

The Costs of Brain Waste among Highly Skilled Immigrants in California

By Ariel G. Ruiz Soto, Jeanne Batalova, and Michael Fix

California, with the sixth largest economy in the world, is home to approximately 11 million immigrants who work in diverse industries and at all skill levels.¹ Nearly 2 million are college educated; a substantial number, however, find that they cannot put their academic and professional qualifications to full use.

Using an innovative methodology developed by the Migration Policy Institute (MPI), this fact sheet examines the skill underutilization of highly skilled immigrants—also known as “brain waste”—and its economic costs in California. The authors estimate the number and share of college-educated immigrants who work in low-skilled jobs or are unemployed in California. They identify the key factors underlying this brain waste, and estimate the amount of annual earnings and state and local taxes lost because immigrant college graduates end up working in low-skilled jobs. In general, the analysis employs two types of comparisons: (1) between the foreign born² and U.S. born who are college graduates; and (2) between foreign-educated and U.S.-educated immigrants. This fact sheet accompanies a national report on skill underutilization, *Untapped Talent: The Costs of Brain Waste among Highly Skilled Immigrants in the United States*.³

Box 1. What Is Brain Waste? Quick Definitions

Brain waste describes the situation when college graduates cannot fully utilize their skills and education in the workplace despite their high professional qualifications. (The terms *college educated* and *highly skilled* are used interchangeably in this fact sheet.)

Brain waste (or *skill underutilization*) is defined here as comprising two unfavorable labor market outcomes: unemployment and underemployment.

- *Unemployment* occurs when a person who is actively searching for employment is unable to find work.
- *Underemployment* refers to work by the highly skilled in *low-skilled jobs*, that is, jobs that require only moderate on-the-job training or less (e.g., home-health aides, personal-care aides, maids and housekeepers, taxi and truck drivers, and cashiers). These occupations typically require a high school diploma or less.

In contrast, highly skilled individuals who are *adequately employed* work in high- or middle-skilled jobs. *High-skilled* jobs require at least a bachelor’s degree (e.g., surgeons, scientists, and engineers); *middle-skilled* jobs require long-term on-the-job training, vocational training, or an associate’s degree (e.g., carpenters, electricians, and real estate brokers).

Because individuals in middle-skilled jobs are considered adequately employed in this analysis, underemployment refers only to those who are *severely underemployed*, or in positions substantially below their level of training.

Key Findings

- California was home to 1.8 million highly skilled immigrants with at least a bachelor's degree during the 2009-13 period.⁴ Of this group, 25 percent—or 452,000 people—were either working in low-skilled jobs or unemployed—the same rate of brain waste experienced by college-educated immigrants nationally.
- Low-skilled employment resulted in immigrant college graduates in California forgoing approximately \$9.4 billion in annual earnings. As a result, California experienced \$694.8 million in forgone state and local tax revenue. Nationally, immigrant underemployment resulted in more than \$39.4 billion in annual earnings losses and \$3 billion in forgone state and local taxes.
- As with the country as a whole, highly skilled immigrants in California experienced higher levels of brain waste than the U.S. born—with 25 percent of college-educated immigrants in the state working in low-skilled jobs or without work, compared to 19 percent of Californians born in the United States.
- Having a degree earned outside the United States increases the likelihood of brain waste: Foreign-educated⁵ immigrants in California were more likely to be either underemployed or unemployed (29 percent) than U.S.-educated immigrants (21 percent)—identical to the national shares. Immigrants in California were also more likely to experience brain waste if they had limited English skills, had only a bachelor's degree, or were Hispanic or Black.⁶ Time in the United States reduced skill underutilization for immigrant women more than for men.⁷

- As at the national level, Hispanic immigrants in California had the highest skill underutilization rates of all racial and ethnic groups, with 49 percent of the foreign educated and 33 percent of the U.S. educated being either underemployed or unemployed. In contrast, Asians had relatively low levels of brain waste, and represented nearly 60 percent of highly skilled immigrants in the state.

I. Highly Skilled Immigrants by the Numbers

Highly Skilled Immigrants. There were 1.8 million immigrant college graduates in the California civilian labor force during the 2009-13 period (see Table 1). They accounted for 32 percent of all highly skilled workers in the state—higher than the share that immigrants made up of the total state population (27 percent). California employed the largest number of college-educated persons of any state, accounting for 24 percent of the 7.6 million immigrants and 10 percent of the U.S. born nationally who were highly skilled. (“College graduates” and the “highly skilled” are used interchangeably in this fact sheet and refer to adults with a bachelor's degree or higher.)

Brain Waste Levels. Twenty-five percent of college-educated immigrants in California (452,000 people) were either underemployed or unemployed, compared to 19 percent (728,000) of their U.S.-born counterparts (see Table 1). These shares were identical to national averages.

Table 1. Employment Status of Highly Skilled Adults in California and United States, by Nativity (%), 2009-13

	California		United States	
	Immigrants	U.S. Born	Immigrants	U.S. Born
Total labor force	1,806,000	3,896,000	7,618,000	37,936,000
<i>Percent</i>	100	100	100	100
Unemployed	6	6	6	4
Employed by job type				
High-skilled	56	63	57	62
Middle-skilled	19	18	18	19
Low-skilled	19	13	19	14
Brain waste: Unemployed or in low-skilled jobs				
Number	452,000	728,000	1,918,100	6,974,800
Percent	25	19	25	18

Source: Migration Policy Institute (MPI) analysis of U.S. Census Bureau data from the pooled 2009-13 American Community Survey (ACS) and 2008 Survey of Income and Program Participation (SIPP), with legal status assignments by James Bachmeier of Temple University and Jennifer Van Hook of The Pennsylvania State University, Population Research Institute.

II. Economic Cost of Brain Waste

Beyond the human-capital losses that are felt by individuals and their families, brain waste has broader economic implications. Workers who are either underemployed or lack employment despite their high professional qualifications have lower disposable incomes to spend and invest, and they pay less in taxes as a result of these forgone earnings. At the same time, employers—and the economy—miss an opportunity to hire available workers with needed skills and qualifications.

In this fact sheet, the Migration Policy Institute (MPI) for the first time estimates the value of forgone earnings associated with low-skilled employment of highly skilled immigrants, as well as the state and local taxes that would be generated by those earnings.⁸ To do so, the authors compared the average annual earnings of highly skilled immigrants working in low-skilled jobs to those of “adequately” employed immigrants—i.e., those working in middle- and high-skilled jobs. Using decomposition analysis, the authors then estimated the amount of earnings losses attributable to low-skilled employment after controlling for demographic, educational, linguistic, legal status, and other factors.⁹

It is important to note that these figures are in some ways conservative, as they do not account for the lost wages of highly skilled immigrants who were unemployed during the study period, despite wanting to work. Lost wages are also not quantified for highly skilled immigrant workers in occupations that require more than a high school diploma but less than a bachelor’s degree (e.g., dental hygienists, teacher assistants, and electricians).

Beyond the human-capital losses that are felt by individuals and their families, brain waste has broader economic implications.

The value of annual earnings that highly skilled immigrants in California lost due to their employment in low-skilled jobs amounted to \$9.4 billion during the period surveyed. If these immigrants had been adequately employed and remunerated correspondingly, their households would have paid an additional \$694.8 million in state and local taxes. Nationwide, the low-skilled employment of college-educated immigrants resulted in \$39.4 billion in forgone wages and \$3 billion in forgone state and local taxes annually.¹⁰

III. Factors Driving Brain Waste

Several demographic characteristics of highly skilled immigrants in California help explain their rates of skill underutilization. Some of these factors are examined below.

Place of Education. Of the 1.8 million highly skilled immigrants in California, 48 percent (866,000) were foreign educated and 52 percent (940,000) obtained their degrees in the United States. Highly skilled immigrants in California were slightly less likely than immigrants nationally to have been educated abroad (52 percent).

Like the country as a whole, foreign-educated immigrants in California were more likely to be either underemployed or unemployed (29 percent) than U.S.-educated immigrants (21 percent). These higher rates of skill underutilization among the foreign educated reflect a number of factors, among them real and perceived differences in the quality of U.S. and foreign education, adult newcomers' access to professional networks, and the difficulties that immigrants can face in getting their foreign credentials and professional experiences recognized by employers and professional licensing bodies.

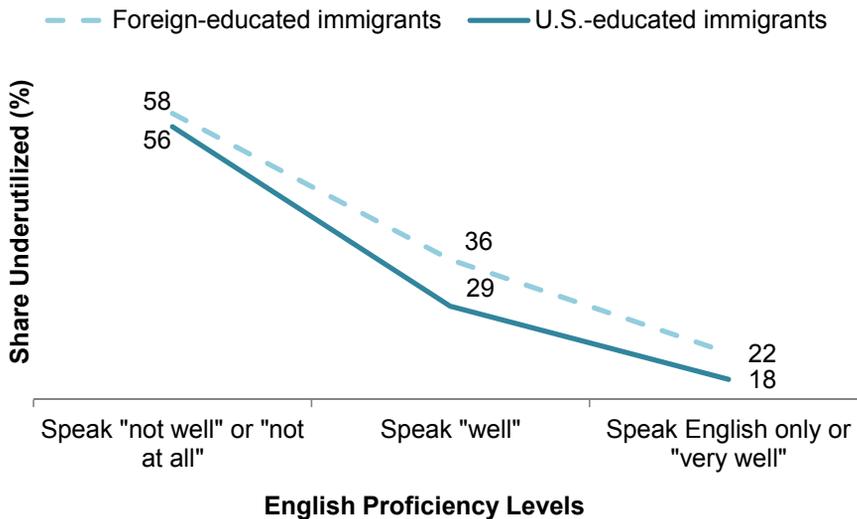
English Proficiency. The majority of high-skilled immigrants in California were English proficient: 63 percent of the foreign educated and 83 percent of the U.S. educated (compared to 67 percent and 86 percent respectively at the national level).¹¹

Limited English skills contribute significantly to higher risk of brain waste. Immigrants in California who spoke English "not well" or "not at all" were approximately three times more likely to experience brain waste than those who spoke English "only" or "very well" (see Figure 1).

Level of Degree. Similar shares of immigrant and U.S.-born college graduates had advanced degrees in California:¹² 38 percent and 36 percent, respectively. Nationally, immigrants were more likely to have advanced degrees than the U.S. born (43 percent versus 37 percent).

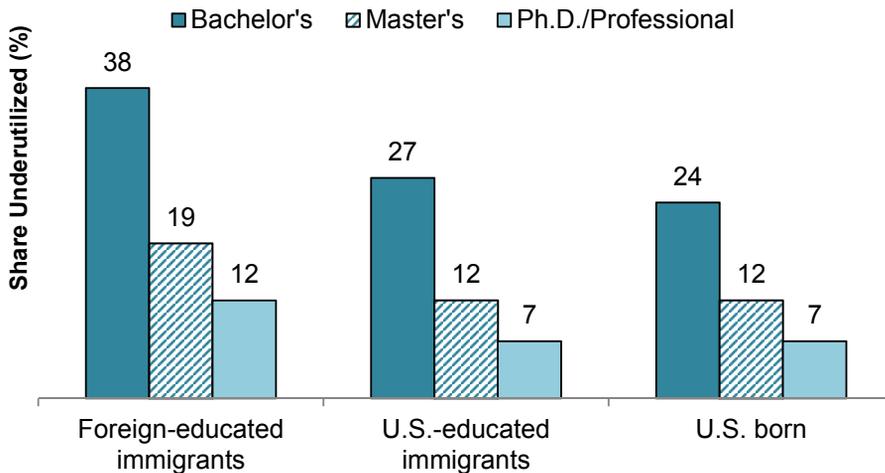
Regardless of place of birth or education, bachelor degree holders had much higher rates of skill underutilization than those with advanced degrees. Among the foreign educated in California, 38 percent of bachelor degree holders experienced brain waste compared to 12 percent of those with a Ph.D. or professional degree,

Figure 1. Underemployment and Unemployment of Highly Skilled Immigrants in California, by Place of Education and English Proficiency (%), 2009-13



Source: MPI analysis of 2009-13 ACS and 2008 SIPP data from the U.S. Census Bureau, with legal status assignments by Bachmeier and Van Hook.

Figure 2. Underemployment and Unemployment of Highly Skilled in California, by Nativity, Place of Education, and Degree Level (%), 2009-13



Source: MPI analysis of 2009-13 ACS and 2008 SIPP data from the U.S. Census Bureau, with legal status assignments by Bachmeier and Van Hook.

such as a law or medical degree (see Figure 2). Foreign-educated immigrants at all degree levels were more likely to be underemployed or unemployed than those with U.S. degrees. In contrast, there was no difference among U.S.-educated immigrants with advanced degrees and their U.S.-born counterparts.

Legal Status/Citizenship. Sixty-three percent of highly skilled immigrants in California were naturalized U.S. citizens, 21 percent were legal permanent residents (LPRs), 10 percent were unauthorized immigrants, and 6 percent were temporary visa holders. Highly skilled immigrants in California were more likely to be naturalized citizens than the national average of 57 percent.

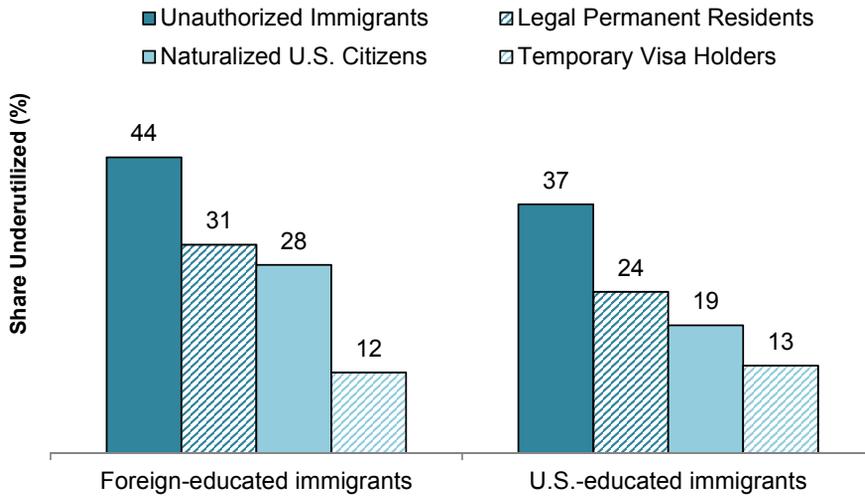
As in the rest of the country, temporary visa holders had the lowest rates of skill underutilization—owing in large part to visa requirements.¹³ For instance, many temporary visa holders have visas such as the H-1B (for highly skilled workers) or the L-1 (for intracompany transfers), meaning they have presumably been sponsored by a company or nonprofit institution to perform a job commensurate with their experience and skill level.

U.S. citizenship appeared to reduce brain waste levels for both foreign- and U.S.-educated immigrants. Among foreign-educated immigrants, the skill underutilization rate for naturalized U.S. citizens (28 percent) was lower than that of LPRs (31 percent) (see Figure 3). Similarly, just 19 percent of naturalized U.S. citizens educated in the United States were underemployed or unemployed compared to 24 percent of LPRs.

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Unauthorized immigrants had the highest risk of brain waste, with 44 percent of those who were foreign educated and 37 percent of the U.S. educated being either underemployed or unemployed. Nonetheless, it is noteworthy that more than 50 percent of college-educated unauthorized immigrants worked in middle- or high-skilled jobs.

Figure 3. Underemployment and Unemployment of Highly Skilled Immigrants in California, by Place of Education and Legal Status (%), 2009-13

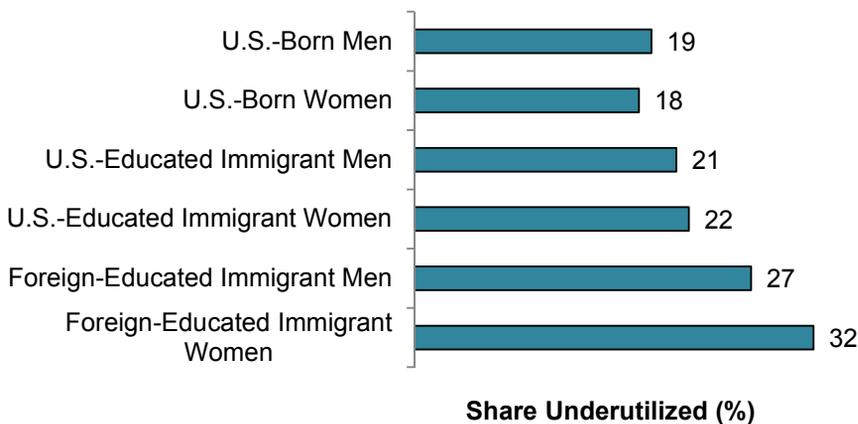


Source: MPI analysis of 2009-13 ACS and 2008 SIPP data from the U.S. Census Bureau, with legal status assignments by Bachmeier and Van Hook.

Gender. Women represented 47 percent of the 1.8 million highly skilled immigrants in California and 48 percent of the state’s 3.9 million U.S.-born college graduates. Foreign-educated immigrant women had the highest skill underutilization rates of all college-educated workers in the state (32 percent) (see Figure 4).

Time in the United States. Length of residence in the United States had a bigger impact on the skill underutilization of immigrant women than of men—a change that may owe to shifting social norms within immigrant families as well as a need for higher household earnings.¹⁴ The levels of brain waste among immigrant women decreased from 39 percent of recent arrivals

Figure 4. Underemployment and Unemployment of Highly Skilled in California, by Nativity, Place of Education, and Gender (%), 2009-13



Source: MPI analysis of 2009-13 ACS and 2008 SIPP data from the U.S. Census Bureau, with legal status assignments by Bachmeier and Van Hook.

Table 2. Race and Ethnicity of the Highly Skilled in California, by Nativity and Place of Education (%), 2009-13

Race/Ethnicity	California		
	Foreign-Educated Immigrants	U.S.-Educated Immigrants	U.S. Born
Number	866,000	940,000	3,896,000
<i>Percent</i>	100	100	100
Hispanic	11	18	11
Non-Hispanic Black	2	2	5
Non-Hispanic Asian	60	57	8
Non-Hispanic White	27	22	76

Source: MPI analysis of 2009-13 ACS and 2008 SIPP data from the U.S. Census Bureau, with legal status assignments by Bachmeier and Van Hook.

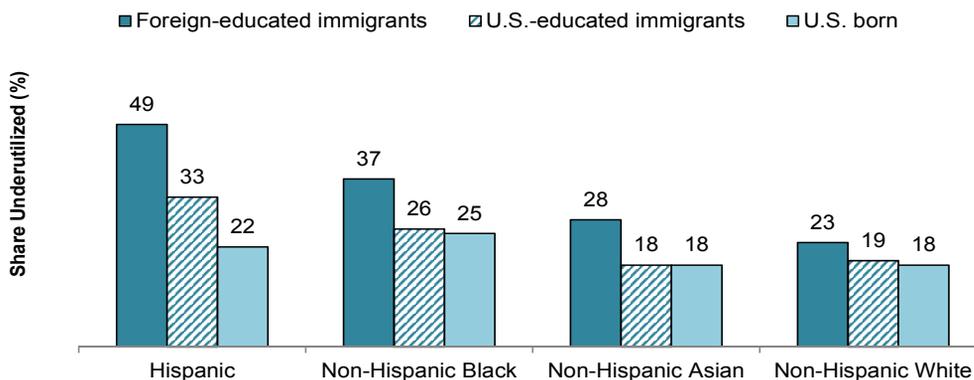
(i.e., in the country for five years or less) to 23 percent of long-term residents (i.e., in the country for 15 years or more). By contrast, skill underutilization rates of immigrant men declined only slightly: from 25 percent of recent arrivals to 23 percent of long-term residents.

Race and Ethnicity. Asians accounted for 60 percent of foreign-educated immigrants in California and 57 percent of U.S.-educated immigrants (see Table 2). California had the largest population of highly skilled Asian immigrants of all states, accounting for 31 percent of the 3.4 million national total. Hispanics represented 11

percent of foreign-educated college graduates in the state and 18 percent of U.S.-educated immigrant college graduates.

Hispanic immigrants had the highest skill underutilization rates of all racial and ethnic groups in the state: 49 percent of the foreign educated and 33 percent of the U.S. educated (see Figure 5). Asians and Whites had relatively low rates of brain waste regardless of their nativity or place of education. Among the U.S. born, Black college graduates experienced the highest levels of brain waste (25 percent).

Figure 5. Underemployment and Unemployment of Highly Skilled in California, by Nativity, Place of Education, and Race/Ethnicity (%), 2009-13



Source: MPI analysis of 2009-13 ACS and 2008 SIPP data from the U.S. Census Bureau, with legal status assignments by Bachmeier and Van Hook.

Table 3. Region/Country of Birth and Place of Education for Highly Skilled Immigrants in California and United States (%), 2009-13

Region or Country of Birth	California		United States	
	Foreign-Educated Immigrants (%)	U.S.-Educated Immigrants (%)	Foreign-Educated Immigrants (%)	U.S.-Educated Immigrants (%)
Total (Number)	866,000	940,000	3,992,000	3,626,000
<i>Percent</i>	100	100	100	100
East Asia	22	22	16	16
China	13	15	9	10
Japan/Asian Tigers*	9	8	6	6
Southeast Asia	24	23	13	14
Philippines	20	11	10	6
Southwest Asia	17	16	20	17
India	12	10	15	12
Middle East	2	3	3	3
Central America	8	15	7	11
Mexico	6	11	5	7
Caribbean	1	1	5	9
South America	4	3	8	7
Canada	2	2	3	3
Australia/Oceania	1	1	1	<1
European Union/EEA**	10	7	12	11
Rest of Europe	5	3	6	4
Africa	4	3	7	5

* Japan/Asian Tigers refers to Hong Kong, Japan, Singapore, and South Korea.

** European Union/EEA refers to the 28 European countries that were part of the European Union as of 2013, plus Iceland, Liechtenstein, and Norway, which are part of the European Economic Area (EEA).

Source: MPI analysis of 2009-13 ACS and 2008 SIPP data from the U.S. Census Bureau, with legal status assignments by Bachmeier and Van Hook.

There were wide differences between the skill underutilization rates of Hispanic foreign-educated immigrants (49 percent), U.S.-educated Hispanic immigrants (33 percent), and U.S.-born Hispanics (22 percent). No other group evidenced such large declines by place of birth and education.

Region and Country of Birth. Immigrants from Southeast Asia accounted for nearly one-quarter of the foreign- and U.S.-educated immigrant populations in California—significantly higher shares than they represented nationally (see

Table 3). By contrast, immigrants from South America and the Caribbean represented smaller shares of highly skilled immigrants in California than nationwide.

Although they represented a relatively low share of highly skilled immigrants in California, Central Americans had the highest rates of skill underutilization: 56 percent of those educated abroad and 35 percent of those educated in the United States (see Table 4). Caribbean and African immigrants had lower skill underutilization rates in the state than at the national level.

Table 4. Underemployment and Unemployment of Highly Skilled Immigrants, by Place of Education and Region/ Country of Birth in California and United States (%), 2009-13

Region or Country of Birth	California		United States	
	Foreign-Educated Immigrants (%)	U.S.-Educated Immigrants (%)	Foreign-Educated Immigrants (%)	U.S.-Educated Immigrants (%)
Total (%)	29	21	29	21
East Asia	22	17	20	16
China	20	15	16	14
Japan/Asian Tigers*	27	20	25	20
Southeast Asia	37	21	35	20
Philippines	38	22	35	21
Southwest Asia	23	16	23	16
India	18	13	18	13
Middle East	28	20	28	21
Central America	56	35	51	36
Mexico	54	36	47	36
Caribbean	29	22	44	24
South America	35	26	37	25
Canada	13	13	12	15
Australia/Oceania	22	23	16	18
European Union/EEA**	16	17	18	19
Rest of Europe	33	21	33	23
Africa	30	22	37	26

* Japan/Asian Tigers refers to Hong Kong, Japan, Singapore, and South Korea.

** European Union/EEA refers to the 28 European countries that were part of the European Union as of 2013, plus Iceland, Liechtenstein, and Norway, which are part of the European Economic Area (EEA).

Source: MPI analysis of 2009-13 ACS and 2008 SIPP data from the U.S. Census Bureau, with legal status assignments by Bachmeier and Van Hook.

IV. Conclusion

In sum, 25 percent of the 1.8 million college-educated immigrants living in California were either underemployed or unemployed during the 2009-13 period. Low-skilled employment among these highly skilled immigrants comes with a price tag: \$9.4 billion in annual lost earnings and \$694.8 million in forgone state and local taxes.

The scale of this economic impact suggests that policymakers would do well to examine the barriers to full employment that immigrants—particularly those who are foreign educated—face in the California labor market. Given the costs documented here, policies that promote the recognition of foreign credentials, make licensing requirements more transparent, and expand access to courses that teach professional English and fill educational gaps should provide substantial returns on public investment.

Endnotes

- 1 See Robin Respaut, “California Surpasses France as World’s Sixth-Largest Economy,” Reuters, June 17, 2016, www.reuters.com/article/us-california-economy-idUSKCN0Z32K2; authors’ tabulations of U.S. Census Bureau data from the 2015 American Community Survey (ACS).
- 2 The foreign born (or immigrants) are persons who were not U.S. citizens at birth. The U.S. born (or natives) are persons who were U.S. citizens at birth, even if they were born outside of the country.
- 3 See Jeanne Batalova, Michael Fix, and James D. Bachmeier, *Untapped Talent: The Costs of Brain Waste among Highly Skilled Immigrants in the United States* (Washington, DC: Migration Policy Institute, New American Economy, and World Education Services, 2016), www.migrationpolicy.org/research/untapped-talent-costs-brain-waste-among-highly-skilled-immigrants-united-states. State-level fact sheets examining brain waste for college-educated immigrants cover California, Florida, Michigan, New York, Ohio, Texas, and Washington, and can be found at www.migrationpolicy.org/topics/brain-waste-credential-recognition.
- 4 All estimates in this fact sheet refer to civilian adults ages 25 and older and are based on analysis of U.S. Census Bureau pooled 2009-13 ACS data unless otherwise stated. The data were pooled to increase the precision of the estimates. James Bachmeier at Temple University, in consultation with Jennifer Van Hook at The Pennsylvania State University and researchers at the Migration Policy Institute (MPI) developed techniques to link the ACS data to the Census Bureau’s 2008 Survey of Income and Program Participation (SIPP) to allow for estimates by legal status. The 2009-13 data were the most recent at the time of the analysis.
- 5 The term “foreign educated” refers to immigrants who have at least a bachelor’s degree and arrived in the United States at age 25 or later. They were likely to have obtained all of their formal education abroad; “U.S. educated” refers to college-educated immigrants who came to the United States before age 25 and are likely to have been educated in the United States.
- 6 Persons identified as Black, Asian, and White refer to non-Hispanic individuals. Persons identified as Hispanic are of any race.
- 7 The national report that accompanies this fact sheet employs logistic regression models to test the effect of place of education, time in the United States, level of educational attainment, English skills, race and ethnicity, and citizenship and legal status on the odds of low-skilled employment of immigrant men and women. The report finds that each of these variables had an independent and statistically significant impact on the likelihood of low-skilled employment. The analysis assumes that the relationships observed at the national level hold at the state level as well. See Batalova, Fix, and Bachmeier, *Untapped Talent*.
- 8 MPI in 2008 first estimated the size of the immigrant population experiencing brain waste. See Jeanne Batalova and Michael Fix with Peter A. Creticos, *Uneven Progress: The Employment Pathways of Skilled Immigrants in the United States* (Washington, DC: MPI, 2008), www.migrationpolicy.org/research/uneven-progress-employment-pathways-skilled-immigrants-united-states.
- 9 The analysis of forgone earnings was done separately by place of education and gender. See Batalova, Fix, and Bachmeier, *Untapped Talent*, Appendix A-3 for additional discussion of the decomposition methodology. Estimates of forgone tax contributions at the state and local level were computed for MPI by the Institute on Taxation and Economic Policy (ITEP). See Batalova, Fix, and Bachmeier, *Untapped Talent*, Appendix A-4 for additional discussion of the tax estimation methodology. The value of forgone federal taxes associated with low-skilled employment of immigrants in California was not estimated.
- 10 The national report also estimates the amount of forgone federal taxes associated with immigrant low-skilled employment: approximately \$10.2 billion. See Batalova, Fix, and Bachmeier, *Untapped Talent*.

- 11 Persons who reported speaking English only or “very well” in the ACS are considered to be English proficient. Persons who reported speaking English “not well” or “not at all” are considered to have low levels of English proficiency.
- 12 Refers to master, doctoral, and professional degrees.
- 13 Foreigners on temporary visas include those on work visas such as the H-1B visa or the L-1 intracompany transferee visa, or international students on F-1 visas. To obtain an H1-B visa, for instance, foreign workers must have a sponsoring employer (i.e., they will have a job) and the position for which they are hired (in most cases) requires at least a bachelor’s degree (i.e., their job per the definition used in this fact sheet is “highly skilled”).
- 14 See Mary C. Waters and Marisa Gerstein Pineau, eds., *The Integration of Immigrants into American Society* (Washington, DC: The National Academies Press), www.nap.edu/catalog/21746/the-integration-of-immigrants-into-american-society.

About the Authors



Ariel G. Ruiz Soto is a Research Assistant at the Migration Policy Institute (MPI), where he provides quantitative research support across MPI programs. His research focuses on the impact of U.S. immigration policies on immigrant experiences of socioeconomic integration across varying geographical and political contexts. More recently, Mr. Ruiz Soto has analyzed methodological approaches to estimate sociodemographic trends of the unauthorized immigrant population in the United States.



Jeanne Batalova is a Senior Policy Analyst at MPI and Manager of its Data Hub, a one-stop, online resource that provides instant access to the latest facts, statistics, and maps covering U.S. and global data on immigration and immigrant integration. Her areas of expertise include the immigration and integration of highly skilled workers and foreign students in the United States and other countries; the impacts of immigrants on society and labor markets; and the social and economic mobility of immigrant-origin young adults.



Michael Fix is President of MPI, a position he assumed in 2014 after serving as CEO and Director of Studies. He joined the Institute in 2005, and was previously Senior Vice President and Co-Director of MPI’s National Center on Immigrant Integration Policy. His research focus is on immigrant integration and the education of immigrant children in the United States and Europe, as well as citizenship policy, immigrant children and families, the effect of welfare reform on immigrants, and the impact of immigrants on the U.S. labor force.

Acknowledgments

This research project was supported by New American Economy (NAE), World Education Services (WES), and the J. M. Kaplan Fund. The authors express their gratitude to Robert Kaufman from Temple University; Jeffrey Reitz from the University of Toronto; Angela Marek Zeitlin, Pavel Dramski, and Kate Brick of NAE; as well as Paul Feltman and Stacey K. Simon of WES. They also thank Carl Davis and Meg Wiehe of the Institute on Taxation and Economic Policy (ITEP), who estimated the amount of forgone state and local taxes; and David Dyssegaard Kallick of the Fiscal Policy Institute (FPI), who guided their thinking regarding tax implications of low-skilled employment of immigrants. Finally, they are grateful to Demetrios G. Papademetriou and Michelle Mittelstadt of MPI, who provided thoughtful comments on earlier drafts, and Liz Heimann, for layout and design of this work.

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Suggested citation: Ruiz Soto, Ariel G., Jeanne Batalova, and Michael Fix. 2016. *The Costs of Brain Waste among Highly Skilled Immigrants in California*. Washington, DC: Migration Policy Institute, New American Economy, and World Education Services.

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