Dilemmas and contradictions facing forestry and economic development in western Montana

Alan Graham McQuillan

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THE DILEMMAS AND CONTRADICTIONS FACING FORESTRY AND ECONOMIC DEVELOPMENT IN WESTERN MONTANA

by

Alan Graham McQuillan


Presented in partial fulfillment of the requirements for the degree of

Master of Science in Forestry

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1972

Approved by:

[Signatures]

Chairman, Board of Examiners

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Date
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CHAPTER I
INTRODUCTION

Objectives

The last decade has witnessed the publication of several studies concerned with the forest products industry in Montana and its importance to the state economy.¹ These studies, however, have mostly been descriptive in nature and have not attempted a thorough analysis of the economic context within which the forest products industry operates today, and which moulds the development of the industry for the future.

The problems facing the Montana forest products industry are becoming more and more sophisticated, requiring greater understanding of the entire economic complex and of the relationship of local firms to regional, national and international competition.²

The aim of this work is to analyze the position of the forest products industry of Western Montana in relation to the local and national economies, and to develop a theoretical construct that,


hopefully, can increase understanding of the factors governing the future development of the industry.

Montana in the United States Economy

Although Montana is the fourth largest state in terms of land area in the United States of America, it really is not a very significant part of the U.S. economy. With a population of 694,409 in 1970\(^1\) out of a total U.S. population of 204,835,000;\(^2\) Montana has only 3.4 per cent of the nation's inhabitants. The state's major productive activity, agriculture, accounts for only about one per cent of U.S. total agricultural income.\(^3\)

In the eight counties of western Montana\(^4\) the forest products industry is, far and away, the most important industry. It accounts directly and indirectly for 51 per cent of the region's personal income.\(^5\) Within this industry, lumber production is the most important


\(^4\)There are nine counties of Montana that lie wholly west of the Continental Divide: Lincoln, Mineral, Flathead, Missoula, Sanders, Ravalli, Lake, Granite and Powell. The Montana Economic Study, however, omitted Powell county in its definition of western Montana, as did Maxine Johnson's "Wood Products in Montana." For simplicity of statistics, therefore, Powell county is omitted here also.

element by far\(^1\) and yet the proportion of total U.S. lumber output produced in Montana has amounted to as much as 4 per cent only once, in 1968.\(^2\)

We can, therefore, view the Montanan economy as being in a state of near-perfect competition with the other states of the Union. That is, the Montanan economy is affected by the total national market, although it is, itself, not large enough to have any significant influence on the state of that national market.\(^3\) The effects of government spending and federal employment can upset this state of affairs and this will be examined later.

Montana is, economically, basically a primary producer. Its major industries involve the production or extraction of raw materials—copper, silver, coal, oil and other minerals; agricultural produce and forest products. These industries are largely dependent on an export market. The produce leaves the state either in its raw condition or else in a state of semi-manufacture for final manufacture, finishing, packaging or marketing elsewhere. Rarely is a Montana product sold straight to its final consumer.

The one exception to this is the recreation industry. Recreation is an export industry based on a natural resource—mostly mountains,

\(^1\)Bolle, et al., *Forest Products Industry in Montana*, Table 2, p. 9.


lakes and forests—where income is received directly from the final consumer. This simple state of affairs is complicated, however, when one considers that most of the income obtained from recreation is derived, not from the sale of the natural resource itself, but from the sale of food, accommodation, sports and recreational equipment and other manufactures.

As a primary producer, Montana is dependent on the income derived from its exports, so that it may import manufactured consumer goods for the final consumption of Montanans. With the exception of machinery and equipment, the primary industries of Montana do not have to import many of their inputs from without the state, whereas Montanans can find very few of their consumption requirements that are produced within the state. A tour around any local shopping center will reveal very few local-produced consumer goods. The state is, therefore, seen to be highly dependent on inter-state trade.

Many of the principles of international trade in a free-market situation apply equally well to an analysis of inter-state trade in the free market of the United States. This analogy will be examined in depth in the theoretical analysis.
Early History, Agriculture and Mining

When Captains Meriwether Lewis and William Clark crossed Lolo Pass on the Bitterroot Range and descended into the Bitterroot valley on July 1, 1806, they were probably about the first white people to enter western Montana.¹ They were heading east on their way home, having crossed the Rockies just to the south of the region on their outward journey a year earlier. Lewis and Clark traversed the Bitterroot valley, explored a little of the Clark Fork River around the present site of Missoula and traveled up the Big Blackfoot River before recrossing the Continental Divide. They could not have spent very long in the region, however, since they entered the Bitterroot on July 1 and Clark reached the site of Great Falls by July 11.

At this time the southern portion of western Montana was inhabited by the Salish, or Flathead Indians, with the closely-related Pend d'Oreille Indians to the north, and the Kutenai in the extreme

¹Except where otherwise noted, the references in this section are taken from: Paul C. Phillips, "History of Montana after the arrival of the White man," Montana Almanac, (Missoula: Montana State University, 1958), Ch. 2, pp. 117-128.
north near to the present Canadian border. Whilst Montana east of the Continental Divide was a part of the Louisiana Territory, the western region was a part of the Oregon Territory—the ownership of which was under dispute. The region later became part of Washington and then of Idaho.

Although discovered thus by Lewis and Clark in the early nineteenth century, Montana was not to be significantly settled for about another 40 years—making it one of the last states to be settled.

In 1810 the Hudson Bay Company established a trading post at the north end of Flathead Lake. The Northwest Company established a post near Thompson Falls. These two British fur trading companies represented almost the sole influence of the white man in western Montana until after 1841. The southern part of the region—Missoula, Ravalli and Granite counties—began development in the 1840's and 50's—but the northern part was removed from the traveled routes and, although explored by Jesuit priests in the 1850's, it was not significantly settled until the arrival of the great Northern Railway in 1891-92. Kalispell was made the county seat of Flathead county in 1894; Lincoln, Sanders and Lake counties were not created until the twentieth century.

The Flathead Indians, intrigued by stories of white man's religion, made several dangerous journeys to St. Louis and finally succeeded in bringing a "great black robe," or priest, to the Bitterroot

\[1\] Carling F. Malouf, "Indian Tribes of Montana," *Montana Almanac*, pp. 110-112.

\[2\] *Montana Almanac*, pp. 388.
Valley in 1841. His name was Father Pierre de Smet\(^1\) and he founded the St. Mary's Mission at Stevensville--this being the first mission in Montana, and giving Stevensville the distinction of being the oldest town in the state. The Indians could not have foreseen that by 1872 they would be ordered out of the Bitterroot Valley onto the Jocko Reservation. Two of their groups complied without resistance, although the third, under the head chief Charlot, was not ousted until 1891.

The second mission in Montana was founded at St. Ignatius in 1854. At this time the chief form of transportation into Montana was the Missouri River, which was navigable only as far as Fort Benton. Between 1858 and 1860 the first road was built--the Mullan Road--which connected Fort Benton with Walla Walla on the Columbia River. This became a major route for travel across the Northern Rockies and spurred the growth of a trading town, known as Missoula, located on the route.

Without doubt, the major contributor to the growth of western Montana was the discovery of gold. Small gold finds were made in the Bitterroot Valley in 1852 and the first commercial discovery was made near Gold Creek in Powell county in 1858. Some gold mining started in Missoula county in 1865.\(^2\) With the discovery of gold, the population of Montana shot up from under 100 in 1860 to 20,595 at the first federal census of 1870,\(^3\) and to over 143,000 by 1890. (See Figure 2 on page 21)

\(^1\)Ibid., p. 409.
\(^2\)Ibid., p. 401-2.
\(^3\)Ibid., p. 159.
The majority of the gold and silver finds, however, occurred just east of the Continental Divide. It is estimated that, in 1864, the largest cities were Virginia City with 11,000 people and Bannack, the territorial capital, with 10,000.\footnote{Ibid. Since the census population for the whole territory was only 20,595 in 1870, these figures for Virginia City and Bannack would appear to be overestimates.} Granite was the only western county to really participate in the gold and silver boom.\footnote{Ibid. Technically Granite was not created a county until 1893.} Philipsburg was founded in 1865 and other centers of mining population in Granite county were found at Beartown, Coloma and Garnet.

It is nevertheless true that the gold and silver boom was responsible for the development of western Montana. The Bitterroot Valley, and the valleys around Missoula, developed as an agricultural area producing for the flourishing markets of the mining region. This agriculture later spread north into the Flathead Valley. The Bitterroot was the first area to be farmed, and Missoula followed in 1865. Ranching started in Granite county in 1857. Indian troubles virtually ceased after the defeat of Chief Joseph and the Nez Perce in 1877, which was also the year of the construction of Fort Missoula. Farming spread rapidly during this latter part of the nineteenth century, with the Carey Land Act of 1894 doing much to encourage homesteading. The depression of 1893 caused a temporary slump in prices of gold and silver, but the general upward trend was not disturbed.
In 1863 all of present Montana was incorporated in Idaho. In 1864 the Montana Territory was formed and in 1889 it was admitted to the Union.

Wood Products

The gold rush days produced many millionaires, some of whom later became the founders of Montana industry. The last decade of the nineteenth century and the first of the twentieth was a period of corporate growth. Marcus Daly founded the Bitterroot Development Company in 1890 and, in 1899, formed the Amalgamated Copper Company. Daly also established a stock farm and introduced irrigation to the Bitterroot Valley in 1889. The Bitterroot Development Company built a large sawmill which founded the town of Hamilton in 1890. This marked the beginning of large scale logging operations in western Montana, although it was, by no means, the beginning of the forest products industry in the state.

Lumbering had developed, hand in hand, as farming's little brother since the early days of settlement in the Bitterroot and Missoula Valleys. Besides food, the mining regions required also timber, and the best timber was found west of the Divide. Montana's first sawmill was set up in the Bitterroot Valley by the Jesuit Fathers in the late 1840's. Its saw consisted of a converted wagon wheel with teeth cut into it. Missoula's first sawmill arrived in 1864--the date

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1Arnold W. Bolle, "Forest Industries," Montana Almanac, Ch. 8, p. 217.
which marks the true beginning of lumber production in the region. By 1869 lumber production in Montana had risen to 13 million board feet per year, and by 1900 had reached 250 million board feet per year.¹

It was during the 1890's, however, that lumbering really emerged as an important industry in western Montana. Anton M. Holter and Marcus Daly were among the first millionaires of the gold boom to invest heavily in the lumber industry in the region. Other great investors were Richard Eddy, E.L. Bonner, T.J. Greenough and A.B. Hammond—all of Missoula. Their customers for lumber included the mining companies of Butte, the railroad companies, and the settlers of eastern Montana and the Dakotas.

This was not a story of harmonious growth, however, owing to the attempts of the federal government to preserve the timber on public lands.² The majority of timbered land in Montana during this period was a part of the public domain—as it is today. The Free Timber Act of 1878 "provided that Westerners could cut timber on the public domain 'for building, agriculture, mining, or other purposes.' but only on mineral lands...". The trouble was that not over one acre in five thousand in the states and territories covered by the act had been filed on as mineral land. "The Supreme Court further held that mineral lands must contain minerals in '... sufficient quantity to add to

¹Ibid., This production figure grew to 1000 million in 1960 and to 1250 million in 1970.

their (the land's) richness and to justify expenditure for its extraction..." As Toole stated: "The Free Timber Act, in effect, was a measure which made the cutting of timber illegal for any operation worth undertaking." From 1882 to 1885 Henry M. Teller served as Secretary of the Interior. Teller, a Westerner, was sympathetic to the needs of the west at that time and "lumber men in Montana went about their business untroubled by agents or edicts."

The Northern Pacific Railroad has been granted 14,740,000 acres in Montana in 1864—constituting 16 per cent of the area of the state, and being the largest land grant made to any Railroad in any state. Except for immediate railroad construction purposes, however, none of the timber on this land could be cut until surveyed by the government—a procedure that they were usually slow to undertake. These restrictions on timber extraction conflicted head-on with the interests of the Montana economy. "By 1888 the Anaconda Company was using 40,000 feet of timber in its mines, exclusive of its smelter." The other mining operations and railroads had equally high demands for timber.

The demand was met in large part by the Montana Improvement Company which was incorporated in 1882. The company was chartered for diverse functions but the principal purpose was lumbering. It was capitalized at $2,000,000.00 and the Northern Pacific Railroad owned $1,000,100.00 worth of the stock. The moving spirit behind the Montana Improvement Company was A.B. Hammond, whose subsequent ventures in railroad building, canneries, shipping and banking in California and Oregon were based on money made from the Montana woods.

In 1885, with conservation-minded Grover Cleveland as President of the United States, the Montana Improvement Company was charged with having cut from the public domain (mostly in the Big Blackfoot Valley): "45,100,000 feet of lumber and bridge timber, 84,744 railroad ties,
15,400,000 shingles, 32,035 cords of wood and 20,000 cedar posts, . . . estimated to be worth more than $600,000." The charges were vigorously protested. Hammond was the main financier of the Republican Party in Montana^1 and had considerable political influence. Marcus Daly and Governor S.T. Hauser wired Joseph K. Toole, Montana's Territorial Delegate to Congress, stating:

We understand there is a move to stop cutting timber on public lands. If successful it will stop all the principal mines in this territory and throw out of employment thousands of people. The companies we represent support directly and indirectly 10,000 people and we know this would be disastrous.

The case dragged on for 33 years before reaching a final settlement on December 30, 1918, when Hammond "agreed to pay a judgement against him in the amount of $7,066.66, without costs." This was an effective victory for Hammond.

Similar cases were brought against the Anaconda Company, for having poached $1,350,000 worth of timber from the public domain, and against William Andrews Clark for having fraudulently filed on 11,000 acres of timberland, but the government lost in both cases.

During the course of these large and unsuccessful cases, lumber production continued to rise rapidly, although, according to K. Ross Toole: "there is a full of measure of irony in the fact that the government was almost universally successful in the prosecution of small individual depredators. . . Scores of Montanans were found guilty of false entry and perjury with respect to 160-acre plots of timberland--and they paid fines and went to jail."

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^Montana Almanac, p. 121.
In defense of Hammond, Daly and others, Toole states: "They saw all about them the need for lumber and timber products; they understood how utterly dependent the territory was on its timber resources." The dispute between national conservation and the strength of the local economy we, therefore, see to be no new phenomenon, but an integral part of the history of Montana. It was in an effort to settle this dispute, and similar ones throughout the nation, that Gifford Pinchot took his stand,¹ and that the first national forest in Montana--the Bitterroot National Forest--was founded in 1897, just seven years after the construction of Montana's first large sawmill at Hamilton. The other national forests of western Montana--the Kaniksu, Lolo, Kootenai and Flathead--were established between 1906 and 1908 during the administration of Theodore Roosevelt.²

Large sawmills predominated in western Montana for about 40 years, until around 1930. The large mills located at Hamilton, Libby, Eureka, Troy, Missoula and Bonner collectively accounted for over 70 per cent of the region's lumber output. However, growth during the next period took place mostly in smaller mills, and by 1948 large mills were producing only 35 per cent of the total output. By 1956 the situation had again reversed, and large mills accounted for 67 per cent.


of the output.\textsuperscript{1} This trend towards large mills is still being consolidated today.

Private farms have never been very important to the region's timber supply. In 1920, $660,000 worth of timber was cut on private farms in Montana. By 1940 this figure had dropped to $190,000, although it had risen again to $643,000 by 1950 and to $923,000 in 1957.\textsuperscript{2}

Montana lumber production since 1864 is shown in Figure 1. The production rose at an increasing rate until the beginning of the twentieth century; the period from approximately 1900 to 1940 was one of erratic but not substantially growing production. Rapid growth really started with the housing boom at the end of World War II\textsuperscript{3} and has continued, with a few minor set-backs, until the present day. The question will be addressed later: 'have we now reached the end of this post-war stage of rapid growth?'

"The years between 1900 and 1930 were the closest to a monopoly period the Montana economy has known.\textsuperscript{4} The lumber industry was mostly in the hands of the Anaconda Company and the Bonner Lumber Company—a subsidiary of the Great Northern Railroad. Most timber, during this period was cut from private lands. The Northern Pacific Railway, the

\textsuperscript{1}Arnold W. Bolle, "Forest Industries," \textit{Montana Almanac}, Ch. 8, pp. 217-225.

\textsuperscript{2}U.S. Department of Commerce, \textit{Census of Agriculture}, (various dates).

\textsuperscript{3}Bolle, \textit{et al.}, \textit{Forest Products Industry in Montana}, p. 17.

\textsuperscript{4}Ibid., p. 14.
Figure 1: Montana Lumber Production, All Species, 1869-1971.¹

¹1869-1939 Figures are in 10-year increments.
largest private landowner, had disposed of considerable acreages, including the sale of enormous tracts to the Anaconda Company in the 1890's. "By the time the Great Northern Railroad was built... in 1892, the government had repealed its policy of granting land. The company engaged in a vigorous program of timberland purchase..."¹ The first of the few large timber sales from public lands took place on the Bitterroot National Forest in 1910.² For the most part the national forests at this time consisted of mountain land. There was neither the demand nor the technology to log these areas when timber was easily available on the lower, usually private, land. The demand, furthermore, was mostly for ponderosa pine and white pine which were found readily in the bottomlands, whereas the mountain species—predominantly western larch and Douglas-fir—were not then deemed desirable. The situation changed in the late 1930's when demand for timber was rising and technology was improving. "The shift was away from a virtual monopoly and toward a form of ologopoly in which several independent large mills shared leadership with the mines and railroads or, in the latter case, replaced them."³ This led straight into the post-war boom, and signified an important structural change in the western Montana timber industry.

The increased demand, coupled with the depletion of timber in other regions, gave the Montana industry a competitive boost and encouraged the immigration of new companies into the state.

¹Ibid., p. 14.
²Ibid., p. 13.
³Ibid., p. 18.
Diversification followed also: first with introduction of plywood plants in the early 1950's, followed by the establishment of a pulp mill in the middle of the decade. Markets for both Christmas trees and poles were significantly expanded also. Companies immigrated from both the Pacific coast and the Mid-west regions.

The end of the post-war boom in 1957 forced a rationalization of the timber industry. Falling prices forced the inefficient--mostly small and small-medium--mills out of business. "In Flathead county alone the number operating fell from 104 to 60 in one year."1 The industry was not slow to consolidate and recover, however, and the decade of the 1960's was one of record production, expansion and employment in the wood products industry. The structure of the industry during this latter period, together with indications of change for the 1970's will be discussed in the next chapter.

The Growth of Recreation

The recreation, or tourist, industry in Montana is about as old as white settlement itself in the state.2 It is reported that the first recreationist in Montana was an Irishman, Sir George Gore, who brought a hunting party in 1855. Guided by Jim Bridger, the party included 112 horses, and "slaughtered so much game that the Indians protested." Gore was succeeded by a number of European and American hunters.

1Ibid., p. 17.

2Except where otherwise noted, the source used in this section was: Merril G. Burlingame and K. Ross Toole, History of Montana, (New York: Lewis Historical Publishing Co., 1957), Vol. 1, pp. 396-398.
The growth of tourism really started in 1883, following the arrival of the railroads. Yellowstone Park had been established in 1872, and there were many other thermal and mineral springs areas, with reputed health-restoring qualities, that underwent development during and after the late 1880's.

Another major boost to tourism in western Montana was Glacier Park, established in 1910. Both the Northern Pacific and Milwaukee Railroads had vested interests in promoting use of Glacier Park, which has 200 lakes and 60 glaciers within its one million acres. Three major lodges were built and, eventually, over 900 miles of trails established.1

It has been estimated that, between 1883 and 1890, hunting parties and sightseers spent $50,000 annually in Montana.2 During the 1890's this figure soared, to $250,000 annually, and, for the decade 1900-1909, averaged around $500,000. Concurrent with the establishment of Glacier Park, tourist expenditures doubled again in the next decade, averaging over one million dollars annually.

It was during this decade of World War I that "dude ranches" came into being. By 1928 there were over one hundred dude ranches in Montana. The State Highway Department began actively promoting tourism in the state in 1930, and, by 1935, over 1.25 million tourists were spending over $25 million per year in Montana. After a brief lull during World War II, the recreation industry boomed again. In

1Montana Almanac, pp. 324-334.
1954 tourism ranked third—after agriculture and mining—as a source of income to the Montana economy. Three million visitors spent an estimated $97 million during that year. It is reported that, in 1957, 3,680,000 visitors spent $92.7 million in the state.\(^1\) Obviously, either expenditure per capita declined between 1954 and 1957, or, more likely different definitions and sources of expenditure were used for these two estimates. Twenty-one per cent of total state visitors went to Glacier Park.

By 1969 tourist expenditure in the state had again soared, to $160 million.\(^2\) Part of the increase in tourism must be due to the concentration of wild and wilderness area in the region. Montana west of the Continental Divide contains about one tenth of total United States designated wilderness land. With Montana's vast acreages of beautiful scenery and its opportunities for virtually every kind of outdoor sport and recreation, many people consider that the recreation industry holds great potential for the future health of the Montanan economy.

Population and Employment

Montana was one of the last states to be settled, and rapid population growth did not occur until after 1880 (Figure 2). The rate of growth in western Montana reached a peak during the decade

\(^1\)Montana Almanac, pp. 324-334.

Figure 2: Population of Eight Counties of Western Montana, 1870-1970, and Result of Linear Regression, 1880-1970.

a. Linear Scale

\[ P_{19q} = 1,638.6(q + 30) - 12,916.0 \]

\[
r^2 = 0.985.
\]

b. Logarithmic Scale

1900 to 1910 and then began to slow down, stagnating completely in the decade 1920 to 1930. Before World War II, however, the rate of population growth resumed its earlier magnitude and has continued at a high rate until the present day.

In spite of these changes, western Montana's population growth since 1880 shows a remarkably straight line pattern of development. A simple linear regression of the population figures taken at 10-year increments yields a prediction equation of \( P_{19q} = 1,638.6 \ (q + 30) - 12,916.0 \), with a \( r^2 \) of 0.985; where \( P_{19q} \) refers to population in year 19q and where \( q \) is any twentieth century date until 1970.\(^1\) This growth pattern closely resembles that for the United States as a whole (Figure 3).

The relationship between Montana's population and total U.S. population since 1870 is interesting (Figure 4). Total Montana population, expressed as a percentage of total U.S. population, rose until 1920 and has declined in every decade since. Western Montana's population, however, has not followed the same pattern. Except during the decade 1920 to 1930, the region's population, as a percentage of total U.S. population, has risen continuously since 1880. Until 1910 the pattern was one of rapid proportional growth, similar to that of the whole state. After 1910 the rate slackened but remained positive.

The reason for this marked difference between western Montana and the remainder of the state is mostly explained by the growth in employment provided by the wood products industry (Figure 5). The

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\(^1\)For calculation see Appendix I.
Figure 3: Population of United States, 1870-1970

a. Linear Scale

b. Logarithmic Scale

Figure 4: Montana and Western Montana Population Expressed as Percentages of Total U.S. Population, 1870-1970.

Source: Montana Almanac, p. 176.
U.S. Bureau of Census, Statistical Abstract
Figure 5: Male Employment in the Eight Counties of Western Montana, 1940-1970.

Source: See Appendix II.
growth of total western Montana employment since 1940 is closely matched by the growth of employment in logging, saw mills, planing mills and other wood products industries; whereas, employment in both agriculture and mining has declined steadily. East of the Divide the wood products industry has not been significant enough to offset the decline of these two traditional industries.

Although employment in the lumber industry has been growing rapidly since World War II, it has been marked by several periods of decline (See Figure 1, p. 15 and Figure 11, p. 40). This is no new phenomenon however. For example, employment in saw mills in Montana dropped from 3,250 in 1913 to 1,340 in 1915 at the same time that capital investment in the mills rose from $6.7 million to $8.9 million.\(^1\) This mostly represented a replacement of unskilled labor by capital-intensive techniques. Again, between 1915 and 1919, employment in saw mills dropped from 1,340 to 460 and investment also fell from $7.6 million to $4.3 million during a period of recession in the lumber industry.\(^2\)

It is significant that although output in Montana saw mills in 1953 was about double that of 1913, employment was only about one third higher. Between 1950 and 1969 lumber output rose by more than 150 per cent whereas saw mill employment rose by only about 44 per cent.

Notwithstanding these increases in labor productivity, employment in the whole wood products industry has been growing in western Montana and has constituted the major growth element of the region's economy. The region holds 70 per cent of Montana's saw timber and, in 1960, 92 per cent of the timber harvested on national forests in the state came from western Montana. Whereas, in 1956 only 6.4 per cent of Montana's agricultural revenue was produced in the region, and only about 3 per cent of the mineral revenue.\(^1\) Maxine Johnson\(^2\) estimates that, in 1969, 43 per cent of total employment and 51 per cent of total personal income in western Montana were directly or indirectly attributable to the wood products industry.

Migration has played an important part in the population history of Montana. Obviously the initial population was entirely due to migration. In 1910, 65 per cent of Montana residents were born out of state,\(^3\) and by 1960 the proportion of Montanans born out of state was still somewhere between 35 and 49 per cent.\(^4\) This is typical of all the states of the Rocky Mountains and Pacific coast. Also typical of many of the western states has been the recurring pattern of net outmigration from Montana. The state has experienced net migration

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\(^1\)Montana Almanac, p. 215 and p. 235.


\(^3\)U.S. Bureau of Census, Census of Population--1910, Reports by States--"Montana."

losses since 1920. It is estimated that migration loss amounted to between 35,000 and 40,000 persons in the decade 1940 to 1950. For the decade 1960 to 1970, 46 counties in Montana experienced net migration losses, in many cases amounting to more than 25 per cent of their 1960 population. Of the ten counties that experienced net migration gains, five were in western Montana: Lincoln, Flathead, Lake, Missoula and Ravalli. Thus only three counties in the region—Sanders, Mineral and Granite—experienced net migration losses and only one of these—Granite—actually experienced a drop in total population (Figure 6). The effect of the wood products industry of western Montana in offsetting the general adverse trend for the state is here again evident. Increasing employment has prevented many people from having to leave the state in search of jobs.

Much of the immigration in the region can probably also be attributed to the attraction of the environment as a place of retirement and as a place to live for people of independent means. This trend can be partially surmised from increases in the proportion of people in the 65 years-and-older age group. There are two possible reasons for such an increase however: firstly, it could accrue from an influx of elderly people but, secondly, it could occur as a result of outmigration of younger people in search of employment elsewhere. This latter reason probably applied in the 1950's when, between 1950 and 1956, Montana population increased by 10.5 per cent but the 18-65 age group increased by only 1.7 per cent. The 0-5 age group increased by 17

Net Migration Rates For Western Montana Counties, 1960-1970 (In percentages)

Source: Johnson, "Wood Products," p. 16.
For whatever reason, until very recent times, there has certainly been a trend of increasing proportions of older people in all the counties of western Montana since 1930 (Figure 7). Some of this trend, at least in the early days, could be attributable to the fact that the early settlers of the region were getting old and creating an elderly group where, before, none had existed. In spite of the widely held belief that many people have been coming into this region to retire during recent years, the trend towards increasing proportions of elderly people seems to have declined since the 1960 census. Between 1960 and 1970 the percentage of population in the 65-and-over age group declined from 11 per cent to 10 per cent for the region as a whole. Only one county—Lake—experienced an extension of the 1930 to 1960 trend, increasing its figure from 13 to 14 per cent. This was most likely due to the attraction of Flathead Lake for establishment of retirement homes. Two counties—Sanders and Ravalli—experienced no change for the decade 1960 to 1970, and the other counties—Granite, Lincoln, Mineral, Flathead and Missoula—all experienced a reversal of the 1930-1960 trend with a decline in their proportion of elderly people.

The region is anything but homogeneous. As shown in Figure 8, population changes since 1950 have varied considerably from county to county. There was a sharp increase in Lincoln county due to the construction of Libby Dam, which will probably be followed by decline

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1Ibid., p. 160, n. 1.
Figure 7: Percentage of Population in the 65 Years and Over Age Group, 1930-1970.
Figure 7 cont.

Source: See Appendix III
Figure 8: Population by County, in Western Montana, 1950-1970, and percent change.

Lincoln
18,100 (8,700) +108%

Flathead
39,500 (31,500) +25%

Lake
14,400 (13,800) +4%

Sanders
7,100 (7,000) +1%

Mineral
3,100 (2,100) +48%

Missoula
58,300 (35,500) +64%

Granite
2,900 (2,800) +4%

Ravalli
14,000 (13,100) +10%

*1950 figures are in parentheses.

Source: See Appendix III.
when the project is finished. Most other rural counties did not show large increases except where conditions favored the immigration of retirement and other non-employed populations--particularly Flathead and Ravalli counties. The city of Missoula is the only urban area of any significance, holding approximately one third of the region's total population. Missoula showed the only really strong population growth, accounting for nearly half of the region's population increase during the 1950 to 1970 period.
CHAPTER III
THE PRESENT SITUATION AND TRENDS IN
THE ECONOMY OF WESTERN MONTANA

The Economy Since 1960

"In two decades western Montana moved from an agricultural area to an economy heavily dependent on industry, primarily wood products."¹

Montana holds about 3.5 per cent of United States' commercial forest land,² and about 3.6 per cent of the sawtimber volume of the eleven western states and coastal Alaska.³ The state produced between 3 and 4 per cent of the nation's lumber output and smaller percentages of plywood and wood pulp. The eight counties of western Montana contain 58 per cent of the state's forest acreage and 71 per cent of its standing sawtimber. Eighty-one per cent of the region is forested and 60 per cent of that is in national forest land. More than 16 per cent of the national forest land is designated wilderness or primitive area. In 1960, 92 per cent of the total value of timber harvested in Montana came from the western region. In 1969, 88 per cent of total Montana employment in the wood products industry was located in the eight western counties. However, in 1960, wood product employment

¹Johnson, "Wood Products," p. 22.
²Bolle, Montana Almanac, p. 63.
accounted for only 3 per cent of the state's active labor force, and, by 1969, this figure had risen to only 4 per cent. In western Montana wood products employment was more significant, accounting in 1970 directly for 15 per cent of employment\(^1\) and directly and indirectly for more than 40 per cent of total employment in 1969.\(^2\)

We see, therefore, that the wood products industry of western Montana is of very little importance to Montana as a whole (although it has been the only significant growth center in the physical production field),\(^3\) but it is of prime importance to the economy of western Montana (Figure 9).

\(^1\)Derived from Appendix II and figures supplied by Maxine Johnson, ("Employees on Montana Nonagricultural Payrolls," unpublished data (Helena, Montana) ).

\(^2\)This figure for indirect employment is well substantiated by Maxine C. Johnson, "Wood Products," pp. 27-34. She calculated a multiplier of 2.73 which compares favorably with the U.S. Department of Commerce multiplier of 2.78 for the region, and with that calculated by the Graduate School of Business, University of Washington, for the forest products industry in Washington state. An employment multiplier of 2.73 means that every primary production job in the wood products industry creates an additional 1.73 regional jobs in secondary manufacturing service or retail trades—gas station attendants, storekeepers, chainsaw repairmen, etc. Income multipliers were slightly larger than employment multipliers, yielding the conclusion that 51 per cent of total personal income in western Montana is directly or indirectly attributable to the wood products industry.

\(^3\)Montana's most significant growth center for employment has been the government. Between 1950 and 1969 public employment—both state and federal—increased by 84 per cent and, in 1969, the government was Montana's largest employer with 20 per cent of the total jobs. The other fastest growing sectors are the finance and retail trades. In terms of physical production, however—agriculture, minerals, timber, manufactured goods and so forth—the wood products has been the only significant growth center. See Maxine C. Johnson, Montana Economic Study, (Missoula: University of Montana, 1970) Pt. 2, Vol. 3, pp. 7.2-7.3, and elsewhere in this comprehensive study.
Figure 9: Male Employment in Logging, Saw and Planing Mills, Furniture and Wood Products in Western Montana as a Percentage of Total Male Employment, by County, 1940-1970.¹

Source: See Appendix II.

¹Employment in the entire wood products industry in 1970 in Western Montana amounted to 14 per cent of total employment. Employment in logging, milling and furniture as categorized by the U.S. Bureau of Census amounted to 11½ per cent. We may therefore take the census figure as a good guide to, but an underestimate of total direct employment in the wood products industry. This should be borne in mind when interpreting this table.
Figure 9 cont.
On a county by county basis, trends in wood products employment have been mixed. Lincoln and Mineral—the two counties most dependent on the timber industry—both experienced increases in proportional employment until 1960, but decreases by 1970. Lake, Ravalli and Granite have shown continued increasing dependence on the timber industry since 1940, while Flathead county showed decreasing dependence until 1960 but an increase by 1970. Sanders has leveled off since its sharp increase during the 1940's. All the counties just mentioned have small absolute populations and are sparsely populated—none having more than ten persons per square mile (See Figure 10). Missoula is the sole urban area of any consequence in the region. Here population increased from under 36,000 in 1950 to over 58,000 in 1970, with a corresponding increase in population density of over 50 per cent—from 13.6 to 22.3 persons per square mile. In Missoula dependence on the timber industry for direct employment has been declining since 1950, not so much as a result of any decline in the timber industry but rather as a result of substantial growth in government, education, retail and service sectors.

Despite the relative decline of timber industry employment in this region, from 1960 to 1970, shown in Figure 8, the medium-long term trend in employment in this sector has been generally upwards. (See Figures 11 and 12). It is notable that total employment in the industry shows signs of greater stability during the 1960's than during the 1950's, although the sharp drop from 1969 to 1970 makes one hesitant to draw any favorable conclusions from this.
Figure 10: Population Density, Persons per square Mile, by County, in Western Montana, 1950 and 1970.*

LINCOLN
4.9
(2.3)

FLATHEAD
7.6
(6.1)

SANDERS
2.5
(2.5)

LAKE
9.6
(9.2)

MINERAL
2.4
(1.7)

MISSOULA
22.3
(13.6)

GRANITE
1.6
(1.6)

RAVALLI
6.0
(5.5)

*1950 Figures are in parentheses

Source: Montana Almanac, pp. 3 & 172 and Appendix III.
Figure 11: Wage and Salary Workers in the Wood Products Industries in Montana.

Source: Johnson, "Wood Products," p. 25, Table 1.
Figure 12: Wage and Salary Workers in the Wood Products Industries in Montana -- Logging Camps and Contractors, Millwork and Related Products, and Paper and Allied Products Sectors.

Source: Johnson, "Wood Products," p. 25, Table 1.
Wood products production has, of course, been rising much quicker than employment owing to the increasing labor productivity resulting from economies of scale, improving technology, and the generally increasing capital intensiveness that is a characteristic of all modern industry. (See Figure 1 on page 15.) This trend towards increased labor productivity is shown in Figure 13 and 14. Value added per employee has fluctuated more than volume production per employee owing to fluctuations in lumber prices, but the general trend is upwards. Short term fluctuations in volume production per employee are a result of fluctuations in proportional utilization of installed plant capacity resulting from short term changes in demand. Improvements in technology, installation of more capital intensive machinery and so on are reflected in the long term trend of labor productivity—which is undoubtedly upwards.

Today, western Montana's main productive industries are: agriculture, hydro-electricity, aluminum smelting and wood products\(^1\) (See Figure 15). Of these, wood products is by far the most important to the economy of western Montana. Besides being the largest employer of the group it is also the fastest growing. "Of the 5,420 new manufacturing employees between 1950 and 1968, 3,500 (65 per cent) went to work in wood products activities. Another 1,000 were involved in the aluminum plant at Columbia Falls."\(^2\)

\(^1\)Here wood products are defined to include pulp and paper.

\(^2\)Johnson, "Wood Products," p. 11.

Figure 15: Total Employment By Major Sectors in Western Montana, 1970.

Agriculture in the region, as in the whole state, is a declining industry in terms of employment. Employment in hydro-electricity is minimal once construction is completed. Of the three major dams in western Montana, two—Hungry Horse and Libby—are federally owned, and two—Noxon Rapids and Libby—export their entire production out of state to the Pacific Northwest with little or no net benefit accruing to the eight counties. The only considerable benefit, in terms of employment, that the region receives from its vast, cheap hydro-electric resources is through the Anaconda Company's aluminum reduction plant at Columbia Falls, which directly employs about 1,000 people. (The other major industrial consumer of the power from Hungry Horse Dam is the Stauffer Chemical Company at Butte.)

The plant at Columbia Falls is badly located and lacking in pollution control facilities so that it has come under considerable attack from environmentalists. Rather than rectify this, and, at the same time, continue facing adverse freight rates for its alumina which is imported through Everett, Washington, from the Caribbean, there is a possibility

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1 Hydro-electric production has about the highest capital—labor ratio and highest production value—labor ratio of any industry. For a more complete discussion of hydro-electrical employment see Alan G. McQuillan, "Depopulation of the Highlands and Islands of Scotland," unpublished thesis (1970), pp. 46-47.


3 Ibid., Pt. 2, Vol. 1, p. 2.29.

that the Anaconda Company will close the plant when its new one in Kentucky is completed.¹

In general, it is the primary production industries, and those secondary manufacturing industries that are based directly on the primary production industries, that determine the economic health of an economy such as Montana's. Most of Montana's consumer goods are imported from out of state. These imports must be paid for with exports of locally produced goods. In Montana the export industries include agriculture, minerals, hydro-electricity, and wood products. All of these utilize natural resources that are found within the state. In western Montana the major export industry is wood products. In 1956 over 50 per cent of Montana's saw mill output was used in-state,² but by the early 1960's over 85 per cent of the lumber output was being exported.³ Employment in retail and service trades, local government, transportation, construction and so on is dependent on the export industry for its existence. The export industry is the source of wealth of the region. Not all export industries are necessarily involved in physical production, however. Tourism, to the extend that it brings in dollars from out-of-state, or out-of-region, is an export industry. So is education with respect to out-of-state students paying out-of-state fees. State government employment is dependent


on locally collected taxes and is, therefore, dependent on export industries, but federal employment is not. While it is true that federal employment is dependent on federal taxes and, therefore, national productive or export industries, western Montana is a small enough region so that it cannot significantly affect federal tax income. We can, therefore, say that federal employment in the region is not dependent on regional export industries. When, however, we consider that a considerable portion of the federal employment is in the U.S. Forest Service, the Bureau of Land Management and the forestry section of the Bureau of Indian Affairs (approximately 1,000 employees, full time equivalent), we must modify this statement.

We can conclude, therefore, that although wood products, other manufacturing, government, trade and services have all been sources of employment growth, the wood products industry has been the king-pin about which the region's economic fortunes have turned (See Figure 16).

The wood products industry is obviously based on the region's forest resources. It is, however, not the only industry so based. Most of the water for the hydro-electric stations and other industrial uses comes from forest lands. The attraction of the region for tourists is largely based on the forest lands also. We see, therefore, that virtually the whole of western Montana (not just the lumberjacks and the mill workers) is dependent on the forest resource base for its economic existence.

We shall, then, briefly discuss the three resource-based sources of employment that appear to be most important to the future
Figure 16: Employment by Sector in Western Montana, 1950-1970.

About 80 per cent of manufacturing jobs are in the wood products industry.

development of western Montana: the wood products industry, the tourist industry and the U.S. Forest Service.

Wood Products Industry

There are five large sawmills in Montana,\(^1\) all of them located in the western region. Thirty-eight of the 44 medium sized mills in the state are also in the western region, as are 28 of the 46 small-medium mills. There are six plywood mills and one particle board plant—all in the western region—also one pulp and paper mill located near Missoula. There are numerous small mills and post-and-pole plants located both east and west of the Divide.

The pulp and paper mill and five of the six plywood mills have all been built since 1956, and the particle board plant was added in the late 1960's. Planned for the future are two particle board plants—Plum Creek and Champion International—and one plywood mill—Champion International. Several publications of the 1960's speculated on the possibility of another pulp and paper mill in the region but, perhaps because of environmental pressure, nothing has so far materialized.

The region is still predominantly oriented towards lumber production. Bolle quoted the following figures for actual and sustainable annual production in western Montana in 1959.\(^2\)

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\(^1\)These figures are taken from Bolle et al., *Forest Products Industry in Montana*, (1966).

\(^2\)Ibid., p. 29.
TABLE 1

ESTIMATED ACTUAL AND SUSTAINABLE ANNUAL PRODUCTION IN WESTERN MONTANA

<table>
<thead>
<tr>
<th>Type of Product</th>
<th>Actual</th>
<th>Sustainable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lumber and dimension, MBM</td>
<td>812,000</td>
<td>750,000</td>
</tr>
<tr>
<td>Veneer, MBM</td>
<td>8,000</td>
<td>80,000</td>
</tr>
<tr>
<td>Pulpwood, M cords</td>
<td>4</td>
<td>1,234*</td>
</tr>
<tr>
<td>Fiberboard, M cords</td>
<td>0</td>
<td>200*</td>
</tr>
<tr>
<td>Christmas tree, M trees</td>
<td>3,520</td>
<td>5,000</td>
</tr>
</tbody>
</table>

*Arnold W. Bolle estimates at the time of writing (November, 1972) that these figures now considerably underestimate the realistic sustainable volumes.

Thus we see that timber for lumber was being overcut, Christmas trees were being well utilized, but veneer, pulpwood and fiberboard sources were hardly being utilized at all. The situation has probably improved somewhat since 1959 but it is certain that much the same picture holds true today. This might lead us to believe that the market situation for the more sophisticated products is poor. An examination of the demand trends for forest products is, therefore, illuminating.

World demand for lumber has been rising at a modest rate, world demand for plywood has been rising rapidly and world demand for pulpwood and particle board has been rising at an inordinate rate.¹ Much the same picture is found in the United States. Between 1952 and

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1962 lumber consumption per capita in the U.S. declined from 263 to 200 board feet, and total lumber consumption dropped from 41,500 to 37,300 million board feet.\(^1\) The general trend has been downwards since 1920\(^2\) (Figure 17).

In contrast, between 1950 and 1965 softwood plywood production increased at an annual average rate of 14 per cent per year.\(^3\) Per capita consumption has increased very rapidly \(^4\) (Figure 18).

Pulp and paper consumption trends are shown in Figures 19 and 20. For the Rocky Mountain Region as a whole: 13.2 per cent of U.S. saw logs are produced in the Rockies but only 2.7 per cent of U.S. veneer logs and 3.3 per cent of U.S. pulpwood. It is evident, therefore, that the Rocky Mountain region, and western Montana in particular, is best developed in the declining sector--lumber--and vastly under-developed in the strongly growing sectors of plywood and pulp. Bolle's figures for western Montana, quoted above, would suggest that this situation is not the result of a deficiency in the availability of raw materials for the veneer and wood pulp industries.

There are several possible explanations of the situation of the wood products industry in Montana, most of them covered admirably in Bolle, Gibson and Hannum's work, *Forest Products Industry in Montana*.


\(^2\)Ibid., p. 43.


Figure 17: U.S. Per Capita Lumber Consumption


Figure 18: U.S. Per Capita Consumption of Softwood Plywood & Veneer

Figure 19: U.S. Per Capita Consumption of Paper and Board.


Figure 20: U.S. Consumption of Wood Pulp.

Montana was late to develop in the wood products field, the real boost coming with the post-World War II building boom when the prime market was for lumber. Profits were made easily and marketing was not a problem. Montana timber industries developed an attitude of production orientation, rather than market orientation, which has lingered to the present day. This has not been helped by the fact that Montana is so far removed from the principle markets that easy feedback of market information has been thwarted. "Montana's marketing difficulties are based on the fact that lumber manufacturers try to sell what they produce rather than produce for the most favorable market."

Montana is one of the last states to make extensive use of brokers in marketing. These brokers mostly live on the Pacific coast or in the Mid-west, they relieve the producer of the problem of marketing, but they also decrease the possibility of producer-sensitivity to changing market situations.

Dependency on brokers and wholesalers, more than physical distance per se, holds the Montana operator in a virtually colonial status.

The relatively remote location of the state and the adverse structure of freight communications and freight rates also tends to inhibit the development of Montana industry in general. Although several large national companies operate in the region—St. Regis, U.S. Plywood-Champion, Diamond-Gardner and Hoerner-Waldorf principally—

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1Bolle, et al., Forest Products, p. 48.

2Ibid.
there is still a large proportion of medium and small companies. These smaller companies often do not have the capital or the ability to invest in the most modern techniques, they are not big enough to establish their own marketing operations, they do not have sufficient stability to be able to afford large long-term risks, and, most importantly, they usually do not have the high caliber of personnel needed to keep them at the forefront of the ever-changing industrial situation.

The activities of the U.S. Forest Service probably also contribute to the relative stagnation of the Montanan timber industry. Unlike the Pacific coast forests where approximately 80 per cent of the land is in private ownership, the U.S. Forest Service control about 80 per cent of the timberland in Montana.¹ The policy of the Forest Service in providing industry with a continued, cheap, supply of saw logs² and the consequent removal of the burden of facing real timber costs from the shoulders of industry cannot help but lead the industry towards stagnation. The adaption of today's timber prices to meet yesterday's demands of the wood products industry makes industry insensitive to the changing real costs of wood production, and the existence of an intermediary (the U.S. Forest Service) between the industry and the resource base itself slows the process of adaptation. Furthermore, despite the theoretical function of the

¹Ibid., p. 23.

federal agency in stabilizing timber supplies,\(^1\) total annual timber sales have been anything but stable (Figure 21). This instability has been made so much worse by the fact that Forest Service decisions, as with most government decisions, are almost totally unpredictable. They are subject to the eternal vicissitudes of the political process.

The western Montana industry has been moving with the times to a certain extent; it has been moving into the fields of plywood, pulp and particle board but, given its present structure, it is hardly surprising that it is still way behind the national leaders of the industry.

"The trend in production has been upward since 1957, with little or no increase in the labor force. In the future, if machinery substitutes labor at a faster pace than production increases, there will be a drop in the number of people employed. Additional employment in Montana's forest products industry can be expected to come mainly from new industries such as pulp and paper, plywood, and particle board or other secondary manufacture."\(^2\)

"Employment in lumber and wood products is expected to decline substantially as output per worker increases; in the paper industry, where the growth in total output will be greater, some increase in employment is anticipated at the national level."\(^3\)


\(^2\)Bolle et al., Forest Products, pp. 56-57.

These quotations refer to a situation where production is assumed to be rising: they predict declining employment in the wood products industry of western Montana. Given present predictions that production will actually fall as a result of reductions by the U.S. Forest Service in the annual allowable cut, and given that wood products is the major employment base of the region, not to mention the fastest growing, it is hardly surprising that many western Montanans are worried about their future employment situation.

Maxine Johnson has made predictions concerning possible loss of employment under three alternative assumptions. The assumptions are: 1) that the fiscal 1972-75 timber cut will be equal to the amount of projected timber sales; 2) that the fiscal 1972-75 timber cut will continue at fiscal 1966-1970 levels; and 3) that there will be a moratorium on clearcutting. In a simplistic, but nevertheless apparently realistic analysis she predicts that, under the first assumption, annual average harvest for the period would be about 150 million board feet less that the 1966-1970 average statewide. This could reduce direct employment in wood products industries in the western region by about 650 jobs and total employment in the region by 1,800 jobs. Such a decline would not be unprecedented since a larger decline occurred between 1956 and 1957 and a similar one occurred between 1969 and 1970. The real difference would arise if the new decline were taken as permanent by industry whereas the previous two were construed as short-term fluctuations.

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Under the second assumption, employment losses would be smaller: between 200 and 450 direct jobs and between 600 and 1,200 total jobs in the western region. The third, and least probable, assumption could result in a loss of over 1,000 jobs directly and another 2,000 jobs indirectly, amounting to 5 per cent of total employment in the region.

Figure 21 shows volume of timber sold on Montana's National Forests from 1960 to 1972, and also volume of timber cut on national forest from 1962 to 1972 backdated by two years. A statistical t-test was performed to test the hypothesis that timber cut equals timber sold with a time lag of two years. (See Appendix V). The hypothesis was easily accepted at the 95 per cent level of certainty. If this relationship continues to hold true, then, we may predict that the sharp decline in volume of timber sold during 1971 will result in a sharp decline in volume of timber cut in 1973. This volume should then remain constant during 1974. This calculation supports the first of Maxine Johnson's assumptions.

While these predictions should obviously be treated cautiously there is no doubt that employment in the wood products industry has an uncertain future. The long term trend may be downwards, and, whether it is or not, continued instability of employment is almost a certainty. "Changes of this magnitude have occurred frequently in Montana communities within the recent past."¹ When a region has such a proportionately high dependence on one industry, instability of employment, regardless of the direction of its long term trend, is a disturbing

¹Ibid., p. 40.
Figure 21: Volumes of Timber Sold and Timber Cut (backdated by 2 Years) on Montana's National Forests, Fiscal Years 1960-1972.

Source: Johnson, "Wood Products," p. 35.
factor. Diversification of employment for increased stability is, therefore, as important an aim of economic development as is the maintenance or increase of total levels of employment.

The Recreation Industry

"We believe this (tourist) industry is one which holds great promise for rapid expansion and hence further contribution to Montana's economy.¹

A great many people in western Montana place their faith in the tourist industry for the future prosperity of their region.² Certainly the tourist trade is highly significant and has been a source of rapid growth in Montana. Western Montana, with 72.3 per cent of the state's total recreation acreage,³ receives the major proportion of the recreation revenue. Total tourist expenditures in Montana increased from an estimated $93 million in 1957⁴ to $100 million in 1962,⁵ and to $160 million by 1969.⁶ The exact figure is very difficult


²Just one example is Bruce Bugbee, Director, Regional Planning Association of western Montana, who, in a personal interview on May 25, 1972, stated that "recreation is the key to the future" and that the tourist industry could well become the "growth center" of the region.


⁴Montana Almanac, p. 324.


to measure and these figures must, therefore, be treated as rough estimates. The Montana Travel Study estimated total expenditure by out-of-state travel parties in 1963 at between $63 and $84 million by different methods of calculation. They concluded that approximately 80 per cent of tourist expenditures were made by out-of-state parties.

The report on game management in Montana quoted the following table from figures obtained from the State Department of Planning and Economic Development.

<table>
<thead>
<tr>
<th>TABLE 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECONOMIC RANKING OF INDUSTRIES IN MONTANA</td>
</tr>
<tr>
<td>FOR 1969</td>
</tr>
<tr>
<td>Agriculture                    $647.3 million</td>
</tr>
<tr>
<td>Mining and petroleum    285.6 million</td>
</tr>
<tr>
<td>Manufacturing                   207.5 million</td>
</tr>
<tr>
<td>Outdoor recreation              145.5 million</td>
</tr>
<tr>
<td>Forest products                 104.5 million</td>
</tr>
</tbody>
</table>

The definition of this recreation figure differs somewhat from that of the Montana Travel Study. The travel study, and most other studies, defined expenditures to include principally food, lodging, automobile and recreation fee revenues. Of total expenditures, meals and food accounted for over 33 per cent, lodging for 27 per cent, and transportation for over 25 per cent. The Fish and Game Department study included hunting and fishing licenses, sporting equipment, lodging

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1. Robert F. Wallace and Daniel R. Blake, Montana Travel Study (Missoula: University of Montana, 1966) pp. 105-113. The study found that about 14 per cent of total out-of-state expenditures were made by business travelers.

and meals, but not travel costs. However defined, it is apparent that
the vast majority of tourist and recreation expenditures accrue to the
retail and service sectors. Out-of-state tourist (non-business)
expenditures probably provided around one tenth of retail and service
trade revenues in 1963. In the specific trades of hotels, motels,
eating and drinking places, service stations, auto repair and rental
shops, out-of-state tourist expenditures provided about one quarter of
total revenues.\(^1\)

In terms of providing a firm economic base for the support and
possible expansion of the economy of western Montana, however, the
picture is not quite so rosy as it might at first seem.

The concept of multipliers is now widely understood. No studies
have been conducted in Montana to determine the multiplier effect of
the tourist dollar. However, a study of southwestern Wyoming in 1959
is probably fairly applicable here. It was found that a dollar
received from the export of agricultural produce circulated 2.32 times
within the region; a dollar received from lumber sales turned over
2.23 times; and a dollar's worth of other manufactured goods had an
average multiplier of 2.37.\(^2\) Compared with this, the sectors that
received the bulk of the tourist dollars had much lower multipliers.
A dollar spent on eating and drinking turned over 1.84 times; a dollar
spent in gas stations circulated 1.73 times; and a dollar spent in
other retail stores, 1.58 times. The Wyoming study also calculated


\(^2\)Maxine C. Johnson, "The Tourist Industry: Some Second Thoughts,"
the personal income to local residents from each dollar of export sales, by sector:

TABLE 3

SOURCE OF PERSONAL INCOME
BY INDUSTRIAL SECTOR

<table>
<thead>
<tr>
<th>Industry</th>
<th>Personal Income to Residents from Each Dollar of Export Sales.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>$0.81</td>
</tr>
<tr>
<td>Lumber manufacturing</td>
<td>0.77</td>
</tr>
<tr>
<td>Other manufacturing</td>
<td>0.63</td>
</tr>
<tr>
<td>Lodging places</td>
<td>0.53</td>
</tr>
<tr>
<td>Eating and drinking places</td>
<td>0.41</td>
</tr>
<tr>
<td>Gas stations and automotive stores</td>
<td>0.39</td>
</tr>
<tr>
<td>Other retail stores</td>
<td>0.28</td>
</tr>
</tbody>
</table>

These results are what would be expected, and are typical of most areas. (For example, a study in New Hampshire yielded a tourist trade multiplier of only 1.63).¹ When a dollar is spent on lumber, besides the considerable labor employed directly in the lumber industry, indirect employment goes to loggers, transporters, equipment maintenance men, power producers, foresters, chainsaw salesmen, consultants and so on; who in turn give business to store keepers, gas station attendants and other service employees. Thus a high multiplier is obtained. When, however, a dollar is spent on beer, a barman is employed and a distributor/salesman, but the remainder of the money goes straight out of state to the brewery company. Thus a low multiplier is obtained. The net effect is that, even if total export income from tourism were equal to total export income from lumber or some other physical

¹Spunich, "Tourist Industry in Montana."
production industry, the total benefits accruing to the region would be unequal.

The more sophisticated the industry, the greater the multiplier effect is likely to be, providing the industry is local. An export dollar spent on finished lumber yields more benefit to the region than one spent on a rough log, and one spent on paper could be more beneficial than either.

The low multiplier is not the only disadvantage of relying on the tourist industry for economic development however. The nature of employment is itself significant. Whereas manufacturing industry employs both skilled and unskilled workers, college graduates, scientists and managerial personnel—with usually a high proportion of males—the tourist industry employs store assistants, gas station attendants, waitresses, maids and the like. For example, when the multi-million dollar Big Sky Development is complete, it is planned to employ 244 unskilled or semi-skilled people, 46 seasonal personnel and only 72 salaried personnel, very few of whom will be skilled workers or college graduates.\(^1\) Yet the Big Sky Project will have better ratios and higher stability of employment than most tourist developments. In general the tourist season, and therefore tourist-generated employment, lasts for only three months of the year; demand is mostly for female or student labor, and wages are notoriously low. In 1970 the average

\(^1\) Montana Department of Planning and Economic Research, "Big Sky Application to the Economic Development Administration for Federal Assistance to Design and Construct a Public Access Road in Madison County," Unpublished, 1970.
annual earnings per worker in the hotel and motel trade were $2,744; in the catering trade they were $2,653, and in service stations, $3,769. By contrast, the corresponding figure for the wood products industry was $7,635.¹ In 1957, Montana ranked in the upper one third of the states of the Union in per capita personnel income. Between 1950 and 1970, however, participation income (income to persons participating in the labor force) increased 118 per cent in the United States as a whole, but by only 40 per cent in Montana, so that Montana incomes are now well below the national average.² Employment in the tourist industry does not usually provide adequate income for the head of a family; increased dependence on the tourist trade will serve to lower Montana incomes further, and pressures on the diminishing tax base will increase.

"Many participants (in recreational activities) lack an appreciation of recreation resources. They indulge in thoughtless or irresponsible acts."³ The type of recreation that Montana offers is of the natural beauty-scenery-wildlife-outdoors variety. It is the kind of get-away-from-it-all experience that can be easily destroyed by increased participation. Expansion of the Montana tourist industry therefore has a limit, if the tourists are not themselves to destroy the very qualities that they seek. Furthermore, this type of recreation does not lend itself to commercialization and development on

¹Johnson, "Wood Products," p. 41.
²Ibid., p. 17.
a large industrial scale. Unless U.S. Forest Service and National Parks Service funding policies change drastically, federal employment in tourist-oriented aspects of forest activity is unlikely to increase considerably. Therefore, the future of employment in the tourist industry will probably remain fairly restricted.

From the investor's point of view the tourist industry has many other disadvantages. Investments made in expensive buildings and fixed equipment must be paid for throughout the year, although they are only used and only return a profit for perhaps a quarter of that time. Year round, or at least summer and winter operations, such as at Big Mountain or with the Big Sky Development, can help alleviate this problem. Ski developments, however, are highly expensive and, in Montana, only yield about two per cent return on investment.¹

The Montana Travel Study found that the average tourist party in 1963/64 spent $28 per day. The average dude ranch party spent $50 per day, and the average camping party spent only $20 per day. Obviously, it is the high-spending tourists that Montanans wish to encourage. Only one per cent of visitors use dude ranches, however, and use is not increasing significantly. It is in the low-spending camping group that the greatest expansion is taking place. In 1963/64, 55 per cent of out-of-state visitors used campgrounds and 78 per cent

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¹A report by the Federal Reserve Bank of Minneapolis, Ski Resorts in the Ninth District, Business Report Series No. 1, (November 1964), p. 17, quoted a figure of 1.98 per cent return on investment over the years 1959-1964. Spunich, Tourist Industry in Relation to Montana's Economy, (1969), reported a figure of 2.7 per cent for Montana, adding that the U.S. average was only between one and two per cent.
of these did not use any other commercial lodging. Significant increases in tourist expenditures do not, therefore, appear imminent.

Despite so much talk of increased leisure time, the average working week for American employees has not really changed considerably since the 1930's.

### TABLE 4

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing Industry</td>
<td>38.1</td>
<td>41.5</td>
<td>40.2</td>
<td>40.6</td>
<td>39.8</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>----</td>
<td>41.3</td>
<td>39.0</td>
<td>36.4</td>
<td>33.8</td>
</tr>
</tbody>
</table>

As Maxine Johnson writes: "In the foreseeable future, most of us will continue to work five days a week and most annual vacations will last only two or three weeks. The great increase in leisure time will come slowly. . . . It will come most slowly for those busy and affluent Americans in professional or managerial positions—the very people we would most like to attract." And Montana is just one of the very many states and countries that is trying so hard to attract these people.

With so many serious drawbacks and disadvantages, it seems somewhat naive for many people to be placing much hope in the tourist industry for the salvation of the western Montanan economy; and one cannot help wondering whether the $350,000 spent each year by the state

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1. Wallace and Blake, *Montana Travel Study*.


government in promoting tourism\(^1\) could not be put to better use elsewhere.

The U.S. Forest Service

"Therefore, the underlying objective of this region is social, and, since that is the only justification, it is essentially a social program."\(^2\)

The regional activities of the U.S. Forest Service have already been briefly discussed under Wood Products Industry and are reviewed further in chapter five. In this section it is simply intended to briefly examine the policies and underlying objectives of their operations in this region. Over and above the usual "greatest good for the greatest number in the long run" type of objective it is not at all easy to ascertain the true aims of the Forest Service in practice. Virtually every conceivable objective can be found somewhere in their publications; from multiple use to sustained yield, from intensive management for its own sake to rational economic forestry, from providing cheap timber for industry in perpetuity to obeying the public whim of the moment, from serving the needs of the nation to supporting the local economy. Ascertaining and isolating the effective operational objective through observation of policy and practice is a considerable task that cannot be undertaken in this study. A


convincing argument, however, has been expounded by John Ardner,1 in his application of Worrell's criteria for evaluation of forest policy2 to Forest Service practice in Region 1. Ardner shows that local practice and policy cannot be justified using economic criteria, technological criteria, ecological criteria or legal-political criteria. It does, however, meet the requirements of Worrell's social criteria and the agency's objectives are therefore induced to be social in nature. He concludes that "the Forest Service is attempting to: 1) stablyze the local economy by providing the maximum, continuous, even supply of timber to the forest products industry, 2) reduce the rate of (local) unemployment, 3) provide an inexpensive source of raw materials to meet the needs of the nation."3 This predominantly local orientation of the agency with respect to economic development and the move towards labor-intensive intensive management4 has a considerable effect on the local economy. The continued, or even intensified, production of

1Ibid.


3Ardner, Forest Policy, p. 40.

timber on poor sites or uneconomic areas\(^1\) serves to maintain lumbering
and timber industry employment at a higher level that might other-
wise be achieved; although it is not possible to categorically conclude
that this level is higher than would be maintained if all good sites
were in private ownership. The protection of the industry from the
changing real costs of timber production, and the guaranteed profit
that is implied by the system of stumpage appraisal can serve to
desensitize the industry from changing conditions and could well
impair its long-term competitive health.

"Orthodox economic theory holds that rates below competitive
market levels promote a less than optimum use of the
nation's total resources. Lower rates in the public sector
for a given service encourage the use of less-productive
units of the publicly-owned resources at the expense
of leaving more-productive privately-owned resources in
idleness.\(^2\)

The advantages and disadvantages of federal forest activity in inter-
fering with Adam Smith's "guiding hand" of the free market system will
be discussed in chapter five.

The Environmental Movement

A factor that cannot be ignored in any study of forestry and
economic development in western Montana is the increasing concern for
intangible environmental and aesthetic values, and the increasing

\(^1\)See, for example, "The Bolle Report," U.S. Congress, Senate,
A University View of the Forest Service, S. Doc. 91-115, 91st Cong.,

\(^2\)William S. Peters and Maxine C. Johnson, Public Lands in
success of the environmentalist movement in modifying the activity of forest and forest product industry management.

One of the salient events in the recent history of the environmentalist movement in western Montana occurred with the publishing of the "Bolle Report" on clearcutting and terracing practices in the Bitterroot National Forest.¹ This report lent academic and professional credence to the cries of the environmentalists to modify timber harvest practices in the region.

Within the past two years greatly increased emphasis on ecologically sound and publically acceptable management practices has been fostered within the U.S. Forest Service. The general result in this region has been a reduction in the allowable cut, at least for a short period and probably for all time. This cut has occurred because some land has been deemed unsuitable for harvest,² other land has been removed from the timber base pending the completion of environmental studies, and, in several cases, manpower and funds have simply not been available to administer sufficient timber sales, given the modified quality management directions.³

¹Bolle, et al., University View of the Forest Service.
"In case of a conflict between quality and quantity, the decision will be made in favor of quality land management."¹

By way of example, the Flathead National Forest had an allowable annual cut of 181.6 million board feet. For year ending June, 1972, committed sales had been reduced to 127 million board feet,² and a further reduction to 112 or 117 million board feet has been forecast for future years.³

Feelings run high, and many recent examples of attempts to reduce clearcutting, and indirectly total harvest, can be found:

The American forest is a battleground. What is left of it. On one side is the timber industry. . . . on the other side are individuals from all walks of life who believe that the national forests belong to the people and who decry the fact that each year one million acres of wilderness fall to industry's chain saws.⁴

Of all the national forests that we've ever seen, I can say we've never seen one as overcut or abused as the Bitterroot.⁵


²Interview with David Rittersbacher, Kalispell, February, 1972.


New forces are challenging the old order in the forests of the Pacific Northwest, seeking to turn the march around—or at least divert it somewhat from the course it's on. . . . New power groups are emerging threatening to upset an ordering of priorities that has persisted for generations. The new groups are ecology oriented. Their memberships tend toward the young and well-educated.¹

The forest managers have been responding with new policies and modified management methods.

Three factors shape the policy of Burlington Northern in managing its forest lands in western Montana—economic, ecological and public opinion.²

"We don't do clearcutting unless absolutely necessary," Whitesitt said. He said in response to a question that approximately 5 per cent of BN cutting involved clearcutting.³

The agency (U.S. Forest Service) states in the action plan it intends to:

--Increase Forest Service sensitivity to aesthetic values in planning and executing timber harvest, road construction and site preparation.
--Recognize areas where timber will not be harvested because there is no suitable alternative to clearcutting and environmental impacts make clearcutting unacceptable.⁴

¹"The Forestry Uproar: What's the Root of It?" Sunday Missoulian, April 9, 1972, p. 35.
³Ibid.
While forest products are increasing in value all the time, the committee said, the forest's other, non-commercial benefits are increasing in value even more rapidly.

Whether they have overtaken the commercial value is part of the dispute.¹

We might well ask whether there is a dramatic structural change taking place in the forest industry, with non-timber forest values becoming relatively more important than timber values. If there is, it cannot yet be proved. Significant trend figures and statistics are only available up to 1970 and do not reveal any dramatic turnarounds. However, most of the impact of the environmental movement has occurred only since 1970 and it will be several years before this impact can be statistically documented. An even longer period must pass before we can decide whether the environmental movement has caused a permanent change in western Montana forest industries.

If forestry in western Montana is indeed undergoing a structural change from timber to non-timber values, significant changes in employment could result. Aggregate demand for labor could well change, and demand by sector—for lumbermen, mill workers, federal employees, retail and service employees—would almost certainly change.

¹"The Forestry Uproar: What's at the Root of It?" Sunday Missoulian, April 9, 1972, p. 35, referring to the "Bolle Committee."
These changes will be discussed further in the next chapter.

The Economic Development Movement

Montana has fabulous resources which someday will be utilized. Other states have resources too and also have the advantage of being close to markets. Montanans must work together to create conditions that will attract industrial enterprises to their state.¹

Three points arise from this statement that will be discussed in turn. First, there is an implicit assumption that economic development and utilization of resources is good, and desirable in Montana. Second, Montana is likely to run into problems—such as with markets—in achieving development; and, third, concerted action must be taken to bring about development, specifically, by attracting industry to the state.

There is undoubtedly a strong desire on the part of many people to achieve some kind of economic development in the region, mostly with a view to providing employment. Many politicians in the current elections are campaigning on the jobs issue. Senator Lee Metcalf, in his campaign for re-election, is making a major issue of the fact that "over nineteen thousand Montanans are out of work" and that, if elected, he will ensure the provision of many new jobs.² Gubernatorial candidate, Tom Judge, has been expounding upon the need for light manufacturing and other "clean" industries in order to reduce


²Lee Metcalf talking on KYSS Radio Broadcast, September 27, 1972.
unemployment and raise incomes. Former gubernatorial candidate Frank Dunkle, campaigned for increasing employment by processing raw materials in state and exporting finished goods rather than raw materials.¹ David Lewis, Republican candidate for Secretary of State, is the only local politician that this writer has heard saying that "Montana does not need industrialization and population growth."²

Many studies and reports, including the recent "Wood Products Industry in Montana" by Maxine Johnson, were written with the prime intention of addressing the employment problem and exploring the forest industry's potential for alleviating it.³

Figure 22 compares unemployment rates in Montana with national averages from 1957 to 1969. Since 1964 the Montana annual average rate has been consistently above the national average and seasonal unemployment has also been significantly worse.⁴ It is estimated that from 1950 to 1970 there was a "job gap" of over 35,000 in Montana. That is, the number of jobs required by the growing population to avoid forcing an increase in unemployment and/or outmigration exceeded the actual net increase in jobs for the period by 35,000.⁵


²David Lewis campaign commercial broadcast, KGVO Radio, September 28, 1972.


⁵Johnson, "Wood Products," p. 16.
Figure 22: Seasonally Adjusted Unemployment as a Percentage of the Civilian Labor Force Montana and United States, Monthly, 1957-1969.

new jobs, jobs for males are usually the most important because of the male's traditional role as head of the household. Yet "all of the growth in our (Montana) labor force since 1930 has been solely through the addition of women."\(^1\)

Various bodies have been set up with a view to obtaining economic development. Perhaps the central one is the Montana State Planning and Economic Development Division which can provide potential industrial investors with contacts, information on markets, suitable locations and other data, and can exert some limited political push.\(^2\)

Sometimes the government works in more direct ways also. Governor Anderson led a delegation of 38 Montanans to California in April, 1972, to "woo" industry to Montana.\(^3\) The state has also hosted visits by Japanese trade officials and industrialists from the Midwest in efforts to gain industry.\(^4\)

If narrowing the "job gap" is going to be an objective of state policy, then so, by definition, is attracting new capital. But to do this on any large scale would require that the prospective rate of return to investment in Montana be at least as great as the prospective rate of return in other regions. That is, policy must aim at making investment in the state more attractive—not an easy task.\(^5\)

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Thus we see that there is more to attracting industrial investment than merely mounting a huge advertising campaign and holding a number of business luncheons. Often, however, regional development planners seem to look at industry solely as a provider of jobs and fail to realize that industry takes a different view. Industry is attempting to seek a financial return on its investment, increase its sales, maintain a buoyant competitive situation or some other objective; and only rarely does it consider the derived demand for labor as a reason for existence.

In much of western Montana, outside of Missoula and, perhaps Kalispell, development can be considered as part of the rural problem.

Two of the aims of the federal Rural Areas Development program are stated as:

To encourage more rapid rural industrialization and expansion of commercial enterprise in rural areas to provide new employment and other non-farm economic opportunities;

To establish a reservoir of experience which the developing nations of the world—largely rural and agrarian—can adopt. It will be a constant reminder that democracy and the free enterprise system can solve the problems of rural poverty and provide the techniques for rapid economic growth.¹

These words display considerable optimism for the success of rural economic development. This optimism is shared by the RC&D committee in the problem-loaded Bitterroot Valley:

Any person who has lived in the Bitterroot for any length of time is cognizant of the lack of employment opportunities. Though many of us have accepted the superior living conditions in the Bitterroot as partial

¹Statement of O.L. Freeman, Secretary of Agriculture, before the Senate Sub-committee on Agricultural Appropriations, March 21, 1963.
compensation for a lower income, this does not answer the needs of the unemployed. We need jobs, not only for the adults but for our youth who so frequently must go elsewhere for employment. Unfortunately, there is no instant solution. However, the progress being made under the RC&D program, as well as the interest and participation so prevalent in our community, lends hope to the situation.¹

The mood of optimism does not run so high in Flathead county which became eligible for federal assistance under an Area Redevelopment Administration program in the early 1960's. Expansion of the Anaconda Aluminum Company's operations at Columbia Falls and the construction of Libby Dam in nearby Lincoln county improved the employment situation, but "continuing immigration of people absorbed available jobs and by August 1, 1971, Flathead county was again designated an area of persistent unemployment."² The O.E.D.P. report that resulted from the redesignation painted a grim employment picture, and predicted further gloom with the possible closure of the aluminum plant and the reduction of the allowable timber cut.³

If Montana is to grow, it will grow because you increase wealth creating activities within your state. You will either have more farmers, more miners, more construction workers, more people working in timbering, or you will have more persons engaging in manufacture. No community ever grew by adding more grocery stores or more gas filling stations; these things come only when there's a demand for them.⁴

³Ibid.
Since the forest products industry is the prime "wealth creating" industry in western Montana it is not surprising that most efforts to develop the region center around this industry. There are also moves to diversity into other manufacturing industry, but, so far, these have been fairly insignificant.¹

Efforts at obtaining economic development of any kind often center around the problem of planning and zoning. Some bodies, including the Regional Planning Association of Western Montana, have been established exclusively to address the planning problem. Bruce Bugbee, the Association's Director, feels that inadequate planning is the major obstacle thwarting economic development in the region.²

How successful can these attempts at engineering economic growth be? Are they enough to solve the problem? Some people, at least, do not believe so. Maxine Johnson in her several publications, and Dennis Schweitzer,³ have both argued that the future economic situation is "gloomy." Richard Shannon said:

For thirteen years I have given lectures across the state saying that there is no economic future for Montana; that Montana cannot support its present population in terms of employment, and that there must be a decrease of between 100,000 and 150,000 people in the state during the next twenty years. And I've been laughed out of every county for saying this.⁴

¹For further discussion on this point see Chapter 5.
²Personal interview with Bruce Bugbee, May 25, 1972.
³Dennis Schweitzer, address to Forest Economics class, 421, University of Montana, October 6, 1972.
Not everyone, of course, would consider Richard Shannon's remarks as an unwelcome prediction. There are those who resent any move towards industrialization. "Montana could be the next state to succumb to industry, progress and greed. . ."¹ These words express a sentiment that is shared by many Montana residents. It is not my intention, here, to attempt to resolve the conflict between industrialists and environmentalists but, rather, to examine the economic development process itself. Many environmentalists are anti-industry because they are anti-pollution, but conceptually, at least, non-polluting industry is a technical feasibility, and industrialization without environmental degradation is a conceivable possibility. Whether or not industrialization without environmental degradation is a practical possibility is not the concern of this study. Our question is "can economic development occur in this region under the functional relationships of the prevailing economic situation, and, if so, are the efforts being made to bring about such development sufficient to complete the task?"

We must also ask "will economic development bring about the increased employment that seems to be desired by a significant proportion of the population?" To answer these questions, we must examine the underlying economic structure, and its implications regarding the demand for labor in the region.

¹Words of Paul Bruner, quoted in "Industry, progress, greed may be Montana's downfall," Montana Kaimin, May 10, 1972, p. 4.
CHAPTER IV.

FREE TRADE, NATURAL RESOURCES, ECONOMIC GROWTH

AND THE DEMAND FOR LABOR IN WESTERN MONTANA.

Theory of Comparative Advantage

This section consists of an application of international free trade theory to an interregional situation. That is, essentially, an application of the Ricardian and Hecksher-Ohlin theories to the western Montana region of the United States. There are several precedents for this application of international theory to a regional situation, perhaps the most applicable having been set by John Moroney in 1967.¹ In an article primarily aimed at testing the Hechkscher-Ohlin and factor-price-equalization theorems, Moroney stated: "it seems that a test based upon regional, rather than international, data is preferable on at least two grounds..."² Moroney's reasons were that several assumed homogeneities of the model fitted the real situation better in an intranational rather than an international sphere.³

Our aim, here, is not to further test the theorems but to


²Ibid., p. 241,

³Ibid., p. 242-244.
apply them to the western Montana situation.\textsuperscript{1} The states of the Union operate on a substantially free trade basis among themselves. There are no tariff barriers or customs posts at state boundaries, there are no overt restrictions on the movement of capital, goods or people across state lines, and the same currency and exchange rates apply throughout the country. A few factors, such as anti-trust laws, federal government spending and development organizations such as the Tennessee Valley Authority may impinge on the workings of the classically "free" system, but, as we shall see, they do not significantly impair its operation. The fact that western Montana's principle industry is wood products, coupled with the fact that the largest four wood products companies in the United States combined control only 15 per cent of the market,\textsuperscript{2} improves the "freedom" of the situation, since it approximates to the classical case of pure competition.

This existence of a free trade system is no accident of fate. It stems directly from the belief of the early economists that free trade would necessarily lead to the maximization of aggregate production--and therefore consumption--among all participating economies. While European free-traders were wrestling to rid their countries of monopoly-seeking, protection-oriented, merchants and repeal

\textsuperscript{1}For empirical tests of the theorems, see works by Arrow, Cheney, Minhas, and Solow (1961), Minhas (1962, 1963), Lieontief (1964), Bharadwaj (1962), Wahl (1961), Tatemoto and Tchimura (1958).

\textsuperscript{2}Leo Cummins, personal interview at Missoula, May 30, 1972.
restrictive acts such as the Corn Laws, the freedom-loving states of the New World found no such obstacles to the establishment of a free interstate system of commerce.

"To enjoy a constant plenty, we have only to lay aside our prohibitions and restrictions, and cease to counteract the benevolent wisdom of Providence."1

"It would be much wiser to acknowledge the errors which a mistaken policy has induced us to adopt, and immediately to commence a gradual recurrence to the sound principles of an universally free trade."2

"Some moderate and gradual relaxation of the laws which give to Great Britain the exclusive trade to the colonies, till it is rendered in a large measure free, seems to be the only expedient which can, in all future times, deliver here from danger . . . . and which, by gradually diminishing one branch of her industry and gradually increasing all the rest, can restore all the different branches of it to that natural, healthful, and proper proportion which perfect liberty necessarily establishes, and which perfect liberty can alone preserve.3

Today, the belief in the necessary benevolence of free trade is still widespread—from the tariff reductions of the Kennedy Round to the European Common Market—although Europe has still not reached the degree of intra-continental free trade long enjoyed in the United States.

Free trade has not been known as a subject that induces much objectivity on the part of economists. Indeed, the emotional element of the rift between the free-traders and the anti-free-


2David Ricardo, On The Principles of Political Economy and Taxation, Ch. XXII.

3Adam Smith, Works of Adam Smith, Bk. IV, Ch. VIII, Pt. iii.
traders appears to be almost as great as that between Marx-admirers and Marx-haters.\(^1\) While many modern economists with sympathies toward the "underdeveloped" nations, such as Andre Gunther Frank, Celso Furtado, and Gunnar Myrdal, would reject free trade as being beneficial only to the developed nations of the world, equally modern, and probably better-known, economists continue to expound the classical inexorable virtues of universally unrestricted trade.

In his widely used textbook, Samuelson states in no uncertain terms:

"The theory of comparative advantage is a closely reasoned doctrine which, when properly stated, is unassailable."\(^2\)

"This simple principle (of comparative advantage) provides the unshakable basis for international trade."\(^3\)

The average student, who probably takes one or two introductory Economics courses, and who reads only Samuelson or some other economist of the "establishment," might well fail to realise that


\(^{3}\)Ibid., p. 665.
there can be any doubt as to the efficacy of free trade. Uniformed opinion is sometimes heard to bemoan, for example, the export of logs to Japan; but better-informed opinion is usually quick to expound on the hidden advantages of such a trade. In short, the truth of the doctrine of free trade is firmly entrenched in the minds of most Americans, and, for that matter, of most Europeans also.

According to William Duerr:

"Uncertainty is related to knowledge. Ignorance coupled with intelligence can lead to uncertainty—or, with stupidity, to certainty. But as individual or social ignorance is replaced by knowledge, uncertainty ordinarily increases: the more one knows, the more clearly he recognizes his limitations."

Duerr's remarks do not appear to apply to popular trade theory. Knowledge of international trade has undoubtedly increased over the last one hundred years, and yet, certainty of belief in the doctrine of free trade amongst orthodox economists has not decreased at all. (Perhaps this stems from some vague moral belief that anything intimative of freedom must be good.)

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1Another popular and highly respected economist, Charles P. Kindleberger, wrote; "under ideal conditions, free trade produces efficiency optimum and a welfare maximum." Foreign Trade and the National Economy, (New Haven: Yale Univ. Press, 1962), p. 147. It must be admitted, however, that Kindleberger's treatment is considerably more thorough and contains many more qualifications than Samuelson's dogmatic textbook assertions. In more advanced works, Samuelson defends his position better, but not in his most widely read and, presumably, most influential text.

Yet, in the political realm, free trade has long been viewed as a two-edged sword. Although all the while extolling the virtues of working towards an universal free trade, the goal of the European Common Market is to establish free trade among its members and to protect its members with a tariff wall from the rest of the world. Such an act, free-traders would argue, is not inconsistent with the long-term goal of universal free trade, but is rather an extension of the well-known "infant industry" approach to protection. This argument is not, however, often accepted when proposed by governments of the "underdeveloped" nations.¹

It would also be hard to apply the "infant industry" justification to the United States' air transport industry, for example. Yet, the U.S. Senate, in February, 1972, granted the U.S. government authority "to suspend or cancel air fares offered by foreign airlines flying across the Atlantic if they were felt to be low enough to present financial hardship to American companies."² In short, although protectionism is a "dirty word," it has by no means been rejected as a tool of economic growth.

The point, in relation to western Montana, is that, although the region exists in an atmosphere of intranational free trade that almost all of us take for granted, we might well benefit from examining the effect of this free-trade system on the economy of the region.


Let us begin by introducing that most basic of free-trade theorems: the Ricarian model. The theorem is described at length by Ricardo,\(^1\) but is much more succinctly explained by Samuelson\(^2\) in the form of an example. Suppose we have a two-country, two-commodity world with a single factor production function: labor. Production costs are measured in labor days. Suppose, for example, one day's labor is required to produce one unit of food in the U.S. and three days are required in the U.K.; whereas, four day's labor are required to produce one unit of clothing in the U.S. but only two days are required in the U.K. And suppose that each country has only twelve workers. The before-trade situation is shown in Table 5.

### TABLE 5.

**ABSOLUTE ADVANTAGE SITUATION BEFORE TRADE**

<table>
<thead>
<tr>
<th></th>
<th>U.S.</th>
<th>U.K.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 unit of food</td>
<td>1 labor day</td>
<td>3 labor days</td>
</tr>
<tr>
<td>1 unit of clothing</td>
<td>4 labor days</td>
<td>2 labor days</td>
</tr>
<tr>
<td>production of food</td>
<td>4 units</td>
<td>2 units</td>
</tr>
<tr>
<td>production of clothing</td>
<td>2 units</td>
<td>3 units</td>
</tr>
</tbody>
</table>

It is clear that total food production equals 6 units and total clothing production equals 5 units. The U.S. has a productivity advantage in food and the U.K. has one in clothing; so suppose, now, that the U.S. specializes in food production, the U.K. in clothing and that the two countries enter trade. (For the moment, transport costs are ignored.) (Table 6).

\(^1\)David Ricardo, *Principles of Political Economy*, Ch. XXII.

\(^2\)Samuelson, *Economics*, Ch. 32.
TABLE 6.

ABSOLUTE ADVANTAGE SITUATION AFTER TRADE

<table>
<thead>
<tr>
<th></th>
<th>U.S.</th>
<th>U.K.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 unit of food</td>
<td>1 labor day</td>
<td>2 labor days</td>
</tr>
<tr>
<td>1 unit of clothing</td>
<td>2 labor days</td>
<td>6 units</td>
</tr>
<tr>
<td>production of food</td>
<td>12 units</td>
<td>6 units</td>
</tr>
<tr>
<td>production of clothing</td>
<td>12 units</td>
<td>6 units</td>
</tr>
</tbody>
</table>

Total food production has risen by 6 units and total clothing production by one unit. Part of these increases can be exchanged and both countries benefit by a net increase in consumption of both commodities. This much is obvious. Ricardo, however, goes on to show that, even if one country holds a net advantage in the production of both commodities, trade can still be mutually beneficial if there exists a relative comparative advantage for different commodities in different countries. Let us reverse the productivities for clothing in our example, so that, now, the U.S. has an absolute advantage in the production of both food and clothing. (Table 7).

TABLE 7.

RELATIVE ADVANTAGE SITUATION BEFORE TRADE

<table>
<thead>
<tr>
<th></th>
<th>U.S.</th>
<th>U.K.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 unit of food</td>
<td>1 labor day</td>
<td>3 labor days</td>
</tr>
<tr>
<td>1 unit of clothing</td>
<td>2 labor days</td>
<td>4 labor days</td>
</tr>
<tr>
<td>production of food</td>
<td>8 units</td>
<td>3.33 units</td>
</tr>
<tr>
<td>production of clothing</td>
<td>2 units</td>
<td>0.5 units</td>
</tr>
</tbody>
</table>

in the pre-trade situation, total food production equals 11.33 units and total clothing production equals 2.5 units. If, however, the U.S. specialized in food production, and the U.K. in clothing, total food production rises to 12 units and total clothing to 3 units.

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The trading of some of these increases will again result in a net increase in the consumption of both commodities in both countries. (Table 8).

TABLE 8.

RELATIVE ADVANTAGE SITUATION AFTER TRADE

| 1 unit of food | 1 labor day | ---- |
| 1 unit of clothing | ---- | 4 labor days |
| production of food | 12 units | ---- |
| production of clothing | ---- | 3 units |

Thus, even although the U.S. can produce clothing with less effort than the U.K., it pays the U.S. to concentrate on its relatively more advantageous industry—food—and import clothing from the U.K. This theory of comparative advantage holds whenever one country possesses a comparative advantage in one product and another country, another product. The benefits will be realized only when there is no restriction on trade.

Obviously transport costs might be high enough to cancel the benefits, but, in general, this is not the case, except where exceptionally bulky products are concerned (for example, cement) or where a country is extremely isolated and possesses only a small population.

As Kindleberger rightly states:

"By and large the long-run cost curve of conducting trade is a falling one as the world shrinks in space and time. Trade must overcome distance and barriers to communication, now as before, but the task becomes continuously easier."1

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1 Kindleberger, Foreign Trade, p. 25.
The disadvantages of Ricardo's model are many, but one is paramount. Ricardo assumes only a single factor of production—labor—and ignores the two other vital factors—capital and natural resources. Obviously if neither capital nor natural resources are in short supply, compared with the supply of labor, there exists no problem. It does not matter if natural resources go unused, and, if there is an over-abundance of capital, we might expect that this will be taken care of through the action of the market mechanism on interest rates in such a simplistic model. Suppose, however, that natural resources are in short supply. If the United Kingdom's comparative advantage lies in wheat production, and all of its suitable land is already being used for such a crop, then further specialization in wheat production, with the transfer of labor from, say, clothing to wheat will not improve matters at all. Rather, it will result in reduced production of clothing and, either in reduced efficiency of wheat production or else in unemployment. In the Ricardian model, unless labor is the limiting factor of production, there is no assurance that full employment will result from free trade. This assurance is gained, only when factor prices are substituted for absolute quantities, and it is assumed that the price mechanism will function to reduce the cost of labor to a level where it will be fully employed. In the real world the price mechanism is notoriously unreliable in the realm of wage rates, owing to the familiar "ratchet effect," whereby wages frequently seem capable of going up but seldom capable of going down. With the labor intensive technologies of the nineteenth century, labor probably was, indeed, the limiting
factor of production,\(^1\) and this objection would, therefore, not have been serious. In today's world of highly capital intensive technology, however, it is doubtful if labor is the limiting factor of production in many cases, and full employment is, therefore, not a necessary consequence of free trade a la Ricardo.

A much more comprehensive and useful theory of comparative advantage has been proposed by Heckscher and Ohlin.\(^2\)

Assume that each commodity is produced according to a linear homogeneous production function, common to all regions that possess qualitatively similar inputs of capital and labor. Comparative advantage, according to the Heckscher-Ohlin theory, then arises from (1) different relative endowments of capital and labor among regions and (2) different factor intensities of production processes for different commodities (Heckscher, 1949, pp. 278-79). More specifically, the Heckscher-Ohlin theory postulates that a region can produce at a comparatively lower unit cost those commodities requiring relatively more of the regions abundant productive factor.\(^3\)

In other words, if the United States is relatively better endowed with capital than Japan, but the latter country is relatively better endowed with labor, then it will behoove both countries to

\(^1\)It might be argued that capital was a more limiting factor in the nineteenth century, but, since this was a period of rapid capital accumulation through the storage of labor production, labor remains in the limiting role.


specialize in those industries that utilize their more abundant factor. The U.S. will export capital intensive goods to Japan in exchange for imports of relatively labor intensive goods. The problem, of course, lies in the definition of "better endowed" or "more abundant." Using a simple measure of labor input--man-years--Lieontief obtained surprising results in his famous input-output analysis of the United State's economy in international trade.¹ The so called, Lieontief paradox showed that, contrary to all expectations, the United States exported relatively labor intensive goods and imported relatively capital intensive goods. Kenen's explanation of this apparent refutation of the Heckscher-Ohlin theory lies in a consideration of the relative skill and education of the labor employed.² He maintains that U.S. workers were more highly trained and, therefore, embodied a considerable investment of social overhead capital in their persons. When this investment was added to the other capital investments, the paradox could be explained, U.S. exports appeared more capital intensive than U.S. imports in most cases, and the Heckscher-Ohlin theory could be tentatively restored to its former glory.³


³Ibid.
The Heckscher-Ohlin theory, however, need not be restricted to the consideration of just two factors of production—labor and capital. Natural resource endowment can be included also. Vanek\(^1\) and Naya\(^2\) have made some valuable advances in this direction. The problem arises, however, in that comparative advantage theory cannot comfortably accommodate more than two factors of production. When three are considered: the U.S. might be capital rich with respect to labor but capital scarce with respect to land. Japan might be land scarce with respect to capital and capital scarce with respect to labor, and so on. If the Heckscher-Ohlin theory was difficult to test with two factors, it becomes virtually incomprehensible, not to mention unverifiable, with three. Vanek's solution to this dilemma is to attempt to find a relationship between capital and resource factor requirements of industry.

Vanek's hypothesis is that there exists a positive correlation between the resource requirements of an industry and capital requirements of the industry, but that there is no such correlation between the industry's resource requirements and its demand for labor.\(^3\) That is to say, that demand for capital is a function of demand for resources, whereas demand for labor is not a function of demand for


resources, per unit of output. His results generally lend credence to his hypothesis in the cases of the United States, Japan and Canada,¹ and, in the case of the United States, offer another possible explanation of the Lieontief paradox, as shown in Table 9.

TABLE 9.
DOMESTIC CAPITAL, LABOR, AND NATURAL RESOURCE PRODUCT REQUIREMENTS PER MILLION DOLLARS OF AMERICAN EXPORTS AND OF COMPETITIVE IMPORT REPLACEMENTS, 1974.

<table>
<thead>
<tr>
<th></th>
<th>Exports (X)</th>
<th>Imports (M)</th>
<th>X/M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital (dollars)</td>
<td>2,551,000</td>
<td>3,091,000</td>
<td>0.83</td>
</tr>
<tr>
<td>Labor (man-years)</td>
<td>182,000</td>
<td>170,000</td>
<td>1.07</td>
</tr>
<tr>
<td>Natural resource products ($)</td>
<td>340,000</td>
<td>630,000</td>
<td>0.54</td>
</tr>
</tbody>
</table>

It is seen that U.S. imports are relatively resource intensive with respect to labor, and its exports are conversely relatively labor intensive with respect to resources. This would follow if the U.S. were resource scarce and, therefore, labor abundant with respect to resources. The fact that relatively less capital was used in the production of U.S. exports than in U.S. imports can be said to have resulted, not from a relative scarcity of capital, but from the lower capital requirements of the resource extensive export industries. This is certainly an easier pill to swallow than Lieontief's conclusion stated without regard to resources. As a broad generalization, U.S. exports do tend to take the form of secondary manufactured goods that are relatively labor intensive with respect to resources, and imports do tend to be primary products and raw materials that are relatively resource intensive. Furthermore, it is not uncommon for primary resource intensive industries to be more capital

¹As shown by Naya, "Natural Resources," pp. 563-567.

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intensive than secondary manufacturing industries with respect to labor. (See Figure 23 on page 99).

A problem with Vanek's hypothesis that capital requirements of industry are positively correlated with resource requirements arises when there are significantly different technologies operating for the same industry in different regions of countries. For example, agriculture tends to be capital intensive and labor extensive with respect to resources in the United States, but, in Japan, where agricultural technology is not as modern, the industry tends to be labor intensive and capital extensive with respect to resources. In a comparative ranking of capital intensity of industry for the U.S. and Japan, Minhas reveals this example clearly.¹ Most industrial sectors are quite comparable for the two countries—petroleum products rank as the most capital intensive sector of both nations; coal, chemicals, paper, minerals, lumber, transportation equipment and most sectors have similar rankings in both countries. The agricultural sector, however, ranks third in capital intensity in the U.S. and twentieth in Japan. This is the greatest difference observed, and other significant differences occurred in grain mill products and processed foods—all related to agriculture. Such radical differences in technology serve to upset Vanek's hypothesis when the industry involved constitutes a significant part of a nation's trade. Within the United States, however, technology tends to be relatively homogeneous and Vanek's hypothesis that capital requirements are positively

¹B.S. Minhas, An International Comparison of Factor Costs and Factor Use (Amsterdam: 1963) Table 5, p. 40.
correlated with resource requirements can be generally assumed to hold true in any interregional analysis.

Figure 22 shows capital-labor ratios for selected manufacturing industries in the U.S. on a regional basis, for 1957. As is to be expected, the figure shows that secondary manufacturing industry—machinery, clothing, furniture, and so on—tends to be labor intensive with respect to capital, while primary manufacturing industry—petroleum products, primary metals, pulp and paper—tend to be capital intensive with respect to labor. Food is an intermediate case, and lumber, not surprisingly, emerges as the most labor intensive of the primary industries. An examination of the Mountain region relative to the other regions is interesting. It appears that it has higher capital-labor ratios than almost any other region for three of its major manufacturing industries—lumber, petroleum and food—and lower capital-labor ratios than most other regions for its lesser industries—machinery and paper. It is also lower than most in the primary metals sector. This leads us, tentatively, to the hypothesis that regional capital-labor ratios tend to be higher, vis-a-vis other regions, in those industries that are of greatest importance to the region. This hypothesis is supported to some extent by the fact that capital-labor ratios for paper and petroleum products are highest in the Pacific region; for transportation and automobiles they are highest in the East-north Central region; they are high for textiles and paper products in the South, and lumber in the west; and

---

1 This is analogous to the forest economist's dictum of "invest your money on your best growing sites."

98
Figure 23: U.S. Regional Capital-Labor Ratios in Selected Manufacturing Industries, 1957.

**FOOD**

<table>
<thead>
<tr>
<th>Region</th>
<th>Dollars Per Man-year</th>
</tr>
</thead>
<tbody>
<tr>
<td>New England</td>
<td></td>
</tr>
<tr>
<td>Middle Atlantic</td>
<td></td>
</tr>
<tr>
<td>East-North Central</td>
<td></td>
</tr>
<tr>
<td>North-West</td>
<td></td>
</tr>
<tr>
<td>South</td>
<td></td>
</tr>
<tr>
<td>East-South Central</td>
<td></td>
</tr>
<tr>
<td>West-South Central</td>
<td></td>
</tr>
<tr>
<td>Mountain</td>
<td></td>
</tr>
<tr>
<td>Pacific</td>
<td></td>
</tr>
</tbody>
</table>

**APPAREL**

<table>
<thead>
<tr>
<th>Region</th>
<th>Dollars Per Man-year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NON-ELECTRICAL MACHINERY**

<table>
<thead>
<tr>
<th>Region</th>
<th>Dollars Per Man-year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ELECTRICAL MACHINERY**

<table>
<thead>
<tr>
<th>Region</th>
<th>Dollars Per Man-year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 23 cont.

LUMBER

Dollars per Man-year

8 -

4 -

N.A.*

PAPER, ETC.

Dollars Per Man-year

20 -

16 -

12 -

8 -

4 -

New England Atlantic Middle Central East-North Central North-West Atlantic South South-East Central East South Central West-South Central Mountain Pacific

PRIMARY METALS

Dollars Per Man-year

20 -

16 -

12 -

8 -

4 -

*Not Available

100
Figure 23 cont.

**FURNITURE**

<table>
<thead>
<tr>
<th>Dollars Per Man-year</th>
<th>4 -</th>
<th>N.A.</th>
<th>N.A.</th>
</tr>
</thead>
</table>

**PETROLEUM, ETC.**

| Dollars Per Man-year | 52 - | 48 - | 44 - | 40 - | 36 - | 32 - | 28 - | 24 - | 20 - | 16 - | 12 - | 8 - | 4 - | N.A. |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|

in New England they are generally low in all sectors.\textsuperscript{1} Certainly the tendency for most regions to be high in some sectors and low in others lends support to the hypothesis that regions do not tend to have general capital scarcities or capital abundancies.

It is this writer's contention that, in an interregional study of the United States, Vanek's solution to the three factor dilemma, by correlating capital with resources, can be taken one step further. Capital can be eliminated from the consideration of comparative advantage altogether, leaving only labor and resource endowments as factors to be considered. Resources are mostly immobile and therefore lead to considerable interregional endowment differences. Labor, in the short run, can be justifiably considered immobile and, in the medium-long run, as only partially mobile. At least, it is not nearly as mobile as capital. Within the United States in particular, but also throughout the "free" world, capital is an extremely mobile factor of production. To quote Kindleberger: "capital is par excellence internationally mobile factor..."\textsuperscript{2} This is witnessed by the general uniformity of interest rates throughout the developed nations, relative to wage rates or resource prices, and the general pattern of ownership of large corporations. Ownership of corporate capital tends to be an incredibly enmeshed and intermingled maze of national and international owners, both private and corporate. United States' and European capital flows freely in and out of the developed nations

\textsuperscript{1}Moroney, "Strong-Factor-Intensity Hypothesis," \textit{J.P.E.}, 75(3), Table 1, p. 247.

\textsuperscript{2}Kindleberger, \textit{Foreign Trade}, p. 82.
and fairly freely in and out of the underdeveloped nations.¹

Relative scarcity or abundance of capital in western Montana, except in very specific cases, is therefore a meaningless concept. Most industries in the region depend on capital that is owned by out-of-state corporations (St. Regis, Champion-International, Hoerner-Waldorf, to name but three), even locally owned corporations obtain much of their finance from out-of-state,² and it is probably safe to assume that most privately-owned productive capital within the region is invested out-of-state. Furthermore, the fact that a corporation has its head office in, say, New York, is no indication whatsoever of the source of its capital. It is this writer's contention, therefore, that, insofar as the Heckscher-Ohlin theory explains inter-regional differences in the pattern of industry in the United States, it does so generally on the basis of differences in natural resource and labor endowments, and is generally independent of capital.³

¹Studies on the patterns of ownership of corporate capital are virtually non-existent—not surprisingly in view of the subject's complexity and the absence of reliable data. These remarks are based on several attempted studies of the author's while in the City of London, and particularly on conversations with Geoffrey Kay of the City University, 1969-1970.

²Surmised from Raymond H. McEvoy, "Bank Financing of Montana Business," Regional Study No. 7, (Missoula: Univ. of Montana, 1957), p. 5, Table 1. Maxine Johnson, in a personal interview at Missoula June 2, 1972, stated that she believed the trend toward out-of-state ownership of locally-invested capital to be increasing. Actual statistics are not available.

³Undoubtedly many corporate investment decisions are made on the basis of personal knowledge, personal contacts, personal prejudices, and individual quirks of confidence and expertise. Although these obviously hinder the "free" flow of capital, they do not lend themselves to the formulation of any general theory, and must, therefore, be left out of this analysis—at least at this stage.
Application in Western Montana

It is contended that, notwithstanding the doubts raised by the Leontief paradox, enough verification of the practical applicability of the Heckscher-Ohlin theory has been published to warrant, at least, tentative acceptance of its applicability to the western Montana case.

The Heckscher-Ohlin theorem is basically a static model but it can be dynamized to a limited degree in qualitative terms. In the early days of Montana a comparative advantage existed with respect to gold and precious metal production. Labor and capital were drawn into the territory as a function of the demand for gold and the prevailing technologies of mining and smelting at that time. This continued only so long as gold prices, markets, and alternative sources of supply maintained the territory's absolute advantage in gold production. Further the area became more accessible, as the plains were settled, and as the national market for food increased the comparative advantage of gold declined relative to agriculture. Thus, even although Montana's gold resources were by no means exhausted, the industry lost its comparative advantage, both absolutely and relatively, and declined under the free trade system. We can assume that this led to the optimization of aggregate national benefit.

Since about 1890 Montana, as a whole, has found its agricultural resource its greatest comparative advantage. Minor advantages have been maintained in oil production, lumber production, copper, hydro-electric power, the recreation resource, and, more recently in the vast resources of low-sulphur coal. Just as changing conditions led to the demise of gold, so the "environmental revolution"
and its consequent demand for low-sulphur fuels is helping the rise of the Eastern Montana coal industry.

Montana is, and has been, a state rich in natural resources but low in population. It is not surprising, therefore, that comparative advantage has been found in the resource intensive industries. More heavily populated, and comparatively less well-endowed, areas such as the north east Atlantic, the Chicago-Detroit and other urban regions, have found their comparative advantage in relatively labor intensive manufacturing industries. In a labor intensive region, labor is the most abundant but also the most scarce factor. Because it is the most abundant factor, labor intensive industries arise. Because labor intensive industries arise, labor becomes the scarce factor and full employment is approached. In other words, the demand for resources is a function of the supply of labor. In a resource abundant area such as Montana, the reverse applies. Resource intensive industries arise and the demand for labor, under any prevailing state of technology, is a function of the supply of resources. Thus, there is no natural tendency towards full employment. If the supply of resources remains fixed, but technology changes, the demand for labor will probably change also. Taking account of technology, therefore, we have that, in a labor abundant region, \( D_R = f(L,T) \) and in a resource abundant region \( D_L = f(R,T) \); where \( D \) represents demand, \( R \) represents resources, \( L \) labor, and \( T \) technology. Obviously the dependent variable, demand, for either labor or resources, does not have to be met locally. The labor abundant region can import raw materials to supply its industry, and , if
necessary, the resource abundant region can import labor to man its industry.

The story of western Montana has been much the same as the story of the whole state, except that the industrial sector names have been changed. Western Montana never did possess a comparative advantage in gold and mineral production. Right from the start, in the 1850's, the comparative advantage lay in the agricultural potential of the Bitterroot and Missoula valleys for supplying food to the mining markets across the Divide. Thus agriculture developed as the principle industry. A minor accompanying advantage lay in the timber resources, fostered by the mining and railroading industries' demand for logs. As agriculture spread east of the Divide, as improved communications made food supplies available from elsewhere, and as agricultural technology changed, the small farms and cramped valleys of the mountain region gradually lost their advantage in agriculture. At the same time, increased demand for timber locally and the depletion of supplies in the Mid-west increased the region's comparative advantage in wood-products. It was not until after 1960, however, that the wood-products industry actually supplanted agriculture as the region's major industry. The region also possesses a comparative advantage in resources for generating hydro-electric power; but the ease with which electric power can be transported and the absence of a comparative advantage in labor has not largely led to

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1Arnold Bolle, personal interview at Missoula, November 6, 1972.

2See Chapter 1, Figure 5.
the establishment of a local manufacturing sector based on this primary product. The one exception to this is the Anaconda Company's aluminum smelter at Columbia Falls. This plant was established because Senator Mansfield ensured that a "block of power" was set aside by Congress to encourage local industry at the time of the construction of Hungry Horse Dam. As stated earlier, this plant now has an uncertain future.

As with the rest of the state, the comparative advantage of the region lies in natural resources, not in labor, and there is, therefore, no logical reason why labor intensive industry should arise under the free trade system, within the limitations of our model. The demand for labor is merely a function of the demands of the comparatively advantageous resource intensive industries and the prevailing state of technology.

We see that comparative advantage is continuously changing over the long run, and, under a system of free trade, industrial activity changes to meet the changing conditions of comparative advantage. Obviously this industrial change takes time and there exists a lag period. Thus, at any one time, certain less-advantageous industries will be in existence, although declining, while other more-advantageous industries may be slow to increase. Social resistance and political intervention can hinder the process of adaptation, and the "natural" tendency to optimization of production through comparative advantage, even under conditions of free trade.

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1Arnold W. Bolle, personal interview at Missoula, November 27, 1972.
It is too early to be conclusive, but it appears that western Montana may presently be undergoing a relative change of comparative advantage within its forest resource—the advantage may be changing from the timber values to the non-timber values of the resource. As accessibility of the region from the urban areas—both physically and financially—is increasing, and as aggregate demand for recreational resources is increasing, so the non-timber, aesthetic and recreational values of the region's forest resource are increasing. The region's forests occupy an area of immense natural beauty but the timber-growing sites are generally less productive than in many other regions. The gradual changeover from old-growth to second-growth management is forcing more strict consideration of the economics involved in timber production in the region. The availability of wood substitutes and the availability of alternative supplies of timber do not serve to increase the relative value of the region's timber component, whereas the relative shortage of mountainous and wilderness land is tending to increase value of the non-timber component of the forest resource. In other words, timber might be available in other areas at less social or opportunity cost in terms of recreational and aesthetic value destroyed. Obviously recreation and timber extraction are not necessarily mutually exclusive industries, but, at least under present technological and economic conditions, there does appear to be an inverse correlation between them.

If the forest resource of western Montana is undergoing a structural change in comparative advantage from timber to non-timber values, and, if this results in a relative decline of the timber
industry and a relative increase in the recreation industry, we may assume that it will serve to optimize the net benefit of the nation. But what effect is it likely to have on the demand for labor in western Montana?

As shown in Chapter 3, the employment structure of the recreation industry tends to be more highly seasonal than the wood products industry, wages are considerably lower. Demand for unskilled, and temporary female and student labor is generally much higher than demand for skilled or highly-educated labor. The multiplier effect of the recreation industry is also lower so that derived employment would most likely decrease. A changeover of emphasis from wood products to recreation in western Montana would probably result in a fall in aggregate demand for labor, and would certainly cause some radical changes. It is difficult to expect a skilled mill worker to accept a job as a seasonal short-order cook or as a waitress.

Even without any significant shift away from the wood products industry, however, it is generally accepted that employment in the primary production industries will decrease as technology advances. In western Montana, for the foreseeable future, it is quite widely expected that increased production in the wood products industry will help to offset this trend, and aggregate employment will, therefore, remain approximately constant.1

To summarize: western Montana possesses a comparative advantage in natural resources, its industries are resource intensive,

and it exists in a situation of free trade. Demand for labor in this situation is a function of the requirements of the resource intensive industries and the prevailing technology. The long term expectation is that demand for labor will not increase at the same rate as the natural population increase, and, either unemployment or net emigration of the economically-productive segment of population will result. Given the present state of factor endowments and the prevailing system of free trade, there is no reason to expect demand for labor to equal supply of labor within the region.

Western Montanans are therefore faced with five choices.

1) They can allow the free trade system and the theory of comparative advantage to run their "natural" course, content in the knowledge that this will help optimize total benefits to the nation, even if it should decrease the labor force in Montana. 2) They can attempt, by various political and fiscal means, to create a comparative advantage for the region's labor force, and therefore, ensure increasing employment within the context of the "free" system. 3) They can attempt to increase the output of the present resource intensive industries to the level where demand for labor will equal supply. 4) They can hope to attract federal government spending on projects that will maintain full employment in the face of a relatively declining demand for labor in the private sector. 5) They can attempt to abandon the system of free trade, and create jobs through a greater self-sufficiency in secondary manufactured goods, even at the loss of total per capita consumption.

The practical considerations involved in each of these five choices are discussed in Chapter 5.
CHAPTER V
ECONOMIC OPTIONS AND FUTURE OF EMPLOYMENT
IN WESTERN MONTANA

This chapter will provide a discussion of the five options open to western Montanans as delineated at the end of the previous chapter. The focus of attention is on economic growth and future employment, with a concluding section on the implications of a no-growth economy.

1. The Laissez-faire Alternative

A completely laissez-faire economy is no more practical a proposition than a completely totalitarian economy. Traditional "laissez-fairists," however, realized this, and when William Pitt stated that "the job of government is to govern as little as possible" he obviously conceded that some government intervention was necessary to ensure the smooth working of what Adam Smith later described as the "guiding hand of providence" in the free-market system. In 1972, with so much of the world moving towards greater degrees of government intervention in the economy, we can probably assert with confidence that Montana, and the United States in general, lies nearer to a laissez-faire system than any other country. Government intervention may be increasing but it is still minimal.

What does this mean for western Montana? There is still widespread belief--which will not be questioned here--that the laissez-faire system leads to the optimal allocation of resources--including
the optimal provision of employment on a geographic basis—and, hence, the maximization of total net benefit to the nation as a whole. Part of the process by which optimization is "naturally" achieved works according to the theory of comparative advantage.

As comparative advantage is changing in our dynamic system, the composition of industry, population, land use and employment in western Montana is changing also. There are indications, that the wood products industry might be about to decline within the region. These are only indications, not certainties, and, even if correct, they say little about the speed with which such a decline might take place. It may well be that such a decline could be relative, rather than absolute, although this is speculative.

If predictions of imminent declines are difficult to substantiate, growing sectors are a little more apparent—although almost as difficult to statistically document. Here, we are referring to the growth of tourism, real estate subdivision, immigration for purposes of retirement or escape from the onerous elements of metropolitan life and so on. Despite gross statistics, little is really known about the structure and growth of these sectors. Tales of rampant sub-dividers and rocketing land values are widespread, yet little concrete information is available. There is reputed to be one realtor for every 800 people in the Bitterroot Valley. Californians are reported to be swarming into the region and even commuting to work from Ravalli county to San Francisco.1

1Bruce Bugbee, personal interview at Missoula, May 25, 1972.

"Montana is experiencing some impact of the new exodus from densely populated metropolitan centers. People are coming to Montana wanting to purchase small tracts of 10 to 25 acres to 'get away from people.' The 1970 census reports that in 1970, there were 71,828 people living in Montana who were living in a different state in 1965."

Land which sold at $100 per acre in the Blackfoot valley five years ago now sells for over $1200 per acre. Laws which tax land on its "highest and best" use force farmers and ranchers out of business when subdividers move into the area causing agricultural or timber land to be reclassified as residential, increasing tax assessments enormously. Laws that require land to be tested for suitability of sewage disposal before construction of dwellings are openly ignored by developers. Zoning to avoid mis-use of land potential is grossly inadequate, and so the stories go on. Efforts are being made to introduce comprehensive planning, but it seems that people do not realize what is happening until it is upon them and planning frequently seems to follow rather than precede real estate development.

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2 Land Lindbergh, personal interview at Greenough, Montana, September 27, 1972.

3 Ibid.

4 Christine Johnson, "Ravalli Sanitarian Claims Bitterroot Resists Change," Missoulian, October 6, 1972, p. 17.

5 Bruce Bugbee, personal interview at Missoula, May 25, 1972.

6 Ibid.
Besides the physical effect on the land, widespread subdivision and accompanying influences of retired or semiretired people can have far-reaching effects on the economy. As already stated, farmers and ranchers can be forced out of business. Increased public pressure against the aesthetic damage of clearcutting, slash burning and other forestry practices can effect the size of the timber harvest. The burden on the local tax base increases as the ratio of productive to non-productive population declines. Downward pressure on wage rates is increased by the larger supply of labor that is prepared to work in the service or retail trades for a nominal, marginal renumeration. These effects can be under or overemphasized, according to the motives of interested persons, owing to the lack of substantive data in the field.

With so much uncertainty, the only conclusion that can be drawn is that, the freer the system, the greater the tendency for Montanans to find themselves floating in a canoe without a paddle. In such a case, they must content themselves with the idea that the "guiding hand of providence" will lead to their benefit, through maximizing benefit to the total nation. This may lead to local unemployment, low wages, and emigration of young people in search of jobs, but, it is perfectly rational to argue that people should be employed in the urban regions where labor possesses a comparative advantage, and that Montana should be reserved as a supplier of natural resources and recreational relief for the urban dwellers. It is not inconceivable that, given such a situation, a minor urban center possessing comparative advantage in labor, might continue to develop at Missoula, although it
is unlikely that Missoula will become another Denver, Salt Lake City or Phoenix.¹

Nevertheless, there is much uneasiness among western Montanans concerning the future of employment in their region, and alternative methods of active intervention in their economy therefore deserve attention.

2. The Comparative Advantage For Labor Alternative.

Historically the classical, laissez-faire, school of thought was led into the "modified-freedom" school of thought by economists such as John Meynard Keynes. The Keynesians and neo-Keynesians take the view that the free-market system can continue to best serve society's needs providing some fiscal and monetary controls can be used to modify its operations. In other words, Smith's "guiding hand of providence" needs a gentle push once in a while.

In terms of regional development, the push is usually aimed at slowing rural depopulation, encouraging new growth centers and avoiding tendencies to regional imbalance through "overdevelopment" of a select few metropolitan areas. Hence in western Montana, we

¹Arnold Bolle, in a memorandum to the author dated March 28, 1972, suggested that Missoula could achieve the same urban development as Denver, Salt Lake City, or Phoenix. Each of these cities, however, has had a special impetus to develop. Denver is the business and governmental capital of the Rocky Mountain region--there is need only for one such entity. Salt Lake City is the center of Mormon society, which is well-known for its propensity to aggressively pursue business success. Phoenix is dependent largely upon its relative proximity to Los Angeles, as well as its favorable winter climate, for attracting wealth and residential development. Although some special characteristics could conceivably fertilize the growth of Missoula in a similar way, there are no signs that this is about to occur.
see the efforts of RC&D committees, development corporations, Rural Areas Development Programs, city, county and state-wide planning departments, university projects and federal agencies at creating a comparative advantage for labor in the region. If conditions can be made favorable—that is, a comparative advantage created—then industry and employment will "naturally" flow into the region with the workings of the otherwise-unhindered free-market system.

There are many precedents for such efforts. On a regionally-co-ordinated and comprehensive basis they have been tried with some degree of success in the South—with the Tennessee Valley Authority—and in Scotland—with the Highlands and Islands Development Board. Efforts in western Montana have not been as well co-ordinated.

Very frequently the aim is to encourage small manufacturing industries that can employ a few dozen or maybe even a few hundred people without disturbing the structure of local society. (The T.V.A. and H.I.D.B. both also sponsor large-scale projects nonetheless.) Environmental awareness has increased the attractiveness of the light industry idea, since such development is usually clean and non-polluting. Gubernatorial candidate, Tom Judge, has made much of the development-through-clean-industry approach in his current campaign.

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Efforts in this direction have taken different forms, from a very indirect to a very direct form of attack. Arnold Olsen, in his political campaign, stated that he believes the existence of a well-educated, highly trained, youthful labor force—such as is being turned out by the Montana school system—will be sufficient to draw industry to the state.¹ What he does not state, is how he expects the labor to stay around awaiting the arrival of such industry. He also overlooks the fact that virtually every other state in the nation produces an equally well-trained labor force. By contrast, Governor Forrest Anderson, apparently believes in more positive action, as shown when he led a delegation of 38 Montanans around the boardrooms of Californian industry hoping to lure some of them to invest in Montana.² It appears that this effort was not very successful.³

Various small successes have been scored in the Bitterroot valley. A butcher and his son in Stevensville, with the help of the RC&D committee, went into business manufacturing plastic goods. The business now employs a half-dozen people.⁴ Projects have been developed in the manufacture of stakes, lathes, fruitboxes and wooden jewelry;

¹Arnold Olsen speaking on "Community Mail Call," Radio KYSS, Missoula, September 27, 1972.
also furniture, campers and portable buildings. The camper and portable building firm is "employing thirteen men who were previously unemployed."\(^1\)

Since out-of-state industries are nearly impossible to attract, the (RC&D)Committee has concentrated on helping individuals and families elevate evening and weekend backyard hobbies to full-fledged industries, employing local citizens.\(^2\)

Such industrial development might be ideal for areas such as the Bitterroot valley if conditions were to remain otherwise unchanged, so that local people could continue to live on low wages in an area of low taxes, low land values, fairly low cost-of-living, and a slow pace of life. One cannot help wondering, however, if such development will not be eclipsed in the storm of immigration and sub-division, when high taxes, high cost-of-living and high land values make it impossible for the local small-time manufacturer of fruitboxes to continue to survive. In this respect, RC&D committees and Rural Areas Development projects may just be playing King Canute.

It is not even as if these groups were extremely active anyway. For instance, there is a Bitterroot Development Corporation—a non-profit corporation—whose purpose is to promote local industrial development. This group can make bond issues to raise money to assist local entrepreneurs. Yet, it has not made any money advances since its establishment.\(^3\)

\(^1\)Ibid., p. 31.  
\(^2\)Ibid.  
\(^3\)Tom Kirkpatrick, personal interview at Missoula, May 25, 1972. At the time of writing (Nov. 6, 1972), the author is informed by Leo Cummins (Missoula, Univ. of Montana) that the Bitterroot Development Corporation is about to make its first advance, in connection with a project to produce ground bark for bedding.
In addressing the lack-of-development problem in the Bitterroot, Tom Kirkpatrick referred to the "inability of valley people to make decisions." He continued:

They plan, then meet together and plan again, but tend to put off making hard decisions.¹

Kirkpatrick said that remoteness from markets and high transport costs are major hindrances to development, but that lack of local entrepreneurial initiative and concerted determination to succeed are more fundamental impediments. He would like to see the Bitterroot Development Corporation evolve into a fully co-ordinated development-planning group, similar to the Highlands and Islands Development Board. Such an organization, however, requires a large area for effective operation and, more importantly, it must wield considerable authority. The Bitterroot valley is not large enough an area, and the political mandate for the necessary degree of authority is not forthcoming.

Kirkpatrick believes that the best "hope" for attracting industrial investment capital lies in the use of political power at the state level. He believes that there exists considerable native capital in the state, but that most of it "is conservatively invested in Wall Street Blue Chips."² As Maxine Johnson stated, however, the legislative tools available to encourage economic development are "pretty limited."³ Besides the advisory functions of the state planning


³Maxine C. Johnson, personal interview in Missoula, June 2, 1972.
boards, some tax incentive and accelerated depreciation allowances are possible, but these can do very little in reality. Johnson stated that "feeble state attempts at promoting economic growth are a waste of time and money," and that "a state does not have it in its power to effectively affect economic growth."\textsuperscript{1} Such is the price of freedom.

The disadvantage of these attempts at promoting development is that they do not essentially change the pattern of comparative advantage. If the region does not possess a comparative advantage in labor, it will still not possess such an advantage after a handful of small industries have been dragged in. Consequently a self-generating growth process has not been started. Even worse, there is a strong probability that these new industries will fail if they have been enticed out of their "natural" range.

Even after minor industrialization of a labor-intensive, light manufacturing nature the region will still be remote from the major markets and transport costs will still be high. Only if enough such local industry became established all at once, so that the size of the local market became considerable, and so that a labor advantage was created to produce self-generating growth, could the region hope to be successful. This would require an enormous increase in population that would not only be undesirable for environmental reasons, but would be impossible to achieve in practice.

It is often contended that the influx of professional people to the state will create a comparative advantage in small, specialist service industries, such as consultants, computer and operations

\textsuperscript{1}Ibid.
research teams, design organizations and so on. Although this is possible, it is unlikely, especially considering that the demand for such services exists almost entirely in distant urban markets. This view is supported by Maxine Johnson, who also adds that the caliber of the Montana universities is generally not high enough to lead to the emergence of "great centers of scientific research" in the state.¹

It is the seeming impossibility of obtaining labor-intensive industrial development, with or without a true creation of a comparative advantage in labor, that leads Johnson to the conclusion that the best hope for employment in western Montana lies in expansion of the traditional resource-intensive industries.²

3. The Derived Labor Demand Alternative.

The idea is very simple. It is implicit in the arguments of many people connected with the wood products industry, and has been explicitly stated by Maxine Johnson.

Since Montana has a comparative advantage in resource-intensive industries, and, since the demand for labor in resource intensive industries is partially a function of the production of these industries, then, so the argument goes, it is logical that full employment without enforced emigration could be maintained if production increased at a desired rate. In other words, one independent variable in our equation, \( D_L = f(R,T) \), could be manipulated so that the dependent variable maintains a desired value. In a dynamic sense, since tech-

¹Maxine C. Johnson, personal interview at Missoula, June 6, 1972.
²Ibid.
nological developments are constantly increasing the productivity of labor, and since the population and labor supply itself tends to grow, it is obvious that production would have to continue to increase at a fairly high rate if full employment were to be maintained in such a fashion.

It will be recalled from Chapter 3 that, in a resource intensive economy such as Montana's, resources are the abundant but also the most limiting factor of production. If production is to increase at a constant and high rate, therefore, supply of resources must increase also. In western Montana, where the prime resource is timber, we might seriously question whether such sustained increases are possible. Besides the obvious hinderance of diminishing marginal returns to investment, there is also the environmental pressure to limit timber harvest, and the realization that allowable cut figures for much public land have already been overestimated. In western Montana, therefore, it seems doubtful that demand for labor can be realistically maintained, let alone increased, by increasing the demand derived from the resource intensive industries.


Government is Montana's largest employer; over 52,000 people, one of every five persons at work in 1969, were employed by either a local, state, or federal agency... Government is also Montana's most rapidly growing employer: between 1950 and 1969, total civilian public employment in the state increased 84 per cent. ... Montana's 84 per cent increase may be compared to a 103 per cent expansion in total government employment throughout the country.\(^1\)

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These figures refer to both federal and state government employees. State government cannot be considered as a primary source of employment, since salaries have to be paid out of taxes, and taxes have to be raised directly or indirectly from the primary production sector. Insofar as Montana is such a small part of the United States' economy, federal employment in the state can be considered as primary employment. Approximately 26 per cent, or 13,500 of the government employees in Montana in 1969 were federally-employed. This represented an increase of 40 per cent on 1950 levels—compared with 43 per cent for the nation.¹

Montana has more federal...government workers in relation to its population than the country as a whole. In October 1969, there were approximately 157 federal employees per 10,000 population in Montana compared to 141 per 10,000 in the entire country.²

In western Montana, total government employment accounts for about 18 per cent of the region's jobs,³ and federal employment separately accounts for about 7 or 8 per cent of the region's jobs.⁴ In 1966 federal employment supplied earnings of $21.7 million in western Montana.⁵

¹Ibid., p. 7.3.
²Ibid.
³Johnson, "Wood Products in Montana," p. 29.
⁴Figure derived from Johnson, Montana Economic Study, p. 7.10, and Johnson "Wood Products in Montana," p. 29.
⁵Johnson, Montana Economic Study, p. 7.10, Table 7.4.
About 40 per cent of federal wages and salaries paid out in "Region I" (western Montana) go to employees in Missoula county, with its extensive Forest Service offices, but several of the smaller western counties are even more dependent upon federal payrolls. In Lake and Mineral counties, 11 per cent of total earnings went to federal civilian employees; in Ravalli county, site of the Rocky Mountain Laboratory, federal payrolls accounted for 19 per cent of total earnings.¹

In a political campaign speech, Arnold Olsen said that western Montana needs full federal funding for the Forest Service to keep the timber harvest up to the level that will maintain employment.² This reasoning runs into the same problems of limitation on resource capacity that were outlined in section 3 of this chapter. Olsen also expounded on the need for federal funding of public works programs to improve the community and provide employment.

Steve Yurich, Regional Forester, advocating more intensive forest management in Region I, said: "we could put 10,000 people to work Monday morning if we had the wherewithal to do it."³

Given the inadequacy of the alternatives for development of employment listed so far, this idea of obtaining increased federal employment seems very attractive at first sight. It has several drawbacks, however.

The interference that federal employment represents in the operation of the free-market pricing system could, theoretically, lead to less than optimal utilization of the nation's scarce resources.

¹Ibid., p. 7.9.
²Arnold Olsen, broadcast on Radio KYSS, September 27, 1972.

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Public projects in areas of high unemployment could also "retard the development of the required mobility for efficient performance of the labor market. . . ."¹

In addressing the needs of an economy with a given pattern of unemployment, the gross employment generated by a project is not the only relevant policy variable. Different types of projects impose their demands on widely different categories of labor. ²

Thus, a federal dam-building project might not help the regional unemployment situation if most of the unemployed are, say, lumber mill workers. Haveman and Krutilla also point out that a substantial portion of the expenditures on most public works projects, wherever located, accrues directly to the industrial durable goods sectors of the Mid-Atlantic and East North Central regions. ³

Economic development is regarded as a beneficial process, and the desire for its benefits lures communities into accepting programs which they believe may provide these benefits. A water resource development project in the vicinity of Sweet Home, Oregon, expected by local residents to spur population and economic growth, instead stimulated the community to overextend its school and municipal services. Coupled with inflation in the national economy, community expectations of growth, citizen non-involvement, and replacement of major decision-makers by urban- and suburban-oriented people, this overextension resulted in short-term expansion and then decline. ⁴


²Ibid., p. 36.

³Ibid., p. 63.

The overextension and subsequent decline of a local economy in Oregon caused by a public works project, mentioned above, applies equally well to cases such as the Libby Dam in Montana.

Besides the "boom or bust" nature of some federal projects, almost all federally funded employment is subject to the eternal vicissitudes of the political process. The recent abandonment of the anti-ballistic missile site in northern Montana, and the subsequent depressive effect on the town of Conrad, is perhaps one of the more salient examples. Not only is federal employment uncertain and unstable, but, even worse, forthcoming changes are almost totally unpredictable. Any economy that finds itself largely dependent on federal spending for its source of primary employment must, therefore, expect to suffer from the same "booms and busts" as the federal projects themselves.

In addition, federal spending seldom creates a self-generating economic and employment growth process in a region. Given so many disadvantages, we can conclude that federal employment does not, in itself, offer a very bright future for the development of western Montana.

5. The Restricted Trade Alternative.

Trade tariffs, quotas, restriction on capital movements and foreign ownership of capital have long been advocated as means of developing an underdeveloped national economy. In different forms, they have led in the past to considerable degrees of success in Japan, Norway, and many countries including even, the United States.¹

¹See, for example, Alan McQuillan, "Norwegian Economic Planning," (unpublished paper, City University, London, 1969).
Trudeau's Canadian government was "strongly considering some restrictions on foreign takeover of Canadian businesses." It had already placed some restrictions on the export of primary products, such as natural gas, to the United States. The indications are that the new administration may make even stronger restrictions on trade and capital movements in order to increase employment in Canada. Such restrictive measures, however, almost invariably arouse adverse reaction from fellow trading nations who invoke the theories about the assured benevolence of free trade. Another problem lies in the fact that, whereas free trade is a discreet state of being with no question of degree, restrictions on trade can take any number of forms and degrees. If restricted trade is decided upon, who can say what the optimum degree of restriction should be?

There is no doubt that, in a closed economy, demand for labor can be made equal to supply. If imports of consumer goods to Montana were cut off and exports of primary products were disallowed, everyone in the state could be kept busy trying to run a self-sufficient economy. In all probability, however, the real income of the average Montanan would decline—at least in the short run.

In any event, although this solution could conceivably lead to the solution of western Montana's employment problems, it is not even worth considering, since it is not a political feasibility. It is very

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1Canadians Abruptly Cancel Meetings with Businessmen," Missoulian, April 7, 1972.

2Various broadcasts on the CBC radio network, CBR radio station, Calgary; especially that by Robert Stansfield, October 17, 1972.
doubtful that either Montanans, or Americans as a whole, would opt for a retrenchment of trade and a wave of parochial quasi-nationalism on a state level.

The No-growth Economy

"A slow sort of a country," said the Queen. "Now, here, you see, it takes all the running you can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that."

Lewis Carroll, Through the Looking Glass.

Most of today's concern of environmentalists centers around the growth of population and the dedication of society to economic growth, or growth of income per capita.

An alternative which appeals to many is to halt economic growth and try to achieve greater welfare for the population at large through increased redistribution of income.¹

The major problem with this seemingly simple solution is that the economic system under which we operate requires growth in order to survive at all. The very existence of an interest rate makes growth an integral part of the economy.

This is a complex subject which cannot be adequately dealt with in this study. Briefly, however, the essence of the Harrod-

Domar growth model brings out this very point. The "natural" rate of growth is a product of the rate of growth of the population and the rate of growth of labor productivity, or technology. This represents the labor-supply side of the growth model. The "warranted" rate of growth is the actual rate of economic growth, and is a function of the rate of investment and the capital-output ratio, or technology. This represents the labor-demand side of the growth model. If full employment is to be maintained, the natural growth rate must obviously equal the warranted growth rate.

The first simple conclusion therefore, is that if economic or warranted growth is to become zero, the rate of population growth must become zero and technology must stagnate.

Domar, however, contends that full employment would not be maintained even if the natural and warranted growth rates were both equal at zero. They must be equal and positive. Keynes told us that people save, and that investment must equal savings if a depression is to avoided. Hoarding idle money balances leads to deflation, and deflation, to unemployment. Investment must therefore be positive. This investment must result in increased income. If, instead, it

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results in idle capacity, the incentive to invest will be reduced and again depression occurs. The increased income leads to increased saving, increased investment, more increased income, and so on.

The answer to the problem of unemployment lies of course in a growing income. If after capital equipment has increased by (an annual rate of) 15 billions an income of 150 billions leaves some capacity unused, then a higher magnitude of income can be found—say 155 or 160 billions—which will do the job.\(^1\)

If for some reason output does not grow rapidly enough, unused capacity develops, investment may fall off, and output will stop expanding and decline. On the other hand, a rapid growth of output presses on existing capacity and encourages investment, which in turn accelerates the growth of output and increases the pressure on capacity. It is quite paradoxical that, with a given propensity to save, to eliminate idle capital, more capital, should be built. . .\(^2\)

To summarize, the maintenance of a continuous state of full employment requires that investment and income grow at a constant annual percentage (or compound interest) rate equal to the product of the marginal propensity to save and the average (to put it briefly) productivity of investment.\(^3\)

Thus we see that, to maintain full employment in a no-growth economy, not only would population and technology have to stagnate completely, but saving would have to cease, also.\(^4\) A necessary, although probably insufficient, condition for the cessation of saving would be the elimination of interest rates. In other words, the capitalist system would cease to exist as such.

\(^4\)Some saving, just enough to replace worn-out machinery, would continue to be desirable, but no more.
This brief description of the dependency of our economic system on the maintenance of economic growth is intended to illuminate some of the complexities involved in the seemingly attractive idea of a no-growth economy, and to throw the emphasis back upon the five alternative courses of action for regional economic growth, discussed earlier in the chapter.

7. Conclusion

There is no clear conclusion as to what course of action western Montanans should take in the field of economic development. It depends largely on what they want.

Restrictive trade and controlled investment could provide economic development and growth of employment. Such a course of action, however, would be fraught with political problems and is not really a feasible alternative.

The creation of a comparative advantage for labor in western Montana, with its small population and abundant resources, appears equally improbable. Without such an advantage, most attempts to encourage labor-intensive secondary manufacturing industry must eventually fail. Labor intensive resource-based tourist-type industry could probably be successful but this would not fundamentally solve the region's employment problems.

The alternatives of developing resource intensive industries for their derived employment and increasing federally-funded employment, are largely complementary in western Montana. The major resource intensive industry is wood products and the major federal employer
is the Forest Service. There is some limited scope for increasing labor demand in both these sectors. Whether such expansion of investment could be justified from a profit-making, classical scarce-resource-optimizing point of view is doubtful. It may be, however, that such criteria would not be applicable, and that the investment would be justified on a cost-benefit basis. That is, "social forestry," aimed at supporting the local community regardless of national cost, is not necessarily undesirable. The fact remains, however, that environmental pressure is probably going to hold down the timber harvest for a long time, and unless widespread changes are made in the federal funding policies for the Forest Service, federal employment in forestry is going to remain almost exclusively timber oriented. These restrictions still leave the possibility, of practicing more intensive management in the field, and utilizing smaller timber in the mill. Standard microeconomic analysis might reject these as yielding unacceptable returns on investment, but again, this criteria may not be applicable. In all probability, employment per board foot of timber harvest will not increase, total timber harvest will probably decline, and, at best, employment in forest industries will remain static.

Adherence to a laissez-faire system might serve to maximize total production, and rationalize industry and employment in the nation. In western Montana, a reduction in employment and a decrease in the employed-to-total population ratio would almost certainly result. If western Montanans believe that this would best serve the needs of the nation, and, indirectly, their own needs also, then, this is the course
to follow. If they fail to face up to the question, and leave the situation to find its own solution, then this is the course they will follow.

If, on the other hand, they wish to maintain employment and income levels, and obtain a modicum of economic development, then, concerted action and positive intervention in the economy are imperative. What direction such action should take is unclear, given the inadequacy of the feasible alternatives. Expansion of employment in the forest industries is the most reasonable alternative. Besides being fraught with difficulty, this alternative does not offer a lasting, stable solution to the regional employment problem, however. In the circumstances, western Montanans might do well to conclude, that laissez-faire is perhaps not such a bad course after all . . .

"'Would you tell me, please, which way I ought to go from here?' Alice asked.
"That depends on where you want to get to,' said the Cheshire Cat."

Lewis Carroll,

Alice in Wonderland
CHAPTER VI

SUMMARY

The development of industry and employment in western Montana has been traced from the early days of white settlement. It has been shown that, in terms of the Heckscher-Ohlin theory of free trade, the region has always possessed a comparative advantage in resources and never possessed a comparative advantage in labor. Under prevailing conditions of free trade, therefore, resource intensive, and particularly forest industries developed. They became the primary employers in the region.

Since industry was resource oriented, there was no reason why demand for labor should have equalled supply. Frequently it did not, but, because the region was sparsely populated and growing, employment grew at fairly acceptable rates. Today, there are fears for the future of employment in the region. There is also the possibility that comparative advantage is moving from the timber to the non-timber values of the forest resource. This could further adversely affect the structure and size of labor demand in the region.

Owing to the lack of comparative advantage for labor, and the general commitment to a free trade system, only two of five possible alternative courses are at all feasible. Western Montanans can accept the changing situation as brought about by the free market system, with all that that implies. Or, they can attempt to develop both the
federal and private sectors of the resource intensive forest industries to the point where demand for labor becomes equal to supply. This latter alternative is fraught with political, as well as economic difficulties, and laissez-faire therefore emerges as the most practicable, if not the most desirable, policy.

We have described the situation, and have superimposed an analytical framework that, hopefully, has clarified some of the complexities of the issue. The resolution must be left to the people concerned.
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Books and Published Reports


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APPENDIX I


<table>
<thead>
<tr>
<th>YEAR OF CENSUS</th>
<th>NUMERICAL DATE X</th>
<th>WESTERN MONTANA POPULATION Y</th>
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<tbody>
<tr>
<td>1880</td>
<td>10</td>
<td>2,540</td>
</tr>
<tr>
<td>1890</td>
<td>20</td>
<td>14,430</td>
</tr>
<tr>
<td>1900</td>
<td>30</td>
<td>35,490</td>
</tr>
<tr>
<td>1910</td>
<td>40</td>
<td>64,340</td>
</tr>
<tr>
<td>1920</td>
<td>50</td>
<td>75,040</td>
</tr>
<tr>
<td>1930</td>
<td>60</td>
<td>78,260</td>
</tr>
<tr>
<td>1940</td>
<td>70</td>
<td>100,120</td>
</tr>
<tr>
<td>1950</td>
<td>80</td>
<td>114,450</td>
</tr>
<tr>
<td>1960</td>
<td>90</td>
<td>128,540</td>
</tr>
<tr>
<td>1970</td>
<td>100</td>
<td>157,430</td>
</tr>
</tbody>
</table>

\[
\Sigma x = 550 \\
\Sigma x^2 = 38,550 \\
\Sigma y = 770,550 \\
\Sigma y^2 = 81,775,905,700 \\
\Sigma xy = 55,875,900 \\
N = 10
\]

\[
r = \frac{\Sigma xy - \Sigma x \Sigma y}{\sqrt{\Sigma x^2 - (\Sigma x)^2} \cdot \sqrt{\Sigma y^2 - (\Sigma y)^2}} = 0.9927
\]

\[
r^2 = 0.9854
\]

\[Y = mx + b\]

\[
m = \frac{\Sigma xy - \Sigma x \Sigma y}{\Sigma x^2 - (\Sigma x)^2}
\]

143
b = \frac{\sum X^2 - \sum X \sum XY}{N \sum X^2 - (\sum X)^2}

= -12,916.0

\sum X^2 = 1,638.6

Y = 1,638.6 X -12,916.0

That is, Population = 1,638.6 X -12,916.0

or, Population = 1,638.6 (q + 30) -12,916.0

where q is any actual date in the twentieth century.
APPENDIX II

Male employment by industry for the eight counties of western Montana, 1940–70.

<table>
<thead>
<tr>
<th>COUNTY</th>
<th>YEAR</th>
<th>TOTAL MALE</th>
<th>MINING</th>
<th>AGRICULTURE</th>
<th>FORESTRY AND</th>
<th>FISHERIES</th>
<th>LOGGING, SAW MILLS, PLANNING MILLS, FURNITURE AND WOOD PRODUCTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>EMPLOYMENT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FLATHEAD</td>
<td>1940</td>
<td>5,920</td>
<td>92</td>
<td>1,680</td>
<td>870</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1950</td>
<td>8,200</td>
<td>26</td>
<td>1,320</td>
<td>920</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1960</td>
<td>10,380</td>
<td>8</td>
<td>1,000</td>
<td>1,030</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1970</td>
<td>12,300</td>
<td>20</td>
<td>720</td>
<td>1,400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRANITE</td>
<td>1940</td>
<td>1,070</td>
<td>348</td>
<td>350</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1950</td>
<td>940</td>
<td>144</td>
<td>320</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1960</td>
<td>1,120</td>
<td>150</td>
<td>290</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1970</td>
<td>950</td>
<td>40</td>
<td>190</td>
<td>160</td>
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<tr>
<td>LAKE</td>
<td>1940</td>
<td>3,320</td>
<td>8</td>
<td>2,010</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1950</td>
<td>3,630</td>
<td>4</td>
<td>1,810</td>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1960</td>
<td>4,000</td>
<td>10</td>
<td>1,200</td>
<td>340</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1970</td>
<td>4,500</td>
<td>20</td>
<td>1,000</td>
<td>430</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIMCOLN</td>
<td>1940</td>
<td>2,020</td>
<td>118</td>
<td>530</td>
<td>700</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1950</td>
<td>2,250</td>
<td>117</td>
<td>380</td>
<td>760</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1960</td>
<td>3,600</td>
<td>170</td>
<td>260</td>
<td>1,440</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1970</td>
<td>6,000</td>
<td>200</td>
<td>370</td>
<td>1,470</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MINERAL</td>
<td>1940</td>
<td>580</td>
<td>71</td>
<td>130</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1950</td>
<td>580</td>
<td>10</td>
<td>100</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1960</td>
<td>990</td>
<td>0</td>
<td>80</td>
<td>250</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>1970</td>
<td>1,050</td>
<td>15</td>
<td>60</td>
<td>220</td>
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<td></td>
</tr>
<tr>
<td>MISSOULA</td>
<td>1940</td>
<td>8,140</td>
<td>68</td>
<td>1,170</td>
<td>860</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1950</td>
<td>9,080</td>
<td>43</td>
<td>980</td>
<td>1,090</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>1960</td>
<td>15,800</td>
<td>17</td>
<td>1,150</td>
<td>1,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1970</td>
<td>21,350</td>
<td>21</td>
<td>1,140</td>
<td>1,430</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RAVALLI</td>
<td>1940</td>
<td>3,500</td>
<td>27</td>
<td>2,040</td>
<td>170</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1950</td>
<td>3,740</td>
<td>10</td>
<td>1,840</td>
<td>280</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1960</td>
<td>4,140</td>
<td>35</td>
<td>1,310</td>
<td>380</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1970</td>
<td>4,850</td>
<td>14</td>
<td>1,180</td>
<td>450</td>
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</tbody>
</table>
APPENDIX II (cont.)

<table>
<thead>
<tr>
<th>COUNTY</th>
<th>YEAR</th>
<th>TOTAL MALE EMPLOYMENT</th>
<th>MINING</th>
<th>AGRICULTURE FORESTRY AND FISHERIES</th>
<th>LOGGING, SAW MILLS, PLANNING MILLS, FURNITURE AND WOOD PRODUCTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>SANDERS</td>
<td>1940</td>
<td>1,800</td>
<td>46</td>
<td>920</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>1950</td>
<td>2,050</td>
<td>9</td>
<td>770</td>
<td>400</td>
</tr>
<tr>
<td></td>
<td>1960</td>
<td>2,330</td>
<td>9</td>
<td>460</td>
<td>430</td>
</tr>
<tr>
<td></td>
<td>1970</td>
<td>2,190</td>
<td>0</td>
<td>340</td>
<td>410</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WEST. MONTANA</td>
<td>1940</td>
<td>26,250</td>
<td>778</td>
<td>8,830</td>
<td>2,835</td>
</tr>
<tr>
<td></td>
<td>1950</td>
<td>30,470</td>
<td>363</td>
<td>7,520</td>
<td>3,820</td>
</tr>
<tr>
<td></td>
<td>1960</td>
<td>42,360</td>
<td>399</td>
<td>5,750</td>
<td>5,440</td>
</tr>
<tr>
<td></td>
<td>1970</td>
<td>53,190</td>
<td>300</td>
<td>5,000</td>
<td>5,970</td>
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</table>

APPENDIX III

Total Population, and Population By Age Class For the Eight Counties of Western Montana, 1930-1970.

<table>
<thead>
<tr>
<th>County</th>
<th>1930 Total</th>
<th>Age Class Percent*</th>
<th>Age Class Percent</th>
<th>Age Class Percent</th>
<th>Age Class Percent</th>
<th>Age Class Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1-2-3</td>
<td>1-2-3</td>
<td>1-2-3</td>
<td>1-2-3</td>
<td>1-2-3</td>
</tr>
<tr>
<td>Lake</td>
<td>9,500</td>
<td>33-61-6</td>
<td>13,500</td>
<td>30-63-7</td>
<td>13,800</td>
<td>32-58-10</td>
</tr>
<tr>
<td>Lincoln</td>
<td>7,100</td>
<td>29-65-6</td>
<td>7,900</td>
<td>28-65-7</td>
<td>8,700</td>
<td>31-61-8</td>
</tr>
<tr>
<td>Sanders</td>
<td>5,700</td>
<td>27-64-7</td>
<td>6,900</td>
<td>27-65-8</td>
<td>7,000</td>
<td>29-60-11</td>
</tr>
<tr>
<td>Mineral</td>
<td>1,600</td>
<td>22-72-6</td>
<td>2,100</td>
<td>22-67-11</td>
<td>2,100</td>
<td>30-60-11</td>
</tr>
<tr>
<td>Missoula</td>
<td>21,800</td>
<td>26-68-6</td>
<td>29,000</td>
<td>23-71-7</td>
<td>35,500</td>
<td>26-65-8</td>
</tr>
<tr>
<td>Ravalli</td>
<td>10,300</td>
<td>29-63-8</td>
<td>13,000</td>
<td>27-65-8</td>
<td>13,100</td>
<td>29-60-11</td>
</tr>
<tr>
<td>Granite</td>
<td>3,000</td>
<td>25-67-8</td>
<td>3,400</td>
<td>21-71-8</td>
<td>2,770</td>
<td>27-63-9</td>
</tr>
</tbody>
</table>

*Percentage of total population:
(1) under 15 years
(2) 15-64 years
(3) over 64 years

APPENDIX IV

<table>
<thead>
<tr>
<th>Date</th>
<th>U.S. Population</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1870</td>
<td>39,800,000</td>
<td></td>
</tr>
<tr>
<td>1880</td>
<td>50,100,000</td>
<td></td>
</tr>
<tr>
<td>1890</td>
<td>62,900,000</td>
<td></td>
</tr>
<tr>
<td>1900</td>
<td>76,000,000</td>
<td></td>
</tr>
<tr>
<td>1910</td>
<td>92,000,000</td>
<td></td>
</tr>
<tr>
<td>1920</td>
<td>105,700,000</td>
<td></td>
</tr>
<tr>
<td>1930</td>
<td>122,800,000</td>
<td></td>
</tr>
<tr>
<td>1940</td>
<td>131,700,000</td>
<td></td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Date</th>
<th>Western Montana Population as Percentage of U.S. Total</th>
<th>Montana Population as Percentage of U.S. Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1870</td>
<td>0.0055</td>
<td>0.052</td>
</tr>
<tr>
<td>1880</td>
<td>0.0046</td>
<td>0.077</td>
</tr>
<tr>
<td>1890</td>
<td>0.023</td>
<td>0.210</td>
</tr>
<tr>
<td>1900</td>
<td>0.047</td>
<td>0.520</td>
</tr>
<tr>
<td>1910</td>
<td>0.070</td>
<td>0.410</td>
</tr>
<tr>
<td>1920</td>
<td>0.071</td>
<td>0.520</td>
</tr>
<tr>
<td>1930</td>
<td>0.064</td>
<td>0.440</td>
</tr>
<tr>
<td>1940</td>
<td>0.075</td>
<td>0.425</td>
</tr>
<tr>
<td>1950</td>
<td>0.075</td>
<td>0.390</td>
</tr>
<tr>
<td>1960</td>
<td>0.077</td>
<td>0.375</td>
</tr>
<tr>
<td>1970</td>
<td>0.081</td>
<td>0.360</td>
</tr>
</tbody>
</table>
APPENDIX V

TEST OF THE HYPOTHESIS THAT TIMBER CUT IN ANY YEAR
EQUALS THE TIMBER SOLD TWO YEARS PREVIOUSLY

<table>
<thead>
<tr>
<th>Year</th>
<th>Timber Cut, $T_c$</th>
<th>Timber Sold, $T_s$</th>
<th>Timber cut, 2 years displaced, $T_s - T_c$</th>
<th>$T_s - T_c$</th>
<th>$(T_s - T_c)^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>4.8</td>
<td>6.7</td>
<td>5.5</td>
<td>1.2</td>
<td>1.44</td>
</tr>
<tr>
<td>1961</td>
<td>4.8</td>
<td>5.8</td>
<td>7.1</td>
<td>-1.3</td>
<td>1.69</td>
</tr>
<tr>
<td>1962</td>
<td>5.5</td>
<td>8.5</td>
<td>7.2</td>
<td>1.1</td>
<td>1.21</td>
</tr>
<tr>
<td>1963</td>
<td>7.1</td>
<td>7.6</td>
<td>7.3</td>
<td>0.3</td>
<td>0.09</td>
</tr>
<tr>
<td>1964</td>
<td>7.2</td>
<td>7.9</td>
<td>8.0</td>
<td>-0.1</td>
<td>0.01</td>
</tr>
<tr>
<td>1965</td>
<td>7.3</td>
<td>7.2</td>
<td>7.3</td>
<td>-0.1</td>
<td>0.01</td>
</tr>
<tr>
<td>1966</td>
<td>8.0</td>
<td>7.1</td>
<td>7.3</td>
<td>-0.2</td>
<td>0.04</td>
</tr>
<tr>
<td>1967</td>
<td>7.3</td>
<td>7.3</td>
<td>7.8</td>
<td>-0.5</td>
<td>0.25</td>
</tr>
<tr>
<td>1968</td>
<td>7.3</td>
<td>8.0</td>
<td>7.3</td>
<td>0.7</td>
<td>0.49</td>
</tr>
<tr>
<td>1969</td>
<td>7.8</td>
<td>7.6</td>
<td>6.9</td>
<td>0.7</td>
<td>0.49</td>
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<tr>
<td>1970</td>
<td>7.3</td>
<td>9.0</td>
<td>8.0</td>
<td>1.0</td>
<td>1.00</td>
</tr>
<tr>
<td>1971</td>
<td>6.9</td>
<td>6.0</td>
<td>---</td>
<td>---</td>
<td>----</td>
</tr>
<tr>
<td>1972</td>
<td>8.0</td>
<td>6.0</td>
<td>---</td>
<td>---</td>
<td>----</td>
</tr>
</tbody>
</table>

$\Sigma(T_s - T_c)^2 = 2.5.$

$\Sigma(T_s - T_c')^2 = 6.72.$

$N = 11.$
APPENDIX V (cont.)

\[
\sqrt{\frac{6.72 - 6.25}{11}} \div 10
\]

= 0.785.

\[t = \frac{(T_S - T_{C'}) - 0}{S/\sqrt{N}}\]

= 0.227 (2.246) / 0.785

= 0.647.

Degrees of freedom = 10.
\(\alpha = 0.05\).

Therefore, reject H if \(|t| < 2.228\)

\(t = 0.647\)

Therefore, accept H: \(T_S - T_{C'} = 0\) at the 95 per cent level of certainty.
PLACE NAMES MENTIONED IN TEXT