Bio-Pharma's Impact on California's State and Local Economies

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The Importance of this Industry in California: 65,000 jobs; $110,000 Average Income; and $500 million of New Construction Each Year

The California pharmaceutical, biopharmaceutical, and biotech research, development and manufacturing industry employs 65,000 Californians annually. This sector is part of the five-sector biomedical industry which includes its sister industries 2) medical devices, 3) laboratory services, biomedical research and training and 4) wholesalers of pharmaceuticals, medical devices, diagnostics and research reagents and 5) basic academic biomedical research and training. Since 1990, the five sector biomedical industry in California has grown from employing 190,000 workers to 270,000 and in tandem with this overall growth, the pharmaceutical, biopharmaceutical and biotech sector has grown from 40,000 to 65,000. Inside this sector, biotech research and development has grown from around 15,000 to 25,000 workers since 1990 while pharmaceutical/biopharmaceutical employment has risen from 25,000 to 40,000 workers in California.

Along with New Jersey, California is the state with the most pharmaceutical-biopharmaceutical employment, and along with Massachusetts, California has the most employment of any state in biotech research and development. Within California, the Bay Area, San Diego and the Los Angeles-Ventura areas are the key locales for pharmaceutical, biopharmaceutical and biotech research, development and manufacturing.

Biotech research and development is becoming an increasing focus of venture capital investment. In 2000, at the peak of the NASDAQ and dot-com boom, nationally, high tech accounted for over 20% of US venture capital investment while biotech absorbed around 5% of venture capital. In 2009, the gap between high tech venture capital investment and biotech investment had closed with biotech receiving 20% of venture capital investment (almost $5 billion) while high tech received 15% of venture capital funds (almost $4 billion). This reflects the growing importance of biotechnology as the focus of new research and the source of new products within the growing biomedical field.

Jobs within the pharmaceutical, biopharmaceutical and biotech industry are well paid with many requiring significant amounts of education. In the pharmaceutical, biopharmaceutical research and manufacturing sector, 16% of the jobs require a bachelors degree, 7% require a bachelors plus significant work experience while 1% require a masters degree and 9% require a doctorate. Another 6% require an associate degree. Thus, 44% of all pharmaceutical/biopharmaceutical jobs in California require a college degree while 56% of the jobs in this sector require a high school degree usually with additional work experience and/or sometimes extensive on-the-job training.

In the biotech R&D sector, formal education and skill requirements are even higher. In this sector, 35% of the jobs require a bachelors degree, 15% require a bachelors plus significant work experience while 3% require a masters degree and 10% require a doctorate. Another 11% require an associate degree. Thus, 74% of all pharmaceutical/biopharmaceutical jobs in California require a college degree while 26% of the jobs in this sector require a high school degree usually with additional work experience and/or sometimes extensive on-the-job training. These substantial formal education, skill and experience requirements lead to generous wages. In both sectors, the average income is almost $110,000 per year.

Because this industry is growing in California, the industry is constantly building new research, development, office and manufacturing facilities. On average, this industry puts into place over $500 million in new building in California each year. In years where new manufacturing plants are built, the industry adds around $1.5 billion in new infrastructure.

Since the mid-1990s, the building of this industry has concentrated in the Bay Area. San Francisco, Alameda, Santa Clara, Solano, San Mateo and Contra Costa counties have accounted for about half of all new construction and renovation of pharmaceutical, biopharmaceutical and biotech facilities in California while LA, Ventura, Orange, San Bernardino, Riverside and Orange counties have accounted for 22% and San Diego has received 16% of these new facilities.

Specialized, experienced and uniquely skilled unionized contractors account for most of the work on these new and renovated pharmaceutical, biopharmaceutical and biotech facilities. Ten unionized general contractors account for over half of all California new and renovation construction in the biopharmaceutical and biotech industries. Indeed, just two unionized general contractors, DPR and Rudolph & Sletten, account for 31% of all of this construction. These same contractors also do considerable high tech construction. Indeed, high-tech, biotech and biopharmaceutical construction demand prove complementary, stimulating the development of a specialized, typically unionized, construction industry serving both sectors. This high-skilled construction segment is adapted to the specific demands for construction quality and speed in high-tech, biotech and biopharmaceutical industries where innovation, product quality and speed-to-market are keys to business success.

The Impact: $3 Billion in New Tax Revenues and 250,000 New Jobs Created Outside the Biopharmaceutical-Biotech Industry, Itself

The pharmaceutical, biopharmaceutical and biotech industry in California exports their products worldwide. The revenues from these exports inject new monies into California that not only pay for the good jobs in this industry but also stimulate new jobs in other sectors of the California economy and in the local communities where this industry is found. The direct effect of this industry is found in the 65,000 workers it employs. A positive indirect effect is created when this industry buys from California suppliers who provide inputs and services to the biotech and biopharmaceutical companies. A additional positive induced effect occurs when the 65,000 workers in the biotech and biopharmaceutical industries spend their $110,000 incomes on homes, products and services created in California. Taken together, the direct, indirect and induced effects from biotech and biopharmaceutical industries create a multiple positive impact on California's overall economy and on the economies of each of the counties in which these companies are located. These multiplier effects can be measured both in terms of new employment gained from the industry and in terms of new output generated. From the new output generated, we can also calculate the new tax revenues generated by the industry. The new tax revenues will include not only the taxes paid by the biotech and biopharmaceutical companies, themselves, and their employees, (this industry's direct effect) but also by all the new or expanded

companies and their employees created by this industry's indirect effect and all the new or expanded companies and their employees created by this industry's induced effect.

For every job directly created by the biotech research and development industry in California, 2.8 jobs are created in other California industries due to the indirect and induced effects. For every job created in the pharmaceutical and biopharmaceutical industry in California, 5.3 jobs are created elsewhere in California. The reason the pharmaceutical and biopharmaceutical sector creates more jobs is because they do more of the manufacturing side of this industry while biotech R&D passes onto biopharmaceutical manufacturing or other manufacturing the non-R&D side of the overall process. R&D requires fewer suppliers and inputs compared to manufacturing. Thus, the indirect jobs created through demand for inputs from suppliers is greater on the manufacturing side of the industry. The indirect effect is about the same in both sectors of the industry because the average income of workers is about $110,000 in both sectors. This is about 80% higher than the $60,000 average income for all of California industries. Because workers on both sides of this industry earn more, they spend more in California generating more demand for local goods and services creating more additional local jobs than a typical new job in California would.

While there are currently about 25,000 biotech R&D workers in California, over the last decade, this growing industry averaged 18,126 workers. Taking this more conservative estimate of biotech employment, the biotech sector generated 50,310 new jobs outside biotech in California. This, in turn, generated just over $9 billion in new output outside the $3.8 billion in new output generated by biotech R&D itself. This created $453 million in new state and local taxes paid by companies and workers in jobs outside biotech whose jobs and businesses would not have been there without the biotech industry in California.

While there are currently about 40,000 pharmaceutical and biopharmaceutical workers in California, over the last decade, this growing industry averaged 36,906 workers. Taking this more conservative estimate of pharmaceutical and biopharmaceutical employment, the biotech sector generated 195,546 new jobs outside pharmaceuticals/biopharmaceuticals in California. This, in turn, generated just over $66 billion in new output outside the $33 billion output generated by pharmaceutical and biopharmaceutical manufacturing, itself. This created $2.6 billion in new state and local taxes paid by companies and workers in jobs outside pharmaceutical and biopharmaceutical manufacturing whose jobs and businesses would not have been there without the pharmaceutical and biopharmaceutical industry in California.

Taken together, the pharmaceutical, biopharmaceutical and biotech industries and their workers not only pay their own corporate, income and sales taxes but they generate $3 billion in state and local taxes coming from the new businesses and new jobs they create outside of their export industry due the new demand they create for local supplies, goods and services. They also created about 250,000 new jobs outside their industry.

In addition to these supplies, goods and services, bio-pharma generates about $500 million in new construction each year. Over the last decade, this growing industry employed about 1000 construction workers per year in new construction. This construction work generated an additional 3200 new jobs outside of construction in California. This, in turn, generated just over $1.1 billion in new output in addition to this $500 million in new construction. This, in turn, created $10 million in new state and local taxes. These new jobs and businesses and the taxes they paid would not have been there without the pharmaceutical and biopharmaceutical industry's annual new construction work in California.