

# Approaches to Immigration Policy and their Impacts on Boston

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Boston's healthcare, scientific, educational, and finance sectors have driven its recent economic growth. Foreign-born workers have supplied needed labor in these sectors. Using the REMI model, this report examines the economic impact that two proposed changes in U.S. immigration policy would have on Boston's economy over a 10-year period.



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## Introduction

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Boston's population and labor force have steadily grown since 1980, and the foreign born have contributed a disproportionate share of this growth. The Immigration Act of 1965, which abolished the quota system from the Immigration Act of 1924, led to increased immigration to the United States and helped shape Boston's population and labor force growth. Under the current immigration system, H-1B visas and employment-based green cards are mechanisms for U.S. companies to hire foreign-born workers. However, the temporary worker visas and employment-based green cards are limited by annual quotas, which have remained constant since 1990.<sup>1</sup> Reforms have been proposed to increase these quotas. Their goal is to provide U.S. companies with an adequate supply of higher skilled workers allowing for needed human capital to remain competitive in the global economy. This report estimates the impacts of one set of recently proposed immigration reforms on Boston's economy.

Inspired by the Business Roundtable's "Economic Effects of Immigration Policies: A 50 State Analysis" that estimated changes to Massachusetts' economy,<sup>2</sup> the Boston Planning and Development Agency (BPDA) Research Division examined the effect of proposed immigration policies on Boston's workforce from 2019 to 2028. Two pieces of legislation analyzed by the Business Roundtable, the Immigration Innovation Act of 2018 (I-Squared) and Border Security, Economic Opportunity, and Immigration Act of 2013 (S. 744)<sup>3</sup> provided examples of possible changes to immigration policy, including increases in H-1B visas and STEM-exempted green cards. We estimate these proposed immigration changes would allow Boston businesses to hire an additional 5,734 foreign-born workers over the 10-year period. According to our analysis using the REMI model, these foreign-born workers would increase Boston's annual gross city product (GCP) by \$1.2 billion and generate 3,549 indirect and induced jobs by 2028. These workers would also bring approximately \$1.5 billion in human capital value with them to Boston.

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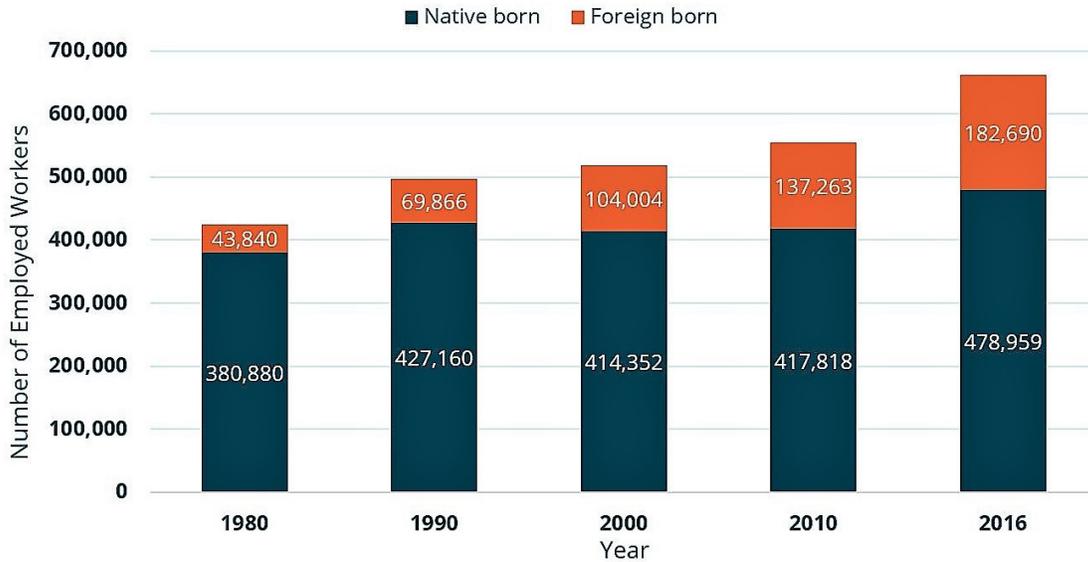
## Background

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Figure 1 shows the large growth in foreign-born workers holding jobs in Boston from 1980 to 2016. During this period, employment located in Boston grew by 56 percent. Foreign-born workers contributed to this large growth in

employment.<sup>4</sup> Boston's foreign-born workforce grew by 317% while the native-born workforce grew by 26%. The foreign born composed 28% of Boston's total employment in 2016, compared to 17% of the total employment in the United States.

**FIGURE 1: Workers Holding Jobs in Boston by Nativity**  
1980 to 2016

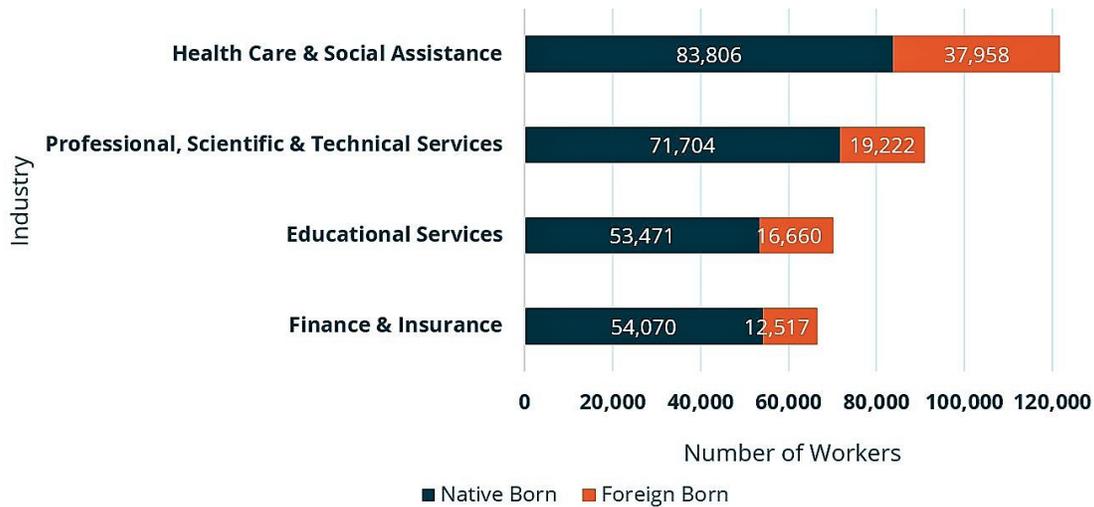


Source: 1980, 1990 & 2000 Decennial Census (IPUMS) & 2010 and 2016 American Community Survey, BPDA Research Division Analysis

Figure 2 shows Boston's four leading industries measured by employment in 2016 and the nativity of workers. These industries tend to require more high-skilled workers, and recruitment of foreign-born workers may help

firms find the talent they need. For example, health care & social assistance alone employed 37,958 foreign-born workers in 2016, making up approximately one-third of the workforce in this industry.

**FIGURE 2: Boston's Top-Four Industries<sup>5</sup>**  
2016



Source: 2016 American Community Survey 1-year Estimates, 2016 American Community Survey (PUMS), BPDA Research Division Analysis

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## Recruitment of Highly Educated Immigrants in STEM Fields

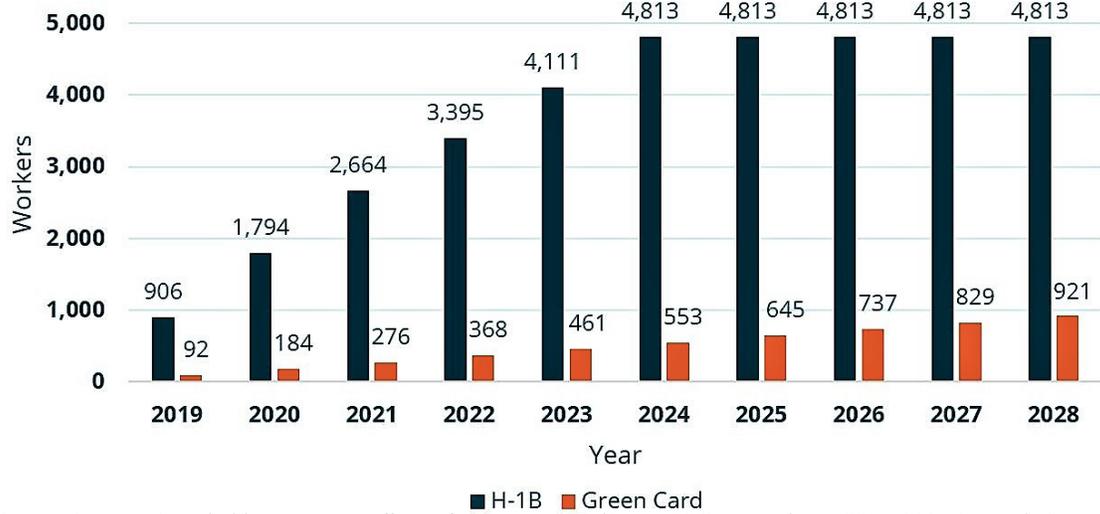
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Some proposed changes to U.S. immigration policy aim to expand the number of highly-educated immigrants available to work in STEM fields. The cap on H-1B visas could be increased, which would boost the number of high-skilled jobs available to foreign-born workers. The Business Roundtable assumed that the H-1B cap would increase to 155,000 at the national level, 70,000 more than the current H-1B cap of 85,000. We use the Office of Foreign Labor Certification (OFLC) 2016 Annual Report Data to break down the H-1B increase to the local level. We estimate Boston's labor force would gain 906 additional H-1B workers per year from 2019 to 2024, and the rest of Massachusetts would gain 1,553 additional H-1B workers. In 2024 the H-1B worker growth rate would drop to 0, indicating no net growth after 2024 because the maximum stay with an H-1B visa is six years (three years that can be renewed once). After that period, H-1B holders need to obtain a green card or leave the country. The Business Roundtable assumed 2% of H-1B workers leave every year, 16% leave after three years, and all H-1B workers go back to their home countries or obtain green cards after six years. Although some H-1B visa holders successfully petition for green cards, the net effect would be as if all H-1B workers leave the country after six years. Thus, the new additional H-1B visa holders who enter after 2018 would begin to leave the country in 2024 so the maximum net additional H-1B visa holders in Boston is 4,813. Figure 3 shows their cumulative employment changes in Boston from 2019 to 2028.

A second immigration policy change, green card reform, could allow STEM graduates with graduate degrees to be exempted from the employment-based green card cap. Figure 3 also shows steady but smaller growth in STEM green card holders in Boston businesses who are exempted from employment-based green card cap each year. The Business Roundtable estimated that of the 76,000 foreign-born STEM graduates yearly in the United States, 20% (or 15,200) would be granted green cards. Accordingly, we estimate Boston's share of this increase to be 92 additional workers each year for Boston's labor force. The rest of Massachusetts would gain an additional 429 workers with STEM-exempted green cards. In contrast to the H-1B visa program, green card holders can stay in the U.S. labor force without time constraint so the employment of green card holders would continue to increase annually over the 10 years.

H-1B and STEM-exempted green card workers would be employed in leading sectors in Boston's economy. This analysis uses historical United States Citizenship and Immigration Services (USCIS) data for H-1B petitions in 2017 to assign these workers to industries. Most industries are directly related to STEM fields (professional, scientific, and technical services). For example, the top five industries of petitions are as follows: custom computer programming services (32.8%), computer systems design services (10.3%), colleges, universities, and professional schools (4.6%), engineering services (2.1%), and other computer related services (2.0%).

**FIGURE 3: Expected Cumulative Change in Non-Citizen Workers in Boston**  
2019 to 2028



Source: Business Roundtable, "Economic Effects of Immigration Policies: A 50 State Analysis", 2017, BPDA Research Division Analysis

## REMI Model

This analysis uses the Regional Economic Models, Inc. (REMI) model to estimate the economic impacts of these immigration policies. REMI uses dynamic modeling techniques that respond to regional changes to employment, income, and sales by performing economic forecasts and simulations for regions in the United States. The major components of model fall into five blocks: 1) output and demand; 2) labor and capital demand; 3) population and labor supply; 4) compensation, prices, and cost; and 5) market shares. The BPDA

3-region REMI model<sup>6</sup> allows for adjusting inputs in these three regions: Suffolk County (Boston), the surrounding counties (Essex, Middlesex, Norfolk, and Plymouth), and the rest of the state. This Boston analysis does not model equivalent changes in the other 49 states and their influence on Boston's economy. After running simulations with increased H-1B and STEM-exempted green card workers, the REMI model estimated economic impacts presented below.

## Economic Impacts

Table 1 shows the impacts of increasing H-1B and STEM-exempted green card workers in Boston's labor market. The 5,734 workers are distributed from 2019 to 2028. This direct employment leads to an average additional 355 indirect and induced jobs created each year for a 10-year total of 3,549 additional jobs. This increase in the labor supply on average adds \$1.2 billion yearly over the 10 years to Boston's GCP.

Table 2 estimates the human capital value associated with the additional H-1B and STEM-exempted green card holders working in Boston in 2028. We assign 5,734 H-1B and STEM-exempted green card holders to their educational attainment level share based on national USCIS H-1B Petitions in 2017.<sup>7</sup> All of these workers are assumed to arrive in the United States with more than a high school education, and STEM-exempted green card workers hold a master's degree or higher. The overall educational shares of H-1B and STEM-exempted workers are as follows: bachelor's

degree (35.5%), master's degree (54.5%), and professional or doctoral degree (10.0%).

Educational attainment accrued outside of the United States is often overlooked in the debate on the effects of international migration. We use 2016 ACS data to estimate if immigrants earned their college degrees abroad based on their age upon arrival in the United States. If they were age 23 or older when they arrived in the United States, we estimate that they earned their bachelor's degree abroad; if they were age 25 or older, we estimate that they earned their master's degree abroad; and if they were age 29 or older, we estimate that they earned their professional or doctoral degree abroad. For their higher educational attainment, 43.5% of bachelor's, 40.8% of master's and 31.9% of professional and doctoral degrees were earned abroad. We estimate that the 5,734 additional foreign-born workers would bring \$1.5 billion in human capital to Boston.

**TABLE 1: Economic Impacts of Expanded H-1B Visas and STEM-Exempt Green Cards**  
2019 to 2028

Place of Work	Increased Output (yearly average 2019 to 2028)	Direct Jobs in 2028	Indirect and Induced Jobs in 2028
Boston	\$1.2 Billion	5,734	3,549

Source: *Regional Economic Models, Inc. (REMI), PI+ Massachusetts Regions, BPDA Research Division Analysis*

**TABLE 2: Educational Value for Additional Boston Workers Holding H-1B and Green Card (STEM - Exempted) 2028**

Educational Attainment	Immigrant Workers	K-12 Total Value (millions of 2016-2017 \$)	Bachelor's Degree Value (millions of 2016-2017 \$)	Master's Degree Value (millions of 2016-2017 \$)	Professional & Doctorate's Value (millions of 2016-2017 \$)	Total Value (millions of 2016-2017 \$)
Bachelor's Degree	2,033	\$347	\$371	\$0	\$0	<b>\$718</b>
Master's Degree	3,126	\$533	\$571	\$148	\$0	<b>\$1,253</b>
Professional & Doctoral Degree	574	\$98	\$105	\$0	\$78	<b>\$280</b>
<b>TOTAL</b>	<b>5,734</b>	<b>\$978</b>	<b>\$1,047</b>	<b>\$148</b>	<b>\$78</b>	<b>\$2,251</b>
Shared Earned Abroad		100%	43.5%	40.8%	31.9%	
Value of educational attainment from abroad		\$978	\$455	\$61	\$25	<b>\$1,519</b>

Source: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), BPDA Research Division Analysis

## Broader Labor Market Implications

As mentioned above, the 5,734 high-skilled workers with H-1B visas and STEM-exempted employment-based green cards would generate 3,549 additional jobs for the local economy. These additional jobs are counted as indirect and induced jobs. Indirect jobs are created to meet the intermediate needs for the production of final goods. For example, increased production due to these new foreign-born workers in professional, scientific and technical services would require legal services to develop contracts to take their

new products to the market. Any additional hiring by law firms would be counted as indirect jobs. Induced jobs are created through additional consumer spending of these workers' households. Increased foreign-born workers living in the region would eat in local restaurants. The local restaurants would hire additional staff to meet this increased customer demand. The creation of these indirect and induced jobs are the effect of local multipliers<sup>8</sup> and induced jobs are usually in local service fields.<sup>9</sup>

Table 3 summarizes REMI's output for indirect and induced jobs by their top 5 private industries. For indirect jobs, REMI estimates that the largest job gain industry is professional, scientific, and technical services. This is because an industry with direct jobs added would generate intermediate demand to meet increasing productivity, and thus create indirect jobs in these industries. For induced jobs, the top five industries are concentrated in the service sectors, such as health care, food services, and real estate. The output of REMI's estimate for induced jobs relies on the model's detailed data on the location of consumption of the goods produced by each local industry. As expected, a large fraction of the output of local service sectors is consumed locally. Those towards the top of the list, such as health care, accommodation and food services, and construction are most reliant on local economic activity to generate demand for the outputs they produce.

These local service jobs in Boston are vital to the city for several reasons. First, the job growth in these services responds effectively to the local economic expansion. When this expansion occurs, local service businesses quickly hire more employees to meet the increasing local demand in sectors such as food services, retail trade, and real estate. Second, while these sectors supply local residents with valued goods and services, they also create jobs for local residents. The Boston resident share of employment in local service industries is higher than for other industries in the city. The continued creation of jobs in these industries helps the city maintain low unemployment and provides opportunities for continued career development for Boston's resident labor force.

**TABLE 3: Indirect and Induced Job Impacts**  
2028

<b>Top Five Industries for Indirect Jobs (Private Sector)</b>	<b>Jobs</b>
Professional, Scientific, and Technical Services	456
Administrative and Waste Management Services	415
Accomodation and Food Services	225
Transportation and Warehousing	138
Finance and Insurance	137
<b>Top Five Industries for Induced Jobs (Private Sector)</b>	
Health Care and Social Assistance	270
Accomodation and Food Services	235
Construction	112
Real Estate and Rental and Leasing	99
Retail Trade	92

Source: *Regional Economic Models, Inc. (REMI), PI+ Massachusetts Region, BPDA Research Division Analysis*

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## Summary

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The implications of implementing these changes to immigration policy were examined for Boston's economy over the next 10 years. The New England Economic Partnership's (NEEP) 2017 report on the Massachusetts economy highlighted that its labor force was at or near full-employment.<sup>10</sup> As a reference, Boston composed 24% of Massachusetts' economy, and the most recent unemployment data in October 2018 had Boston's unemployment rate at 2.7%.<sup>11</sup> NEEP's forecast raised concerns about the future labor shortages in Massachusetts because it is already at full-employment and a large component of its population is aging into traditionally lower labor force participation cohorts. Boston experiences the same concerns but to a lesser degree than the state as a whole.

These proposed immigration policies would be an effective way to mitigate future labor shortages. Increasing the number of foreign-born workers with H1-B visas and STEM-exempted green cards would increase economic output and assist Boston firms in filling open positions. These proposed immigration policies could help ameliorate the concerns raised by NEEP about a future labor market demand for workers. An additional bonus is that these workers would come to Boston with \$1.5 billion of educational attainment obtained abroad and expand the workforce through indirect and induced jobs.

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## End Notes

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<sup>1</sup> The immigration Act of 1990 set H-1B annual cap as 65,000, employment-based green card annual cap as 140,000. Later the Visa Reform Act of 2004 set the first 20,000 with master's, professional, or doctoral degree to be exempted from the H-1B annual cap of 65,000. Therefore, the current H-1B annual cap is 65,000 with 20,000 master's or higher educational degree exempted from the cap.

<sup>2</sup> *Business Roundtable, "Economic Effects of Immigration Policies: A 50 State Analysis", 2017.*

<sup>3</sup> Immigration Innovation Act of 2018 was proposed by Senator Orrin Hatch from Utah. It is an updated version of Immigration Innovation Act of 2015, which was analyzed by the Business Roundtable. Border Security, Economic Opportunity, and Immigration Act of 2013 (S. 744) was proposed by Senator Chuck Schumer from New York.

<sup>4</sup> *1980, 1990 & 2000 Decennial Census (IPUMS) & 2010 and 2016 American Community Survey, BPDA Research Division Analysis.*

<sup>5</sup> Boston's employment by nativity and industry in 2016 was estimated using Suffolk County's employment (place of work) by industry from 2016 ACS PUMS and the ratio of Boston's employment (workplace geography) and Suffolk's employment (workplace geography) from 2016 ACS.

<sup>6</sup> *Regional Economic Models, Inc. (REMI), PI+ Massachusetts Regions.*

<sup>7</sup> *USCIS Immigration and Citizenship Data, H-1B Trends: 2007 to 2017, CLAIM3, <https://www.uscis.gov/sites/default/files/USCIS/Resources/Reports%20and%20Studies/Immigration%20Forms%20Data/BAHA/h-1b-2007-2017-trend-tables-12.19.17.pdf>*

<sup>8</sup> *Moretti, Enrico. "Local multipliers." American Economic Review 100.2 (2010): 373-77.*

<sup>9</sup> *Moretti, Enrico. The new geography of jobs. Houghton Mifflin Harcourt, 2012.*

<sup>10</sup> *New England Economic Partnership, "Charting Economic Policy: The New Normal in Non-normal Times", November 2017 Economic Outlook Conference, November 28, 2017.*

<sup>11</sup> *Massachusetts Executive Office of Labor and Workforce Development (EOLWD), Labor Force and Unemployment Data.*

