

BROOKLYN LABOR MARKET REPORT:

Food Manufacturing Industry

Design Manufacturing Industry

Apparel Manufacturing Industry

Beverage Manufacturing Industry

Prepared for



Submitted by

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SUMMARY

The U.S. manufacturing industry is undergoing a transformation. Technological advances combined with changing consumer tastes are staving-off the decades-long decline of the industry. Given Brooklyn's skilled labor pool, innovative spirit, legacy manufacturing infrastructure (including industrial real estate and established networks of production and distribution), large consumer market, and supportive policy framework, Brooklyn is very well positioned to reap the benefits of the upswing in manufacturing. In fact, though the years of heavy industrial production in the city, and specifically in Brooklyn, are long gone, there's a resurgence of specialty manufacturing. This includes craft food and beverage manufacturing, furniture and home décor products, and fashion (apparel and textile goods).

This report examines trends in the three largest manufacturing industries in Brooklyn: food, design, and apparel manufacturing. These three industries account for more than two-thirds of manufacturing sector employment. Trends in the beverage manufacturing industry are also covered; specifically the small, but growing, craft distilling and brewing industries in Brooklyn, which have grown exponentially in response to state legislation over the last five years.¹

Appendix A presents a detailed description of each industry. Appendix B describes data sources and notes on the analysis.

Brooklyn Manufacturing Sector Jobs in 2014, by Industry

Industry	Jobs	% of Manufacturing Employment	% of Total Employment
Food Manufacturing	5,785	28.0%	1.0%
Design Manufacturing	4,769	23.0%	0.8%
Fashion Manufacturing	3,630	17.5%	0.6%
Miscellaneous Manufacturing	2,122	10.3%	0.4%
Printing and Related Support Activities	1,069	5.2%	0.2%
Computer and Electronic Product Manufacturing	849	4.1%	0.1%
Chemical Manufacturing	807	3.9%	0.1%
Paper Manufacturing	584	2.8%	0.1%
Nonmetallic Mineral Product Manufacturing	373	1.8%	0.1%
Machinery Manufacturing	299	1.4%	0.1%
Beverage and Tobacco Product Manufacturing	227	1.1%	0.0%
Primary Metal Manufacturing	149	0.7%	0.0%
Transportation Equipment Manufacturing	34	0.2%	0.0%
Total, Manufacturing Sector	20,697		3.6%
Total, All Industries	568,008		

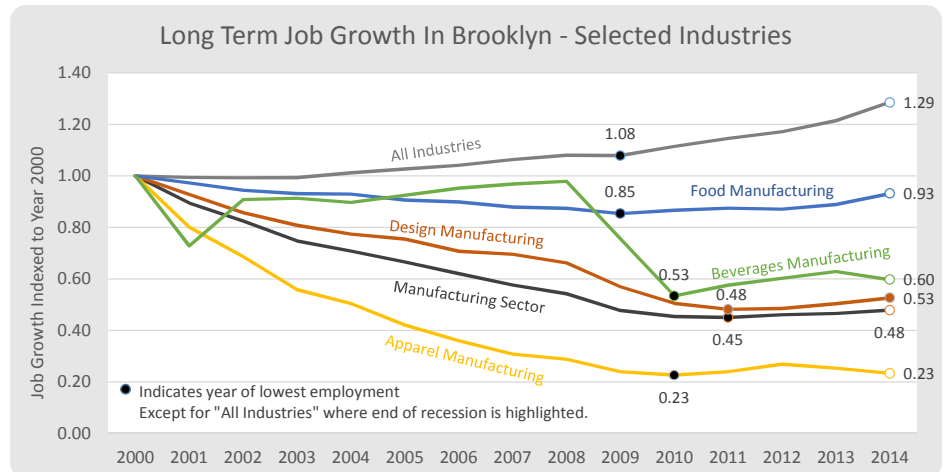
Food manufacturing

The food manufacturing industry began to regain jobs and number of businesses earlier than most other manufacturing industries. Employment bottomed out in 2009, but has since grown at a steady 1.8% per year. While this is still well below employment growth for all industries in Brooklyn, it is welcome news for a sector that experienced significant job losses between 2000 and 2009. If trends for the first half of 2015 hold up, the industry should experience its most robust growth in over 15 years.

Trends in wages are not as favorable. The average annual food manufacturing wage in Brooklyn was \$34,525 in 2014, well below wages for the manufacturing sector as a whole (\$38,955) and for all industries in Brooklyn (\$41,073). Brooklyn wages for this industry are also lower than for the same industry elsewhere in the city and state.

¹ For example, craft brewers are responsible for 10% of all beer production in the U.S. by volume and their share is projected to grow to 20% by 2020. Along with increased market share, there is a growing recognition that these types of businesses can play an important role in the economic development of a city. This has resulted in many cities courting these businesses through zoning, economic incentives, etc. Best, A. "Welcome to Beer Country: Small breweries are a big deal – and some cities are courting them." Planning Magazine, February 2015.

The food manufacturing workforce has seen a shift towards more highly-educated workers. The share of workers with college or advanced degrees increased from 18% in 2000 to 23% in 2014. Since 2009, job gains in this industry for those with bachelor's or advanced degrees is greater than all other educational attainment categories combined.



Design Manufacturing

Brooklyn plays a key role within the design manufacturing industry as highlighted by the fact that Brooklyn is home to 46% of New York City's design manufacturing businesses. The turnaround of the design manufacturing industry in Brooklyn began later than the other industries examined; employment stopped shrinking only in 2011. Since then, however, this industry has experienced robust growth of 3% per year, exceeding the rate for the city (2.1%) and state (1.2%), but still trailing overall job growth in Brooklyn of 3.9%. Between 2011 and 2014 the industry added 400 net new jobs; more than any other manufacturing industry in Brooklyn. Given that the numbers of firms remained steady during this expansion, it is likely that most of the new jobs have been created by existing firms (as opposed to new business formation). If trends for the first half of 2015 continue, the industry is poised to grow even faster at approximately 6.2%.

The outlook for industry wages is also favorable. Annual wages in the industry averaged \$46,725 in 2014, well above the average for the manufacturing sector and the average for all industries in the borough. Design manufacturing wages have also been relatively more stable than wages for the manufacturing sector overall, as well as average wages for all industries in the borough, both of which have declined significantly since 2006. Another positive development for this industry in Brooklyn is that during the first half of 2015 it experienced a significantly larger increase in real wages than the city and state as a whole.

The design manufacturing workforce has become better educated. The share of workers with bachelor's or advanced degrees increased from 17% in 2000 to 22% in 2014. While employment has increased for all educational categories, since 2011 the job gains in this industry for people with bachelor's or advanced degrees has been nearly three times that of workers with less than a high school degree.

Apparel Manufacturing

The apparel manufacturing industry employed approximately 3,560 workers in Brooklyn during the first half of 2015. After the decade between 2000 and 2010 in which the industry in Brooklyn shrank by more than 80%, employment has experienced modest growth in the range of 0-1% per year. During the first half of 2015 Brooklyn experienced yet another drop in employment in the apparel manufacturing industry, albeit less severe than that experienced for the rest of the city and state. The number of apparel manufacturing businesses in Brooklyn has also continued to decline between 2010 and 2014.

Apparel manufacturing industry wages are relatively low. In 2014, the industry in Brooklyn had an average annual wage of \$22,821, well below the average for the manufacturing sector and the average for all industries in the borough. A relatively

positive development is that wages have held steady since 2000. By comparison, average wages for all industries and the manufacturing sector, in particular, have been declining in real terms.

The workforce involved in apparel manufacturing is also becoming better educated. Between 2010 and 2014, more than 85% of the jobs created in the industry have been filled by people with some college, an associate, bachelor's or advanced degree. Between 2000 and 2014 the share of industry workers with this level of education attainment increased from 35% to 45%.

Beverage Manufacturing

The beverage manufacturing industry in Brooklyn officially represents less than 1% of manufacturing employment. This may underestimate the full extent of the industry, however. First, some beverage manufacturing businesses may be reflected in the “bars and restaurants” category as explained below. Second, craft beverage manufacturers, an important and rapidly growing segment of the beverage manufacturing industry in Brooklyn, tend to be small and therefore may not be captured in the Bureau of Labor Statistics Quarterly Census of Employment and Wages.

Despite these data limitations, it appears that employment in the beverage manufacturing industry in Brooklyn has been growing at approximately 2.8% per year since 2010. The number of beverage manufacturing businesses in Brooklyn has also grown by nearly 60% (from 14 to 22). As those new businesses mature, they are likely to increase their employment footprint in Brooklyn. These new jobs have the potential to bring significant economic benefits, as the beverage manufacturing industry in Brooklyn has relatively high wages, \$49,894 in 2014, significantly above the average wage for all industries (\$41,073).

Training Programs

Wages in various manufacturing industries are higher than overall average wages in Brooklyn. Jobs in the manufacturing sector are a pathway to the middle-class, especially for immigrants and people with low educational attainment. However, despite the importance of manufacturing jobs for social mobility, manufacturing training programs for adults in New York are extremely limited and do not meet the current demand of the sector. The programs identified in the last section of this report show that most of the training programs offered focus on transportation, such as commercial driving programs.

In order to ensure that the manufacturing sector continues its turnaround, it is essential to ensure that adequate training programs are in place to provide individuals the opportunity to take advantage of the employment opportunities created in this expanding sector.

BACKGROUND AND CONTEXT

National Context: Manufacturing Sector Trends

The proportion of manufacturing employment to total employment has been declining for the past half century in the United States.² In Brooklyn, the share of manufacturing as a percentage of total employment decreased from 9.8% to 3.6% between 2000 and 2014 alone.

While increased international competition (i.e., locations with cheaper labor cost) is often cited for the decline in manufacturing jobs, it is not the principal factor. One of the major reasons for this decline is the remarkable gains in productivity that the sector has achieved.³

² “Concern About The Decline in Manufacturing in the United States?” The Becker-Posner Blog. <http://www.becker-posner-blog.com/2012/04/concern-about-the-decline-in-manufacturing-in-the-united-states-becker.html>

³ St. Louis Federal Reserve. <https://research.stlouisfed.org/fred2/series/MFGPROD>

While manufacturing may never get back to its heyday of the early 1960s, when it accounted for nearly a third of U.S. employment, technological advances, as well as changing consumer tastes are staving-off the decades-long decline of the manufacturing sector. The manufacturing businesses driving this change are also upending the traditional view of manufacturing: hundreds of low-skilled workers, producing generic products, within large industrial parks. Instead, these enterprises:

- Depend on skilled workers to produce specialized, niche, typically higher-value products ranging from high-tech equipment to artisanal food products;
- Are small, agile businesses whose success depends on complex, decentralized networks of production and distribution; and
- Locate in dense urban areas (with available stock of industrial space), closer to their factors of production and final consumers. This allows for faster adaptation of their goods to changing consumer preferences, permits rapid distribution of their goods, and provides easy access to a skilled labor force, and extensive production and distribution networks.

Regional Context: Shifts in NYC manufacturing sector

The manufacturing industry in New York is at the forefront of nationwide trends, as it evolves to incorporate technology into its systems, and adjusts for certain market dynamics that affect the extent to which manufacturing processes can occur in the city.

Over the past 5 years, there have been a number of policies and investment by both public and private entities, responding to the needs of the city's evolving manufacturing sector. The resurgence and revitalization of manufacturing hubs such as the Brooklyn Navy Yard, Brooklyn Army Terminal, Bush Terminal (now Industry City), the former Pfizer factory, and Liberty View Industrial Plaza, has been a multi-pronged approach to respond to the needs of and accommodate new and innovative industrial tenants in Brooklyn.

The establishment of industry-focused incubators, accelerators, and other similar entities such as Manufacture NY, Brooklyn Foodworks, and the Brooklyn Fashion and Design Accelerator (BF+DA), is another indicator of support systems that have been gradually introduced to the manufacturing ecosystem to improve its sustainability and increase market access for budding entrepreneurs.

The Administration has also shown its full commitment to the sector's longevity in the city by instituting a robust set of policies that establishes various new programs for manufacturing firms, and protects the sector from market pressures (real estate related ones in particular). Late last year, the Mayor's Office unveiled their Industrial Action Plan aimed at supporting and preserving manufacturing in NYC. The plan sets forth a series of investment commitments and regulatory changes with the goal of creating 20,000 new manufacturing jobs, and protecting core industrial areas. Some other components of the Plan include the creation of a new Advanced Manufacturing Center, a new loan fund for start-ups and growing firms, and new training to prepare New Yorkers for careers in manufacturing.

It is within this national and regional context that we examine trends in the manufacturing sector in Brooklyn.

FOOD MANUFACTURING INDUSTRY

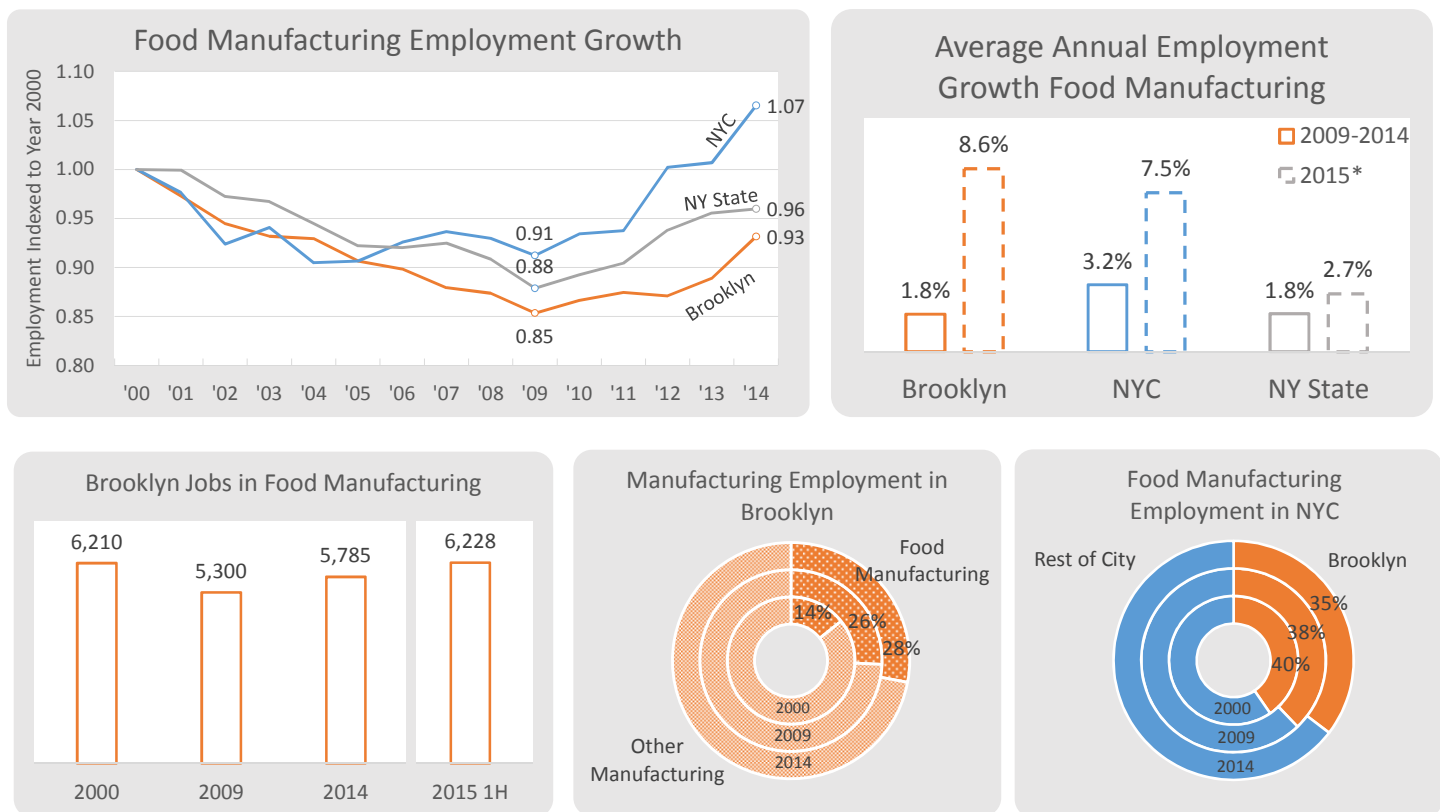
Employment

Food manufacturing is an important industry within the manufacturing sector in Brooklyn with an average of 6,228 jobs during the first half of 2015. It is the largest industry within the manufacturing sector in terms of employment, accounting for approximately 28% of total manufacturing jobs in the borough. Furthermore, Brooklyn plays a key role within the food manufacturing industry of New York City, accounting for 35% of total food manufacturing employment in the city.

Food manufacturing is also one of the better-performing industries within the manufacturing sector in Brooklyn. Following significant declines in the number of firms and employment, the industry began to turn around in 2009. Between 2009 and 2014, employment grew at approximately 1.8% per year, adding nearly 500 net new jobs during this period. By comparison, overall employment in the manufacturing sector in Brooklyn has remained flat since 2009. Also, this industry experienced significantly milder job losses than the manufacturing sector as whole between 2000 and 2009. As a result of these trends, food manufacturing now accounts for 28% of manufacturing employment in Brooklyn, up from 14% in 2000.

While employment growth of the industry in Brooklyn has kept pace with that of the state, it has not however kept pace with the rest of New York City. During the earlier part of the last decade, Brooklyn experienced more severe job losses in this sector than the rest of the city and state. As a result, Brooklyn's share of citywide employment within this industry dropped from 40% to 35% between 2000 and 2014.

Data for the first half of 2015 suggests robust growth of this industry in Brooklyn. Relative to the first half of 2014, employment in the industry increased by 8.6% compared to 7.5% in the city and 2.7% in the state.

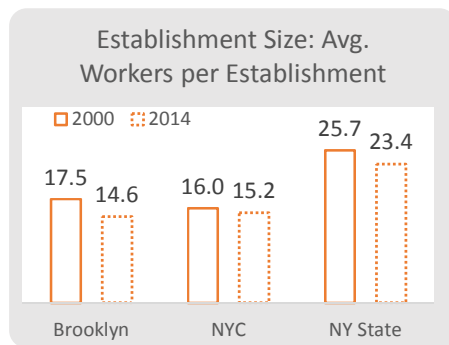
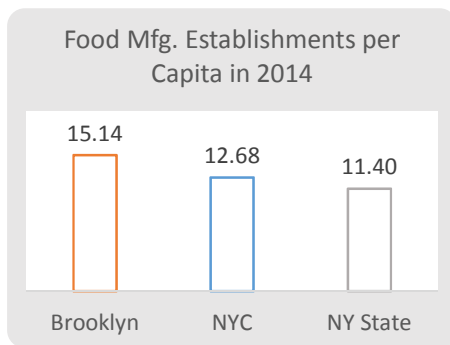
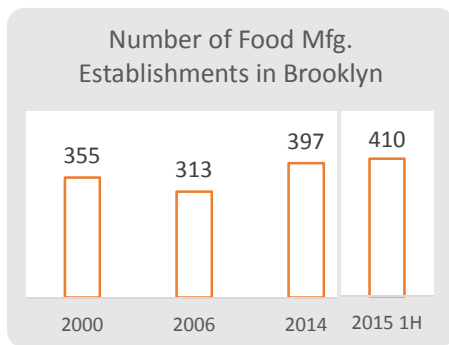


* Data for the first half of the year.

Business Establishments

With 410 food manufacturing businesses, Brooklyn accounts for nearly 38% of all food manufacturing establishments within the city. Brooklyn has a higher concentration of food manufacturing businesses than the rest of the city with 15.14 establishments per 100,000 residents compared to 12.68 in the city as a whole and 11.40 in New York State.

The number of establishments has been increasing since 2006, but average workers per establishment has been steadily decreasing. This is particularly true in Brooklyn where the average food manufacturer had 14.6 workers in 2014, compared to 15.2 in New York City and 23.5 in the state.

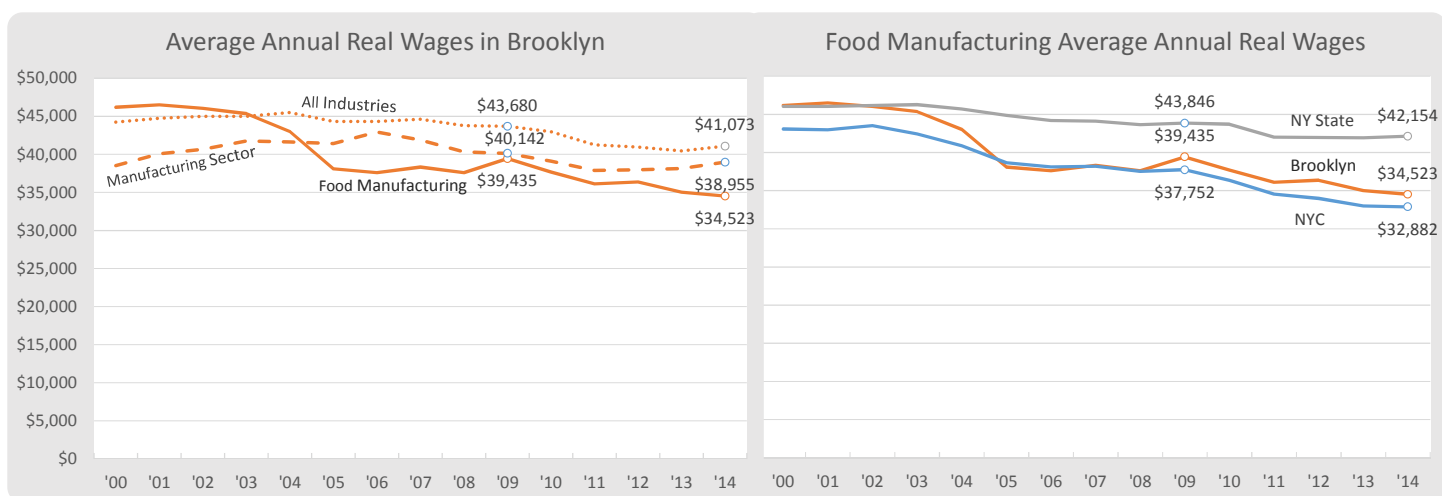
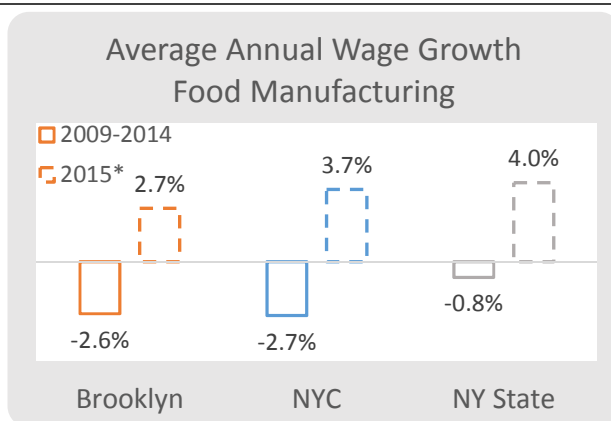


* Data for 2015 is for the first half of the year.
 **Establishments per 100,000 residents.

Real Wages

Trends in food manufacturing industry wages are not as favorable. The industry average annual wage in Brooklyn was \$34,525 in 2014. This is below average annual wages for the manufacturing sector (\$38,955) and for all industries (\$41,073). The wages are also low compared to statewide average wages for this industry (\$42,154). Nevertheless, average wages in the food manufacturing industry are higher than many other blue-collar industries, such as tourism & entertainment, administrative support services and retail.

Average wages (in real terms) for this industry have been decreasing rapidly in Brooklyn (-2.6% per year compared to -0.8% per year in the state). On a more positive note, average wages increased by 2.7% during the first half of 2015, still below the increase in the city and state, however this may be an indication that industry wages are poised to continue increasing.



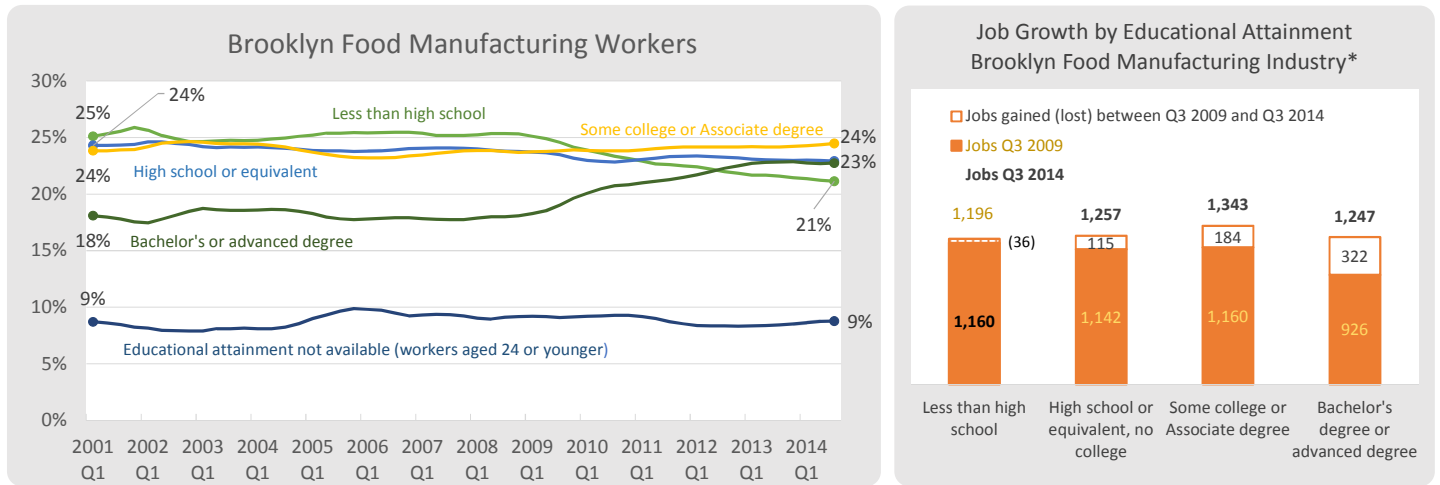
* Data for the first half of the year.

Educational Attainment

The workers involved in food manufacturing in Brooklyn have become significantly more educated. In 2000, workers with an educational attainment of high school or less than high school accounted for 49% of food manufacturing workers, and workers with

some college, an associate, bachelors, or advance degrees accounted for 42%. By 2014, the percentages were almost inversed. Workers with an educational attainment of high school or less than high school accounted for 44% of food manufacturing workers, and workers with some college, an associate, bachelor’s, or advance degrees accounted for 47%.⁴ This trend has been more acute since 2009.

Since 2009, the job gains in this industry for people with bachelor’s or advanced degrees is greater than all other educational attainment categories combined.



*Excludes workers aged 24 or younger, for which educational attainment is not available.

DESIGN MANUFACTURING INDUSTRY

The design manufacturing industry is actually an aggregate of five manufacturing industries: 1) Plastics and Rubber Products Manufacturing, 2) Wood Product Manufacturing, 3) Fabricated Metal Product Manufacturing, 4) Electrical Equipment, Appliance, and Component, and 5) Furniture and Related Product Manufacturing. These industries have been aggregated into the design manufacturing industry because aesthetic and functional design is a major part of the products manufactured by companies in these industries. A detailed description of these industries is presented in Appendix A.

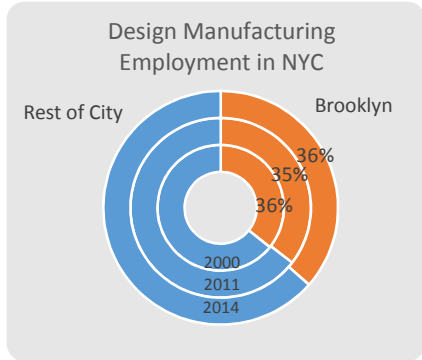
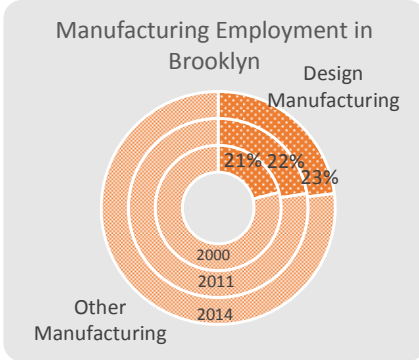
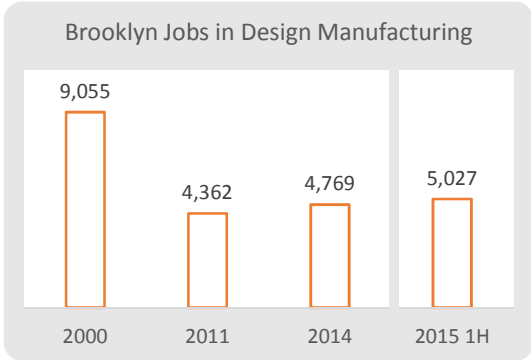
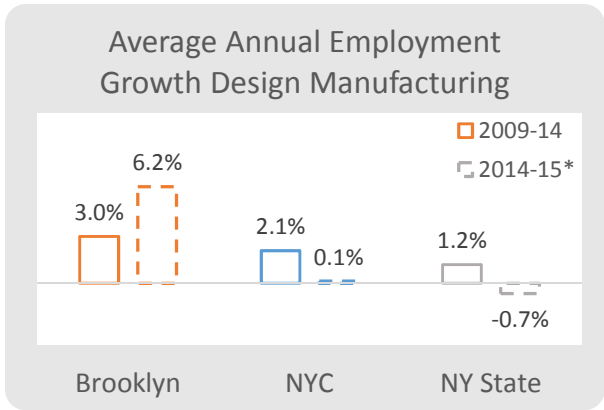
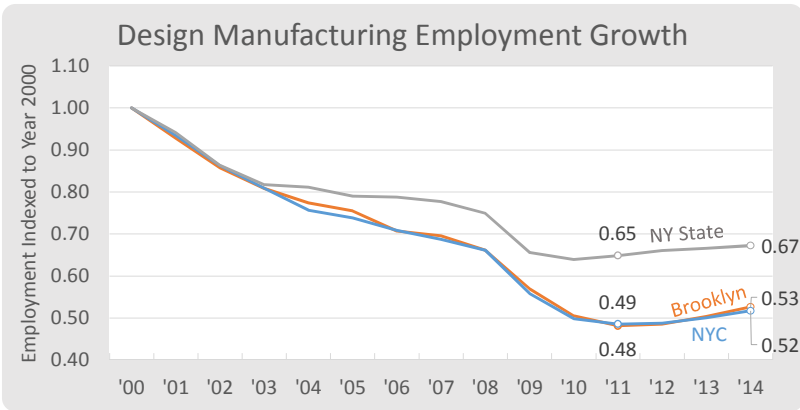
Employment

The design manufacturing industry is the second largest industry within the manufacturing sector in Brooklyn. It accounts for 23% of total employment with approximately 5,027 jobs during the first half of 2015. Brooklyn is an important regional hub for the design manufacturing industry. In 2014, it accounted for nearly 36% of total industry employment in New York City.

Similar to other manufacturing industries nationwide, this industry has undergone a tremendous transformation in Brooklyn. Between 2000 and 2011, it lost more than 50 percent of its job base shrinking from 9,055 jobs to less than 4,770. The pace of decline of this industry in Brooklyn matched the citywide decline, but was more severe than the employment decline experienced in the state as a whole.

Since 2011, the industry appears to have turned around, as design manufacturing has experienced steady employment growth of 3% per year in Brooklyn, surpassing the city’s and state’s rates of growth. Year-over-year employment growth in the first half of 2015 was 6% in Brooklyn. In contrast, employment in this industry in the city did not grow at all during this period and it actually shrunk in the state as a whole.

⁴ The share of workers aged 24 or younger, for which educational attainment is not available, has remained flat at around 8%.

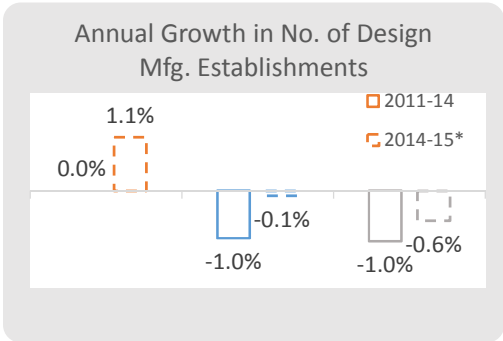
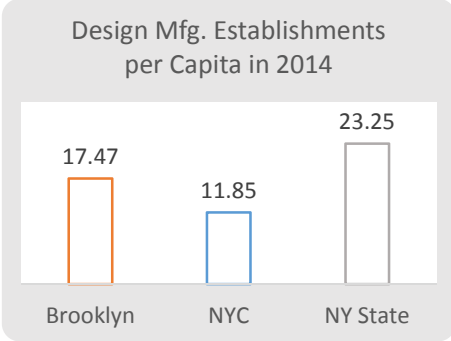
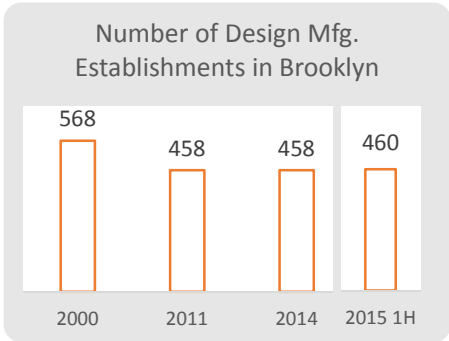


* Data for 2015 is for the first half of the year.

Business Establishments

Brooklyn is home to the most design manufacturing businesses in New York City. There are approximately 460 design manufacturing businesses in Brooklyn (average for first half of 2015). This figure represents 46% of New York City's design manufacturing businesses. Brooklyn has 17.47 design manufacturing businesses per every 100,000 residents compared to New York City's 11.85. Nevertheless, Brooklyn has a lower density of design manufacturing than the state as a whole, which has 23.25 businesses per 100,000 residents.

Unlike employment, which increased at 3% per year between 2011 and 2014, the number of design manufacturing businesses in Brooklyn remained steady between 2011 and 2014. By comparison, the number of businesses in this industry shrank by approximately 1% per year in the city and state. During the first half of 2015, Brooklyn experienced a mild increase in the number of design manufacturing businesses, while the number continued to decline citywide and statewide.



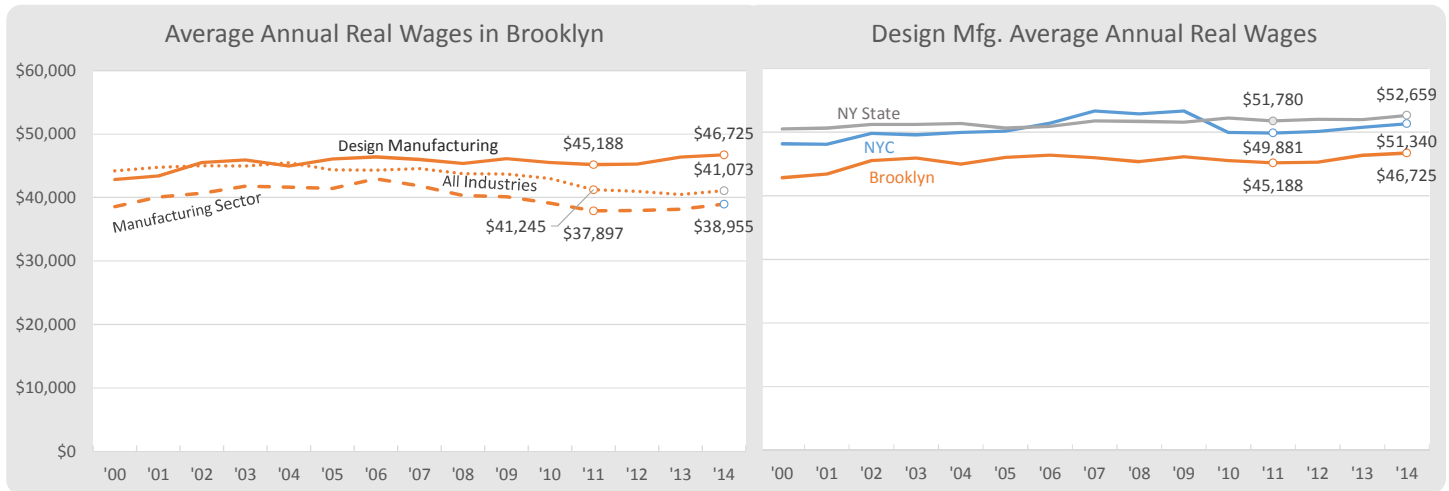
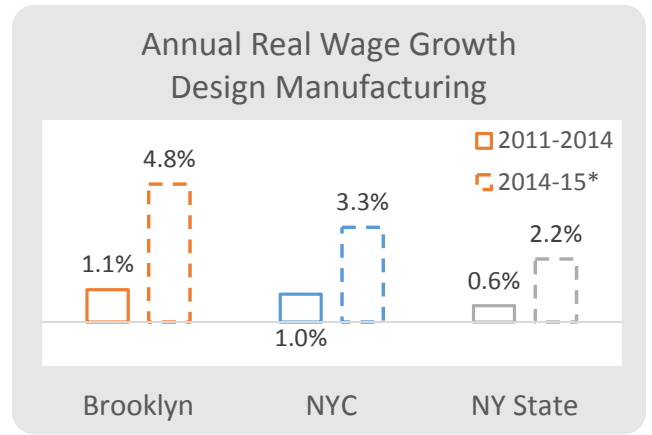
* Data for 2015 is for the first half of the year.
 **Establishments per 100,000 residents.

Real Wages

In 2014, the design manufacturing industry in Brooklyn had an average annual wage of \$46,725, well above the average for the manufacturing sector and the average for all industries in the borough. Significantly, design manufacturing wages have been more stable than wages for the manufacturing sector overall, as well as average wages for all industries in the borough, both of which have declined significantly since 2006.

While this is very positive, design manufacturing average annual wages in Brooklyn trail those of the rest of the city and state by a significant margin.

During the first half of 2015, Brooklyn experienced an increase in real wages significantly larger than the city and state as a whole.

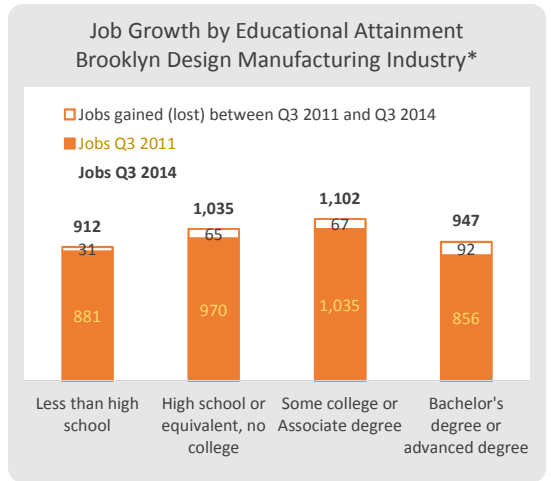
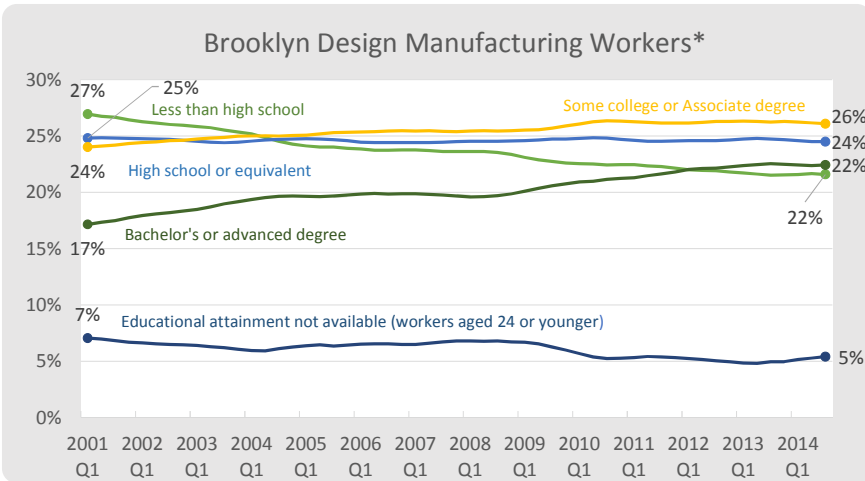


* Data for 2015 is for the first half of the year.

Educational Attainment

Design manufacturing workers today have significantly higher educational level attainment than before. The share of workers with bachelor's and advanced degrees in the industry increased from 17% to 22% between 2000 and 2014, while the share of workers with less than high school education dropped from 27% to 22% during this period. Furthermore, the share of workers with high school degrees or equivalent has remained steady while there has been a slight increase in the share of workers with some college or associates degrees.

Between the third quarter of 2011 (when employment in the industry started to stabilize) and the third quarter of 2014, the number of new workers with college or advanced degrees hired in this industry was three times greater than the number of people with less than high school education.



*Due to data suppression issues, data excludes workers 24 and younger for whom education attainment is not available.

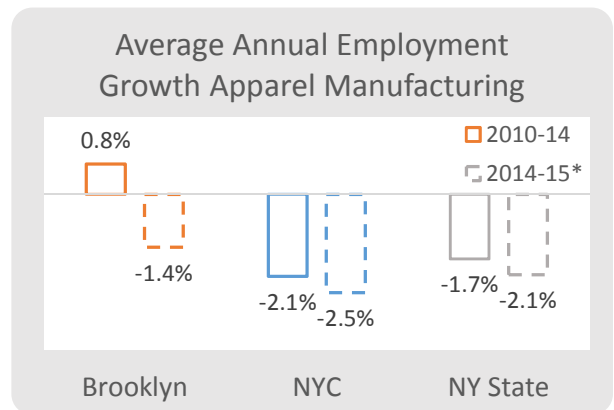
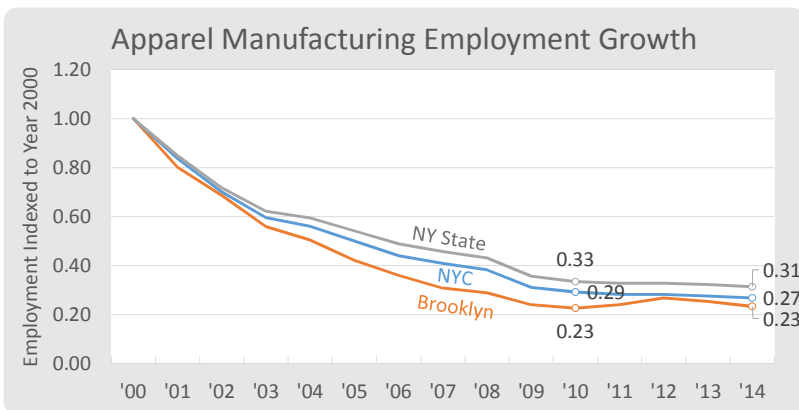
APPAREL MANUFACTURING INDUSTRY

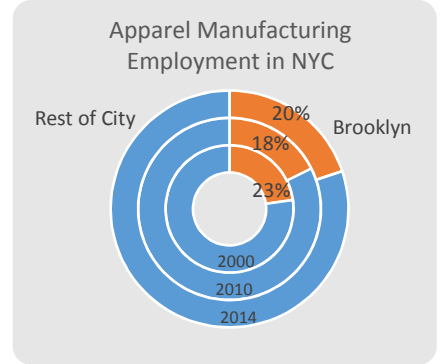
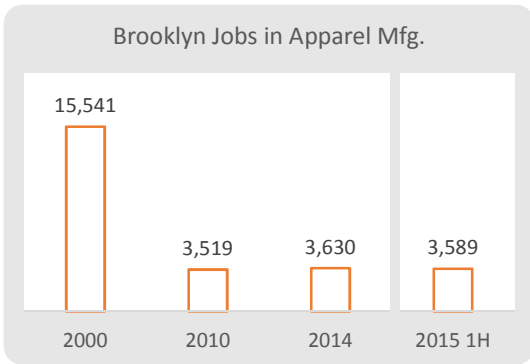
The definition of Apparel Manufacturing used in this analysis includes three additional, related industries: 1) Textile Mills, 2) Textile Product Mills, and 3) Leather and Allied Product Manufacturing. We aggregated these industries because they are part of the supply chain of apparel manufacturing.

Employment

The apparel manufacturing industry is the third largest manufacturing industry in Brooklyn, employing approximately 3,560 workers during the first half of 2015. Employment in this industry plunged between 2000 and 2010, when Brooklyn lost nearly 80% of apparel manufacturing jobs. In 2000, apparel manufacturing accounted for nearly a third of manufacturing employment in Brooklyn. That share is now less than one-fifth.

The job losses during the last decade were more severe in Brooklyn than elsewhere in the city and state. Since 2010 the number of jobs has stabilized, while the rest of the city and state have continued to lose jobs in this industry. It may be premature to conclude that the industry has stabilized, however, since there were some mild losses in 2013, 2014, and the first half of 2015. These declines were not as severe as for the rest of the city and state.



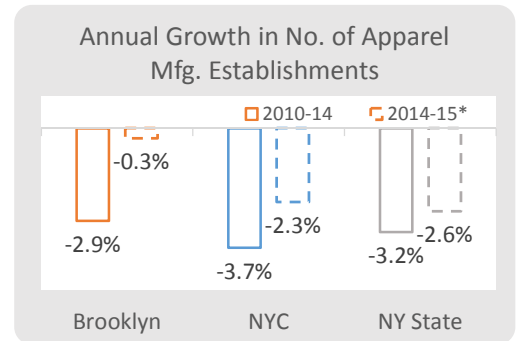
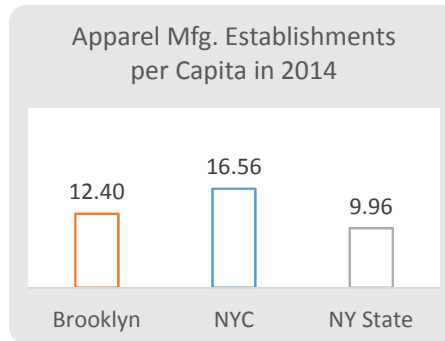
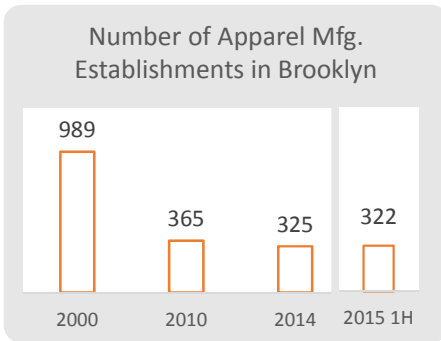


* Data for 2015 is for the first half of the year.

Business Establishments

Brooklyn has also lost a significant number of apparel manufacturing businesses. There were approximately 322 apparel manufacturing businesses in Brooklyn in the first half of 2015, which is only a third of the number in 2000. As a result, Brooklyn has fewer apparel manufacturing businesses per capita than New York City (12.40 and 16.56 per 100,000 residents, respectively). However, it does have a greater concentration of apparel businesses than the state (9.96 per 100,000 residents).

While employment numbers hint toward stabilization, the number of apparel manufacturing businesses in Brooklyn continued to decline between 2010 and 2014. During the first half of 2015, Brooklyn experienced yet another mild decrease in the number of apparel manufacturing businesses. As with job losses in this industry, the decline in the number of businesses was more mild compared to the city and state.



* Data for 2015 is for the first half of the year.

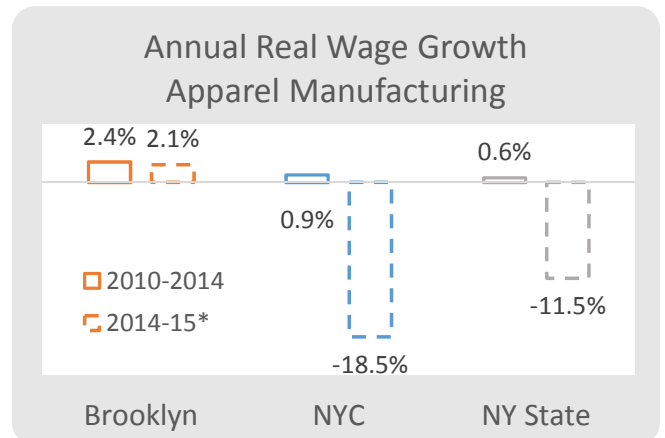
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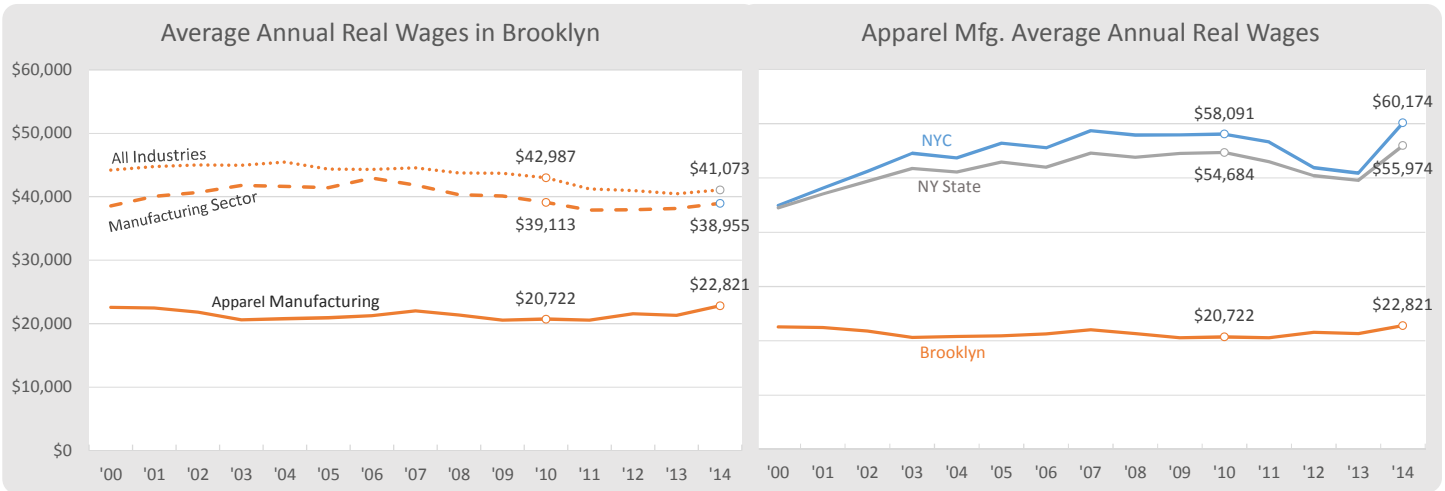
Real Wages

In 2014, the apparel manufacturing industry in Brooklyn had an average annual wage of \$22,821, well below the average for the manufacturing sector and for all industries in the borough. The wages of Brooklyn workers in this industry also trail the rest of the city and state by a significant margin.

While average wages are low, they have held relatively steady since 2000. By comparison, average wages for all industries and the manufacturing sector, in particular, have been declining in real terms.

During the first half of 2015, Brooklyn's apparel manufacturing experienced a mild increase in real wages, while average wages in the city and state plunged.



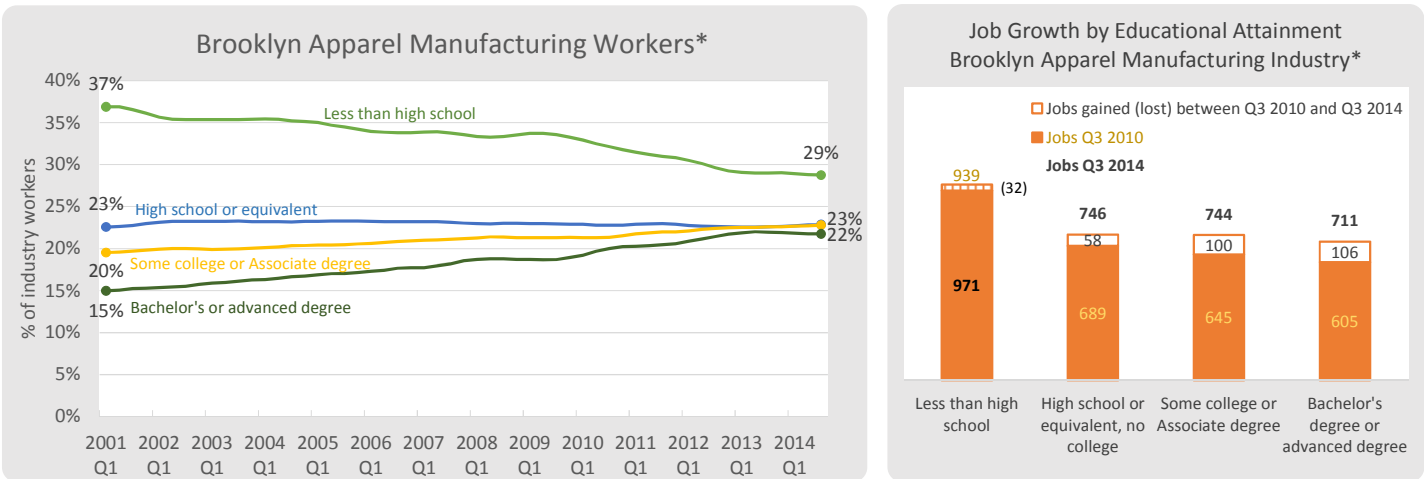


* Data for 2015 is for the first half of the year.

Educational Attainment

Similar to the food and design manufacturing industries, the apparel manufacturing workforce is becoming more educated. The percentage of workers with less than a high school education declined from 37% in 2000 to 29% in 2014. Meanwhile, the share of workers with some college, an associate, bachelor's or advanced degree increased from 35% to 45%.

As employment in the industry stabilized since 2010, the number of jobs for workers with some college, an associate, bachelor's or advanced degree increased by more than 200 new jobs. By comparison, workers with less than a high school education continued to lose jobs, and workers with only a high school degree or equivalent experienced moderate job growth of fewer than 60 total jobs during this four-year period.



*Due to data suppression issues, data excludes workers 24 and younger for whom education attainment is not available.

BEVERAGE MANUFACTURING INDUSTRY

Beverage manufacturing is a small but growing industry in Brooklyn. It is important to note that the statistics presented here underestimate the impact of beverage manufacturing businesses and employment in Brooklyn. According to New York State's Empire State Development Agency there are at least 31 licensed distilleries, breweries, wineries and cideries in Brooklyn. Yet, the Bureau of Labor Statistics Quarterly Census of Employment and Wages (QCEW) only tracks 22 beverage manufacturing business establishments. The primary reasons for this discrepancy are:

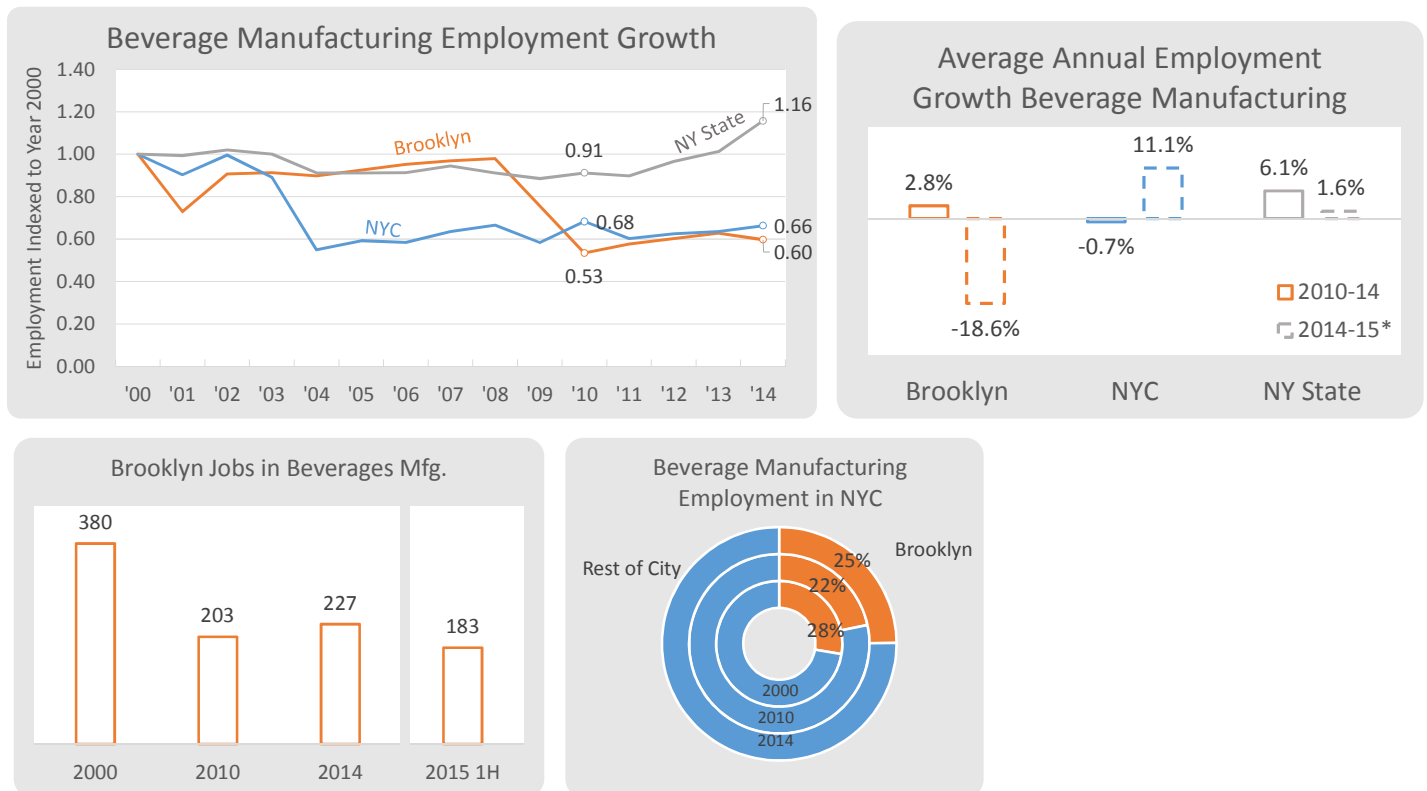
- 1) Some breweries or distilleries may be tracked under other industries, such as food and beverages services (i.e., restaurants and bars) if their products are sold on-site.

- 2) Some of the craft beverage businesses in Brooklyn are in an early stage of growth and therefore are excluded from the official statistics. QCEW data on employment, establishments, and wages excludes proprietors, the unincorporated self-employed, and unpaid family members.

Employment

Due to its relatively small size, it is difficult to identify trends in the Beverage Manufacturing industry. The beverage manufacturing industry accounts for under 1% of manufacturing employment in Brooklyn, with less than 200 employees during the first half of 2015. Despite such small numbers, Brooklyn still accounts for 25% of beverage manufacturing employment in New York City.

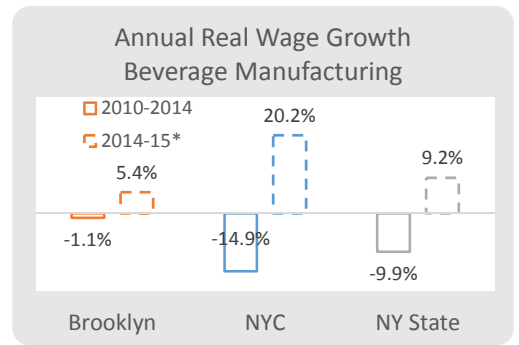
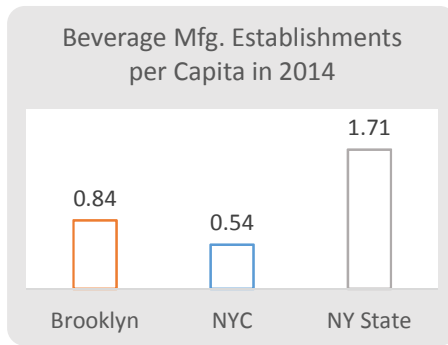
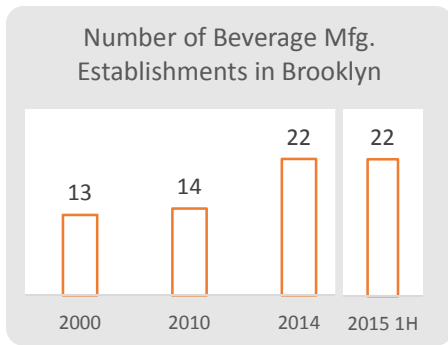
There has been an overall drop in employment since 2000, with the greatest number of job losses in 2009 and 2010 when nearly 170 jobs were lost in Brooklyn. This represented a loss of more than half of the jobs in this industry in Brooklyn. The industry has since stabilized, growing at approximately 3% per year. While this rate of growth is higher than the city as a whole, it is only half the rate of growth experienced in the state.



* Data for 2015 is for the first half of the year.

Business Establishments

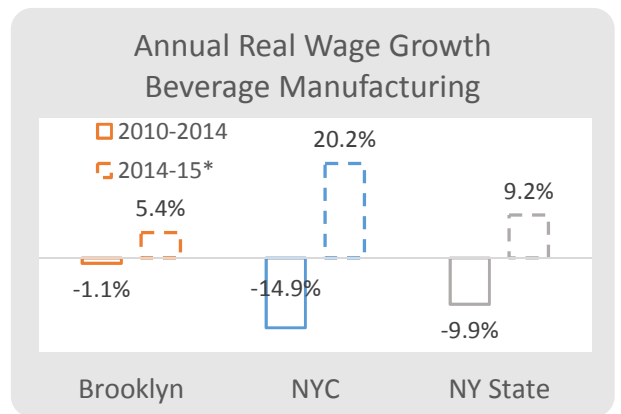
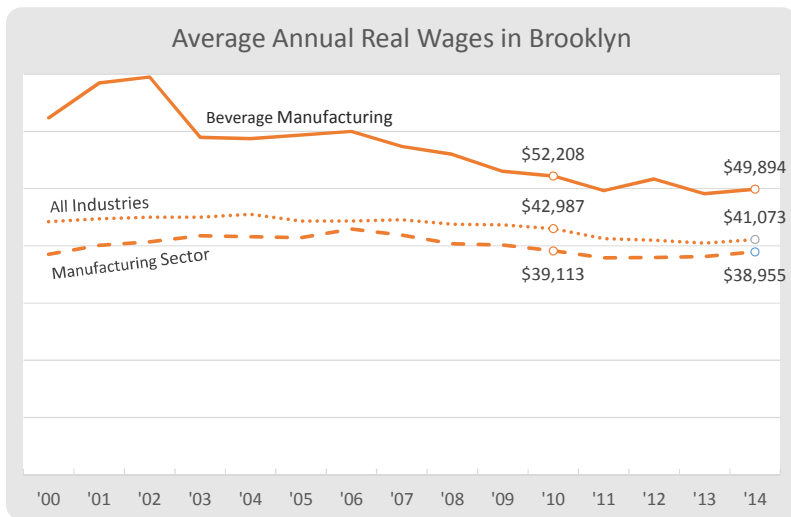
While employment growth has been moderate, the number of beverage manufacturing establishments has grown by nearly 60% since 2010. As a result Brooklyn has a higher number of beverage manufacturing businesses per 100,000 residents than the city, although it still trails the state by a significant margin. As shown below, Brooklyn has outpaced the city and state in the rate of new business formation in this industry since 2010. The rapid growth in the number of establishments is promising for employment in the industry in Brooklyn, because as those new businesses mature, they are likely to create new jobs.



Real Wages

Average annual wages of beverage manufacturing workers in Brooklyn are significantly higher (\$49,894) than average wages for workers in the manufacturing sector as whole (\$38,955) and for all industries (\$41,073).

Average wages in the industry declined significantly between 2002 and 2010, however, they have stabilized since then. Between 2010 and 2014 industry wages in Brooklyn declined by just 1.1% per year compared to nearly 15% per year in New York City and nearly 10% in New York State.



* Data for 2015 is for the first half of the year.

Craft Beverages Industry Overview

Alcohol production in Brooklyn dates back to the late 1760's when a distillery was established where Atlantic Avenue crosses Columbia Street.⁵ Lore has it that production was so important to the men of the time that during the Revolutionary War the British seized the plant as the "King's Brewery" to produce 20 barrels of beer a day for their own troops.⁶ Output of beer in Brooklyn only grew from there, partially due to New York State's extraordinary hop production which peaked in the 1850s when it led the nation with annual sales of over three million pounds.⁷ During that time, North Brooklyn was considered the brewing capital of the state and, some might say of America, with Brewers Row on Meserole Street home to at least a dozen producers. These breweries didn't just provide jobs and a place to socialize, they physically shaped the neighborhood. The companies built grand homes for the owners, brownstones for the managers and workers, and brought running water, sanitation, and electricity to the area.

Whiskey production was so prolific in Brooklyn in the 1860s and 70s that distillery tax evasion was enough to prompt the federal government, desperate for revenue to fund the Civil War, to send thousands of troops to the Navy Yard. The worst two years of violent

⁵ "New York's First Distillery Since Prohibition Keeps the Liquor History Brewing" Observer. <http://observer.com/2015/12/kings-county-distillery-tasting/>

⁶ "Brooklyn Heights History: Phillip Livingston" Brooklyn Heights Blog. <http://brooklynheightsblog.com/archives/29375>

⁷ "New York State: America's Former Hop Capital" Craft Beer. <http://www.craftbeer.com/craft-beer-muses/new-york-state-americas-former-hop-capital>

raids throughout Kings County occurred in 1869 and 1870 are known as the Whiskey Wars of Brooklyn.⁸ Distillers ranged from industrial shops which could produce 45,000 gallons a week to individuals producing only a few gallons totaling almost 35 million gallons a year.⁹ The greatest concentration was in Brooklyn's Fifth Ward, also known as Vinegar Hill, named after legitimate distilleries converted to "vinegar" factories to avoid taxes that are the modern-day equivalent of \$30 a gallon.

Prohibition ended Brooklyn's reign as producer and farmers in New York State stopped growing hops and barley in favor of corn and vegetables. For decades, laws created during Prohibition remained on the books making it all but impossible for new urban distillers and brewers to open. Over the last 5 years, several pieces of state legislation aimed at promoting wine, beer, and spirits along with New York State agriculture have resulted in exponential growth in new licenses across the state. The legislation included¹⁰:

- A new class of "farm distillery" licenses for products with a specified portion of ingredients from New York State farms
- Permission for distilleries to open tasting rooms and retail shops on their premises
- A raised production cap for small producers
- Allowance for retail stores to give tastings without the presence of a manufacturer's representative

The boom in licenses has had statewide benefits with at least one licensee in all 62 New York State counties. But the growth has been particularly good for Brooklyn and the borough is home to at least 31 licensed distilleries, breweries, wineries and cideries. While production and employee costs might be cheaper elsewhere, the distillers are attracted to the borough for several reasons.

First, they benefit from being close to their ultimate consumer, since these smaller firms tend to distribute hyper-locally until they gain market traction. With a focus on the use of local product and local production and the associated smaller carbon footprint, there is distinct marketing to individuals, retailers, restaurants, and bars that value these elements. As one example, Robert, a cocktail bar in Boerum Hill, opened its doors in 2015 with a mixologist focused exclusively on spirits from New York State.

Initially, Brooklyn was seen as a relatively affordable place to rent industrial space due to a number of dormant manufacturing sites waiting to be repurposed. But, similar to the increased demand for residential and commercial real estate in the borough, industrial real estate rents have escalated to a point that is unsustainable for the typical start up. With the exception of some enclaves in Industry City and the Brooklyn Navy Yard, there are not many affordable options available. In addition, individual industrial property owners are reluctant to sign the kind of long term lease that allows distillers and brewers to be comfortable making the necessary large capital investments. However, the unique density and interconnectedness of brewing in Brooklyn support opportunities for burgeoning brewers. Entrepreneurs without enough start-up capital to operate independently from day one can work with breweries with excess capacity to contract brew. Over a dozen Brooklyn brewers are known to be "gypsy" brewers, as it's known in the industry.¹¹ This kind of experimentation can happen even prior to being licensed and allows for building brand recognition and a buying audience locally. For some brewers, this stepping stone becomes part of their business model. Chris Cuzme currently brews his brand, Cuzett Libations at Greenpoint Beer Works. When he opens his own brewery, 5th Hammer Brewing Company, he hopes to have the capacity to accommodate other small brewers until he needs to maximize production.

Finally, there are economies of agglomeration or network effects from having the businesses clustered together. The small stills and very small batches that are common in Kings County allow for a level of experimentation and flexibility that gives Brooklyn distillers an edge over larger companies and the national competition. The innovation that Brooklyn distillers are world famous for is partly due to the collaborative culture that encourages mixing ideas.

However, there are challenges to this continued growth. In addition to real estate costs, the industry faces constraints outside of the control of the state legislature. The breweries, in particular, are limited by distribution systems through wholesalers owned by giant beer

⁸ "The Whiskey Wars That Left Brooklyn in Ruins" Smithsonian. <http://www.smithsonianmag.com/history/whiskey-wars-left-brooklyn-ruins-180953352/>

⁹ "New York's First Distillery Since Prohibition Keeps the Liquor History Brewing" Observer. <http://observer.com/2015/12/kings-county-distillery-tasting/>

¹⁰ New York State Governor's Office. "Wine, Beer, & Cider Summit". http://www.governor.ny.gov/sites/governor.ny.gov/files/archive/assets/documents/Beer_&_Wine_Summit_Final_April_2014_FINAL.PDF

¹¹ "Some of the city's top beermakers are brewing on borrowed time" Crain's New York. <http://www.crainnewyork.com/article/20160203/PHOTOFINISH/160209939/some-of-the-citys-top-beermakers-are-brewing-on-borrowed-time>

corporations who are not inclined to promote craft products.¹² And New York State farmers aren't growing nearly enough hops for breweries; the required percentage of locally sourced grain under the farm brewery and distillery licenses increases from 20% in 2018 to 90% in 2024.¹³

Despite these challenges, Brooklyn beers and spirits are getting national and international recognition in the form of awards and demand. Brooklyn Brewery is one of the top 10 craft beer producers in the country. Distillers, including New York Distilling, Brueckelen and Kings County Distillery, are benefiting from international demand for all things Brooklyn and are shipping an increasing amount of product to Europe and Japan.

While the industry is growing exponentially, it is difficult to be certain of the employment impacts. On a statewide basis, the average distiller employs nearly 200 workers.¹⁴ However, this includes wineries and cideries in upstate New York with agricultural components. Even the most established craft distilleries in Brooklyn indicate anecdotally that full-time salaried staff are limited to 4 or 5 and hourly staff range by season to up to two dozen for summer events and temporary food service or catering.

In addition to direct employment, there are local ripple effects in employment in related industries: marketing, delivery, bar/event space rental, label making and bottling, and graphic design. In fact, the industry's expansion prompted the launch of the first hop plant production in New York City. Tinyfield Rooftop Farm launched its 1,000 square foot operation on the roof of the former Pfizer Building in 2015 and offers fresh hops, in contrast to the usual preserved, pelletized hops used by most breweries.¹⁵

¹² "Craft Beer is Booming, but Some Brewers Worry About the Future" The New York Times. www.nytimes.com/2015/10/22/opinion/craft-beer-is-booming-but-some-brewers-worry-about-the-future.html

¹³ "How New York Legislation Helped Put Local Liquor in Your Cabinet" Edible Manhattan. <http://www.ediblemanhattan.com/departments/liquid-assets/booze-lose/>

¹⁴ "Exclusive: Most Licensed Booze Makers in New York State housed in Brooklyn" New York Daily News. <http://www.nydailynews.com/new-york/brooklyn/brooklyn-booze-makers-new-york-state-article-1.2393460#ifrndnlogoogle>

¹⁵ "This Tiny Rooftop Farm is Hoping to Revolutionize NYC's Craft Breweries" Gothamist. http://gothamist.com/2015/12/14/tinyfield_farm_hops_brooklyn.php

Manufacturing Sector Training Programs

Jobs in the manufacturing sector are a pathway to the middle-class, especially for immigrants and people with low educational attainment. Wages in the manufacturing sector are higher than other industries such as retail, transportation, administration and entertainment sectors.

The Chamber has been working directly with manufacturers since the creation of the Industrial and Manufacturing Coalition in 2013. The Chamber's targeted manufacturing workforce program (WIN for Manufacturers) has helped the borough's manufacturers find qualified candidates to fill open positions within their firms. Through this program, the Chamber learned that while there are jobs available at these firms, skilled labor is extremely scarce. This raises questions about the current state of the workforce development system and the training opportunities available to individuals who might be seeking employment in manufacturing, but do not necessarily hold the technical qualifications needed for the positions available.

The positions in question range across manufacturing sub-sectors like apparel production, furniture production, and food manufacturing, which are the most prevalent types of firm in Brooklyn. Jobs like sewing-machine operators, patternmakers, cabinet maker, production assistant, woodworkers, welders, are just some of the positions that are increasingly difficult to fill with today's workforce. Adequate training would provide an opportunity for individuals with certain barriers to employment to take advantage of these opportunities.

Manufacturing training programs for adults in New York are limited and do not meet the current demand of the sector. Most of the training programs offered focus on transportation, such as commercial driving programs.

Below is an overview of the training programs available to job-seekers. Note that this overview focuses on outlining programs available to job-seekers outside of the public school system.

Workforce 1's Industrial and Transportation Center

The City's Workforce 1 system has an Industrial and Transportation Career Center in Queens. They work mostly within the transportation, construction, and wholesale trade industries, and minimally within manufacturing.

Aside from soft skills training programs like business communication, resume building, and interviewing workshops, they offer 5-hour industry orientations for the following industry foci:

- Truck and Ground Transportation
- Transportation Support, Professional Services, and Management
- Construction and Manufacturing
- Warehouse, Aviation, and Entry-Level Labor

In addition, they offer individual training grants for commercial drivers (Class A, B, & C).

Brooklyn Workforce Innovations:

BWI's Brooklyn Woods program offers free full time training to unemployed and low-income New Yorkers in woodworking skills, providing them with a solid foundation to begin a career in woodworking, cabinetmaking and fabrication. Brooklyn Woods runs five 7-week cycles per year and trains 50-60 individuals per year.

BWI at BLDG 92 Brooklyn Navy Yard is a free program that provides 5 weeks of training in skills manufacturing employers are looking for, plus job placement assistance.

Red Hook on the Road (RHOR):

RHOR helps unemployed and low-income New Yorkers start good careers in commercial driving. After four weeks of classroom and behind-the-wheel training, RHOR students are prepared to take the NYS CDL road test. Once

licensed, RHOR places graduates in a variety of jobs driving school buses, coaches, Access-A-Ride vehicles, and trucks.

WishWas:

WishWas offers ten-month course in apparel construction, pattern making projects, and product making. Classes start from September to June every year.

APEX Technical School:

Founded in 1961, APEX Technical School now offers seven certificate courses that can be completed in as few as seven months in the following areas:

- Automotive service and repair
- Refrigeration, air conditioning
- Appliance and controls
- Auto body repair
- Electrical and advanced electrical
- Combination welding technology
- Plumbing and pipefitting or construction skills: plumbing, carpentry, and electrical

HOPE Program:

In collaboration with Brooklyn FoodWorks - a new food incubator in Central Brooklyn - the HOPE Program offer an eight-weeks/280 hours training including product recognition, food safety, field trips, networking with industry professionals, OSHA 10 and food handler's certification.

Appendix A – Industry Definitions

Food Manufacturing

The food manufacturing industry is comprised of all businesses under NAICS 311 (Food Manufacturing).

Industries in the Food Manufacturing subsector transform livestock and agricultural products into products for intermediate or final consumption. The industry groups are distinguished by the raw materials (generally of animal or vegetable origin) processed into food products. The food products manufactured in these establishments are typically sold to wholesalers or retailers for distribution to consumers, but establishments primarily engaged in retailing bakery and candy products made on the premises not for immediate consumption are included.”

Design Manufacturing

The design manufacturing industry is comprised of 5 NAICS Industries, each of which is described in detail below. The pie chart shows the breakdown of employment in the Design Manufacturing Industry disaggregated by each of the NAICS industries.

NAICS 326 Plastics and Rubber Products Manufacturing

Industries in the Plastics and Rubber Products Manufacturing subsector make goods by processing plastics materials and raw rubber. The plastics and rubber products manufacturing subsector consists of these industry groups:

- Plastics Product Manufacturing: NAICS 3261
- Rubber Product Manufacturing: NAICS 3262

NAICS 331 - Wood Product Manufacturing

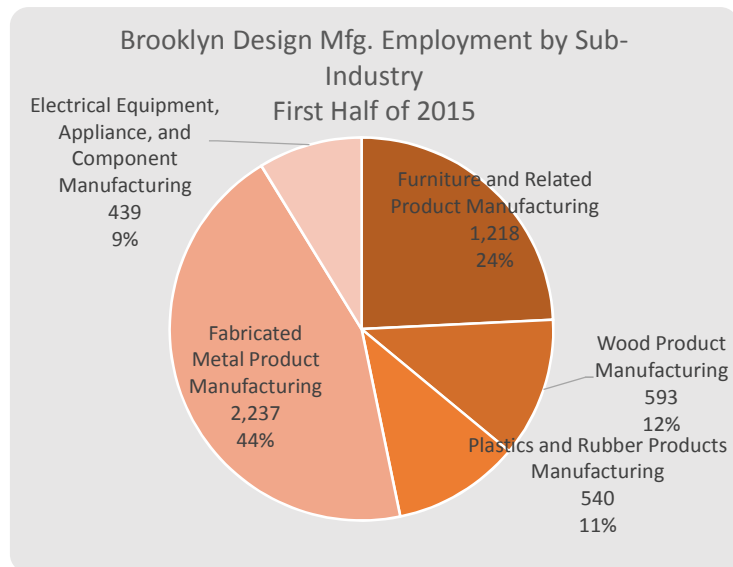
Industries in the Wood Product Manufacturing subsector manufacture wood products, such as lumber, plywood, veneers, wood containers, wood flooring, wood trusses, manufactured homes (i.e., mobile homes), and prefabricated wood buildings. The wood product manufacturing subsector consists of these industry groups:

- Sawmills and Wood Preservation: NAICS 3211
- Veneer, Plywood, and Engineered Wood Product Manufacturing: NAICS 3212
- Other Wood Product Manufacturing: NAICS 3219

NAICS 332 Fabricated Metal Product Manufacturing

Industries in the Fabricated Metal Product Manufacturing subsector transform metal into intermediate or end products, other than machinery, computers and electronics, and metal furniture, or treat metals and metal formed products fabricated elsewhere. The fabricated metal product manufacturing subsector consists of these industry groups:

- Forging and Stamping: NAICS 3321
- Cutlery and Handtool Manufacturing: NAICS 3322
- Architectural and Structural Metals Manufacturing: NAICS 3323



- Boiler, Tank, and Shipping Container Manufacturing: NAICS 3324
- Hardware Manufacturing: NAICS 3325
- Spring and Wire Product Manufacturing: NAICS 3326
- Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing: NAICS 3327
- Coating, Engraving, Heat Treating, and Allied Activities: NAICS 3328
- Other Fabricated Metal Product Manufacturing: NAICS 3329

NAICS 335 Electrical Equipment, Appliance, and Component

Industries in the Electrical Equipment, Appliance, and Component Manufacturing subsector manufacture products that generate, distribute and use electrical power. Electric Lighting Equipment Manufacturing establishments produce electric lamp bulbs, lighting fixtures, and parts. Household Appliance Manufacturing establishments make both small and major electrical appliances and parts. Electrical Equipment Manufacturing establishments make goods, such as electric motors, generators, transformers, and switchgear apparatus. Other Electrical Equipment and Component Manufacturing establishments make devices for storing electrical power (e.g., batteries), for transmitting electricity (e.g., insulated wire), and wiring devices (e.g., electrical outlets, fuse boxes, and light switches).

The electrical equipment, appliance, and component manufacturing subsector consists of these industry groups:

- Electric Lighting Equipment Manufacturing: NAICS 3351
- Household Appliance Manufacturing: NAICS 3352
- Electrical Equipment Manufacturing: NAICS 3353
- Other Electrical Equipment and Component Manufacturing: NAICS 3359

NAICS 337 Furniture and Related Product Manufacturing

Industries in the Furniture and Related Product Manufacturing subsector make furniture and related articles, such as mattresses, window blinds, cabinets, and fixtures. The integrated design of the article for both esthetic and functional qualities is also a major part of the process of manufacturing furniture. Design services may be performed by the furniture establishment's work force or may be purchased from industrial designers. The furniture and related product manufacturing subsector consists of these industry groups:

- Household and Institutional Furniture and Kitchen Cabinet Manufacturing: NAICS 3371
- Office Furniture (including Fixtures) Manufacturing: NAICS 3372
- Other Furniture Related Product Manufacturing: NAICS 3379

Apparel Manufacturing

The definition of Apparel Manufacturing used in this analysis includes three additional, related industries. The pie chart shows the breakdown of employment in the Apparel Manufacturing Industry disaggregated by each of the NAICS industries.

NAICS 313 Textile Mills

Industries in the Textile Mills subsector group establishments that transform a basic fiber (natural or synthetic) into a product, such as yarn or fabric that is further manufactured into usable items, such as apparel, sheets, towels, and textile bags for individual or industrial consumption. The further manufacturing may be performed in the same establishment and classified in this subsector, or it may be performed at a separate establishment and be classified elsewhere in manufacturing.

- Fiber, Yarn, and Thread Mills: NAICS 3131
- Fabric Mills: NAICS 3132

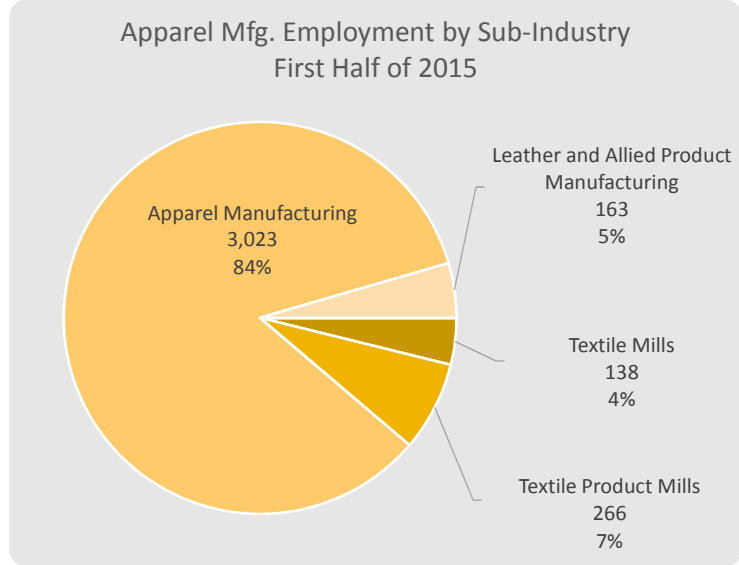
- Textile and Fabric Finishing and Fabric Coating Mills: NAICS 3133

NAICS 314 Textile Product Mills

Industries in the Textile Product Mills subsector group establishments that make textile products (except apparel). With a few exceptions, processes used in these industries are generally cut and sew (i.e., purchasing fabric and cutting and sewing to make nonapparel textile products, such as sheets and towels).

NAICS 315 Apparel Manufacturing

Industries in the Apparel Manufacturing subsector group establishments with two distinct manufacturing processes: (1) cut and sew (i.e., purchasing fabric and cutting and sewing to make a garment), and (2) the manufacture of garments in establishments that first knit fabric and then cut and sew the fabric into a garment. The Apparel Manufacturing subsector includes a diverse range of establishments manufacturing full lines of ready-to-wear apparel and custom apparel: apparel contractors, performing cutting or sewing operations on materials owned by others; jobbers performing entrepreneurial functions involved in apparel manufacture; and tailors, manufacturing custom garments for individual clients are all included. Knitting, when done alone, is classified in the Textile Mills subsector, but when knitting is combined with the production of complete garments, the activity is classified in Apparel Manufacturing.



The apparel manufacturing subsector consists of these industry groups:

- Apparel Knitting Mills: NAICS 3151
- Cut and Sew Apparel Manufacturing: NAICS 3152
- Apparel Accessories and Other Apparel Manufacturing: NAICS 3159

NAICS 316 Leather and Allied Product Manufacturing

Establishments in the Leather and Allied Product Manufacturing subsector transform hides into leather by tanning or curing and fabricating the leather into products for final consumption. It also includes the manufacture of similar products from other materials, including products (except apparel) made from "leather substitutes," such as rubber, plastics, or textiles. Rubber footwear, textile luggage, and plastics purses or wallets are examples of "leather substitute" products included in this group. The products made from leather substitutes are included in this subsector because they are made in similar ways leather products are made (e.g., luggage). They are made in the same establishments, so it is not practical to separate them. The leather and allied product manufacturing subsector consists of these industry groups:

- Leather and Hide Tanning and Finishing: NAICS 3161
- Footwear Manufacturing: NAICS 3162
- Other Leather and Allied Product Manufacturing: NAICS 3169

Beverage Manufacturing

NAICS 312 Beverage and Tobacco Product Manufacturing

Industries in the Beverage and Tobacco Product Manufacturing subsector manufacture beverages and tobacco products. The industry group, Beverage Manufacturing, includes three types of establishments: (1) those that manufacture nonalcoholic beverages; (2) those that manufacture alcoholic beverages through the fermentation process; and (3) those that produce distilled alcoholic beverages. Ice manufacturing, while not a beverage, is included with nonalcoholic beverage manufacturing because it uses the same production process as water purification. The industry group, Tobacco Manufacturing, includes two types of establishments: (1) those engaged in redrying and stemming tobacco and, (2) those that manufacture tobacco products, such as cigarettes and cigars. However, it should be noted that data for Brooklyn is likely to have few (1 or none) tobacco product manufacturing businesses.¹⁶

Appendix B - Data sources

Employment, Establishments, and Wages

Data on employment, establishment and wages are from the New York State of Bureau Statistics' Quarterly Census of Employment and Wages (QCEW). The QCEW represent the complete and final count of employment and wages for workers covered by State Unemployment Insurance (UI) laws and the Unemployment Compensation for Federal Employees (UCFE). Data are aggregated industry as defined under the 2012 North American Industry Classification System (NAICS).

Data from the QCEW excludes proprietors, the unincorporated self-employed, unpaid family members, and certain farm and domestic workers. The employment count also excludes workers who earned no wages during the entire applicable pay period because of work stoppages, temporary layoffs, illness, or unpaid vacations. The data are by place of employment, meaning that a job in Brooklyn is counted a Brooklyn job regardless of where the person who holds that job lives.

The QCEW provides wage data in nominal terms. Land Econ Group estimated real wages by applying the Consumer Price Index (CPI) for Urban Wage Earners and Clerical Workers in the New York-Northern New Jersey-Long Island, NY-NJ-CT-PA region. CPI data are from the U.S. Bureau of Labor Statistics.

Please note that annual data are only available through 2014. Data for 2014 and 2015 are preliminary and subject to revision. Also, data for 2015 is only available for the first two quarters of 2015. Employment, Establishment and Wages for 2015 presented in this study represents an average for the first two quarters of 2015. It is important to note that due to seasonal fluctuations, it is not possible to compare data for the first half of 2015 with previous years. However, whenever appropriate, data for the first half of 2015 is compared against data for the first half of 2014.

Additional information about these data can be found at <https://labor.ny.gov/stats/LSQCEW.shtm>

Educational Attainment

Data on education attainment of workers are from the Quarterly Workforce Indicators (QWI). QWI makes available are a set of economic indicators including employment, job creation, earnings, and other measures of employment flows. The QWI are reported based on detailed firm characteristics (geography, industry, age, size) and worker demographics information (sex, age, education, race, ethnicity) and are available tabulated to national*, state, metropolitan/micropolitan areas, county, and Workforce Investment Board (WIB) areas.

Additional information about these data is available at <http://qwiexplorer.ces.census.gov>

¹⁶ An internet search identified only one business that could potentially be cataloged as tobacco manufacturing in Brooklyn.