 1986 Dollars)

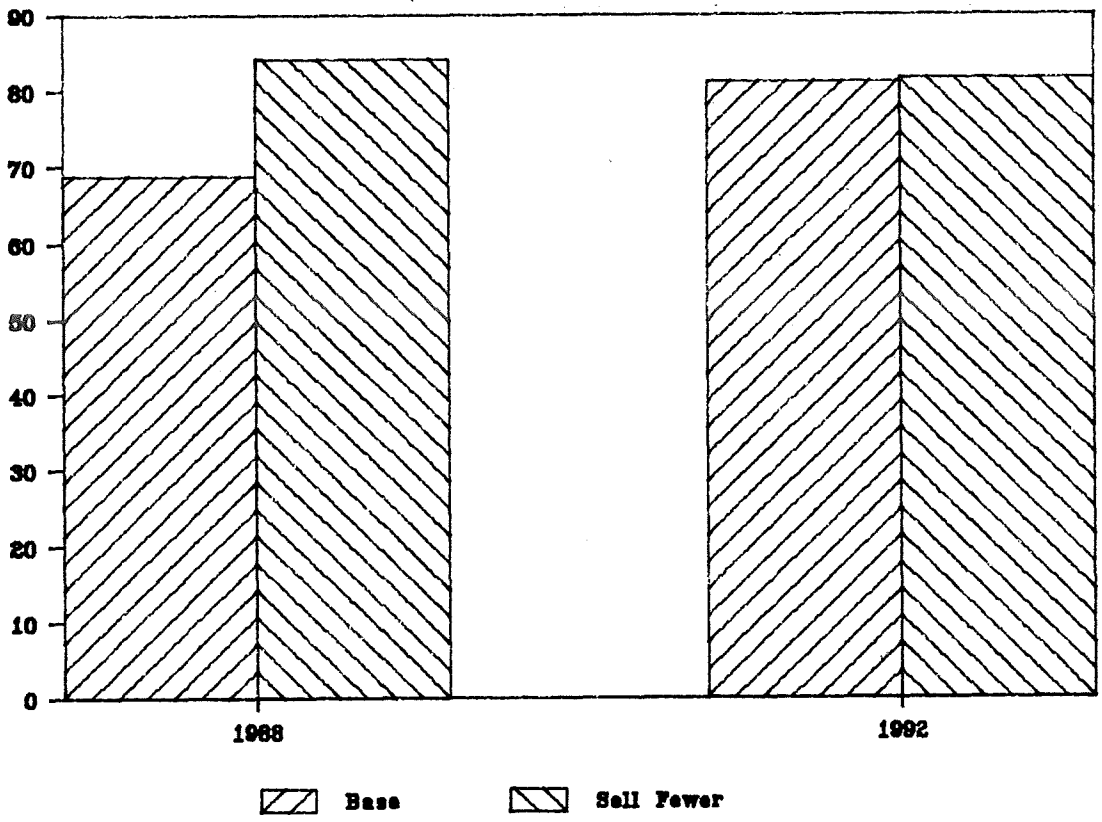


Figure 4.18 Average Equity, Anchorage Condominiums,
Under Two Cases, 1988 and 1992
(In Thousands of Dollars)

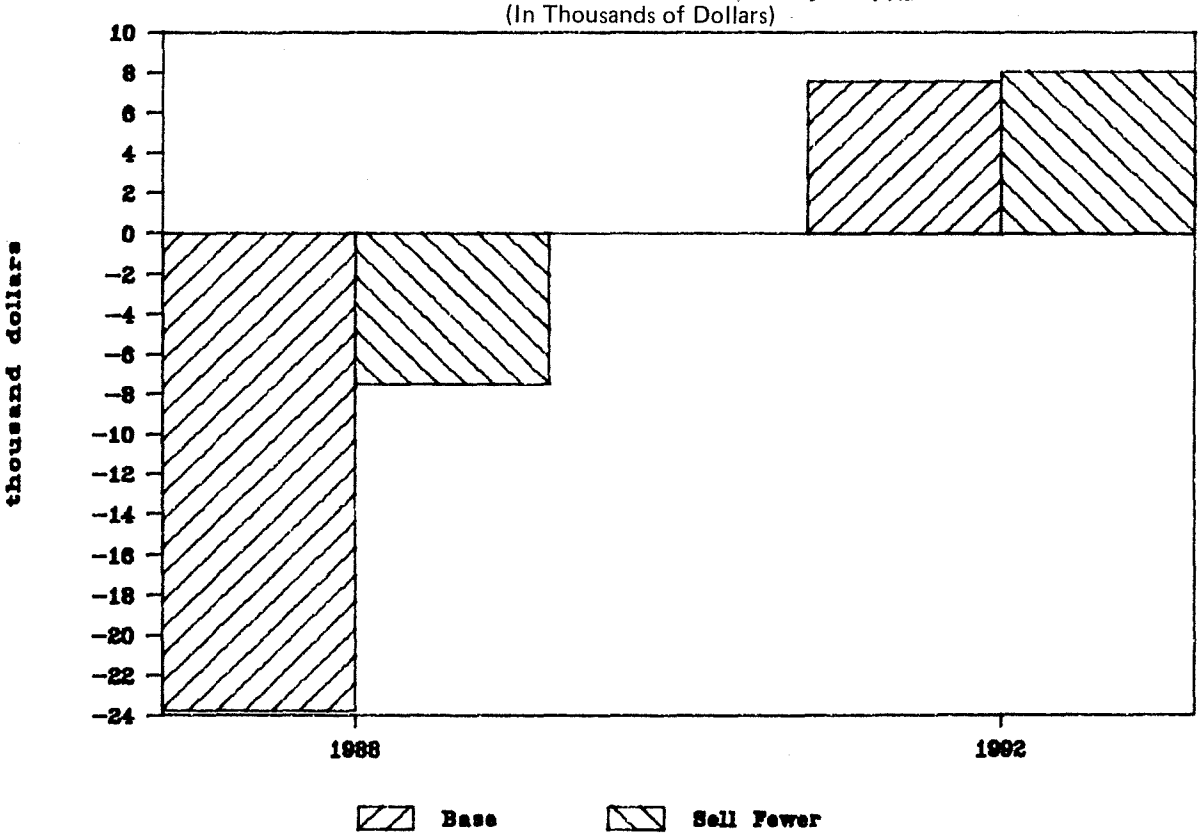
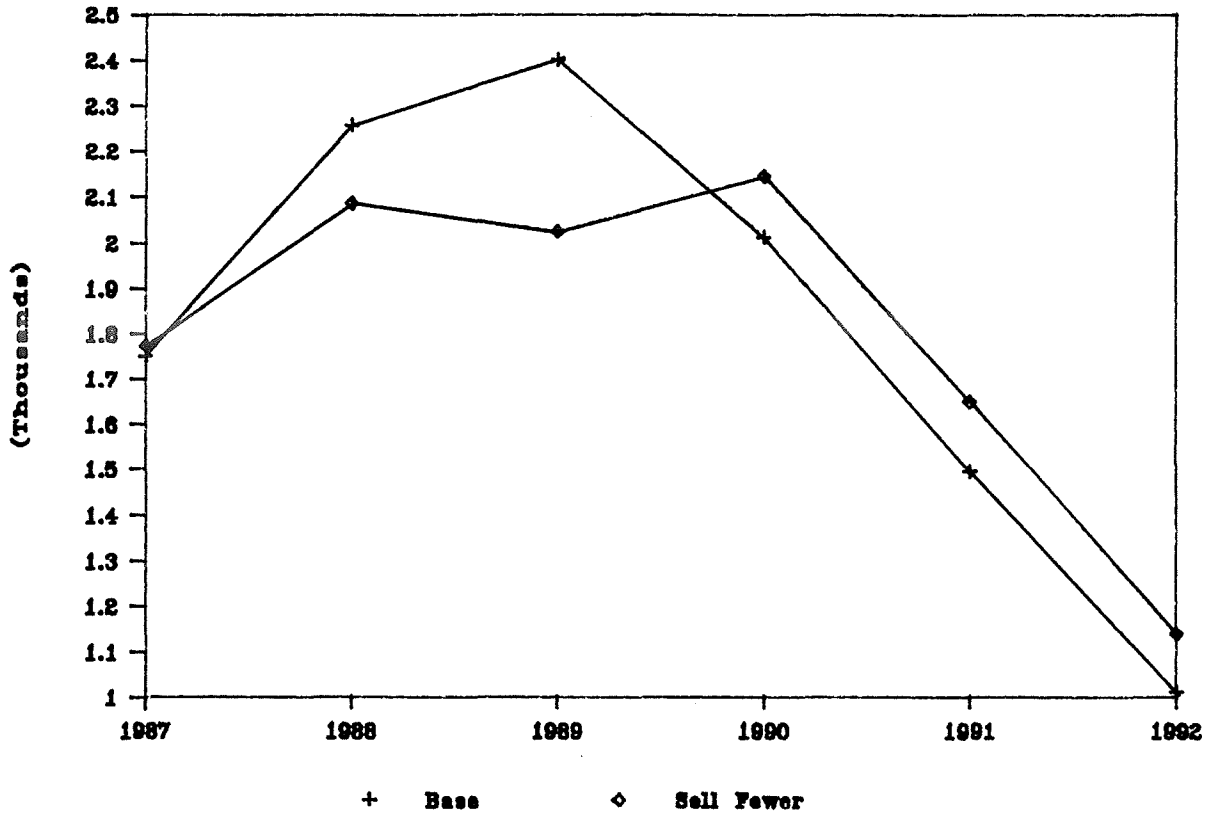


Figure 4.19 Inventory of Foreclosed Anchorage Condominiums Under Two Cases, 1987-1992



the base case prices exceed 1986 levels by 1991 and under the auction case prices just regain their 1986 level by 1992. Holding costs increase $7 thousand every year the condominium goes unsold. Prices rise enough to offset holding costs by 1991 under the base case and by 1992 under the auction case.

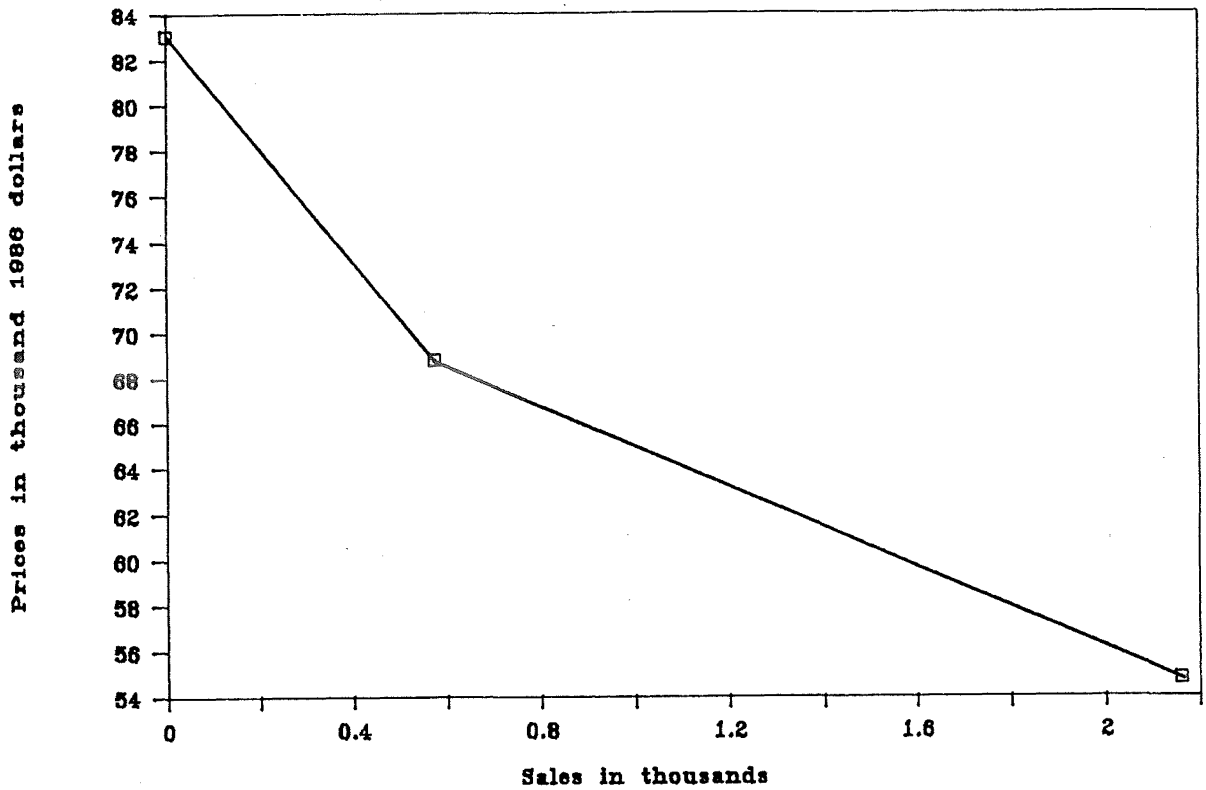
In either case lenders face significant losses--but those losses are even larger under the auction case, because prices are more depressed. For example, a lender could see losses (as measured by combined price declines and holding costs) in the neighborhood of $50 thousand on this hypothetical condominium in 1988 under the auction case, as compared with losses of about $28 thousand under the base case. The figure tells us that lenders are in a tough spot in any case, but that their losses can be made even worse if they auction large numbers of condominiums.

Another policy option that we assessed with the model was simply demolishing a portion of the inventory of foreclosed condominiums. We assessed the effects of taking 1,200 condominiums out of the inventory over a three-year period, and found that removing that many units from the stock would of course reduce the inventory faster and would modestly improve prices and other measures of market stability. At the extreme, the effects of demolishing all foreclosed condominiums would be the same as we projected in the case where all condominiums are kept off the market through 1992.

Demolishing condominiums would be very costly in a number of ways, and we are not advocating it. But all options in a depressed housing market are costly, including costs of holding onto condominiums that may be very difficult to sell at any price--and which, if sold at very low prices, could create a vicious circle of more foreclosures by putting more owners at risk of default. We are advocating that lenders carefully consider the overall costs and benefits of any policy they undertake.

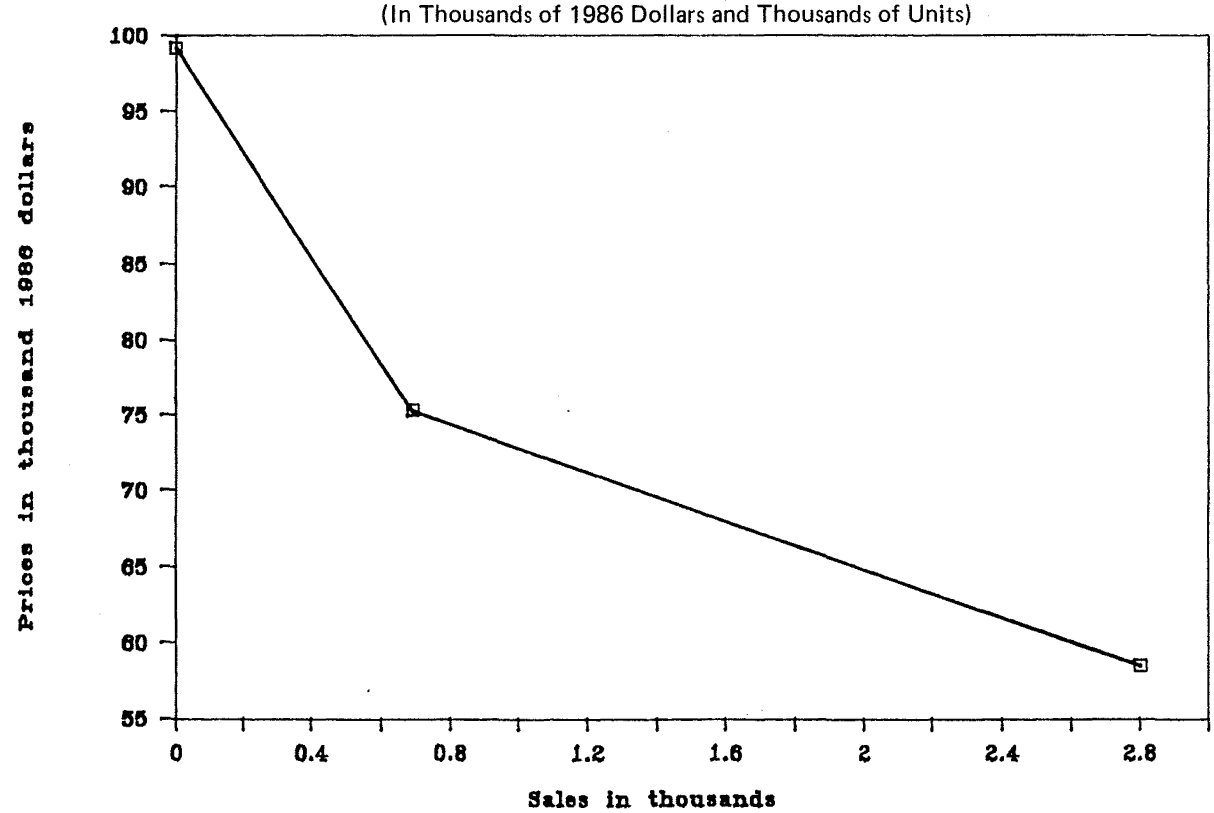
Another measure we looked at for reducing defaults and increasing demand was limiting mortgage liability of homeowners who are forced to sell at prices below their outstanding mortgages, or who would like to take advantage of lower prices to move into better houses but are constrained by negative equity on their current houses. We found that limiting mortgage liability for those with negative equity would sharply reduce the future number of defaults. However, our limit liability case represents the extreme: it reports how defaults could be reduced if lenders' limited mortgage liability of all would-be sellers with negative equity to the market values of their properties. In reality, lenders would not offer such blanket limits on liability--they would establish critieria for determining when and how to limit mortgage liability. In the General Policy Options section we discussed some of the possible ways lenders could limit mortgage liability, and the costs and benefits of those methods.

Figure 4.20 Relationship Between Real Prices and Sales of Foreclosed Condominiums, 1988
(In Thousands of 1986 Dollars and Thousands of Units)



Holdall Case | Base Case | Auction Case

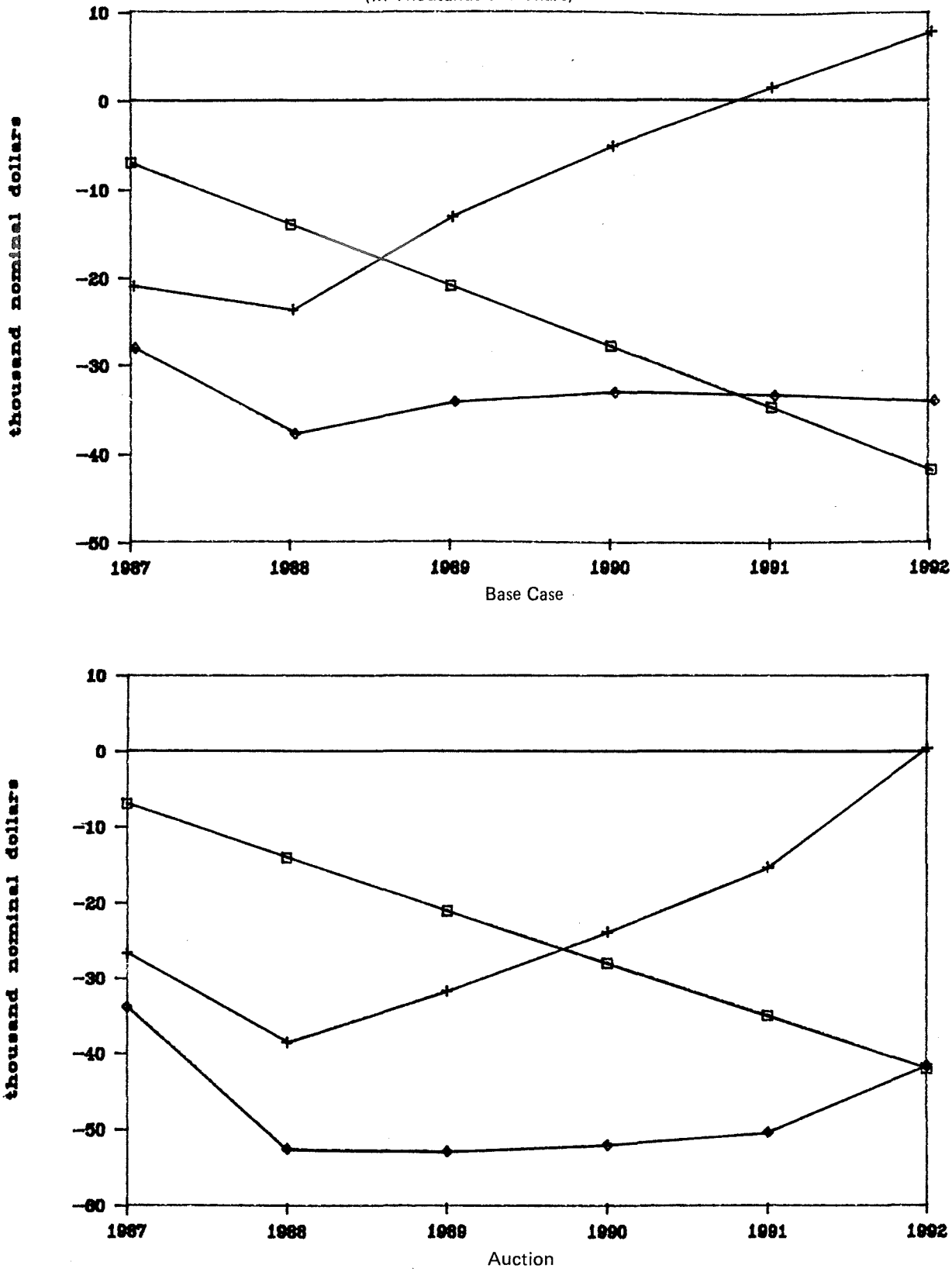
Figure 4.21 Relationship Between Real Prices and Sales of Foreclosed Condominiums, 1989
(In Thousands of 1986 Dollars and Thousands of Units)



Holdall Case | Base Case | Auction Case

Figure 4.22 Relative Price Changes and Holding Costs for One Condominium, Under Two Cases

(In Thousands of Dollars)



Our policy analyses also showed that subsidizing mortgage interest rates on condominiums could help that market in several ways: it would help improve prices and average equity, it would help private owners sell more condominiums (although sales by institutional owners would still dominate the market), and it would help reduce defaults. Subsidizing interest rates would of course be an additional cost to lenders; lenders would need to weigh the benefits of such subsidies against the costs.

Faster or Slower Economic Growth

All our policy analyses assume the moderate rate of economic growth projected in the base case of Chapter II. The economy may grow more or less than we expect in the next few years. Such faster or slower economic growth would of course also affect the housing market. Figures 4.23 though 4.26 show how some aspects of the Anchorage house market would be affected if the economy grew at the rates projected under the high and the low cases in Chapter II.

Real prices--prices in 1986 dollars--for Anchorage condominiums and single-family houses under the low, base, and high cases through 1992 are shown in Figures 4.23 and 4.24. (These cases assume the same rate of sales of foreclosed houses and condominiums as in the base case; only rates of economic activity are different.) Real average condominium prices could vary by as much as 25 percent between the high and the low cases in 1989 and remain nearly 20 percent apart by 1992.

Real average prices for single family houses would also vary under the three cases, but not so dramatically as would condominium prices. For instance, the difference between prices in the high and low case would be greatest in 1991, but the difference would be less than 10 percent. The very slow economic growth projected under the low case would be harder on condominium owners than on house owners.

Figure 4.25 shows another measure of housing market activity under the three case: projected numbers of building permits for new single-family houses. The figure compares the cumulative projected number of building permits from 1987 through 1992 under the high, medium, and low cases. Projected permits under the high case would be in the neighborhood of 3,400, under the base case roughly 2,800 and under the low case just over 2,000. Looked at another way, the number of building permits for new houses in Anchorage could be about 70 percent larger under the high case than under the low.

Still another measure of housing market activity is sales; Figure 4.26 shows cumulative projected private and foreclosure sales from 1987 through 1992 under the high, medium, and low cases. The number of foreclosure sales depends on how many homeowners default

Figure 4.23 Real Prices, Anchorage Condominiums, Under Three Cases
(In Thousands of 1986 Dollars)

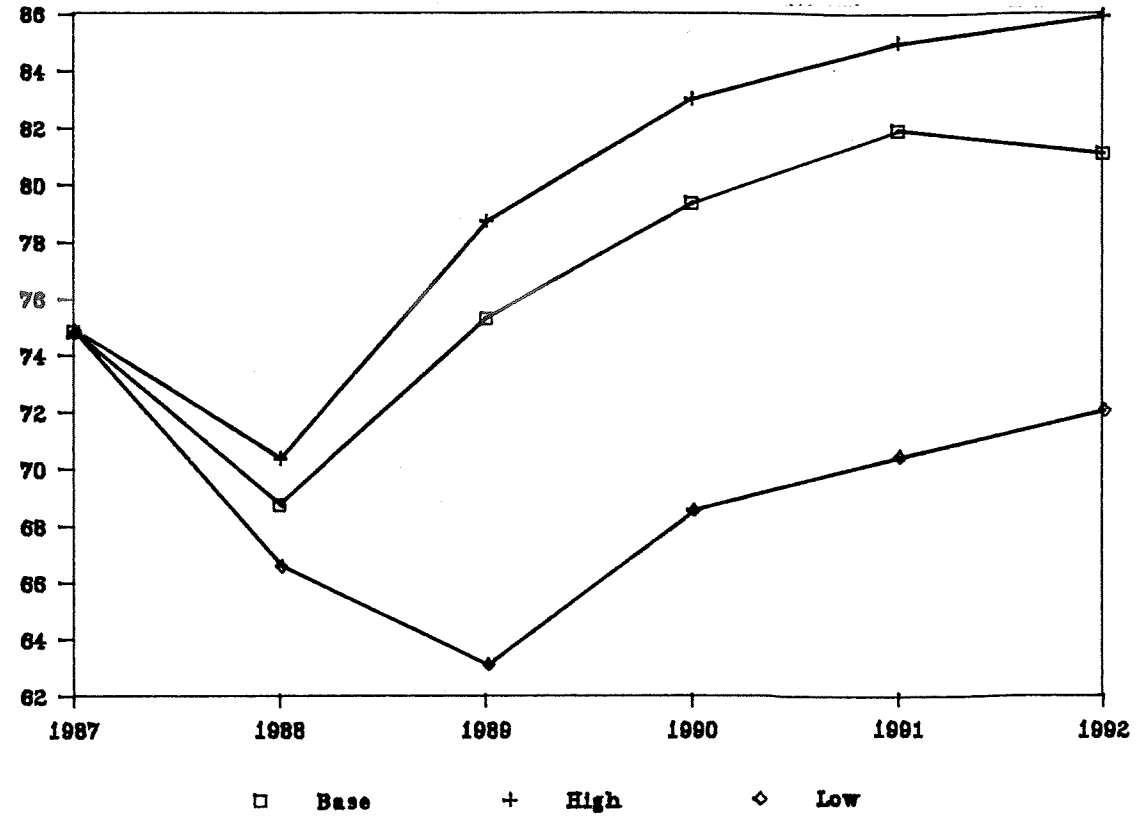


Figure 4.24 Real Prices, Anchorage Single-Family Houses, Under Three Cases
(In Thousands of 1986 Dollars)

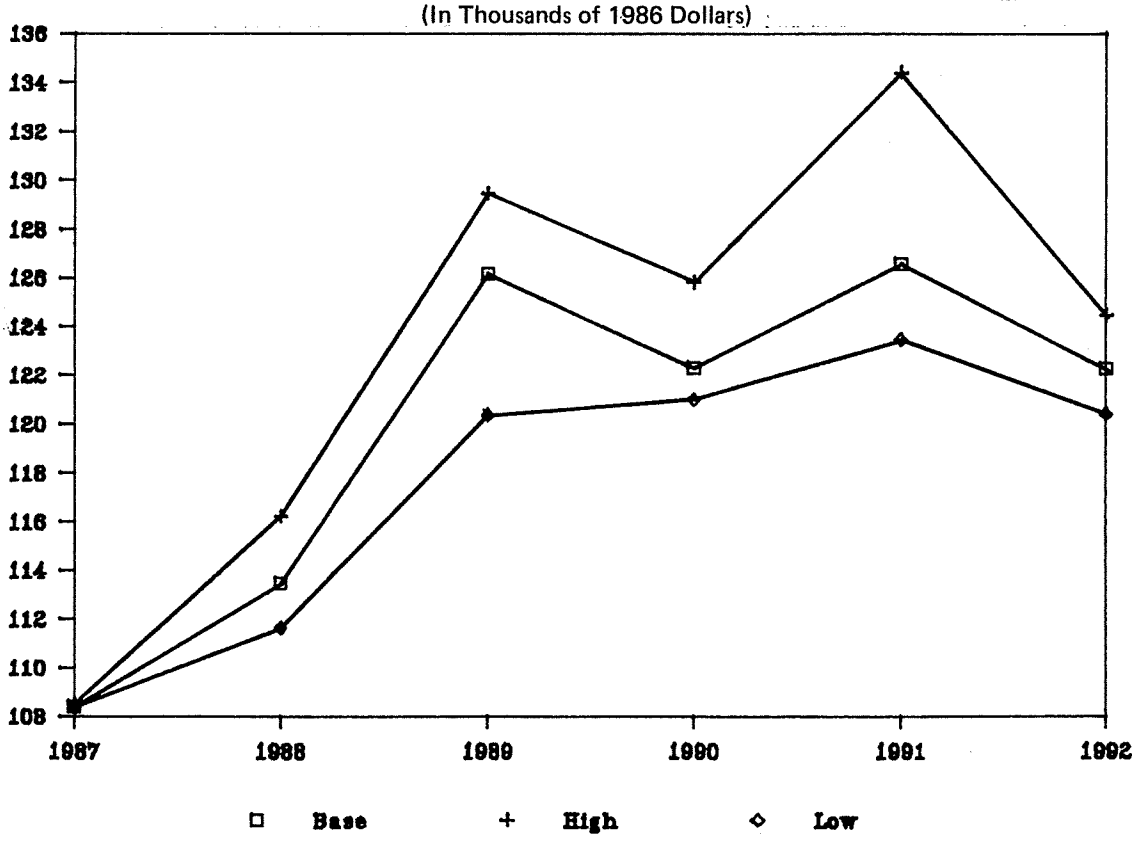


Figure 4.25 Projected Cumulative Building Permits for Anchorage Single-Family Houses, Under Three Cases

(In Thousands)

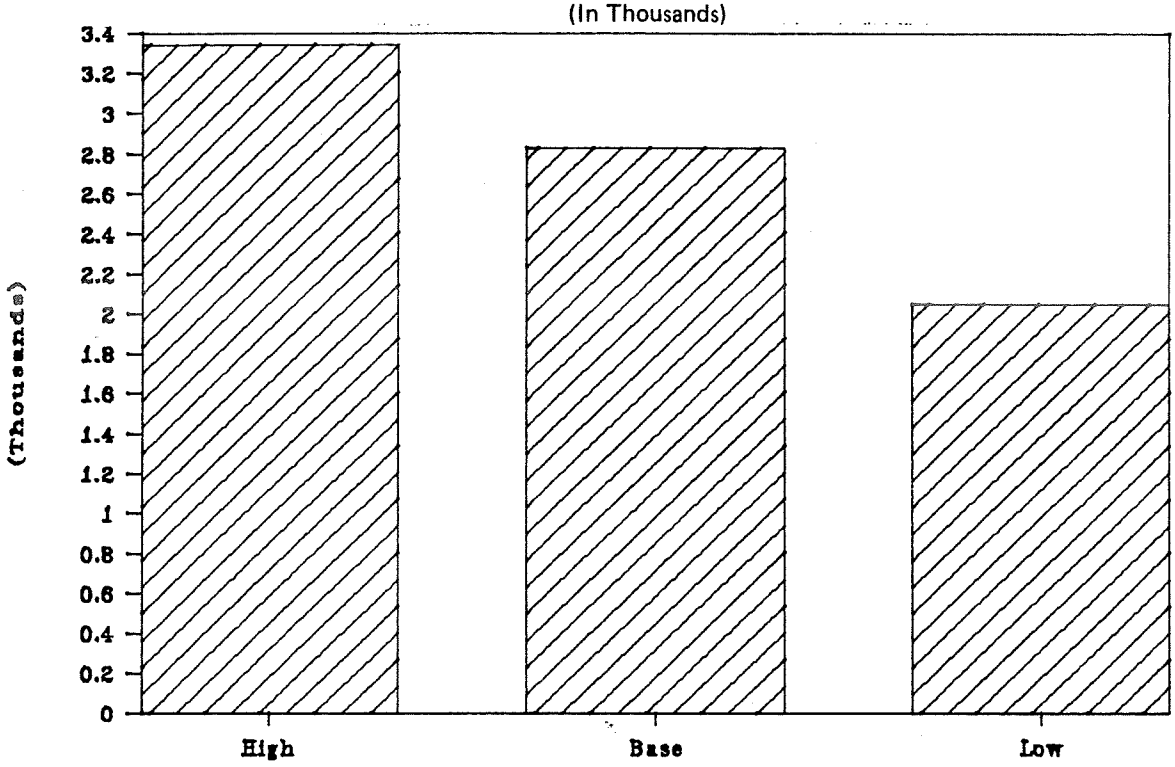
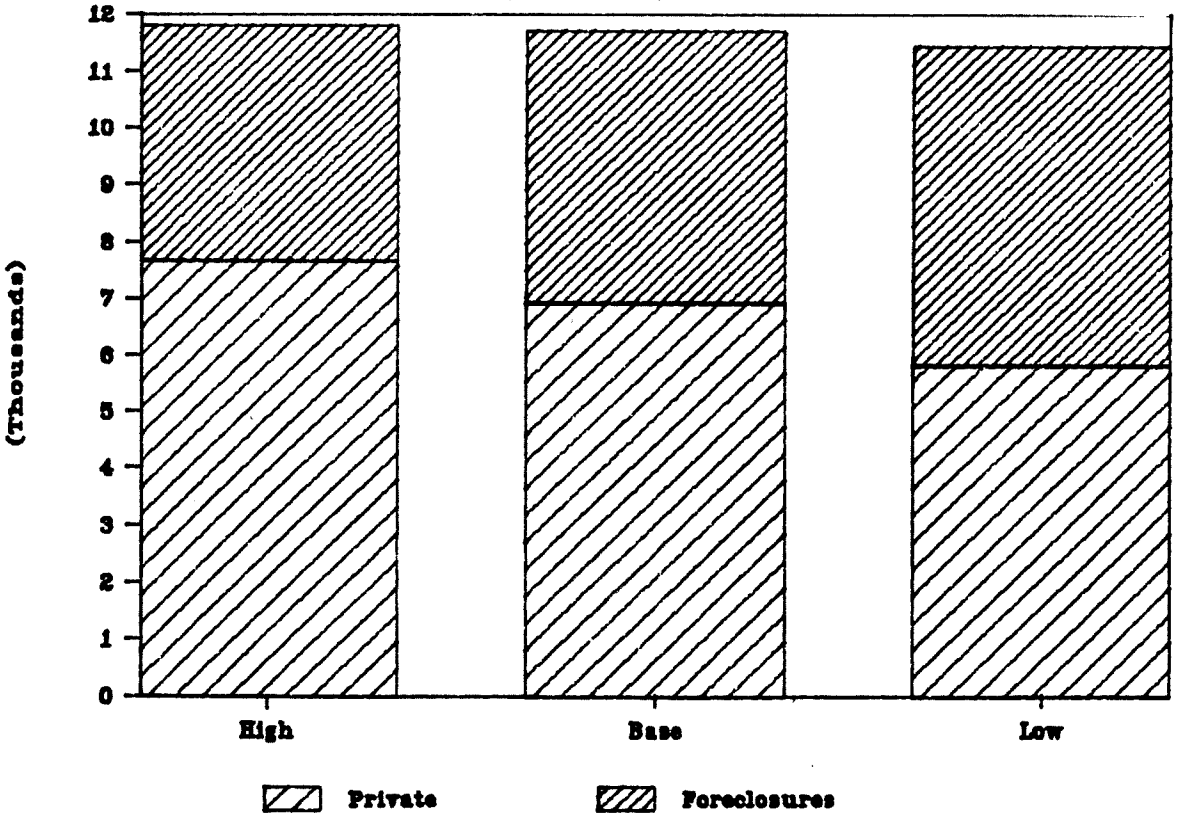


Figure 4.26 Projected Private and Foreclosure Sales of Anchorage Single-Family Houses, Under Three Cases

(In Thousands)



on their mortgages; the high case projects fewer foreclosure sales because under better economic conditions fewer homeowners would default. In all the cases foreclosure sales are projected to make up a significant share of total sales, but under the poorer economic conditions in the low case they would make up more than half of total houses sales from 1987 through 1992. Better economic conditions would improve the sales market for private sellers--private owners would be able to sell about 30 percent more houses under the high than under the low case.

Other indications of how the housing market would respond if the economy grows faster than we expect can be found in earlier ISER reports that assessed the effects of AHFC programs during the housing market boom of the early 1980s. (The Effects of Changes in the Alaska Housing Finance Corporation Mortgage Programs, Interim and Final Reports, 1986.)

APPENDIX A

ECONOMIC PROJECTION MODEL ASSUMPTIONS

1987 AHFC STUDY

SUMMARY OF MAP MODEL ASSUMPTIONS: BASE [AHFC.B]

A. PETROLEUM REVENUE ASSUMPTIONS: $19 WORLD PRICE
B. FISCAL ASSUMPTIONS: NEW REVENUES MEASURES IMPOSED IN EARLY 1990S (A6.2EX1)
C. INDUSTRY ASSUMPTIONS: MODERATE GROWTH (S87.N1)
D. NATIONAL VARIABLE ASSUMPTIONS: MODERATE GROWTH

A. PETROLEUM REVENUE ASSUMPTIONS

1. Average Expected OPEC Price	$19 nominal world oil price in late 1980s. The real price rises slightly faster than inflation in 1990s.
2. Petroleum Production-- North Slope & Cook Inlet	Total production gradually declines with the depletion of the giant Prudhoe Bay field from 674 million barrels/year in 1987 to 452 in 1995 and 187 in 2003. Producing fields include Prudhoe Bay, Kuparuk, West Sak, Lisburne, Endicott, Milne Point, Cook Inlet, and other small onshore and offshore fields (DORD6.7X).
3. Severance Taxes	Based on assumed price and production applied to current tax structure. After 2003, revenues remain constant in nominal dollars (DORD6.7X). Alyeska pipeline tariff dispute settlement revenues included [RPTS].
4. Royalties	Based on assumed price and production applied to current royalty structure. After 2003, revenues remain constant in nominal dollars. These revenues are distributed between the General Fund and Permanent Fund (DORD6.7X) [RPRY].
5. Bonuses	Alaska receives $500 million over the period FY 1989 to 1992 in settlement of disputed offshore leases in the Beaufort Sea. Also treated as bonuses are $500 million received between 1991 and 1995 in settlement of lawsuits and tax disputes regarding the valuation of North Slope oil. These revenues are distributed between the General Fund and Permanent Fund [RPBS].

(a) Codes in parentheses indicate ISER names for MAP Model SCEN_ case files, and codes in brackets indicate MAP variable names.

6. Property Taxes	Based on projections published by Alaska Department of Revenue, Revenue Sources (DORD6.7X) augmented by taxes on onshore facilities related to OCS development (OCS.6NGT -12) [RPPS].
7. Petroleum Corporate Income Tax	Based on projections published by Alaska Department of Revenue, Revenue Sources (DORD6.7X). No change in tax regulations [RTCSPX].
8. Rents	Increasing slowly from current level of $8 million [RPEN].
9. Miscellaneous Petroleum Revenues	Zero [RP9X].
10. Federal-State Petroleum-Related Shared Revenues	Increasing $1 million annually from current level of $25 million [RSFDNPX].
11. Windfalls	During FY 1986 the Permanent Fund experienced a capital gain of approximately $323 million. During FY 1987, $250 million accrues to Alaska from a litigation settlement with ARCO, $450 million in settlement of the Alyeska pipeline tariff dispute, and $50 million from past federal revenue sharing.

B. FISCAL ASSUMPTIONS

B.1. State Appropriations

1. Aggregate Appropriations	If funds available, ceiling established by Constitutional Spending Limit; otherwise appropriations equal revenues plus 50 percent [EXWIND] of general fund balance available for appropriations.
2. Capital/Operations Split	Two-thirds operations if Spending Limit in effect; 85 percent operations otherwise [EXSPLITX].
3. General Obligation Bonds	Bonding occurs up to point where debt service is 5 percent of state revenues.
4. Federal Grants-in-Aid for Capital Expenditures	Constant at $75 million [RSFDNCAX].

5. State Loan Programs	New capitalization terminated after FY 1987 [EXKTR1X]. Programs continue functioning on existing capitalization including AHFC [EXLOAN2] and APA revenue bond expenditures [EXCPSR1].
6. Municipal Capital Grants	Funding terminated after FY 1987 [RLTMCAP].
7. State-Local Revenue Sharing	Continuation proportional to total state expenditures [RLTRS].
8. State-Local Municipal Assistance	Continuation proportional to total state expenditures [RLTMA].
9. Permanent Fund/Other Appropriations in Excess of Spending Limit	None for operations [EXGFOPSX]; none for capital [EXSPCAP].

B.2. Permanent Fund

10. Permanent Fund Principal	Continuous accumulation from petroleum revenues [EXPF1]; inflation-proofing eliminated when complete withdrawal of earnings commences.
11. Permanent Fund Earnings	A quarter of the earnings after payment of the dividend are allocated to the General Fund beginning in 1988, rising to 50 percent of earnings in 1998, 75 percent in 2002, and all earnings in 2005 [EXPFTOGF].
12. Permanent Fund Dividend	Eliminated after FY 1994 distribution which occurs in the fall of that year [EXPFDIST].

B.3. Revenues

13. Personal Income Tax	Reimposed FY 1991; collections begin January of that year [EXPIT].
14. Miscellaneous Local Revenue Sources	Miscellaneous state-local transfers [RLTX], large project property taxes [RLPTX], petroleum-related federal transfers [RLTFPX] all set to zero.
15. New Federal-State Shared Revenues	Zero [RSFDNX].

16. Large Project Corporate Income Taxes	Zero [RTCSX].

B.4. Miscellaneous

17. State-Local Wage Rates	Constant average real wage rate beginning from 1988 through 1995 [EXWR].

C. INDUSTRY ASSUMPTIONS

1. Trans-Alaska Pipeline	Operating employment remains constant at 885 through 2010 (TAP.S86X).
2. North Slope--ANWR Petroleum Development and Production	Petroleum industry employment on the North Slope rises from 3.5 thousand in 1988 to 4 thousand in 1998. Employment engaged in new construction is constant at 1 thousand (NSO.S87A).
3. Upper Cook Inlet Petroleum Production	Employment in exploration and development of oil and gas in the Upper Cook Inlet area declines gradually beginning in 1983 by approximately 2.5 percent per year (UPC.S86).
4. OCS Development	Employment in exploration and development activity associated with Bering Sea and Arctic areas peaks at about 7,000 in 2005. Direct employment continues through the following decade at a level of about 3,000 (OCS.6NGT -12).
5. Oil Industry Headquarters	Oil company headquarters employment in Anchorage remains at about 3,900 through 2010 (OHQ.S86).
6. Healy Coal Mining	Export of approximately 1 million tons of coal annually adds 25 new workers to current base of 100 by 1986 (HCL.84X).
7. Beluga Chuitna Coal Production	Development of a 4.4 million ton/year mine for export beginning in 1989 provides employment of 524 (BCL.04T -4).
8. U.S. Borax	The U.S. Borax mine near Ketchikan is brought into production with operating employment of 685 beginning in 1993 and eventually increasing to 1,020 (BXM.F84-4).

9. Greens Creek Mine	Production from the Greens Creek Mine on Admiralty Island results in employment of 150 people from 1988 through 2003 (GCM.F84).
10. Red Dog Mine	The Red Dog Mine in the Western Brooks Range begins operation in 1991 with production employment of 393 rising to 428 (RED.F84-1).
11. Other Mining Activity	Mining employment not included in special projects increases from current level at 1 percent annually (OMN.S86).
12. Agriculture	Reduction in state support results in constant employment in agriculture (AGR.S86).
13. Logging and Sawmills	Logging for export by Native corporations expands employment to 3,100 by 1992 before declining at 1% annually due to productivity gains (FLL.S87).
14. Pulp Mills	Productivity gains result in employment declines at a rate of 1 percent per year after 1991 from the present level of 600 (FPU.S86).
15. Commercial Fish Harvesting--Nonbottomfish	Employment levels in traditional fisheries harvest remain constant at 7,500 through 2010 (TCF.S86).
16. Commercial Fish Processing--Nonbottomfish	Employment in processing traditional fisheries harvest remains at 7,000 (TFP.S87).
17. Commercial Fishing--Bottomfish	The total U.S. bottomfish catch expands at a constant rate to allowable catch in 2000, with Alaska resident harvesting employment rising to 1.033 thousand. Onshore processing capacity expands in the Aleutians and Kodiak census divisions to provide total resident employment of 1.471 thousand by 2000 (BCF.S86).
18. Federal Military Employment	Employment declines at 1 percent per year, consistent with the long-term trend since 1960 (GFM.S86).

19. Light Army Division Deployment	A portion of a new Army division is deployed to Fairbanks and Anchorage beginning in 1986, augmenting active-duty personnel by 3,800 by 1989 (GFM.S87)
20. Federal Civilian Employment	After remaining constant from 1987 through 1990, employment rises at 0.5 percent annual rate consistent with the long-term trend since 1960 (GFC.S87).
21. Tourism	Number of visitors to Alaska increases by 30,000 per year to over 1.3 million by 2010 (TRS.J85).
22. State Hydroelectric Projects	Construction employment from Alaska Power Authority projects includes several projects in Southcentral and Southeast Alaska, including Bradley Lake (SHP.F85) and (SHP.B86).

D. NATIONAL VARIABLE ASSUMPTIONS

1. U.S. Inflation Rate	Consumer prices rise at an annual rate of 3% in 1987, 4.6% from 1988 to 1992, and gradually increase to 5.4% in 1997. This assumption is consistent with petroleum price and revenue.
2. Real Average Weekly Earnings	Growth in real average weekly earnings averages 1 percent annually.
3. Real Per Capita Income	Growth in real per capita income averages 1.5 percent annually.
4. Unemployment Rate	Long-run rate of 6.5 percent.

E. REGIONAL ASSUMPTIONS

1. Population	Regional population growth allocated on the basis of employment growth.
2. Employment	No significant shifts in the location of support industries.

SUMMARY OF MAP MODEL ASSUMPTIONS: HIGH [AHFC.H]

A. PETROLEUM REVENUE ASSUMPTIONS: $26 WORLD PRICE
B. FISCAL ASSUMPTIONS: NEW REVENUES MEASURES IMPOSED IN EARLY 1990S (A6.2EX2)
C. INDUSTRY ASSUMPTIONS: MODERATE GROWTH (S87.N2)
D. NATIONAL VARIABLE ASSUMPTIONS: MODERATE GROWTH

A. PETROLEUM REVENUE ASSUMPTIONS

* 1. Average Expected OPEC Price	$26 nominal world oil price in late 1980s. The real price continues to rise faster than inflation in 1990s. The nominal price approaches $80/barrel by 2000.
2. Petroleum Production-- North Slope & Cook Inlet	Total production gradually declines with the depletion of the giant Prudhoe Bay field from 674 million barrels/year in 1987 to 452 in 1995 and 187 in 2003. Producing fields include Prudhoe Bay, Kuparuk, West Sak, Lisburne, Endicott, Milne Point, Cook Inlet, and other small onshore and offshore fields (DORD6.9X).
* 3. Severance Taxes	Based on assumed price and production applied to current tax structure. After 2003, revenues remain constant in nominal dollars (DORD6.9X). Alyeska pipeline tariff dispute settlement revenues included [RPTS].
* 4. Royalties	Based on assumed price and production applied to current royalty structure. After 2003, revenues remain constant in nominal dollars. These revenues are distributed between the General Fund and Permanent Fund (DORD6.9X) [RPRY].
5. Bonuses	Alaska receives $500 million over the period FY 1989 to 1992 in settlement of disputed offshore leases in the Beaufort Sea. Also treated as bonuses are $500 million received between 1991 and 1995 in settlement of lawsuits and tax disputes regarding the valuation of North Slope oil. These revenues are distributed between the General Fund and Permanent Fund [RPBS].

*Indicates an element different from the base case.

* 6. Property Taxes	Based on projections published by Alaska Department of Revenue, Revenue Sources (DORD6.9X) augmented by taxes on onshore facilities related to OCS development (OCS.6NGT -5) [RPPS].
7. Petroleum Corporate Income Tax	Based on projections published by Alaska Department of Revenue, Revenue Sources (DORD6.7X). No change in tax regulations [RTCSPX].
8. Rents	Increasing slowly from current level of $8 million [RPEN].
9. Miscellaneous Petroleum Revenues	Zero [RP9X].
10. Federal-State Petroleum-Related Shared Revenues	Increasing $1 million annually from current level of $25 million [RSFDNPX].
11. Windfalls	During FY 1986 the Permanent Fund experienced a capital gain of approximately $323 million. During FY 1987, $250 million accrues to Alaska from a litigation settlement with ARCO, $450 million in settlement of the Alyeska pipeline tariff dispute, and $50 million from past federal revenue sharing.

B. FISCAL ASSUMPTIONS

B.1. State Appropriations

1. Aggregate Appropriations	If funds available, ceiling established by Constitutional Spending Limit; otherwise appropriations equal revenues plus 50 percent [EXWIND] of general fund balance available for appropriations.
* 2. Capital/Operations Split	Two-thirds operations during 1990s when revenues are large; 85 percent operations otherwise [EXSPLITX].
3. General Obligation Bonds	Bonding occurs up to point where debt service is 5 percent of state revenues.
4. Federal Grants-in-Aid for Capital Expenditures	Constant at $75 million [RSFDNCAX].

	5. State Loan Programs	New capitalization terminated after FY 1987 [EXKTR1X]. Programs continue functioning on existing capitalization including AHFC [EXLOAN2] and APA revenue bond expenditures [EXCPSR1].
	6. Municipal Capital Grants	Funding terminated after FY 1987 [RLTMCAP].
	7. State-Local Revenue Sharing	Continuation proportional to total state expenditures [RLTRS].
	8. State-Local Municipal Assistance	Continuation proportional to total state expenditures [RLTMA].
	9. Permanent Fund/Other Appropriations in Excess of Spending Limit	None for operations [EXGFOPSX]; none for capital [EXSPCAP].
	B.2. Permanent Fund	
	10. Permanent Fund Principal	Continuous accumulation from petroleum revenues [EXPF1]; inflation-proofing eliminated when complete withdrawal of earnings commences.
*	11. Permanent Fund Earnings	Half the earnings after payment of the dividend are allocated to the General Fund beginning in 2001, rising to 100 percent of earnings in 2007 [EXPFTOGF].
*	12. Permanent Fund Dividend	Continued through 2010 [EXPFDIST].
	B.3. Revenues	
*	13. Personal Income Tax	Reimposed FY 2004; collections begin January of that year [EXPIT].
	14. Miscellaneous Local Revenue Sources	Miscellaneous state-local transfers [RLTX], large project property taxes [RLPTX], petroleum-related federal transfers [RLTFPX] all set to zero.
	15. New Federal-State Shared Revenues	Zero [RSFDNX].
	16. Large Project Corporate Income Taxes	Zero [RTCSX].

B.4. Miscellaneous

* 17. State-Local Wage Rates	No constraints on average real wage rates [EXWR].

C. INDUSTRY ASSUMPTIONS

1. Trans-Alaska Pipeline	Operating employment remains constant at 885 through 2010 (TAP.S86X).
* 2. North Slope--ANWR Petroleum Development and Production	Petroleum industry employment on the North Slope rises from 3.5 thousand in 1988 to 5 thousand in 2001. Employment engaged in new construction is constant at 1.5 thousand (NSO.S87H).
3. Upper Cook Inlet Petroleum Production	Employment in exploration and development of oil and gas in the Upper Cook Inlet area declines gradually beginning in 1983 by approximately 2.5 percent per year (UPC.S86).
* 4. OCS Development	Employment in exploration and development activity associated with Bering Sea and Arctic areas peaks at about 7,000 in 1998. Direct employment continues through the following decade at a level of about 3,000 (OCS.6NGT -5).
5. Oil Industry Headquarters	Oil company headquarters employment in Anchorage remains at about 3,900 through 2010 (OHQ.S86).
5a. TAGS Pipeline	A pipeline to transport North Slope natural gas to market in Japan is constructed between 2000 and 2008. The line extends from Prudhoe Bay to Kenai and includes compression stations, conditioning facilities, and a liquefaction plant. Construction employment is 890 in the initial year, rises to a peak of 4,782 in 2003, and falls to 3,692 in 2008. Operations employment rises from 236 in 2005 to 435 in 2010. Construction and operations employment occurs all along the pipeline corridor. On the Kenai Peninsula, employment begins at 73 in 2000, rises to 2,673 in 2003, and is 200 in the operations phase (TAG.HIC).

6. Healy Coal Mining	Export of approximately 1 million tons of coal annually adds 25 new workers to current base of 100 by 1986 (HCL.84X).
7. Beluga Chuitna Coal Production	Development of a 4.4 million ton/year mine for export beginning in 1989 provides employment of 524 (BCL.04T -4).
8. U.S. Borax	The U.S. Borax mine near Ketchikan is brought into production with operating employment of 685 beginning in 1993 and eventually increasing to 1,020 (BXM.F84-4).
9. Greens Creek Mine	Production from the Greens Creek Mine on Admiralty Island results in employment of 150 people from 1988 through 2003 (GCM.F84).
10. Red Dog Mine	The Red Dog Mine in the Western Brooks Range begins operation in 1991 with production employment of 393 rising to 428 (RED.F84-1).
11. Other Mining Activity	Mining employment not included in special projects increases from current level at 1 percent annually (OMN.S86).
12. Agriculture	Reduction in state support results in constant employment in agriculture (AGR.S86).
13. Logging and Sawmills	Logging for export by Native corporations expands employment to 3,100 by 1992 before declining at 1% annually due to productivity gains (FLL.S87).
14. Pulp Mills	Productivity gains result in employment declines at a rate of 1 percent per year after 1991 from the present level of 600 (FPU.S86).
15. Commercial Fish Harvesting--Nonbottomfish	Employment levels in traditional fisheries harvest remain constant at 7,500 through 2010 (TCF.S86).
16. Commercial Fish Processing--Nonbottomfish	Employment in processing traditional fisheries harvest remains at 7,000 (TFP.S87).

17. Commercial Fishing--Bottomfish	The total U.S. bottomfish catch expands at a constant rate to allowable catch in 2000, with Alaska resident harvesting employment rising to 1.033 thousand. Onshore processing capacity expands in the Aleutians and Kodiak census divisions to provide total resident employment of 1.471 thousand by 2000 (BCF.S86).
18. Federal Military Employment	Employment declines at 1 percent per year, consistent with the long-term trend since 1960 (GFM.S86).
19. Light Army Division Deployment	A portion of a new Army division is deployed to Fairbanks and Anchorage beginning in 1986, augmenting active-duty personnel by 3,800 by 1989 (GFM.S87)
20. Federal Civilian Employment	After remaining constant from 1987 through 1990, employment rises at 0.5 percent annual rate consistent with the long-term trend since 1960 (GFC.S87).
21. Tourism	Number of visitors to Alaska increases by 30,000 per year to over 1.3 million by 2010 (TRS.J85).
22. State Hydroelectric Projects	Construction employment from Alaska Power Authority projects includes several projects in Southcentral and Southeast Alaska, including Bradley Lake (SHP.F85) and (SHP.B86).

D. NATIONAL VARIABLE ASSUMPTIONS

1. U.S. Inflation Rate	Consumer prices rise at an annual rate of 3% in 1987, 4.6% from 1988 to 1992, and gradually increase to 5.4% in 1997. This assumption is consistent with petroleum price and revenue.
2. Real Average Weekly Earnings	Growth in real average weekly earnings averages 1 percent annually.

3. Real Per Capita Income	Growth in real per capita income averages 1.5 percent annually.
4. Unemployment Rate	Long-run rate of 6.5 percent.

E. REGIONAL ASSUMPTIONS

1. Population	Regional population growth allocated on the basis of employment growth.
2. Employment	No significant shifts in the location of support industries.

SUMMARY OF MAP MODEL ASSUMPTIONS: LOW [AHFC.L]

A. PETROLEUM REVENUE ASSUMPTIONS: $15 WORLD PRICE
B. FISCAL ASSUMPTIONS: NEW REVENUES MEASURES IMPOSED IN LATE 1980S (A6.2EX3)
C. INDUSTRY ASSUMPTIONS: MODERATE GROWTH (S87.N3)
D. NATIONAL VARIABLE ASSUMPTIONS: MODERATE GROWTH

A. PETROLEUM REVENUE ASSUMPTIONS

* 1. Average Expected OPEC Price	$15 nominal world oil price in late 1980s. The real price remains constant in 1990s.
2. Petroleum Production-- North Slope & Cook Inlet	Total production gradually declines with the depletion of the giant Prudhoe Bay field. Producing fields include Prudhoe Bay, Kuparuk, West Sak, Lisburne, Endicott, Milne Point, Cook Inlet, and other small onshore and offshore fields (DORD6.3X).
* 3. Severance Taxes	Based on assumed price and production applied to current tax structure. After 2003, revenues remain constant in nominal dollars (DORD6.3X). Alyeska pipeline tariff dispute settlement revenues included [RPTS].
* 4. Royalties	Based on assumed price and production applied to current royalty structure. After 2003, revenues remain constant in nominal dollars. These revenues are distributed between the General Fund and Permanent Fund (DORD6.3X) [RPRY].
5. Bonuses	Alaska receives $500 million over the period FY 1989 to 1992 in settlement of disputed offshore leases in the Beaufort Sea. Also treated as bonuses are $500 million received between 1991 and 1995 in settlement of lawsuits and tax disputes regarding the valuation of North Slope oil. These revenues are distributed between the General Fund and Permanent Fund [RPBS].

* 6. Property Taxes	Based on projections published by Alaska Department of Revenue, Revenue Sources (DORD6.3X) augmented by taxes on onshore facilities related to OCS development (OCS.CM3Z -3) [RPPS].
7. Petroleum Corporate Income Tax	Based on projections published by Alaska Department of Revenue, Revenue Sources (DORD6.7X). No change in tax regulations [RTCSPX].
8. Rents	Increasing slowly from current level of $8 million [RPEN].
9. Miscellaneous Petroleum Revenues	Zero [RP9X].
10. Federal-State Petroleum-Related Shared Revenues	Increasing $1 million annually from current level of $25 million [RSFDNPX].
11. Windfalls	During FY 1986 the Permanent Fund experienced a capital gain of approximately $323 million. During FY 1987, $250 million accrues to Alaska from a litigation settlement with ARCO, $450 million in settlement of the Alyeska pipeline tariff dispute, and $50 million from past federal revenue sharing.

B. FISCAL ASSUMPTIONS

B.1. State Appropriations

1. Aggregate Appropriations	If funds available, ceiling established by Constitutional Spending Limit; otherwise appropriations equal revenues plus 50 percent [EXWIND] of general fund balance available for appropriations.
2. Capital/Operations Split	Two-thirds operations if Spending Limit in effect; 85 percent operations otherwise [EXSPLITX].
3. General Obligation Bonds	Bonding occurs up to point where debt service is 5 percent of state revenues.
4. Federal Grants-in-Aid for Capital Expenditures	Constant at $75 million [RSFDNCAX].

5. State Loan Programs	New capitalization terminated after FY 1987 [EXKTR1X]. Programs continue functioning on existing capitalization including AHFC [EXLOAN2] and APA revenue bond expenditures [EXCPSR1].
6. Municipal Capital Grants	Funding terminated after FY 1987 [RLTMCAP].
7. State-Local Revenue Sharing	Continuation proportional to total state expenditures [RLTRS].
8. State-Local Municipal Assistance	Continuation proportional to total state expenditures [RLTMA].
9. Permanent Fund/Other Appropriations in Excess of Spending Limit	None for operations [EXGFOPSX]; none for capital [EXSPCAP].
B.2. Permanent Fund	
10. Permanent Fund Principal	Continuous accumulation from petroleum revenues [EXPF1]; inflation-proofing eliminated when complete withdrawal of earnings commences.
* 11. Permanent Fund Earnings	All the earnings of the Permanent Fund allocated to the General Fund [EXPFTOGF].
* 12. Permanent Fund Dividend	Eliminated after FY 1988 distribution which occurs in the fall of that year [EXPFDIST].
B.3. Revenues	
* 13. Personal Income Tax	Reimposed FY 1989; collections begin January of that year [EXPIT].
14. Miscellaneous Local Revenue Sources	Miscellaneous state-local transfers [RLTX], large project property taxes [RLPTX], petroleum-related federal transfers [RLTFPX] all set to zero.
15. New Federal-State Shared Revenues	Zero [RSFDNX].

	16. Large Project Corporate Income Taxes	Zero [RTCSX].
	B.4. Miscellaneous	
*	17. State-Local Wage Rates	Constant average real wage rate beginning from 1988 through 2000 [EXWR].
C.	INDUSTRY ASSUMPTIONS	
	1. Trans-Alaska Pipeline	Operating employment remains constant at 885 through 2010 (TAP.S86X).
*	2. North Slope--ANWR Petroleum Development and Production	Petroleum industry employment on the North Slope contracts to 2 thousand in the early 1990s. Employment engaged in new construction is constant at 1 thousand (NSO.860G).
	3. Upper Cook Inlet Petroleum Production	Employment in exploration and development of oil and gas in the Upper Cook Inlet area declines gradually beginning in 1983 by approximately 2.5 percent per year (UPC.S86).
*	4. OCS Development	Employment in exploration and development activity stops due to the low price of oil (OCS.CM3Z -3).
*	5. Oil Industry Headquarters	Oil company headquarters employment in Anchorage contracts from 3,900 to 300 in 2010 (OHQ.F84W).
	6. Healy Coal Mining	Export of approximately 1 million tons of coal annually adds 25 new workers to current base of 100 by 1986 (HCL.84X).
	7. Beluga Chuitna Coal Production	Development of a 4.4 million ton/year mine for export beginning in 1989 provides employment of 524 (BCL.04T -4).
	8. U.S. Borax	The U.S. Borax mine near Ketchikan is brought into production with operating employment of 685 beginning in 1993 and eventually increasing to 1,020 (BXM.F84-4).

9. Greens Creek Mine	Production from the Greens Creek Mine on Admiralty Island results in employment of 150 people from 1988 through 2003 (GCM.F84).
10. Red Dog Mine	The Red Dog Mine in the Western Brooks Range begins operation in 1991 with production employment of 393 rising to 428 (RED.F84-1).
11. Other Mining Activity	Mining employment not included in special projects increases from current level at 1 percent annually (OMN.S86).
12. Agriculture	Reduction in state support results in constant employment in agriculture (AGR.S86).
13. Logging and Sawmills	Logging for export by Native corporations expands employment to 3,100 by 1992 before declining at 1% annually due to productivity gains (FLL.S87).
14. Pulp Mills	Productivity gains result in employment declines at a rate of 1 percent per year after 1991 from the present level of 600 (FPU.S86).
15. Commercial Fish Harvesting--Nonbottomfish	Employment levels in traditional fisheries harvest remain constant at 7,500 through 2010 (TCF.S86).
16. Commercial Fish Processing--Nonbottomfish	Employment in processing traditional fisheries harvest remains at 7,000 (TFP.S87).
17. Commercial Fishing--Bottomfish	The total U.S. bottomfish catch expands at a constant rate to allowable catch in 2000, with Alaska resident harvesting employment rising to 1.033 thousand. Onshore processing capacity expands in the Aleutians and Kodiak census divisions to provide total resident employment of 1.471 thousand by 2000 (BCF.S86).
18. Federal Military Employment	Employment declines at 1 percent per year, consistent with the long-term trend since 1960 (GFM.S86).

19. Light Army Division Deployment	A portion of a new Army division is deployed to Fairbanks and Anchorage beginning in 1986, augmenting active-duty personnel by 3,800 by 1989 (GFM.S87)
20. Federal Civilian Employment	After remaining constant from 1987 through 1990, employment rises at 0.5 percent annual rate consistent with the long-term trend since 1960 (GFC.S87).
21. Tourism	Number of visitors to Alaska increases by 30,000 per year to over 1.3 million by 2010 (TRS.J85).
22. State Hydroelectric Projects	Construction employment from Alaska Power Authority projects includes several projects in Southcentral and Southeast Alaska, including Bradley Lake (SHP.F85) and (SHP.B86).

D. NATIONAL VARIABLE ASSUMPTIONS

1. U.S. Inflation Rate	Consumer prices rise at an annual rate of 3% in 1987, 4.6% from 1988 to 1992, and gradually increase to 5.4% in 1997. This assumption is consistent with petroleum price and revenue.
2. Real Average Weekly Earnings	Growth in real average weekly earnings averages 1 percent annually.
3. Real Per Capita Income	Growth in real per capita income averages 1.5 percent annually.
4. Unemployment Rate	Long-run rate of 6.5 percent.

E. REGIONAL ASSUMPTIONS

1. Population	Regional population growth allocated on the basis of employment growth.
2. Employment	No significant shifts in the location of support industries.

APPENDIX B

ECONOMIC PROJECTION OUTPUT TABLES

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC BASE
TABLE 1.
SUMMARY

	POPULATION (000)	HOUSEHOLDS (000)	TOTAL EMPLOYMENT (000)	WAGE AND SALARY EMPLOYMENT (000)	PERSONAL INCOME (MILLION 1986 $)	PETROLEUM REVENUES (MILLION 1986 $)
1985	539.963	183.149	272.146	226.929	9618.600	3175.935
1986	535.654	182.335	263.366	218.182	9272.130	2547.350
1987	529.318	180.944	254.825	210.342	9059.820	1358.306
1988	523.571	179.497	250.062	204.872	8833.363	1641.740
1989	524.658	180.348	252.888	206.257	8936.207	1931.765
1990	527.605	182.108	256.969	210.166	9104.080	1914.017
1991	531.828	184.288	261.494	214.475	9284.730	1914.045
1992	534.612	185.953	263.505	216.469	9341.840	1812.881
1993	537.770	187.722	265.504	218.446	9543.710	1670.751
1994	547.310	191.654	273.975	226.341	9942.040	1966.706
1995	551.864	193.868	275.335	227.711	9817.030	1883.978
1996	554.932	195.548	275.284	227.821	9932.960	1679.364
1997	563.507	199.085	281.545	233.693	10286.910	2013.772
1998	572.660	202.810	287.268	239.051	10633.810	1856.289
1999	580.606	206.111	290.896	242.471	10918.810	1698.993
2000	587.973	209.202	293.830	245.297	11185.960	1555.109
2001	593.792	211.750	295.125	246.673	11397.290	1423.180
2002	603.983	215.771	301.458	252.644	11791.170	1321.352
2003	611.801	218.980	304.287	255.414	12057.560	1244.791
2004	620.032	222.320	307.662	258.677	12346.640	1192.944
2005	635.828	228.221	319.005	269.191	13034.100	1151.292
2006	652.227	234.342	329.331	278.763	13633.100	1116.190
2007	661.881	238.191	331.016	280.477	13799.120	1069.503
2008	676.612	243.754	338.786	287.710	14256.570	1021.175
2009	691.124	249.253	345.462	293.944	14710.790	974.989
2010	705.805	254.820	352.134	300.165	15169.580	930.778

SOURCE: ISER MAP MODEL SIMULATION AHFC.B, CREATED AUGUST 1987.

POPULATION (POP) IS JULY 1, CENSUS DEFINITION.
HOUSEHOLDS (HH) IS JULY 1, CENSUS DEFINITION.
TOTAL EMPLOYMENT (EM99) INCLUDES ACTIVE DUTY MILITARY AND PROPRIETORS--
PRE 1985 PROPRIETOR DEFINITION.
WAGE AND SALARY EMPLOYMENT (EM97) IS ALASKA
DEPARTMENT OF LABOR DEFINITION.
PERSONAL INCOME (DF.PIB) IS US BEA DEFINITION.
PETROLEUM REVENUES (DF.RP9S) INCLUDES PERMANENT FUND CONTRIBUTION.

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC BASE
TABLE 2.
EMPLOYMENT BY SECTOR
(THOUSANDS)

	TOTAL EMPLOYMENT	BASIC EMPLOYMENT	INFRA-STRUCTURE EMPLOYMENT	SERVICES EMPLOYMENT	GOVERNMENT EMPLOYMENT
1985	272.146	76.888	40.964	104.290	50.004
1986	263.366	77.785	35.690	101.027	48.864
1987	254.825	78.543	31.196	97.975	47.110
1988	250.062	80.048	29.480	94.828	45.706
1989	252.888	81.683	30.178	94.377	46.649
1990	256.969	82.749	33.025	95.371	45.825
1991	261.494	84.277	33.181	95.938	48.099
1992	263.505	84.630	34.136	96.822	47.918
1993	265.504	84.611	35.952	98.492	46.449
1994	273.975	85.313	36.505	101.890	50.267
1995	275.335	85.919	35.732	103.063	50.621
1996	275.284	86.602	35.209	104.012	49.461
1997	281.545	86.978	35.338	106.816	52.415
1998	287.268	87.909	36.076	110.165	53.118
1999	290.896	89.091	36.996	113.036	51.774
2000	293.830	89.509	37.873	115.902	50.545
2001	295.125	89.309	38.447	118.391	48.978
2002	301.458	89.797	38.989	121.995	50.677
2003	304.287	89.766	39.617	125.152	49.753
2004	307.662	89.656	40.273	128.178	49.554
2005	319.005	94.358	41.275	134.042	49.330
2006	329.331	96.647	42.561	140.527	49.596
2007	331.016	93.356	43.510	143.914	50.236
2008	338.786	92.761	44.643	148.432	52.951
2009	345.462	93.047	46.317	153.534	52.565
2010	352.134	93.268	48.193	158.455	52.218

SOURCE: ISER MAP MODEL SIMULATION AHFC.B, CREATED AUGUST 1987.

TOTAL EMPLOYMENT (EM99).
BASIC EMPLOYMENT (EM9BASE) CONSISTS OF EXOGENOUS COMPONENTS OF CONSTRUCTION, MANUFACTURING, AND TRANSPORTATION; MINING (PETROLEUM); TOURISM, FEDERAL GOVERNMENT, AND AGRICULTURE, FORESTRY, AND FISH HARVESTING.
INFRASTRUCTURE EMPLOYMENT (EM9INFR) CONSISTS OF TRANSPORTATION, COMMUNICATIONS, PUBLIC UTILITIES, ENDOGENOUS CONSTRUCTION, AND BUSINESS SERVICES, NET OF EXOGENOUS AND TOURISM-RELATED TRANSPORTATION.
SUPPORT EMPLOYMENT (EM9SUPRT) CONSISTS OF TRADE, FINANCE, SERVICES, LOCAL MANUFACTURING, AND PROPRIETORS NOT ENGAGED IN FISH HARVESTING, NET OF TRADE AND SERVICE TOURISM EMPLOYMENT AND BUSINESS SERVICES.
GOVERNMENT EMPLOYMENT (EMGA) CONSISTS OF STATE AND LOCAL GOVERNMENT EMPLOYMENT.

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC BASE
TABLE 3.
PRIVATE EMPLOYMENT
(THOUSANDS)

	TOTAL PRIVATE	AGRI-CULTURE, FORESTRY, FISHERIES	MINING	CONSTRUC-TION	MANU-FACTURING	TRANS-PORTATION, COMMUNI-CATIONS, PUBLIC UTILITIES	SUPPORT
1985	181.963	9.330	9.472	18.810	11.844	18.724	113.783
1986	173.248	9.532	9.125	12.300	12.620	18.455	111.216
1987	166.235	9.560	8.913	8.513	12.782	18.229	108.238
1988	161.798	9.577	8.707	7.623	12.945	17.936	105.010
1989	162.500	9.612	8.798	8.448	13.168	17.953	104.520
1990	167.622	9.675	9.277	11.432	13.479	18.114	105.644
1991	169.997	9.741	9.434	12.381	13.765	18.177	106.499
1992	172.309	9.812	9.662	12.770	14.003	18.338	107.724
1993	175.895	9.888	10.231	13.364	14.080	18.610	109.722
1994	180.664	9.972	10.674	13.281	14.205	19.098	113.435
1995	181.783	10.064	10.978	12.051	14.260	19.290	115.140
1996	183.003	10.117	11.122	11.476	14.369	19.489	116.430
1997	186.419	10.184	11.330	10.964	14.548	19.873	119.520
1998	191.544	10.268	11.733	11.125	14.764	20.391	123.263
1999	196.619	10.374	12.139	11.625	15.021	20.924	126.536
2000	200.882	10.429	12.183	11.761	15.296	21.336	129.878
2001	203.843	10.429	11.926	11.751	15.299	21.579	132.859
2002	208.573	10.429	12.156	11.647	15.334	22.132	136.874
2003	212.420	10.429	12.007	11.614	15.347	22.474	140.549
2004	216.084	10.429	11.772	11.651	15.364	22.825	144.042
2005	227.740	10.429	15.337	12.097	15.454	24.112	150.311
2006	237.887	10.429	16.997	12.396	15.526	25.109	157.429
2007	239.016	10.429	14.378	11.883	15.517	25.245	161.564
2008	244.152	10.429	13.608	12.180	15.564	25.758	166.614
2009	251.294	10.429	13.735	12.799	15.609	26.362	172.360
2010	258.389	10.429	13.765	13.731	15.656	26.942	177.867

SOURCE: ISER MAP MODEL SIMULATION AHFC.B, CREATED AUGUST 1987.

PRIVATE (EMPVT) IS ALL NON-GOVERNMENT.
AGRICULTURE, FORESTRY, FISHERIES (EMAFF).
MINING (EMP9) IS TOTAL MINING, INCLUDING OIL AND GAS.
CONSTRUCTION (EMCN).
MANUFACTURING (EMM9).
TRANSPORTATION, COMMUNICATIONS, PUBLIC UTILITIES (EMTCU).
SUPPORT (EMSUP) INCLUDES TRADE, FINANCE, SERVICE, AND
PROPRIETORS NOT INVOLVED IN FISH HARVESTING.

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC BASE
TABLE 4.
GOVERNMENT EMPLOYMENT
(THOUSANDS)

	TOTAL	MILITARY	FEDERAL CIVILIAN	STATE	LOCAL
1985	90.183	22.579	17.600	20.904	29.100
1986	90.117	23.253	18.000	19.911	28.953
1987	88.590	23.230	18.250	19.007	28.104
1988	88.264	24.308	18.250	19.035	26.670
1989	90.388	25.489	18.250	20.246	26.402
1990	89.347	25.272	18.250	19.858	25.967
1991	91.497	25.058	18.341	20.851	27.247
1992	91.196	24.845	18.433	20.666	27.252
1993	89.609	24.635	18.525	19.754	26.696
1994	93.311	24.426	18.618	21.607	28.660
1995	93.552	24.220	18.711	21.390	29.231
1996	92.281	24.016	18.804	19.855	29.606
1997	95.127	23.814	18.898	21.774	30.641
1998	95.724	23.613	18.993	21.920	31.198
1999	94.277	23.415	19.088	20.490	31.284
2000	92.947	23.219	19.183	19.432	31.113
2001	91.282	23.025	19.279	18.307	30.671
2002	92.885	22.833	19.376	18.834	31.844
2003	91.868	22.642	19.472	18.006	31.746
2004	91.578	22.454	19.570	17.469	32.085
2005	91.265	22.267	19.668	16.981	32.349
2006	91.444	22.083	19.766	16.630	32.965
2007	92.000	21.900	19.865	16.117	34.119
2008	94.634	21.719	19.964	16.933	36.018
2009	94.168	21.540	20.064	16.380	36.185
2010	93.745	21.362	20.164	15.750	36.468

SOURCE: ISER MAP MODEL SIMULATION AHFC.B, CREATED AUGUST 1987.

TOTAL (EMG9).
MILITARY (EMGM) IS ACTIVE DUTY.
FEDERAL CIVILIAN (EMGC).
STATE (EMGS).
LOCAL (EMGL).

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC BASE
TABLE 5.
POPULATION CHANGE
(THOUSANDS)

		COMPONENTS OF CHANGE			
	TOTAL POPULATION	TOTAL ANNUAL CHANGE	NATURAL INCREASE	NON-MILITARY MIGRATION	MILITARY MIGRATION
1985	539.963	16.915	10.203	5.377	0.623
1986	535.654	-4.309	10.149	-14.850	0.391
1987	529.318	-6.336	9.542	-14.861	-1.058
1988	523.571	-5.747	9.084	-16.058	1.185
1989	524.658	1.087	8.654	-8.957	1.346
1990	527.605	2.947	8.412	-3.950	-1.548
1991	531.828	4.223	8.326	-2.594	-1.534
1992	534.612	2.784	8.285	-4.009	-1.521
1993	537.770	3.158	8.211	-3.573	-1.507
1994	547.310	9.540	8.161	2.842	-1.494
1995	551.864	4.554	8.300	-2.283	-1.481
1996	554.932	3.068	8.278	-3.774	-1.467
1997	563.507	8.575	8.229	1.767	-1.454
1998	572.660	9.153	8.346	2.224	-1.441
1999	580.606	7.946	8.463	0.886	-1.429
2000	587.973	7.367	8.540	0.214	-1.416
2001	593.792	5.820	8.600	-1.411	-1.404
2002	603.983	10.190	8.618	2.930	-1.391
2003	611.801	7.818	8.766	0.403	-1.379
2004	620.032	8.231	8.833	0.731	-1.367
2005	635.828	15.796	8.916	8.202	-1.355
2006	652.227	16.399	9.211	8.509	-1.343
2007	661.881	9.654	9.492	1.472	-1.331
2008	676.612	14.731	9.568	6.450	-1.319
2009	691.124	14.512	9.801	5.994	-1.308
2010	705.805	14.681	10.010	5.941	-1.296

SOURCE: ISER MAP MODEL SIMULATION AHFC.B, CREATED AUGUST 1987.

NOTE: POPULATION IS EQUAL TO POPULATION IN PRIOR YEAR
PLUS MIGRATION AND NATURAL INCREASE. THE SUM OF COMPONENTS
DOES NOT EQUAL THE TOTAL DUE TO ROUNDING IN THE
ALLOCATION OF MIGRANTS TO INDIVIDUAL COHORTS.

POPULATION (POP) IS JULY 1, CENSUS DEFINITION.
ANNUAL CHANGE IN POPULATION (DELPOP) IS YEAR TO YEAR JULY 1 CHANGE.
NATURAL INCREASE (POPNI9) INCLUDES CIVILIAN AND MILITARY.
NON- MILITARY MIGRATION (POPMIG).
MILITARY MIGRATION (POPMIGM) INCLUDES ACTIVE DUTY MILITARY
PLUS DEPENDENTS.

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC BASE
TABLE 6.
POPULATION COMPONENTS
(THOUSANDS)

	TOTAL	CIVILIAN NON-NATIVE	NATIVE	MILITARY
1985	539.963	419.416	73.639	46.908
1986	535.654	411.839	75.507	48.309
1987	529.318	403.677	77.381	48.260
1988	523.571	393.810	79.261	50.501
1989	524.658	390.558	81.147	52.954
1990	527.605	392.062	83.040	52.504
1991	531.828	394.829	84.942	52.058
1992	534.612	396.141	86.855	51.616
1993	537.770	397.808	88.784	51.179
1994	547.310	405.834	90.730	50.746
1995	551.864	408.850	92.697	50.317
1996	554.932	410.350	94.689	49.893
1997	563.507	417.326	96.708	49.473
1998	572.660	424.845	98.758	49.057
1999	580.606	431.121	100.840	48.646
2000	587.973	436.778	102.957	48.238
2001	593.792	440.846	105.111	47.835
2002	603.983	449.244	107.304	47.435
2003	611.801	455.225	109.536	47.040
2004	620.032	461.575	111.810	46.648
2005	635.828	475.443	114.125	46.261
2006	652.227	489.868	116.482	45.877
2007	661.881	497.500	118.883	45.497
2008	676.612	510.164	121.328	45.121
2009	691.124	522.559	123.816	44.749
2010	705.805	535.075	126.350	44.380

SOURCE: ISER MAP MODEL SIMULATION AHFC.B, CREATED AUGUST 1987.

POPULATION (POP) IS JULY 1, CENSUS DEFINITION.
CIVILIAN NON-NATIVE (CNNTOT).
NATIVE (NATTOT) CIVILIAN.
MILITARY (MILTOT) IS ACTIVE DUTY PLUS DEPENDENTS.

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC BASE
TABLE 7.
STATE UNRESTRICTED GENERAL FUND
(MILLION 1986 DOLLARS)

	EXPENDI-TURES	REVENUES			
		TOTAL	PETROLEUM	ENDOGENOUS	INVESTMENT EARNINGS
1985	3903.539	3300.278	2811.646	250.547	238.083
1986	3200.410	2607.973	2249.371	250.592	108.011
1987	2606.484	2073.724	1210.965	245.595	617.164
1988	2186.451	1894.016	1438.986	235.609	219.422
1989	2220.214	2109.911	1668.635	228.671	212.605
1990	2207.873	2084.385	1649.732	227.526	207.127
1991	2287.594	2206.075	1636.297	368.482	201.297
1992	2260.021	2208.300	1535.826	480.064	192.411
1993	2169.742	2115.373	1421.977	488.730	204.667
1994	2396.309	2388.033	1680.143	498.694	209.198
1995	2418.207	2388.644	1604.297	503.740	280.608
1996	2255.691	2212.407	1431.846	502.204	278.357
1997	2502.240	2527.889	1720.331	508.238	299.319
1998	2599.986	2612.219	1583.542	519.821	508.855
1999	2484.453	2478.909	1435.943	531.310	511.658
2000	2378.027	2363.513	1309.530	540.546	513.438
2001	2265.634	2256.633	1195.308	546.973	514.352
2002	2380.418	2401.225	1107.500	555.594	738.130
2003	2330.508	2332.095	1034.079	565.701	732.315
2004	2296.388	2291.211	991.473	573.757	725.982
2005	2267.878	2269.361	958.576	591.383	719.402
2006	2255.497	2262.129	931.719	617.202	713.207
2007	2217.743	2222.630	886.793	629.512	706.325
2008	2374.451	2394.710	846.419	634.692	913.599
2009	2341.539	2344.060	807.823	647.440	888.796
2010	2293.464	2295.255	770.869	661.154	863.231

SOURCE: ISER MAP MODEL SIMULATION AHFC.B, CREATED AUGUST 1987.

EXPENDITURES (DF.EXGFB) IS UNRESTRICTED GENERAL FUND EXPENDITURES.
TOTAL REVENUES (DF.RSGFB).
PETROLEUM REVENUES (DF.RP95G) EXCLUDES PERMANENT FUND CONTRIBUTION.
ENDOGENOUS REVENUES (DF.RSENG) IS TOTAL NET OF PETROLEUM AND INVESTMENT EARNINGS.
INVESTMENT EARNINGS (DF.RSIN) IS EARNINGS FROM ALL SOURCES DEPOSITED IN THE GENERAL FUND.

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC BASE
TABLE B.
STATE GOVERNMENT MISCELLANEOUS VARIABLES
(MILLION 1986 DOLLARS)

	GENERAL FUND APPROPRIATIONS				PERMANENT FUND	PERMANENT FUND	PERSONAL INCOME TAX
	TOTAL	OPERATING	CAPITAL	DEBT SERVICE	DIVIDEND	BALANCE	
1985	3279.325	2295.079	824.981	159.266	210.624	6631.855	0.000
1986	3115.421	2308.209	652.082	155.131	266.976	7200.707	0.000
1987	2528.572	1965.826	412.647	150.099	312.422	7928.242	0.000
1988	2127.893	1743.123	246.520	138.250	312.434	7985.832	0.000
1989	2282.104	1836.529	324.093	121.482	309.756	8108.129	0.000
1990	2210.799	1790.716	316.009	104.074	300.635	8292.332	0.000
1991	2308.813	1894.628	334.346	79.839	293.077	8498.727	140.190
1992	2275.593	1888.712	333.302	53.580	271.401	8438.848	257.263
1993	2166.221	1778.544	313.861	73.818	280.906	8616.234	264.653
1994	2430.222	1976.702	348.830	104.690	291.092	8830.430	273.220
1995	2425.913	1953.587	344.750	127.575	0.000	9256.480	275.517
1996	2246.582	1795.292	316.816	134.473	0.000	9655.640	274.440
1997	2544.211	2054.710	362.596	126.905	0.000	10107.340	280.168
1998	2620.009	2125.120	375.021	119.870	0.000	10340.410	289.194
1999	2482.633	2015.516	355.679	111.441	0.000	10562.300	297.277
2000	2378.905	1932.719	341.068	105.122	0.000	10765.650	303.681
2001	2263.982	1833.054	323.480	107.451	0.000	10949.660	308.319
2002	2404.736	1948.432	343.841	112.465	0.000	10898.790	315.222
2003	2333.772	1888.189	333.210	112.375	0.000	10845.690	322.382
2004	2303.362	1860.691	328.357	114.315	0.000	10784.740	327.753
2005	2275.169	1837.723	324.304	113.142	0.000	10720.850	342.540
2006	2264.904	1833.039	323.478	108.390	0.000	10650.950	361.698
2007	2223.957	1802.121	318.021	103.816	0.000	10577.410	367.558
2008	2404.818	1968.396	347.364	89.058	0.000	10285.300	370.834
2009	2348.891	1941.229	342.570	65.093	0.000	9999.620	379.718
2010	2297.565	1888.969	333.347	75.250	0.000	9719.400	388.835

SOURCE: ISER MAP MODEL SIMULATION AHFC.B, CREATED AUGUST 1987.

TOTAL (DF.APGF).
OPERATING (DF.APGFO).
CAPITAL (DF.APGFC).
DEBT SERVICE (DF.EXDSS) INCLUDES ONLY GENERAL OBLIGATION DEBT OF STATE.
PERMANENT FUND DIVIDEND (DF.EXTRN).
PERMANENT FUND BALANCE (DF.BALPF).
PERSONAL INCOME TAX (DF.RTIS).

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC BASE
TABLE 9.
COMPONENTS OF REAL PERSONAL INCOME
(MILLION 1986 DOLLARS)

	WAGE AND SALARY PAYMENTS	NET EARNINGS	RESIDENCE ADJUSTMENT	DIVIDENDS, INTEREST, RENT	TRANSFERS	PERSONAL INCOME	DISPOSABLE PERSONAL INCOME
1985	7242.887	8076.711	599.043	858.745	1078.622	9618.600	8147.848
1986	6775.402	7516.152	513.270	909.403	1167.064	9272.130	7859.898
1987	6426.594	7139.238	484.186	935.542	1284.319	9059.820	7683.488
1988	6172.824	6872.285	461.725	909.618	1335.788	8833.363	7491.715
1989	6245.453	6956.602	465.119	884.344	1383.487	8936.207	7576.473
1990	6372.539	7099.465	474.665	870.457	1431.074	9104.080	7715.363
1991	6499.691	7244.270	484.218	865.688	1480.471	9284.730	7683.645
1992	6579.316	7334.254	492.727	848.540	1475.132	9341.840	7725.754
1993	6701.867	7465.559	502.846	862.948	1541.192	9543.710	7889.875
1994	6998.613	7794.723	526.427	883.520	1610.008	9942.040	8214.734
1995	7092.672	7895.676	534.373	897.904	1378.187	9817.030	8097.863
1996	7133.922	7938.844	538.254	915.672	1438.631	9932.960	8191.758
1997	7400.953	8231.008	559.596	933.795	1501.465	10286.910	8480.219
1998	7657.359	8511.035	580.785	955.377	1566.184	10633.810	8762.613
1999	7860.180	8729.891	601.739	975.586	1632.403	10918.810	8994.172
2000	8026.738	8910.074	610.171	1003.307	1700.146	11185.960	9212.190
2001	8143.199	9033.920	619.900	1032.552	1769.060	11397.290	9384.720
2002	8430.070	9347.920	642.839	1063.027	1839.979	11791.170	9705.630
2003	8596.582	9528.210	657.099	1091.957	1911.911	12057.560	9922.930
2004	8783.008	9730.750	672.301	1120.967	1985.006	12346.640	10159.030
2005	9366.650	10362.880	735.214	1158.915	2060.772	13034.100	10714.730
2006	9841.120	10883.050	781.694	1204.185	2138.195	13633.100	11201.010
2007	9858.240	10910.540	757.388	1244.096	2215.619	13799.120	11340.480
2008	10183.720	11272.160	784.762	1287.628	2294.975	14256.570	11714.370
2009	10502.970	11623.530	809.087	1334.048	2375.777	14710.790	12084.760
2010	10831.000	11984.160	835.418	1376.736	2457.841	15169.580	12459.120

SOURCE: ISER MAP MODEL SIMULATION AHFC.B, CREATED AUGUST 1987.

WAGE AND SALARY PAYMENTS (DF.PIWS) IN NONAGRICULTURAL
WAGE AND SALARY JOB CATEGORIES PLUS MILITARY.
NET EARNINGS (DF.PINE) IS NET LABOR AND PROPRIETORS' INCOME
BY PLACE OF WORK.
RESIDENCE ADJUSTMENT (DF.PIRAD).
DIVIDENDS, INTEREST, AND RENT (DF.PIDIR).
TRANSFERS (DF.PITRAN).
PERSONAL INCOME (DF.PIB).
DISPOSABLE PERSONAL INCOME (DF.DPIB)

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC BASE
TABLE 10.
PRICE INDEXES

	ANCHORAGE CPI-W	ALASKA/US PRICE LEVEL
1985	274.906	1.230
1986	280.274	1.235
1987	282.838	1.210
1988	295.849	1.210
1989	309.458	1.210
1990	321.628	1.202
1991	334.295	1.195
1992	359.323	1.228
1993	375.563	1.220
1994	392.414	1.211
1995	410.148	1.204
1996	428.702	1.196
1997	448.783	1.188
1998	469.742	1.180
1999	491.692	1.171
2000	514.652	1.163
2001	538.701	1.155
2002	563.759	1.147
2003	589.999	1.139
2004	617.449	1.131
2005	645.905	1.122
2006	675.622	1.114
2007	706.945	1.106
2008	739.589	1.098
2009	773.652	1.089
2010	809.271	1.081

SOURCE: ISER MAP MODEL SIMULATION AHFC.B, CREATED AUGUST 1987.

ANCHORAGE CPI (PDANCPI) CONSUMER PRICE INDEX FOR URBAN WAGE EARNERS.
ALASKA/US PRICE LEVEL (PDRATIO) IS THE RATIO OF US AND
ANCHORAGE CONSUMER PRICE INDEX LEVELS.

ISER MAP REGIONAL MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC BASE
TABLE 11.
POPULATION BY LABOR MARKET AREA
(THOUSANDS)

	ANCH/MATSU	SOUTHEAST	INTERIOR	NORTH	GULF COAST	SOUTHWEST	TOTAL
1985	272.156	64.227	88.327	19.102	61.302	34.851	539.962
1986	265.547	65.002	88.673	18.218	62.581	35.633	535.654
1987	259.760	64.957	87.737	18.483	62.666	35.717	529.318
1988	254.743	64.898	88.482	18.429	61.701	35.319	523.571
1989	253.076	65.207	92.028	17.756	61.512	35.080	524.659
1990	254.845	65.822	91.798	18.921	61.574	34.647	527.604
1991	255.069	69.366	91.725	19.165	61.638	34.867	531.828
1992	255.800	69.482	93.518	19.202	61.669	34.942	534.612
1993	259.719	68.687	94.013	19.102	61.352	34.899	537.769
1994	263.600	70.407	95.033	19.864	62.858	35.550	547.310
1995	265.481	70.908	95.354	20.116	64.023	35.984	551.864
1996	267.302	71.555	95.445	20.150	64.350	36.132	554.931
1997	271.381	72.723	96.569	20.721	65.257	36.857	563.507
1998	276.773	73.493	97.528	21.091	66.107	37.670	572.661
1999	281.655	72.943	97.814	21.010	66.622	38.227	578.270
2000	287.041	73.731	98.859	21.185	67.560	38.878	587.252
2001	292.339	74.513	99.975	21.324	68.407	38.767	595.323
2002	297.739	75.287	101.008	21.660	69.257	39.267	604.215
2003	303.175	75.776	101.972	21.668	70.046	39.312	611.947
2004	308.915	76.053	103.083	21.740	70.912	39.526	620.228
2005	317.369	75.958	102.967	21.721	71.557	46.458	636.029
2006	328.381	76.713	105.158	23.480	72.878	45.765	652.373
2007	335.079	78.618	107.404	23.137	74.333	43.435	662.004
2008	343.145	80.782	109.721	23.619	75.888	43.552	676.706
2009	352.810	81.794	111.545	23.836	77.215	43.986	691.184
2010	362.640	82.820	113.453	24.046	78.567	44.315	705.838

SOURCE: ISER MAP MODEL SIMULATION AHFC.R.B, CREATED AUGUST 1987.

NOTE:OFFICIAL STATE OF ALASKA AND CENSUS AREA GOVERNMENT POPULATION ESTIMATES MAY NOT BE EQUAL.

ANCH/MATSU (PL.ANCMS).
SOUTHEAST (PL.SEAST).
INTERIOR (PL.INTER).
NORTH (PL.NORTH).
GULF COAST (PL.GULF).
SOUTHWEST (PL.SWEST).
TOTAL (P.ST)

ISER MAP REGIONAL MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC BASE
TABLE 12.
TOTAL EMPLOYMENT BY LABOR MARKET AREA
(THOUSANDS)

	ANCH/MATSU	SOUTHEAST	INTERIOR	NORTH	GULF COAST	SOUTHWEST	TOTAL
1985	140.010	33.954	41.978	14.633	25.577	16.209	272.360
1986	134.037	33.572	41.559	12.447	25.687	16.271	263.571
1987	128.515	32.880	40.333	12.013	25.242	16.039	255.022
1988	125.120	32.585	40.497	11.575	24.690	15.784	250.252
1989	125.279	33.026	42.633	11.535	24.801	15.804	253.078
1990	127.462	33.695	42.994	12.145	25.056	15.811	257.162
1991	128.708	35.858	43.324	12.440	25.331	16.030	261.691
1992	129.261	36.001	44.335	12.582	25.404	16.122	263.704
1993	131.326	35.617	44.631	12.661	25.308	16.165	265.706
1994	135.217	37.068	45.763	13.228	26.275	16.636	274.187
1995	135.711	37.231	45.768	13.378	26.650	16.811	275.549
1996	135.764	37.349	45.533	13.401	26.626	16.827	275.500
1997	138.824	38.259	46.398	13.826	27.216	17.247	281.768
1998	141.984	38.817	47.003	14.278	27.648	17.770	287.499
1999	143.321	38.263	46.794	14.516	27.625	18.130	288.647
2000	146.499	38.791	47.473	14.587	28.104	18.525	293.977
2001	149.119	39.154	48.017	14.493	28.437	18.358	297.577
2002	151.696	39.540	48.474	14.766	28.751	18.596	301.822
2003	153.979	39.650	48.832	14.587	28.977	18.529	304.554
2004	156.646	39.714	49.337	14.461	29.279	18.577	308.011
2005	161.946	40.039	49.706	14.823	29.593	23.274	319.380
2006	167.459	40.666	50.535	17.934	30.116	22.921	329.629
2007	170.430	41.350	51.620	16.251	30.687	21.021	331.357
2008	175.099	42.582	52.949	16.161	31.445	20.890	339.123
2009	179.728	43.041	53.793	16.253	31.919	21.063	345.795
2010	184.386	43.503	54.670	16.349	32.400	21.166	352.472

SOURCE: ISER MAP MODEL SIMULATION AHFC.R.8, CREATED AUGUST 1987.

ANCH/MATSU (ML.ANCMS).
SOUTHEAST (ML.SEAST).
INTERIOR (ML.INTER).
NORTH (ML.NORTH)
GULF COAST (ML.GULF).
SOUTHWEST (ML.SWEST).
TOTAL (M.ST).

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC HIGH
TABLE 1.
SUMMARY

	POPULATION (000)	HOUSEHOLDS (000)	TOTAL EMPLOYMENT (000)	WAGE AND SALARY EMPLOYMENT (000)	PERSONAL INCOME (MILLION 1986 $)	PETROLEUM REVENUES (MILLION 1986 $)
1985	539.963	183.149	272.146	226.929	9618.600	3175.935
1986	535.654	182.335	263.366	218.182	9272.130	2547.350
1987	529.318	180.944	254.825	210.342	9059.820	1358.306
1988	526.789	180.606	253.480	208.013	8891.840	2153.363
1989	533.256	183.320	261.421	214.091	9107.500	2572.932
1990	542.019	187.103	269.958	222.079	9411.580	2558.485
1991	551.507	191.128	277.529	229.168	9679.180	2562.257
1992	558.558	194.307	281.089	232.575	9941.160	2556.920
1993	562.568	196.425	281.294	232.905	10128.800	2428.129
1994	575.542	201.594	291.595	242.454	10612.200	3140.116
1995	584.981	205.550	296.137	246.726	10940.980	3051.522
1996	592.674	208.896	298.655	249.180	11212.520	2779.018
1997	609.029	215.189	310.730	260.330	11782.850	3527.187
1998	626.959	222.029	322.152	270.850	12428.000	3281.153
1999	643.308	228.339	330.789	278.803	12953.910	3029.897
2000	653.561	232.575	332.521	280.524	13150.430	2791.419
2001	668.097	238.260	339.710	287.242	13588.560	2557.957
2002	682.962	244.061	346.718	293.788	14033.160	2377.618
2003	701.350	251.065	357.365	303.620	14623.690	2268.199
2004	717.636	257.370	364.868	310.596	15102.870	2163.265
2005	725.244	260.734	362.965	309.062	15068.120	1986.740
2006	736.098	265.181	366.533	312.472	15433.860	1897.679
2007	754.098	272.046	378.178	323.173	16080.220	1812.932
2008	768.716	277.783	384.706	329.242	16537.260	1732.008
2009	776.918	281.353	384.318	329.071	16759.380	1654.382
2010	787.285	285.638	387.478	332.097	17110.290	1580.551

SOURCE: ISER MAP MODEL SIMULATION AHFC.H, CREATED AUGUST 1987.

POPULATION (POP) IS JULY 1, CENSUS DEFINITION.
HOUSEHOLDS (HH) IS JULY 1, CENSUS DEFINITION.
TOTAL EMPLOYMENT (EM99) INCLUDES ACTIVE DUTY MILITARY AND PROPRIETORS--
PRE 1985 PROPRIETOR DEFINITION.
WAGE AND SALARY EMPLOYMENT (EM97) IS ALASKA
DEPARTMENT OF LABOR DEFINITION.
PERSONAL INCOME (DF.PIB) IS US BEA DEFINITION.
PETROLEUM REVENUES (DF.RP9S) INCLUDES PERMANENT FUND CONTRIBUTION.

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC HIGH
TABLE 2.
EMPLOYMENT BY SECTOR
(THOUSANDS)

	TOTAL EMPLOYMENT	BASIC EMPLOYMENT	INFRA-STRUCTURE EMPLOYMENT	SERVICES EMPLOYMENT	GOVERNMENT EMPLOYMENT
1985	272.146	76.888	40.964	104.290	50.004
1986	263.366	77.785	35.690	101.027	48.864
1987	254.825	78.543	31.196	97.975	47.110
1988	253.480	81.048	29.542	95.503	47.387
1989	261.421	82.783	30.408	96.310	51.920
1990	269.958	83.949	36.207	98.820	50.982
1991	277.529	85.863	38.728	101.663	51.275
1992	281.089	86.885	39.869	104.367	49.969
1993	281.294	86.816	40.321	106.431	47.726
1994	291.595	87.155	39.936	110.634	53.870
1995	296.137	88.073	40.741	114.498	52.825
1996	298.655	88.555	42.050	117.590	50.460
1997	310.730	88.799	42.304	122.877	56.751
1998	322.152	93.870	43.813	129.593	54.876
1999	330.789	96.584	45.491	135.679	53.035
2000	332.521	94.369	45.541	139.271	53.340
2001	339.710	93.949	45.603	143.773	56.384
2002	346.718	95.234	46.318	148.958	56.207
2003	357.365	98.409	47.121	155.058	56.777
2004	364.868	98.521	47.168	158.933	60.246
2005	362.965	97.029	47.281	160.383	58.273
2006	366.533	97.119	48.369	163.324	57.722
2007	378.178	98.393	49.896	169.203	60.688
2008	384.706	98.506	51.359	174.416	60.425
2009	384.318	95.124	52.350	176.922	59.923
2010	387.478	95.329	52.947	180.308	58.894

SOURCE: ISER MAP MODEL SIMULATION AHFC.H, CREATED AUGUST 1987.

TOTAL EMPLOYMENT (EM99).
BASIC EMPLOYMENT (EM9BASE) CONSISTS OF EXOGENOUS COMPONENTS OF CONSTRUCTION, MANUFACTURING, AND TRANSPORTATION; MINING (PETROLEUM); TOURISM, FEDERAL GOVERNMENT, AND AGRICULTURE, FORESTRY, AND FISH HARVESTING.
INFRASTRUCTURE EMPLOYMENT (EM9INFR) CONSISTS OF TRANSPORTATION, COMMUNICATIONS, PUBLIC UTILITIES, ENDOGENOUS CONSTRUCTION, AND BUSINESS SERVICES, NET OF EXOGENOUS AND TOURISM-RELATED TRANSPORTATION.
SUPPORT EMPLOYMENT (EM9SUPRT) CONSISTS OF TRADE, FINANCE, SERVICES, LOCAL MANUFACTURING, AND PROPRIETORS NOT ENGAGED IN FISH HARVESTING, NET OF TRADE AND SERVICE TOURISM EMPLOYMENT AND BUSINESS SERVICES.
GOVERNMENT EMPLOYMENT (EMGA) CONSISTS OF STATE AND LOCAL GOVERNMENT EMPLOYMENT.

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC HIGH
TABLE 3.
PRIVATE EMPLOYMENT
(THOUSANDS)

	TOTAL PRIVATE	AGRI-CULTURE, FORESTRY, FISHERIES	MINING	CONSTRUC-TION	MANU-FACTURING	TRANS-PORTATION, COMMUNI-CATIONS, PUBLIC UTILITIES	SUPPORT
1985	181.963	9.330	9.472	18.810	11.844	18.724	113.783
1986	173.248	9.532	9.125	12.300	12.620	18.455	111.216
1987	166.235	9.560	8.913	8.513	12.782	18.229	108.238
1988	163.534	9.577	9.207	8.123	12.959	17.998	105.670
1989	165.762	9.612	9.398	8.948	13.203	18.129	106.471
1990	175.454	9.675	9.977	14.640	13.539	18.441	109.181
1991	182.855	9.741	10.414	17.583	13.878	18.873	112.366
1992	187.842	9.812	11.042	17.965	14.153	19.395	115.475
1993	190.409	9.888	11.669	16.907	14.227	19.732	117.986
1994	194.681	9.972	11.858	15.751	14.367	20.198	122.535
1995	200.381	10.064	12.385	15.665	14.493	20.825	126.949
1996	205.375	10.117	12.382	16.518	14.629	21.171	130.558
1997	211.268	10.184	12.507	15.701	14.847	21.750	136.279
1998	224.669	10.268	16.196	16.371	15.118	23.112	143.605
1999	235.251	10.374	17.954	17.062	15.417	24.074	150.370
2000	236.779	10.429	15.421	16.304	15.679	24.253	154.692
2001	241.022	10.429	14.749	15.615	15.722	24.768	159.740
2002	248.303	10.429	14.873	16.321	15.773	25.389	165.517
2003	258.472	10.429	14.901	19.053	15.846	26.086	172.159
2004	262.598	10.429	14.849	18.280	15.839	26.475	176.727
2005	262.757	10.429	14.868	15.835	15.873	26.844	178.909
2006	266.963	10.429	14.874	16.243	15.902	27.256	182.260
2007	275.726	10.429	14.872	17.871	16.024	27.971	188.560
2008	282.597	10.429	14.869	18.284	16.068	28.560	194.388
2009	282.792	10.429	14.877	14.935	16.124	28.932	197.495
2010	287.057	10.429	14.863	14.861	16.152	29.372	201.381

SOURCE: ISER MAP MODEL SIMULATION AHFC.H, CREATED AUGUST 1987.

PRIVATE (EMPVT) IS ALL NON-GOVERNMENT.
AGRICULTURE, FORESTRY, FISHERIES (EMAFF).
MINING (EMP9) IS TOTAL MINING, INCLUDING OIL AND GAS.
CONSTRUCTION (EMCN).
MANUFACTURING (EMM9).
TRANSPORTATION, COMMUNICATIONS, PUBLIC UTILITIES (EMTCU).
SUPPORT (EMSUP) INCLUDES TRADE, FINANCE, SERVICE, AND
PROPRIETORS NOT INVOLVED IN FISH HARVESTING.

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC HIGH
TABLE 4.
GOVERNMENT EMPLOYMENT
(THOUSANDS)

	TOTAL	MILITARY	FEDERAL CIVILIAN	STATE	LOCAL
1985	90.183	22.579	17.600	20.904	29.100
1986	90.117	23.253	18.000	19.911	28.953
1987	88.590	23.230	18.250	19.007	28.104
1988	89.946	24.308	18.250	20.717	26.670
1989	95.660	25.489	18.250	23.039	28.882
1990	94.504	25.272	18.250	22.261	28.721
1991	94.674	25.058	18.341	21.924	29.351
1992	93.247	24.845	18.433	20.964	29.005
1993	90.885	24.635	18.525	19.592	28.134
1994	96.914	24.426	18.618	23.158	30.712
1995	95.756	24.220	18.711	22.142	30.683
1996	93.280	24.016	18.804	20.050	30.410
1997	99.462	23.814	18.898	23.488	33.262
1998	97.482	23.613	18.993	21.733	33.144
1999	95.538	23.415	19.088	19.898	33.137
2000	95.742	23.219	19.183	19.311	34.029
2001	98.688	23.025	19.279	20.452	35.932
2002	98.415	22.833	19.376	19.941	36.266
2003	98.892	22.642	19.472	19.706	37.071
2004	102.270	22.454	19.570	21.185	39.061
2005	100.208	22.267	19.668	19.670	38.603
2006	99.570	22.083	19.766	18.938	38.783
2007	102.452	21.900	19.865	19.892	40.795
2008	102.108	21.719	19.964	19.120	41.305
2009	101.526	21.540	20.064	18.264	41.659
2010	100.420	21.362	20.164	17.349	41.545

SOURCE: ISER MAP MODEL SIMULATION AHFC.H, CREATED AUGUST 1987.

TOTAL (EMG9).
MILITARY (EMGM) IS ACTIVE DUTY.
FEDERAL CIVILIAN (EMGC).
STATE (EMGS) INCLUDES UNIVERSITY OF ALASKA.
LOCAL (EMGL).

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC HIGH
TABLE 5.
POPULATION CHANGE
(THOUSANDS)

	TOTAL POPULATION	TOTAL ANNUAL CHANGE	COMPONENTS OF CHANGE: NATURAL INCREASE	NON-MILITARY MIGRATION	MILITARY MIGRATION
1985	539.963	16.915	10.203	5.377	0.623
1986	535.654	-4.309	10.149	-14.850	0.391
1987	529.318	-6.336	9.542	-14.861	-1.058
1988	526.789	-2.529	9.084	-12.842	1.185
1989	533.256	6.467	8.745	-3.662	1.346
1990	542.019	8.763	8.642	1.646	-1.548
1991	551.507	9.488	8.693	2.311	-1.534
1992	558.558	7.051	8.762	-0.208	-1.521
1993	562.568	4.010	8.765	-3.271	-1.507
1994	575.542	12.974	8.694	5.746	-1.494
1995	584.981	9.438	8.894	2.011	-1.481
1996	592.674	7.694	8.971	0.167	-1.467
1997	609.029	16.355	9.004	8.780	-1.454
1998	626.959	17.930	9.290	10.069	-1.441
1999	643.308	16.348	9.589	8.172	-1.429
2000	653.561	10.254	9.824	1.829	-1.416
2001	668.097	14.535	9.880	6.031	-1.404
2002	682.962	14.866	10.074	6.163	-1.391
2003	701.350	18.388	10.265	9.478	-1.379
2004	717.636	16.286	10.550	7.090	-1.367
2005	725.244	7.609	10.758	-1.817	-1.355
2006	736.098	10.854	10.720	1.439	-1.343
2007	754.098	18.000	10.804	8.494	-1.331
2008	768.716	14.618	11.089	4.825	-1.319
2009	776.918	8.202	11.256	-1.779	-1.308
2010	787.285	10.367	11.245	0.374	-1.296

SOURCE: ISER MAP MODEL SIMULATION AHFC.H, CREATED AUGUST 1987.

NOTE: POPULATION IS EQUAL TO POPULATION IN PRIOR YEAR PLUS MIGRATION AND NATURAL INCREASE. THE SUM OF COMPONENTS DOES NOT EQUAL THE TOTAL DUE TO ROUNDING IN THE ALLOCATION OF MIGRANTS TO INDIVIDUAL COHORTS.

POPULATION (POP) IS JULY 1, CENSUS DEFINITION.
ANNUAL CHANGE IN POPULATION (DELPOP) IS YEAR TO YEAR JULY 1 CHANGE.
NATURAL INCREASE (POPNI9) INCLUDES CIVILIAN AND MILITARY.
NON- MILITARY MIGRATION (POPMI6).
MILITARY MIGRATION (POPMIGM) INCLUDES ACTIVE DUTY MILITARY PLUS DEPENDENTS.

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC HIGH
TABLE 6.
POPULATION COMPONENTS
(THOUSANDS)

	TOTAL	CIVILIAN NON-NATIVE	NATIVE	MILITARY
1985	539.963	419.416	73.639	46.908
1986	535.654	411.839	75.507	48.309
1987	529.318	403.677	77.381	48.260
1988	526.789	397.028	79.261	50.501
1989	533.256	399.155	81.147	52.954
1990	542.019	406.476	83.040	52.504
1991	551.507	414.508	84.942	52.058
1992	558.558	420.087	86.855	51.616
1993	562.568	422.606	88.784	51.179
1994	575.542	434.067	90.730	50.746
1995	584.981	441.966	92.697	50.317
1996	592.674	448.093	94.689	49.893
1997	609.029	462.848	96.708	49.473
1998	626.959	479.145	98.758	49.057
1999	643.308	493.822	100.840	48.646
2000	653.561	502.366	102.957	48.238
2001	668.097	515.151	105.111	47.835
2002	682.962	528.224	107.304	47.435
2003	701.350	544.774	109.536	47.040
2004	717.636	559.178	111.810	46.648
2005	725.244	564.859	114.125	46.261
2006	736.098	573.739	116.482	45.877
2007	754.098	589.718	118.883	45.497
2008	768.716	602.268	121.328	45.121
2009	776.918	608.354	123.816	44.749
2010	787.285	616.555	126.350	44.380

SOURCE: ISER MAP MODEL SIMULATION AHFC.H, CREATED AUGUST 1987.

POPULATION (POP) IS JULY 1, CENSUS DEFINITION.
CIVILIAN NON-NATIVE (CNNTOT).
NATIVE (NATTOT) CIVILIAN.
MILITARY (MILTOT) IS ACTIVE DUTY PLUS DEPENDENTS.

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC HIGH
TABLE 7.
STATE UNRESTRICTED GENERAL FUND
(MILLION 1986 DOLLARS)

	EXPENDITURES	REVENUES			
		TOTAL	PETROLEUM	ENDOGENOUS	INVESTMENT EARNINGS
1985	3903.539	3300.278	2811.646	250.547	238.083
1986	3200.410	2607.973	2249.371	250.592	108.011
1987	2606.484	2073.724	1210.965	245.595	617.164
1988	2186.451	2267.000	1879.550	235.858	151.592
1989	2492.990	2636.546	2219.266	232.388	184.894
1990	2844.882	2625.460	2202.508	233.680	189.273
1991	2739.364	2599.736	2191.719	237.400	170.617
1992	2654.613	2567.335	2168.830	241.184	157.320
1993	2540.708	2466.998	2065.596	243.525	157.876
1994	2986.802	3102.689	2686.309	244.798	171.582
1995	3054.634	3024.296	2602.012	248.935	173.349
1996	2850.065	2781.823	2369.635	252.694	159.492
1997	3294.973	3451.938	3016.952	255.310	179.676
1998	3268.142	3245.522	2804.543	261.050	179.930
1999	3035.112	3004.960	2569.467	269.213	166.279
2000	2895.122	2787.249	2358.927	275.119	153.202
2001	2931.701	2886.112	2156.036	277.666	452.411
2002	2809.833	2716.593	1997.476	281.433	437.684
2003	2687.019	2601.711	1891.153	287.866	422.692
2004	2808.740	2729.862	1802.714	516.950	410.198
2005	2636.370	2731.194	1654.673	691.895	384.625
2006	2665.910	2668.995	1580.121	701.483	387.391
2007	2860.275	2894.672	1498.406	714.913	681.352
2008	2825.006	2821.820	1431.234	732.510	658.075
2009	2743.397	2741.474	1366.828	739.980	634.666
2010	2662.612	2660.937	1305.598	741.293	614.046

SOURCE: ISER MAP MODEL SIMULATION AHFC.H, CREATED AUGUST 1987.

EXPENDITURES (DF.EXGFB) IS UNRESTRICTED GENERAL FUND EXPENDITURES.
TOTAL REVENUES (DF.RSGFB).
PETROLEUM REVENUES (DF.RP9SG) EXCLUDES PERMANENT FUND CONTRIBUTION.
ENDOGENOUS REVENUES (DF.RSENG) IS TOTAL NET OF PETROLEUM AND INVESTMENT EARNINGS.
INVESTMENT EARNINGS (DF.RSIN) IS EARNINGS FROM ALL SOURCES DEPOSITED IN THE GENERAL FUND.

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC HIGH
TABLE B.
STATE GOVERNMENT MISCELLANEOUS VARIABLES
(MILLION 1986 DOLLARS)

	GENERAL FUND APPROPRIATIONS				PERMANENT FUND	PERMANENT FUND	PERSONAL INCOME TAX
	TOTAL	OPERATING	CAPITAL	DEBT SERVICE	DIVIDEND	BALANCE	
1985	3279.325	2295.079	824.981	159.266	210.624	6631.855	0.000
1986	3115.421	2308.209	652.082	155.131	266.976	7200.707	0.000
1987	2528.572	1965.826	412.647	150.099	312.422	7928.242	0.000
1988	2127.893	1743.123	246.520	138.250	312.704	8127.156	0.000
1989	2989.249	1920.889	946.109	122.251	313.346	8466.910	0.000
1990	2839.063	1831.978	902.317	104.770	306.804	8831.441	0.000
1991	2744.772	1779.175	876.310	89.288	303.080	9228.920	0.000
1992	2657.468	1721.005	847.659	88.806	295.716	9666.550	0.000
1993	2529.583	1614.878	795.388	119.317	312.212	10075.540	0.000
1994	3151.271	2023.105	996.455	131.710	330.206	10579.450	0.000
1995	3065.378	1968.129	969.378	127.874	349.599	11077.960	0.000
1996	2818.560	1792.763	883.003	142.795	369.949	11531.140	0.000
1997	3469.491	2219.693	1093.282	156.518	392.935	12086.000	0.000
1998	3253.914	2080.829	1024.886	148.201	412.696	12609.150	0.000
1999	3008.969	1913.400	942.421	153.151	432.893	13113.460	0.000
2000	2803.417	1886.196	769.669	147.556	452.951	13583.010	0.000
2001	2893.836	2075.802	681.594	136.443	472.965	13702.480	0.000
2002	2720.284	2068.433	523.648	128.206	488.164	13793.250	0.000
2003	2603.477	2092.419	381.297	129.761	500.014	13876.260	0.000
2004	2742.607	2341.597	270.006	131.006	508.543	13935.260	222.507
2005	2737.061	2223.740	392.425	120.897	495.023	13459.970	402.241
2006	2671.798	2172.661	383.411	115.729	497.297	13478.150	411.004
2007	2896.012	2366.228	417.570	112.216	499.136	13198.850	422.540
2008	2832.027	2318.768	409.194	104.066	498.039	12917.940	434.321
2009	2746.351	2239.930	395.282	111.140	494.111	12633.110	437.422
2010	2663.268	2146.294	378.758	138.217	487.791	12350.000	439.885

SOURCE: ISER MAP MODEL SIMULATION AHFC.H, CREATED AUGUST 1987.

TOTAL (DF.APGF).
OPERATING (DF.APGFO).
CAPITAL (DF.APGFC).
DEBT SERVICE (DF.EXDSS) INCLUDES ONLY GENERAL OBLIGATION DEBT OF STATE.
PERMANENT FUND DIVIDEND (DF.EXTRN).
PERMANENT FUND BALANCE (DF.BALPF).
PERSONAL INCOME TAX (DF.RTIS).

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC HIGH
TABLE 9.
COMPONENTS OF REAL PERSONAL INCOME
(MILLION 1986 DOLLARS)

	WAGE AND SALARY PAYMENTS	NET EARNINGS	RESIDENCE ADJUSTMENT	DIVIDENDS, INTEREST, RENT	TRANSFERS	PERSONAL INCOME	DISPOSABLE PERSONAL INCOME
1985	7242.887	8076.711	599.043	858.745	1078.622	9618.600	8147.848
1986	6775.402	7516.152	513.270	909.403	1167.064	9272.130	7859.898
1987	6426.594	7139.238	484.186	935.542	1284.319	9059.820	7683.488
1988	6238.313	6949.742	483.945	910.865	1336.380	8891.840	7540.188
1989	6390.410	7131.789	493.005	893.568	1394.929	9107.500	7719.887
1990	6634.207	7407.520	511.410	885.062	1446.996	9411.580	7973.188
1991	6822.313	7624.973	526.094	892.225	1502.752	9679.180	8195.832
1992	7013.840	7830.777	545.794	913.250	1555.777	9941.160	8413.480
1993	7103.184	7922.516	549.120	935.304	1633.514	10128.800	8570.008
1994	7459.895	8319.430	577.646	964.131	1715.401	10612.200	8974.301
1995	7670.141	8548.813	594.883	994.447	1800.350	10940.980	9248.880
1996	7824.680	8714.973	608.393	1025.552	1887.897	11212.520	9475.590
1997	8244.277	9183.660	641.885	1062.789	1981.389	11782.850	9952.270
1998	8751.707	9738.510	697.000	1109.479	2074.738	12428.000	10490.140
1999	9131.320	10155.660	735.265	1157.355	2170.982	12953.910	10928.570
2000	9186.540	10220.980	743.770	1201.715	2268.547	13150.430	11092.150
2001	9471.900	10538.880	772.655	1249.403	2368.978	13588.560	11457.300
2002	9807.990	10907.170	841.459	1294.853	2467.172	14033.160	11826.460
2003	10262.180	11409.770	899.284	1340.111	2564.971	14623.690	12317.540
2004	10600.580	11783.830	928.060	1376.866	2661.316	15102.870	12426.790
2005	10557.000	11738.420	894.304	1367.768	2654.303	15068.120	12396.140
2006	10791.390	11992.040	910.685	1407.740	2743.731	15433.860	12694.430
2007	11301.040	12557.090	968.501	1452.737	2835.984	16080.220	13220.040
2008	11615.310	12904.700	992.504	1495.712	2927.028	16537.260	13592.550
2009	11634.220	12925.860	920.254	1539.278	3015.880	16759.380	13778.200
2010	11859.480	13169.710	940.409	1579.740	3104.451	17110.290	14063.940

SOURCE: ISER MAP MODEL SIMULATION AHFC.H, CREATED AUGUST 1987.

WAGE AND SALARY PAYMENTS (DF.PIWS) IN NONAGRICULTURAL
WAGE AND SALARY JOB CATEGORIES PLUS MILITARY.
NET EARNINGS (DF.PINE) IS NET LABOR AND PROPRIETORS' INCOME
BY PLACE OF WORK.
RESIDENCE ADJUSTMENT (DF.PIRAD).
DIVIDENDS, INTEREST, AND RENT (DF.PIDIR).
TRANSFERS (DF.PITRAN).
PERSONAL INCOME (DF.PIB).
DISPOSABLE PERSONAL INCOME (DF.DPIB)

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC HIGH
TABLE 10.
PRICE INDEXES

	ANCHORAGE CPI-W	ALASKA/US PRICE LEVEL
1985	274.906	1.230
1986	280.274	1.235
1987	282.838	1.210
1988	295.849	1.210
1989	307.512	1.202
1990	319.493	1.194
1991	331.901	1.186
1992	344.778	1.178
1993	360.237	1.170
1994	376.269	1.162
1995	393.001	1.153
1996	410.516	1.145
1997	429.500	1.137
1998	449.252	1.128
1999	469.940	1.120
2000	491.722	1.111
2001	514.435	1.103
2002	538.133	1.095
2003	562.854	1.087
2004	588.822	1.078
2005	639.567	1.111
2006	669.283	1.103
2007	700.129	1.095
2008	732.407	1.087
2009	766.364	1.079
2010	801.782	1.071

SOURCE: ISER MAP MODEL SIMULATION AHFC.H, CREATED AUGUST 1987.

ANCHORAGE CPI (PDANCPI) CONSUMER PRICE INDEX FOR URBAN WAGE EARNERS.
ALASKA/US PRICE LEVEL (PDRATIO) IS THE RATIO OF US AND
ANCHORAGE CONSUMER PRICE INDEX LEVELS.

ISER MAP REGIONAL MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC HIGH
TABLE 11.
POPULATION BY LABOR MARKET AREA
(THOUSANDS)

	ANCH/MATSU	SOUTHEAST	INTERIOR	NORTH	GULF COAST	SOUTHWEST	TOTAL
1985	272.156	64.227	88.327	19.102	61.302	34.851	539.962
1986	265.547	65.002	88.673	18.218	62.581	35.633	535.654
1987	259.760	64.957	87.737	18.483	62.666	35.717	529.318
1988	255.964	65.317	88.974	19.259	61.885	35.392	526.789
1989	255.991	66.952	93.326	19.156	62.192	35.641	533.255
1990	262.053	67.838	94.052	20.268	62.668	35.142	542.019
1991	266.972	70.999	94.665	20.358	63.086	35.430	551.507
1992	270.710	71.027	96.866	20.575	63.445	35.936	558.559
1993	275.031	70.265	97.440	20.509	63.294	36.032	562.568
1994	279.669	73.052	99.124	21.605	65.267	36.827	575.543
1995	285.743	73.358	100.017	21.800	66.750	37.314	584.981
1996	291.616	73.986	100.769	21.630	67.418	37.257	592.674
1997	298.898	76.674	103.087	22.663	69.097	38.612	609.029
1998	309.248	76.369	103.223	22.571	70.008	45.542	626.958
1999	320.939	76.559	105.243	24.090	71.385	45.092	643.307
2000	327.327	78.120	108.024	23.844	73.097	43.151	653.562
2001	334.803	80.361	110.386	24.495	74.669	43.383	668.096
2002	343.686	81.215	113.378	24.847	76.080	43.758	682.963
2003	348.289	81.565	114.393	24.910	88.550	43.645	701.350
2004	356.353	83.644	116.744	25.824	90.293	44.780	717.635
2005	364.349	84.634	118.213	26.142	86.482	45.426	725.244
2006	371.465	85.479	119.509	26.307	87.646	45.693	736.097
2007	379.365	87.272	122.027	26.913	92.347	46.174	754.097
2008	389.051	88.339	123.847	27.150	93.834	46.498	768.716
2009	401.365	90.351	124.108	27.532	86.029	47.536	776.918
2010	408.651	90.893	125.324	27.670	87.043	47.706	787.285

SOURCE: ISER MAP MODEL SIMULATION AHFC.R.H, CREATED AUGUST 1987.

NOTE:OFFICIAL STATE OF ALASKA AND CENSUS AREA GOVERNMENT POPULATION ESTIMATES MAY NOT BE EQUAL.

ANCH/MATSU (PL.ANCMS).
SOUTHEAST (PL.SEAST).
INTERIOR (PL.INTER).
NORTH (PL.NORTH).
GULF COAST (PL.GULF).
SOUTHWEST (PL.SWEST).
TOTAL (P.ST)

ISER MAP REGIONAL MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC HIGH
TABLE 12.
TOTAL EMPLOYMENT BY LABOR MARKET AREA
(THOUSANDS)

	ANCH/MATSU	SOUTHEAST	INTERIOR	NORTH	GULF COAST	SOUTHWEST	TOTAL
1985	140.010	33.954	41.978	14.633	25.577	16.209	272.360
1986	134.037	33.572	41.559	12.447	25.687	16.271	263.571
1987	128.515	32.880	40.333	12.013	25.242	16.039	255.022
1988	126.172	33.042	40.788	12.902	24.870	15.899	253.673
1989	128.423	34.520	43.714	13.303	25.441	16.218	261.618
1990	133.507	35.525	44.777	14.108	25.973	16.273	270.163
1991	137.217	37.541	45.474	14.530	26.355	16.626	277.742
1992	138.783	37.532	46.513	15.064	26.438	16.979	281.308
1993	139.995	36.861	46.490	14.996	26.208	16.967	281.516
1994	144.518	38.915	47.995	15.579	27.431	17.394	291.829
1995	147.428	39.045	48.377	15.885	27.953	17.693	296.379
1996	149.756	39.174	48.560	15.715	28.081	17.620	298.904
1997	155.612	41.165	50.355	16.293	29.205	18.364	310.993
1998	161.291	41.204	50.640	16.668	29.498	23.135	322.434
1999	166.232	41.280	51.098	19.696	29.864	22.883	331.052
2000	168.743	41.754	52.345	18.264	30.503	21.221	332.828
2001	172.812	42.975	53.584	18.330	31.222	21.106	340.027
2002	176.998	43.384	54.989	18.682	31.734	21.263	347.049
2003	180.804	43.975	56.009	18.916	36.645	21.367	357.714
2004	184.660	45.032	57.057	19.369	37.331	21.781	365.229
2005	185.548	44.723	56.768	19.236	35.332	21.724	363.328
2006	188.232	44.942	57.145	19.235	35.621	21.732	366.906
2007	193.864	46.301	58.877	19.777	37.708	22.044	378.569
2008	198.452	46.772	59.700	19.835	38.230	22.124	385.111
2009	201.990	47.105	59.033	19.366	34.990	22.246	384.728
2010	204.573	47.153	59.354	19.386	35.216	22.218	387.898

SOURCE: ISER MAP MODEL SIMULATION AHFC.R.H, CREATED AUGUST 1987.

ANCH/MATSU (ML.ANCMS).
SOUTHEAST (ML.SEAST).
INTERIOR (ML.INTER).
NORTH (ML.NORTH)
GULF COAST (ML.GULF).
SOUTHWEST (ML.SWEST).
TOTAL (M.ST).

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC LOW
TABLE 1.
SUMMARY

	POPULATION (000)	HOUSEHOLDS (000)	TOTAL EMPLOYMENT (000)	WAGE AND SALARY EMPLOYMENT (000)	PERSONAL INCOME (MILLION 1986 $)	PETROLEUM REVENUES (MILLION 1986 $)
1985	539.963	183.149	272.146	226.929	9618.600	3175.935
1986	535.654	182.335	263.366	218.182	9272.130	2547.350
1987	529.318	180.944	254.825	210.342	9059.820	1358.306
1988	521.345	178.729	247.697	202.699	8734.711	1130.117
1989	515.876	177.316	243.759	197.864	8329.930	1306.774
1990	515.647	177.961	245.922	200.015	8424.215	1278.325
1991	516.348	178.901	248.437	202.483	8532.938	1276.810
1992	516.125	179.496	249.216	203.348	8656.227	1205.350
1993	515.208	179.822	248.945	203.242	8756.813	1041.647
1994	514.179	180.074	248.446	202.917	8856.543	948.826
1995	512.457	180.053	247.182	201.879	8926.695	868.112
1996	510.951	180.068	246.247	201.176	9012.930	717.656
1997	511.357	180.702	247.363	202.344	9164.680	676.347
1998	512.417	181.527	248.660	203.662	9322.890	606.076
1999	514.613	182.712	250.652	205.597	9504.770	543.645
2000	518.269	184.370	253.548	208.405	9719.150	482.238
2001	519.848	185.299	253.403	208.466	9923.410	439.462
2002	523.454	186.893	255.739	210.804	10150.200	395.769
2003	527.936	188.766	258.397	213.435	10389.470	355.202
2004	533.370	190.947	261.453	216.429	10638.730	336.193
2005	539.518	193.359	264.613	219.514	10897.520	318.084
2006	546.622	196.087	268.261	223.043	11177.480	304.900
2007	554.622	199.114	272.305	226.932	11474.450	291.875
2008	563.886	202.566	277.143	231.543	11803.610	279.430
2009	574.382	206.439	282.625	236.738	12162.910	267.540
2010	585.915	210.670	288.513	242.297	12543.730	256.177

SOURCE: ISER MAP MODEL SIMULATION AHFC.L, CREATED AUGUST 1987.

POPULATION (POP) IS JULY 1, CENSUS DEFINITION.
HOUSEHOLDS (HH) IS JULY 1, CENSUS DEFINITION.
TOTAL EMPLOYMENT (EM99) INCLUDES ACTIVE DUTY MILITARY AND PROPRIETORS--
PRE 1985 PROPRIETOR DEFINITION.
WAGE AND SALARY EMPLOYMENT (EM97) IS ALASKA
DEPARTMENT OF LABOR DEFINITION.
PERSONAL INCOME (DF.PIB) IS US BEA DEFINITION.
PETROLEUM REVENUES (DF.RP9S) INCLUDES PERMANENT FUND CONTRIBUTION.

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC LOW
TABLE 2.
EMPLOYMENT BY SECTOR
(THOUSANDS)

	TOTAL EMPLOYMENT	BASIC EMPLOYMENT	INFRA-STRUCTURE EMPLOYMENT	SERVICES EMPLOYMENT	GOVERNMENT EMPLOYMENT
1985	272.146	76.888	40.964	104.290	50.004
1986	263.366	77.785	35.690	101.027	48.864
1987	254.825	78.543	31.196	97.975	47.110
1988	247.697	78.454	29.402	94.136	45.706
1989	243.759	79.711	29.521	89.649	44.878
1990	245.922	80.332	31.585	88.691	45.314
1991	248.437	81.434	31.801	89.063	46.138
1992	249.216	81.446	32.673	89.611	45.486
1993	248.945	81.115	33.719	90.193	43.917
1994	248.446	81.527	33.454	91.071	42.393
1995	247.182	81.862	32.340	91.750	41.230
1996	246.247	82.290	31.933	92.472	39.552
1997	247.363	82.426	32.097	93.700	39.139
1998	248.660	82.748	32.352	95.180	38.381
1999	250.652	83.148	32.676	96.900	37.928
2000	253.548	83.515	33.085	98.995	37.953
2001	253.403	83.587	33.547	100.959	35.309
2002	255.739	83.681	34.079	103.121	34.857
2003	258.397	83.777	34.731	105.548	34.341
2004	261.453	83.733	35.281	108.146	34.293
2005	264.613	83.849	35.771	110.878	34.116
2006	268.261	83.983	36.368	113.791	34.119
2007	272.305	84.117	37.065	116.901	34.222
2008	277.143	84.258	37.886	120.313	34.687
2009	282.625	84.416	39.082	124.062	35.066
2010	288.513	84.572	40.615	128.091	35.236

SOURCE: ISER MAP MODEL SIMULATION AHFC.L, CREATED AUGUST 1987.

TOTAL EMPLOYMENT (EM99).
BASIC EMPLOYMENT (EM9BASE) CONSISTS OF EXOGENOUS COMPONENTS OF CONSTRUCTION, MANUFACTURING, AND TRANSPORTATION; MINING (PETROLEUM); TOURISM, FEDERAL GOVERNMENT, AND AGRICULTURE, FORESTRY, AND FISH HARVESTING.
INFRASTRUCTURE EMPLOYMENT (EM9INFR) CONSISTS OF TRANSPORTATION, COMMUNICATIONS, PUBLIC UTILITIES, ENDOGENOUS CONSTRUCTION, AND BUSINESS SERVICES, NET OF EXOGENOUS AND TOURISM-RELATED TRANSPORTATION.
SUPPORT EMPLOYMENT (EM9SUPRT) CONSISTS OF TRADE, FINANCE, SERVICES, LOCAL MANUFACTURING, AND PROPRIETORS NOT ENGAGED IN FISH HARVESTING, NET OF TRADE AND SERVICE TOURISM EMPLOYMENT AND BUSINESS SERVICES.
GOVERNMENT EMPLOYMENT (EMGA) CONSISTS OF STATE AND LOCAL GOVERNMENT EMPLOYMENT.

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC LOW
TABLE 3.
PRIVATE EMPLOYMENT
(THOUSANDS)

	TOTAL PRIVATE	AGRI-CULTURE, FORESTRY, FISHERIES	MINING	CONSTRUC-TION	MANU-FACTURING	TRANS-PORTATION, COMMUNI-CATIONS, PUBLIC UTILITIES	SUPPORT
1985	181.963	9.330	9.472	18.810	11.844	18.724	113.783
1986	173.248	9.532	9.125	12.300	12.620	18.455	111.216
1987	166.235	9.560	8.913	8.513	12.782	18.229	108.238
1988	159.433	9.577	7.113	7.623	12.926	17.858	104.336
1989	155.141	9.612	6.826	8.448	13.033	17.347	99.876
1990	157.086	9.675	6.860	11.036	13.330	17.337	98.847
1991	158.900	9.741	6.591	12.181	13.640	17.431	99.316
1992	160.452	9.812	6.478	12.695	13.888	17.559	100.020
1993	161.868	9.888	6.735	12.778	13.949	17.697	100.822
1994	163.009	9.972	6.888	12.185	14.020	17.930	102.013
1995	163.021	10.064	6.921	10.783	14.100	18.141	103.013
1996	163.876	10.117	6.810	10.395	14.204	18.307	104.043
1997	165.512	10.184	6.779	10.110	14.348	18.524	105.567
1998	167.674	10.268	6.678	10.054	14.530	18.765	107.379
1999	170.221	10.374	6.571	10.031	14.769	19.031	109.445
2000	173.193	10.429	6.456	10.026	15.036	19.336	111.910
2001	175.790	10.429	6.362	10.030	15.038	19.649	114.280
2002	178.673	10.429	6.287	10.130	15.045	19.965	116.817
2003	181.941	10.429	6.211	10.281	15.054	20.309	119.657
2004	185.136	10.429	5.993	10.293	15.066	20.670	122.686
2005	188.563	10.429	5.932	10.213	15.079	21.044	125.867
2006	192.293	10.429	5.886	10.215	15.096	21.437	129.230
2007	196.318	10.429	5.838	10.286	15.116	21.848	132.803
2008	200.773	10.429	5.793	10.434	15.142	22.289	136.687
2009	205.956	10.429	5.764	10.898	15.173	22.763	140.928
2010	211.751	10.429	5.729	11.645	15.209	23.264	145.475

SOURCE: ISER MAP MODEL SIMULATION AHFC.L, CREATED AUGUST 1987.

PRIVATE (EMPVT) IS ALL NON-GOVERNMENT.
AGRICULTURE, FORESTRY, FISHERIES (EMAFF).
MINING (EMP9) IS TOTAL MINING, INCLUDING OIL AND GAS.
CONSTRUCTION (EMCN).
MANUFACTURING (EMM9).
TRANSPORTATION, COMMUNICATIONS, PUBLIC UTILITIES (EMTCU).
SUPPORT (EMSUP) INCLUDES TRADE, FINANCE, SERVICE, AND
PROPRIETORS NOT INVOLVED IN FISH HARVESTING.

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC LOW
TABLE 4.
GOVERNMENT EMPLOYMENT
(THOUSANDS)

	TOTAL	MILITARY	FEDERAL CIVILIAN	STATE	LOCAL
1985	90.183	22.579	17.600	20.904	29.100
1986	90.117	23.253	18.000	19.911	28.953
1987	88.590	23.230	18.250	19.007	28.104
1988	88.264	24.308	18.250	19.035	26.670
1989	88.618	25.489	18.250	19.245	25.634
1990	88.837	25.272	18.250	19.770	25.545
1991	89.537	25.058	18.341	20.435	25.703
1992	88.764	24.845	18.433	19.891	25.595
1993	87.077	24.635	18.525	18.992	24.926
1994	85.437	24.426	18.618	18.117	24.277
1995	84.161	24.220	18.711	17.381	23.849
1996	82.372	24.016	18.804	16.376	23.176
1997	81.851	23.814	18.898	16.035	23.104
1998	80.987	23.613	18.993	15.495	22.886
1999	80.431	23.415	19.088	15.032	22.896
2000	80.355	23.219	19.183	14.805	23.147
2001	77.613	23.025	19.279	12.898	22.412
2002	77.066	22.833	19.376	12.378	22.479
2003	76.456	22.642	19.472	11.853	22.488
2004	76.317	22.454	19.570	11.550	22.743
2005	76.051	22.267	19.668	11.179	22.936
2006	75.968	22.083	19.766	10.895	23.224
2007	75.987	21.900	19.865	10.639	23.583
2008	76.370	21.719	19.964	10.540	24.147
2009	76.670	21.540	20.064	10.388	24.678
2010	76.763	21.362	20.164	10.116	25.120

SOURCE: ISER MAP MODEL SIMULATION AHFC.L, CREATED AUGUST 1987.

TOTAL (EMG9).
MILITARY (EMGM) IS ACTIVE DUTY.
FEDERAL CIVILIAN (EMGC).
STATE (EMGS) INCLUDES UNIVERSITY OF ALASKA.
LOCAL (EMGL).

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC LOW
TABLE 5.
POPULATION CHANGE
(THOUSANDS)

	TOTAL POPULATION	TOTAL ANNUAL CHANGE	COMPONENTS OF CHANGE: NATURAL INCREASE	NON-MILITARY MIGRATION	MILITARY MIGRATION
1985	539.963	16.915	10.203	5.377	0.623
1986	535.654	-4.309	10.149	-14.850	0.391
1987	529.318	-6.336	9.542	-14.861	-1.058
1988	521.345	-7.973	9.084	-18.283	1.185
1989	515.876	-5.469	8.591	-15.455	1.346
1990	515.647	-0.229	8.173	-6.899	-1.548
1991	516.348	0.701	8.028	-5.823	-1.534
1992	516.125	-0.224	7.916	-6.651	-1.521
1993	515.208	-0.917	7.789	-7.231	-1.507
1994	514.179	-1.029	7.658	-7.230	-1.494
1995	512.457	-1.722	7.537	-7.817	-1.481
1996	510.951	-1.506	7.408	-7.488	-1.467
1997	511.357	0.406	7.295	-5.477	-1.454
1998	512.417	1.060	7.245	-4.784	-1.441
1999	514.613	2.196	7.212	-3.627	-1.429
2000	518.269	3.656	7.212	-2.178	-1.416
2001	519.848	1.580	7.249	-4.302	-1.404
2002	523.454	3.605	7.220	-2.264	-1.391
2003	527.936	4.482	7.255	-1.431	-1.379
2004	533.370	5.435	7.308	-0.543	-1.367
2005	539.518	6.148	7.383	0.085	-1.355
2006	546.622	7.104	7.472	0.939	-1.343
2007	554.622	8.000	7.582	1.715	-1.331
2008	563.886	9.264	7.710	2.841	-1.319
2009	574.382	10.497	7.866	3.908	-1.308
2010	585.915	11.533	8.047	4.754	-1.296

SOURCE: ISER MAP MODEL SIMULATION AHFC.L, CREATED AUGUST 1987.

NOTE: POPULATION IS EQUAL TO POPULATION IN PRIOR YEAR PLUS MIGRATION AND NATURAL INCREASE. THE SUM OF COMPONENTS DOES NOT EQUAL THE TOTAL DUE TO ROUNDING IN THE ALLOCATION OF MIGRANTS TO INDIVIDUAL COHORTS.

POPULATION (POP) IS JULY 1, CENSUS DEFINITION.
ANNUAL CHANGE IN POPULATION (DELPOP) IS YEAR TO YEAR JULY 1 CHANGE.
NATURAL INCREASE (POPNI9) INCLUDES CIVILIAN AND MILITARY.
NON- MILITARY MIGRATION (POPMIG).
MILITARY MIGRATION (POPMIGM) INCLUDES ACTIVE DUTY MILITARY PLUS DEPENDENTS.

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC LOW
TABLE 6.
POPULATION COMPONENTS
(THOUSANDS)

	TOTAL	CIVILIAN NON-NATIVE	NATIVE	MILITARY
1985	539.963	419.416	73.639	46.908
1986	535.654	411.839	75.507	48.309
1987	529.318	403.677	77.381	48.260
1988	521.345	391.583	79.261	50.501
1989	515.876	381.776	81.147	52.954
1990	515.647	380.104	83.040	52.504
1991	516.348	379.349	84.942	52.058
1992	516.125	377.653	86.855	51.616
1993	515.208	375.246	88.784	51.179
1994	514.179	372.703	90.730	50.746
1995	512.457	369.442	92.697	50.317
1996	510.951	366.369	94.689	49.893
1997	511.357	365.176	96.708	49.473
1998	512.417	364.602	98.758	49.057
1999	514.613	365.127	100.840	48.646
2000	518.269	367.074	102.957	48.238
2001	519.848	366.902	105.111	47.835
2002	523.454	368.715	107.304	47.435
2003	527.936	371.360	109.536	47.040
2004	533.370	374.913	111.810	46.648
2005	539.518	379.133	114.125	46.261
2006	546.622	384.263	116.482	45.877
2007	554.622	390.242	118.883	45.497
2008	563.886	397.437	121.328	45.121
2009	574.382	405.817	123.816	44.749
2010	585.915	415.185	126.350	44.380

SOURCE: ISER MAP MODEL SIMULATION AHFC.L, CREATED AUGUST 1987.

POPULATION (POP) IS JULY 1, CENSUS DEFINITION.
CIVILIAN NON-NATIVE (CNNTOT).
NATIVE (NATTOT) CIVILIAN.
MILITARY (MILTOT) IS ACTIVE DUTY PLUS DEPENDENTS.

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC LOW
TABLE 7.
STATE UNRESTRICTED GENERAL FUND
(MILLION 1986 DOLLARS)

	EXPENDI-TURES	REVENUES			
		TOTAL	PETROLEUM	ENDOGENOUS	INVESTMENT EARNINGS
1985	3903.539	3300.278	2811.646	250.547	238.083
1986	3200.410	2607.973	2249.371	250.592	108.011
1987	2606.484	2073.724	1210.965	245.595	617.164
1988	2186.451	1519.804	998.422	235.346	286.037
1989	2104.575	2159.583	1131.958	349.764	677.860
1990	2184.387	2160.580	1104.486	447.309	608.785
1991	2240.217	2196.098	1090.420	448.785	656.894
1992	2160.623	2112.006	1018.644	451.264	642.098
1993	2058.317	2011.680	887.749	452.974	670.956
1994	1954.140	1911.159	807.103	454.953	649.103
1995	1858.696	1819.783	735.976	456.023	627.785
1996	1713.712	1672.482	611.828	456.439	604.215
1997	1644.008	1629.600	575.094	457.848	596.658
1998	1559.847	1550.780	513.971	461.223	575.586
1999	1480.366	1476.010	455.268	465.394	555.349
2000	1422.246	1408.812	402.175	470.618	536.018
2001	1365.477	1358.978	365.558	476.570	516.849
2002	1312.766	1310.240	329.148	482.640	498.451
2003	1262.674	1261.374	291.774	488.926	480.674
2004	1244.274	1235.449	275.441	495.729	464.280
2005	1214.442	1210.683	259.892	502.897	447.895
2006	1191.810	1192.343	249.037	510.736	432.570
2007	1171.379	1173.669	236.448	519.161	418.061
2008	1162.972	1158.989	226.327	528.356	404.306
2009	1145.336	1145.789	216.660	538.570	390.560
2010	1134.063	1134.638	207.422	549.633	377.584

SOURCE: ISER MAP MODEL SIMULATION AHFC.L, CREATED AUGUST 1987.

EXPENDITURES (DF.EXGFB) IS UNRESTRICTED GENERAL FUND EXPENDITURES.
TOTAL REVENUES (DF.RSGFB).
PETROLEUM REVENUES (DF.RP9SG) EXCLUDES PERMANENT FUND CONTRIBUTION.
ENDOGENOUS REVENUES (DF.RSENG) IS TOTAL NET OF PETROLEUM AND INVESTMENT EARNINGS.
INVESTMENT EARNINGS (DF.RSIN) IS EARNINGS FROM ALL SOURCES DEPOSITED IN THE GENERAL FUND.

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC LOW
TABLE 8.
STATE GOVERNMENT MISCELLANEOUS VARIABLES
(MILLION 1986 DOLLARS)

	GENERAL FUND APPROPRIATIONS				PERMANENT FUND	PERMANENT FUND	PERSONAL INCOME TAX
	TOTAL	OPERATING	CAPITAL	DEBT SERVICE	DIVIDEND	BALANCE	
1985	3279.325	2295.079	824.981	159.266	210.624	6631.855	0.000
1986	3115.421	2308.209	652.082	155.131	266.976	7200.707	0.000
1987	2528.572	1965.826	412.647	150.099	312.422	7928.242	0.000
1988	2127.893	1743.123	246.520	138.250	312.164	7845.727	0.000
1989	2152.898	1726.704	304.712	121.482	0.000	7675.520	123.577
1990	2200.682	1782.681	314.590	103.410	0.000	7568.246	229.727
1991	2257.039	1851.062	326.658	79.319	0.000	7466.863	232.289
1992	2161.357	1786.844	315.325	59.189	0.000	7370.555	234.467
1993	2054.453	1678.151	296.144	80.159	0.000	7205.133	236.473
1994	1949.962	1571.878	277.390	100.695	0.000	7035.816	238.958
1995	1855.896	1481.333	261.412	113.152	0.000	6864.148	240.668
1996	1706.552	1359.453	239.903	107.195	0.000	6673.828	241.924
1997	1645.871	1313.628	231.816	100.427	0.000	6476.066	244.054
1998	1558.552	1244.421	219.604	94.528	0.000	6278.656	247.204
1999	1479.723	1183.689	208.886	87.148	0.000	6086.898	250.594
2000	1424.573	1149.844	202.914	71.815	0.000	5896.051	254.612
2001	1366.508	1107.039	195.360	64.109	0.000	5707.688	258.939
2002	1313.838	1066.547	188.214	59.076	0.000	5520.797	263.433
2003	1263.093	1022.659	180.469	59.964	0.000	5339.516	268.168
2004	1247.935	1007.035	177.712	63.188	0.000	5163.957	272.821
2005	1216.649	980.406	173.013	63.232	0.000	4993.930	277.613
2006	1195.195	964.541	170.213	60.442	0.000	4829.426	282.860
2007	1175.032	951.609	167.931	55.493	0.000	4672.090	288.437
2008	1169.380	961.626	169.699	38.055	0.000	4519.746	294.486
2009	1150.757	963.304	169.995	17.459	0.000	4372.281	301.162
2010	1137.013	944.978	166.761	25.274	0.000	4229.504	308.276

SOURCE: ISER MAP MODEL SIMULATION AHFC.L, CREATED AUGUST 1987.

TOTAL (DF.APGF).
OPERATING (DF.APGFO).
CAPITAL (DF.APGFC).
DEBT SERVICE (DF.EXDSS) INCLUDES ONLY GENERAL OBLIGATION DEBT OF STATE.
PERMANENT FUND DIVIDEND (DF.EXTRN).
PERMANENT FUND BALANCE (DF.BALPF).
PERSONAL INCOME TAX (DF.RTIS).

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC LOW
TABLE 9.
COMPONENTS OF REAL PERSONAL INCOME
(MILLION 1986 DOLLARS)

	WAGE AND SALARY PAYMENTS	NET EARNINGS	RESIDENCE ADJUSTMENT	DIVIDENDS, INTEREST, RENT	TRANSFERS	PERSONAL INCOME	DISPOSABLE PERSONAL INCOME
1985	7242.887	8076.711	599.043	858.745	1078.622	9618.600	8147.848
1986	6775.402	7516.152	513.270	909.403	1167.064	9272.130	7859.898
1987	6426.594	7139.238	484.186	935.542	1284.319	9059.820	7683.488
1988	6079.359	6771.051	454.528	907.509	1335.294	8734.711	7409.297
1989	5986.262	6666.367	445.147	864.583	1072.717	8329.930	6893.359
1990	6066.016	6755.207	451.366	827.898	1121.360	8424.215	6969.289
1991	6132.762	6832.277	456.261	809.541	1176.620	8532.938	7058.078
1992	6209.641	6913.160	462.825	803.056	1232.262	8656.227	7158.480
1993	6262.012	6966.141	467.522	800.108	1288.489	8756.813	7239.457
1994	6299.285	7003.367	471.054	810.295	1345.637	8856.543	7319.895
1995	6307.797	7009.289	472.371	819.829	1403.528	8926.695	7376.355
1996	6330.965	7030.867	474.817	829.745	1462.320	9012.930	7446.324
1997	6414.395	7119.965	481.928	840.037	1522.385	9164.680	7569.777
1998	6501.180	7213.152	489.300	851.838	1583.583	9322.890	7698.727
1999	6607.172	7328.121	498.166	865.598	1645.926	9504.770	7847.094
2000	6739.906	7473.066	509.103	882.414	1709.452	9719.150	8022.199
2001	6870.703	7604.883	519.875	901.589	1773.588	9923.410	8188.914
2002	7013.367	7757.824	531.573	922.176	1838.564	10150.200	8374.086
2003	7165.699	7921.746	544.026	944.283	1904.237	10389.470	8569.516
2004	7325.105	8094.410	557.038	967.654	1970.465	10638.730	8773.465
2005	7492.867	8275.992	570.706	991.875	2037.124	10897.520	8984.844
2006	7679.309	8478.258	585.840	1017.553	2104.164	11177.480	9213.710
2007	7880.434	8696.949	602.125	1044.585	2171.532	11474.450	9456.430
2008	8110.324	8947.715	620.658	1073.404	2239.275	11803.610	9725.480
2009	8366.898	9228.010	641.282	1104.399	2307.437	12162.910	10019.190
2010	8641.586	9528.410	663.332	1137.769	2376.043	12543.730	10330.500

SOURCE: ISER MAP MODEL SIMULATION AHFC.L, CREATED AUGUST 1987.

WAGE AND SALARY PAYMENTS (DF.PIWS) IN NONAGRICULTURAL
WAGE AND SALARY JOB CATEGORIES PLUS MILITARY.
NET EARNINGS (DF.PINE) IS NET LABOR AND PROPRIETORS' INCOME
BY PLACE OF WORK.
RESIDENCE ADJUSTMENT (DF.PIRAD).
DIVIDENDS, INTEREST, AND RENT (DF.PIDIR).
TRANSFERS (DF.PITRAN).
PERSONAL INCOME (DF.PIB).
DISPOSABLE PERSONAL INCOME (DF.DPIB)

ISER MAP MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC LOW
TABLE 10.
PRICE INDEXES

	ANCHORAGE CPI-W	ALASKA/US PRICE LEVEL
1985	274.906	1.230
1986	280.274	1.235
1987	282.838	1.210
1988	295.849	1.210
1989	309.458	1.210
1990	323.692	1.210
1991	336.487	1.203
1992	349.743	1.195
1993	365.581	1.187
1994	382.075	1.180
1995	399.317	1.172
1996	417.322	1.164
1997	436.897	1.156
1998	457.343	1.148
1999	478.701	1.140
2000	500.998	1.132
2001	524.321	1.124
2002	548.691	1.116
2003	574.140	1.108
2004	600.727	1.100
2005	628.503	1.092
2006	657.517	1.084
2007	687.820	1.076
2008	719.456	1.068
2009	752.478	1.059
2010	786.950	1.051

SOURCE: ISER MAP MODEL SIMULATION AHFC.L, CREATED AUGUST 1987.

ANCHORAGE CPI (PDANCPI) CONSUMER PRICE INDEX FOR URBAN WAGE EARNERS.
ALASKA/US PRICE LEVEL (PDRATIO) IS THE RATIO OF US AND
ANCHORAGE CONSUMER PRICE INDEX LEVELS.

ISER MAP REGIONAL MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC LOW
TABLE 11.
POPULATION BY LABOR MARKET AREA
(THOUSANDS)

	ANCH/MATSU	SOUTHEAST	INTERIOR	NORTH	GULF COAST	SOUTHWEST	TOTAL
1985	272.156	64.227	88.327	19.102	61.302	34.851	539.962
1986	265.547	65.002	88.673	18.218	62.581	35.633	535.654
1987	259.793	64.916	87.729	18.540	62.648	35.693	529.318
1988	252.324	65.192	88.542	17.927	61.812	35.550	521.345
1989	246.322	64.848	91.407	16.943	61.194	35.164	515.876
1990	244.829	65.750	90.901	18.172	61.104	34.893	515.647
1991	243.497	68.687	90.360	18.085	60.881	34.841	516.348
1992	242.486	68.452	91.806	17.942	60.674	34.766	516.125
1993	243.586	67.382	91.791	17.726	60.062	34.662	515.208
1994	243.061	67.014	91.233	17.673	60.651	34.548	514.178
1995	241.903	66.543	90.613	17.543	61.275	34.581	512.457
1996	241.427	66.598	90.027	17.306	61.156	34.440	510.950
1997	242.187	66.213	89.896	17.250	61.284	34.528	511.357
1998	243.363	66.044	89.763	17.147	61.449	34.652	512.417
1999	245.061	66.006	89.767	17.099	61.740	34.941	514.612
2000	247.386	66.170	90.017	17.143	62.192	35.362	518.268
2001	249.900	65.585	90.065	16.853	62.406	35.040	519.848
2002	252.641	65.749	90.446	16.859	62.774	34.985	523.453
2003	255.993	65.937	90.957	16.874	63.226	34.951	527.935
2004	259.833	65.976	91.695	16.995	63.829	35.043	533.371
2005	263.938	66.418	92.453	17.107	64.465	35.138	539.518
2006	268.539	67.010	93.352	17.257	65.186	35.280	546.621
2007	273.667	67.676	94.389	17.437	65.993	35.461	554.622
2008	279.411	68.540	95.620	17.686	66.914	35.717	563.885
2009	286.044	69.484	97.028	17.927	67.928	35.972	574.382
2010	293.541	70.409	98.588	18.141	69.026	36.211	585.915

SOURCE: ISER MAP MODEL SIMULATION AHFC.R.L, CREATED AUGUST 1987.

NOTE:OFFICIAL STATE OF ALASKA AND CENSUS AREA GOVERNMENT POPULATION ESTIMATES MAY NOT BE E@UAL.

ANCH/MATSU (PL.ANCMS).
SOUTHEAST (PL.SEAST).
INTERIOR (PL.INTER).
NORTH (PL.NORTH).
GULF COAST (PL.GULF).
SOUTHWEST (PL.SWEST).
TOTAL (P.ST)

ISER MAP REGIONAL MODEL ECONOMIC PROJECTIONS
AUGUST 1987 AHFC LOW
TABLE 12.
TOTAL EMPLOYMENT BY LABOR MARKET AREA
(THOUSANDS)

	ANCH/MATSU	SOUTHEAST	INTERIOR	NORTH	GULF COAST	SOUTHWEST	TOTAL
1985	140.010	33.954	41.978	14.633	25.577	16.209	272.360
1986	134.037	33.572	41.559	12.447	25.687	16.271	263.571
1987	128.566	32.880	40.333	12.133	25.242	16.039	255.193
1988	123.737	32.588	40.552	10.497	24.699	15.812	247.885
1989	119.923	32.218	41.743	10.161	24.294	15.599	243.938
1990	120.361	33.002	41.947	10.644	24.495	15.652	246.101
1991	120.734	34.784	42.069	10.632	24.633	15.765	248.617
1992	120.566	34.786	42.975	10.608	24.644	15.818	249.397
1993	121.100	34.242	43.006	10.526	24.425	15.828	249.127
1994	120.842	34.066	42.785	10.464	24.631	15.841	248.629
1995	120.060	33.785	42.457	10.353	24.817	15.893	247.365
1996	119.664	33.774	42.162	10.212	24.747	15.872	246.431
1997	120.454	33.706	42.277	10.208	24.895	16.008	247.549
1998	121.373	33.722	42.367	10.176	25.042	16.169	248.849
1999	122.619	33.825	42.544	10.175	25.256	16.425	250.845
2000	124.283	34.061	42.870	10.224	25.560	16.748	253.745
2001	125.045	33.622	42.777	10.045	25.532	16.584	253.604
2002	126.691	33.784	43.085	10.059	25.734	16.590	255.944
2003	128.593	33.944	43.438	10.075	25.958	16.599	258.607
2004	130.723	34.024	43.893	10.135	26.243	16.651	261.669
2005	132.859	34.277	44.313	10.180	26.515	16.691	264.835
2006	135.256	34.611	44.805	10.246	26.824	16.748	268.490
2007	137.900	34.979	45.357	10.326	27.164	16.817	272.542
2008	140.949	35.473	46.031	10.445	27.568	16.922	277.388
2009	144.463	36.012	46.799	10.569	28.010	17.028	282.880
2010	148.345	36.527	47.628	10.685	28.471	17.123	288.778

SOURCE: ISER MAP MODEL SIMULATION AHFC.R.L, CREATED AUGUST 1987.

ANCH/MATSU (ML.ANCMS).
SOUTHEAST (ML.SEAST).
INTERIOR (ML.INTER).
NORTH (ML.NORTH)
GULF COAST (ML.GULF).
SOUTHWEST (ML.SWEST).
TOTAL (M.ST).

APPENDIX C

DOCUMENTATION FOR HOUSING MODEL, AHFC87C

APPENDIX C

DOCUMENTATION FOR HOUSING MODEL, AHFC87C

Introduction

The model AHFC87C projects a regional Alaska housing market using a set of economic projections and a set of assumptions about alternative policies which influence mortgage interest rates and the rate of disposal of inventories of foreclosed homes. The model coefficients are estimated using market for the greater Anchorage area housing market, with Fairbanks data included for some equations. The model structure follows closely the model of the housing market described in Berman and Huskey (1986) [AHFC final report], Chapters 3 and 4.

The model produces forecasts of sales prices for two types of standard units, single-family homes and condominiums, and sales quantities of single-family homes and condominiums. Condominium prices and sales are intended to represent the market for all owner-occupied nonsingle-family units, except for mobile homes.

Using the Model for Policy Analysis

Assumptions about housing policy enter the model and affect the forecasts in a number of ways. Changes in interest rates affect housing demand. A portion of this long-term demand change affects sales demand in each period. A policy which allow buyers to sell homes and not be liable for negative equity enters the model by changing the value of the parameter FORGIVE to 1.0. The exact definition of these and other parameters used in the model is given below in the section on parameter definitions and sources.

A number of options exist for treating foreclosures which the model forecasts for single-family homes and condominiums. These options include (1) the portion immediately listed for sale by realtors (parameters A1 and B1), (2) the rate of sale of listed foreclosures (parameters FS.SFO and FS.CO), and (3) the proportion of the inventory of unsold foreclosures sold by auctions (parameters A4 and B4). The "auction sales" produced by the model do not necessarily refer to actual auctions but signify any sales where the institutional seller is willing to accept a potentially significant price reduction in order to reduce the foreclosure inventory.

Estimation of Model Coefficients

Coefficients for equations representing the effects of economic conditions on sales prices and quantities and on properties listed for sale are estimated using quarterly data derived mainly from the

Anchorage Multiple Listing Service. Data on building permits are derived from the Municipality of Anchorage and the Matanuska-Susitna Borough. The regression equations showing the estimation of these coefficients are shown below in the section on regression results.

Coefficients for equations representing long-term housing demand, including changes in owner-occupancy rates and the proportion of buyers choosing single-family homes, multifamily units, and mobile homes as well as default rates on condominiums and single-family homes, are estimated from survey microdata. The equation results are presented for several alternative specifications of the equations in tables D-1 through D-22 in Appendix D. The section below on parameter definitions and values specifies the actual table number used to compute the parameters for each equation of the forecasting model.

The equation results on the effect of changes in economic conditions on owner-occupancy were estimated from the 1980 U.S. Census Public Use Sample for Anchorage and the Alaska Economc Survey conducted in Anchorage in June, 1987. The coefficients, therefore, include the effects of changes in economic and housing market conditions between 1980 and 1987 as well as differences among individual households in each survey.

Coefficients for equations forecasting defaults were estimated from data on individual mortgage borrowers who financed home purchases through AHFC. These data cover over 4,700 homes purchased in Anchorage, the Mat-Su Borough, and Fairbanks between the spring of 1980 and June 1987. The model used for predicting defaults is described in Chapter 4 of Berman and Huskey (1986). Households are assumed to have always available to them the option to sell their homes instead of defaulting on the loan.

TABLE C.1. HOUSING MODEL LISTING

```
MODEL: AHFC87C

SYMBOL DECLARATIONS

ENDOGENOUS:
  E@UITY.C  E@UITY.R  FI.C  FI.SF  FS.C  FS.SF  HUMF  HUSF  LD.C  LD.MH  LD.SF  MALI.C  MALI.R  MLIS.C
  MLSDAYS  P.MH  PD.C  PD.R  PDIV.C  PDIV.R  PMH  PO  PSAL.C  PSAL.R  PSF  RA.CPIRN  RENT.L  RE@UIT.C
  RE@UIT.R  RESAL.R  RMPR.C  RMPR.R  ST.MF  ST.MH  ST.SF  WDRAW.C  WDRAW.R

DEFINITION:
  A.CPIRNT  AUCT.C  AUCT.R  DEFAULTC  DEFAULTR  DEFAULTS  ERMPR.C  ERMPR.R  LD.RENT  LONG.C  LONG.R  MPR.C
  MPR.R  MSAL.C  MSAL.R  NFL.C  NFL.R  RPCMI.AK  RPCMI.AM  RPCMI.AN  RPCMI.FB  WDRAW.F

EXOGENOUS:
  A.CPI@86  CFORCE  FI.MH  HH  PCMI,AK  RBLDINDX  REMOVE.C  RMORTHFC  RPRIME

POLICY:
  PCMI.AMS  PCMI.ANC  PCMI.FBK  RAHFC1ST

COEFFICIENT:
  D2.0  D2.1  D2.3  D2.4  D2.5  D3.0  D3.1  D3.2  D3.3  D3.4  D3.5  E0  E1  M1.0  M1.1  M1.2  M2.0  M2.1  M2.2
  R1.0  R1.2  R1.3  R1.4  R1.5  S1.0  S1.1  S1.2  S1.3  S1.4  S2.0  S2.2  S2.3  S2.4  S2.5  S4.0  S4.1  S4.2
  S4.3  S4.6  S5.0  S5.1  S5.2  S5.3  S5.6  W1.0  W1.1  W1.2  W2.0  W2.1  W2.2

PARAMETER:
  ADJUST.C  ADJUST.R  A1  A4  B1  B4  CMF  CMH  CSF  FORGIVE  FS.CO  FS.SFO  L1.0  L1.1  L1.2  L1.3  L2.0
  L2.1  L2.2  L2.3  L2.4  L3.0  L3.1  L3.2  L3.3  L4.0  L4.01  L4.1  L4.2  L5.0  L5.1  L5.2  OCC.MF  OCC.MH
  OCC.SF  P.MHO  RO  TRANS.MH  W1.01


E@UATIONS

    1:      MPR.R == RMPR.R*(A.CPI@86/100)

    2:      MPR.C == RMFR.C*(A.CPI@86/100)

    3:      RPCMI.AK == PCMI.AK/(A.CPI@86/100)

    4:      RPCMI.AN == PCMI.ANC/(A.CPI@86/100)

    5:      RPCMI.FB == PCMI.FBK/(A.CPI@86/100)

    6:      RPCMI.AM == PCMI.AMS/(A.CPI@86/100)

    7:      RE@UIT.R == IF FORGIVE E@ 1 THEN (IF 0.25*(E@UITY.R+E@UITY.R(-1)+E@UITY.R(-2)+E@UITY.R(-3))/(
            A.CPI@86/100) LT 0 THEN 0 ELSE 0.25*(E@UITY.R+E@UITY.R(-1)+E@UITY.R(-2)+E@UITY.R(-3))/(A.CPI@86/
            100)) ELSE 0.25*(E@UITY.R+E@UITY.R(-1)+E@UITY.R(-2)+E@UITY.R(-3))/(A.CPI@86/100)
```

MODEL: AHFC87C

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 8:    REQUIT.C == IF FORGIVE EQ 1 THEN (IF 0.25*(EQUITY.C+EQUITY.C(-1)+EQUITY.C(-2)+EQUITY.C(-3))/(
       A.CPI@86/100) LT 0 THEN 0 ELSE 0.25*(EQUITY.C+EQUITY.C(-1)+EQUITY.C(-2)+EQUITY.C(-3))/(A.CPI@86/
       100)) ELSE 0.25*(EQUITY.C+EQUITY.C(-1)+EQUITY.C(-2)+EQUITY.C(-3))/(A.CPI@86/100)

 9:    A.CPIRNT == RA.CPIRN*(A.CPI@86/100)

10:    DEFAULTR == 0.25*(PD.R+PD.R(-1)+PD.R(-2)+PD.R(-3))/(1-0.25*(PD.R+PD.R(-1)+PD.R(-2)+PD.R(-3)))*(
       PSAL.R-HUSF(-1))

11:    NFL.R == DEFAULTR*A1

12:    FI.SF = FI.SF(-1)+DEFAULTR-FS.SF(-1)

13:    AUCT.R == A4*FI.SF(-1)

14:    DEFAULTC == IF PSAL.C LT 50 THEN 0.25*(PD.C+PD.C(-1)+PD.C(-2)+PD.C(-3))/(1-0.25*(PD.C+PD.C(-1)+
       PD.C(-2)+PD.C(-3)))*50 ELSE 0.25*(PD.C+PD.C(-1)+PD.C(-2)+PD.C(-3))/(1-0.25*(PD.C+PD.C(-1)+PD.C(-2
       )+PD.C(-3)))*PSAL.C

15:    NFL.C == DEFAULTC(-1)*B1

16:    FI.C = FI.C(-1)+DEFAULTC-FS.C(-1)+REMOVE.C

17:    AUCT.C == B4*FI.C(-1)

18:    DEFAULTS == DEFAULTC+DEFAULTR

19:    LONG.R == 0.24*L1.3*(RMORTHFC-10)*HH*PSF

20:    LONG.C == 0.24*L1.3*(RMORTHFC-10)*HH*(1-PSF-PMH)

21:    MSAL.R == IF ADJUST.R*LONG.R LT (-1)*PSAL.R+1 THEN FS.SF+1 ELSE PSAL.R+FS.SF+ADJUST.R*LONG.R

22:    MSAL.C == IF ADJUST.C*LONG.C LT (-1)*PSAL.C+1 THEN FS.C+1 ELSE PSAL.C+FS.C+ADJUST.C*LONG.C

23:    FS.SF = IF FS.SF0+AUCT.R GT FI.SF THEN FI.SF ELSE FS.SF0+AUCT.R

24:    FS.C = IF FS.C0+AUCT.C GT FI.C THEN FI.C ELSE FS.C0+AUCT.C

25:    WDRAW.F == NFL.R(-1)-FS.SF(-1)

26:    MALI.R == RESAL.R+HUSF(-1)+NFL.R+MALI.R(-1)-MSAL.R(-1)+AUCT.R(-1)-WDRAW.R(-1)-WDRAW.F

27:    MALI.C == MLIS.C+MALI.C(-1)-MSAL.C(-1)+AUCT.C(-1)-WDRAW.C(-1)

28:    MLSDAYS = E0+E1*MALI.R/(MSAL.R-AUCT.R)

29:    LOG(RMPR.R) = 1/D2.1*(LOG(MSAL.R/CFORCE)-D2.0-D2.3*((CFORCE-CFORCE(-4))/CFORCE(-4))-D2.4*LOG(
       RPCMI.AK)-D2.5*LOG(RMORTHFC))
```

MODEL: AHFC87C

```
30:     LOG(RMPR.C) = 1/03.1*(LOG(MSAL.C/CFORCE)-03.0-03.2*LOG(RA.CPIRN)-03.3*((CFORCE-CFORCE(-4))/CFORCE
        (-4))-03.4*LOG(RPCMI.AK)-03.5*LOG(RAHFC1ST))

31:     ERMPR.R == (RMPR.R(-1)/RMPR.R(-5)+RMPR.R(-5)/RMPR.R(-9))/2*RMPR.R(-4)

32:     ERMPR.C == (RMPR.C(-1)/RMPR.C(-5)+RMPR.C(-5)/RMPR.C(-9))/2*RMPR.C(-4)

33:     LOG(RESAL.R) = LOG(CFORCE(-4))+S4.0+S4.1*LOG(ERMPR.R)+S4.2*LOG(MLSDAYS)+S4.3*RE@UIT.R/RMPR.R+S4.4
        *(CFORCE-CFORCE(-4)/CFORCE(-4))

34:     LOG(MLIS.C-NFL.C) = LOG(CFORCE(-4))+S5.0+S5.1*LOG(ERMPR.C)+S5.2*LOG(MLSDAYS)+S5.3*RE@UIT.C/RMPR.C
        +S5.4*(CFORCE-CFORCE(-4)/CFORCE(-4))

35:     LOG(PSAL.R) = IF PSAL.R(-1)-FS.SF+FS.SF(-1) LE 100 THEN 4.605 ELSE (IF M1.0+M1.1*RE@UIT.R/RMPR.R(
        -1) LT -0.04+LOG((PSAL.R(-1)-FS.SF+FS.SF(-1))/MALI.R(-1)) THEN LOG(MALI.R)-0.04+LOG((PSAL.R(-1)-
        FS.SF+FS.SF(-1))/MALI.R(-1)) ELSE (IF M1.0+M1.1*RE@UIT.R/RMPR.R(-1) GT 0.04+LOG((PSAL.R(-1)-FS.SF
        +FS.SF(-1))/MALI.R(-1)) THEN LOG(MALI.R)+0.04+LOG((PSAL.R(-1)-FS.SF+FS.SF(-1))/MALI.R(-1)) ELSE
        LOG(MALI.R)+M1.0+M1.1*RE@UIT.R/RMPR.R(-1)))

36:     LOG(PSAL.C) = IF PSAL.C(-1)-FS.C+FS.C(-1) LT 7 THEN 2 ELSE (IF M2.0+M2.1*RE@UIT.C/RMPR.C(-1) LT
        -0.04+LOG((PSAL.C(-1)-FS.C+FS.C(-1))/MALI.C(-1)) THEN LOG(MALI.C)-0.04+LOG((PSAL.C(-1)-FS.C+FS.C(
        -1))/MALI.C(-1)) ELSE (IF M2.0+M2.1*RE@UIT.C/RMPR.C(-1) GT 0.04+LOG((PSAL.C(-1)-FS.C+FS.C(-1))/
        MALI.C(-1)) THEN LOG(MALI.C)+0.04+LOG((PSAL.C(-1)-FS.C+FS.C(-1))/MALI.C(-1)) ELSE LOG(MALI.C)+
        M2.0+M2.1*RE@UIT.C/RMPR.C(-1)))

37:     LOG(WDRAW.R/MALI.R(-1)) = IF RE@UIT.R LT 0 THEN W1.01+W1.1*LOG(MLSDAYS(-1)) ELSE W1.0+W1.1*LOG(
        MLSDAYS(-1))+W1.2*RE@UIT.R/RMPR.R(-1)

38:     LOG(WDRAW.C/MALI.C(-1)) = W2.0+W2.1*LOG(MLSDAYS(-1))+W2.2*RE@UIT.C/RMPR.C(-1)

39:     LOG(RA.CPIRN) = R1.0+R1.2*LOG(CFORCE)+R1.3*LOG(RPCMI.AK)+R1.4*LOG(RA.CPIRN(-4))+R1.5*LOG(RBLDINDX
        (-1))

40:     LD.SF = HH*PSF*(PO-PO(-1))+LD.SF(-1)

41:     LD.MH = HH*PMH*(PO-PO(-1))+LD.MH(-1)

42:     LD.C = HH*(1-PSF-PMH)*(PO-PO(-1))+LD.C(-1)

43:     LD.RENT == HH-LD.SF-LD.MH-LD.C

44:     LOG(PO/(1-PO)) = L1.0+L1.1*(RMPR.R/135-RENT.L)+L1.2*RPCMI.AK+L1.3*RMORTHFC

45:     PSF = 1/(1+EXP((-1)*(L2.0+L2.1*LOG(RMPR.R/RMPR.C)+L2.2*LOG(RPCMI.AK)+L2.3*RMORTHFC+L2.4*LOG(
        RMPR.C))))

46:     PMH = 1/(1+EXP((-1)*(L3.0+L3.1*LOG(RMPR.C)+L3.2*LOG(RPCMI.AK)+L3.3*RMORTHFC)))

47:     RENT.L = IF RA.CPIRN LT R0 THEN R0 ELSE RA.CPIRN
```

MODEL: AHFC87C

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48:     P.MH = IF LO.MH GE ST.MH(-1)*CMH*OCC.MH THEN P.MHO ELSE P.MHO-TRANS.MH

49:     PO.R = 1/(1+EXP((-1)*(L5.0+L5.1*REQUIT.R+L5.2*0.5*(MLSDAYS+MLSDAYS(-1)))))

50:     PO.C = 1/(1+EXP((-1)*(L5.0+L5.1*REQUIT.C+L5.2*0.5*(MLSDAYS+MLSDAYS(-1)))))

51:     PDIV.R = 1/(1+EXP((-1)*(L4.0+L4.1*REQUIT.R+L4.2*(CFORCE-CFORCE(-4)))))

52:     PDIV.C = 1/(1+EXP((-1)*(L4.01+L4.1*REQUIT.C+L4.2*(CFORCE-CFORCE(-4)))))

53:     EQUITY.R = EQUITY.R(-1)+(MPR.R-MPR.R(-1))

54:     EQUITY.C = EQUITY.C(-1)+(MPR.C-MPR.C(-1))

55:     ST.SF = ST.SF(-1)*CSF+HUSF(-1)

56:     ST.MF = ST.MF(-1)*CMF+HUMF(-1)

57:     ST.MH = IF (ST.SF-FI.SF)*OCC.SF+(ST.MF-FI.C)*OCC.MF+(ST.MH(-1)*CMH-FI.MH)*OCC.MH GE HH THEN ST.MH
        (-1)*CMH ELSE (HH-(ST.SF-FI.SF)*OCC.SF-(ST.MF-FI.C)*OCC.MF)/OCC.MH+FI.MH

58:     LOG(HUSF) = IF S1.0+S1.1*LOG(RMPR.R)+S1.2*LOG(MLSDAYS)+S1.3*LOG(RBLDINDX)+S1.4*LOG(RPRIME) LT 3.4
         THEN 3.4 ELSE (IF S1.0+S1.1*LOG(RMPR.R)+S1.2*LOG(MLSDAYS)+S1.3*LOG(RBLDINDX)+S1.4*LOG(RPRIME)
         GT LOG(PSAL.R/2) THEN LOG(PSAL.R/2) ELSE S1.0+S1.1*LOG(RMPR.R)+S1.2*LOG(MLSDAYS)+S1.3*LOG(
        RBLDINDX)+S1.4*LOG(RPRIME))

59:     LOG(HUMF) = IF S2.0+S2.2*LOG(RA.CPIRN)+S2.3*LOG(MLSDAYS)+S2.4*LOG(RBLDINDX)+S2.5*LOG(RPRIME) LT
        1.79 THEN 1.79 ELSE S2.0+S2.2*LOG(RA.CPIRN)+S2.3*LOG(MLSDAYS)+S2.4*LOG(RBLDINDX)+S2.5*LOG(RPRIME)
```

TABLE C.2. HISTORICAL HOUSING MODEL LISTING

```
MODEL: AHFC87B


SYMBOL DECLARATIONS


ENDOGENOUS:
   A.CPIRNT  EQUITY.C  EQUITY.R  HUMF  HUSF  MALI.C  MALI.R  MALIMS.R  MLIS.R  MLSDAYS  MPR.C  MPR.R  MSAL.C
   MSAL.R  RA.CPIRN  WDRAW.R

DEFINITION:
   ERMPR.C  ERMPR.R  REQUIT.C  REQUIT.R  RESAL.R  RMPR.C  RMPR.R  RPCMI.AK  RPCMI.AM  RPCMI.AN  RPCMI.FB

EXOGENOUS:
   A.CPIQ86  CFORCE  F.SF  FS.C  FS.SF  MLIS.C  PCMI.AK  RBLDINDX  RMORTHFC  RPRIME  WDRAW.C

POLICY:
   ABE  CPSFD.AM  CPSFD.FB  DUMMY1  DUMMY2  PCMI.AMS  PCMI.ANC  PCMI.FBK  RAHFC1ST  REFI

COEFFICIENT:
   D2.0  D2.1  D2.10  D2.11  D2.12  D2.2  D2.3  D2.4  D2.5  D2.6  D2.7  D2.8  D2.9  D3.0  D3.1  D3.10  D3.2
   D3.3  D3.4  D3.5  D3.6  D3.7  D3.8  D3.9  E0  E1  M1.0  M1.1  M1.2  M1.2A  M1.2B  M1.3  M1.4  M1.5  M2.0
   M2.1  M2.2  M2.2A  M2.3  M2.4  M2.5  M3.0  M3.1  M3.2  M3.3  M3.4  M3.5  M3.6  R1.0  R1.1  R1.2  R1.3  R1.4
   R1.5  R1.6  R1.7  S1.0  S1.1  S1.2  S1.3  S1.4  S1.5  S1.6  S1.7  S2.0  S2.1  S2.2  S2.3  S2.4  S2.5  S2.6
   S2.7  S2.8  S4.0  S4.1  S4.1A  S4.1B  S4.2  S4.3  S4.4  S4.5  S4.6  S4.7  S4.8  S4.9  S5.0  S5.1  S5.2  S5.3
   S5.6  W1.0  W1.1  W1.2  W2.0  W2.1  W2.2


EQUATIONS


    1:      RMPR.R == MPR.R/(A.CPIQ86/100)

    2:      RMPR.C == MPR.C/(A.CPIQ86/100)

    3:      RPCMI.AK == PCMI.AK/(A.CPIQ86/100)

    4:      RPCMI.AK == PCMI.ANC/(A.CPIQ86/100)

    5:      RPCMI.FB == PCMI.FBK/(A.CPIQ86/100)

    6:      RPCMI.AK == PCMI.AMS/(A.CPIQ86/100)

    7:      REQUIT.R == EQUITY.R/(A.CPIQ86/100)

    8:      REQUIT.C == EQUITY.C/(A.CPIQ86/100)
```

MODEL: AHFC87B

```
 9:    LOG(MSAL.R/CFORCE) = D2.0+D2.1*LOG(RMPR.R)+D2.3*((CFORCE-CFORCE(-4))/CFORCE(-4))+D2.4*LOG(
       RPCMI.AK)+D2.5*LOG(RMORTHFC)

10:    LOG(MSAL.C/CFORCE) = D3.0+D3.1*LOG(RMPR.C)+0*LOG(RA.CPIRN)+D3.3*((CFORCE-CFORCE(-4))/CFORCE(-4))+
       D3.4*LOG(RPCMI.AK)+0*LOG(RAHFC1ST)

11:    LOG(HUSF) = S1.0+S1.1*LOG(RMPR.R)+S1.2*LOG(MLSDAYS)+S1.3*LOG(RBLDINDX)+S1.4*LOG(RPRIME)

12:    LOG(HUMF) = S2.0+S2.2*LOG(RA.CPIRN)+S2.3*LOG(MLSDAYS)+S2.4*LOG(RBLDINDX)+S2.5*LOG(RPRIME)

13:    RESAL.R == MLIS.R-HUSF(-1)-MALIMS.R+MALIMS.R(-1)-F.SF(-1)

14:    ERMPR.R == (RMPR.R(-1)/RMPR.R(-5)+RMPR.R(-5)/RMPR.R(-9))/2*RMPR.R(-4)

15:    ERMPR.C == (RMPR.C(-1)/RMPR.C(-5)+RMPR.C(-5)/RMPR.C(-9))/2*RMPR.C(-4)

16:    LOG(RESAL.R/CFORCE(-4)) = S4.0+S4.1*LOG(ERMPR.R)+S4.6*(CFORCE-CFORCE(-4)/CFORCE(-4))

17:    LOG(MLIS.C/CFORCE(-4)) = S5.0+S5.1*LOG(ERMPR.C)+S5.6*(CFORCE-CFORCE(-4)/CFORCE(-4))

18:    LOG((MSAL.R-FS.SF)/MALI.R) = M1.0+M1.1*REQUIT.R/RMPR.R(-1)+M1.2*LOG(RMPR.R/ERMPR.R)

19:    LOG((MSAL.C-FS.C)/MALI.C) = M2.0+M2.1*REQUIT.C/RMPR.C(-1)+M2.2*LOG(RMPR.C/ERMPR.C)

20:    LOG(MLSDAYS) = M3.0+M3.1*LOG(MALI.R/MSAL.R)+M3.5*DUMMY1+M3.6*DUMMY2

21:    LOG(WDRAW.R/MALI.R(-1)) = W1.0+W1.1*LOG(MLSDAYS(-1))+W1.2*REQUIT.R/RMPR.R(-1)

22:    LOG(WDRAW.C/MALI.C(-1)) = W2.0+W2.1*LOG(MLSDAYS(-1))+W2.2*REQUIT.C/RMPR.C(-1)

23:    LOG(RA.CPIRN) = R1.0+R1.2*LOG(CFORCE)+R1.3*LOG(RPCMI.AK)+R1.4*LOG(RA.CPIRN(-4))+R1.5*LOG(RBLDINDX
       (-1))

24:    MLSDAYS = E0+E1*MALI.R/MSAL.R
```

TABLE C.3. DATA DEFINITIONS AND SOURCES

ABE	The time period (2/1982 - 1/1987) when ABE mortgage structure is in effect.
A.CPIQ86	Quarterly series of AKRAM2_A.CPIXM, Anchorage Consumer Price Index for all items for urban wage earners and clerical workers (with NA's replaced by interpolated values), with 1986 = 100, using the annual average value for 1986, 2.803. SOURCES: U.S. Bureau of Labor Statistics, A.CPIQ86=A.CPIQ/2.803
A.CPIRNT	Quarterly series of the Anchorage Consumer Price Index for residential rent, for urban wage earners and clerical workers, 1967 = 100. SOURCES: U.S. Bureau of Labor Statistics, A.CPIRNT=COMPACT (A.CPIRNT,0,4)
CEMP	Alaska employment adjusted to be consistent with the CPS annual average for the state, in thousands SOURCE: Alaska Department of Labor
CFORCE	Alaska labor force adjusted to be consistent with the CPS annual overage for the state, in thousands. SOURCE: CFORCE = CEMP + CUNEM
CPSEM.AM	Anchorage-Matsu region employment adjusted to be consistent with the CPS annual average for the state, in thousands SOURCE: Alaska Department of Labor
CPSEM.FB	Fairbanks North Star Borough employment adjusted to be consistent with the CPS annual average for the state, in thousands SOURCE: Alaska Department of Labor
CPSFO.AM	Anchorage-Matsu region labor force adjusted to be consistent with the CPS annual average for the state, in thousands. SOURCE: CPSFO.AM = CPSEM.AM + CPSUN.AM
CPSUN.AM	Anchorage-Matsu region unemployment adjusted to be consistent with the CPS annual average for the state, in thousands SOURCE: Alaska Department of Labor

CPSUN.FB — Fairbanks North Star Borough unemployment adjusted to be consistent with the CPS annual average for the state, in thousands
SOURCE: Alaska Department of Labor

CUNEM — Alaska unemployment adjusted to be consistent with the CPS annual average for the state, in thousands
SOURCE: Alaska Department of Labor

DUMMY1 — Equals 1 during time period (1975-78) when MLS sales data include land, residential and commercial; zero during other periods.
SOURCE: Anchorage Multiple Listing Service.

DUMMY 2 — Equals 1 during time period (10/1982 forward) when MLS sales data refer to just residential properties, not condos, nor lots and acres, nor all other; zero during other periods.
SOURCE: Anchorage Multiple Listing Service.

EQUITY.C — Equity after five years, condos, in thousands of dollars

SOURCE: $\text{EQUITY.C} = \text{MPR.C} - \left(\sum_{i=-4}^{-20} \text{MPR.C}(i)*\text{MSAL.C}(i) \right) \Big/ \sum_{i=-4}^{-20} \text{MSAL.C}(i)$

EQUITY.R — Equity after five years, single-family residences, in thousands of dollars

SOURCE: $\text{EQUITY.R} = \text{MPR.R} - \left(\sum_{i=-4}^{-20} \text{MPR.R}(i)*\text{MSAL.R}(i) \right) \Big/ \sum_{i=-4}^{-20} \text{MSAL.R}(i)$

F.C — Foreclosures that quarter, condominiums, Anchorage-Matsu, in units.
SOURCE: AHFC and other mortgage lenders.

F.SF — Foreclosures that quarter, single-family residences, Anchorage-Matsu, in units
SOURCE: AHFC and other mortgage lenders.

FI.C — Foreclosed inventory as of the quarter, condominiums, Anchorage-Matsu, in units
SOURCE: AHFC and other mortgage lenders

FI.MH — Foreclosed inventory as of the quarter, mobile homes, Anchorage-Matsu, in units
SOURCE: AHFC

FI.SF — Foreclosed inventory as of the quarter, single-family residences, Anchorage-Matsu, in units
SOURCE: AHFC and other mortgage lenders

FS.C — Number of sales of foreclosed units, condominiums, Anchorage-Matsu, in units
SOURCE: AHFC and other mortgage lenders

FS.SF — Number of sales of foreclosed units, single-family residences, Anchorage-Matsu, in units
SOURCE: AHFC and other mortgage lenders

HH — Number of households (total occupied housing units), Anchorage-Matsu, in units.
SOURCES: Matanuska-Susitna Borough, Development Services Dept.; Municipality of Anchorage, Community Planning Dept.; Federal Home Loan Bank of Seattle, Anchorage, Alaska Housing Vacancy Survey, June 1986.

HUMF — Number of building permit applications accepted for multifamily structures, Anchorage, in units.
SOURCE: Municipality of Anchorage, Building Safety Division, Building Safety Activity Reports.

HUSF — Number of building permit applications accepted for single-family structures, Anchorage, in units.
SOURCE: Municipality of Anchorage, Building Safety Division, Building Safety Activity Reports.

MALI.C — Number of active listing for Anchorage-Matsu, condos, in units. (Note: condos were not listed separately in 1975 and 1976 but were included in the residential listings.)
SOURCES: Multiple Listing Service, Anchorage; and Valley Board of Realtors (1987 forward).

MALI.R — Number of active listings for Anchorage-Matsu, residential, in units. (Note: the values for 1975 and 1976 include condos.)
SOURCES: Multiple Listing Service, Anchorage; and Valley Board of Realtors (1987 forward).

MALIMS.R — Number of active residential listings in the Mat-Su area (condos not included), in units.
SOURCES: Anchorage Multiple Listing Service and Valley Board of Realtors.

MLIS.C — Number of new condominium listings with Anchorage MLS, minus number of foreclosures, in units. (Note: Most current 12 months are preliminary.)
SOURCES: Multiple Listing Service, Inc., Listing Exchange Statistics. MLIS.C = MLIS.C-F.C

MLIS.R — Number of new residential listings with Anchorage MLS, minus number of foreclosures, in units. (Note: 1980 and most current 12 months are preliminary, all others are revised.)
SOURCES: Multiple Listing Service, Inc., Listing Exchange Statistics. MLIS.R = MLIS.R-F.SF

MLSDAYS — Average number of days on market of MLS residential listings.
SOURCE: Multiple Listing Service, Inc.

MPR.C — Average sale price of condominiums, in thousands of dollars. MPR.C = MVOL.C/MSAL.C*1000 to 1980 3 (MLS data). Figures for 1980 4 forward are prices based on AHFC data and adjusted using hedonic equations.
SOURCES: Multiple Listing Service, Inc., and AHFC.

MPR.R — Average sale price of residences, in thousands of dollars. MPR.R = MVOL.R/MSAL.R*1000 for 1974 5 to 1980 3 (MLS data). Figures for 1970 1 through 1974 4 are estimates based on census data. Figures for 1980 4 forward are prices based on AHFC data and adjusted using hedonic equations.
SOURCES: Multiple Listing Service, Inc.; AHFC; and U.S. Bureau of the Census.

MSAL.C — Number of condominium sales closed through MLS, in units. (Note: most current 12 months are preliminary.)
SOURCE: Multiple Listing Service, Inc., Listing Exchange Statistics.

MSAL.R — Number of residential sales closed through Anchorage MLS, in units. (Note: 1980 and most current 12 months' figures are preliminary, all others are revised. Also, figures for 1970 1 through 1974 4 are estimates based on census data.)
SOURCES: Multiple Listing Service, Inc., Listing Exchange Statistics; U.S. Bureau of the Census.

MVOL.C — Total volume of condominium sales closed through Anchorage MLS, in millions of dollars. (Note: most current 12 months are preliminary.)
SOURCE: Multiple Listing Service, Inc., Listing Exchange Statistics.

MVOL.R — Total volume of residential sales closed through Anchorage MLS, in millions of dollars. (Note: 1980 and most current 12 months' figures are preliminary; all others are revised.)
SOURCE: Multiple Listing Service, Inc., Listing Exchange Statistics.

PI — Personal income: Total, in millions of current dollars. Series adjusted for 1975 1 through 1979 4 by ISER. Based on BEA's annual revised series
SOURCE: U.S. Bureau of Economic Analysis

PCMI.AK — Average personal income per worker, Alaska, in thousands of dollars. (Note: Value for 1987 1 is ISER estimate.)
SOURCE: PCMI.AK = PI/CFORCE

PCMI.AMS — Average earnings per worker, Anchorage-Matsu, in thousands of dollars.
SOURCES: Alaska Dept. of Labor (wages and salaries and labor force). PCMI.AMS = WSAMS*4/CPSFO.AM.

PCMI.FBK — Average earnings per worker, Fairbanks, in thousands of dollars.
SOURCES: Alaska Dept. of Labor (wages and salaries and labor force). PCMI.FBK = WSFBK*4/CPSFO.FB

RA.CPIRN — Real Anchorage Consumer Price Index for residential rent, 1986 = 100.
SOURCE: RA.CPIRN = CPIRNT86/A.CPIQ86*100

RAHFC1ST — Home mortgage interest rates on a $135,000 mortgage in the AHFC conventional, taxable program for the period 1981 4 forward. Prior to this, U.S. average for new home purchases, in percent.
SOURCES: AHFC, and U.S. Dept. of Commerce, Survey of Current Business.

RBLDINDX — Real construction cost index for institutional and large commercial buildings, Anchorage, 1986 = 100.
SOURCES: HMS, Inc., developed by Cliff Hitchins;
RBLDINDX = EXPAND(BLDINDXY/PDANCPI,4,4)/0.00717

REFI — The time period (1986 1 - 1987 2) that the AHFC refinance program is in effect.

RESAL.R — New resale listings, residential, in units.
SOURCES: Multiple Listing Service, Inc.; and Municipality of Anchorage, Building Safety Division.
RESAL.R = MLIS.R-HUSF(-1)-MALIMS.R+MALIMS.R(-1)

RMPR.C — Real average sale price of condominiums, in thousands of dollars.
SOURCE: RMPR.C = MPR.C*A.CPIQ86/100

RMPR.R — Real average sale price of residences, in thousands of dollars.
SOURCE: RMPR.R = MPR.R*A.CPIQ86/100

RPRIME — Prime rate charged by banks on short-term business loans, in percent.
SOURCE: U.S. Dept. of Commerce, Survey of Current Business.

ST.MF — Housing stock, multifamily structures, Anchorage-Matsu, in units.
SOURCES: Matanuska-Susitna Borough, Development Services Dept.; Municipality of Anchorage, Community Planning Dept.

ST.MH — Housing stock, mobile homes, Anchorage-Matsu, in units.
SOURCES: Matanuska-Susitna Borough, Development Services Dept.; Municipality of Anchorage, Community Planning Dept.

ST.SF — Housing stock, single-family structures, Anchorage-Matsu, in units.
SOURCES: Matanuska-Susitna Borough, Development Services Dept.; Municipality of Anchorage, Community Planning Dept.

WDRAW.C — Number of condominiums withdrawn from the market (nonforeclosures), in units.
SOURCE: WDRAW.C = MALI.C(-1)-MALI.C-MSAL.C+MLIS.C+F.C

WDRAW.R — Number of single-family residences withdrawn from the market (nonforeclosures), in units.
SOURCE: WDRAW.R = MALI.R(-1)-MALI.R-MSAL.R+MLIS.R+F.SF

Table C.4 HOUSING MODEL PARAMETER DEFINITIONS AND SOURCES

Parameters	Definitions	Sources
ADJUST.C	Long-run demand adjustment, condos.	ISER estimate.
ADJUST.R	Long-run demand adjustment, single-family.	ISER estimate.
A1	Fraction of single-family foreclosures listed for sale.	Policy.
A2	Ratio of single-family foreclosure sales to single-family foreclosure listings.	Policy.
A4	Fraction of single-family foreclosure inventory auctioned.	Policy.
B1	Fraction of condo foreclosures listed for sale.	Policy.
B2	Ratio of condo foreclosure sales to condo foreclosure listings.	Policy.
B4	Fraction of condo foreclosure inventory auctioned.	Policy.
CMF	Depreciation rate for housing stock, multifamily.	ISER estimate.
CMH	Depreciation rate for housing stock, mobile homes.	ISER estimate.
CSF	Depreciation rate for housing stock, single-family.	ISER estimate.
D2.0 – D2.5	Single-family demand coefficient.	Estimated from aggregate historical data.
D3.0 – D3.5	Condo demand coefficient.	Estimated from aggregate historical data.
E0 – E1	Days on market coefficient.	Estimated from aggregate historical data.
FS.SF0	Rate of sales out of foreclosed inventory, single-family houses.	Policy.
FS.C0	Rate of sales out of foreclosed inventory, condos.	Policy.
L1.0 – L1.3	Estimated ownership demand coefficient.	Estimated from AHFC survey and loan data.
L2.0 – L2.4	Housing demand coefficient.	Estimated from AHFC survey and loan data.
L3.0 – L3.3	Housing demand coefficient.	Estimated from AHFC survey and loan data.
L5.0 – L5.2	Probability of default coefficient.	Estimated from AHFC loan data.
M1.0 – M1.2	Price adjustment coefficient.	Estimated from aggregate historical data.
M2.0 – M2.2	Price adjustment coefficient.	Estimated from aggregate historical data.
M3.0 – M3.6	Price adjustment coefficient.	Estimated from aggregate historical data.
OCC.MF	Occupancy rate, multifamily.	Estimated from Municipality of Anchorage and Mat-Su Borough population and housing documents.
OCC.MH	Occupancy rate, mobile home.	"
OCC.SF	Occupancy rate, single-family.	"
P.MHO	World real price of mobile homes.	Average price 1980 1986.
RO	Minimum real rent, 1986 rent = 100.	Lowest level of real rent index, RA.CPIRN, 1975-1986.
R1.0 – R1.5	Rent index coefficient.	Estimated from historical cost of living data.
S1.0 – S1.4	New construction coefficient.	Estimated from aggregate historical data.
S2.0 – S2.5	New construction coefficient.	"
S4.0 – S4.6	New construction coefficient.	"
S5.0 – S5.6	New construction coefficient.	"
W1.0 – W1.2	Market adjustment coefficient.	"
W2.0 – W2.2	Market adjustment coefficient.	"

TABLE C.5. HOUSING MODEL PARAMETER VALUES

AHFC87C -

ADJUST.C	0.05	ADJUST.R	0.05
A1	1.	A4	0.
B1	0.3	B4	0.05
CMF	1.	CMH	0.93
CSF	1.	D2.0	12.3665
D2.1	-3.04996	D2.3	5.18443
D2.4	0.321377	D2.5	0.75356
D3.0	-22.5775	D3.1	-5.79511
D3.2	0.	D3.3	16.8689
D3.4	13.0466	D3.5	0.
EXPDAYS	16.22	E0	48.6142
E1	11.9458	FACTOR	0.06
FORGIVE	0.	FS.C0	50.
FS.SF0	250.	L1.0	-1.71
L1.1	-0.00589	L1.2	0.05264
L1.3	-0.045	L2.0	11.985
L2.1	-3.918	L2.2	2.23
L2.3	-0.169	L2.4	-3.743
L3.0	0.	L3.1	2.007
L3.2	-2.907	L3.3	-0.046
L4.0	-4.75	L4.01	-4.75
L4.1	0.000617	L4.2	0.005202
L5.0	-21.6	L5.1	-0.04436
L5.2	0.1628	M1.0	-3.562
M1.1	8.998	M1.2	0.
M2.0	-5.563	M2.1	11.0758
M2.2	0.	M3.0	4.01191
M3.1	0.386967	M3.5	-0.063142
M3.6	0.142467	OCC.MF	0.85
OCC.MH	0.93	OCC.SF	0.95
P.MH0	20.	R0	80.
R1.0	-11.4033	R1.2	0.83068
R1.3	1.03689	R1.4	0.415748
R1.5	1.23057	S1.0	-6.48515
S1.1	13.9139	S1.2	-3.93075
S1.3	-7.61136	S1.4	-0.629331
S2.0	25.5153	S2.2	17.7972
S2.3	-5.9601	S2.4	-17.7085
S2.5	2.27792	S4.0	-5.5987
S4.1	1.79927	S4.2	0.
S4.3	0.	S4.6	-0.005219
S5.0	1.105	S5.1	1.5643
S5.2	0.	S5.3	0.
S5.6	-0.032886	TRANS.MH	5.
W1.0	-1.12002	W1.01	-1.42
W1.1	0.014521	W1.2	2.49924
W2.0	-0.972	W2.1	0.
W2.2	0.833		

TABLE C.6. MACROS FOR MODEL USE

```
AHFCRUN -

 &COMMENT MACRO FOR SIMULATING MODEL_AHFC87C
 &END
USEMOD AHFC87C ;
DELSEARCH ALL; SEARCH DATA_AKRA@SA DATA_AKRA@9 DATA_AHFC87C;
PERIOD 4;DELBINDATA ALL;
BINOVAL W1.0 -1.22 B1 0.3 B4 0.05;LKBINOVAL;
&PRINT SIMULATIONS START IN 1987 1 AND MUST END BY 1995 4
&END
&READ &1"END DATE, IN DOUBLE QUOTES" &END
&READ &2"SCENARIO ARCHIVE TO SEARCH" &END
&READ &3"NAME FOR OUTPUT OSET" &END
BINDATA HH &2_HH A.CPI@86 &2_A.CPI@86 CFORCE &2_CFORCE
   PCMI.AK &2_PCMI.AK RMORTHFC &2_RMORTHFC RPRIME &2_RPRIME ;
BINDATA FI.MH AHFC87C_FI.MH RBLDINDX AHFC87C_RBLDINDX;
SIMULATE RELAX; SIMAL6 GAUSS;CONOPT STOP 30;
NEWDATA ALL,HH A.CPI@86 CFORCE PCMI.AK RMORTHFC RPRIME
  FI.MH RBLDINDX;
NEWDATA 1987 1 TO 1987 2,RMPR.R RMPR.C;
NEWDATA 1987 1 TO 1987 2,MLSDAYS FI.SF FS.C PSAL.C;
NEWDATA 1987 1 TO 1987 3,RE@UIT.R RE@UIT.C PD.R PD.C;
LKBINDATA;LKNEWDATA;
SIMSTART 1987 1;
DOTIL &1;
FILESIM &3 ;
DELBINDATA ALL;
&DELETE &1 &2 &3 &END
```

```
AHFCRUN1 -

 &COMMENT MACRO FOR SIMULATING MODEL_AHFC87C
 &END
USEMOD AHFC87C ;
DELSEARCH ALL; SEARCH DATA_AKRA@SA DATA_AKRA@9 DATA_AHFC87C;
PERIOD 4;DELBINDATA ALL;
BINDVAL W1.0 -1.22 B1 0.3 B4 0.05;LKBINDVAL;
&PRINT SIMULATIONS START IN 1987 1 AND MUST END BY 1995 4
&END
&READ &1"END DATE, IN DOUBLE QUOTES" &END
&READ &2"SCENARIO ARCHIVE TO SEARCH" &END
&READ &3"NAME FOR OUTPUT DSET" &END
BINDATA HH &2_HH A.CPI@86 &2_A.CPI@86 CFORCE &2_CFORCE
   PCMI.AK &2_PCMI.AK RMORTHFC &2_RMORTHFC RPRIME &2_RPRIME ;
BINDATA FI.MH AHFC87C_FI.MH RBLDINDX AHFC87C_RBLDINDX;
BINDATA REMOVE.C JUNK_REMOVE.C;
SIMULATE RELAX; SIMALG GAUSS;CONOPT STOP 30;
NEWDATA ALL,HH A.CPI@86 CFORCE PCMI.AK RMORTHFC RPRIME
  FI.MH RBLDINDX;
NEWDATA 1987 1 TO 1987 2,RMPR.R RMPR.C;
NEWDATA 1987 1 TO 1987 2,MLSDAYS FI.SF FS.C PSAL.C;
NEWDATA 1987 1 TO 1987 3,REQUIT.R REQUIT.C PD.R PD.C;
NEWDATA 1988 1 TO 1995 4, REMOVE.C;
LKBINDATA;LKNEWDATA;
SIMSTART 1987 1;
DOTIL &1;
FILESIM &3 ;
DELBINDATA ALL;
&DELETE &1 &2 &3 &END
```

```
AHFCRUN2 -

 &COMMENT MACRO FOR SIMULATING MODEL AHFC87C FOR FLOOR PRICE AND
 AUCTION CASES &END
USEMOD AHFC87C ;
DELSEARCH ALL; SEARCH DATA_AKRA@SA DATA_AKRA@9 DATA_AHFC87C;
PERIOD 4;DELBINDATA ALL;
BINDVAL W1.0 -1.22 B1 0.3 ;   LKBINDVAL;
&PRINT SIMULATIONS START IN 1987 1 AND MUST END BY 1995 4
&END
&READ &1"END DATE, IN DOUBLE QUOTES" &END
&READ &2"SCENARIO ARCHIVE TO SEARCH" &END
&READ &3"NAME FOR OUTPUT DSET" &END
BINDATA HH &2_HH A.CPI@86 &2_A.CPI@86 CFORCE &2_CFORCE
   PCMI.AK &2_PCMI.AK RMORTHFC &2_RMORTHFC RPRIME &2_RPRIME ;
BINDATA FI.MH AHFC87C_FI.MH RBLDINDX AHFC87C_RBLDINDX;
BINDATA PSAL.R MSAL.R HUSF JUNK_HUSF;
BINDATA MLSDAYS &2_MLSDAYS;
SIMULATE RELAX;SIMALG GAUSS;CONOPT STOP 30;
NEWDATA ALL,HH A.CPI@86 CFORCE PCMI.AK RMORTHFC RPRIME
  FI.MH RBLDINDX;
NEWDATA 1987 1 TO 1987 2,RMPR.R RMPR.C;
NEWDATA 1987 1 TO 1987 2, FI.SF FS.C PSAL.C PSAL.R;
NEWDATA 1987 1 TO 1987 3,RE@UIT.R RE@UIT.C PD.R PD.C;
NEWDATA 1988 1 TO 1995 4,MLSDAYS;
NEWDATA 1987 3 TO 1987 3,HUSF;
LKBINDATA;LKNEWDATA;
SIMSTART 1987 1;
DOTIL &1;
FILESIM &3 ;
DELBINDATA ALL;
&DELETE &1 &2 &3 &END
```

```
AHFC.EX -

&COMMENT
THIS MACRO CREATES THE EXOGENOUS DATA NECESSARY TO RUN THE AHFC
HOUSING MODEL. CREATED BY DSG 8/14/87. MODIFIED BY MDB 8/17/87
&END

&READ &1"NAME OF ARCHIVE TO CREATE" &END
&READ &2"NAME OF STATE OUTPUT DSET" &END
&READ &3"NAME OF REGIONAL OUTPUT DSET" &END

&COMMENT ********HISTORICAL DATA*********&END
DELSEARCH ALL;
SEARCH DATA_&1 W;
SEARCH DATA_AKRA@SA DATA_AKRA@9 DATA_AHFC87C;

&COMMENT ********PROJECTION DATA FROM MAP MODEL*****&END
PERIOD 1;
CRDATA DSETS &2,RANGE 1985 TO 1995, VARIABLES PDANCPI HH LF06
P.PI..BE P.DPI.B PI;
CRDATA DSETS &3, RANGE 1985 TO 1995, VARIABLES HH.AM HH.FG
HHCEN.05 PDP.12 PDP.13 PDP.14;
DO PHH=SPAT@(&3_HH.AM,4)*1000;
DO PPDANCPI=SPAT@(&2_PDANCPI,4);
DO PLF06=SPAT@(&2_LF06,4);
DO PP.PI=SPAT@(&2_PI/&2_LF06,4);
DELETE DATA PRPRIME; DELETE DATA PRMORTHFC;
DEDIT PRPRIME,4,1986 1; ADD TOP, 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8  8 8 ; FILE;
DEDIT PRMORTHFC,4,1986 1;ADD TOP, 10 10 10 10 10 10 10 10 10 10 10 10
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
10 10 10 10 10 10 10 10 10 10;FILE;
PERIOD 4;

DO X=PPDANCPI/2.803;
DO A.CPI@86=OVERLAY(A.CPI@86,X);
DO RPRIME=OVERLAY(RPRIME,PRPRIME);
DO RMORTHFC=OVERLAY(RMORTHFC,PRMORTHFC);
DO HH=OVERLAY(HH,PHH);
DO CFORCE=OVERLAY(CFORCE,PLF06);
DO PCMI.AK=OVERLAY(PCMI.AK,PP.PI);
DELETE DATA X;

DELSEARCH ALL;
SEARCH DATA_&1;
USEMOD &1; MODEDIT; ADDEQ TOP, JUNK==A.CPI@86+RPRIME+PCMI.AK+RMORTHFC+
HH+CFORCE;
CHANGESYM DEFINITION JUNK; CRDSET ALL;
DPRTDSET DSETS &1, RANGE 1980 1 TO 1995 4, VARIABLES EXOGENOUS;
DELETE DSET &1;&DELETE &1 &2 &3 &END
DELSEARCH ALL; STARTPRT;
```

APPENDIX D

HOUSING MODEL REGRESSION OUTPUT

PART D.1. REGRESSION EQUATIONS

TWO-STAGE LEAST SQUARES

MODEL NAME: AHFC87B

9 : LOG(MSAL.R/CFORCE) = D2.0+D2.1*LOG(RMPR.R)+D2.3*((CFORCE-CFORCE(-4))/CFORCE(-4))+D2.4*LOG(RPCMI.AK)+D2.5*LOG(RMORTHFC)

NOB = 41		NOVAR = 5		NCOEF = 5		NOINST = 8		RANGE: 1977 1	TO 1987 1		
RS@ =	0.465	CRS@ =	0.405	F(4/36) =	7.807	PROB>F =	0.	SER =	0.245		
SSR =	2.156	DW(0) =	0.629	COND =	380.661	MAX:HAT =	NA	RSTUDENT =	NA		
DFFITS =	NA										

COEF	ESTIMATE	STER	TSTAT	PROB>|T|
D2.0	12.671	5.513	2.298	0.027
D2.1	-3.05	0.682	-4.469	0.
D2.3	5.184	1.597	3.246	0.003
D2.4	0.321	0.921	0.349	0.729
D2.5	0.754	0.308	2.448	0.019

MODEL NAME: AHFC87B

10 : LOG(MSAL.C/CFORCE) = D3.0+D3.1*LOG(RMPR.C)+0*LOG(RA.CPIRN)+D3.3((CFORCE-CFORCE(-4))/CFORCE(-4))+D3.4*LOG(RPCMI.AK)+0*LOG(RAHFC1ST)

NOB = 29		NOVAR = 4		NCOEF = 4		NOINST = 8					
RANGE: 1980 1	TO 1987 1										
RS@ =	0.642	CRS@ =	0.599	F(3/25) =	14.945	PROB>F =					
0.	SER =	0.517									
SSR =	6.682	DW(0) =	0.361	COND =	347.861	MAX:HAT =					
NA	RSTUDENT =	NA									
DFFITS =	NA										

COEF	ESTIMATE	STER	TSTAT	PROB>|T|
D3.0	-21.826	10.844	-2.013	0.055
D3.1	-5.795	1.688	-3.433	0.002
D3.3	16.869	3.604	4.681	0.
D3.4	13.047	3.802	3.432	0.002

Part D.1. (continued)

TWO-STAGE LEAST SQUARES

MODEL NAME: AHFC87B

11 : LOG(HUSF) = S1.0+S1.1*LOG(RMPR.R)+S1.2*LOG(MLSDAYS)+S1.3*LOG(RBLDINDX)+S1.4*LOG(RPRIME)

NOB = 41	NOVAR = 5		NCOEF = 5		NOINST = 8		RANGE: 1977 1	TO 1987 1	
RSQ =	0.506	CRSQ =	0.451	F(4/36) =	9.209	PROB>F =	0.	SER =	0.646
SSR =	15.019	DW(0) =	1.767	COND =	880.892	MAX:HAT =	NA	RSTUDENT =	NA
DFFITS =	NA								

COEF	ESTIMATE	STER	TSTAT	PROB>|T|
S1.0	-6.485	31.239	-0.208	0.837
S1.1	13.914	2.433	5.719	0.
S1.2	-3.931	1.139	-3.452	0.001
S1.3	-7.611	5.324	-1.43	0.161
S1.4	-0.629	0.389	-1.619	0.114

TWO-STAGE LEAST SQUARES

MODEL NAME: AHFC87B

12 : LOG(HUMF) = S2.0+S2.2*LOG(RA.CPIRN)+S2.3*LOG(MLSDAYS)+S2.4*LOG(RBLDINDX)+S2.5*LOG(RPRIME)

NOB = 41	NOVAR = 5		NCOEF = 5		NOINST = 8		RANGE: 1977 1	TO 1987 1	
RSQ =	0.605	CRSQ =	0.562	F(4/36) =	13.812	PROB>F =	0.	SER =	1.039
SSR =	38.893	DW(0) =	1.965	COND =	869.554	MAX:HAT =	NA	RSTUDENT =	NA
DFFITS =	NA								

COEF	ESTIMATE	STER	TSTAT	PROB>|T|
S2.0	25.515	48.139	0.53	0.599
S2.2	17.797	2.468	7.21	0.
S2.3	-5.96	1.785	-3.339	0.002
S2.4	-17.708	8.734	-2.028	0.05
S2.5	2.278	0.725	3.142	0.003

Part D.1. (continued)

TWO-STAGE LEAST SQUARES

MODEL NAME: AHFC87B

16 : LOG(RESAL.R/CFORCE(-4)) = S4.0+S4.1*LOG(ERMPR.R)+S4.6*(CFORCE-CFORCE(-4)/CFORCE(-4))

NOB = 34		NOVAR = 3		NCOEF = 3		NOINST = 8		RANGE: 1978 4	TO	1987 1
RSQ =	0.356	CRSQ =	0.314	F(2/31) =	8.569	PROB>F =	0.001	SER =		0.161
SSR =	0.807	DW(0) =	1.617	COND =	193.033	MAX:HAT =	NA	RSTUDENT =		NA
DFFITS =	NA									

COEF	ESTIMATE	STER	TSTAT	PROB>|T|
S4.0	-5.558	2.08	-2.671	0.012
S4.1	1.799	0.473	3.806	0.
S4.6	-0.005	0.001	-3.835	0.

TWO-STAGE LEAST SQUARES

MODEL NAME: AHFC87B

17 : LOG(MLIS.C/CFORCE(-4)) = S5.0+S5.1*LOG(ERMPR.C)+S5.6*(CFORCE-CFORCE(-4)/CFORCE(-4))

NOB = 20		NOVAR = 3		NCOEF = 3		NOINST = 8		RANGE: 1982 2	TO	1987 1
RSQ =	0.887	CRSQ =	0.873	F(2/17) =	66.398	PROB>F =	0.	SER =		0.202
SSR =	0.695	DW(0) =	1.68	COND =	115.096	MAX:HAT =	NA	RSTUDENT =		NA
DFFITS =	NA									

COEF	ESTIMATE	STER	TSTAT	PROB>|T|
S5.0	1.447	2.234	0.648	0.526
S5.1	1.564	0.442	3.543	0.003
S5.6	-0.033	0.003	-10.752	0.

Part D.1. (continued)

```
        MODEL NAME:  AHFC87B

         18 :  LOG((MSAL.R-FS.SF)/MALI.R) = M1.0+M1.1*REQUIT.R/RMPR.R(-1)+0*LO
(RMPR.R/ERMPR.R)

NOB = 41             NOVAR = 2             NCOEF = 2             NOINST = 8
RANGE:  1977 1  TO  1987 1
RS@ =          0.804 CRS@ =          0.799  F(1/39) =     159.532  PROB>F =
0.     SER =           0.363
SSR =          5.148 DW(0) =         1.11   COND =          6.158  MAX:HAT =
NA     RSTUDENT =      NA
DFFITS =       NA

     COEF       ESTIMATE    STER        TSTAT       PROB>|T|

M1.0              -3.02        0.179     -16.844        0.
M1.1               8.998       0.711      12.658        0.
```

```
        MODEL NAME:  AHFC87B

         19 :  LOG((MSAL.C-FS.C)/MALI.C) = M2.0+M2.1*REQUIT.C/RMPR.C(-1)+0*LOG
RMPR.C/ERMPR.C)

NOB = 20             NOVAR = 2             NCOEF = 2             NOINST = 8
RANGE:  1982 2  TO  1987 1
RS@ =          0.783 CRS@ =          0.771  F(1/18) =      65.088  PROB>F =
0.     SER =           0.809
SSR =         11.781 DW(0) =         0.484  COND =          2.905  MAX:HAT =
NA     RSTUDENT =      NA
DFFITS =       NA

     COEF       ESTIMATE    STER        TSTAT       PROB>|T|

M2.0              -3.992       0.294     -13.583        0.
M2.1              11.076       1.379       8.032        0.
```

Part D.1. (continued)

```
        TWO-STAGE LEAST SQUARES

        MODEL NAME:  AHFC87B

          20 :  LOG(MLSDAYS) = M3.0+M3.1*LOG(MALI.R/MSAL.R)+M3.5*DUMMY1+M3.6*DUMMY2

NOB = 41            NOVAR = 4            NCOEF = 4            NOINST = 8          RANGE:  1977 1  TO  1987 1
RSQ =          0.886 CRSQ =         0.877  F(3/37) =      95.771  PROB>F =        0.    SER =          0.119
SSR =          0.52  DW(0) =        1.228  COND =          6.552  MAX:HAT =       NA    RSTUDENT =     NA
DFFITS =       NA
```

COEF	ESTIMATE	STER	TSTAT	PROB>|T|
M3.0	4.012	0.04	99.075	0.
M3.1	0.387	0.058	6.718	0.
M3.5	-0.063	0.055	-1.141	0.261
M3.6	0.142	0.068	2.092	0.043

```
        MODEL NAME:  AHFC87B

          21 :  LOG(WDRAW.R/MALI.R(-1)) = W1.0+W1.1*LOG(MLSDAYS)+W1.2*REQUIT.R/
MPR.R(-1)

NOB = 41            NOVAR = 3            NCOEF = 3            NOINST = 8
RANGE:  1977 1  TO  1987 1
RSQ =          0.35  CRSQ =         0.316  F(2/38) =      10.248  PROB>F =
0.     SER =          0.277
SSR =          2.922 DW(0) =        1.782  COND =         80.552  MAX:HAT =
NA     RSTUDENT =      NA
DFFITS =       NA
```

COEF	ESTIMATE	STER	TSTAT	PROB>|T|
W1.0	-1.12	1.557	-0.72	0.476
W1.1	0.015	0.296	0.049	0.961
W1.2	2.499	1.2	2.082	0.044

Part D.1. (continued)

MODEL NAME: AHFC87B

22 : LOG(WDRAW.C/MALI.C(-1)) = W2.0+0*LOG(MLSDAYS)+W2.2*REQUIT.C/RMP
.C(-1)

NOB = 20 NOVAR = 2 NCOEF = 2 NOINST = 8
RANGE: 1982 2 TO 1987 1
RSQ = 0.149 CRSQ = 0.101 F(1/18) = 3.141 PROB>F =
0.093 SER = 0.294
SSR = 1.553 DW(0) = 2.081 COND = 2.905 MAX:HAT =
NA RSTUDENT = NA
DFFITS = NA

COEF	ESTIMATE	STER	TSTAT	PROB>|T|
W2.0	-0.972	0.107	-9.112	0.
W2.2	0.833	0.501	1.663	0.114

TWO-STAGE LEAST SQUARES

MODEL NAME: AHFC87B

23 : LOG(RA.CPIRN) = R1.0+R1.2*LOG(CFORCE)+R1.3*LOG(RPCMI.AK)+R1.4*LOG(RA.CPIRN(-4))+R1.5*LOG(RBLDINDX(-1))

NOB = 41 NOVAR = 5 NCOEF = 5 NOINST = 8 RANGE: 1977 1 TO 1987 1
RSQ = 0.887 CRSQ = 0.874 F(4/36) = 70.54 PROB>F = 0. SER = 0.036
SSR = 0.047 DW(0) = 1.014 COND = 784.709 MAX:HAT = NA RSTUDENT = NA
DFFITS = NA

COEF	ESTIMATE	STER	TSTAT	PROB>|T|
R1.0	-11.354	1.591	-7.136	0.
R1.2	0.831	0.103	8.087	0.
R1.3	1.037	0.108	9.561	0.
R1.4	0.416	0.06	6.917	0.
R1.5	1.231	0.233	5.279	0.

Part D.1. (continued)

```
        ORDINARY LEAST SQUARES

        MODEL NAME:  AHFC87B

         24 :  MLSDAYS = E0+E1*MALI.R/MSAL.R

NOB = 50            NOVAR = 2            NCOEF = 2            RANGE:  1975
1  TO  1987 2
RSQ =          0.81  CRSQ =         0.806  F(1/48) =     204.267  PROB>F =
0.     SER =          12.963
SSR =       8065.72  DW(0) =         0.667  COND =         2.778  MAX:HAT =
0.187  RSTUDENT =      2.979
DFFITS =      -0.605

     COEF       ESTIMATE    STER       TSTAT      PROB>|T|

E0                48.614      2.876     16.902      0.
E1                11.946      0.836     14.292      0.
```

PART D.2. REGRESSION OUTPUT

LOGIT ESTIMATION 1 DATA SUMMARY

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
OWN	391.0	100.0	247.0	63.17
RENT	391.0	100.0	144.0	36.83

LOGIT ESTIMATION RESULTS
THE DEPENDENT VARIABLE IS TENURE

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-4.777	0.7936	-6.020
HCOSTA[a]	-0.8373E-03	0.3383E-03	-2.475
HHSIZE	0.1150	0.1989	0.5781
HHTYPE	0.8553	0.4818	1.775
HHINCOME	0.5896E-04	0.9115E-05	6.469
SEX	0.1852	0.3010	0.6151
AGE	0.4773E-01	0.1373E-01	3.477
SINGLE	0.5233	0.4444	1.178
DIVWID	-1.263	0.6589	-1.916
MIG75	1.279	0.3083	4.150
RETIRED	-0.1146	0.8907	-0.1287

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-186.2	-271.0
SUM OF SQUARED RESIDUALS	400.8	391.0
DEGREES OF FREEDOM	380.0	391.0
PERCENT CORRECTLY PREDICTED	77.24	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.3130
LIKELIHOOD RATIO STATISTIC	169.7

---

[a] $\frac{\text{actual payment}}{\text{estimated payment}}$

DATA SOURCE: ISER Alaska Economic Survey, June 1987

LOGIT ESTIMATION 4 DATA SUMMARY

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
OWN	421.0	100.0	235.0	55.82
RENT	421.0	100.0	186.0	44.18

LOGIT ESTIMATION RESULTS
THE DEPENDENT VARIABLE IS TENURE

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-5.294	0.7516	-7.043
HCOSTBS[b]	-0.1693E-02	0.4868E-03	-3.478
HHSIZE	-0.6355E-01	0.1767	-0.3596
HHTYPE	1.233	0.4546	2.712
HHINCOME	0.6964E-04	0.9025E-05	7.716
SEX	0.1097E-01	0.2904	0.3777E-01
AGE	0.6287E-01	0.1350E-01	4.658
SINGLE	0.3568	0.4246	0.8403
DIVWID	-0.8406	0.6582	-1.277
MIG75	1.459	0.2989	4.880
RETIRED	-0.8383	0.7822	-1.072

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-195.5	-291.8
SUM OF SQUARED RESIDUALS	425.0	421.0
DEGREES OF FREEDOM	410.0	421.0
PERCENT CORRECTLY PREDICTED	79.57	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.3299
LIKELIHOOD RATIO STATISTIC	192.5

---

[b] $\frac{\text{value}}{\text{standard rent}}$, $\frac{\text{rent}}{\text{standard value}}$

DATA SOURCE: ISER Alaska Economic Survey, June 1987

Part D.2. (continued)

LOGIT ESTIMATION 5 DATA SUMMARY

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
OWN	1070.	100.0	439.0	41.03
RENT	1070.	100.0	631.0	58.97

LOGIT ESTIMATION RESULTS
THE DEPENDENT VARIABLE IS TENURE

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-3.901	0.4050	-9.633
HCOSTA[a]	-0.1635E-02	0.2617E-03	-6.248
HHSIZE	0.1066	0.8706E-01	1.225
HHTYPE	0.2421	0.2241	1.080
HHINCOME	0.5264E-04	0.4986E-05	10.56
SEX	0.2299	0.1802	1.276
AGE	0.3560E-01	0.7712E-02	4.616
SINGLE	0.8012E-01	0.2083	0.3847
DIVWID	-0.6482	0.2307	-2.809
MIG75	1.315	0.1677	7.841
RETIRED	-0.4379	0.5357	-0.8174

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-527.5	-741.7
SUM OF SQUARED RESIDUALS	1684.	1591.
DEGREES OF FREEDOM	1059.	1070.
PERCENT CORRECTLY PREDICTED	76.79	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.2887
LIKELIHOOD RATIO STATISTIC	428.3

---

[a] $\frac{\text{actual payment}}{\text{estimated payment}}$

DATA SOURCES: ISER Alaska Economic Survey, June 1987; U.S. Census of 1980, Public Use Sample, Anchorage.

LOGIT ESTIMATION 8 DATA SUMMARY

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
OWN	1618.	100.0	937.0	57.91
RENT	1618.	100.0	681.0	42.09

LOGIT ESTIMATION RESULTS
THE DEPENDENT VARIABLE IS TENURE

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-3.949	0.3423	-11.54
HCOSTBS[b]	-0.1935E-02	0.2415E-03	-8.014
HHSIZE	-0.5880E-01	0.6807E-01	-0.8638
HHTYPE	1.097	0.1876	5.846
HHINCOME	0.6373E-04	0.4425E-05	14.40
SEX	-0.2084	0.1569	-1.328
AGE	0.4876E-01	0.6630E-02	7.355
SINGLE	-0.2193E-01	0.1818	-0.1206
DIVWID	-0.2105	0.1916	-1.099
MIG75	1.248	0.1382	9.029
RETIRED	-0.6117	0.4212	-1.452

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-752.0	-1122.
SUM OF SQUARED RESIDUALS	2692.	2439.
DEGREES OF FREEDOM	1607.	1618.
PERCENT CORRECTLY PREDICTED	77.64	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.3295
LIKELIHOOD RATIO STATISTIC	739.2

---

b $\frac{\text{value}}{\text{standard rent}}$, $\frac{\text{rent}}{\text{standard value}}$

DATA SOURCES: ISER Alaska Economic Survey, June 1987; U.S. Census of 1980, Public Use Sample, Anchorage.

LOGIT ESTIMATION 10 DATA SUMMARY

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
OWN	1070.	100.0	439.0	41.03
RENT	1070.	100.0	631.0	58.97

LOGIT ESTIMATION RESULTS
THE DEPENDENT VARIABLE IS TENURE

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	10.73	2.516	4.265
HCOSTA[a]	-0.1847E-02	0.2710E-03	-6.814
SCOST[c]	-0.3326E-01	0.5695E-02	-5.840
HHSIZE	0.1660E-01	0.8923E-01	0.1860
HHTYPE	0.4295	0.2296	1.871
HHINCOME	0.4965E-04	0.5051E-05	9.829
SEX	0.8236E-01	0.1857	0.4434
AGE	0.3139E-01	0.7866E-02	3.991
SINGLE	-0.2572E-01	0.2128	-0.1209
DIVWID	-0.2605	0.2406	-1.082
MIG75	1.133	0.1731	6.543
RETIRED	-0.3113	0.5487	-0.5674

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-509.9	-741.7
SUM OF SQUARED RESIDUALS	1670.	1591.
DEGREES OF FREEDOM	1058.	1070.
PERCENT CORRECTLY PREDICTED	77.30	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.3125
LIKELIHOOD RATIO STATISTIC	463.6

[a] $\frac{\text{actual payment}}{\text{estimated payment}}$ [c] $\frac{\text{standard value}}{\text{standard rent}}$

DATA SOURCES: ISER Alaska Economic Survey, June 1987; U.S. Census of 1980, Public Use Sample, Anchorage.

LOGIT ESTIMATION 1 DATA SUMMARY

THE ALTERNATIVES AND THEIR FREQUENCIES ARE -

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
DEFAULT	1117.	100.0	413.0	36.97
SELL	1117.	100.0	704.0	63.03

LOGIT ESTIMATION RESULTS
****
THE DEPENDENT VARIABLE IS STATUS

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-21.13	2.200	-9.602
FBK	-0.2208	0.1905	-1.159
CO	0.4845	0.2518	1.924
MH	0.7497	0.2938	2.552
TOTFAM	0.8669E-01	0.8339E-01	1.040
AGE1	0.8280E-03	0.1443E-01	0.5739E-01
AGE2	-0.8363E-02	0.1794E-01	-0.4662
SPOUSE	0.3731	0.6062	0.6156
LOGINC	0.2154	0.3432	0.6275
LOGASS	-0.2713	0.1453	-1.867
LOGLIAB	0.8641E-01	0.6647E-01	1.300
HOF	0.8663	0.3940	2.198
PAM	-1.899	0.8145	-2.331
EQUITY	-0.3739E-04	0.5665E-05	-6.599
PMLSDAYS	0.1713	0.1580E-01	10.84

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-396.0	-774.2
SUM OF SQUARED RESIDUALS	1385.	1117.
DEGREES OF FREEDOM	1102.	1117.
PERCENT CORRECTLY PREDICTED	85.23	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.4886
LIKELIHOOD RATIO STATISTIC	756.5

SOURCE: AHFC borrower file, 1980-1987

Part D.2. (continued)

LOGIT ESTIMATION 2 DATA SUMMARY

THE ALTERNATIVES AND THEIR FREQUENCIES ARE -

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
DEFAULT	1117.	100.0	413.0	36.97
SELL	1117.	100.0	704.0	63.03

LOGIT ESTIMATION RESULTS
****
THE DEPENDENT VARIABLE IS STATUS

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-22.23	2.265	-9.817
FBK	-0.2707	0.1931	-1.402
CO	0.5971	0.2560	2.332
MH	0.8611	0.2975	2.895
TOTFAM	0.6673E-01	0.8439E-01	0.7906
AGE1	0.3202E-02	0.1461E-01	0.2192
AGE2	-0.1175E-01	0.1811E-01	-0.6488
SPOUSE	0.5168	0.6138	0.8419
LOGINC	0.2106	0.3432	0.6136
LOGASS	-0.3325	0.1492	-2.229
LOGLIAB	0.8696E-01	0.6663E-01	1.305
HOF	0.8454	0.3976	2.127
PAM	-1.863	0.8210	-2.270
PERIOD	-0.1436E-01	0.5953E-02	-2.413
EQUITY	-0.2855E-04	0.6256E-05	-4.564
PMLSDAYS	0.1848	0.1698E-01	10.89

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-393.1	-774.2
SUM OF SQUARED RESIDUALS	1391.	1117.
DEGREES OF FREEDOM	1101.	1117.
PERCENT CORRECTLY PREDICTED	84.60	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.4923
LIKELIHOOD RATIO STATISTIC	762.4

SOURCE: AHFC borrower file, 1980-1987

Part D.2. (continued)

LOGIT ESTIMATION 3 DATA SUMMARY

THE ALTERNATIVES AND THEIR FREQUENCIES ARE -

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
DEFAULT	1117.	100.0	413.0	36.97
SELL	1117.	100.0	704.0	63.03

LOGIT ESTIMATION RESULTS
****
THE DEPENDENT VARIABLE IS STATUS

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-21.36	2.223	-9.606
FBK	-0.2256	0.1909	-1.182
CO	0.4858	0.2521	1.927
MH	0.7368	0.2950	2.498
TOTFAM	0.8749E-01	0.8343E-01	1.049
AGE1	0.1251E-03	0.1447E-01	0.8643E-02
AGE2	-0.8339E-02	0.1797E-01	-0.4641
SPOUSE	0.3700	0.6072	0.6094
LOGINC	0.2294	0.3443	0.6664
LOGASS	-0.2761	0.1458	-1.894
LOGLIAB	0.8779E-01	0.6673E-01	1.316
HOF	0.8626	0.3946	2.186
PAM	-1.901	0.8153	-2.331
ABEPER	-0.4147E-01	0.4740E-01	-0.8749
EQUITY	-0.3716E-04	0.5665E-05	-6.560
PMLSDAYS	0.1733	0.1603E-01	10.81

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-395.6	-774.2
SUM OF SQUARED RESIDUALS	1406.	1117.
DEGREES OF FREEDOM	1101.	1117.
PERCENT CORRECTLY PREDICTED	84.96	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.4891
LIKELIHOOD RATIO STATISTIC	757.3

SOURCE: AHFC borrower file, 1980-1987

Part D.2. (continued)

LOGIT ESTIMATION 4 DATA SUMMARY

THE ALTERNATIVES AND THEIR FREQUENCIES ARE -

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
DEFAULT	1117.	100.0	413.0	36.97
SELL	1117.	100.0	704.0	63.03

LOGIT ESTIMATION RESULTS
****
THE DEPENDENT VARIABLE IS STATUS

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-22.38	2.281	-9.811
FBK	-0.2731	0.1933	-1.412
CO	0.5955	0.2562	2.324
MH	0.8482	0.2987	2.839
TOTFAM	0.6803E-01	0.8443E-01	0.8057
AGE1	0.2585E-02	0.1465E-01	0.1764
AGE2	-0.1161E-01	0.1813E-01	-0.6404
SPOUSE	0.5094	0.6145	0.8290
LOGINC	0.2214	0.3441	0.6433
LOGASS	-0.3344	0.1494	-2.238
LOGLIAB	0.8789E-01	0.6685E-01	1.315
HOF	0.8426	0.3979	2.118
PAM	-1.866	0.8216	-2.271
PERIOD	-0.1400E-01	0.5981E-02	-2.340
ABEPER	-0.3062E-01	0.4692E-01	-0.6525
EQUITY	-0.2862E-04	0.6262E-05	-4.571
PMLSDAYS	0.1860	0.1712E-01	10.87

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-392.8	-774.2
SUM OF SQUARED RESIDUALS	1413.	1117.
DEGREES OF FREEDOM	1100.	1117.
PERCENT CORRECTLY PREDICTED	84.51	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.4926
LIKELIHOOD RATIO STATISTIC	762.8

SOURCE: AHFC borrower file, 1980-1987

Part D.2. (continued)

LOGIT ESTIMATION 1 DATA SUMMARY

THE ALTERNATIVES AND THEIR FREQUENCIES ARE -

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
DEFAULT	1117.	100.0	413.0	36.97
SELL	1117.	100.0	704.0	63.03

LOGIT ESTIMATION RESULTS

****

THE DEPENDENT VARIABLE IS STATUS

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-19.00	2.002	-9.493
FBK	-0.1521	0.1867	-0.8146
TOTFAM	0.6491E-01	0.8135E-01	0.7979
AGE1	0.3183E-02	0.1431E-01	0.2224
AGE2	-0.7992E-02	0.1779E-01	-0.4491
SPOUSE	0.3191	0.5990	0.5327
LOGINC	-0.2064E-01	0.3259	-0.6334E-01
LOGASS	-0.2872	0.1437	-1.999
LOGLIAB	0.9122E-01	0.6602E-01	1.382
HOF	0.7259	0.3697	1.964
PAM	-2.096	0.8185	-2.561
EQUITY	-0.4436E-04	0.5336E-05	-8.312
PMLSDAYS	0.1628	0.1508E-01	10.80

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-399.8	-774.2
SUM OF SQUARED RESIDUALS	1531.	1117.
DEGREES OF FREEDOM	1104.	1117.
PERCENT CORRECTLY PREDICTED	85.32	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.4837
LIKELIHOOD RATIO STATISTIC	748.9

SOURCE: AHFC borrower file, 1980-1987

Part D.2. (continued)

LOGIT ESTIMATION 2 DATA SUMMARY

THE ALTERNATIVES AND THEIR FREQUENCIES ARE -

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
DEFAULT	1117.	100.0	413.0	36.97
SELL	1117.	100.0	704.0	63.03

LOGIT ESTIMATION RESULTS
****
THE DEPENDENT VARIABLE IS STATUS

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-19.59	2.043	-9.586
FBK	-0.1796	0.1881	-0.9547
TOTFAM	0.4608E-01	0.8231E-01	0.5598
AGE1	0.5119E-02	0.1447E-01	0.3538
AGE2	-0.1026E-01	0.1792E-01	-0.5725
SPOUSE	0.4122	0.6041	0.6823
LOGINC	-0.4963E-01	0.3258	-0.1524
LOGASS	-0.3333	0.1471	-2.265
LOGLIAB	0.9120E-01	0.6623E-01	1.377
HOF	0.7077	0.3715	1.905
PAM	-2.093	0.8222	-2.545
PERIOD	-0.1077E-01	0.5901E-02	-1.825
EQUITY	-0.3805E-04	0.6111E-05	-6.226
PMLSDAYS	0.1720	0.1607E-01	10.70

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-398.1	-774.2
SUM OF SQUARED RESIDUALS	1433.	1117.
DEGREES OF FREEDOM	1103.	1117.
PERCENT CORRECTLY PREDICTED	84.96	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.4858
LIKELIHOOD RATIO STATISTIC	752.3

SOURCE: AHFC borrower file, 1980-1987

Part D.2. (continued)

LOGIT ESTIMATION 3 DATA SUMMARY

THE ALTERNATIVES AND THEIR FREQUENCIES ARE -

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
DEFAULT	1117.	100.0	413.0	36.97
SELL	1117.	100.0	704.0	63.03

LOGIT ESTIMATION RESULTS
****
THE DEPENDENT VARIABLE IS STATUS

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-19.28	2.030	-9.499
FBK	-0.1602	0.1872	-0.8556
TOTFAM	0.6570E-01	0.8143E-01	0.8068
AGE1	0.2340E-02	0.1436E-01	0.1629
AGE2	-0.7997E-02	0.1783E-01	-0.4485
SPOUSE	0.3152	0.6003	0.5251
LOGINC	-0.6074E-03	0.3272	-0.1856E-02
LOGASS	-0.2920	0.1441	-2.027
LOGLIAB	0.9338E-01	0.6632E-01	1.408
HOF	0.7284	0.3705	1.966
PAM	-2.090	0.8184	-2.554
ABEPER	-0.4772E-01	0.4792E-01	-0.9957
EQUITY	-0.4401E-04	0.5337E-05	-8.247
PMLSDAYS	0.1651	0.1533E-01	10.77

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-399.3	-774.2
SUM OF SQUARED RESIDUALS	1534.	1117.
DEGREES OF FREEDOM	1103.	1117.
PERCENT CORRECTLY PREDICTED	85.32	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.4843
LIKELIHOOD RATIO STATISTIC	749.9

SOURCE: AHFC borrower file, 1980-1987

Part D.2. (continued)

LOGIT ESTIMATION 4 DATA SUMMARY

THE ALTERNATIVES AND THEIR FREQUENCIES ARE -

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
DEFAULT	1117.	100.0	413.0	36.97
SELL	1117.	100.0	704.0	63.03

LOGIT ESTIMATION RESULTS
****
THE DEPENDENT VARIABLE IS STATUS

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-19.81	2.067	-9.584
FBK	-0.1858	0.1886	-0.9853
TOTFAM	0.4763E-01	0.8238E-01	0.5781
AGE1	0.4300E-02	0.1452E-01	0.2961
AGE2	-0.1014E-01	0.1794E-01	-0.5652
SPOUSE	0.4039	0.6051	0.6675
LOGINC	-0.3122E-01	0.3271	-0.9544E-01
LOGASS	-0.3356	0.1474	-2.277
LOGLIAB	0.9304E-01	0.6651E-01	1.399
HOF	0.7102	0.3722	1.908
PAM	-2.087	0.8220	-2.539
PERIOD	-0.1035E-01	0.5928E-02	-1.745
ABEPER	-0.4008E-01	0.4761E-01	-0.8418
EQUITY	-0.3801E-04	0.6112E-05	-6.220
PMLSDAYS	0.1737	0.1625E-01	10.69

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-397.7	-774.2
SUM OF SQUARED RESIDUALS	1451.	1117.
DEGREES OF FREEDOM	1102.	1117.
PERCENT CORRECTLY PREDICTED	85.23	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.4863
LIKELIHOOD RATIO STATISTIC	753.0

SOURCE: AHFC borrower file, 1980-1987

Part D.2. (continued)

LOGIT ESTIMATION 1 DATA SUMMARY

THE ALTERNATIVES AND THEIR FREQUENCIES ARE -

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
DIVEST	7620.	100.0	943.0	12.38
HOLD	7620.	100.0	6677.	87.62

LOGIT ESTIMATION RESULTS
****
THE DEPENDENT VARIABLE IS STATUS

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-1.335	0.3736	-3.574
FBK	-0.1543E-01	0.7231E-01	-0.2134
CO	0.2815	0.9545E-01	2.950
MH	0.3977	0.1094	3.634
TOTFAM	0.2794E-01	0.3463E-01	0.8068
AGE1	-0.1923E-01	0.5520E-02	-3.483
AGE2	-0.1194E-02	0.6905E-02	-0.1729
SPOUSE	-0.7423E-01	0.2335	-0.3180
LOGINC	0.7045E-01	0.1304	0.5404
LOGASS	-0.1044	0.5181E-01	-2.015
LOGLIAB	0.5026E-01	0.2575E-01	1.952
HOF	-0.1207	0.1482	-0.8143
PAM	0.4940	0.2006	2.462
ABEPER	0.1684	0.4305E-01	3.911
EQUITY	0.5978E-06	0.1702E-05	0.3513
PDFORCE	0.6281E-02	0.4732E-02	1.327

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-2813.	-5282.
SUM OF SQUARED RESIDUALS	7633.	7620.
DEGREES OF FREEDOM	7604.	7620.
PERCENT CORRECTLY PREDICTED	87.62	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.4674
LIKELIHOOD RATIO STATISTIC	4938.

SOURCE: AHFC borrower file, 1980-1987

Part D.2. (continued)

LOGIT ESTIMATION 2 DATA SUMMARY

THE ALTERNATIVES AND THEIR FREQUENCIES ARE -

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
DIVEST	7620.	100.0	943.0	12.38
HOLD	7620.	100.0	6677.	87.62

LOGIT ESTIMATION RESULTS
****
THE DEPENDENT VARIABLE IS STATUS

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-2.069	0.3880	-5.333
FBK	-0.8281E-02	0.7254E-01	-0.1142
CO	0.2519	0.9593E-01	2.626
MH	0.3433	0.1103	3.113
TOTFAM	0.3769E-01	0.3478E-01	1.084
AGE1	-0.1979E-01	0.5525E-02	-3.581
AGE2	-0.2663E-03	0.6895E-02	-0.3862E-01
SPOUSE	-0.1215	0.2334	-0.5206
LOGINC	0.9850E-01	0.1307	0.7538
LOGASS	-0.7488E-01	0.5215E-01	-1.436
LOGLIAB	0.5422E-01	0.2601E-01	2.085
HOF	-0.5368E-01	0.1491	-0.3600
PAM	0.4930	0.2011	2.452
PERIOD	0.1728E-01	0.2470E-02	6.997
EQUITY	-0.4732E-05	0.2043E-05	-2.317
PDFORCE	0.1833E-01	0.5097E-02	3.595

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-2795.	-5282.
SUM OF SQUARED RESIDUALS	7599.	7620.
DEGREES OF FREEDOM	7604.	7620.
PERCENT CORRECTLY PREDICTED	87.62	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.4709
LIKELIHOOD RATIO STATISTIC	4974.

SOURCE: AHFC borrower file, 1980-1987

Part D.2. (continued)

LOGIT ESTIMATION 3 DATA SUMMARY

THE ALTERNATIVES AND THEIR FREQUENCIES ARE -

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
DIVEST	7620.	100.0	943.0	12.38
HOLD	7620.	100.0	6677.	87.62

LOGIT ESTIMATION RESULTS
****
THE DEPENDENT VARIABLE IS STATUS

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-2.057	0.3887	-5.292
FBK	-0.4679E-02	0.7261E-01	-0.6443E-01
CO	0.2484	0.9601E-01	2.588
MH	0.3592	0.1105	3.251
TOTFAM	0.3697E-01	0.3482E-01	1.062
AGE1	-0.2006E-01	0.5537E-02	-3.623
AGE2	-0.6200E-04	0.6909E-02	-0.8974E-02
SPOUSE	-0.1274	0.2339	-0.5449
LOGINC	0.9472E-01	0.1307	0.7246
LOGASS	-0.7557E-01	0.5226E-01	-1.446
LOGLIAB	0.5399E-01	0.2599E-01	2.077
HOF	-0.4994E-01	0.1492	-0.3346
PAM	0.5030	0.2012	2.501
ABEPER	0.1433	0.4340E-01	3.302
PERIOD	0.1678E-01	0.2484E-02	6.756
EQUITY	-0.4528E-05	0.2037E-05	-2.223
PDFORCE	0.1886E-01	0.5110E-02	3.691

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-2790.	-5282.
SUM OF SQUARED RESIDUALS	7602.	7620.
DEGREES OF FREEDOM	7603.	7620.
PERCENT CORRECTLY PREDICTED	87.62	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.4718
LIKELIHOOD RATIO STATISTIC	4984.

SOURCE: AHFC borrower file, 1980-1987

Part D.2. (continued)

LOGIT ESTIMATION 4 DATA SUMMARY

THE ALTERNATIVES AND THEIR FREQUENCIES ARE -

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
DIVEST	7620.	100.0	943.0	12.38
HOLD	7620.	100.0	6677.	87.62

LOGIT ESTIMATION RESULTS
****
THE DEPENDENT VARIABLE IS STATUS

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-1.325	0.3729	-3.553
FBK	-0.1993E-01	0.7221E-01	-0.2760
CO	0.2864	0.9535E-01	3.004
MH	0.3824	0.1092	3.502
TOTFAM	0.2846E-01	0.3457E-01	0.8232
AGE1	-0.1887E-01	0.5504E-02	-3.428
AGE2	-0.1500E-02	0.6889E-02	-0.2177
SPOUSE	-0.6503E-01	0.2328	-0.2793
LOGINC	0.7277E-01	0.1303	0.5585
LOGASS	-0.1042	0.5167E-01	-2.017
LOGLIAB	0.5023E-01	0.2575E-01	1.950
HOF	-0.1275	0.1481	-0.8611
PAM	0.4823	0.2005	2.406
EQUITY	0.6167E-06	0.1696E-05	0.3636
PDFORCE	0.5202E-02	0.4711E-02	1.104

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-2819.	-5282.
SUM OF SQUARED RESIDUALS	7629.	7620.
DEGREES OF FREEDOM	7605.	7620.
PERCENT CORRECTLY PREDICTED	87.62	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.4662
LIKELIHOOD RATIO STATISTIC	4925.

SOURCE: AHFC borrower file, 1980-1987

Part D.2. (continued)

LOGIT ESTIMATION 5 DATA SUMMARY

THE ALTERNATIVES AND THEIR FREQUENCIES ARE -

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
DIVEST	7620.	100.0	943.0	12.38
HOLD	7620.	100.0	6677.	87.62

LOGIT ESTIMATION RESULTS
****
THE DEPENDENT VARIABLE IS STATUS

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-0.7074	0.3407	-2.076
FBK	-0.1204E-01	0.7196E-01	-0.1673
TOTFAM	0.2020E-01	0.3397E-01	0.5947
AGE1	-0.1758E-01	0.5533E-02	-3.177
AGE2	-0.9229E-03	0.6954E-02	-0.1327
SPOUSE	-0.1125	0.2335	-0.4817
LOGINC	-0.7527E-01	0.1234	-0.6098
LOGASS	-0.1161	0.5180E-01	-2.242
LOGLIAB	0.5183E-01	0.2561E-01	2.024
HOF	-0.1822	0.1409	-1.294
PAM	0.4084	0.1984	2.059
ABEPER	0.1647	0.4307E-01	3.825
EQUITY	-0.1230E-05	0.1694E-05	-0.7259
PDFORCE	0.6422E-02	0.4728E-02	1.358

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-2821.	-5282.
SUM OF SQUARED RESIDUALS	7637.	7620.
DEGREES OF FREEDOM	7606.	7620.
PERCENT CORRECTLY PREDICTED	87.62	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.4659
LIKELIHOOD RATIO STATISTIC	4922.

SOURCE: AHFC borrower file, 1980-1987

Part D.2. (continued)

LOGIT ESTIMATION 6 DATA SUMMARY

THE ALTERNATIVES AND THEIR FREQUENCIES ARE -

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
DIVEST	7620.	100.0	943.0	12.38
HOLD	7620.	100.0	6677.	87.62

LOGIT ESTIMATION RESULTS
****
THE DEPENDENT VARIABLE IS STATUS

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-1.569	0.3613	-4.343
FBK	-0.3724E-02	0.7218E-01	-0.5159E-01
TOTFAM	0.3058E-01	0.3411E-01	0.8966
AGE1	-0.1844E-01	0.5536E-02	-3.332
AGE2	0.5150E-04	0.6937E-02	0.7424E-02
SPOUSE	-0.1600	0.2332	-0.6860
LOGINC	-0.2105E-01	0.1239	-0.1699
LOGASS	-0.8095E-01	0.5224E-01	-1.550
LOGLIAB	0.5551E-01	0.2589E-01	2.144
HOF	-0.1018	0.1415	-0.7196
PAM	0.4184	0.1989	2.104
PERIOD	0.1790E-01	0.2474E-02	7.238
EQUITY	-0.6862E-05	0.2028E-05	-3.383
PDFORCE	0.1880E-01	0.5089E-02	3.695

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-2801.	-5282.
SUM OF SQUARED RESIDUALS	7629.	7620.
DEGREES OF FREEDOM	7606.	7620.
PERCENT CORRECTLY PREDICTED	87.62	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.4697
LIKELIHOOD RATIO STATISTIC	4962.

SOURCE: AHFC borrower file, 1980-1987

Part D.2. (continued)

LOGIT ESTIMATION 7 DATA SUMMARY

THE ALTERNATIVES AND THEIR FREQUENCIES ARE -

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
DIVEST	7620.	100.0	943.0	12.38
HOLD	7620.	100.0	6677.	87.62

LOGIT ESTIMATION RESULTS

****

THE DEPENDENT VARIABLE IS STATUS

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-1.537	0.3621	-4.245
FBK	0.5375E-03	0.7225E-01	0.7440E-02
TOTFAM	0.3059E-01	0.3415E-01	0.8957
AGE1	-0.1862E-01	0.5548E-02	-3.356
AGE2	0.2151E-03	0.6950E-02	0.3095E-01
SPOUSE	-0.1632	0.2337	-0.6981
LOGINC	-0.3193E-01	0.1240	-0.2574
LOGASS	-0.8226E-01	0.5235E-01	-1.571
LOGLIAB	0.5544E-01	0.2587E-01	2.143
HOF	-0.1061	0.1416	-0.7491
PAM	0.4233	0.1989	2.128
ABEPER	0.1387	0.4344E-01	3.194
PERIOD	0.1743E-01	0.2488E-02	7.004
EQUITY	-0.6715E-05	0.2024E-05	-3.317
PDFORCE	0.1933E-01	0.5102E-02	3.788

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-2796.	-5282.
SUM OF SQUARED RESIDUALS	7633.	7620.
DEGREES OF FREEDOM	7605.	7620.
PERCENT CORRECTLY PREDICTED	87.62	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.4706
LIKELIHOOD RATIO STATISTIC	4971.

SOURCE: AHFC borrower file, 1980-1987

Part D.2. (continued)

LOGIT ESTIMATION 8 DATA SUMMARY

THE ALTERNATIVES AND THEIR FREQUENCIES ARE -

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
DIVEST	7620.	100.0	943.0	12.38
HOLD	7620.	100.0	6677.	87.62

LOGIT ESTIMATION RESULTS
****
THE DEPENDENT VARIABLE IS STATUS

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-0.7158	0.3398	-2.106
FBK	-0.1718E-01	0.7187E-01	-0.2391
TOTFAM	0.1997E-01	0.3391E-01	0.5888
AGE1	-0.1732E-01	0.5518E-02	-3.138
AGE2	-0.1190E-02	0.6939E-02	-0.1716
SPOUSE	-0.1064	0.2329	-0.4569
LOGINC	-0.6591E-01	0.1233	-0.5347
LOGASS	-0.1153	0.5166E-01	-2.233
LOGLIAB	0.5168E-01	0.2562E-01	2.018
HOF	-0.1807	0.1407	-1.284
PAM	0.4020	0.1982	2.028
EQUITY	-0.1159E-05	0.1688E-05	-0.6866
PDFORCE	0.5365E-02	0.4707E-02	1.140

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-2827.	-5282.
SUM OF SQUARED RESIDUALS	7631.	7620.
DEGREES OF FREEDOM	7607.	7620.
PERCENT CORRECTLY PREDICTED	87.62	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.4647
LIKELIHOOD RATIO STATISTIC	4909.

SOURCE: AHFC borrower file, 1980-1987

Part D.2. (continued)

LOGIT ESTIMATION 9 DATA SUMMARY

THE ALTERNATIVES AND THEIR FREQUENCIES ARE -

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
DIVEST	7620.	100.0	943.0	12.38
HOLD	7620.	100.0	6677.	87.62

LOGIT ESTIMATION RESULTS
****
THE DEPENDENT VARIABLE IS STATUS

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-1.205	0.3746	-3.216
FBK	0.1207E-02	0.7246E-01	0.1665E-01
CO	0.2460	0.9524E-01	2.583
MH	0.2544	0.1152	2.207
TOTFAM	0.2679E-01	0.3454E-01	0.7757
AGE1	-0.1904E-01	0.5535E-02	-3.441
AGE2	-0.1192E-02	0.6909E-02	-0.1726
SPOUSE	-0.8148E-01	0.2334	-0.3491
LOGINC	-0.1466E-01	0.1330	-0.1102
LOGASS	-0.9809E-01	0.5022E-01	-1.953
LOGLIAB	0.4695E-01	0.2581E-01	1.819
HOF	-0.2149	0.1498	-1.435
PAM	0.4822	0.2004	2.406
ABEPER	0.1726	0.4319E-01	3.997
CAPGAIN	0.3903E-05	0.2825E-05	1.382
LOSS	-0.8895E-04	0.1987E-04	-4.477
PDFORCE	0.9168E-02	0.4832E-02	1.897

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-2803.	-5282.
SUM OF SQUARED RESIDUALS	7636.	7620.
DEGREES OF FREEDOM	7603.	7620.
PERCENT CORRECTLY PREDICTED	87.61	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.4692
LIKELIHOOD RATIO STATISTIC	4957.

SOURCE: AHFC borrower file, 1980-1987

Part D.2. (continued)

LOGIT ESTIMATION 10 DATA SUMMARY

THE ALTERNATIVES AND THEIR FREQUENCIES ARE -

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
DIVEST	7620.	100.0	943.0	12.38
HOLD	7620.	100.0	6677.	87.62

LOGIT ESTIMATION RESULTS
****
THE DEPENDENT VARIABLE IS STATUS

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-2.333	0.3970	-5.878
FBK	0.3027E-01	0.7318E-01	0.4136
CO	0.1584	0.9686E-01	1.635
MH	0.8656E-01	0.1170	0.7398
TOTFAM	0.4253E-01	0.3474E-01	1.224
AGE1	-0.2023E-01	0.5559E-02	-3.639
AGE2	-0.1948E-03	0.6919E-02	-0.2815E-01
SPOUSE	-0.1448	0.2338	-0.6190
LOGINC	0.9313E-01	0.1329	0.7008
LOGASS	-0.7226E-01	0.5063E-01	-1.427
LOGLIAB	0.5368E-01	0.2600E-01	2.065
HOF	-0.1432	0.1507	-0.9503
PAM	0.4757	0.2013	2.364
PERIOD	0.2728E-01	0.3109E-02	8.775
CAPGAIN	-0.1935E-04	0.3987E-05	-4.854
LOSS	-0.8007E-04	0.1976E-04	-4.053
PDFORCE	0.3217E-01	0.5565E-02	5.780

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-2772.	-5282.
SUM OF SQUARED RESIDUALS	7527.	7620.
DEGREES OF FREEDOM	7603.	7620.
PERCENT CORRECTLY PREDICTED	87.61	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.4752
LIKELIHOOD RATIO STATISTIC	5020.

SOURCE: AHFC borrower file, 1980-1987

Part D.2. (continued)

LOGIT ESTIMATION 11 DATA SUMMARY

THE ALTERNATIVES AND THEIR FREQUENCIES ARE -

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
DIVEST	7620.	100.0	943.0	12.38
HOLD	7620.	100.0	6677.	87.62

LOGIT ESTIMATION RESULTS
****
THE DEPENDENT VARIABLE IS STATUS

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-2.294	0.3977	-5.768
FBK	0.3265E-01	0.7322E-01	0.4459
CO	0.1590	0.9692E-01	1.641
MH	0.1079	0.1174	0.9191
TOTFAM	0.4116E-01	0.3478E-01	1.184
AGE1	-0.2043E-01	0.5569E-02	-3.669
AGE2	-0.2102E-04	0.6930E-02	-0.3034E-02
SPOUSE	-0.1484	0.2343	-0.6335
LOGINC	0.8552E-01	0.1330	0.6429
LOGASS	-0.7408E-01	0.5066E-01	-1.462
LOGLIAB	0.5343E-01	0.2599E-01	2.056
HOF	-0.1402	0.1508	-0.9297
PAM	0.4854	0.2013	2.411
ABEPER	0.1141	0.4406E-01	2.591
PERIOD	0.2624E-01	0.3142E-02	8.351
CAPGAIN	-0.1802E-04	0.4014E-05	-4.489
LOSS	-0.8136E-04	0.1978E-04	-4.112
PDFORCE	0.3196E-01	0.5574E-02	5.734

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-2769.	-5282.
SUM OF SQUARED RESIDUALS	7533.	7620.
DEGREES OF FREEDOM	7602.	7620.
PERCENT CORRECTLY PREDICTED	87.61	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.4758
LIKELIHOOD RATIO STATISTIC	5026.

SOURCE: AHFC borrower file, 1980-1987

Part D.2. (continued)

LOGIT ESTIMATION 12 DATA SUMMARY

THE ALTERNATIVES AND THEIR FREQUENCIES ARE -

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
DIVEST	7620.	100.0	943.0	12.38
HOLD	7620.	100.0	6677.	87.62

LOGIT ESTIMATION RESULTS
****
THE DEPENDENT VARIABLE IS STATUS

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-1.199	0.3740	-3.205
FBK	-0.3620E-02	0.7236E-01	-0.5002E-01
CO	0.2489	0.9513E-01	2.617
MH	0.2356	0.1150	2.050
TOTFAM	0.2771E-01	0.3448E-01	0.8035
AGE1	-0.1871E-01	0.5520E-02	-3.390
AGE2	-0.1477E-02	0.6893E-02	-0.2143
SPOUSE	-0.7393E-01	0.2328	-0.3176
LOGINC	-0.9287E-02	0.1329	-0.6987E-01
LOGASS	-0.9695E-01	0.5015E-01	-1.933
LOGLIAB	0.4695E-01	0.2582E-01	1.819
HOF	-0.2217	0.1496	-1.482
PAM	0.4687	0.2003	2.341
CAPGAIN	0.3441E-05	0.2814E-05	1.223
LOSS	-0.8779E-04	0.1984E-04	-4.425
PDFORCE	0.8116E-02	0.4811E-02	1.687

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-2810.	-5282.
SUM OF SQUARED RESIDUALS	7631.	7620.
DEGREES OF FREEDOM	7604.	7620.
PERCENT CORRECTLY PREDICTED	87.61	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.4680
LIKELIHOOD RATIO STATISTIC	4943.

SOURCE: AHFC borrower file, 1980-1987

Part D.2. (continued)

LOGIT ESTIMATION 13 DATA SUMMARY

THE ALTERNATIVES AND THEIR FREQUENCIES ARE -

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
DIVEST	7620.	100.0	943.0	12.38
HOLD	7620.	100.0	6677.	87.62

LOGIT ESTIMATION RESULTS
****
THE DEPENDENT VARIABLE IS STATUS

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-0.7732	0.3354	-2.305
FBK	0.2340E-02	0.7209E-01	0.3246E-01
TOTFAM	0.1533E-01	0.3389E-01	0.4523
AGE1	-0.1816E-01	0.5543E-02	-3.275
AGE2	-0.8907E-03	0.6946E-02	-0.1282
SPOUSE	-0.1185	0.2332	-0.5083
LOGINC	-0.1004	0.1249	-0.8035
LOGASS	-0.1098	0.4987E-01	-2.202
LOGLIAB	0.4632E-01	0.2567E-01	1.804
HOF	-0.2368	0.1419	-1.668
PAM	0.4415	0.1984	2.225
ABEPER	0.1707	0.4316E-01	3.954
CAPGAIN	0.2595E-05	0.2810E-05	0.9234
LOSS	-0.1016E-03	0.1895E-04	-5.363
PDFORCE	0.9869E-02	0.4819E-02	2.048

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-2808.	-5282.
SUM OF SQUARED RESIDUALS	7635.	7620.
DEGREES OF FREEDOM	7605.	7620.
PERCENT CORRECTLY PREDICTED	87.61	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.4684
LIKELIHOOD RATIO STATISTIC	4948.

SOURCE: AHFC borrower file, 1980-1987

Part D.2. (continued)

LOGIT ESTIMATION 14 DATA SUMMARY

THE ALTERNATIVES AND THEIR FREQUENCIES ARE -

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
DIVEST	7620.	100.0	943.0	12.38
HOLD	7620.	100.0	6677.	87.62

LOGIT ESTIMATION RESULTS
****
THE DEPENDENT VARIABLE IS STATUS

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-2.200	0.3706	-5.937
FBK	0.2947E-01	0.7262E-01	0.4058
TOTFAM	0.3344E-01	0.3413E-01	0.9800
AGE1	-0.1999E-01	0.5553E-02	-3.600
AGE2	0.1145E-03	0.6935E-02	0.1651E-01
SPOUSE	-0.1757	0.2332	-0.7533
LOGINC	0.7685E-01	0.1255	0.6123
LOGASS	-0.7395E-01	0.5029E-01	-1.471
LOGLIAB	0.5222E-01	0.2589E-01	2.017
HOF	-0.1209	0.1429	-0.8462
PAM	0.4686	0.1995	2.349
PERIOD	0.2797E-01	0.3064E-02	9.127
CAPGAIN	-0.2071E-04	0.3857E-05	-5.369
LOSS	-0.8309E-04	0.1906E-04	-4.360
PDFORCE	0.3281E-01	0.5520E-02	5.944

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-2773.	-5282.
SUM OF SQUARED RESIDUALS	7533.	7620.
DEGREES OF FREEDOM	7605.	7620.
PERCENT CORRECTLY PREDICTED	87.61	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.4750
LIKELIHOOD RATIO STATISTIC	5018.

SOURCE: AHFC borrower file, 1980-1987

Part D.2. (continued)

LOGIT ESTIMATION 15 DATA SUMMARY

THE ALTERNATIVES AND THEIR FREQUENCIES ARE -

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
DIVEST	7620.	100.0	943.0	12.38
HOLD	7620.	100.0	6677.	87.62

LOGIT ESTIMATION RESULTS
****
THE DEPENDENT VARIABLE IS STATUS

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-2.137	0.3720	-5.744
FBK	0.3335E-01	0.7268E-01	0.4589
TOTFAM	0.3264E-01	0.3416E-01	0.9555
AGE1	-0.2011E-01	0.5564E-02	-3.615
AGE2	0.2615E-03	0.6948E-02	0.3764E-01
SPOUSE	-0.1775	0.2336	-0.7595
LOGINC	0.6100E-01	0.1258	0.4848
LOGASS	-0.7691E-01	0.5034E-01	-1.528
LOGLIAB	0.5225E-01	0.2588E-01	2.019
HOF	-0.1266	0.1430	-0.8850
PAM	0.4731	0.1996	2.371
ABEPER	0.1127	0.4385E-01	2.569
PERIOD	0.2702E-01	0.3096E-02	8.727
CAPGAIN	-0.1955E-04	0.3882E-05	-5.036
LOSS	-0.8534E-04	0.1910E-04	-4.468
PDFORCE	0.3272E-01	0.5528E-02	5.920

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-2770.	-5282.
SUM OF SQUARED RESIDUALS	7540.	7620.
DEGREES OF FREEDOM	7604.	7620.
PERCENT CORRECTLY PREDICTED	87.61	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.4756
LIKELIHOOD RATIO STATISTIC	5024.

SOURCE: AHFC borrower file, 1980-1987

Part D.2. (continued)

LOGIT ESTIMATION 16 DATA SUMMARY

THE ALTERNATIVES AND THEIR FREQUENCIES ARE -

ALTERNATIVE LABEL	FREQUENCY	PERCENT OF CASES	FREQUENCY CHOSEN	PERCENT CHOSEN
DIVEST	7620.	100.0	943.0	12.38
HOLD	7620.	100.0	6677.	87.62

LOGIT ESTIMATION RESULTS
****
THE DEPENDENT VARIABLE IS STATUS

VARIABLE NAME	LOGIT ESTIMATE	STANDARD ERROR	T-STATISTIC
B1	-0.7910	0.3346	-2.364
FBK	-0.3396E-02	0.7199E-01	-0.4717E-01
TOTFAM	0.1557E-01	0.3384E-01	0.4601
AGE1	-0.1792E-01	0.5528E-02	-3.241
AGE2	-0.1143E-02	0.6930E-02	-0.1649
SPOUSE	-0.1137	0.2326	-0.4890
LOGINC	-0.8708E-01	0.1246	-0.6987
LOGASS	-0.1076	0.4979E-01	-2.161
LOGLIAB	0.4610E-01	0.2568E-01	1.795
HOF	-0.2345	0.1418	-1.654
PAM	0.4335	0.1983	2.186
CAPGAIN	0.2217E-05	0.2800E-05	0.7917
LOSS	-0.9947E-04	0.1891E-04	-5.260
PDFORCE	0.8778E-02	0.4798E-02	1.830

AUXILIARY STATISTICS.	AT CONVERGENCE	AT ZERO
LOG LIKELIHOOD	-2814.	-5282.
SUM OF SQUARED RESIDUALS	7627.	7620.
DEGREES OF FREEDOM	7606.	7620.
PERCENT CORRECTLY PREDICTED	87.61	50.00

GOODNESS OF FIT STATISTICS.	ABOUT ZERO
LIKELIHOOD RATIO INDEX	0.4672
LIKELIHOOD RATIO STATISTIC	4935.

SOURCE: AHFC borrower file, 1980-1987