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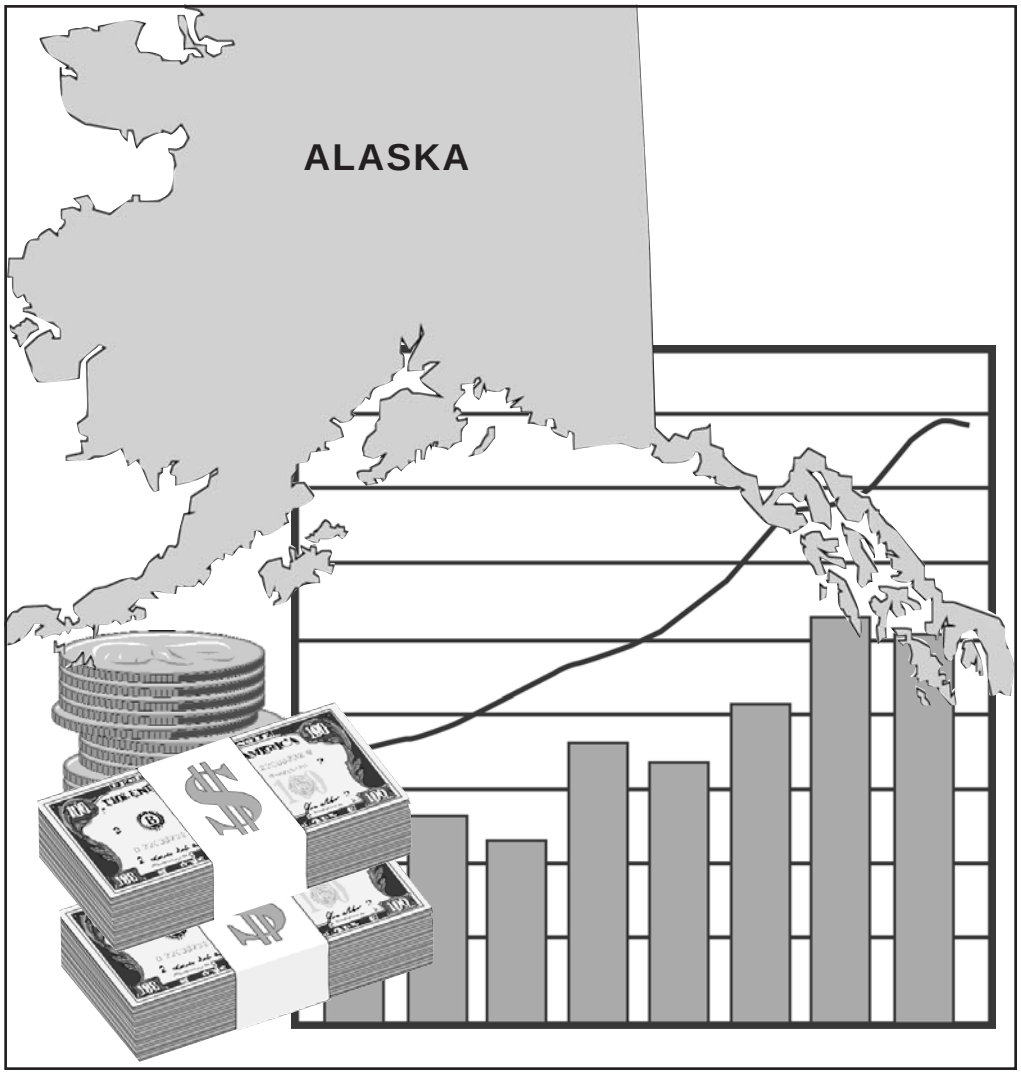
Economic Growth and Change in Southeast Alaska



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Technical Editor

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Economic Growth and Change in Southeast Alaska

Rhonda Mazza, Technical Editor

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Abstract

Mazza, Rhonda, tech. ed. 2004. Economic growth and change in southeast Alaska. Gen. Tech. Rep. PNW-GTR-611. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 71 p.

This report focuses on economic trends since the 1970s in rural southeast Alaska. These trends are compared with those in the Nation and in nonmetropolitan areas of the country to determine the extent to which the economy in rural southeast Alaska is affected by regional activity and by larger market forces. Many of the economic changes occurring in rural southeast Alaska, such as the decline in the manufacturing sector, are reflections of broad-scale changes in the greater U.S. economy. Other changes, such as the increase in nonwage income as a percentage of total income, have been greater in rural southeast Alaska than at the larger scales of comparison.

In chapter 1, Robertson describes these changes and their underlying causes and outlines some of their implications for the management of the Tongass National Forest. Providing forest-based recreational opportunities and aesthetic amenities is becoming increasingly important as tourism and residential activity compose a larger portion of the region's economy. In chapter 2, Crone provides a historical context for the economic changes in rural southeast Alaska. She also establishes the global context for these changes, concluding that forces at local, national, and international scales have shaped economic growth patterns in rural southeast Alaska.

Keywords: Southeast Alaska, economy, economic trends, income, rural manufacturing, wood products, community resiliency.

Preface

These chapters were written separately at different points in the Tongass Land Management Plan[1] process. Individually, each chapter addresses the economic trends in southeast Alaska from 1970 through the 1990s. They have been compiled here to provide historical context for current studies that address the ongoing changes in the economy of southeast Alaska.

The economy of southeast Alaska illustrates the dynamic nature that characterizes economies everywhere. In the past 30 years, the region's economy has changed from one dependent on natural resource extraction and the associated manufacturing to one based on services and related economic sectors. During this time of change, the manufacturing sector declined owing to regional changes in supply and national and global changes in demand for Alaska products. Increased competition by other producers in traditional markets for southeast Alaska resources has also been an influential factor. Concurrently with the decline in manufacturing, the service and retail sectors have experienced steady growth, and the proportion of unearned income (investment income and transfer payments from government to individuals) in the region's total income mix has increased rapidly. The two chapters in this report examine these changes, the reasons for them, and how the changes differ from economic trends elsewhere.

Many of the economic changes occurring in rural southeast Alaska are reflections of broad-scale changes in the greater U.S. economy. For instance, at both the regional and national scales, the manufacturing sector has declined. At the same time, the service sector has grown at both scales, although in rural southeast Alaska, the growth has not been as great, despite the increase in tourism. The increase in unearned income as a percentage of total income is evident at all scales, with the greatest relative increase occurring in rural southeast Alaska.

In chapter 1, Robertson identifies these trends and the link that continues to exist between forest policy and the economy of southeast Alaska even though logging and wood processing are no longer predominant activities in the region. Although tourism has contributed to economic growth in southeast Alaska, Robertson concludes that the increase in unearned income, particularly retirement and medical benefits, likely has been a more significant factor in the region's current economy. Given the importance of unearned income, the region's ability to retain existing residents and attract

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[1] Shaw, Charles G., III. 1999. Use of risk assessment panels during revision of the Tongass Land and Resource Management Plan. Gen. Tech. Rep. PNW-GTR-460. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 43 p. (Shaw, Charles G., III, tech. coord., Conservation and resource assessments for the Tongass Land Management Plan revision).

new ones is necessary to maintain current economic growth. Local natural amenities and recreational opportunities are key factors that make the region an attractive home and visitor destination. The challenge will be to provide forest-based amenities that meet the needs of these different user groups; the amenities that attract rural residents may be different than the ones that attract visitors.

In chapter 2, Crone continues the analysis of economic change in rural southeast Alaska. Her focus is the influence of trends in rural manufacturing in general and cycles in wood products markets in particular on rural areas. She compares changes in the rural southeast Alaska economy with those occurring in another historically timber-abundant and manufacturing-dominated rural region in Idaho and Montana and finds many similarities. She also establishes the global context for these changes, concluding that forces at the local, national, and international scales have shaped economic growth patterns in rural southeast Alaska. The resiliency of many rural communities that have traditionally depended on natural-resource-related industries will depend on their ability to exploit comparative advantages associated with tourism and quality-of-life amenities.

Contents

Chapter 1: An Analysis of Changing Income Sources

Guy Robertson[1]

Abstract

Robertson, Guy. 2004. Economic growth and change in southeast Alaska. In: Mazza, R., tech. ed. Economic growth and change in southeast Alaska. Gen. Tech. Rep. PNW-GTR-611. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 1-32.

The rural economy of southeast Alaska has experienced profound changes in recent decades, changes that have important implications for forest management in the region. This chapter describes the nature of these changes and their underlying causes, and then outlines some of their implications for the management of the Tongass National Forest. Additionally, the report compares developments in southeast Alaska with those occurring in the Pacific Northwest and in the Nation at large.

The most important economic developments in rural southeast Alaska are the decline in manufacturing activity and the concomitant increase in services and related activity. While the contraction in manufacturing has resulted in falling wages and stagnant total income, expansion in services and related sectors has allowed for continued employment growth in the region. Increases in tourism-related activity underlie a portion of the structural shift to nonmanufacturing sectors, but increases in other income sources are found to be at least equally important in maintaining regional income and thereby supporting economic growth. Nonwage income, such as retirement and health benefits or returns on investments, composes most of these other income sources. These developments reflect trends occurring at the national level and within the Pacific Northwest. The changes outlined in this report indicate the increasing importance of noncommodity forest outputs (primarily amenities and recreational opportunities) in supporting both the tourism and residential activity on which the region's economy increasingly relies.

Keywords: Southeast Alaska, economic trends, income, unearned income, tourism, forest management.

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Introduction

Rapid Change: Overall Growth and Shift From Traditional Resource-Extraction Industries

The regional economy of southeast Alaska has undergone dramatic change in recent decades. With an approximate doubling of population and real income since 1970, overall economic growth is the most salient aspect of this change, directly affecting the lifestyles and environment of southeast Alaska inhabitants. Additionally, this growth has been accompanied by structural changes in the regional economy and its constituent localities. Perhaps most notable of these has been the rise of

service-based activities and the relative decline in traditional, resource-based activities, particularly timber harvesting and processing. This is the combined result of sharp reductions in wood products manufacturing in the 1990s and generally steady growth in services and retail activity over the last three decades.

Is Change Merely the Result of Regionally Specific Factors?

Both overall regional growth and the relative increase in the service sector and other nonmanufacturing sectors generally mirror developments occurring in the U.S. economy. It would be a mistake, however, to immediately conclude that the changes observed in southeast Alaska are merely a reflection of national trends. First, much of the expansion in services and related sectors may be attributed to rapid growth in recreation and tourism, growth that, although certainly evident elsewhere in the United States, is particularly pronounced in Alaska. Second, the decline in timber-related activity can be partially attributed to supply constraints (both physical and policy induced) and, perhaps, to persistent diseconomies associated with manufacturing in the region. In either case, characteristics specific to the region, rather than macroforces inherent in the national economy, can be construed as the driving force for change.

An important implication of these changes is that links between local economic performance and the management of the Tongass National Forest have become more subtle and increasingly complex. Whereas in the past, the supply of timber for harvest and processing composed the major channel through which forest management could impact economic activity, the impact of management on the quality and quantity of recreational opportunities, aesthetic experiences, and lifestyle amenities is now paramount. This is especially so if one allows for the positive role played by the forest in the residential decisions of unearned-income recipients. Assuming continued growth in recreational use in particular and the regional economy in general, balancing the demands of different recreational user groups and amenities beneficiaries will increasingly challenge forest managers.

In addition to overall growth, a decline in the relative importance of manufacturing and an increase in that of services are the most salient developments in the region's rural economy. This is the combined result of sharp reductions in wood products manufacturing in the 1990s and generally steady growth in services and retail activity over the last three decades. Although evidence suggests that tourism is an important factor in this expansion, increases in unearned income, especially those associated with retirement and medical benefits, are probably more important. In fact, increases in unearned income are responsible for slightly more than half of total gains in personal income from 1969 to 1996, and health services has been the

single largest private sector contributor to new employment in the region since 1981. These developments broadly mirror changes occurring elsewhere in the U.S. economy. At the same time, however, growth in southeast Alaska's service sector lagged well behind that of the Nation, and certain important subsectors, such as business services, are still largely underrepresented (if not nonexistent) in the region. Consequently, although the region's development appears to generally follow national trends, rural southeast Alaska's economy remains somewhat specialized in a limited number of products and activities. More and more, however, these goods take the form of services and forest-based amenities rather than the resource commodities that have been dominant in the past.

Paradigm of Resource Dependency

Under this interpretation of events, the region (with the exception of Juneau, the capital) has remained dependent on a few key industries focused on the utilization of its natural resources, but, increasingly, tourism has come to be the dominant pattern of use. Although the shift to a tourism-based economy brings profound changes in local lifestyles and land use patterns, the fundamental characteristics of forest dependency and lack of depth and diversification in the local economy remain. Likewise, the sensitivity of the regional economy to decisions regarding the management of the Tongass National Forest, which comprises nearly 80 percent of the regional land base, will remain, in theory at least, quite pronounced. The region and its small towns can continue to be characterized as "resource dependent" and susceptible to the concomitant problems of instability, vulnerability to decisions and market developments occurring far away, lack of opportunity, and a host of others discussed in the academic literature and common press (e.g., Force et al. 1993, Freudenburg 1992, Humphrey 1995).

Is Tourism the Driving Force or Is the Economy Deepening?

It is by no means clear, however, that this is an accurate description of either the economic changes that have occurred in southeast Alaska or the current state of its constituent communities. Do the changes observed in the region's economy merely represent the rise of tourism and relative decline of timber or, on the other hand, are they the result of a more robust form of growth depending on the development of a diversified set of income sources? More generally, what are the underlying causes of growth in the region? The answer to this question has important implications for our understanding of the dynamics underlying growth and change in the region's economy in general, and the links between forest policy decisions and local economies in particular.

Objectives of This Report

This report has three main objectives. The first is to describe the changes in the regional economy of southeast Alaska in terms of primary income sources. This, in turn, will help shed light on the underlying impetus for economic growth and change in the region. The second objective is to provide a comparative context for analyzing these changes by using U.S. aggregate measures and measures from nonmetropolitan counties in Oregon and Washington as comparators. Here, the goal is to identify ways in which southeast Alaska's economic performance is similar to that of other regions and significant ways in which it may differ. The final objective is to describe the implications of these results for forest policy decisions, particularly those relating to the management of the Tongass National Forest.

The Setting and Data

The forest communities of southeast Alaska are the primary focus of this report. From the town of Haines in the north to Ketchikan some 300 miles to the south, the region comprises numerous islands and miles of convoluted shoreline similar to the Puget Sound but more rugged and sparsely inhabited. Currently, southeast Alaska's population stands at about 75,000 people, 29,000 of whom live in Juneau. As well as being the state capital, Juneau constitutes the region's principal transportation hub and trade center. Other regional centers include Ketchikan with about 14,000 people living in or around the community, and Sitka with about 7,000 people living in the general area. The remainder of the population is divided among various small towns and settlements, some of which hold over 1,000 residents, but many of which are considerably smaller. Many of the communities rely on air or boat traffic as their sole transportation link to the other towns; with the exception of Haines, none of the major towns in the region have road links to the outside world.

Removal of Juneau From Analysis

Because of its relative size, Juneau tends to dominate aggregate statistics on regional economic performance. Moreover, owing to the importance of state government functions in the town's local economy, Juneau's economic fortunes are somewhat independent of those of the other communities in the region, and the town cannot be classified as an isolated forest-dependent community, the focus of this report. Consequently, Juneau is largely omitted from the subsequent analysis, and, henceforth, the term "rural southeast Alaska" will be used to refer to the entire region with the exception of Juneau. The remaining communities and settlements of southeast Alaska have a strong history of dependency on local natural resources, primarily

fishing, timber, and mining, and many display emergent service economies presumably based on tourism and perhaps amenity-related residential development. As such, these communities appear at an economic and social crossroads similar to that noted in other rural communities in the Western United States (Harris et al. 1998).

Regional Economic Information System Data

This report relies extensively on data published by the Bureau of Economic Analysis under its Regional Economic Information System (REIS). The REIS data provide information on annual income, employment, and other economic measures at the county level (or boroughs—the Alaska equivalent of counties) between 1969 and 1996. Although the data set provides comprehensive coverage and considerable detail, it is not infallible. For instance, income and employment levels for certain industries may be omitted at the county level owing to legal restrictions designed to protect the privacy of individual firms. This problem is particularly pronounced in sparsely populated regions where the number of local firms in many industries will be quite small.[2]

General Challenge of Constructing a Coherent Picture

More generally, a fundamental challenge in using the REIS data (or any other similar data set for that matter) is constructing a concise yet meaningful picture of regional economic change from the numerous and sometimes contradictory data series available. This challenge extends not just to choosing relevant variables, but also to the ways in which these variables are handled, and the time periods that are analyzed. For example, measuring the change in a given variable between two discreet points in time (e.g., 1986 vs. 1996) may give very different results than those obtained by using linear regression or a logistic estimate of annual growth applied to the whole time series. Likewise, any estimate will be sensitive to the choice of time periods and their relation to the business cycle or other fluctuations. This report focuses on providing robust measures of growth and change while bearing in mind the potential biases introduced by the inevitable choices necessary to conduct analysis.

Alaska Department of Labor Employment Data

In addition to the REIS data, this report uses detailed local employment data provided by the Alaska Department of Labor (ADOL). These data are available,

[2] An initial estimate of the extent of disclosure holds in the REIS data for southeast Alaska can be derived by comparing reported aggregate income with that obtained by summing income from specific industries. This analysis indicates that approximately 2 percent of total income in rural southeast Alaska is subject to disclosure holds. Of course, at the community level this discrepancy may be much higher.

free of disclosure-related omissions, for 1981 to 1996, and they provide a uniquely detailed picture of employment in the region's various communities. Similar data are available for Oregon counties, providing a basis for comparison.[3]

Economic Change in Southeast Alaska

This section of the report describes changes that have occurred in southeast Alaska's regional economy over the last few decades. Aggregate income for rural southeast Alaska (i.e., the regional total net of Juneau) and the decomposition of this income into its constituent components receive the bulk of attention. The ADOL employment data are used to provide additional detail on the relative growth and current shares of specific industry sectors, detail that is not available from the more broadly aggregated income data supplied by the Bureau of Economic Analysis.

Income

A logical first step in the analysis of economic growth and change in southeast Alaska is an examination of the performance over time of total personal income in the region. All income figures presented in this report are in 1995 real dollars and were derived by using the Bureau of Economic Analysis consumer price index as a deflator. Total personal income is shown in figure 1 for both Juneau and the rest of the region. Along with the overall growth trend occurring over the entire study period, the figure indicates both the relative size of Juneau and the fact that income performances for Juneau and the rest of the region diverge, particularly over the last 10 years or so. Figure 1 also indicates that during the 1990s, income outside of Juneau was stagnant and even declined some years. A satisfactory description of economic change in rural southeast Alaska has to explain both the relatively steady expansion occurring prior to 1990 as well as the recent downturn. Hence, this analysis considers two specific periods—the 1969-89 period characterized by relatively steady income growth, and the 1990-96 period in which income stagnated. Initial hypotheses for the recent income stagnation must include the sharp decline in timber harvest and

[3] The spatial reporting units differ according to data source. Bureau of Economic Analysis information is available at the borough (Alaska's equivalent of county) level. These units have changed several times over the years for certain areas. A complete list of the areas used to construct the aggregate measures presented in this report is as follows: Angoon Division, Haines Division, Outer Ketchikan Division, Prince of Wales Division, Sitka Division, Skagway-Yakutat Division, Wrangell-Petersburg Division, Haines Borough, Juneau Borough, Ketchikan-Gateway Borough, Prince of Wales-Outer Ketchikan Census Area, Sitka Borough, Skagway-Yakutat-Angoon Census Area, Skagway-Hoonah-Angoon Census Area, Wrangell-Petersburg Census Area, and Yakutat Borough. The Alaska Department of Labor data are based on municipalities, or groups thereof, and cover essentially the same geographic area as the Bureau of Economic Analysis statistical data, but with greater spatial detail.

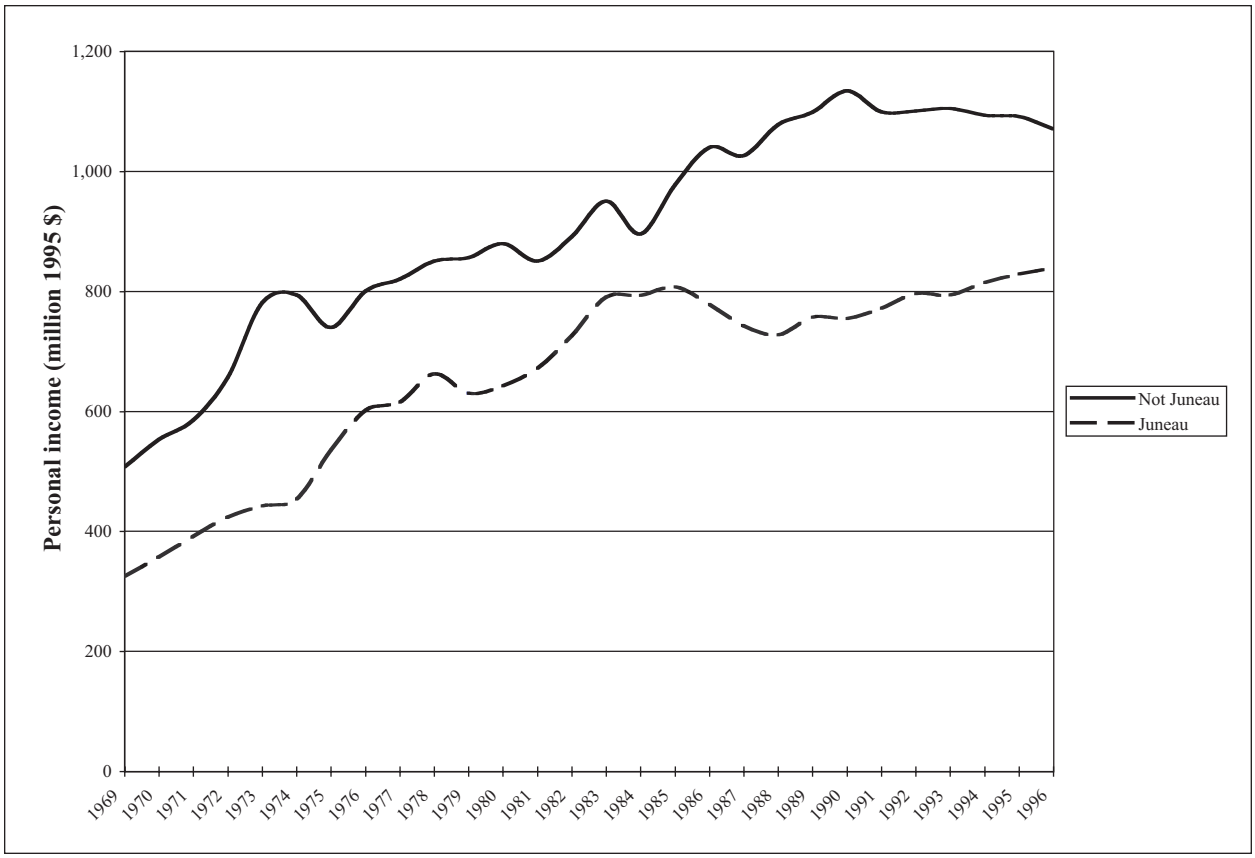

Figure 1—Total southeast Alaska personal income, 1969-1996. Nominal values deflated by using national consumer price index. See footnote 3 for list of included boroughs and census areas. Source: Bureau of Economic Analysis, Regional Economic Information System.

processing in the 1990s as a result of supply constraints, but it is certainly not a foregone conclusion that this is the underlying cause. A decomposition of income into its constituent parts may help determine the reasons behind the income stagnation as well as identify the major contributors to growth over the long term.

Note that the income figures discussed in the preceding paragraph are for total income and not per capita income. Southeast Alaska, as elsewhere in the United States, has experienced steady population growth throughout much of the 20th century. Consequently an increase in total income does not necessarily reflect growth in regional per capita income. Indeed, although real income in rural southeast Alaska increased from around $17,000 per capita in 1969 to $24,000 in 1996, all of this increase occurred prior to 1986. Since that time, real per capita income has been relatively stable. In Juneau, real per capita income peaked at $34,000 in 1978 and has since declined to $28,000, with much of this decline occurring in the early 1980s. Although it is a crucial measure of economic welfare, per capita income

is not the focus of this report. Nevertheless, remember that increasing total income figures, by themselves, do not necessarily indicate increasing personal wealth.

Perhaps the most important distinction that can be drawn between different types of income sources is between earned and unearned income. Earned income, whether in the form of wages or profits to the self-employed, is directly tied to economic activity occurring within the region. Unearned income, on the other hand, comprises dividends, other payments to capital, and a wide variety of transfer payments to individuals from local, state, and federal governments, and it need not be connected to local economic performance.[4] Likewise, whereas earned income will necessarily correspond with a certain number of jobs in which the income is earned, unearned income has no direct link to employment. Consequently, the importance of unearned income in regional economies is often overlooked in studies that tend to concentrate on key local industries, particularly those engaged in manufacturing for export out of the region. These industries, by virtue of their employees, their tangible production facilities and, often, their central role in the history and identity of local communities, are often identified as the impetus driving regional economic change and development. Unearned income, in contrast, is far less visible as a component in the local economy. Nonetheless, it constitutes an increasingly important income source in many rural communities. And, although the dynamics entailed in its distribution and impact in the local economy are quite different from those of major manufacturing or resource extraction industries (Galston and Baehler 1995), the role of unearned income as an outside source of money is broadly analogous to the role of the major export industries commonly emphasized in export-base analysis.

Often overlooked, unearned income is an increasingly important income source in many rural communities.

Both the growing importance of unearned income and its relative lack of correlation with earned income are displayed in figure 2, and further detailed in table 1. The numbers displayed are aggregates for all southeast Alaska boroughs with the exception of Juneau. As such, they mask some important differences in the performance of separate boroughs. Although an analysis of income on a borough-by-borough basis is beyond the scope of this analysis, versions of figure 2 for specific boroughs have been included in the appendix to this report. From 1969 to 1996, real unearned income increased fourfold, and, as a result, this income category now accounts for approximately one-third of total personal income in rural southeast

[4] Remember that the dividends, interest, and rent category does not account for increases in asset values. Recent developments such as the sustained bull market in stock equities are not reflected in the unearned income statistics. In fact, to the extent that rising share prices have been used as a justification for reducing stock dividend payments, gains in stocks may actually result in a net reduction in this dividend portion of the unearned income category.

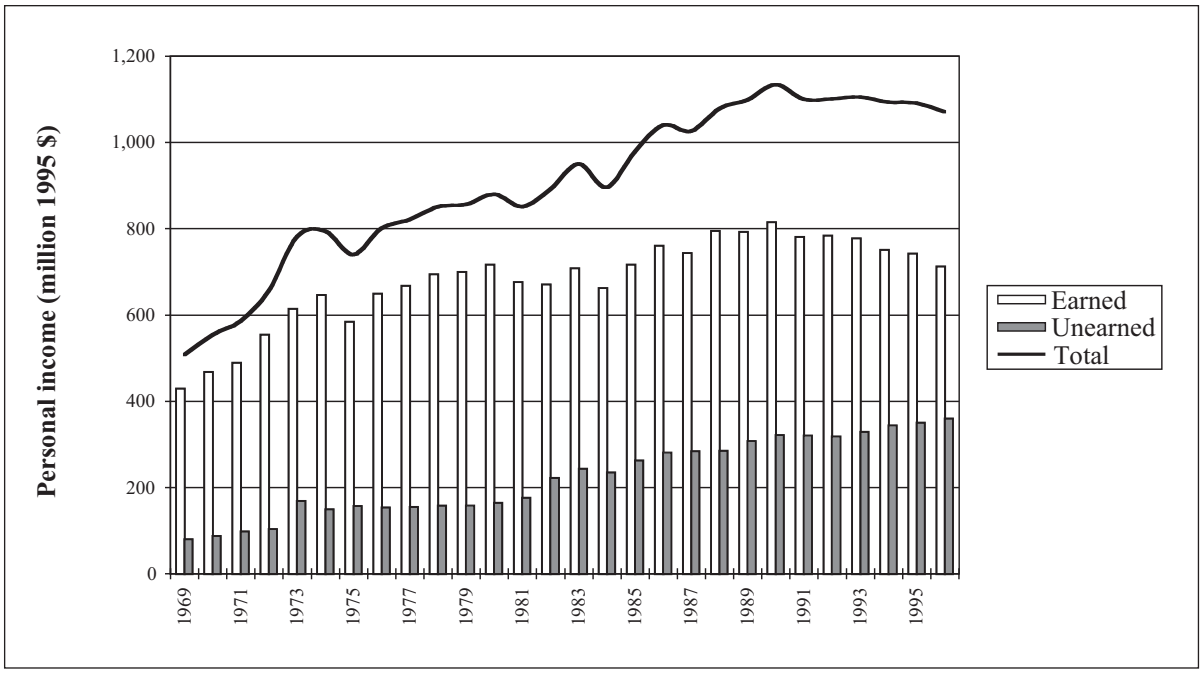

Figure 2—Southeast Alaska personal income by major source, 1969-1996. See text for explanation of income categories.
Source: Bureau of Economic Analysis, Regional Economic Information System.

Table 1—Income in rural southeast Alaska by major source

Income source	1969		1990		1996		Annual growth[a]	
	Value	Share	Value	Share	Value	Share	1969-89	1990-96
	Million 1995 $	*Percent*	*Million 1995 $*	*Percent*	*Million 1995 $*	*Percent*		
Earnings, by place of work								
Wage	419	83	671	59	590	55	1	-2
Proprietor's income	47	9	153	13	132	12	6	-2
Other labor income	22	4	85	8	70	7	5	-3
Total	488	96	909	80	792	74	2	-2
Net earnings, by residence[b]	428	84	814	72	712	67	2	-2
Unearned income								
Returns to capital[c]	45	9	161	14	165	15	7	1
Transfer payments	34	7	159	14	193	18	5	3
Total unearned income	79	16	320	28	359	33	6	2
Total personal income[d]	507	100	1,134	100	1,071	100	3	-1

Note: All dollar figures were converted to 1995 dollars by using U.S. aggregate consumer price index.

[a] Estimated by using logistic growth function.

[b] Equals total earnings minus adjustments for net flow of earnings to interregional commuters and for personal contributions for social insurance.

[c] Includes dividends, interest, and rent.

[d] Equals net earnings by residence plus unearned income.

Source: Bureau of Economic Analysis, Regional Economic Information System.

Alaska, as compared to 16 percent in 1969. In spite of its relatively smaller share in total income, growth in unearned income was responsible for half of the $564 million increase in personal income occurring over the 1969-96 period. Additionally, the increase in unearned income has been quite stable over time ($r^2 = 0.96$ when regressed on a simple trend variable) as compared to greater volatility in earned income ($r^2 = 0.73$). This is not surprising, as a large proportion of unearned income will be determined by slow-moving demographic trends, and other portions, such as unemployment insurance, may move in a countercyclical fashion to partially mitigate downturns in the business cycle. Earned income, in contrast, has no such buffer mechanisms and is more directly susceptible to demand fluctuations emanating from the national business cycle, or short-term supply effects resulting from such factors as fluctuations in commercial fish populations or changes in forest policy. This greater variability in earned income and its consequent impact on the variability of total income are clearly evident in figure 2.

Before turning to a more detailed discussion of changes in earned income, the component sources of unearned income deserve some examination. The major distinction is between transfer payments and payments to capital, which include dividends, interest, and rent. As shown in table 1, both categories have been increasing both in absolute levels and in their share of total income, but the rate of increase has been somewhat higher for transfer payments than for payments to capital, particularly since 1990. (The fact that annual growth for the 1969-89 period is higher for payments to capital whereas the increase in share between 1969 and 1990 is higher for transfer payments is the result of the difference between point measures used to calculate shares and continuous measures used to calculate growth rates). The REIS data provide no detail on the composition of payments to capital, but do give considerable information on the composition of transfer payments. The relevant aspects of this information are summarized in table 2. In terms of 1996 share of total transfer payments, the largest categories are retirement and disability payments, which are dominated by social security benefits; “other payments to individuals,” which are composed mainly of disbursements from the Alaska Permanent Fund and from the Bureau of Indian Affairs; and medical benefits, which initially were composed mostly of Medicare benefits but are now approximately evenly divided between Medicare and payments for Medicaid and related benefits. Of the $160 million increase in total transfer payments from 1969 to 1996, 88 percent resulted from increases in these three largest categories.

Additional categories are income maintenance (primarily welfare benefits) and unemployment payments, which together account for around 12 percent of current transfer payments. In terms of total income, these two categories accounted for an

Table 2—Transfer payments to rural southeast Alaska

Payment type	1969		1996		Change	Annual growth
	Value	Share	Value	Share		
	1,000 1995 $	*Percent*	*1,000 1995 $*	*Percent*		*Percent*
Total transfer payments[a]	34,021	100	193,273	100	159,251	4
Retirement and disability insurance benefit payments	10,993	32	70,570	37	59,578	6
Other payments to individuals[b]	6,519	19	51,305	27	44,786	4
Medical payments	1,900	6	36,913	19	35,013	8
Income maintenance benefit payments	3,563	10	13,889	7	10,326	4
Unemployment insurance benefit payments	5,284	16	10,621	5	5,337	1
Other[c]	3,214	9	9,006	5	5,792	2

Note: All dollar figures were converted to 1995 dollars by using the U.S. aggregate consumer price index.
[a] Totals do not match owing to rounding and omitted measurements.
[b] Primarily Bureau of Indian Affairs payments and disbursements form the Alaska Permanent Fund.
[c] Includes veterans' benefits, government and private payments to nonprofit institutions, and private payments to individuals.
Source: Bureau of Economic Analysis, Regional Economic Information System.

average of 2.5 percent of income over the 1969-96 period with a peak of 3.6 percent in 1977 and recent levels close to the 2.5 percent average.

Another important development evident in figure 2 and table 1 is the sharp decline in earned income in southeast Alaska in the 1990s. Prior to 1990, earned income displayed relatively stable growth, with the exception of downturns in 1975 and the first half of the 1980s. However, at 2 percent per annum, growth in this category was still considerably smaller than the 6 percent annual rate for unearned income. In the 1990s, growth in earned income reversed itself, posting a 2 percent annual rate of decline that resulted in an $89 million total contraction (or 13 percent) over the 1990-96 period.

Examining earned income by industry classification, as shown in table 3, helps identify the source of this decline. The table displays major industry aggregates (the most detail available given data omissions and disclosure holds at lower levels of aggregation) sorted in order of declining share of 1996 total income. In spite of the removal of Juneau from the analysis, government remains the single largest source of earned income in the region. This is followed by manufacturing, services, retail trade, construction, and several lesser categories. With the exception of construction, retail trade, and mining, all categories exhibit significantly smaller growth rates for the 1990-96 period than for the previous period. Three industry groups (manufacturing, forestry and fishing, and wholesale trade) show actual

Table 3—Earned income by industry in rural southeast Alaska, by sector

	1969		1990		1996		Annual growth	
Sector	**Value**	**Share**	**Value**	**Share**	**Value**	**Share**	**1969-89**	**1990-96**
	1,000 1995 $	*Percent*	*1,000 1995 $*	*Percent 1995 $*	*Percent*	*Percent*	*Percent*	*Percent*
Government	111,689	23	205,689	23	207,554	26	3	0
Manufacturing	162,997	34	251,200	29	136,104	17	1	-9
Services	37,892	8	103,062	12	127,507	16	5	4
Retail trade	38,491	8	74,533	8	86,229	11	2	3
Construction	50,909	11	53,406	6	76,072	10	1	5
T.P.U.[a]	39,023	8	68,075	8	68,303	9	1	1
Forestry and fishing	16,256	3	82,968	9	52,610	7	8	-7
F.I.R.E.[b]	7,459	2	20,117	2	20,905	3	4	3
Wholesale trade	10,228	2	17,172	2	11,096	1	1	-6
Mining	1,975	0	662	0	1,468	0	-3	12
Total	476,918	100	876,884	100	787,848	100	2	-1

Note: All dollar figures were converted to 1995 dollars by using U.S. aggregate consumer price index.
[a] T.P.U. = transportation and public utilities.
[b] F.I.R.E = finance, insurance, and real estate.
Source: Bureau of Economic Analysis, Regional Economic Information System.

declines, together losing $151 million (constant dollars). Of these declines, the manufacturing sector experienced 76 percent of the $151 million total decrease. Although all other major sectors posted gains in the 1990-96 time period, the size of these increases totaled just $62 million and were thus insufficient to offset declines in the losing sectors. At $24 million, income gains in services accounted for 39 percent of the $62 million increase, and at $22 million, construction was close behind. However, construction-related income shows a high degree of volatility across the entire 1969-96 period, and when measured at this longer time scale, income growth in the sector is relatively low. Services and, to a lesser extent retail trade, display relatively stable and sustained rates of growth across the entire study period.

The different growth rates for different employment sectors have resulted in a marked shift in the industrial structure of rural southeast Alaska's economy. This can be seen by examining the industry shares shown in table 3 and figure 3. In line with the relatively slow growth in the 1969-89 period and actual declines in the 1990-96 period, manufacturing has experienced a dramatic reduction in its share of total earned income, falling from 34 percent of the total in 1969 to 17 percent in 1996. With the decline in manufacturing income, government has emerged as the largest single source of earned income in the region, maintaining a stable 23 percent share in the earlier periods and increasing its share to 26 percent in the

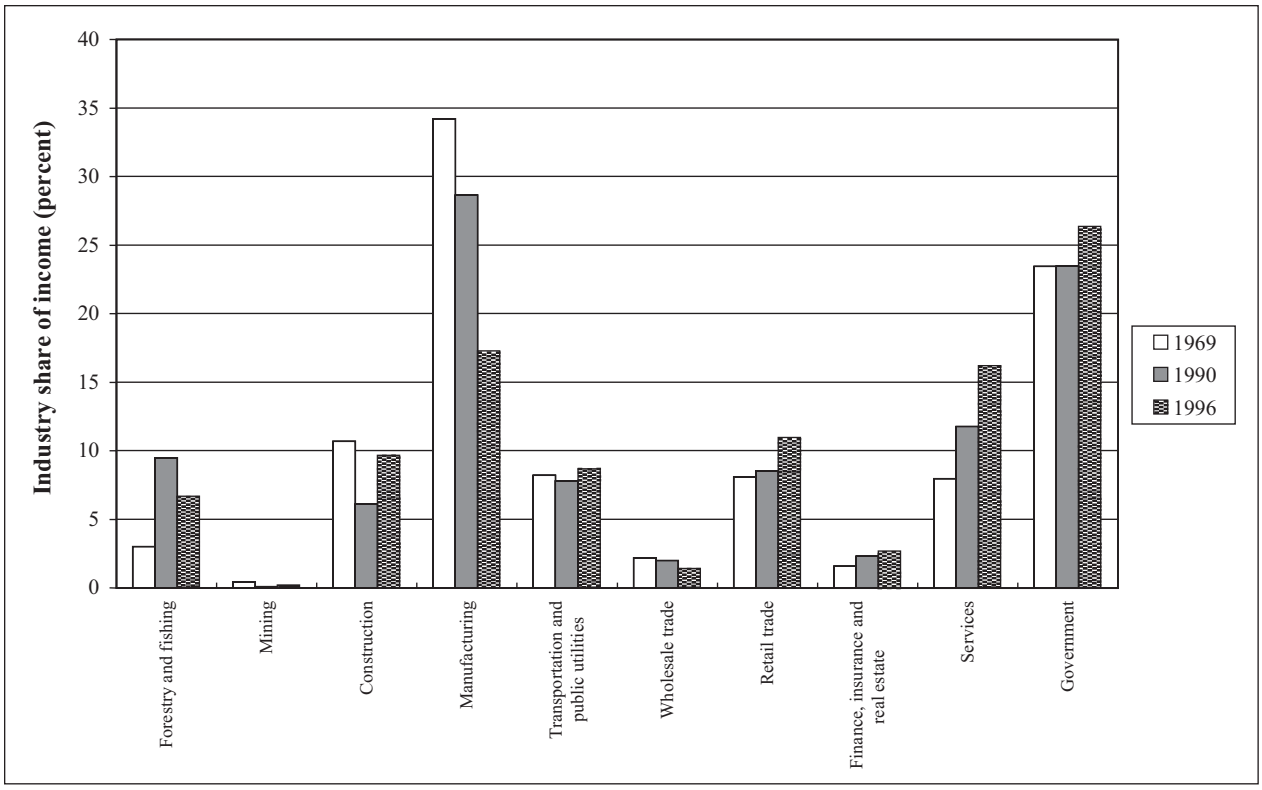

Figure 3—Industry shares in total earned income (by place of work). Source: Bureau of Economic Analysis, Regional Economic Information System.

1990-96 period. Alongside the decline in manufacturing's share, perhaps the most important change has been the steady gains exhibited in the service sector. Here, owing to stable growth, services doubled their share from 8 percent in 1969 to 16 percent in 1996, and are now roughly equivalent to manufacturing in terms of earned income. Other major categories include forestry and fishing (primarily commercial fishing as most timber operations are included under manufacturing), construction, transportation and public utilities, and retail trade. Shares for the first two of these categories have shown considerable fluctuation over the years. The transportation and public utilities sector has remained relatively stable, and retail has posted steady gains, particularly since 1990.

Growth in unearned income and service and retail jobs characterize the rural southeast Alaska economy.

Taken together, the changes outlined above have resulted in a dramatic shift in the regional economy away from manufacturing as a primary source of income and employment toward an economy more reliant on unearned income, and characterized by a higher proportion of employment in services and retail occupations. Manufacturing currently accounts for only 13 percent of total regional income when unearned income is included in the analysis, as opposed to 32 percent in 1969. Of course, the current low share does not account for the total contribution of manufacturing

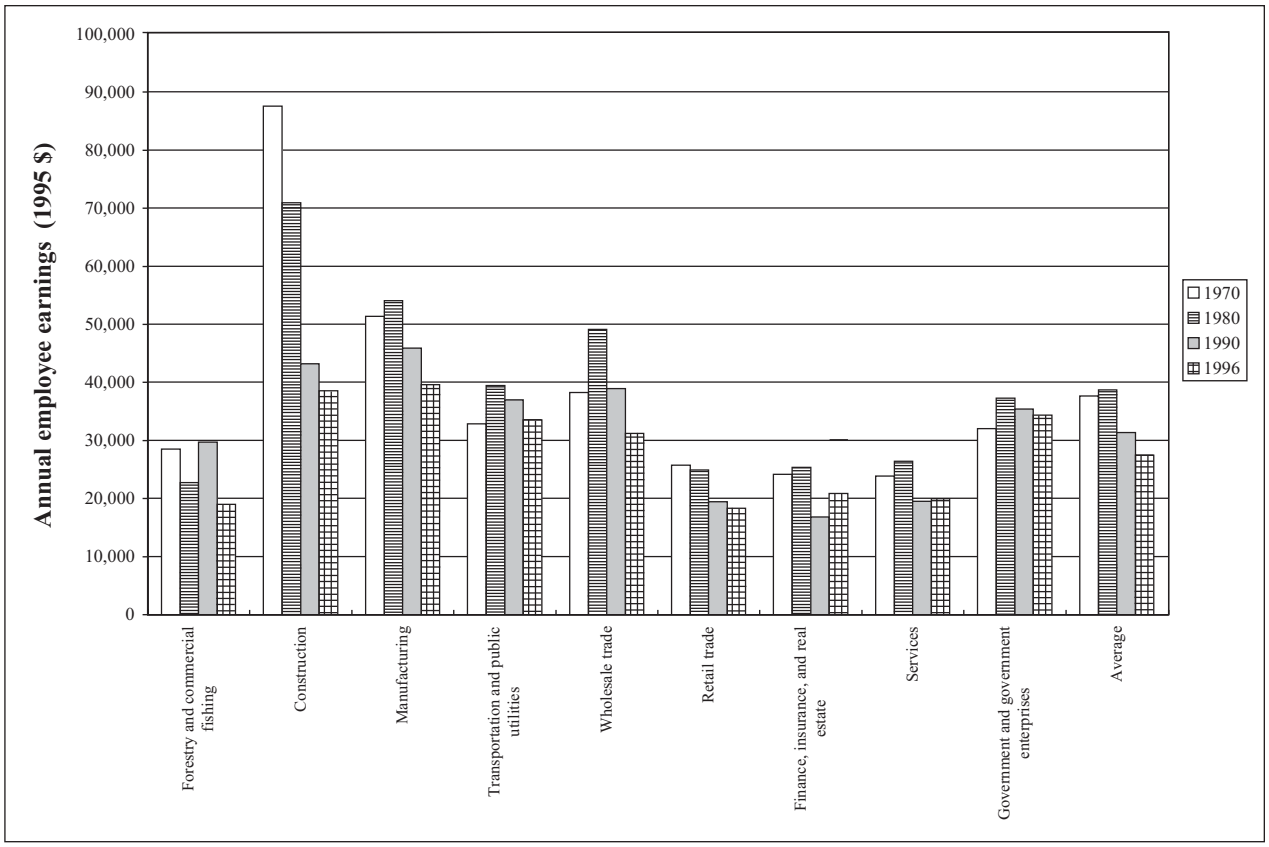

Figure 4—Yearly employee compensation in rural southeast Alaska by industry. Source: Bureau of Economic Analysis, Regional Economic Information System.

to regional income. As "basic" industries bringing new money to the local economy, many manufacturing industries are thought to provide support for local service and retail operations. However, the same may be said for both unearned income and tourist income.

Employee Compensation

An examination of employee compensation in different sectors will help shed further light on recent changes in total earned income in rural southeast Alaska. By dividing total earned income in a given sector by the number of employees reported in the REIS data, we can derive a measure for average employee compensation that is roughly analogous to average wages paid in the sector. These estimates are shown for major industry divisions in figure 4 (note that mining was omitted owing to lack of data resulting from disclosure holds). One point, which is immediately obvious from an examination of the figure, is that average compensation has been generally declining in all sectors, particularly since 1980. Average annual compensation across all sectors peaked in 1978 at $42,000 (1995 dollars) per

employee and has since declined at a rate of approximately 2 percent per annum. The largest declines have been concentrated in the high wage sectors. Although construction provides the most dramatic example of this, decreases in manufacturing are more important owing to the greater weight of that sector in the regional economy as a whole. Another important point is that compensation differs widely from sector to sector. Construction and manufacturing compose relatively high wage sectors, each paying approximately $39,000 per employee per year in 1996. Government, transportation and public utilities, and wholesale trade formed a middle tier, paying from $31,000 to $34,000. Services, retail, and F.I.R.E. (finances, insurance, and real estate) composed the lowest tier, paying approximately $20,000 each. Commercial fishing and forestry (of which commercial fishing composes the major share) also falls into the low wage category, but owing to high seasonality and other peculiarities of the fishing sector, direct comparisons with other sectors are problematic.

Average annual compensation has declined since 1980.

Two main factors may underlie the long-term decline of per-employee compensation in the region. The first is an actual decline of wages, and the second is shifts in industry composition within a given sector. The second factor likely will be most pronounced in manufacturing where a majority of activity is concentrated in relatively high-wage timber employment and lower wage seafood processing. Alaska Department of Labor data, which are described earlier in the text, indicate that these two industries have consistently accounted for more than 90 percent of total manufacturing employment, with the remainder mostly composed of printing and boatbuilding. The ADOL also reports average annual 1995 employee earnings of $45,000 per employee in the wood products sector as compared to $26,000 in the seafood-processing sector. After averaging around 29 percent of total manufacturing employment between 1981 and 1990, seafood processing increased its share to around 40 percent over the 1990-96 period, primarily as a result of declines in wood products employment. Consequently, we can conclude that a significant proportion of the recent decrease in average employee compensation in manufacturing was the result of declines in timber employment relative to seafood processing. However, the 1980-90 period also demonstrates falling compensation in manufacturing in spite of relatively stable shares for the two main sectors. Here, actual declines in wages are the most likely cause.

A similar approach may be used to examine changes in average employee compensation across all sectors, as well as changes in total regional earned income. Average annual compensation for all sectors has fallen steadily from $42,000 (1995 dollars) in 1978 to $27,000 in 1996. Over that same period, manufacturing employment fell from around 20 percent of total employment to 12 percent, and

employment in retail and services (both low-wage sectors) increased from 27 percent of total employment to 39 percent. At the same time, however, note that large fluctuations in the share of manufacturing employment, particularly the sharp increase in the late 1980s with the recovery of the timber sector, are not significantly reflected in changes in average annual compensation levels across all sectors.

Long-term decline in wages and short-term change in regional industry led to falling income in the 1990s.

In general, declines in compensation levels within sectors (i.e., wages) have been far more important than shifts in employment between sectors in depressing average regional compensation. This can be demonstrated by fixing employment shares at their 1978 levels and by using 1996 compensation levels for each sector to calculate a 1996 average estimate for all sectors. This approach allows us to estimate the impact of within-sector compensation changes while assuming fixed employment shares in each sector. The results of this calculation show that even without the substantial shift in employment from manufacturing to services, retail, and other lower wage sectors, average annual compensation for all sectors would still have fallen to around $30,000 in 1996. Since 1990, however, declines in manufacturing employment have been particularly severe and the effects of changing industry shares on regional average compensation more pronounced. Performing the same calculation for the 1990-96 period indicates that changes in shares between sectors accounted for approximately 75 percent of the total decline of regional compensation (from $31,300 [1995 dollars] in 1990 to $27,400 [1995 dollars] in 1996). This decline in regional average compensation, in turn, explains the fall in total regional earned income over the 1990-96 period, which occurred despite a 3-percent increase in total employment.

Two main conclusions may be drawn from the information presented in this section. The first is that changes in wages are the probable cause of long-term declines in employee compensation in southeast Alaska. Major regional trends such as this are most likely the result of broader developments in the regional economy at large rather than specific policy or market developments pertaining to a single industry or sector. Also, it should be noted that average regional wages still exceed the national average by a significant proportion (see section below). The second conclusion is that abrupt, short-term changes in regional industry structure can impact average employee compensation and thereby total regional income. Specifically, recent declines in timber harvesting and manufacturing are largely responsible for falling average earnings and total earned income in the 1990s.

Industry-Specific Employment

The level of industry detail in the REIS data is not sufficient to answer several important questions regarding the major sources of growth and change in the region.

The growth in service-related employment and income evident in the REIS data, for example, gives no indication of the types of businesses that are growing within the sector, and thus gives no evidence of whether tourism or expansion in unearned income is behind this growth. The ADOL data can provide us with some of this information. The ADOL data consist of quarterly estimates of local employment levels in specific industries (to the 4-digit standard industrial classification [SIC] level) for individual municipalities in southeast Alaska, or small groupings thereof, and they span the 1981-96 period. The identification of industries in the ADOL data that display the largest increases and decreases in employment will allow us to further identify the major underlying causes of growth and change in southeast Alaska.

Table 4 displays ADOL employment data (once again net of Juneau) for industries with major increases or decreases in employment for the 1981-90 period. The 10 largest advances and declines in terms of actual employment levels are arranged in declining order. The advancing industries identified in table 4 accounted for 70 percent of 1981-96 employment advances in the region (an increase of 4,036 jobs) and declining industries shown in the table accounted for 93 percent of declines (a decrease of 1,686 jobs).

For advancing industries, local government is identified as the single most important contributor to employment growth in rural southeast Alaska. It is followed by health services and a variety of other industries among which retail activities figure prominently. Growth in local government is tied to general increases in regional population and income rather than to any specific sector or activity. Increases in health services, on the other hand, can be linked directly to the expansion in medical benefits outlined in the previous section on regional income, and may be driven, in large part, by an increase in number of retired residents. Likewise, building construction is linked to overall economic growth in the region. In miscellaneous retail, on the other hand, souvenir and gift shops accounted for over half of total growth in the sector, and thus demonstrate an obvious link to the tourist trade. For most of the remaining growth sectors, it is difficult to draw links to specific activities. Thus, with the important exception of health services and miscellaneous retail, private sector employment growth in rural southeast Alaska cannot be traced to any single industry, but is rather the result of increased spending from both local and outside sources across a broad range of retail and service activities.

Declining sectors display a very different picture. Employment losses in the pulp and logging and lumber sectors together account for half of total employment declines in the 1981-96 period. The remainder is distributed across various sectors,

Table 4—Employment levels and change in major advancing and declining industries, 1981-96

Advancing sectors	1981	1996	Change	%[a]	Declining sectors	1981	1996	Change	%[a]
Local government	2,447	3,268	821	14	Pulp and paper	966	516	-450	25
Health services	398	991	593	10	Logging and lumber	1,603	1,154	-449	25
Food retail	435	904	469	8	Federal government	1,270	1,072	-198	11
General building contractors	195	633	438	8	Railroad transportation	172	0	-172	10
Miscellaneous retail	361	709	348	6	Heavy construction excluding building	523	405	-118	7
Air transportation	337	637	300	5	Other services	99	2	-97	5
Eating and drinking places	673	972	299	5	Water transportation	506	416	-90	5
Membership organizations	264	527	263	5	Communications	158	120	-38	2
Amusement and recreation services	6	266	260	5	Public admin. (exec., leg., and other)	65	27	-38	2
State government	835	1,080	245	4	Mining	36	0	-36	2
Total advances			4,036	70	Total declines			-1,686	93
Regional total ADOL employment	15,555	19,516	3,961						

[a] Refers to percentage of total advancing or declining industries.
Source: Alaska Department of Labor.

most notably federal government, railroad transportation (which, according to the ADOL data, is found only in the town of Skagway), and heavy construction excluding buildings. Declines in federal employment occurred throughout much of the 1980s, but employment in this category has been relatively stable since 1988. The other industries mentioned above demonstrate high year-to-year fluctuations in employment levels, and the changes shown in table 4 do not reflect long-term trends so much as they do employment peaks in 1981 and troughs in 1996. Similarly, declines in the wood products industries are not the result of steady changes over the entire period. Rather, they reflect sharp declines from a peak year in 1990. Logging and lumber was, in fact, the fasting growing single industry in the 1981-90 period, but the industry has since lost over 1,400 jobs. Although employment in pulp production was relatively stable over most of the 1981-96 period, the closure of a mill in Sitka in 1993 resulted in a loss of around 500 jobs, and the 1997 closure of the Ketchikan mill (not yet evident in the ADOL data) has, with the exception of modest custodial activities, resulted in the elimination of the remaining employment in the industry. In contrast to advancing sectors where gains were broadly distributed across a number of sectors, employment declines in rural southeast Alaska are concentrated in the wood products sectors and are the result of a sharp reduction of activity in the 1990s.

In Review

The information presented in this section allows for a number of conclusions about the general evolution of rural southeast Alaska's economy and the underlying causes of change. Overall, the region's economy has been growing, with much of this growth resulting from increases in government, services, and retail activity. Although an increase in tourism is no doubt responsible for a substantial proportion of this growth, the steady growth in unearned income, especially retirement and medical benefits, is likely a more important (though less noticed) factor. Also, the importance of unearned income has been enhanced in recent years owing to declines in earned income since 1990. These declines are primarily the result of recent declines in the forest products industries, but it should be remembered that wages have been generally declining in the region since the 1970s, and this has been an important factor in constraining long-term growth in total earned income.

The overall impact of these changes is that rural southeast Alaska is increasingly less reliant on resource extraction and processing sectors and more reliant on a broad range of nonmanufacturing activities that look to both tourism and local residents for their support. This, in turn, can be partially interpreted as a shift from a traditional frontier economy to a more rounded and developed regional economy.

Ongoing economic diversification and the decline of average wages to levels closer to the national average favor this interpretation. However, to the extent that tourism is driving growth, the region may be merely replacing more traditional resource-dependent industries with another, albeit quite different, resource-dependent industry. The question remains, how much is the regional economy's ongoing evolution reliant on specific forest outputs, such as tourism amenities, and to what extent does it depend on broader changes arising from overall economic development and changes in the U.S. economy at large? Growth in unearned income and in residential sectors (such as health care, food retail, etc.) indicates that tourism is by no means the sole driver of growth in the rural southeast Alaska. A comparison of key economic measures for rural southeast Alaska with those for other regions and the Nation will help further answer this question, as well as provide a necessary context for understanding economic growth and change in the region.

Southeast Alaska in a Comparative Context

This section provides a comparative context for understanding developments in the economy of rural southeast Alaska. The focus is on growth in various types of income, concentrating first on the division between earned and unearned income and then on a more detailed examination of earned income by industry sector. Two comparators are considered. The first is the U.S. economy as a whole. Because U.S. aggregate measures are dominated by the large urban economies in which most Americans live and work, nonmetropolitan Oregon and Washington counties are included as a second comparator. These provide information more specific to rural economies where natural resources and public lands play a more important part. As before, the Bureau of Economic Analysis REIS data on county income are the major source of data for this section. Additionally, the Oregon Employment Department provides county-level employment data similar to that of the Alaska Department of Labor, allowing a comparison of industry-specific changes in employment.

Income

The initial division of total personal income into earned and unearned income is shown in index form in figure 5. From the figure, it is clear that both income categories follow much the same trends in all three regions (United States, the nonmetropolitan Pacific Northwest [PNW], and rural southeast Alaska), although the year-to-year variance is considerably higher in the smaller regions as compared to the U.S. aggregate. In the earned income category, business cycle downturns are evident for all regions in 1975 and again in the early 1980s, when the downturn in

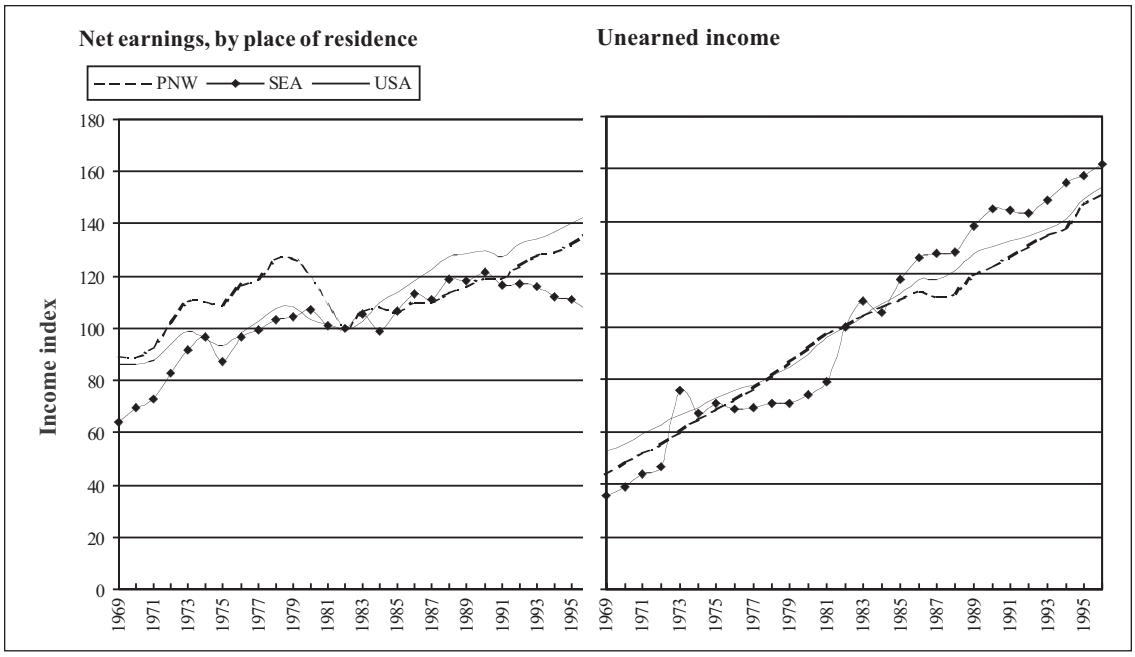

Figure 5—Indexes of real income by type (1982 = 100). PNW = nonmetropolitan Pacific Northwest, SEA = southeast Alaska (excluding Juneau). Source: Bureau of Economic Analysis, Regional Economic Information System.

the PNW was particularly severe. Until the 1990s, rural southeast Alaska's earned income generally kept pace with both national growth and growth in the PNW. Beginning in 1991, however, earned income in the region began to diverge from that of the other regions, posting consecutive declines in spite of continued advances at the national level. As noted above, these declines were the result of a combination of declining average wages and a loss of wood products manufacturing employment.

Earned income in rural southeast Alaska diverged from the national trend in 1991, declining rather than increasing.

Unearned income presents a somewhat different picture. Growth rates in this category far exceed those in earned income, and those for rural southeast Alaska slightly exceed those for the other regions. Once again, year-to-year variance is much higher in rural southeast Alaska than elsewhere, but on the whole, southeast Alaska's performance is more closely correlated with national and PNW performance. (Simple cross-correlation scores for unearned income estimated from the series shown in figure 5 are southeast Alaska-PNW = 0.97; southeast Alaska-U.S. = 0.99; and PNW-U.S. = 0.97. These compare with 0.73, 0.83, and 0.78 calculated for earned income by using the same pairings). Additionally, unearned income in all regions shows little tendency to deviate from the overall trend. Certainly, lagging performance in southeast Alaska in the 1970s represents a slight divergence, but the region quickly regained the trend in the early 1980s, and deviations such as that seen in earned income in the 1990s are not apparent. The high correlation between rural southeast Alaska's performance and that of the other regions provides

evidence that growth in this increasingly important income category is tied to fundamental forces at work in the U.S. economy rather than to developments specific to southeast Alaska's regional economy. Dividends, interest, and rent, which constitute close to half of total unearned income in each region, can be tied to an increasing reliance on accumulated capital assets as an income source. In the case of transfer payments, which constitute the other half of unearned income, retirement and medical benefits account for the majority of current payments and historical growth in each region. In this category, however, southeast Alaska differs somewhat from both the PNW and the United States in that "other payments to individuals" (primarily Bureau of Indian Affairs and Alaska Permanent Fund payments) account for a significant share (27 percent) of total transfers.

The effect of different growth rates for different income categories on the structure of income in the three regions is shown in table 5. Growth in total personal income over the 1969-96 period is roughly equivalent across the regions. Likewise, all regions have experienced a shift from earned to unearned income sources. In both southeast Alaska and the nonmetropolitan PNW, however, this shift has been more pronounced than in the national economy as a whole. In 1970, southeast Alaska was considerably more reliant on earned income than the other regions, which fits the common conception of frontier economies as places that attract new residents primarily by virtue of their employment opportunities (North 1955). Over the last three decades, and especially since 1980, the share of earned income has fallen to the point where it is now only slightly above that prevailing at the national level. The earned income share in the PNW, in contrast, began at a comparatively low level and continued to fall, especially during the recession of the early 1980s. The result is that unearned income now accounts for fully 43 percent of total personal income in the rural PNW. Although it is difficult to draw direct conclusions for southeast Alaska from this fact, it does indicate that the current share of unearned income (33 percent) in southeast Alaska need not represent an upper bound.

Earned income across industrial sectors (table 6) also displays similar growth rates for specific sectors across all regions but considerable variation between regions in sector shares. Manufacturing income is relatively stagnant, particularly in southeast Alaska and the PNW. Services, on the other hand, demonstrate strong growth in each region with annual growth rates exceeding 4 percent in both southeast Alaska and the Nation. Other sectors display intermediate levels, with rates predominantly in the 1.5 to 2 percent range. One result of these different rates of increase is a marked shift from manufacturing to services in all regions, a shift that was emphasized in the previous section of this report. In southeast Alaska, where

Table 5—Major source of income by locale

Income source	1970	1980	1990	1996	Annual growth[a]
	----------Million 1995 dollars----------				*Percent*
Personal income:					
Rural southeast Alaska	553	880	1,134	1,071	2.5
United States	3,261,239	4,229,021	5,582,378	6,295,242	2.5
Nonmetro Pacific Northwest	18,362	27,371	30,639	36,158	2.1
	---------Percentage of total personal income---------				*Percent*
Earned income (net earnings by place of residence):					
Rural southeast Alaska	84	81	72	67	1.7
United States	76	70	67	65	1.9
Nonmetro Pacific Northwest	73	65	59	57	1.0
Dividends, interest, and rent:					
Rural southeast Alaska	8	9	14	15	5.9
Unites States	14	16	19	18	3.9
Nonmetro Pacific Northwest	15	18	22	21	4.0
Transfer payments:					
Rural southeast Alaska	8	9	14	18	5.2
United States	10	14	14	16	4.0
Nonmetro Pacific Northwest	12	16	20	22	4.6

[a] Annual percentage of growth estimated by using logistic regression on 1969-96 data.
Source: Bureau of Economic Analysis, Regional Economic Information System.

manufacturing initially accounted for a larger share of earned income than elsewhere, this shift has been comparatively more pronounced, and manufacturing now accounts for a smaller proportion than in either the U.S. total or the PNW. The majority of this change has been the result of declines in manufacturing employment and wages in the 1990s. In fact, in 1990 the region still exhibited concentrations in manufacturing that were considerably higher relative to the other regions.

Growth in trade in southeast Alaska has been relatively strong, but the sector is still underrepresented relative to the other regions. Owing to an initially low relative share, services are also largely underrepresented in the region. In all three regions, growth in income derived from government employment has kept pace with overall growth and has thus maintained generally stable shares. However, when viewed in comparison to the U.S. total, both rural PNW and southeast Alaska exhibit a higher dependence on government activity. This is typical for many rural areas. The "other" category shown in table 6 includes construction; agricultural services, commercial fishing, and forestry; transportation and public utilities; and mining. Concentrations in this aggregate category are much higher for southeast Alaska owing mostly to the predominance of commercial fishing in the region.

Table 6—Comparison of industry income shares

Sector	1970	1980	1990	1996	Annual Growth[a]
	Percentage of nonfarm earnings by sector				
Manufacturing					
Rural southeast Alaska	33	32	28	17	0.0
United States	27	25	20	18	0.4
Nonmetro Pacific Northwest	30	28	24	21	-0.1
Trade					
Rural southeast Alaska	9	9	10	12	1.9
United States	17	17	16	16	1.6
Nonmetro Pacific Northwest	17	16	16	16	1.3
Services					
Rural southeast Alaska	8	9	11	16	4.4
United States	16	19	26	28	4.6
Nonmetro Pacific Northwest	12	15	19	21	3.6
Finance, insurance, and real estate					
Rural southeast Alaska	1	3	2	3	3.2
United States	6	6	7	8	3.7
Nonmetro Pacific Northwest	3	3	3	3	1.8
Government					
Rural southeast Alaska	23	24	23	26	1.9
United States	18	16	16	15	1.6
Nonmetro Pacific Northwest	22	19	22	22	1.8
Other[b]					
Rural southeast Alaska	23	22	23	25	1.9
United States	16	17	15	14	1.4
Nonmetro Pacific Northwest	16	18	16	15	1.0

[a] Annual percentage of growth estimated by using logistic regression on 1969-96 data.

[b] Includes agricultural services, forestry, fishing and other; mining; construction; and transportation and public utilities.

Source: Bureau of Economic Analysis, Regional Economic Information System.

Although exhibiting relatively strong growth, the finance, insurance, and real estate sector accounts for only 3 percent of southeast Alaska's regional employment, a figure in keeping with the PNW share but considerably less than the U.S. average.

Taken together, the aggregate income and income by industry sector data presented in this section indicate that the evolution of southeast Alaska's rural economy is broadly shaped by the same forces that are at work in both the PNW and the Nation at large. These include the increasing importance of unearned income and a shift from manufacturing to services. In terms of current industry structure, however, the region remains quite different from both the Nation and, to a lesser extent, the PNW. Specifically, rural southeast Alaska continues to rely more on

government activity while trade and services sectors remain relatively undeveloped. Interestingly, the PNW seems to occupy a middle ground between southeast Alaska and U.S. shares in many industrial sectors. One possible conclusion here is that much of the deviation between the regions is the result of size and local economies of scale. As regions become more densely populated, the local economy is assumed to be able to support a greater diversity of services, trade, and related activity (Hoover and Giarratani 1984) and thus increase the share of these sectors in the local economy. If this is the case, then continued population growth in southeast Alaska would be a major contributor to further development in currently under-represented sectors.

Employment

By examining relative rates of employment growth in specific industries, the comparison between southeast Alaska and other regions can be drawn in greater detail. Data are available for nonmetropolitan Oregon, so it is used as the comparator for this portion of the analysis. Based on Oregon Employment Department annual employment data available for counties at the 4-digit SIC level, the top 10 growth industries are displayed in table 7 along with comparative rankings and shares for southeast Alaska. Several high-growth industries in southeast Alaska, notably restaurants, health services, and food stores, also display high rankings in Oregon. Note, however, that both restaurants and health services constitute a considerably smaller share of total employment in southeast Alaska. Although not displayed in the table, declines in nonmetropolitan Oregon employment have been concentrated in the wood products sector as they have in southeast Alaska.

Several high-growth industries in Oregon have contributed little or nothing to growth in southeast Alaska. Notable among these are business services and electronics manufacturing. Both of these sectors are tied to advances in technology. In the case of business services, several researchers have noted the tendency of service providers to take advantage of advances in communications technology and locate in rural areas, where local amenities may be higher and costs lower (Beyers and Lindahl 1996). Electronics manufacturing is likely tied to the high-tech sector that has emerged as a leading industry in Portland and is becoming more important in other areas of the state. Given the economies of scale and information needs in the high-tech sector, it is doubtful that southeast Alaska can duplicate this sort of performance any time soon. In the area of business services, there is perhaps a greater opportunity for the region to foster telecommuting and entrepreneurial activity based on advanced communications, but much of this will depend on the ability of the region to provide adequate communication and transportation links,

Table 7—Top 10 private sector employment growth industries in nonmetropolitan Oregon (1981-95) and comparison with rural southeast Alaska

Sector	Oregon growth[a]	Oregon share[b]	SE Alaska rank	SE Alaska growth[a]	SE Alaska share[b]
	--------*Percent*-------			----------*Percent*----------	
1. Eating and drinking places	3	10	6	3	5
2. Business services	10	4	32	0	1
3. Health services	3	8	1	6	5
4. Social services	9	3	14	2	2
5. Electronics manufacturing	11	2	46	--[c]	0
6. Food stores	4	4	2	5	5
7. Special trade contractors	7	3	19	-1	1
8. General merchandise stores	5	3	55	-1	1
9. Engineering and management services	3	1	12	--[c]	1
10. Membership organizations	8	2	7	4	3

Note: Private sector excludes government employment. Southeast Alaska rankings are adjusted accordingly.

[a] Annual percentage of growth estimated by using logistic regression.

[b] Share of total employment in 1996.

[c] Unable to estimate owing to zero values in earlier periods.

Source: Oregon Employment Department, Alaska Department of Labor.

and on the overall attractiveness of the region to participants in this sort of footloose commerce.

Implications for Forest Policy

One important implication of the changes outlined in this report is that the ways in which forest policy decisions affect rural southeast Alaska's economy have become, at the same time, both less direct and more complex. With the relative decline in the timber sector, the traditional link through which forest policy affects employment and earnings in the timber sector has become much less pronounced in the region. To a certain degree, this situation is the recent result of forest policy decisions that have reduced available timber. At the same time, however, it must be recognized that the timber employment levels prevalent in the late 1980s did not constitute a permanent or even long-standing characteristic of the regional economy, and that market forces are equally important in determining activity in the sector. These two points are evidenced by the fact that during the timber recession of the early 1980s, timber employment levels were close to levels recorded for 1996, and that sharp declines in the 1990s were preceded by even sharper increases in the late 1980s. In the absence of significant increases in national forest timber sales (and the market to support them), the ability of forest policy to further impact the regional economy via the timber sector will be small.

The focus then turns to the relation between forest policy and the other sectors and income sources examined in this paper. Commercial fishing, particularly salmon fishing, is widely believed to be negatively impacted by forest disturbances entailed in timber harvest. The dynamics and extent of this relationship, however, are still poorly understood, and the impact of forest policy decisions on fish catches is well beyond the scope of this report. Moreover, the major sources of income growth in the region are outside of the traditional resource industries of timber, fishing, or mining. Hence, the question of how forest policy will impact the region's economy hinges on the relation between the forest and these increasingly important sources of income.

Despite decline in the timber sector, forest policy still affects the regional economy.

Tourism is recognized as a fast-growing component in southeast Alaska's regional economy, and an increasingly important economic role for the forest is its ability to attract visitors to the region. This role can be viewed two ways. First is the ability of the forest to supply specific settings in which recreation and tourism activity can take place. Campgrounds, cabins, and trails are in this category. Second is the general provision of natural amenities that provide a backdrop for tourist and recreational activity and that may be the factor that influences visitors to travel to southeast Alaska. Although the first function can be analyzed in terms of specific and concrete management decisions (e.g., whether to build an access road or campground), the second function involves the consideration of such intangible factors as aesthetic appreciation and personal values. These two functions may be in conflict that escalates with the density of use in a given area of the forest. Management aimed at fostering tourism-related activity and benefits on the forest will increasingly have to consider conflicts between different visitor activities as well as conflicts with other types of forest uses, such as resource extraction.

In assessing the links between forest management and local economic activity, analysts, decisionmakers, and the public have generally stressed the influence of management on specific industries such as timber or tourism. The results of the current analysis, however, identify unearned income as a major driver of local economic activity, and the links between forest management practices and unearned income receipts deserve more attention than they commonly receive. The ability of a region to attract new residents and retain current residents is a key factor in securing unearned income, especially retirement benefits. In addition to other factors, local natural amenities and recreational opportunities may be important considerations in people's decisions to reside in a given place. The value of forest amenities to southeast Alaska residents has been amply recognized in the past (USDA Forest Service 1997), but with the growing importance of unearned income, the actual links to local economic activity in the form of employment and income also need to be recognized.

Here again, increasing use will entail increased conflict. Different types of local forest users may demand very different types of management. Whereas many residents may prefer pristine settings, others, especially older residents, may desire increased convenience and ease of access. Moreover, it must be recognized that local residents will likely use the forest in very different ways than would out-of-state visitors engaged in a rare or even once-in-a-lifetime trip to the region. An added complication is that local residents will be more spatially specific in their use of the forest, returning to favorite places and concentrating their activity in locally accessible areas. Consequently, management decisions that degrade local amenities either through resource extraction or by opening an area to tourism activity can significantly impact the welfare of local residents, even if the aggregate impact is small or even positive. When viewed from the standpoint of local economic vitality, as managers try to balance increasing demands for forest amenities and access by different groups, a key question will be, at what point do congestion and general development impact the residential decisions of potential and current residents?

The influence of forest policy decisions also will extend beyond the provision of specific forest amenities associated with a given location and impact the overall character and attractiveness of the communities themselves. For example, policies that stress tourism development over timber development will foster increased local concentrations of tourist-related activity, activity that may or may not be desired by local residents or potential residents. Additionally, forest policy may affect residential decisions of unearned income recipients through its ability to impact overall local economic growth; vital communities with sufficient local services will be more attractive than communities in decline. And finally, to the extent that workers also receive unearned income, forest policy will impact unearned income receipts through direct and indirect impacts to employment in specific industries. Owing to these various factors, the link between forest policy and local economic activity must be seen as taking place through various and often indirect channels. Understanding and predicting the influence of these links on local employment and income will be far more difficult than merely predicting activity levels resulting from a given level of timber harvest and local processing.

Conclusion

This report has described and documented major economic changes occurring in rural southeast Alaska. On the whole, the results contain no major surprises. As a result of cutbacks in timber harvest and, especially, processing in the 1990s, manufacturing employment and earnings experienced sharp declines during the same

period, declines that are clearly visible in aggregate statistics on earned and total income. Over the long term, growth in other sectors, particularly services, has surpassed that in manufacturing, and hence the recent decline in manufacturing's share of total earned income merely accelerated a long-standing trend. Growth in these other sectors cannot be explained solely as a result of increases in tourism and recreation, but represent a general expansion in purchases by local residents along with those of visitors. Although growth in employment and earned income helped fuel this expansion, strong growth in unearned income sources, principally retirement benefits and medical payments, was equally important, accounting for half of the total expansion in personal income in the 1969-96 period.

Many, but not all changes in rural southeast Alaska's economy are reflective of broad-scale changes in the U.S. economy.

Many of the changes occurring in rural southeast Alaska's economy are reflections of broad-scale changes in the U.S. economy. The declining importance of manufacturing and increases in services are two such changes, and the increasing importance of unearned income is another. At the same time, however, the region's economic development diverges from that of the Nation in several important ways. Growth in services has not kept pace with the national average, and many sectors are still greatly underrepresented when compared to the national economy or that of the nonmetropolitan Pacific Northwest.

Economic changes in the region have important implications for management of the Tongass National Forest. Assuming no major rebound in the timber sector, tourism is and will continue to be the major industry that can be directly impacted by forest management decisions.[5] With continued growth in the tourism sector, the importance of actively managing to benefit from tourism and recreation will increase. Many of the links between forest policy and unearned income receipts are similar to those between tourism and forest policy in that the provision of natural amenities and recreational opportunities is a major factor in the decisions of many to both visit and to live in southeast Alaska. Here again, the major contribution forest management can make to local economic vitality will be to provide forest-based amenities and lifestyle benefits for local residents. Note, however, that the desires of residents and visitors are not always compatible; the factors involved in the attractiveness of a locality as a place to live are different and more complex than those involved in its attractiveness as a place to visit.

[5] Commercial fishing also is an important industry with possibly strong links to forest management, links that must be considered in management decisions. However, as outlined earlier in this report, these links are neither direct nor well understood. In the immediate future, forest policy directed to the maintenance and promotion of fish populations will most likely be restricted primarily to constraints on management practices and development in order to minimize impacts to fish populations and their habitat.

In the past, a major challenge for forest managers has been balancing commodity production and other forest uses. In the future, these other uses will dominate the benefits flowing from the forest more and more, and they will constitute the principal driver for forest-related regional economic activity. This is not to say that timber production need be completely absent, but its relative importance will be greatly reduced both as a result of past declines in the sector and, equally, increases in other sectors and uses. Here, the major challenge for managers will be to maintain the ecological integrity and natural character of the forest while accommodating the demands of different user groups, groups who view these qualities as an important factor in their choice to visit or live in the region.

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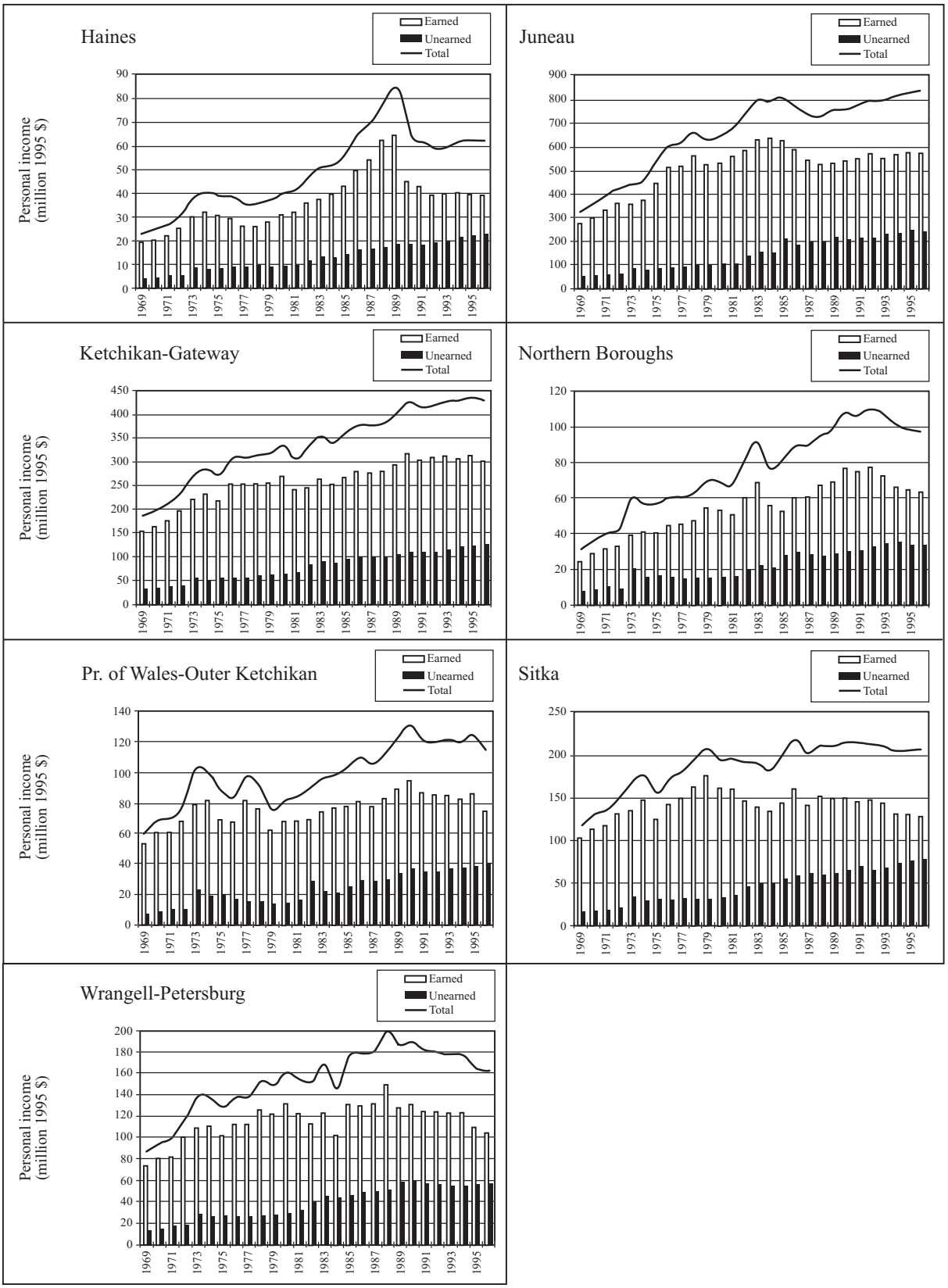
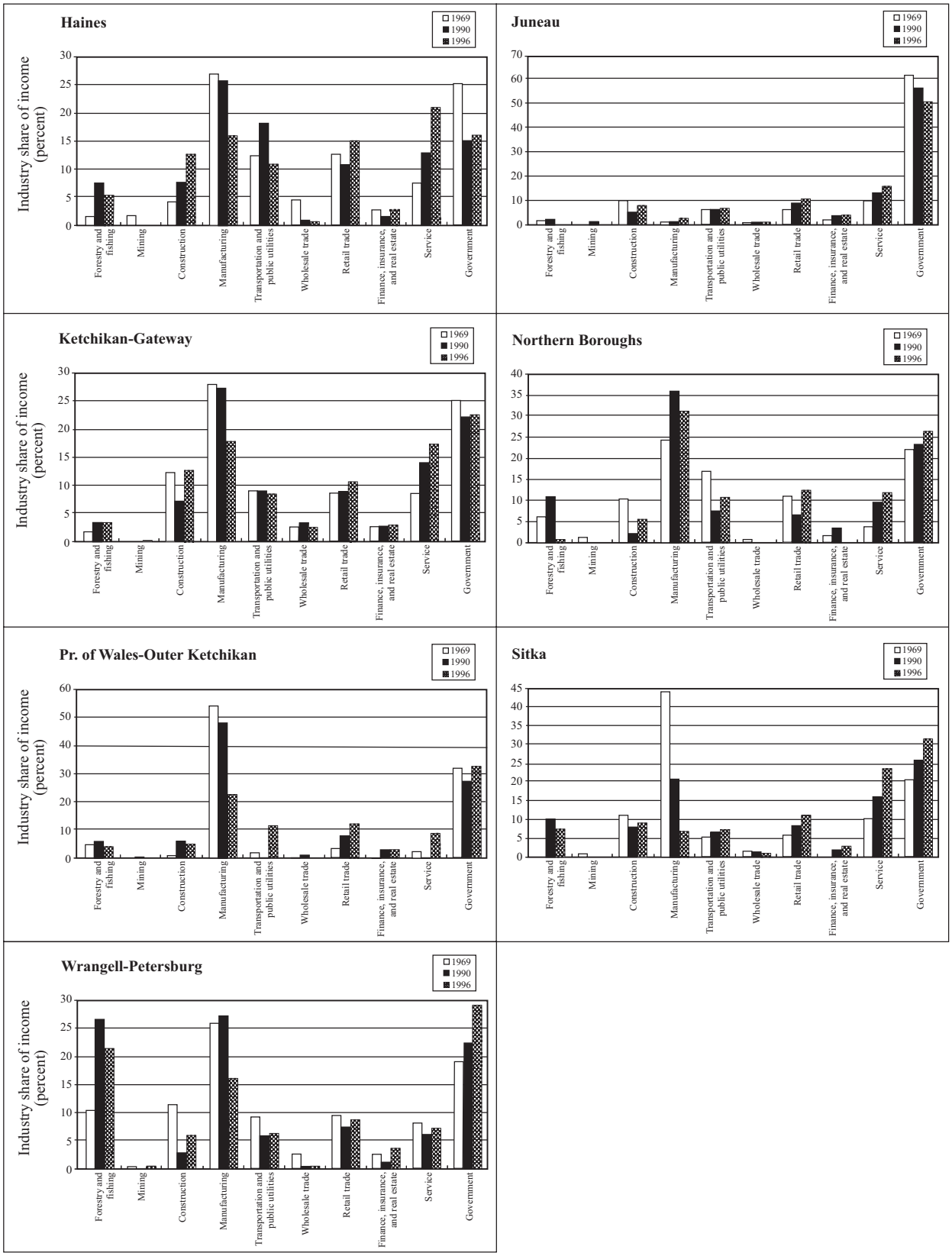
Appendix 1: Southeast Alaska Income by Borough



Sources Bureau of Economic Analysis, Regional Economic Information System.

Appendix 2: Southeast Alaska Industry Income Shares by Borough



Source: Bureau of Economic Analysis, Regional Economic Information System.

Chapter 2: Rural Manufacturing and the U.S. Wood Products Industry: Trends and Influences on Rural Areas

Lisa K. Crone[1]

Abstract

Crone, Lisa K. 2004. Rural manufacturing and the U.S. wood products industry: trends and influences on rural areas. In: Mazza, R., tech. ed. Economic growth and change in southeast Alaska. Gen. Tech. Rep. PNW-GTR-611. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 33-71.

Demographic and economic trends from 1970 to 2000 are compared for rural southeast Alaska, a composite of rural counties in Idaho and Montana, the borough of Juneau, Alaska, and the United States. National and global trends that influenced manufacturing in the rural United States in general, and the wood products industry in particular, also affected economic performance in the two rural areas over the past 30 years. Unique characteristics of the Alaska forest products sector, which allowed it to survive the major market downturn of the early 1980s, are discussed as are factors leading to its subsequent decline in the 1990s. New sources of comparative advantage in the region are identified, and indicators of socioeconomic conditions at the community scale are analyzed within the broader context of community resiliency in rural areas.

Keywords: Southeast Alaska, rural, economic trends, manufacturing, comparative advantage, community resiliency.

Introduction

Historically, economic activity in rural southeast Alaska has been heavily reliant on the extraction and primary processing of natural resources. As such, it is dependent on conditions in the national and global economies. Globalization and changes in the markets for key Alaska products have increased this dependency. The resulting changes in the regional economy have not been expressed uniformly among the communities of southeast Alaska. This chapter evaluates the economic changes taking place in rural southeast Alaska, reviews the sources of these changes, and determines if and why they differ from the changes occurring at larger scales. Because many of the concerns expressed about the economic effects of forest policy and management focus on rural areas, I also compare trends in rural southeast Alaska with those in another rural and resource-abundant region.

I begin with a comparison of trends at the national, state, and regional level with southeast Alaska further divided into two subregions: (1) the borough of Juneau and (2) rural southeast Alaska, defined as everywhere other than Juneau. This is done

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not only because of Juneau's relative size (42 percent of the population in southeast Alaska in 2000), but also because of the importance of state government operations in its economy. Because of its size, Juneau tends to dominate aggregate statistics for southeast Alaska, and its economic activity is often more reflective of trends within the state than of economic activity in the less populated areas of southeast Alaska.

The other rural area chosen for comparison includes four counties in Idaho (Adams, Boundary, Clearwater, and Idaho) and two counties in Montana (Mineral and Sanders). This group of counties will be referred to as rural IdMt. They were selected according to the following criteria: (1) the county population was less than 16,000 in 2000, (2) the county was not adjacent to a metro area (as defined by the Economic Research Service in Cook and Mizer 1994), (3) at least 8 percent of county employment was in the wood products sector in 1995, (4) the county was not farming dependent (as defined by the Economic Research Service in Cook and Mizer 1994), and (5) National Forest System lands make up at least 50 percent of the county's land area. These criteria were used because they are representative of conditions in rural southeast Alaska.[2]

A Comparison of Trends—Population, Personal Income, and Earnings

Comparisons at the scales mentioned above are carried out for population, income, and earnings for the years 1969-2000 by using Bureau of Economic Analysis (BEA) Regional Economic Information System (REIS) data (U.S. Bureau of Economic Analysis 2002). The population estimates are based on data from the Bureau of the Census. Changes in population and demographics can be useful in describing past and potential economic growth. Figure 6 displays trends in population growth for the five areas from 1969 through 2000, indexed to 1969. The use of an index allows for comparisons of changes between areas on a relative scale rather than in absolute magnitudes.

Population

The U.S. population has grown at a fairly steady average annual growth rate of about 1.1 percent from 1969 to 2000. Over the same period, the Alaska population grew at an average annual growth rate of 2.5 percent. Population change is made up of two components: natural increase (births minus deaths), and net migration, which is inmigration (people moving into the region) minus outmigration (people

[2] None of the counties in Oregon or Washington met all of these criteria.

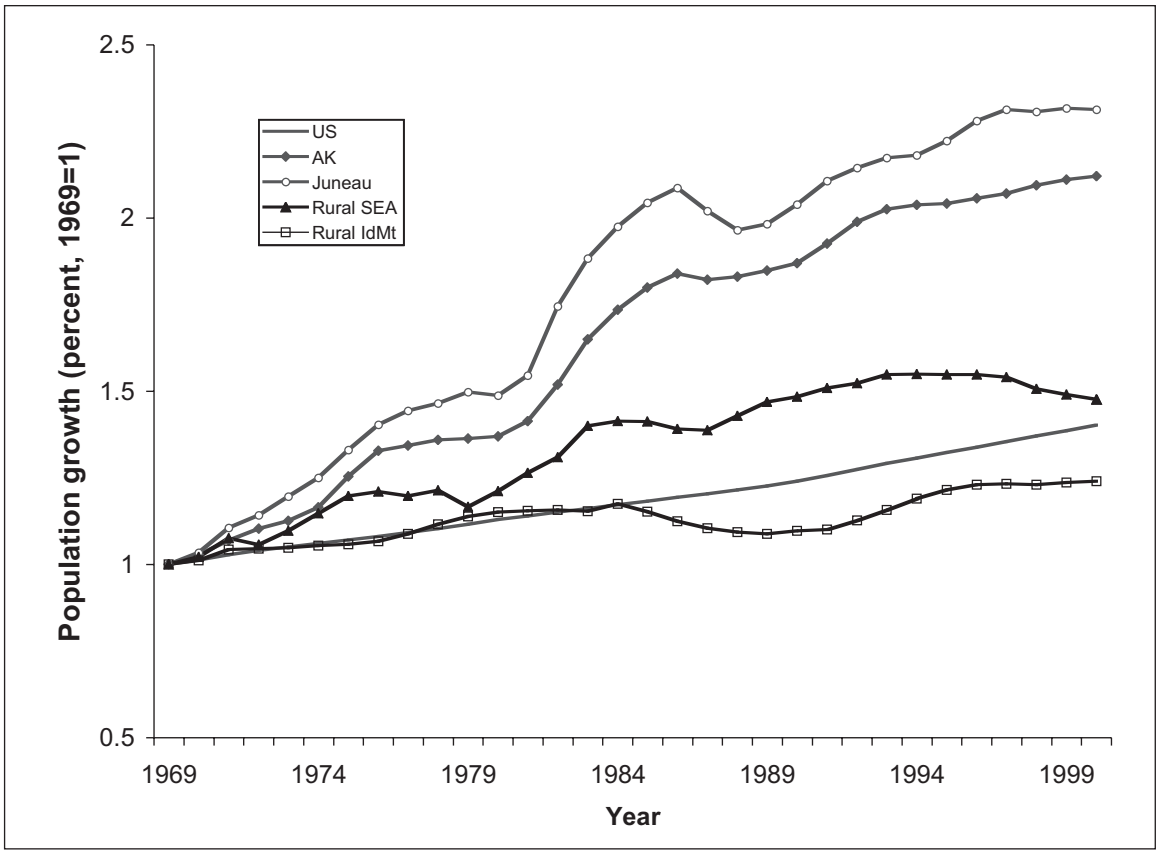

Figure 6—Population trends for the United States, Alaska, Juneau, rural southeast Alaska, and rural IdMt, 1969-2000, indexed to 1969 (U.S. Bureau of Economic Analysis 2002).

moving out of the region). In general, the higher the level of gross migration (the sum of inmigration and outmigration), the more unstable the population. Although natural increase has been fairly stable in Alaska, the state has, on average, the third highest gross migration rate in the country. Changes in net migration in Alaska have been influenced more by changes in inmigration than changes in outmigration. The state experienced increased growth rates followed by decreased growth rates associated with the construction of the trans-Alaska pipeline from 1973 to 1975 and the construction and infrastructure development from 1980 to 1985 arising from a combination of state spending based on oil revenues, major federal expenditures, and private development (Alaska Department of Labor, Research and Analysis 2000). The strength of the Alaska economy relative to the continental United States, especially the Pacific and Mountain regions, is a major influence on migration to and from Alaska. In contrast to the early to mid 1980s, the 1990s were characterized by net outmigration caused by a smaller military presence in the state, a strong national economy, and a slowing of the Alaska economy because of

Strength of Alaska's economy relative to that of the Nation influences migration to and from the state.

decreased oil, mineral, fish, and timber production. As the population of the state has increased over time, however, the number of migrants has grown smaller relative to the base population. This has decreased the influence of net migration and increased the influence of natural increase on population change leading to more stable (although slower) population growth in the state.

Juneau experienced basically the same growth patterns as the state from 1969 to 2000, with the exception of higher rates of increase and decrease associated with the increases in state spending from 1980 to 1985. Rural southeast Alaska also has followed the same increasing and decreasing trends, but since 1996 has experienced annual decreases in population. Rural IdMt had generally positive growth rates until the mid-1980s, after which the area had negative annual rates of growth for the next 5 years. The population began to increase in 1990 with annual growth rates around 2 percent; this continued through the mid-1990s. Since 1996, annual growth rates in this area have been less than 1 percent.

Personal Income

Total personal income is an estimate of the total income received in an area by all individuals who live in the area. As defined by the BEA, it includes wage and salary income; other labor income; proprietor income; personal dividend, interest, and rental income; and transfer payments. Transfer payments include such things as retirement and disability insurance benefits, medical payments (mainly Medicare and Medicaid), unemployment insurance benefits, veterans' payments, and federal grants and loans to students. In Alaska, a large component of transfer payments is the yearly payment all residents receive from the Alaska Permanent Fund. Figure 7 displays trends in total personal income (converted to 1995 dollars by using the Bureau of Labor Statistics consumer price index as a deflator) for the five areas from 1969 through 2000. Again, 1969 is used as an index year to allow relative comparisons across the regions.

Compared to population changes, total personal income changes in the United States have varied more and generally reflect the expansions and contractions of the U.S. business cycle, as determined by National Bureau of Economic Research economists (National Bureau of Economic Research, Inc. 2003). The average annual rate of change from 1969 to 2000 was 2.5 percent; the minimum annual rate of change, -1.7 percent, occurred in 1980, and the maximum of 6.3 percent occurred in 1984. Total personal incomes in Alaska and Juneau also were more variable but generally followed the same trends as population in these areas. Both areas experienced their largest annual rates of increase in total personal income in 1975 (25.3 percent for Alaska and 17.1 percent for Juneau) during the trans-Alaska pipeline

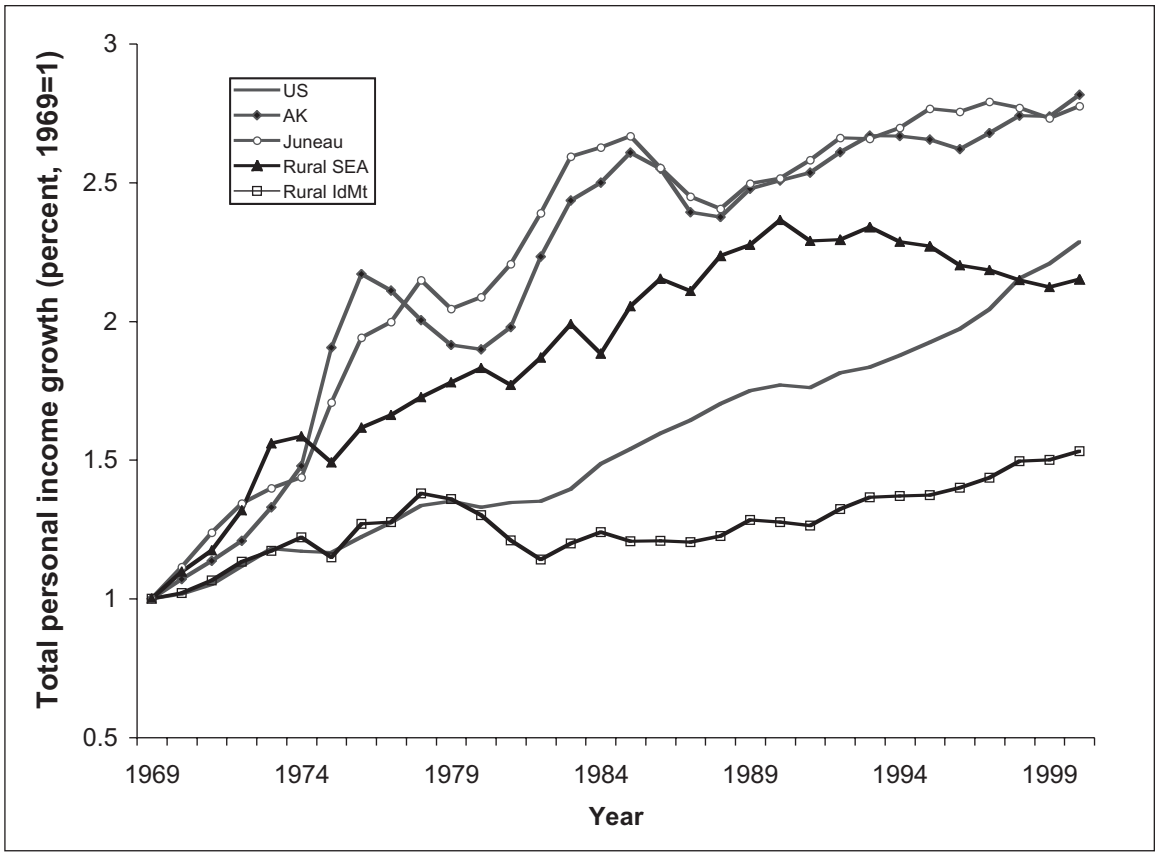

Figure 7—Total personal income trends (1995 dollars) for the United States, Alaska, Juneau, rural southeast Alaska, and rural IdMt, 1969-2000, indexed to 1969 (U.S. Bureau of Economic Analysis 2002).

construction period. Alaska experienced its largest average annual decrease (-6.4 percent) in personal income in 1988, whereas the largest decrease (-5 percent) for Juneau took place in 1979. The average annual rates of change in total personal income over the entire period for Alaska and Juneau were 3.1 and 3 percent, respectively.

Much of the variation in personal income in rural southeast Alaska can be explained by changes in the wood products and fishing sectors. For example, the decreases in 1975, 1981, and 1984 all occurred in years of decreased timber harvest. The decrease in 1987 coincided with a 29-percent decrease in gross salmon fishing revenues in southeast Alaska. Timber harvests in southeast Alaska have generally decreased since 1992, and gross fishing revenues have generally decreased since 1994. A similar relationship between earnings in the wood products sector and total personal income existed in rural IdMt from 1978 to 1990. During this period there was a significant and positive relationship between wood products earnings and total personal income, with 93 percent of the variation in total personal income explained by variation in earnings in the wood products sector. After 1990, this

Table 8—Comparison of total personal income components (U.S., Alaska, Juneau, rural southeast Alaska, rural IdMt[a])

	1970	1980	1990	2000	Share change 1970-2000
	Percentage of total personal income				*Percent*
Earnings:					
U.S.	77	71	68	69	-8
Alaska	88	85	74	67	-21
Juneau	85	84	72	67	-18
Rural SE Alaska	86	82	71	62	-24
Rural IdMt	79	70	59	54	-25
Dividends, interest, and rent:					
U.S.	14	16	20	18	4
Alaska	7	10	15	17	10
Juneau	10	11	19	20	10
Rural SE Alaska	6	11	18	20	14
Rural IdMt	11	16	21	22	11
Transfer payments:					
U.S.	9	12	12	13	4
Alaska	4	6	11	16	12
Juneau	4	4	9	13	9
Rural SE Alaska	7	7	11	18	11
Rural IdMt	10	13	19	23	13

[a] IdMt = Idaho and Montana.

Source: U.S. Bureau of Economic Analysis 2002.

relationship no longer existed; wood products earnings have followed a decreasing trend whereas personal income has followed an increasing trend. An examination of changes in the components of personal income provides insight into the cause of this reversal.

In chapter 1 of this report, Robertson defines and discusses the important distinction between earned income (earnings) and unearned income (dividends, interest, rent, and transfer payments). He notes that unearned income, although less visible, has become an increasingly important source of income in many rural areas. (See Niemi and Whitelaw 1997, Power 1996, Rasker 1995, and Southwick Associates 2000 for studies that have documented this trend.)

Table 8 displays changes in the components of personal income over time for the five areas and clearly reveals the increasing share of unearned income at all scales. The most dramatic increases have occurred in the two rural areas where unearned income increased as a percentage of total income by 24 percent between 1970 and 2000. The aging of the population has been cited as a major factor in this change.

Changes in economic structure have also been linked to this phenomenon. I now turn to a closer examination of these structural changes.

Earnings

The BEA provides estimates of total earnings (by place of work) as well as earnings by industry for the Nation, individual states, and individual counties, boroughs, and census areas. Unfortunately, in the smaller counties and boroughs, much of the information for specific industries is unavailable because of disclosure rules designed to protect the privacy of individual firms. For this reason, I aggregate industries into the following five categories: manufacturing, services, retail trade, government, and "other." Table 9 provides a comparison of the share of total earnings accruing to each of these aggregates over time for the five areas.

A common trend in all areas is the increase in the share of earnings in the service sector. This sector includes a variety of businesses including hotels and other lodging places; establishments providing personal, business, repair, and amusement services; health, legal, engineering, and other professional services; educational institutions; membership organizations; and other miscellaneous services (U.S. Department of Labor, Occupational Health and Safety Administration 2003). Increased demand for health, recreational, and other services has come from increases in population and incomes. Within the service sector, health care and social services have experienced rapid growth owing largely to increased demand as the population ages. In Alaska, the demand for in-state specialized health care has also contributed to expansion of health care services and facilities (Baker 2001). Another major factor in service-sector growth has been technology. Information and communication technology, such as the Internet, now allow many services to be provided without personal contact to a wider market and with lower production and distribution costs.

Travel and tourism is a service business with particular importance in Alaska and in the specific areas studied—Juneau, rural southeast Alaska and rural IdMt—where natural amenities are high. Naisbitt (1994) has suggested that "three service paradigms" will drive the service-led economies in the future—telecommunications, information technology, and travel and tourism. Bosselman et al. (1999: 1) list the chief reasons for the dramatic growth in tourism as:

> . . . increased wealth (especially the emergence of larger middle classes); changed demographics (an increase in the number of retired persons with additional time to travel, especially in the developed countries); greater mobility (increased car ownership); transportation improvements (especially the increased size and number of larger airplanes, combined with the reduced cost of travel); technological changes (improved communications); and maturation of the tourism industry.

Table 9—Comparison of industry income shares (U.S., Alaska, Juneau, rural southeast Alaska, rural IdMt[a])

	1970	1980	1990	2000	1970-2000
	Percentage of nonfarm earnings by place of work				*Percent*
Manufacturing:					
U.S.	27	25	19	16	-11
Alaska	6	7	6	4	-2
Juneau	1	1	1	2	1
Rural SE Alaska	33	31	27	13	-20
Rural IdMt	31	39	30	19	-12
Services:					
U.S.	16	19	26	29	13
Alaska	10	14	18	22	12
Juneau	9	13	12	17	8
Rural SE Alaska	8	9	12	20	12
Rural IdMt	9	11	11	18	9
Retail trade:					
U.S.	11	10	9	9	-2
Alaska	8	8	8	9	1
Juneau	6	7	8	9	3
Rural SE Alaska	7	7	8	10	3
Rural IdMt	10	9	10	9	-1
Government:					
U.S.	19	18	18	16	-3
Alaska	44	35	36	32	-12
Juneau	63	57	60	49	-14
Rural SE Alaska	24	27	25	31	7
Rural IdMt	21	25	31	32	11
Other:[b]					
U.S.	27	29	28	31	4
Alaska	32	37	33	33	1
Juneau	21	23	18	24	3
Rural SE Alaska	27	26	28	26	-1
Rural IdMt	29	17	18	22	-7

[a] IdMt = Idaho and Montana.

[b] Includes agricultural services, forestry, fishing, and other; mining and construction; transportation, public utilities, and communications; wholesale trade; and financial services, insurance, and real estate.

Source: U.S. Bureau of Economic Analysis 2002.

Another common trend in all areas, except Juneau,[3] is the decrease in the share of earnings in the manufacturing sector. This trend has been linked to the industrial restructuring from a goods-producing to a service-based economy in what has been called the "new economy." In this context, service-producing industries are defined

[3] Juneau's manufacturing sector over the entire period has always been very small, and increased from 1 to 2 percent between 1990 and 2000 owing to the startup of a single firm, the Alaska Brewing Company.

more widely to include all economic activities not directly associated with the manufacture of goods, construction, agriculture, forestry, fishing, energy, and nonenergy mining. According to Summers (2000), a fundamental aspect of this new economy is "the move from an economy based on the production of physical goods to an economy based on the production and application of knowledge." The leading sector in this new economy is information technology. This sector and efficiencies resulting from its use in other industries, along with the globalization of business, have been credited for the U.S. economic expansion during the 1990s.

The government sector grew in two rural areas while declining at other scales.

Because many of the most valuable products in the new economy, such as computer software and technologies, require few raw material inputs, the industrial economy is becoming decoupled from the primary products (raw materials) economy (Drucker 1986). Another trend is the decoupling of industrial economy employment from production as increased technology and computerized production have decreased the demand for labor in the manufacturing sector.

Globalization of the markets for coal, timber, and agricultural products has decreased prices and reduced employment in local economies reliant on extractive industries (McLaughlin 2002). In order to compete in global markets or take advantage of rapid technological change, firms have to move quickly (Shepard 1997). Certain rural areas, such as the U.S. South, experienced economic growth as a result of these trends as manufacturing plants shifted production to rural areas in search of cheaper labor and land. Other manufacturers have responded to globalization by seeking even cheaper labor and land and fewer environmental restrictions overseas (Gilbertsen 2002, McLaughlin 2002). On the subject of capital investment in the global economy, Weber (1997: 77-78) writes:

> Developing countries already contain 80 percent of the world's population, and almost all net growth in the global labor force over the next 30 years will take place in the South (developing countries). Capital and labor seek each other out, which implies either migration of workers from South to North or capital flows from North to South. . . . The stark truth is that most political forces North and South prefer capital flows to immigration, so this solution is likely to grow, . . .

Table 9 also reveals that while the share of earnings in the government sector has decreased for the United States, Alaska, and Juneau, the share has increased in the two rural areas. This may be due to several factors including contraction of the military in the Nation and Alaska, the higher costs of providing government services in the sparsely populated rural areas, a higher proportion of employees in government agencies serving Alaska Natives owing to the higher proportion of Alaska Natives in rural southeast Alaska, the higher proportion of personal income coming

Table 10—Business cycle response: average annual growth rates in nonfarm earnings during expansions and recessions

	Expansions				Recessions			
Areas	**1972-73**	**1976-79**	**1983-89**	**1992-2000**	**1970-71**	**1974-75**	**1980-82**	**1990-91**
	Percent				*Percent*			
U.S.	4.3	3.4	3.7	3.2	2.5	-2.1	-1.0	-1.3
Alaska	3.9	-9.8	-1.1	-.2	5.7	36.0	7.0	1.1
Juneau	-.3	1.6	-2.5	0	11.7	20.3	5.3	3.3
Rural SE Alaska	10.0	2.5	2.0	-2.5	5.0	-11.2	-2.9	-3.8
Rural IdMt[a]	.6	1.7	1.1	1.0	4.7	-2.4	-14.5	-1.6
Rural SE Alaska:								
Manufacturing	12.0	1.9	5.6	-9.7	-3.8	-16.3	-12.9	-11
Retail trade	10.9	1.0	-.4	-.5	10.1	-19.6	6.3	1.0
Services	5.9	7.8	3.9	3.0	11.2	-7.3	7.8	2.6
Government	2.7	3.0	-.9	-1.2	12.2	7.2	3.7	1.7
Other	13.4	1.4	1.5	1.0	5.2	-22.3	-6.5	-6.5

[a] IdMt = Idaho and Montana.

Source: U.S. Bureau of Economic Analysis 2002.

Rural economies followed the national business cycle; Alaska and Juneau economies ran countercyclical to it.

from transfer payments in the rural areas, and a higher proportion of public land management employees owing to the higher proportion of public land in the rural areas.

Examining changes in nonfarm earnings in response to national business cycles provides further insight into the functioning of economies. Table 10 provides a comparison of the average annual rates of growth in nonfarm earnings during national expansions and recessions for the five areas, as well as average annual rates of growth in individual sectors for rural southeast Alaska.

Table 10 reveals that, in general, the Alaska and Juneau economies have not followed the business cycles of the United States, and during most cycles appear to operate in a countercyclical manner. The reasons for this were discussed above in the population and personal income sections. On the other hand, until recently, the rural areas did appear to be heavily influenced by national business cycles. Rural IdMt was most impacted during the 1980-82 recession. Rural southeast Alaska experienced its largest positive annual growth rates during the 1972-73 expansion, followed by its largest negative annual growth rates during the recession of 1974-75. After enjoying a 2 percent average annual growth rate during the expansion of 1983-89, rural southeast Alaska suffered negative average annual growth rates during the recession of 1990-91.

Much of the susceptibility of the rural economies to national business cycles can be traced to their manufacturing sectors. Weber (1997) has argued that service

employment is less cyclical than employment in manufacturing. This is because it is difficult to build up or run down stocks of intangible goods or alter the rate at which services can be provided. Additionally, government services tend to be countercyclical and in greatest demand during recessions. Weber reports that during the 1990-91 recession, American, Japanese, and German manufacturing output dropped 3.4 percent, 13.5 percent, and 11 percent respectively, while their output of services dropped 0 percent, 2 percent and 0.2 percent, respectively. Table 10 shows that government sector earnings in rural southeast Alaska increased during every national recession, even in 1974-75 when all other sectoral groups experienced negative growth rates. Except for the 1974-75 downturn, service sector earnings in rural southeast Alaska grew over all periods. The manufacturing sector in rural southeast Alaska experienced negative average annual growth rates during all of the U.S. recessions, with the largest negative growth rate in the 1974-75 recession.

History of Rural Manufacturing, Wood Products Industry, and Rural Southeast Alaska and Rural IdMt Economies

The apparent influence of the manufacturing sector on changes in nonfarm earnings in rural southeast Alaska warrants a closer look at the history of this sector. To better understand oscillations in this sector, it is important to place this examination within the context of rural manufacturing in general and wood products manufacturing in particular.

1940-1970

During World War II, many factories were moved to or newly built in rural areas away from the eastern and western coasts of the United States, both to avoid potential attack and to support the war effort (Roth 2000). In 1942, the Roosevelt administration established the Alaska Spruce Log Program, operated by the USDA Forest Service and financed by the Commodity Credit Corporation, to supply Boeing Aircraft Co. in Seattle with spruce wood from Alaska forests for airplane manufacture (Rakestraw 1981).

After World War II, the dispersal of manufacturing to rural areas increased as improvements in agricultural productivity during the 1950s and 1960s created a large pool of surplus labor in rural areas. This source of low-cost labor along with cheap land, relatively relaxed regulations, weak or nonexistent unions, lower taxes, and often government incentives and subsidies enticed many manufacturers to move to rural America (Galston and Baehler 1995, Roth 2000). Although the federal

The national housing boom and a paper shortage after World War II provided the impetus for Alaska's timber industry.

government promoted the idea of rural industrialization in the 1950s, it wasn't until the Kennedy and Johnson administrations that it invested billions of dollars in loans and grants to stimulate industrial development in poor rural areas (Roth 2000).

In rural southeast Alaska, the national boom in housing construction and a newsprint shortage following World War II provided the impetus for the development of a pulp and wood products industry. The development of this industry was touted as a means to promote economic growth, provide year-round employment, and stabilize and increase populations in the region. Because only 50 percent of the region's overmature forest would meet sawmill standards, most believed a viable wood products sector hinged on the development of a regional pulp industry. Champions of this development strategy for rural southeast Alaska included the Alaska Regional Forester B. Frank Heintzelman, statehood proponents, both the U.S. State Department and the Department of Defense, and President Truman (Haycox 1990, 1997; Smith 1975). In order to attract the necessary large-scale investment to this remote and high-cost region, the Tongass Timber Act of 1947 authorized the construction of pulp mills in the forest and the use of 50-year timber sale contracts to supply their multiproduct wood processing operations.

In 1951, Ketchikan Pulp Company (KPC) was awarded a 50-year contract for cutting rights to approximately 8.25 billion board feet (BBF) of timber. The company built a pulp mill in Ketchikan and also operated sawmills in Ketchikan and on Annette Island. In 1957, a Japanese-owned company, Alaska Lumber and Pulp Company (APC), signed a 50-year contract for cutting rights to 5.25 BBF of timber. Originally, the Japanese investors wanted to use their own Japanese workers to harvest the timber and ship logs directly to mills in Japan. The U.S. immigration policy and a Forest Service policy requiring that primary manufacturing occur in Alaska[4] caused them to change these plans, and instead, build a pulp mill in Sitka and take over the operation of a sawmill in Wrangell (Tussing et al. 1968). Prices for the first 10 years of the KPC contract were $0.85 per cord of pulp, $3 per thousand board feet (MBF) for spruce (*Picea* spp.), $1.50 per MBF for cedar (*Chamaecyparis nootkatensis* or *Thuja plicata*), and $2 per MBF for hemlock (*Tsuga* spp.) and other log species. Stumpage prices were similar in the APC contract (Garrett and Dykstra 1988). The two pulp mills were designed to produce bleached-sulfite dissolving

[4] In 1926, Congress prohibited the export of round logs from the Tongass National Forest. U.S. Congress, Act of April 12, 1926, Exportation of Timber, P.L. 69-100. Ch. 117; 44 Stat. 242, as amended; 16 U.S. C. 616, 617. Harvests from Alaska Native lands are not subject to this log export ban.

pulp, which is used to produce synthetic cellulose fibers (rayon and acetate), cellophane films, and polymers, such as cellulose acetate, rather than pulp for newsprint as originally envisioned by Heitzelman, Senator Homer Capehart, and other early Alaska pulp development proponents.[5]

Thus, although the surplus of cheap labor was not part of the draw for the pulp companies, they were granted subsidies in the form of a guaranteed 50-year supply of cheap timber. In addition, the companies were granted exemptions from state and local taxes under the Alaska Industrial Incentive Act of 1957 (Tussing et al. 1968). Rogers (1960) described the construction of these new plants, arising mainly from the primary manufacturing requirement, as a gross misallocation of capital and labor resources from a national economic standpoint. Yet, as a policy-induced rural development strategy, their construction made sense. Some consequences of this particular strategy will be discussed shortly.

The 1970s

Manufacturing employment in the rural United States, rural southeast Alaska, and rural IdMt peaked in 1974 and then fell during the oil-shock-induced recession of 1974-75.[6] Employment also dropped in the U.S. lumber and wood products and pulp and allied paper sectors during this period as U.S. housing starts declined about 50 percent between 1973 and 1975 (Flora et al. 1991). Japan was hit hard by the oil shock as a 400-percent increase in oil prices led to decreased production for the first time since World War II. Japanese housing starts decreased by 19 percent between the first quarter of 1974 and the first quarter of 1975 as a result of the higher cost of living, a decrease in home loans, and rapidly increasing land prices after 1973 (Flora et al. 1991). Because Japan was the primary export market for Alaska forest products, employment in logging, lumber, and pulp also fell in 1974, as displayed in figure 8. Lumber and wood products earnings in rural IdMt fell 10 percent between 1973 and 1975.

In the U.S. expansion from the end of 1975 to 1979, manufacturing employment in the rural United States increased 18 percent to a new peak. By 1979, 44 percent

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[5] Capehart was the chairman of a subcommittee investigating the newsprint shortage in 1947 (Smith 1975).

[6] All manufacturing employment data in this section, unless otherwise noted, are from U.S. Bureau of Economic Analysis (2002). All U.S. employment in the lumber and wood products and pulp and allied paper industries data, unless otherwise noted, are from U.S. Department of Labor, Bureau of Labor Statistics (2003). All Alaska logging, sawmill, and pulp employment data, unless otherwise noted, are from Alaska Department of Labor, Research and Analysis (2002), and all lumber and wood products earnings data for rural IdMt are from U.S. Bureau of Economic Analysis (2002).

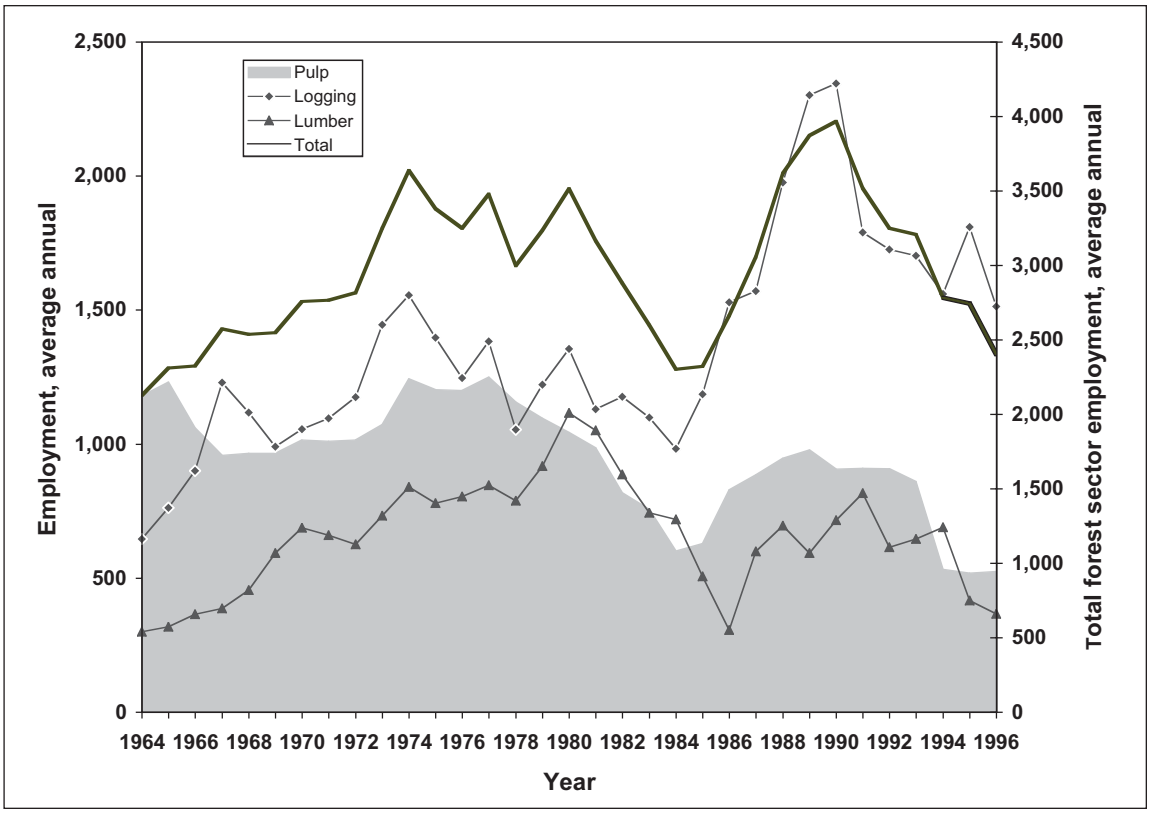

Figure 8—Employment in Alaska's timber harvesting and wood products industries, 1964-1996 (Alaska Department of Labor, Research and Analysis 2002).

of all rural residents lived in counties dominated by manufacturing (Carlin 1987). In rural southeast Alaska, manufacturing employment increased 25 percent between 1975 and 1980, whereas in rural IdMt, manufacturing employment increased 14 percent between 1975 and 1978 before declining. Between 1975 and 1979, industrial production in the United States and Japan increased by 36 percent and 45 percent respectively, and housing starts in the United States increased by 73 percent. Japanese wood housing starts had peaked in 1973, which was the first year that the number of houses surpassed the number of households and signaled the end of the postwar rebuilding. Since that time, the number of Japanese wood housing starts has been following a generally declining trend.

The U.S. lumber and wood products employment increased 25 percent between 1975 and 1979, while paper and allied products employment increased 10 percent. The growth in the Japanese economy and an increase in the value of the yen fueled an increase in the demand for North American wood products exports. Lumber employment in Alaska increased 43 percent between 1975 and 1980 to reach its alltime high. Pulp employment in Alaska increased 4 percent between 1975 and 1977 to reach its alltime high but then decreased 17 percent between 1977 and

1980. Logging employment in Alaska fluctuated up and down by as much as 23 percent over the period, and in 1980 was 3 percent lower than in 1975. Lumber and wood products earnings in rural IdMt increased 41 percent between 1975 and 1978, reaching their alltime high.

The 1980s

High trade deficits negatively affected rural manufacturing employment.

The recession years of 1980-82 had a severe impact on rural manufacturing. Describing this period Galston and Baehler (1995: 126-127) write,

> The back-to-back recession years of the early 1980s, combined with large trade deficits, debilitated U.S. manufacturers everywhere, but especially those in rural areas. Overall unemployment rates rose two percentage points more in rural areas than in urban areas between 1979 and 1982. During the same period, while the national employment rate remained level, employment in rural manufacturing dependent counties fell 5.6 percent. Every state in the Union except Nevada and Rhode Island lost rural manufacturing jobs in those recession years.

Manufacturing employment in the rural United States decreased 12 percent between 1979 and 1982, and did not recover to its 1979 level until 1989. In an attempt to control inflation in the early 1980s, U.S. policymakers increased both interest rates and the value of the dollar (Galston and Baehler 1995). High interest rates in the United States radiated to other industrial countries, such as Japan (Flora et al. 1991). The combination of higher interest rates and increased value of the dollar relative to other currencies decreased the demand for U.S. exports and affected rural areas more because they had disproportionately more employment in the goods-producing industries and were more export dependent than urban areas (Hamrick 1997). Although rural manufacturing employment was less than 30 percent of total manufacturing employment, nearly half of the losses in manufacturing employment between 1979 and 1987 had come from rural areas, with remote and sparsely populated rural counties hit hardest (Roth 2000).

Manufacturing employment decreased by 33 percent in rural southeast Alaska between 1980 and 1984, and it wasn't until 1988 that it rose above its 1980 level. In rural IdMt, manufacturing employment decreased 27 percent from its high in 1978 to a low in 1982. In 1990, it was still only 84 percent of its 1978 level. The U.S. forest products sector suffered as high interest rates reduced U.S. housing starts in 1982 to their lowest level since 1946 (Galston and Baehler 1995). The high value of the dollar decreased lumber exports. Lumber and wood products employment in the United States decreased 22 percent between 1979 and 1982

reaching its lowest level in the past 50 years, but recovered to its 1979 level by 1989. Employment in the U.S. paper and allied products industry decreased 6 percent between 1979 and 1983 but increased to 98 percent of its 1979 level by 1988.

Employment in Alaska's lumber industry decreased 73 percent between 1980 and 1986, and in 1991 was still only 73 percent of its 1980 high. One southeast Alaska mill was shut down from 1984 to 1988, and two others were closed from 1985 to 1987. This decrease in production was due to both decreased Japanese demand for lumber imports and the increased competition Alaska encountered in this export market. Haynes and Brooks (1990: 6) wrote,

> In the mid-1970s lumber producers in the Pacific Northwest began to look beyond the United States for markets; this was a response to long-term trends in U.S. markets and an effort to find outlets for products during U.S. recessions. At the same time and for similar reasons, producers in British Columbia also increased shipments to overseas markets. ... Alaska's share of North American softwood lumber exports to Japan fell from 42 percent in 1972 to 6 percent in 1985.

Alaska pulp employment decreased 42 percent between 1980 and 1984 and by 1989 was still only 78 percent of its 1977 high. Logging employment in Alaska decreased 27 percent between 1980 and 1984, but by 1990 had increased to 151 percent of its previous high in 1974. This was primarily due to private harvests on Alaska Native lands. As part of the Alaska Native Claims Settlement Act (ANCSA) of 1971, Alaska Native corporations were allowed to select lands from the national forests, and by 1980 about 900,000 acres had been reassigned (Flora et al. 1991). Native corporations were not subject to the ban on log exports and decided early on to cut their high-quality, easily marketed timber as quickly as possible (Erickson 2000). Their primary output was softwood log exports to the Pacific Rim, which increased sharply in 1979, and except for 1984 continued to increase every year of the 1980s despite declining export prices from 1979 until 1985 (Garrett and Dykstra 1988). Private harvests in Alaska climbed from 125 million board feet (MMBF) in 1979 to a peak of 672 MMBF in 1990 (Brooks and Haynes 1994). In rural IdMt, earnings in the wood products sector decreased 56 percent between 1978 and 1982 and then increased 70 percent by 1989, but only reached 74 percent of its 1978 high.

The Irland Group (1991) attributes the rebound of the Alaska forest products sector in the late 1980s to four factors: the declining dollar-yen exchange rate; the strong world pulp market; a stabilization of the dissolving pulp market; and the

strong peak in log exports, which boosted logging jobs. The Irland Group saw the shift in lumber milling from cants to surfaced lumber as a positive move. However, even with these favorable trends and a high lumber demand, the Alaska industry operated below capacity. The authors argue that if the increased production and employment of the late 1980s were caused by an improvement in southeast Alaska's competitive position, at least one of the following should have occurred: recruitment of new entrants into sawmilling, a shift from logs in the product mix, strong capacity expansion in pulp, or forward integration toward value-added products in either pulp or lumber. None of these occurred.

Economic recession accelerated trends already present in the timber industry.

In the Pacific Northwest and other wood-producing regions, it was a different story. During the recession of the early 1980s, many lumber and wood products plants laid off workers or closed outright. Companies went bankrupt, merged, or were bought out. In 1968, Oregon had 300 sawmills, but by 1988 there were only 165 mills. The number of sawmills in Washington fell from 182 in 1978 to 118 in 1988, while the number of wood processing operations (including veneer and plywood, pulp, shake and shingle plants, and others) fell from 764 in 1978 to 351 in 1988. The recession sped up trends already at work in the industry, with companies that survived the recession investing in cost-cutting and efficiency measures for their plants. The result was a more efficient industry that employed fewer, more productive workers (Conway and Wells 1994, Greber 1993).

Between 1979 and 1989, lumber and wood products employment decreased 19 percent in Oregon and Washington even though timber harvests increased 4 percent. Conway and Wells (1994) attributed the job losses to four factors: closure of older inefficient mills, improved skills of workers, layoffs, and increased capital investment in manufacturing technology. They believed these job cuts were necessary for the industry to survive and cited Greber (1993) who wrote, "What would have been the fate of the timber industries in the region had productivity changes not occurred? Simply put, job displacement in the Pacific Northwest would likely have been accelerated had producers not improved efficiency." Similarly, in Idaho, timber harvests were 6 percent higher in 1989 than in 1979, but lumber and wood products employment was 22 percent lower and earnings were 32 percent less in real terms (Niemi and Whitelaw 1995). In Montana, wood products output was higher in 1986 than in 1979, but 2,400 fewer people were employed (Corporation for Enterprise Development 1989). Savage (1990) estimated that when a lumber mill retools, employment decreases 20 to 25 percent on average. However, in one Montana mill, output per worker increased by 98 percent between 1978 and 1988 owing largely to mechanization (Heffner et al. 1989). The General Accounting Office (1990)

estimated that even if timber harvests across the Nation increased by 55 percent between 1990 and 2040, timber industry employment would still decrease by 27 percent owing to mill mechanization.

The 1990s

Manufacturing employment in the rural United States increased modestly by 3 percent between 1990 and 2000. This increase occurred primarily in the interior regions of the country (Great Lakes, Plains, and Rocky Mountain BEA regions), with rural manufacturing jobs actually declining in the Nation's coastal regions (New England, Mideast, Southeast, and Farwest BEA regions) in the 1990s (Wilkerson 2001). In rural IdMt, manufacturing employment decreased 13 percent over the same period, while in rural southeast Alaska, employment in this sector decreased dramatically by 43 percent. The root causes of this drastic decline in rural southeast Alaska are outlined next.

In southeast Alaska, the integrated pulp mill operators were able historically to offset losses during low points in the pulp market with the higher revenues they received when markets improved (USDA Forest Service 1994). In the 1990s, however, this ability disappeared for several reasons. First, the Tongass Timber Reform Act (TTRA) of 1990, passed in response to concerns about the environment and below-cost timber sales, revised the long-term contracts to make timber sales authorized under these contracts more consistent with independent timber sales in terms of planning, management requirements, and environmental assessment procedures.[7] The Alaska National Interest Lands Conservation Act (ANILCA) of 1981 had set aside 5.4 million acres of the Tongass for wilderness. To offset the potential decrease in timber harvest associated with the wilderness designation and the selection of land by Native corporations and the state, the act included a section that set the target timber supply from the Tongass National Forest at 4.5 BBF per decade, and included an annual appropriation of at least $40 million to fund the road preparations, cultural treatments, and logging systems to maintain this offer level (Morse 2000). The TTRA removed the 4.5 BBF per decade requirement, decreased the annual appropriation to $4 million, and directed the Forest Service to set the harvest level each year to meet "market demand" and sell timber at a profitable price. Because the most accessible timber had been harvested, the

[7] The revisions also included stipulations to eliminate the practice of overharvesting old growth, to re-offer timber rejected by the pulp companies as independent sales and subtract this volume from the long-term contract volume, to adjust the price of timber offered under the long-term contracts to levels comparable to independent sale prices, to count utility logs against the contract volume, to assure purchaser road credits are treated the same as in independent sales, and to assure the timber offered meets the same economic criteria used for independent sales

pulp companies' costs were already increasing, and the cumulative effect of the TTRA provisions was to push them higher.

A second factor affecting the profit margin of the pulp companies was the declining demand for their primary product, dissolving pulp.[8] World production of dissolving pulp reached an alltime high in 1974 (5.42 million metric tons); declined to a trough in 1982 (75 percent of its 1974 high), increased to a new lower peak in 1998 (88 percent of its 1974 high); and has since decreased every year except 1995 (United Nations FAO 2003). In 2001, world dissolving pulp production was only 53 percent of its 1974 high, and since 1994, production has been lower than its 1961 level of 3.62 million metric tons (United Nations FAO 2003). United States production of dissolving pulp has followed the same general trends, and since 1997 has been below its 1961 level of 1.08 million metric tons, and by 2001 was only 48 percent of its 1974 high of 1.56 million metric tons (United Nations FAO 2003).

The decline in the production of dissolving pulp is due to a decrease in the demand for products that use this type of pulp. Competition from petroleum-based synthetic fiber and films has depressed dissolving pulp demand: demand for rayon staple, in particular, has been displaced by polyester, and cellophane has been displaced by plastic films. There has been a move away from commodity viscose pulp production for rayon staple toward more specialized high-performance end uses. The sulfite process and batch digesters used by Alaska mills are less suitable than the sulfate process and continuous (flow-through) digesters used by most modern mills. Conversion of the Alaska pulp mills from batch sulfite processes to sulfate would have been very expensive. Pulp company costs were already increasing because of increased environmental monitoring and regulation owing to concerns over dioxin released during the chlorinated pulp bleaching processes.[9]

Dissolving pulp prices fluctuated widely in the 1990s (+/-$200 or more per metric ton). Sulfite viscose staple grade, which the Alaska mills produced, had a U.S. delivered price of $800 to $900 per metric ton in 1988 and 1989, but that price slid to cyclical lows of $635 in the third quarter of 1993 and $620 in the first quarter of 1994 (Miller-Freeman Publications, Inc. 2001). The APC mill inSitka shut down on September 30, 1993, unable to withstand this high-cost, low

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[8] Much of the information in this section is drawn from a personal e-mail communication from Peter Ince, 2003. pince@fs.fed.us (22 January).

[9] In March 1995, KPC entered into agreements with the federal government to resolve the issues related to water and air compliance problems experienced at KPC's pulp mill during the late 1980s and early 1990s. In addition to civil and criminal penalties that have been paid, KPC also agreed to undertake further expenditures, which are primarily capital in nature, including certain remedial and pollution-control measures, with an estimated cost of approximately $20 million (Louisiana-Pacific Corporation 1998).

price squeeze. There was a dramatic upswing in world pulp markets in 1995, and the price of dissolving pulp spiked to over $1,000 per metric ton in the third quarter of 1995. This was followed by a collapse in late 1995 and early 1996 as prices for all grades of market pulp began to decrease rapidly. During the first quarter of 1996, the parent company of KPC, Louisiana-Pacific, suffered a record operating loss of $30.5 million for their pulp operations and attributed more than half of their loss to the KPC mill (USDA Forest Service 1997, Whitelaw et al. 1998). By early 1997, the price of dissolving pulp was down to $750 per metric ton, and the KPC mill closed on March 24, 1997 (Miller-Freeman Publications, Inc. 2001). Another older dissolving pulp mill, the Rayonier, Inc. mill in Port Angeles, Washington, also closed in March 1997 as did a similar mill in Sweden the following year. Since the mid-1990s, more than 90 U.S. pulp, paper, and paperboard mills have shut down, and about 1 in every 12 industry-wide jobs has disappeared. On January 24, 2003, International Paper announced that it would shut down its 52-year-old dissolving pulp mill in Natchez, Mississippi, by mid-2003, resulting in 728 job losses. This was after 2 years of trying to sell the mill, tighten up operations, and find potential markets (PaperAge 2003).

When the pulp mills closed, the marginal position of the Alaska wood products manufacturers in the cyclical and global wood products industry became more evident and acute. As high-cost producers, Alaska manufacturers feel the effects of market downturns first. With the pulp mills no longer ready markets for their mill residues and chips, Alaska firms must now compete with more efficient and lower cost suppliers from other regions in the global marketplace. The Forest Service's requirement that primary manufacturing of timber harvested from Alaska national forests occur in Alaska, and long-term contracts with pulp companies undoubtedly led to increased population and contributed to the development of a more diversified economy in the region.[10] However, this particular development strategy may have retarded the development of a competitive lumber and value-added industry. Describing the Alaska industry in 1991, the Irland Group (1991) referred to cants as nothing more than "vandalized logs" and wrote, "An industry oriented to regulatory-induced cant production is not an industry that has any potential for restructuring to meet value-added wood products needs." On the other hand, because

[10] The increased diversity of the economy is borne out by the fact that of the 70 percent of the workers laid off from APC who were still in the state 3 years later, 78 percent were reemployed or self-employed with 80 percent of these jobs in southeast Alaska (Tromble 1998). Similarly, 60 percent of the workers laid off by KPC were still in the state 3 years later, and at least 75 percent of the workers reemployed within the state were working in the Ketchikan-Prince of Wales area (Landry 2001).

of Alaska's numerous cost disadvantages, it is doubtful that a large and viable value-added industry would have developed under any scenario. In response to the argument that Alaska has a market advantage because of the high value of its old-growth timber, the Irland Group (1992: 35-36) wrote,

> If this were true it would be likely that large export oriented sawmills would have developed here at the same time as [sic] did elsewhere on the Pacific Coast. Also, some production of plywood or veneer would be expected. Yet these industries did not develop in SEA. This was because, as was generally recognized at the time, Alaska's old growth timber was not suited to lumber production, but was better suited to pulp manufacturing. ... Both the inventory and harvest of TNF timber are dominated by lower grades of logs.

Today, many of the obstacles the industry faced in the 1950s remain, and others have emerged (Morse 2000). The Southeast Regional Timber Industry Task Force (1997: 31) reported,

> Computer assisted cutting, trimming, sorting, grading and shipping has increased both resource recovery and production speed and shipment in regions which already enjoyed cost advantages over Alaska. Advanced mills are not single-product operations but integrated manufacturing plants generating their own energy from wood chips and turning out an array of structurally superior engineered building products. While the cost and quality of the timber supply continues to be an issue for the industry, perhaps even more critical is the strategic development of technology to more productively extract full value from a costly resource. These economic disadvantages imply that only a limited amount of secondary processing will occur in the state. When more is required, costs rise at a faster rate than in competitor regions. How far they can rise before existing operations become submarginal is a key question.

The Chilkoot Lumber Company sawmill in Haines closed in 1991 prior to the pulp mill closures. Following the closure of the APC pulp mill, APC also closed its sawmill in Wrangell in 1994. This mill was subsequently purchased by Silver Bay Logging in 1998 and has been operating at a lower capacity, but this company recently filed for Chapter 11 bankruptcy protection (Markel 2003). Following the closure of the KPC pulp mill, KPC continued its other operations until Gateway Forest Products took over in 1999 and constructed a veneer mill at the former pulp mill site. Gateway Forest Products filed for Chapter 11 bankruptcy in February 2001,

and the mill equipment was scheduled to be auctioned off in July of 2002. At the last minute, however, the mill was purchased by the Borough of Ketchikan after a group from Oregon expressed interest in operating the veneer mill. As of this writing, the Oregon group had not yet purchased the mill. The sawmill KPC leased on Annette Island has not operated since 2000. Three mills continue to operate in southeast Alaska—Viking Lumber in Klawok, Pacific Log and Lumber in Ketchikan, and Icy-Strait Lumber Co.-Whitestone Logging in Hoonah.

Estimated total timber harvest in southeast Alaska peaked in 1989 at 991.5 MMBF. Tongass National Forest harvests peaked in 1973 at almost 600 MMBF, whereas estimated harvests from southeast Alaska Native corporation lands peaked in 1989 at 531.9 MMBF. Between 1989 and 2000, Native corporation harvests in southeast Alaska fell 70 percent to 160.6 MMBF because most village corporation timber had been harvested.[11] Similarly, harvests from the Tongass fell 69 percent between 1990 (the most recent peak) and 2000 (the last year of KPC's long-term contract harvest) (Southeast Regional Timber Industry Task Force 1997; USDA Forest Service 2002a, 2002b). These declines resulted in a 54-percent reduction in logging employment in southeast Alaska, from a peak of 2,141 jobs in 1990 to 994 in 2000 (USDA Forest Service 2002b).

The Future of the Alaska Wood Products Sector

Morse (2000) wrote, ". . . movement away from an industry structure planned in the 1950's to an industry structure linked to the competitive market will be a lengthy and difficult process." The wood products firms that remain in southeast Alaska have survived by finding niche markets for at least some of their products. For example, tight-grained old-growth hemlock wood is sold to producers of window and door casings and other special application wood products. Efforts are underway to improve the competitiveness of Alaska wood products and expand into other niche markets. For example, the Alaska Manufacturers' Association and the Alaska Science and Technology Foundation (ASTF) initiated a lumber-grading project in 1998. Prior to this, no graded lumber was produced in Alaska, but by 2002 around 90 percent of all lumber produced was graded (Alaska Manufacturers' Association 2002). Lumber grading has resulted in increased markets and higher prices. Forest Service districts are using graded yellow-cedar (*Chamaecyparis nootkatensis* (D. Don) Spach) on trail projects, and some boroughs are using graded and dried white

[11] Koncor, once the second largest timber producer among Alaska Native corporations, ceased logging operations in 2001 (Gilbertsen 2002). The company's president cited permanent changes in the market for Alaska logs (primarily in the Japanese market) and both the current poor market as well as equally poor long-term projections as major factors in the company's decision to leave the industry (Wheeler 2001).

spruce (*Picea glauca* (Moench) Voss) from interior Alaska for construction projects. The ASTF set up an in-grade testing lab at the former KPC mill site (Ketchikan Daily News 2002) to quantify the superior mechanical properties of four Alaska species (western hemlock (*Tsuga heterophylla* (Raf.) Sarg.), yellow-cedar, Sitka spruce (*Picea sitchensis* (Bong.) Carr.), and white spruce), so that they can be separated from their less valuable counterparts in the continental United States with which they are currently lumped.

The U.S. Forest Service Alaska Wood Utilization Research and Development Center was established in 1999. Some of the projects undertaken by this group include determining the economic impact of establishing new species groups for Alaska-grown timber based on the results of the in-grade tests; conducting lumber recovery studies for Alaska mills; improving kiln-drying technologies; identifying markets for red alder (*Alnus rubra* Bong.) and birch (*Betula* L. spp.) value-added products, such as kitchen cabinets; examining the feasibility of using standing dead Alaska yellow-cedar for playground equipment and small-diameter poles as substitutes for 4 by 4s in residential fence construction; investigating the use of wood waste for compost and energy production; determining consumers' willingness to pay a price premium for "Made in Alaska" wood products; and determining the types and effects of credit rationing in the Alaska wood products industry.

Although these efforts will help ensure the continued existence of a wood products industry in rural southeast Alaska, most observers, for reasons already noted, believe it is unlikely that production and employment will return to their previous levels.[12] The question then becomes, What other economic opportunities exist in the region, and what development strategies are most likely to succeed based on rural southeast Alaska's particular comparative advantages?

Southeast Alaska's Other Natural Resource Industries

The current conditions in southeast Alaska's other major natural resource industries, salmon fishing and mining, are in many ways similar to conditions in the wood products industry. Traditionally, the Alaska salmon industry has sold a large amount of its product in the export market to Japan, Canada, and the United Kingdom. The main species sold to these markets is sockeye salmon (*Oncorhynchus nerka*), and in the past it produced the most revenue. Between 1992 and 2000, as the Japanese

[12] See for example, Gilbertsen (2002) who wrote, "While some local opportunities may remain, it is doubtful that the wood products industry will either improve in the short term, or ever regain the prominent position it once occupied in Alaska's manufacturing sector."

economy collapsed and farmed salmon entered the market, Alaska sockeye exports to Japan fell 50 percent from 100 000 metric tons to 50 000 metric tons (McDowell et al. 2001).

Salmon fishing and mining industries are both declining.

In the U.S. market, Alaska salmon producers are facing intense price competition from farmed salmon, especially Chilean farmed salmon. The volume of Chilean imports into the United States has increased nearly every year since 1994 and has grown from less than 10 000 kg in 1990 to almost 90 000 kg in 2001. Also of importance is the change in composition of Chilean salmon imports from dressed form to fillets. In 1991, these imports were almost 100 percent dressed, but by 2001, more than 90 percent of the imports were fillets. While the volume of fillets increased, the price per pound of Chilean salmon imports has dropped from around $3.80 in March of 1999 to around $1.80 in December of 2001 (McDowell et al. 2001). As more Alaska salmon producers shift from canned or dressed salmon to value-added and consumer-ready fillet products, they are having a difficult time competing with the farmed salmon.

In 1995, estimated employment in the salmon fishing industry in southeast Alaska was 1,821, and estimated employment in the seafood processing industry was 1,648. In 2000, the estimates were 1,635 for salmon fishing and 1,450 for seafood processing. Estimated earnings for fishing crewmembers in 1995 totaled about $39 million, and in 2000 about $24.3 million.[13]

The total value of the mineral industry in Alaska in 2001 was around $1 billion, which includes the expenditures for exploration and development projects and revenue from mineral production. This was a 20-percent decrease from 2000 (Swainbank et al. 2002). This decrease was caused by historically low metal prices and rising costs, especially fuel. The only major mine producing in southeast Alaska during the past 5 years is the Greens Creek Mine on Admiralty Island, which reopened in 1996. In 2001, 600 000 metric tons of ore was milled containing 58 000 metric tons of zinc, 20 000 metric tons of lead, 339 million grams of silver, 27.2 million grams of gold, and 1270 metric tons of copper. This was up from 447 000 metric tons of ore milled in 1997. Profitability suffered from severe decreases in the prices of silver and zinc. Between 1996 and 2001, the prices of gold, silver, copper, zinc, and lead decreased by 30 percent, 16 percent, 30 percent, 18 percent and 41 percent, respectively. The Greens Creek Mine employs about 275

[13] The estimates for employment and earnings for salmon fishing were calculated by using average crew size (McDowell Group 1989), number of permits fished, and ex-vessel values (price of fish at the dock) (Alaska Commercial Fisheries Entry Commission 2002). Employment in the seafood processing industry is from Alaska Department of Labor, Research and Analysis (2002).

workers. Recent mining employment in southeast Alaska peaked in 1990 at 346 jobs. In 1995, there were 189 jobs, and in 1999 there were 318 jobs (Alaska Department of Labor, Research and Analysis 2002).

In response to low gold prices, Coeur Alaska has been conducting a comprehensive optimization study to increase the economic return on its proposed Kensington gold mine project about 40 miles northwest of Juneau. Some of the redesign proposals require new permits that may lengthen the time before construction and operations can occur (Swainbank et al. 2002).

New Sources of Comparative Advantage

Rural southeast Alaska is not unique with respect to changes in its resource extractive industries. Johnson (2000) writes that rural areas still tied to traditional rural industries face big challenges as commodity producers face stiff competition and thin profit margins in the global economy, leaving many rural communities unsure of their best strategies. Niemi and Whitelaw (1997) warn, "Communities that have depended heavily on resource-related industries generally should expect economic stagnation or contraction in the future if they continue to look mainly to these industries for maintenance of economic vitality." Rural southeast Alaska, like many other rural areas, did not share in the "new economy" earnings growth of the late 1990s. One reason for this is that rural areas had less employment in and less growth of the producer services sector. This sector, which includes communication, finance and insurance, legal, accounting, temporary employment, computer-related, security, advertising, consulting, and similar business services whose customers are usually other businesses, contributed most to increased urban earnings. Urban areas also tend to specialize in high-tech manufacturing industries, which have provided most of the growth in manufacturing earnings, whereas rural areas tend to specialize in slower growing value-added and routine technology manufacturing (Gale and McGranahan 2001).

In many rural areas, the traditional sources of rural comparative advantage—abundant and cheap land (natural resources) and labor—have been replaced by a new comparative advantage—quality of life. Galston and Baehler (1995) wrote,

> Perhaps the most striking fact about the U.S. rural economy in the 1980s was the shift in the development momentum from traditional economic base sectors (natural resources and manufacturing) to the new economic base sectors (tourism, retirement, and government). . . . While the more traditional counties were struggling to keep up with these forces of decline, some of their neighboring counties were enjoying large influxes of retirees as a result of general trends toward earlier retirement, greater

mobility of the elderly, and generous public and private retirement benefits. At the same time, other rural areas with similar amenities were benefiting from rising American incomes and shifts in consumer preferences for travel and tourism.

Rural southeast Alaska has a comparative advantage with its high quality of life.

It is undeniable that rural southeast Alaska is endowed with many amenities sought by tourists and that it has reaped economic benefits from this comparative advantage. In summer 2001, an estimated 975,000 visitors traveled to southeast Alaska to experience the area's glaciers, fiords, wildlife, wilderness, and "authentic communities" (Northern Economics 2002a, 2002b; Schroeder et al., n.d.). Most of these visitors, an estimated 690,650, arrived on cruise ships. The dramatic growth in cruise ship passengers to Alaska is documented in Schroeder et al. (n.d.) who note that in the early 1980s, between 83,000 and 87,000 cruise visitors arrived in Juneau, but by 2000 there were seven times as many cruise visitors. The cruise industry's key demographic target, baby boomers earning $55,000 or more, will double by 2010, and Alaska cruise prices continue to decrease, making cruises increasingly affordable (Cordova et al. 2002). Schroeder et al. (n.d.) estimated the number of independent (noncruise passenger) visitors to southeast Alaska to be somewhere between 100,000 and 200,000 in 2000. Tourist-related employment in the southeast Alaska region was estimated to be 2,065 jobs in 1989 and 3,035 in 1998 (McDowell Group 1991, 1999). Using the same methodology as McDowell Group (1991, 1999), I estimate **rural** southeast Alaska had about 1,752 tourism-related jobs in 1999.

In addition to attracting tourists, rural southeast Alaska enjoys a comparative advantage in attracting migrants seeking improvements in quality of life. Residents enjoy the same amenities that attract tourists (discussed above), and the region also features outstanding outdoor recreation opportunities and what Isserman (2000) refers to as AMENities–freedom from congestion, crime, commuting, pollution, and other conflicts of urban life. Much has been written in recent years regarding the ability of these types of amenities to stimulate rural population growth and economic development by attracting both individuals and firms.[14] Nelson (1999) documented that investment income and self-employment income were concentrating and growing fastest in rural Western counties with high levels of natural amenities as a result of the influx of young professional inmigrants. Nelson (1999: 34) wrote,

[14] For examples and additional references, see Crone and Haynes (1999), Johnson and Rasker (1993), McGranahan (2000), Pezzini and Wojan (2001), Rudzitis (1999), Southwick Associates (2000), and Vias (1999).

> The promise of better schools, less congestion, less crime, and scenic beauty attract relatively well-off individuals and families that are in a position to act on their preferences. When these people move to an area, they bring with them both financial and human capital that can stimulate local economic development.

The advent of the Internet, telecommuting, and the electronic office has meant entrepreneurs using these tools have more options in where they physically locate their business. In a survey of 102 rural firms that produce services sold primarily to business and government and receive at least 40 percent of their revenues from outside their local market area, Beyers and Lindahl (1996) found that 67 percent located in rural areas for quality-of-life reasons. The ability of rural southeast Alaska to attract retirees (who bring with them investment and transfer payment sources of income and increase the demand for local goods and services) may be limited by the region's comparative disadvantages in accessibility, specialized healthcare, and climate.

Debate continues over the potential of tourism to stimulate economic growth in rural and less diverse regions with some arguing that jobs associated with tourism provide lower average incomes and offer fewer benefits. Smith (1989) wrote in support of this view, whereas Christensen and Nickerson (1995) offered a contrary view. The benefits and risks of adopting tourism as a rural development strategy are detailed in general in Galston and Baehler (1995) and Bosselman et al. (1999), whereas Pattulo (1996), Wood (2000), Hall (2001) and Johnson (2002) detail positive and negative aspects of cruise tourism in particular, and Behnke (1999), Cerveny (n.d.), and Schroeder et al. (n.d.) examine issues associated with tourism in southeast Alaska specifically.

Indicators of Resiliency in Rural Areas

Drabenstott and Smith (1996) examined economic trends in rural counties in the "rural heartland"[15] between 1980 and 1993. They found three types of counties fared the best: (1) counties that had a combination of characteristics that attracted businesses, such as low labor and other business costs, better transportation, a higher level of agglomeration, more doctors, more colleges, and a better educated workforce; (2) counties with scenic and recreational amenities, which led to retirement- and recreation-based growth; and (3) counties that had become centers of

[15] Includes Colorado, Iowa, Kansas, Minnesota, Missouri, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, and Wyoming.

retail trade consolidation. Counties that fared the worst had less-extensive transportation networks, a lower degree of agglomeration, fewer doctors, fewer colleges, a less educated workforce, a higher degree of dependence on natural resources, and fewer scenic and recreation amenities. They forecast a continuation of two trends for the rural heartland (Drabenstott and Smith 1996: 10):

> Rural counties that have overcome their remoteness and improved their access to markets or emerged as rural trade centers, or that have scenic amenities, all appear to have a bright future. On the other hand, counties that are remote or depend on natural resource industries will probably grow somewhat slower.

This dichotomy in rural growth appears equally applicable to rural southeast Alaska. Based on 2000 U.S. census data (USDC Bureau of the Census 2002), the larger communities of Ketchikan, Sitka, and Petersburg had a significantly higher mean value for median household income and significantly lower mean unemployment rates and mean percentage of families in poverty, than the 27 communities with populations less than 2,500. By using the amount of per capita funds each community received between 1996 and 2002 from the Southeast Alaska Economic Disaster Fund[16] as a proxy for forest products dependence, I classified the communities as timber dependent if they received more than $1,000 per capita from this fund. Based on this classification system and the 2000 census data, the 14 timber-dependent communities as a group were significantly larger, had significantly lower education levels, had a significantly lower mean age, had a significantly higher mean proportion of Alaska Natives, had a significantly lower mean percentage of people not in the labor force, and had a significantly lower percentage of people who had lived in the same residence in 1995. However, there was no significant difference in mean median household income, mean per capita income, mean unemployment rate, or mean percentage of families in poverty between this group of communities and the other 13 small rural southeast Alaska communities as a group.

Based on this analysis, it is difficult to say that the small communities that had a higher dependence on timber harvests in the region are worse off than the other small communities. The future growth of each community will depend on its

[16] This fund, established by Congress in 1996, directed the Secretary of Agriculture to "allocate funds to local communities suffering economic hardship because of mill closures and economic dislocation in the timber industry to employ unemployed timber workers and for related community redevelopment projects." (Public Law 104-134 section 101, Title II (a-c4), Public Law 106-113, Title II and Public Law 106-391, Title II).

individual resiliency. Resiliency, in this sense, is defined as adaptability to change. Social or economic systems with high resiliency will be those capable of absorbing external shocks, such as a recession, and rebounding as demonstrated by system indicators, such as total employment and per capita income. Resiliency is influenced by more than just the economic structure of a community. It also depends on community leadership, activities like planning for the future, the presence and management of amenities that might attract and keep people in the area, and physical infrastructure (roads, sewers, water) (Crone and Haynes 2001).

Harris et al. (2000) calculated community resiliency ratings for 198 randomly selected small (populations less than 10,000) rural communities in the interior and upper Columbia River basin. They found that a town's population size, autonomy, economic diversity, quality of life, and experience with change were positively related to the town's resiliency. From a survey of 17 communities in south-central and southeast Alaska, Brown (1999) computed quality-of-life and community-resiliency ratings for each community. The southeast Alaska communities included were Juneau, Ketchikan, Petersburg, Sitka, and Skagway.[17] Overall community resiliency score rankings from highest to lowest were 2, 3, 5, 6, and 13, for Sitka, Juneau, Petersburg, Skagway, and Ketchikan. Relative quality-of-life rankings (based on the answer to a single survey question) were 2, 5, 6, 11, and 16 for Petersburg, Juneau, Sitka, Skagway, and Ketchikan.[18] Although smaller communities in south-central Alaska were included in the survey, none was surveyed in southeast Alaska. For south-central community residents, factors associated with public lands or their management were among the most important considerations in choosing the community in which they lived. The most important quality-of-life factors across all south-central Alaska communities were clean air and water, beauty of the surrounding area, and open/undeveloped areas (Crone et al. 2002). These factors are probably important in the rural southeast communities as well. Whether the smaller, more isolated, and less economically diverse communities in southeast Alaska will be able to leverage their many natural amenities to overcome these development obstacles is likely to differ with each community's unique characteristics.

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[17] For more detail on the survey, the communities included, and the results for the south-central Alaska communities see Crone et al. (2002).

[18] The lower quality-of-life and community-resiliency scores for Ketchikan compared to Sitka may help to explain why more workers left Ketchikan than Sitka following their respective pulp mill closures. Additionally, in response to the question, "Given your overall satisfaction with the quality of life in your community, what would you do if you had the ability to live anywhere with the same standard of living?" 82 percent of the respondents in Sitka said they would remain in their community, whereas only 50 percent of the respondents from Ketchikan said they would stay in their community (Brown 1999).

Conclusion

The closure of southeast Alaska's pulp mills in the 1990s and overall loss of jobs and decline in earnings from the logging and wood products industries signaled that manufacturing no longer dominated the region's economy. The reduced timber harvest on the Tongass National Forest is only one of several factors that have contributed to the decline in the forest products industry. Other contributing factors include (1) declining market demand for the pulp mills' products, (2) the adoption of efficiency-enhancing and cost-cutting mechanization as well as aggressive marketing strategies in competing regions, (3) increased costs associated with operating older, polluting mills, (4) decreased timber harvests from Alaska Native lands, and (5) the larger forces of global competition, which have affected Alaska's wood products industry as well as the state's fishing and mineral industries.

Some of the changes to the economy in rural southeast Alaska are particular to the region, whereas others follow trends apparent in the state and the Nation. Although the decline in the manufacturing sector was most pronounced in rural southeast Alaska, this sector also declined in the state and Nation. An urban-rural division was evident in some of the changes in the distribution of earnings. Rural southeast Alaska and rural IdMt differed from Juneau, Alaska, and the Nation in that the share of earnings from the government sector increased and the share of earnings in the "other" sector decreased in the rural areas.[19] Additionally, the rural areas experienced a larger increase in unearned income as a percentage of total income compared to the other areas.

The Alaska and Juneau economies have generally not followed U.S. business cycles. On the other hand, owing to the size of their manufacturing sectors, rural southeast Alaska and rural IdMT have historically followed national business cycles. With the declines in their manufacturing sectors, however, this trend is unlikely to continue. The manufacturing sector in rural IdMt never really recovered from the severe contraction caused by the downturn in the wood products market during the early 1980s. However, in spite of decreases in manufacturing employment and wood products earnings in the 1990s, population and total personal income in this area increased throughout the decade. Although the manufacturing sector in rural southeast Alaska was able to recover from the 1980s downturn, it subsequently collapsed in the 1990s, and despite the expansion of the national economy from 1992 to 2000, the area suffered negative average annual growth rates in earnings, total personal income, and population.

[19] "Other" includes agriculture services, forestry, and fishing; mining and construction; transportation, public utilities, and communication; wholesale trade; and financial services, insurance, and real estate.

A trend common to all five areas is a growing service sector. In southeast Alaska, part of this growth is a result of the growth in tourism to the region. Rural communities can become more resilient by increasing their accessibility and economic diversity and by planning for the future by developing physical infrastructure to accommodate growth. In addition to tourism, southeast Alaska has a comparative advantage in attracting migrants seeking quality-of-life improvements. Both tourism and inmigration may continue to contribute to growth in the service sector in southeast Alaska, but it is not likely that this growth will be experienced uniformly across the region.

Metric Equivalents

When you know:	Multiply by:	To get:
Thousand board feet, log scale (mbf)	5.7	Cubic meters
Board feet, lumber scale	.00452	Cubic meters
Cord (80 cubic feet)	.44	Cubic meters
Tons	907	Kilograms
Tons	.91	Metric tons
Ounces (troy)	31.1035	Grams
Miles	1.609	Kilometers

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