

Analysis of economic specialization and industry sectors uses a lot of terminology and abbreviations. The following appendix lists and defines the terms and concepts used in the report.

E.1 INDUSTRY SECTORS

- **Industry sector.** An industry sector is a group of businesses that provide an identical or similar good or service. Industry sectors have varying levels of classification, ranging from broad (manufacturing) to narrow (frozen specialty food manufacturing). For example, two different businesses that manufacture frozen specialty food are in the same industry sector. A business that produces automobiles is in the same industry sector in one regard, but they are clearly different industries.
- **NAICS.** The North American Industry Classification System (NAICS) is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy.¹
- **IMPLAN.** Impact analysis for planning (IMPLAN) is a set of data and software used to perform input-output analysis. IMPLAN uses a set of 440 industry sectors based off of NAICS codes. The 440 industries used by IMPLAN are the basis of our evaluation of Portland's economic specialization.

E.2 INDUSTRY MEASURES

- **Output.** In the context of IMPLAN, output is representative of the value of production attributed to Portland's industry sectors. Output is the most aggregate measure of economic activity. For some industry sectors, such as retail and wholesale, it represents only the margin of sales.² Broadly, *output* as measured in this report is an

¹ U.S. Census Bureau. <http://www.census.gov/eos/www/naics/>

² Output equals the sum of the value of intermediate goods and services, wages, business income, other income, and indirect business taxes.

approximate measure of the money that construction drops into the local economy to be spent on local goods, services, and wages.³

- **Value added (VA).** In the context of IMPLAN, value added is very similar to gross domestic product (GDP). It includes four components: wages, business income, other income, and indirect business taxes. Therefore, it accounts for the value of work, land, and capital. For example, businesses purchase raw or intermediate products and repackage or transform them into new products to be sold to consumers. The difference between the cost of the intermediate goods and the final product is the amount by which businesses have added value in production, and, hence, to the economy. Therefore, a business that takes existing products and repackages them (i.e., a wholesaler) creates less added value for the economy than a business that takes inputs, and utilizes labor services to create something new (i.e., an airplane).⁴ The four components are defined as follows:
 1. *Wages.* The sum of workers' wages and salaries as well as benefits, including health and life insurance, gratuities, bonuses and retirement payments.
 2. *Business income.* Income received by local businesses and the self-employed; it is also called proprietor's income. Depending upon local economic conditions, between five and 15 percent of the earnings by individuals comes from self-employment.
 3. *Other income.* These are payments to individuals in the form of rents received on properties, royalties from contracts, dividends paid by corporations, and profits earned by corporations.
 4. *Indirect business taxes.* Federal, State and local excise, property, and sales taxes as well as taxes on other business-related activities or equipment, such as taxes related to motor vehicles.

³ Gross Domestic Product (GDP), at the national level, and Gross State Product (GSP), at the state level, is sometimes confused with output. Total output, as calculated by IMPLAN, is not the same thing as GDP. GDP only considers the final cost of goods and services (the total of four value added components: wages, business income, other income, and indirect business taxes), and excludes the value of intermediate goods in order to avoid double counting. IMPLAN's measure of total value added, not total output, is the most comparable measure of GDP or GSP. With output, IMPLAN is attempting to capture the broadest measure of economic activity in an area. Since many intermediate goods are produced locally for local businesses, IMPLAN includes the value of these goods in addition to the traditional definition of economic activity (value added) to achieve this encompassing picture of activity. This table shows both value added (broken into its four components) and output estimates.

⁴ We assume that what businesses spend beyond the cost of material and intermediate products translates directly into additional value. The largest pieces of this additional value are actually costs: wages and taxes. The difference between cost of production and the sales price is profit, which is captured in the remaining value added categories: business income and other income.

- **Traded sector (TS).** Traded sector provides a measurement of the amount of value added that is exported outside the local area. Traded sectors are important to a local economy because they bring new dollars into the region rather than just recycling existing dollars. In concept if two sectors had the same LQ and value added, but one exported most of its value added and the other did not, the former would be more valuable to the local economy (other things being equal): it would have a greater *multiplier effect* on the local economy.
- **Location quotient (LQ).** Location quotients describe the extent to which a particular industry is concentrated in one area relative to a larger area. A location quotient is simply a ratio of ratios-- specifically, the ratio of an area's employment in one industry to its employment in all industries, divided by the ratio of a larger area's employment in that same industry to this larger area's employment in all industries. Location quotients greater than one indicate that the industry is more represented in the smaller area (e.g., the region) than it is in the larger area (e.g., the nation), while location quotients less than one indicate that the industry is less represented in the smaller area than it is in the larger area. If, for example, mitten manufacturing accounts for 5% of employment in the Portland metropolitan region, and also for 5% of employment in the United States, the location quotient is one. If mitten manufacturing accounts for 10% of employment in the region, the location quotient is two. If mitten manufacturing accounts for 2.5% of employment in the region, the location quotient is one-half. Putting the last example another way, the region has half the mitten manufacturing employment one would expect if its employment were distributed across industries at the same proportion as national employment. In short, the higher the location quotient, the more concentrated the employment in that industry is in the area.

Location quotients are interesting, but their interpretation is not straightforward. One common interpretation is that location quotients show the comparative advantage of an area in attracting and retaining various industries, and that they reflect the degree to which firms find an area advantageous. While this interpretation is probably correct, it is not clear that location quotients tell much about *trends*. A high regional location quotient in an industry might signal that the region is "tapped out," and employment growth in that industry might stagnate unless there is national growth in that industry. A low location quotient might, in contrast, indicate untapped potential. In any case, location quotients do show, at a point in time, the concentration of an industry in an area.

Although employment is the most common measurable used in location quotient analysis, other measures of an industry's strength in an area, such as value added, total output, or wages paid, can be used.

- **Shift-share analysis.** Shift-share analysis is used to decompose growth or decline of industries in a local area within a specified timeframe. By comparing change in economic activity (usually employment) in the base study area (Portland) with that of a reference area (the nation) over the specific time period, the analysis calculates the retrospective expected change in the local area during the same timeframe. Comparing the actual change in the measurable with the calculated expected change allows analysts to differentiate between industries that are changing in accordance with national trends from those that are changing due to more localized factors.
- **National growth effect.** The national growth effect multiplies the nation-wide growth rate by the base level of employment or output in the local economy. This calculates expected growth simply from natural, nation-wide growth in the economy.
- **Industrial mix effect.** The industrial mix effect multiplies nation-wide growth in a specific industry (minus nation-wide growth to avoid double-counting) by the base level of employment or output in that industry. This calculates expected growth in each industry explained by growth of that sector in the national economy.
- **Local effect.** The local effect is the difference between the actual local change and the expected change stemming from activity at the national level. The local effect is the most important, as it shows how the study area differs from the nation as a whole.

Unlike a location quotient analysis that can be easily summarized with one number, shift-share analysis is best represented by reporting both the expected change and the local effect. Displaying the results of a shift-share analysis as an “all-in-one” ratio can be misleading because an industry that is shrinking in both geographies (negative divided by negative) can appear identical to one that is growing in both geographies (positive divided by positive). Reporting both the expected change and the local effect illustrates national trends (expected change), local performance against those trends (local effect), and an absolute measure of growth (the sum of the two).

E.3 GEOGRAPHY

The IMPLAN analysis presents results for multiple different geographies, some of which appear similar but are not. The following geographies are used in the report.

- **United States**
- **Portland region.** The Portland region is defined as the official U.S. Census consolidated metropolitan statistical area: Clark, Skamania, Columbia, Multnomah, Washington, Clackamas, Yamhill, Marion, and Polk Counties.
- **Multnomah County**
- **The City of Portland.** The value added or GDP of the City's economy had to be estimated because economic data are available at the county and the zip code levels, and do not align with City boundaries exactly. In total, this analysis estimated the Portland economy by combining data for 25 zip codes⁵
- **Downtown Portland.** The analysis used an area defined as zip codes 97201, 97204, 97205, and 97209 to approximate downtown Portland.

⁵ Demographic data show that the population residing in those zip codes equaled 99.4% of City's population in 2007, so boundaries are fairly accurate even if they don't align perfectly. Although most zip codes are completely or nearly entirely within the city limits, there are some that are not. Therefore, only those with more than half of their economic activity in Portland were used.

- In all fourteen industry groupings, Portland's LQ is higher than the averaged LQ for the ten comparison cities. The hypothesis that led us to this analysis (that the clusters reflect only the fact that Portland is a city, and not economic specialization relative to other cities) appears to be false based on these results. While selecting different cities might return a different answer (the sample is not statistically valid)¹², we can say that Portland is more specialized than these competitor cities in these clusters.
- The LQs in corporate, regional, and management offices; transportation; iron and steel mills, foundries, and service centers; software publishing; truck manufacturing; printing; and asphalt products are especially high relative to this set of cities.

¹² Of particular note is the truck manufacturing cluster. Nashville (Davidson County) has a national LQ of 12.39 in the cluster which greatly increases the reference area denominator in the eleven county reference area. If a different county had been randomly selected that had an average LQ, the results would show that Portland is much more specialized in truck manufacturing than the current table depicts.