

Chapter 10

Economy of the Portland Area

Steven R. Kale and Patrick E. Corcoran

Department of Geography
Oregon State University

Portland has long been Oregon's dominant economic center. The city's importance stems largely from its location at the head of ocean-going navigation on the Columbia-Willamette River system. In the early years goods brought in by ship from the outside world were unloaded and hauled to growing settlements in the Willamette Valley. Agricultural products, in turn, were exported via Portland, mostly to California during the first few decades and later to mining areas east of the Cascades. Factors contributing to Portland's early economic growth have been summarized in detail by Merriam (1971) and Abbott (1985).

During the first 100 years after its beginning in the 1840's, Portland specialized in commercial activities. Although the city still has a strong commercial base, it has diversified considerably, especially since World War II. This diversity has helped Portland through the economic difficulties experienced by many communities in Oregon and elsewhere during the early 1980's.

The diversity of the Portland area's economy is reviewed in this chapter. Most of the discussion covers trends from the mid-1970's to the mid-1980's. An overview is first presented of the metropolitan economy, followed by summaries for each of the major sectors. Trends are summarized primarily for the greater Portland metropolitan area, which includes Clackamas, Multnomah, Washington, and Yamhill Counties in Oregon, and Clark County, Washington.

OVERVIEW OF THE PORTLAND AREA'S ECONOMY

Personal income in Oregon's portion of the Portland metropolitan area was about \$11.4 billion in 1984, 114 percent more than in 1975 (Figure 10.1). Despite a decline in Oregon's economy during the recession of the early 1980's, personal income in the Portland area continued to grow. Throughout the latter half of the 1970's and early 1980's, more than 50 percent of Oregon's personal income was generated in the Portland area (Figure 10.2). It appears that the metro area is accounting for an increasingly larger proportion of the state's economy. This trend represents a reversal from more rapid growth in Oregon's nonmetropolitan areas during the latter part of the 1970's, and is similar to trends occurring at the national level (Daberkow and Bluestone, 1984; Bluestone and Daberkow, 1985; Kale, 1986).

The trade sector is more important in Portland's metropolitan area than nationally (Figure 10.3). On the other hand, the manufacturing and government sectors contribute less to the Portland area's economy than they do to the nation's. Manufacturing is the area's most important sector in terms of income, but follows trade and services in employment. This occurs because of higher wages in manufacturing than in the trade and services sectors.

The extent of diversification in Portland's economy can be measured

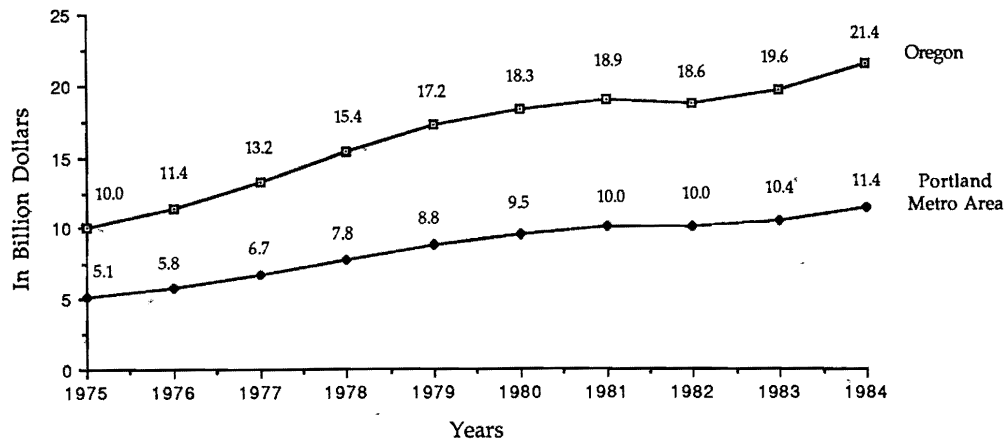


Figure 10.1 Personal income in Oregon and in the Portland metropolitan area, 1975-1984 (does not include Clark County, Washington) (U.S. Bureau of Economic Analysis).

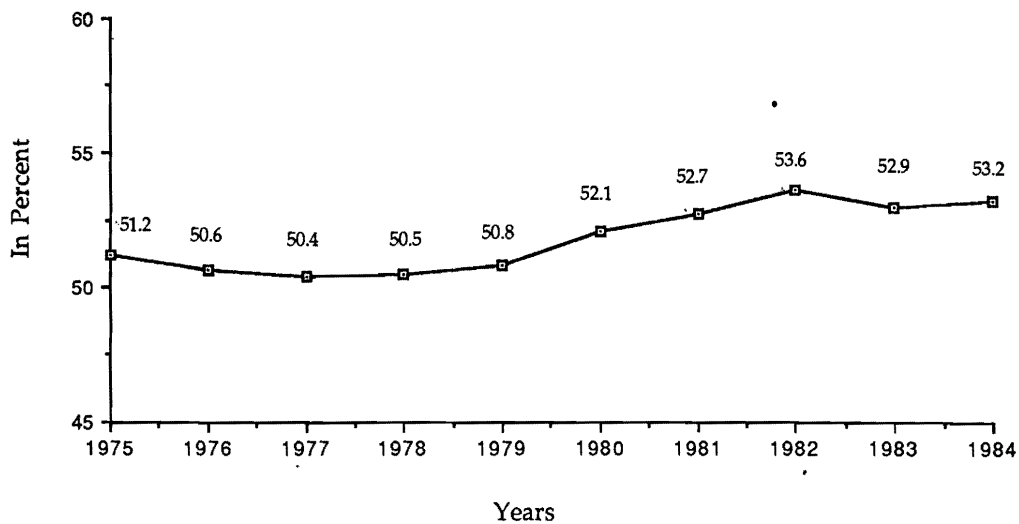
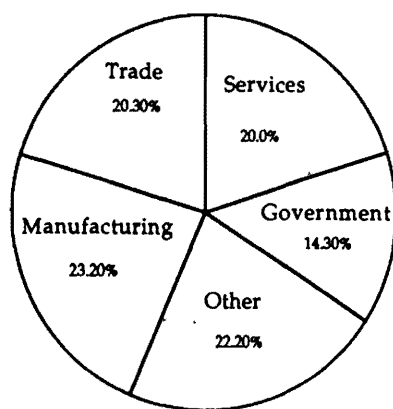
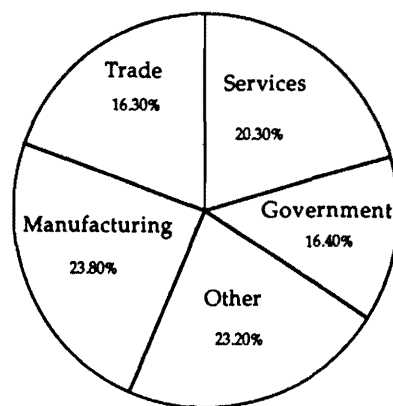


Figure 10.2 Proportion of Oregon's personal income generated in the Portland metropolitan area, 1975-1984 (U.S. Bureau of Economic Analysis).

Income, 1984

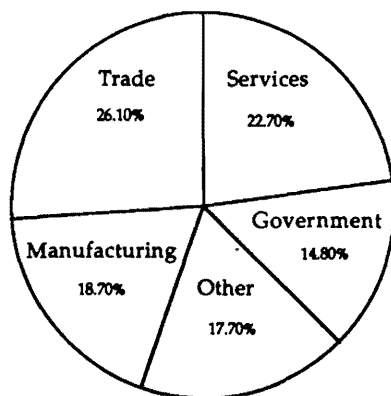


Portland Metro Area

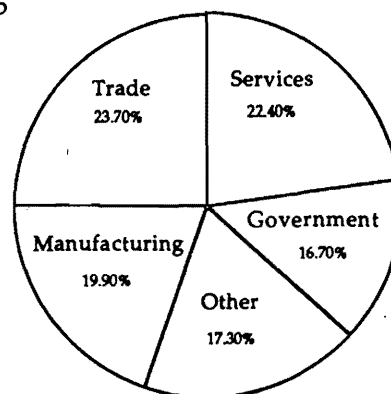


United States

Employment, 1985



Portland Metro Area



United States

Figure 10.3 Proportion of the Portland and U. S. economies attributable to major sectors, selected years (U.S. Bureau of Economic Analysis; U.S. Department of Labor).

by comparing the metropolitan area's proportion of income or employment in

a given sector to the nation's proportion of income or employment in the same sector. One measure based on such a comparison is the location quotient (Table 10.1). If a location quotient has a value of one, then the proportion of income or employment in a given sector is identical to the national proportion

Table 10.1:

Location quotients and indexes of specialization in the Portland metropolitan area, selected years (n.a. = not available) (U.S. Bureau of Economic Analysis; U.S. Department of Labor; Oregon Employment Division; Washington Employment Security Department).

	Location Quotients					
	Income			Employment		
	1975	1980	1984	1975	1980	1985
Farm	0.50	0.56	0.72	n.a.	n.a.	n.a.
Agricultural Services, Forestry, Fisheries, Other	1.00	n.a.	1.00	n.a.	n.a.	n.a.
Mining	0.07	n.a.	0.13	n.a.	n.a.	n.a.
Construction	1.03	1.19	0.89	0.89	0.92	n.a.
Manufacturing	0.91	0.95	0.97	0.87	0.89	0.94
Transportation and Public Utilities	1.19	1.14	1.21	1.15	1.14	1.19
Trade	1.27	1.24	1.25	1.13	1.12	1.10
Finance, Insurance, and Real Estate	1.12	1.17	1.02	1.33	1.42	1.29
Services	1.04	0.99	0.99	1.08	1.02	1.01
Government	0.87	0.82	0.87	0.87	0.83	0.89
	Indexes of Specialization					
	Income			Employment		
	1975	1980	1984	1975	1980	1985
Portland Metro Area Compared to the U.S.	0.15	0.14	0.11	0.13	0.13	0.11
Note: Location quotients and indexes of specialization were calculated by comparing the Portland metropolitan area's proportion of income or employment in a given sector to the national proportion of income or employment in the same sector.						

of less than one means that the Portland area is less specialized than the U.S. An area with location quotients near one for most sectors has an economy that is relatively diversified.

The coefficient of specialization is another measure of economic diversification. Coefficients of specialization can range from zero to one (Table 10.1). The closer a coefficient of specialization is to zero, the more diversified an area's economy is. The closer a coefficient of specialization is to one, the more specialized an area's economy is in only

a few sectors.

Location quotients are greater than one for transportation and public utilities (TPU); trade; finance, insurance, and real estate (FIRE); and services (Table 10.1). The farm, mining, construction, manufacturing, and government sectors have location quotients of less than one. Location quotients thus confirm that the Portland metropolitan area continues to focus more on commercial activities than on manufacturing and other more traditional basic activities. Nonetheless, location quotients do not

vary much from a value of one in any sector except mining, indicating that Portland's economy is relatively diversified.

This diversification is supported further by the indexes of specialization in the Portland area. These indexes are not much greater than zero, which would be the highest level of diversification possible. Moreover, decreases in indexes of specialization during the last 10 years suggest that the Portland economy is becoming even more diversified.

PRIMARY ACTIVITIES

Timber

Oregon leads the nation in timber production. Competition from companies in Canada and the southern United States has reduced Oregon's role in recent years, but the state likely will continue to be important in the manufacturing of wood-based products, especially those made from fir and other softwoods, through the remainder of this century.

Most of the forests in the immediate Portland area have been replaced by urban, agricultural, and other uses. The eastern portion of the Portland metropolitan area, however, has substantial timber reserves in the Mt. Hood National Forest. Part of this area is vital to Portland's water supply (Bull Run Watershed) and there are growing concerns about inter-relationships between timber-harvesting practices and water availability and quality.

Portland leads all other Oregon ports in the export of softwood logs. In 1985, over 361 million board feet were exported through Portland (Warren, 1986, 19). This total represented 47 percent of Oregon's exports of softwood logs. Timber harvested near Portland also is processed into wood products or paper at numerous facilities in the metropolitan area.

Agriculture

Oregon's four counties in the Portland metropolitan area accounted for 21 percent of the state's agricultural sales in 1986 (Oregon State University, 1987). This rather sizable production is based on the demands of the greater metropolitan area, and on physical factors enabling the cultivation of a variety of crops. Specialty horticultural crops contribute the most to production, but vegetables and truck crops, small fruits and berries, eggs and poultry, and dairy products also are important (Figure 10.4). The most productive agricultural areas are in Clackamas and Washington Counties, where over two-thirds of the total sales occurred in 1986 (Figure 10.5).

Mining

Oregon is a relatively insignificant producer of minerals. In 1984, the state

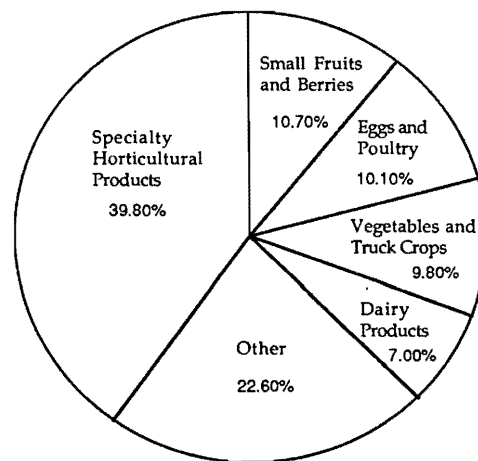


Figure 10.4 Proportion of the Portland area's farm production sales attributable to various commodities, 1986 (Oregon State University, 1987).

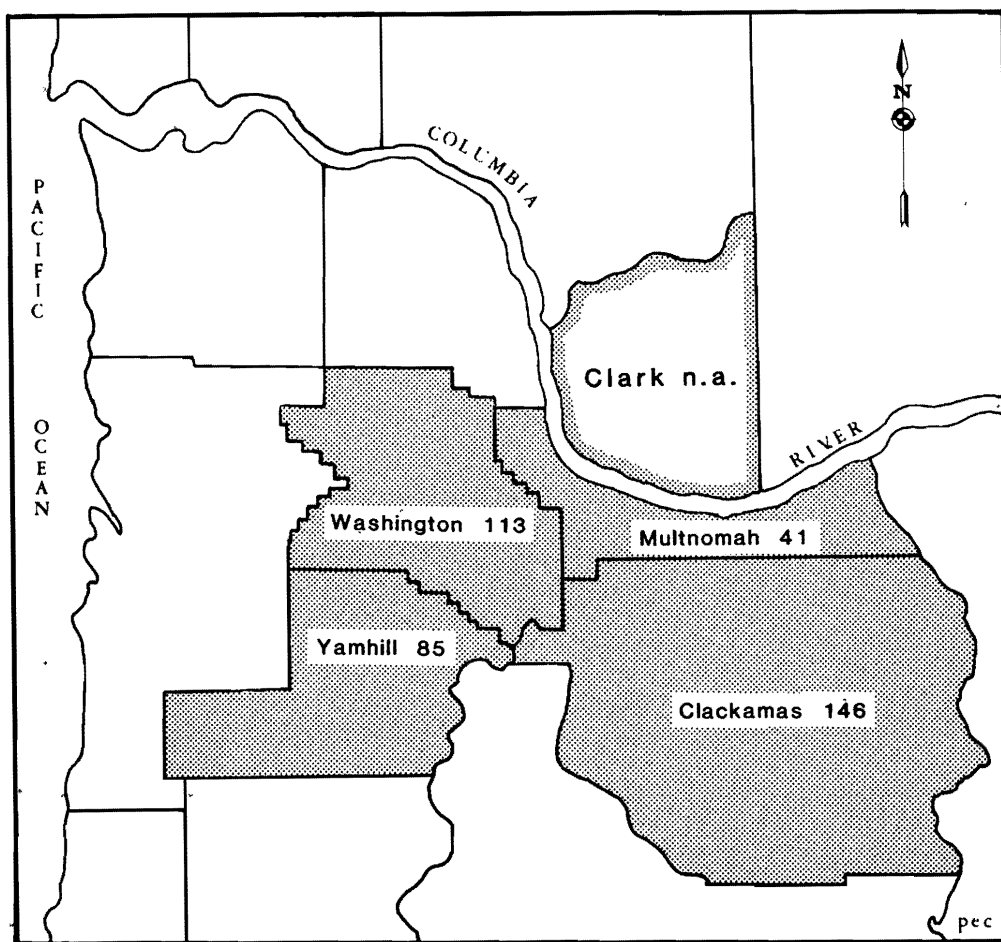


Figure 10.5 Farm sales in millions of dollars by county in the Portland metropolitan area, 1986 (Oregon State University).

ranked 37th in the value of non-fuel mineral production, and only 0.5 percent of the nation's total was attributable to Oregon (U. S. Bureau of Mines, 1986, p. 5). Multnomah County is Oregon's leading producer of minerals. Although reported data are incomplete, it appears that 15 to 20 percent of Oregon's non-fuel mineral production in 1982 was attributable to the Portland metropolitan area (Babitzke and Brooks, 1986, p.

490). The most important products were lime, crushed stone, sand and gravel, and clays.

CONSTRUCTION AND MANUFACTURING

Construction

During the 1970's, rapid population growth in Oregon stimulated expansion of the construction sector. The recession of the early 1980's severely affected this sector, and many construction workers in Oregon lost their jobs. In the Portland metropolitan area, employment in construction decreased by about 39 percent

between 1979 and 1982. Since 1982, employment has recovered somewhat, but there were still fewer employed construction workers in 1985 than in 1979.

The top 15 projects in the Portland area in 1986 represented an investment of nearly \$970 million, over half the value of Oregon's 50 largest construction projects (Table 10.2). Most of the projects in the Portland area consisted of the construction of commercial, governmental, industrial, medical, and residential buildings.

Manufacturing

In 1985, manufacturing was the Portland area's leading employer and

the most important generator of personal income. Despite this contribution, the manufacturing sector is becoming a less significant employer in the metro area: from 1975 to 1985, manufacturing's share of total employment decreased from 20.7 percent to 18.7 percent. In terms of personal income, however, manufacturing's share increased slightly -- from 22.9 percent of total income in 1975 to 23.2 percent in 1984. Discrepancies between trends in employment and trends in income reflect the high wage levels of manufacturing in comparison to wage levels in other sectors. Although employment is growing more rapidly in service-producing sectors, wages in these sectors are generally

Table 10.2: *Fifteen largest construction projects in the Portland metropolitan area, 1986 (Oregon Business, 1987).*

Project	Location	Investment (\$ millions)	Scheduled Completion
Kruse Woods Office Park	Lake Oswego	250	n.a.
Veterans Administration Hospital	Portland	110	1990
RiverPlace, Phase II	Portland	83	1992
Roseway Industrial Center, Phase I	Hillsboro	70	1990
Waterhouse Housing Development	Beaverton	68	1988
One Financial Center	Portland	55	1987
BPA Headquarters Building	Portland	54	1987
Twin Oaks	Washington County	54	1989
Port of Portland Cargo Facility, Terminal Two	Portland	46	1987
Cornell Oaks Corporate Center	Washington County	40	1987
Sterling Pointe Apartments	Beaverton	35	n.a.
Montgomery Park	Portland	30	1987
Quad 217 Corporate Center	Beaverton	25	n.a.
Oregon Graduate Center Science Park	Beaverton	25	n.a.
Good Samaritan Medical Plaza	Portland	24	1987

much lower than in manufacturing. Increases in employment for the services sectors have not generated enough personal income to improve the overall position of these sectors relative to manufacturing.

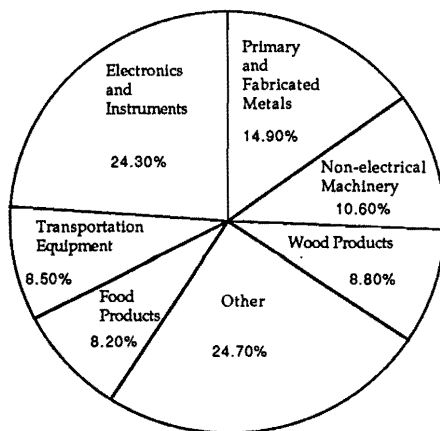
Electronics and instruments companies are the leading manufacturing employers in the Portland area (Figure 10.6). Factors contributing to trends in these high-technology sectors are discussed in Chapter 12. No other sector accounts for as much as 15 percent of total manufacturing employment in the metropolitan area.

Importance among manufacturing sectors varies within the region. In 1983, the leading industrial grouping in each county was as follows: Clackamas -- non-electrical machinery, Multnomah -- food products, Washington -- instruments, Yamhill -- timber products, and

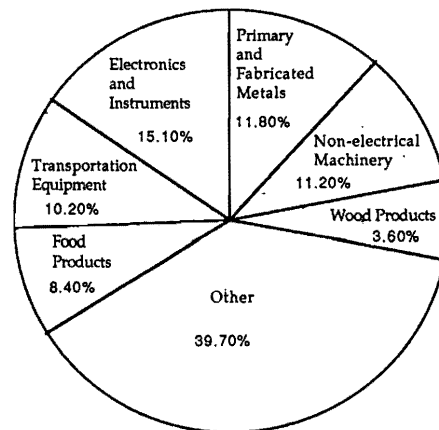
Clark -- paper products (U.S. Department of Commerce, 1985). Multnomah is the most diversified, with approximately 9 to 12 percent of total 1983 manufacturing employment in each of the following six sectors: food products, printing and publishing, primary metals, fabricated metals, non-electrical machinery, and transportation equipment.

Two-thirds of Portland's manufacturers have located in the area since World War II (Table 10.3). By far the largest manufacturer is Tektronix, which was begun in the late 1940's. Another three of the 15 largest manufacturers -- Intel, Floating Point, and Electro-Scientific Industries -- also are high technology companies. Nike, Jantzen, and Pendleton -- three nationally known makers of apparel and footwear -- have headquarters in the Portland area.

The Portland area's major industrial



Portland Metro Area



United States

Figure 10.6 Proportion of manufacturing employment attributable to major sectors, Portland and the U.S., 1985 (U.S. Department of Labor).

Table 10.3:

Fifteen largest manufacturing employers in the Portland metropolitan area, May, 1986 (Paglin and Inskeep, 1986, pp. 7-9).

Employer	Number of Employees	Year Established in Portland	Type of Product
Tektronix	14,500	1946	Instruments, Electronics
Crown Zellerbach Corporation	4,800	1884	Pulp and Paper Products
Intel Corporation	4,300	1968	Electronics
Freightliner Corporation	3,000	1947	Trucks
Precision Castparts	2,400	1953	Metal Casting
Nike, Inc.	1,450	1972	Footwear, Apparel
Jantzen, Inc.	1,300	1910	Sportswear, Swimwear
Boeing of Portland	1,250	1974	Aircraft Components
Floating Point Systems	1,250	1970	Computing Equipment
Esco Corporation	1,200	1913	Steel Casting
Omark Industries, Inc.	1,100	1947	Saw Chains, Power Tools
Pendleton Woolen Mills	1,100	1909	Apparel
Oregonian Publishing Company	1,050	1850	Newspapers
Reynolds Metals Company	950	1946	Aluminum
Electro-Scientific Industries	900	1953	Electronics

sites are shown in Figure 10.7. Heavy manufacturing is concentrated in areas along the Willamette River below downtown Portland, especially in the Swan Island and Rivergate industrial districts. Several large manufacturing plants (for example, Esco Corporation, Jantzen, OECO Corporation, and Omark Industries) are located in industrial areas near downtown Portland. The West and East Columbia Industrial Districts near the Portland International Airport are among several areas being more intensively developed. Perhaps the highest level of activity is occurring in Hillsboro, Beaverton, Tigard, and Wilsonville. Most of Portland's high technology companies are located in

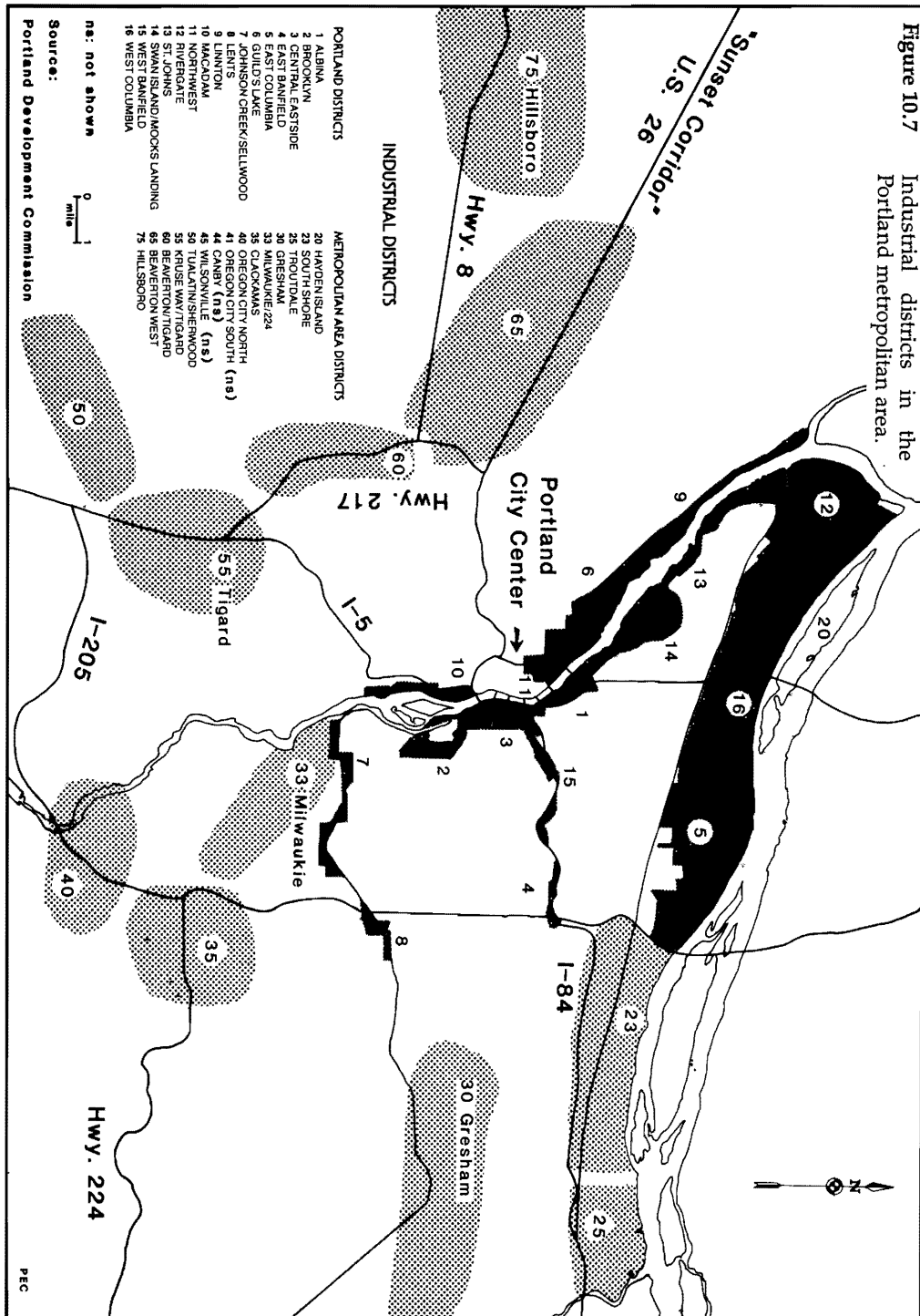
these areas, and numerous facilities have been built to accommodate recent and anticipated growth.

SERVICES-PRODUCING SECTORS

Trade, services, and government are the largest tertiary sectors in the Portland area (Figure 10.8). Trade, finance, insurance, and real estate (FIRE); and transportation and public utilities (TPU) account for a larger proportion of employment in the Portland area than they do nationally. Services and government are relatively less important for the Portland area than for the U. S. as a whole.

Within the trade sector, retail trade employed about 83 percent of the 1983

Figure 10.7 Industrial districts in the Portland metropolitan area.



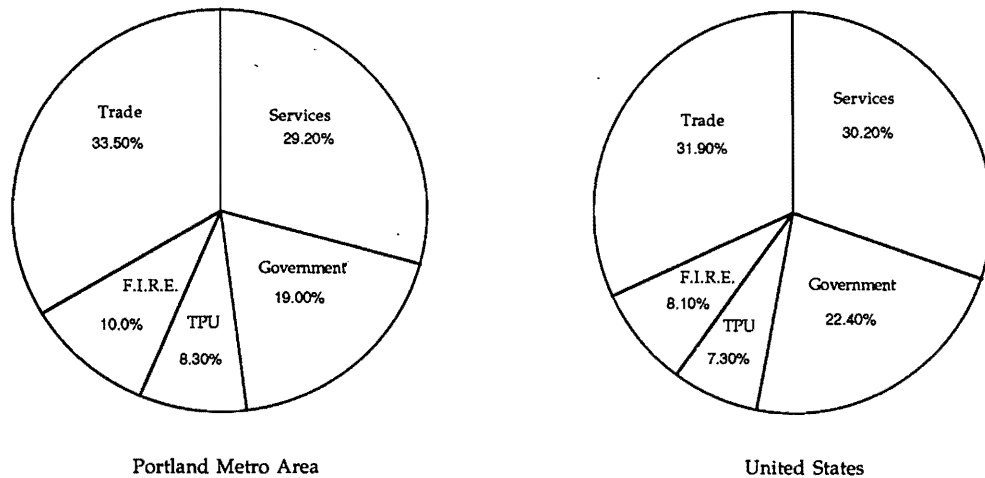


Figure 10.8 Proportion of service employment attributable to major sectors, Portland and the U.S., 1985 (U.S. Department of Labor).

total; 17 percent was attributable to wholesale trade (U. S. Department of Commerce, 1985). During the same year, one-third of the service sector's employees worked at hospitals, doctors' offices, and other health-related establishments, and 16 percent worked in business services. Local government employed more than state or federal governments, and education was the most important local-government employer.

Although transportation and public utilities and finance, insurance, and real estate do not employ as many persons as trade, services, and government do, they nonetheless account for five of the 15 largest services-producing businesses in the Portland area (Table 10.4). The significant contribution of health services to the regional economy is illustrated by the four hospitals (Table 10.4). Fred Meyer and Meier and Frank, two well-known retail stores in the Pacific Northwest, have headquarters in the Portland

area, as does Red Lion Motor Inns. Although not included in Table 10.4, the federal government is also a major employer, especially the U.S. Department of Energy's Bonneville Power Administration, whose headquarters are in Portland.

TRAVEL AND TOURISM

Revenues from travel and tourism contribute substantially to the economy of Portland. There are numerous recreational opportunities available and the city hosts several heavily attended annual festivals. Like most large metropolitan areas, Portland has a symphony orchestra, a zoo, several theater companies, museums, and a team in the National Basketball Association.

Estimates of impacts from travel and tourism in the Portland area and elsewhere in Oregon have been made by the U.S. Travel Data Center (1986), which defines travelers as persons making an overnight trip, or making a one-day trip in which they went 100 miles or more away from home. The Travel Data Center's estimates do not include impacts from foreign students away at school. Additionally, the estimates mea-

Table 10.4: *Fifteen largest services-producing employers in the Portland metropolitan area, May, 1986 (Table does not include public-sector employers) (Paglin and Inskeep, 1986, pp. 7-9).*

Employer	Number of Employees	Year Established in Portland	Type of Business
Fred Meyer	5,200	1923	Retail Store
U. S. Bancorp	4,150	1891	Bank and Holding Company
Kaiser Permanente	3,650	1942	Hospital
Pacific Northwest Bell	3,600	1878	Telephone Utility
Metropolitan Hospitals	3,500	1971	Hospital
Portland General Electric Corporation	3,150	1889	Electric Utility
First Interstate Bank of Oregon	2,950	1865	Bank
Meier and Frank Company	2,750	1857	Department Store
Good Samaritan Hospital and Medical Center	2,550	1875	Hospital
Thunderbird/Red Lion Motor Inns	2,400	1959	Lodging
Safeway Stores, Inc.	2,200	1926	Grocery Chain
St. Vincent Hospital and Medical Center	2,150	1875	Hospital
PacifiCorp	2,000	1910	Electric Utility, Resource Development, Telecommunications
Providence Medical Center	1,800	1941	Hospital
Nordstrom	1,500	1950	Retail Store

sure only the direct impacts from travel, and do not include direct and indirect impacts created via the multiplier process. Their estimates in 1985 indicate that, more than \$1.2 billion in expenditures directly related to travel were generated in the Portland area (U.S. Travel Data Center, 1986). These expenditures were responsible for approximately 27,200 jobs, 46 percent of all travel-related jobs in Oregon, and for \$39.3 million in state and local tax receipts. Impacts from travel and tourism probably were greatest for the trade

and services sectors, especially for restaurants, grocery stores, gasoline stations, and lodging establishments.

THE ECONOMIC FUTURE OF THE PORTLAND AREA

Portland's economic future appears bright. Within Oregon, the Portland area will remain dominant, and if recent trends continue, the region will gain an increasingly larger share of the state's economy. This does not mean that Portland will be able to avoid economic stress. There will undoubtedly

be major companies that close, move from the area, or lay-off employees. Georgia-Pacific, Hyster, White Stag, and several high technology companies are recent examples. On the other hand, new companies will begin locally or move to the area. The December 1986 decision by Albertson's to open a grocery-distribution facility in Gresham on the east side of Portland illustrates a recent success. This facility is projected

to employ 350 persons initially, and as many as 800 within 10 years (Goranson, 1986).

Economic projections further support the contention that Portland's economy will do well in the future. The Oregon Employment Division projects that much of the state's future employment growth will occur in the services sector (Tables 10.5 and 10.6). Altogether, services are projected to account for about 40,700

Table 10.5: *Oregon's 20 fastest growing economic sectors in percentage terms, 1984-92 (Source: Oregon Employment Division).*

	Standard Industrial Classification (SIC)	Employment 1984	1992	Percent Change
73	Business Services	31,339	45,730	45.9
47	Transportation Services	2,942	3,905	32.7
17	Special Trade Contractors	16,707	21,850	30.8
54	Food Stores	27,859	35,790	28.5
37	Transportation Equipment	8,461	10,840	28.1
15	General Building Contractors	7,189	9,150	27.3
62	Security, Commodity Brokers, and Services	1,981	2,500	26.2
83	Social Services	13,355	16,800	25.8
51	Wholesale Trade -- Nondurable Goods	26,620	33,100	24.3
79	Amusement and Recreation Services	7,564	9,350	23.6
81	Legal Services	7,058	8,700	23.3
76	Miscellaneous Repair Services	3,349	4,090	22.1
30	Rubber and Miscellaneous Plastic Products	2,809	3,411	21.4
39	Miscellaneous Manufacturing Industries	2,594	3,140	21.0
42	Trucking and Warehousing	18,185	21,980	20.9
89	Miscellaneous Services	9,751	11,650	19.5
70	Hotels and Other Lodging Places	13,985	16,680	19.3
07	Agricultural Services	4,184	4,980	19.0
45-46	Air Transportation and Pipelines	2,204	2,620	18.9
63	Insurance Carriers	12,127	14,383	18.6
	TOTAL	220,263	280,649	27.4

additional jobs -- one-third of net growth in employment -- from 1984 to 1992. Business services is projected to be the fastest growing sector in net terms as well as in percentage terms, and will contribute about 12 percent of the net new jobs.

Most of the other sectors listed in Tables 10.5 and 10.6 are well represented in the Portland area. As is the situation nationally, only a few manufacturing sectors are listed. High-

technology manufacturing, in particular, is conspicuously absent from either table of fastest growing sectors. This suggests that rapid growth experienced by Portland's high technology companies in the 1970's and early 1980's may not be repeated during the latter 1980's (but see Chapter 12).

Economic projections suggest that Portland will remain an important commercial center. It does not appear that any one or two sectors will dominate

Table 10.6: *Oregon's 20 fastest growing economic sectors in net terms, 1984-92 (Oregon Employment Division).*

	Standard Industrial Classification (SIC)	Employment		Net Change
		1984	1992	
73	Business Services	31,339	45,730	14,391
80	Health Services	67,476	77,259	9,783
58	Eating and Drinking Places	67,568	76,100	8,532
54	Food Stores	27,859	35,790	7,931
51	Wholesale Trade -- Nondurable Goods	26,620	33,100	6,480
	Local Education	70,531	76,530	5,999
17	Special Trade Contractors	16,707	21,850	5,143
50	Wholesale Trade -- Durable Goods	38,144	43,100	4,956
	Other Local Government	42,683	46,874	4,191
42	Trucking and Warehousing	18,185	21,980	3,795
83	Social Services	13,355	16,800	3,445
	Federal Government	29,071	32,100	3,029
	Other State Government	28,748	31,745	2,997
70	Hotels and Other Lodging Places	13,985	16,680	2,695
35	Machinery, except Electrical	15,623	18,250	2,627
53	General Merchandise Stores	25,357	27,950	2,593
59	Miscellaneous Retail	21,210	23,800	2,590
37	Transportation Equipment	8,461	10,840	2,379
55	Automotive Dealers and Service Stations	23,956	26,260	2,304
63	Insurance Carriers	12,127	14,383	2,256
	TOTAL	599,005	697,121	98,116

the regional economy. Diversity has served the Portland area well in the past, and should continue to do so in the future.

REFERENCES

- Abbott, C., 1985, *Portland: Gateway to the Northwest*, Northridge, CA: Windsor Publications, 270 pp.
- Babitzke, H. R., and Brooks, H. C., 1986, "The Mineral History of Oregon," pp. 489-499. In *Minerals Yearbook 1984, Area Reports: Domestic*, Volume II, Washington, D. C.: U. S. Bureau of Mines, 669 pp.
- Bluestone, H., and Daberkow, S. G., 1985, "Employment Growth in Nonmetro America: Past Trends and Prospects to 1990," *Rural Development Perspectives*, 1(3): 20,35-37.
- Daberkow, S. G., and Bluestone, H., 1984, Patterns of Change in the Metro and Nonmetro Labor Force, 1976-82, Rural Development Research Report Number 44, Washington, D. C.: U. S. Department of Agriculture, 23 pp.
- Goranson, E., 1986, "Albertson's Project Slated for Portland," *The Oregonian*, December 17, p. D13.
- Kale, S. R., 1986, "Stability, Growth, and Adaptability to Economic and Social Change in Rural Labor Markets," pp. 77-119. In Killian, M. S., Bloomquist, L. E., Pendleton, S., and McGranahan, D. A., *Symposium on Rural Labor Market Research Issues*, Washington, D. C.: U. S. Department of Agriculture, 196 pp.
- Merriam, P. G., 1971, "Portland, Oregon, 1840-1890: A Social and Economic History," Ph.D. Dissertation, Department of History, University of Oregon, 348 pp.
- Oregon Business*, 1987, "Oregon's Top 50 Construction Projects," 10(1): 25. Oregon Employment Division, unpublished data.
- Oregon State University, Extension Service, 1987, "1986 Oregon County and State Agricultural Estimates," Special Report 790, Corvallis, January, 13 pp.
- Paglin, C., and Inskeep, M., 1986, "50 Largest Private Employers," *The Business Journal*, May 19, pp. 7-9.
- Portland Development Commission, no date, "Portland and Metropolitan Industrial Districts," map.
- U.S. Bureau of Economic Analysis, various years, *Local Area Personal Income*, Washington, D. C.: Government Printing Office.
- U.S. Bureau of Mines, 1986, *Minerals Yearbook 1984, Area Reports: Domestic*, Volume II, Washington, D. C., 669 pp.
- U.S. Department of Commerce, 1985, *County Business Patterns 1983*, Washington, D. C.: Government Printing Office.
- U.S. Department of Labor, various years, *Employment and Earnings*, Washington, D. C.: Government Printing Office.
- U.S. Travel Data Center, 1986, "The Economic Impact of Travel on Oregon Counties 1985," Prepared for the Tourism Division, Oregon Economic Development Department, Washington, D. C., October, 9 pp.
- Warren, D., 1986, *Production, Prices, Employment, and Trade in Northwest Forest Industries, Second Quarter 1986*, PNW-139. Portland: U. S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, September, 70 pp.
- Washington Department of Employment Security, unpublished data.