

The Economic Impact of the Ophthalmic Goods Manufacturing Industry on the Southern California Economy

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Introduction and Study Objectives

The goal of this research overview is to quantify how the Ophthalmic Goods Manufacturing Industry impacts the Southern California economy. Overall, Ophthalmic Goods Manufacturing brings significant economic benefits to Southern California in the form of high wages, job creation, and positive impacts on local industries. The report was created at the request of Visionary Venture Fund, an Ophthalmology focused venture fund located in Orange County, and OCTANe, a business accelerator driving innovation in life sciences and technology in Southern California (“the Sponsors”)

This report highlights industry’s regional importance, an overview and discussion of economic impact analyses and input-output models used to identify the relationships between sectors, and an account of how Ophthalmic Goods Manufacturing affects other local industries. The benefits provided to the Southern California region by the Ophthalmic Goods Manufacturing industry include significant employment/job creation, wages and income benefits, overall economic impact to the region’s economy in terms of value-added and output, as well as positive impacts on other industries throughout the region.

This report’s analysis uses widely-accepted quantitative economic impact methods for determining the impact of the Ophthalmic Goods Manufacturing industry operations, incorporating proprietary and confidential data to conduct this economic impact analysis. This includes estimates and projections that reflect of 2016 revenue and employment estimates compiled using several sources highlighted in this report’s appendix.

Key Findings

- The Medical Device and Biopharma industries in Orange County have location quotients of 5.54 (1st nationally) and 2.12 (5th nationally), respectively, making them the county’s most concentrated industries. Location quotients represent the concentration of these industries compared to the national baseline average of 1; a score below 1 indicates an industry less concentrated than the national average while a score above 1 indicates an industry more concentrated than the national average. Orange County’s Medical Device industry, for example, is more than five times as concentrated in Orange County as it is in the nation as a whole.
- According to output from IMPLAN economic modeling software, the Ophthalmic Goods Manufacturing industry has significant positive impacts on the Southern California economy in terms of its direct, indirect, induced and total effects. Direct impacts measure the activities directly related to the Ophthalmic Goods Manufacturing industry itself. Indirect impacts measure business-to-business

transactions resulting from activity within the Ophthalmic Goods Manufacturing. Induced impacts measure the impacts associated with spending derived from the wages paid to consumers.

- In total, Ophthalmic Goods Manufacturing activities in Southern California result in approximately 56,000 direct, indirect and induced jobs with labor incomes totaling \$4.14 billion
- The Ophthalmic Goods Manufacturing industry in Southern California directly employs approximately 25,105 individuals while its indirect and induced effects increases total employment by 15,247 and 15,654, respectively.
- This high level of job creation provides value-added benefits of \$6.83 billion and total output of \$12.5 billion to the region’s economy each year, demonstrating the industry’s substantial economic impact on the region.

Total Direct, Indirect and Induced Impacts of the Ophthalmic Goods Manufacturing Industry in Southern California				
	<u>Employment</u>	<u>Labor Income (\$)</u>	<u>Value Added (\$)</u>	<u>Output (\$)</u>
Direct Effect	25,105	\$ 2,232,983,382	\$ 3,728,370,385	\$ 7,437,195,907
Indirect Effect	15,247	\$ 1,074,311,578	\$ 1,615,239,973	\$ 2,689,553,399
Induced Effect	15,654	\$ 832,320,312	\$ 1,488,086,523	\$2,372,984,896
Total Impacts	56,006	\$ 4,139,615,273	\$ 6,831,696,881	\$ 12,499,734,202

- Southern California’s Ophthalmic Goods Manufacturing industry creates jobs throughout a number of key regional sectors with the largest employment contributions going to:
 - Wholesale Trade;
 - Management of Companies and Enterprises;
 - Advertising, Public Relations;
 - Full-Service Restaurants;
 - Retail – General Merchandise;
 - Limited-Service Restaurants;
 - Real Estate;
 - Employment Services;
 - Retail – Miscellaneous Stores; and
 - Retail – Food and Beverage Stores.

Ophthalmic Goods Manufacturing Industry Overview In Southern California

While Southern California's Ophthalmic Goods Manufacturing industry concentrates in several specific areas, particularly Orange and San Diego counties, many major industry employers have multiple locations throughout the region. Southern California's concentrated Ophthalmic Goods Manufacturing industry emerged out of a combination of the region's strong R&D and innovation assets at leading universities and healthcare institutions throughout the region, and clustered advanced manufacturing, medical device, and pharmaceutical industries. The growth and expansion of these industries provided the necessary environment for Ophthalmic Goods Manufacturing cluster to flourish in the region and become a world-class center of excellence, attracting profitable and innovative organizations such as Allergan, J&J AMO, and Alcon . This highly supportive environment for Ophthalmic Goods Manufacturing cultivated in Southern California has enabled the industry to expand rapidly, providing substantial benefits to both the region itself and individuals across the world in need of innovative Ophthalmic care.

Southern California's world-renown educational institutions, such as the University of California, Los Angeles (UCLA), the University of Southern California (USC), the University of California, San Diego (UCSD), and the University of California, Irvine (UCI), have supported this industry by building strong labor pools and advancing medicine through research and development initiatives. In addition to universities, numerous industry groups such as OCTANE have fostered an innovative environment, facilitating communication and collaboration between industry players, policymakers, educators, and the public to keep cutting edge Healthcare accessible to all.

Economic Impact Analysis Overview

An economic impact analysis (EIA) is a standard way to estimate the effect of economic activity on the larger general economy, typically by measuring changes in economic activity, job creation, and income in a specific geographic region. EIAs can measure the effects of a new policy or project, or of an already existing business or organization. Economic activity, especially in high multiplier sectors such as Ophthalmic Goods Manufacturing, drives a region's economy as productive sectors buy and sell goods and services from one another; an EIA estimates this activity's total effect on an economy by measuring changes in the final demand components for these goods and services.

A regional multiplier is the ratio of total economic effect on regional economy to the initial activity. Regional multipliers measure the estimated changes in output, income and employment resulting from an initial round of spending, economic activity, or job creation. The term "regional multiplier" is analogous to the standard Keynesian multipliers used in macroeconomics: an initial increase in demand leading to a larger expansion of regional income, which leads to spending and income generation in other

sectors. This provides a way to estimate the economy-wide effects that economic activity has on a particular geographical economy, in this case the Southern California region.

The Sponsors used IMPLAN economic analysis software and data to quantify these impacts. IMPLAN, originally developed by the Agricultural Economics Department at the University of Minnesota, is widely used to conduct economic impact analysis. Using classic input-output analysis in combination with regional specific Social Accounting Matrices and Multiplier Models, IMPLAN provides a highly accurate, adaptable model using statistics specialized by region, not estimated from national averages. Total economic impacts, including total spending, job, and tax impacts, were calculated using the IMPLAN economic impact software package. Within a defined study region, IMPLAN uses average expenditure data from the industries that originate the effect on supplier industries to trace and calculate the multiple rounds of secondary indirect and induced impacts that remain in the state (as opposed to “leakage” outside the state’s boundaries). IMPLAN then uses this total to calculate total job and tax impacts.

APPENDIX

Regional Input-Output Modeling Systems

Economic impact analyses typically employ an input-output model (I/O model) for analyzing regional economic impact. I/O models are at root mathematical descriptions of how all sectors of an economy are related and rely on inter-industry data to determine how effects in one industry will impact other sectors. Regional I/O models estimate the total effects that an economic activity will have on a local economy, and the associated multipliers are typically used to estimate the economy-wide effects that economic activity has on a regional economy. Each sector has a unique multiplier because each has a different pattern of purchases from firms in and outside the region. The table below highlights the unique multipliers for certain Orange County industries in order to demonstrate how each industry could potentially be affected by fluctuations in business and overall economic activity. Regional I/O modeling systems such as IMPLAN estimate how much an increase in economic activity in a particular region will ripple throughout a regional, state, or national economy.

Types of Economic Impacts

Economic impact analyses estimate multiple types of impacts:

- **Output** is the total increase in business sales revenue in the state. Local businesses, in turn, use some of this revenue to pay for goods and services outside of the study region; this spending is known as “leakage.”

- **Value added** estimates the increase in the study region's gross regional product, in this case the increase in Southern California's gross state product (GSP) contribution. This impact estimates the differences between an industry's or company's total output (sales or other operating income, plus inventory change) and the cost of its intermediate inputs (consumption of goods and services purchased from other industries or imported) and are somewhat akin to contributions to gross domestic product (GDP).
- **Labor income** represents the increase in total money paid to local employees throughout the state in the form of salaries and wages. These increases in income may come in the form of raises and/or increased hours for existing employees or as new jobs for the unemployed.
- **Employment** measures the increase in the number of total employees in the state due to impacts of Southern California's Ophthalmic Goods Manufacturing industry.

Descriptions of Direct, Indirect, and Induced

In addition to the types of impacts, economic impact analyses estimate the sources of the impacts. Each impact can be broken down into different components:

Direct effects are the result of the money initially spent in the study region by the industry being studied. This includes money spent to pay for salaries, supplies, raw materials, and operating expenses.

An industry's direct effects create additional regional economic activity in two ways:

Indirect effects are the results of business-to-business transactions indirectly caused by direct effects, as companies purchase goods and service from other regional industries. The indirect effect can therefore be characterized as a measure of the Ophthalmic Goods Manufacturing industry's impact on the increase in business-to-business activity in other industries such as Healthcare, Professional and Business Services, Wholesale and Retail Trade.

Induced effects are the results of increased personal income caused by the direct and indirect effects: the effects, in other words, of consumer spending by Ophthalmic Goods Manufacturing employees. Induced impacts reflect the fluctuations in local spending resulting from income changes (wage and payroll fluctuations) in the industries directly and indirectly affected by the Ophthalmic Goods Manufacturing industry. Businesses experiencing increased revenue from the direct and indirect effects will subsequently

increase payroll expenditures (by hiring more employees, increasing payroll hours, raising salaries, etc.). Households will, in turn, increase spending at local businesses. The induced effect is best characterized as a measure of increased in household-to-business activity in the state due to the Ophthalmic Goods Manufacturing industry's Southern California operations.

Sources:

- California Employment Development Department
- Quarterly Census of Wages and Employment
- IMPLAN Economic Modeling Software
- U.S. Cluster Mapping, Harvard Business School
- EconoVue
- Bloomberg
- Bureau of Labor Statistics
- Experian
- Dun and Bradstreet
- Burning Glass Technologies – Labor Insight