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The Importance of Skills and Qualifications for College-Educated Immigrants' Economic Integration

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I. Introduction

Despite recent COVID-19 related declines in college attendance,[1] adults in the United States have among the highest levels of educational attainment in the world.[2] The number and share of U.S. college-educated adults (that is, those with a Bachelor's degree or higher) have risen steadily since the post-WWII period, increasing from 20 percent to 33 percent between 1990 and 2019.[3] It is an often-overlooked fact that immigrants have contributed to this rise. Among recently arrived immigrants, the college-educated share is even higher than in the overall immigrant population, and it has nearly doubled from 27 percent in 1990 to 48 percent in 2019.[4]

Rising education and skills represent a boon for individuals, the economy, and for government treasuries.[5] One recent study estimates that a typical Bachelor's degree holder in the United States earns $1.2 million more over their career than a high school graduate with no further education, with the gap expanding for workers with advanced degrees.[6] Looking forward, higher education and skills levels are likely to prove critical in a future that will be marked by an aging and declining population and rapid technological advances.[7] As workers' numbers fall, those who remain in the labor force will need to be increasingly productive. But here the United States will continue to confront the challenge of lagging skills among the country's adults. Analysis of the international survey of adult skills (known as the Programme for the International Assessment of Adult Competencies, or PIAAC) has revealed that cognitive skills of U.S. adults trail international averages for the 40 countries participating in PIAAC in the critical domains of numeracy and digital problem-solving skills.[8] They also lag behind adults in high-performing countries such as Finland and Japan across all skill domains tested by PIAAC (i.e., literacy, numeracy, and digital skills).

While U.S. immigrants' education levels have been rising, they have not always translated into occupational gains, as many immigrant college graduates work in low-skilled jobs or are unemployed.[9] Indeed, recent PIAAC research has found that first and second-generation immigrant workers overall are more likely to be overeducated for their work than U.S.-born workers.[10] In the case of the college-educated immigrants, key factors that limit their employment opportunities include lower levels of English proficiency, lack of legal status, limited social and professional networks, interrupted career trajectories, and lack of transparency regarding U.S. licensing requirements.[11] Further, college-educated

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[1] National Student Clearinghouse, Overview: Fall 2021 Enrollment Estimate.
[2] U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics (NCES), "Highlights of the 2017 U.S. PIAAC Results Web Report (NCES 2020-777)," accessed December 15, 2021.
[3] Authors' tabulation of the U.S. Census Bureau's 1990 decennial census and 2019 American Community Survey (ACS).
[4] Jeanne Batalova and Michael Fix, *Leaving Money on the Table: The Persistence of Brain Waste among College-Educated Immigrants* (Washington, DC: Migration Policy Institute (MPI), 2021).
[5] Organization for Economic Cooperation and Development (OECD), *Skills Matter: Further Results from the Survey of Adult Skills* (Paris: OECD, 2016); Eric Hanushek, Guido Schwerdt, Simon Wiederhold, and Ludger Woessmann, "Returns to skills around the world: Evidence from PIAAC," *European Economic Review*, vol. 73, no. C (2015), pages 103-130.
[6] Anthony P. Carnevale, Ban Cheah, and Emma Wenzinger, *The College Payoff More Education Doesn't Always Mean More Earnings* (Washington, DC: Georgetown University Center on Education and the Workforce, 2021).
[7] Lee Rainie and Janna Anderson, *The Future of Jobs and Jobs Training* (Washington, DC: Pew Research Center, 2017); Julia Gelatt, Jeanne Batalova and Randy Capps, *Navigating the Future of Work: The Role of Immigrant-Origin Workers in the Changing U.S. Economy* (Washington, DC: MPI, 2020).
[8] NCES, "Highlights of the 2017 U.S. PIAAC Results Web Report."
[9] Batalova and Fix, *Leaving Money on the Table.*
[10] Margarita Pivovarova and Jeanne Powers, "Do Immigrants Experience Education-Job Mismatch? New Evidence from the U.S. PIAAC." (Washington, DC: PIAAC Gateway website, 2021).
[11] See Box 2. "Other Factors Contributing to Brain Waste among College-Educated Immigrants" in Batalova and Fix, *Leaving Money on the Table.*

immigrants' underutilization—or "brain waste"—leads to substantial economic and fiscal costs. The Migration Policy Institute (MPI) has estimated that the costs to immigrants in forgone wages to be approximately $40 billion and the costs to governments in lost revenues to be $10 billion annually.[12] Other MPI research has documented that over 270,000 immigrant college graduates with degrees in health and medicine are underemployed or out of work and, as a result, have likely been sitting on the sidelines during the current COVID-19 crisis.[13] This failure to tap the skills and education of immigrants plays, in turn, into larger political narratives that raise doubts about immigrants' integration into their communities and their contributions to the economy: Doubts that can derail the adoption of more inclusive immigration policies.[14]

To better understand immigrant college graduates' economic integration in the United States this report uses the unique resource of the combined 2012, 2014, and 2017 PIAAC.[15] The report examines their economic progress, probes for the first time their cognitive skills (i.e., literacy, numeracy, and digital skills), and explores the interrelationships between those outcomes and skills (see Box 1 for a brief description of PIAAC dataset and definitions of key terms).

The three principal research questions addressed are:

- What are the demographic, educational characteristics, cognitive skills, and labor market outcomes of college-educated immigrants in the United States, and how do they differ from those of their native-born counterparts?

- What is the relationship between the economic integration outcomes of college-educated immigrants and their cognitive skills? How does this relationship differ from U.S.-born college graduates?

- How do the relationships between the skills and economic integration outcomes vary for immigrants depending on English proficiency, degree majors, and other characteristics associated with labor market outcomes?

The report begins with a descriptive profile of immigrant and U.S.-born adults (ages 25-65) focusing on key demographics, cognitive skills proficiency levels, economic outcomes including the share in the labor force, their average monthly earnings, the share underutilized, and workers' job quality. The authors then explore the relationship between literacy, numeracy, and digital skills and employment and job quality outcomes of immigrant and U.S.-born workers. They employ regression models to distinguish the differing effects of cognitive skills on economic outcomes from those of other human capital variables

[12] 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: MPI, 2016).
[13] Jeanne Batalova, Michael Fix, and José Ramón Fernández-Peña, *The Integration of Immigrant Health Professionals: Looking beyond the COVID-19 Crisis* (Washington, DC: MPI, 2021).
[14] Simon Kuper, "Liberals Can Win the Immigration Debate," *The Financial Times*, January 6, 2022.
[15] PIAAC is a sophisticated survey with a four-stage stratified area probability sample. PIAAC also has a complex assessment design: Respondents did not have to answer all test questions (some of their scores were imputed) and the level of question difficulty depended on the respondents' skills. The complexity of both sample and assessment design had implications for how the scores were generated. To account for these features of the PIAAC survey, the analysis was done by using appropriate procedures in the STATA statistical package that analyzes ten plausible values on literacy, numeracy, and problem-solving domains. Unweighted sample sizes are rounded to the nearest 10. Estimates that are calculated based on less than 3 cases in the cell are not displayed.

while holding constant a set of socio-demographic characteristics. Finally, the authors summarize the findings and highlight their relevance for immigrant integration policy.

BOX 1
Value of PIAAC Data

Developed and conducted by the Organization for Economic Cooperation and Development (OECD), the Program for the International Assessment of Adult Competencies (PIAAC) is the largest direct assessment of the cognitive skills of working-age adults in the world. Approximately 40 countries participated in the survey during three cycles between 2011 and 2018.

Unlike other commonly used population surveys, PIAAC directly assesses respondents' cognitive (or foundational) skills—literacy, numeracy, and problem-solving skills in a technology rich environment—to explore what adults know and how well they can use their skills at work, school, and in everyday life. *Literacy* refers to adults' ability to understand and use written text in print and electronic formats; *numeracy*—to evaluate, use, and communicate numerical and mathematical concepts; *and problem-solving skills in the technology rich environment* (digital problem-solving skills or digital skills, for short)—to access and interpret information in digital environments such as websites and e-mails. Respondents can be classified by skill level, ranging from 0 to 5. The researchers followed the language and guidelines of the National Center for Education Statistics (NCES) and grouped the skill levels on each of the three skill assessments into high, middle, and low proficiency levels.

In addition to assessing adults' foundational skills, the survey provides detailed data on demographic, social, educational, and linguistic characteristics. PIAAC also probes job quality dimensions such as work autonomy, managerial duties, and job satisfaction. Although the U.S. background questionnaire was administered in both English and Spanish, all proficiency assessments of literacy, numeracy, and digital problem-solving skills were carried out exclusively in English.

This report focuses on non-institutionalized, college-educated U.S. adults ages 25 to 65. To increase the sample size and thus improve the robustness of the estimates, the researchers used a pooled 2012/2014/2017 PIAAC data set provided by NCES.

Key terms

College-educated adults refers to adults with at least a bachelor's degree. The terms *college educated and college graduates* are used interchangeably.

Immigrants refer to persons born outside of the United States.

Race and ethnicity. In this analysis, the researchers used the PIAAC variable that combined Latino origin and race. Under this definition, Latinos can be of any race, while the other racial groups (Black; Asian/Pacific Islander; Other race; and White) refer to non-Latino individuals.

Three economic outcomes are analyzed in this report. They are defined as follows:

Labor force participation refers to the share of employed and unemployed adults of the population ages 25-65.

Earnings refer to the average monthly earnings of full-time workers.

Workers who experience *skill underutilization* (or brain waste) are defined as college-educated workers in the civilian labor force who reported that they were in a job requiring no more than a high school education or that they were unemployed.

Appendix A defines these and other variables in greater detail and describes the decisions the researchers made in constructing them.

Sources: NCES, "Highlights of the 2017 U.S. PIAAC Results Web Report;" OECD, *Time for the U.S. to Reskill? What the Survey of Adult Skills Says*,(Brussels: OECD, 2013).

II. A Comparative Profile of College-Educated Immigrant and U.S.-Born Adults

Immigrants contribute to the vitality and competitiveness of U.S. economy, and they and their U.S.-born children are projected to account for all net growth of the U.S. working-age population in the next decade.[16] Many are at the forefront of the nation's knowledge-based economy: more than a quarter of physicians, a third of computer specialists, a fifth of postsecondary teachers, and a quarter of the founders of high-tech companies are immigrants.[17] The growth of this college-educated population is outpacing that of the native born nationwide and across most states.[18]

Trends in the college-educated immigrant population in the United States reflect a shifting combination of economic, educational, political, and policy developments in the United States (as a country of destination) and the rest of the world. The 1965 Immigration and Nationality Act, which removed the stringent, racially-biased national-origins quota system and created a new pathway for employment-based immigration, coincided with a push by several countries in Asia and Africa to educate their populations.[19] Thanks to the strong U.S. economy and the country's reputation for offering high-quality postsecondary education, the United States became a leading destination for both workers and international students from the rest of the world. Several subsequent changes in U.S. immigration policy, most notably the 1990 Immigration Act, and the shift towards a knowledge-based economy contributed to an expanding number of highly skilled temporary workers and students, particularly from Asia.[20]

A. Demographic Characteristics by Nativity

These developments have shaped the size and composition of the college-educated immigrant population in the United States. Immigrants are overrepresented among college-educated adults (17 percent) relative to their share of the total U.S. population (14 percent), according to the U.S. Census Bureau's 2019 ACS. PIAAC data yield similar results, finding that 16 percent of all college-educated adults were born abroad. (See Table B.1. in Appendix B for a detailed profile of the two groups of adults).

The racial and ethnic composition of immigrant and U.S.-born college graduates differ widely. Historically, Asians made up a significant portion of college-educated immigrant population. For instance, Indian immigrants account for the majority of highly skilled temporary H-1B visa workers; and China, India, and South Korea remain the top sending countries of international students enrolled in U.S.

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[16] Harry J. Holzer, *Immigration and the U.S. Labor Market: A Look Ahead* (Washington, DC: MPI, 2019); Pia M. Orrenius, Madeline Zavodny, and Stephanie Gullo, "How Does Immigration Fit into the Future of the U.S. Labor Market?" *IZA,* accessed October 3, 2021; Jeffrey S. Passel and D'Vera Cohn, *Immigration Projected to Drive Growth in U.S. Working-Age Population through at Least 2035* (Washington, DC: Pew Research Center, 2017).

[17] Batalova and Fix, *Leaving Money on the Table.*

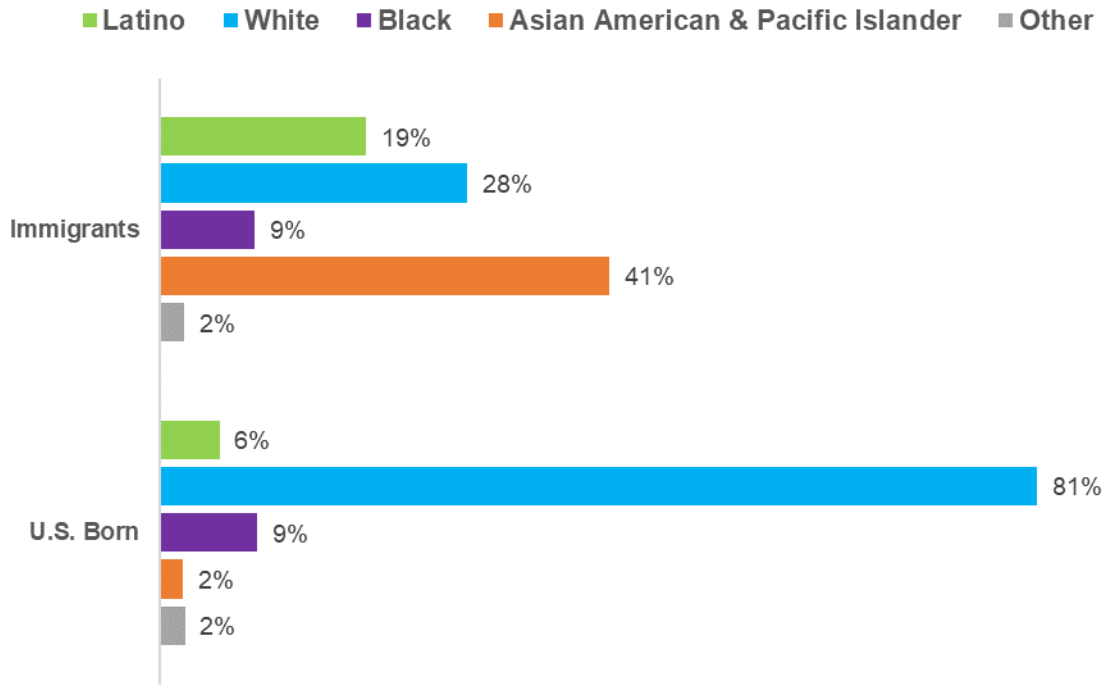
[18] The number of college-educated immigrants (ages 25 and older) grew by 42 percent between 2010 and 2019 compared to 27 percent of the U.S.-born college-graduate population in the United States overall. The rate of growth was much higher (above 60 percent) in 12 states, including Washington State, North Carolina, and Texas. See Batalova and Fix, *Leaving Money on the Table.*

[19] Aristide R. Zolberg, "A Nation by Design Immigration Policy in the Fashioning of America" (Boston, MA: Harvard University Press, 2008); Jessica Bolter, "Immigration Has Been a Defining, Often Contentious, Element Throughout U.S. History," *The Migration Information Source*, January 6, 2022.

[20] National Academies of Sciences, Engineering, and Medicine, "The Integration of Immigrants into American Society. Panel on the Integration of Immigrants into American Society." Mary Waters and Marisa Pineau, eds. (Washington, DC: The National Academies Press Committee on Population, Division of Behavioral and Social Sciences and Education, 2015).

higher education.[21] According to the PIAAC, 41 percent of college-educated immigrants are Asian American and Pacific Islander (AAPI), 28 percent are White, 19 percent are Latino, and 9 percent are Black (see Figure 1). In contrast, 81 percent of U.S. born college graduates are White; 9 percent are Black, and 6 percent are Latino. Only 2 percent are AAPI.

FIGURE 1
Race and Ethnicity of Adult College Graduates (ages 25-65) by Nativity



Notes: Latinos can be of any race, while the other racial groups (Black; Asian American & Pacific Islander; Other race; and White) refer to non-Latinos.
Source: Authors' tabulation of pooled 2012/2014/2017 Program for the International Assessment of Adult Competencies (PIAAC), provided by the National Center for Education Statistics (NCES).

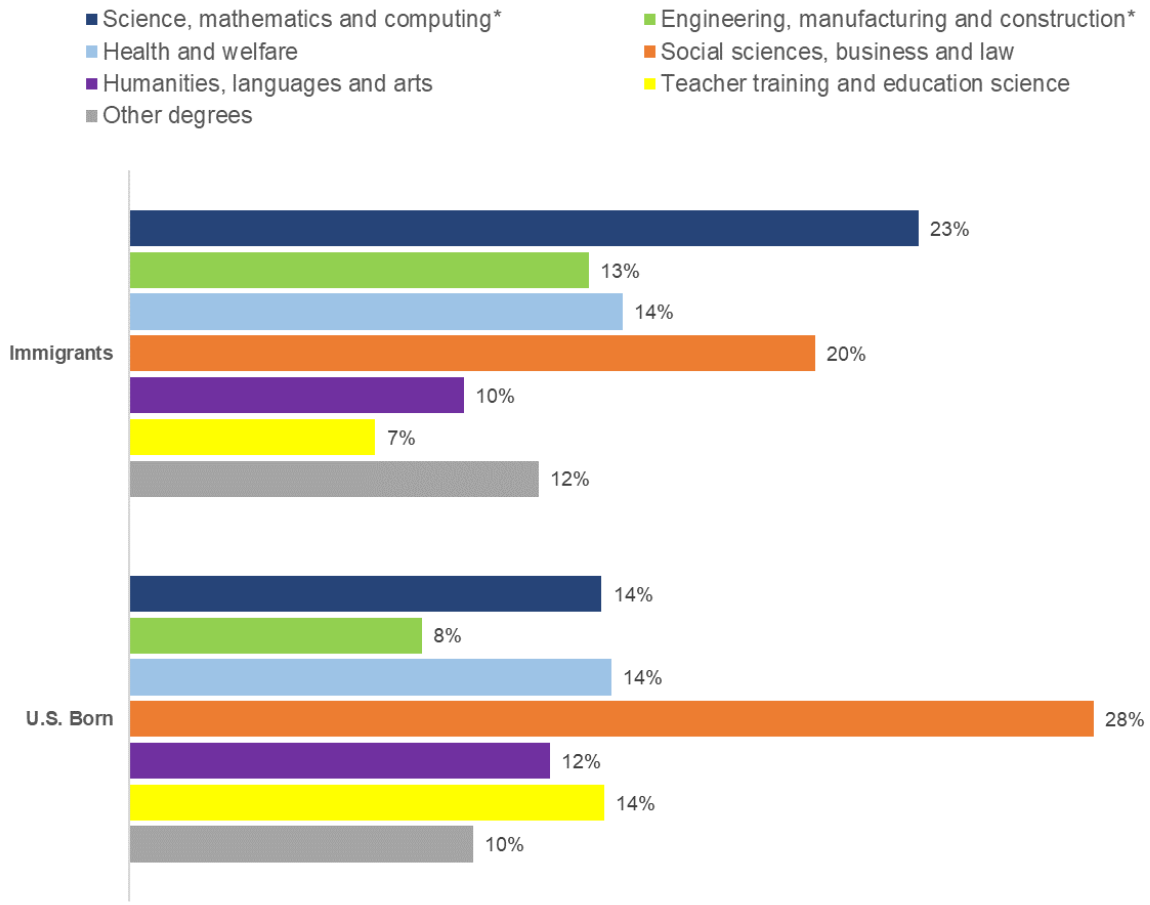
B. Educational Characteristics by Nativity

The number of international students in the U.S. has been rising steadily since 1950, with many finding jobs and remaining in the United States after graduation. Data show that two-thirds of college-educated immigrants in the PIAAC sample are U.S. educated (i.e., they attained their highest degree in the United States). Immigrants' educational characteristics differ from their native-born counterparts in two ways. First, they are more likely to hold advanced degrees: 60 percent of immigrant college graduates have at least a Master's degree versus 53 percent of the U.S. born. Second, they are more likely to have degrees in the high-demand fields of science, technology, engineering, and math (STEM) and health:[22] 51 percent of immigrants have degrees in STEM or health versus 36 percent of the U.S. born (see Figure 2).

[21] U.S. Citizenship and Immigration Services (USCIS), *Characteristics of H-1B Specialty Occupation Workers: Fiscal Year 2020 Annual Report to Congress* (Washington, DC: USCIS, 2021); Institute of International Education (IIE), *Open Doors: Report on International Educational Exchange* (New York, NY: IIE, 2021).
[22] Alan Zilberman and Lindsey Ice, "*Why Computer Occupations Are Behind Strong Stem Employment Growth in the 2019–29 decade*" (Washington, DC: Bureau of Labor Statistics, 2021).

Most college-educated immigrants reported that they speak English only or "very well". However, about 37 percent stated that they speak English "well" or less than well (i.e., "not well", or "not at all") and are typically classified as being limited English proficient or LEP.

FIGURE 2
Degree Majors of the Highest Degree, by Nativity



* Refers to degree majors in science, technology, engineering, and mathematics (STEM) fields.
Note: "Other degrees" include degrees in general programs, services, and agriculture/veterinary.
Source: Authors' tabulation of pooled 2012/2014/2017 PIAAC, provided by NCES.

C. Skills by Nativity

Table 1 shows the skills distribution of college-educated adults by nativity for each of the three tested cognitive skills domains. Several key findings emerge. Like immigrants overall, college-educated immigrants scored at lower measured proficiency levels in literacy, numeracy, and digital problem-solving than their native-born counterparts. Fifty-three percent of immigrants scored at high proficiency level in literacy versus almost 76 percent of the U.S. born: a gap of about 22 percentage points. The nativity gap persists but is narrower (11 percentage points) in numeracy: A result that is driven mostly by the lower performance in numeracy compared to literacy of the U.S. born.

Second, proficiency in digital skills is low for immigrants and natives alike: Only 35 percent of immigrants and 54 percent of the U.S. born performed at high levels. Third, immigrants who obtained their highest

degree in the United States have much higher scores across the three domains than those who obtained their degrees abroad. Sixty-two percent of U.S. educated immigrants scored at the high-performance level on literacy and 60 percent on numeracy versus 37 percent and 42 percent, respectively, for immigrants with their highest degrees from abroad. U.S.-educated immigrants' performance levels on literacy and numeracy levels were closer to those of the U.S. born. On numeracy, the share of U.S.-educated immigrants who performed at the high proficiency level was nearly the same as the U.S. born (60 percent versus 64 percent).

TABLE 1
Percentages of College-Educated Adults Performing at Each Proficiency Level in Literacy, Numeracy, and Digital Skills by Nativity and Place of Education

	U.S. Born	All Immigrants	U.S.-Educated Immigrants	Internationally Educated Immigrants
Literacy (%)				
Low	3	14	9	23
Middle	21	33	29	40
High	76	53	62	37
Numeracy (%)				
Low	8	17	13	23
Middle	27	30	27	35
High	64	54	60	42
Digital skills (%)				
Low	9	26	10	18
Middle	36	38	44	44
High	54	35	45	39

Source: Authors' tabulation of pooled 2012/2014/2017 PIAAC, provided by NCES.

III. Economic Outcomes and Job Quality by Nativity

As in other PIAAC participating countries, the skills and competencies of U.S.-born adults were higher than those of immigrants, reflecting the fact that some immigrants have lower English skills as English is a second language for many.[23] Research also shows that higher skill and education levels translate into better economic outcomes such as earnings, occupational status, and ability to obtain a higher-quality job.[24] They help the skilled withstand the economic downturns and other crises.[25] For instance, workers with more education were able to transition to remote work during the COVID-19 pandemic, while many lower-skilled workers either lost their jobs or had to work at their job sites despite high infection levels. Here the authors explore several economic and work-related outcomes of college-graduates, highlighting differences by nativity.

A. Labor Force Participation and Earnings

[23] OECD, *Skills Outlook 2013.*
[24] Hanushek, et al., Returns to Skills; Harry Holzer and Robert Lerman, *Cognitive Skills in the U.S. Labor Market: For Whom Do They Matter?* PIAAC Gateway (2015), accessed September 1, 2021.
[25] Carnevale, Cheah, and Wenzinger, *The College Payoff*; Steve Lohr, "Millions Have Lost a Step Into the Middle Class, Researchers Say," *The New York Times,* January 14, 2022.

On average, only 66 percent of U.S. adults are engaged in the civilian labor force.[26] The labor force participation rate for college graduates is much higher—above 85 percent—with U.S.-born adults having slightly higher rates than their immigrant counterparts (89 percent versus 86 percent). Full-time immigrant workers have higher monthly earnings ($7,140) than U.S. born workers ($6,500).[27] The finding that college-educated immigrants earn more may come as a surprise given that at least in some ways immigrants' skills are lower than the U.S. born. However, as shown previously, immigrants are more likely to have graduate-level degrees and to have majored in high-demand fields like STEM. Extensive research demonstrates that the earnings of college graduates vary by their degree majors.[28] Carnevale and colleagues find that the median entry annual income for recent graduates of the highest earnings majors such as STEM and health, is between $41,000 and $50,000; by mid-career those earnings have grown to $67,000-$81,000.[29] This concentration in high-paying fields appears to give immigrants an earnings advantage.

TABLE 2
Labor Force Participation, Average Monthly Wages, and Skill Underutilization of College-Educated Adults, by Nativity

	Immigrants	U.S. Born
Share in labor force (%)	86.0	89.1
Average monthly earnings* ($)	$ 7,145	$ 6,499
Share underutilized** (%)	21	21

* Refers to average (mean) monthly earnings of full-time employed workers. ** Refers to the share of workers in the labor force who are employed in jobs that require a high school diploma or less or workers who are unemployed.
Source: Authors' tabulation of pooled 2012/2014/2017 PIAAC, provided by NCES.

B. Skill Underutilization

The third economic outcome presented in Table 2 is skill underutilization. Skills underutilization has been approached and defined in different ways in the literature.[30] Some analysts focus mostly on the mismatch between an individual worker's educational qualifications and the qualifications required to

[26] The authors' tabulation of the 2019 ACS.
[27] This analysis is based on the NCES dataset representing three pooled years of PIAAC. This means that all variables, including workers' earnings, are the average values across three years. With regard to the earnings, because the goal is to compare the earnings of U.S.- and foreign-born workers, to the extent there are any distortions related to inflation, they are likely to affect the earnings of both groups equally.
[28] Karly Ford and Junghee Choi, *The Importance of Skills and Majors in Determining Future Earnings* (Washington, DC: PIAAC Gateway, 2018).
[29] For comparison, on average, recent college graduates (ages 21-24) with degrees in teaching earned $30,000 annually while mid-career professionals (ages 35-44) earned $47,000. See Anthony P. Carnevale, Ban Cheah, and Andrew Hanson, *The Economic Value of College Majors* (Washington, DC: Georgetown University Center on Education and the Workforce, 2015).
[30] Müge Adalet McGowan and Dan Andrews, *Labour Market Mismatch And Labour Productivity: Evidence From Piaac Data* (Paris, OECD, 2015); Steven Rose, *Mismatch: How Many Workers with a Bachelor's Degree Are Overqualified for Their Jobs?* (Washington, DC: Urban Institute, 2017).

do the job.[31] Others explore measures such as involuntary part-time employment, having to work multiple jobs, or difficulties finding a job consistent with one's qualifications.[32]

In this report, the authors use the term skill underutilization. Other researchers have used terms such as overqualified, overeducated, and mal-employed. Skill underutilization represents a failure to leverage the human capital of existing workers. Both U.S. and international research find that brain waste comes with a heavy penalty.[33] At the individual level, it increases poverty, reduces workers' job satisfaction, and wages, and contributes to skills obsolescence. At the macro-economic level, it increases unemployment, reduces public revenues, and slows GDP growth.[34]

The PIAAC survey asks workers to report the qualification they consider necessary to get their job today.[35] Building on the work of LaRochelle-Côté and Hango and own research,[36] the authors define skill underutilization as college-educated workers who reported that they were in a job requiring no more than a high school education or that they were unemployed. On average, about a fifth of both immigrant and U.S.-born working adults with at least a four-year college degree stated that their job only required a high school education or that they were unemployed (see Table 2).[37]

C. Job Quality

A recent survey of 3,200 senior executives and 15,600 workers engaged across 15 industries in the United States and nine other countries found that employees have multiple core needs that drive their behavior and satisfaction at work.[38] While pay certainly matters, it is only one of the several elements employees consider when they apply for or decide to leave their job. Other aspects, such as emotional needs, relationship with colleagues and managers, work-life balance, and a sense of purpose and ownership, matter as well.

While many population and labor force surveys collect information on earnings and wages, non-financial aspects of job quality are understudied. The PIAAC survey includes several questions that allow analysts to explore the non-financial elements of job quality, such as job flexibility or autonomy, management experience, and job security (see Appendix A for the PIAAC questions regarding job quality dimensions).

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[31] One set of approaches focuses on the concept of qualification mismatch (also referred to as education-job mismatch). Many PIAAC-based reports explore qualification mismatch, its determinants, and implications. Three main approaches are used to measure qualification mismatch. One compares respondents' highest degrees to the required qualification level corresponding to his/her occupation code according to the International Standard Classification of Occupations. A second approach compares workers' qualifications to the modal qualification of workers already employed in the same occupation. A third strategy is based on workers' opinions on the mismatch between their jobs and education.

[32] David Bell and David Blanchflower, "Underemployment in the US and Europe," Cambridge, MA: National Bureau of Economic Research, 2018, working paper 24927); Binyamin Appelbaum and Damon Winter, "One Job Is Better Than Two," The New York Times, September 1, 2019; BLS, "Table A-15. Alternative Measures of Labor Underutilization," accessed March 15, 2021.

[33] McGowan and Andrews, *Labor Market Mismatch and Labor Productivity*.

[34] OECD, *Skills Matter: Further Results from the Survey of Adult Skills* (Paris, OECD, 2016).

[35] Focusing on employed workers, PIAAC survey asks the following question: "If applying today, what would be the usual qualifications, if any that someone would need to get this type of job"?

[36] Sébastien LaRochelle-Côté and Darcy Hango, *Overqualification, Skills, and Job Satisfaction* (Ottawa, Canada: Statistics Canada, 2016); Batalova and Fix, *Leaving Money on the Table.*

[37] Workers whose skills were underutilized are comprised of two populations: those who were overqualified and those who were unemployed. Among both immigrants and U.S. born engaged in the civilian labor force, approximately 17 percent were in the former group and 4 percent were in the latter group.

[38] Ellyn Shook and David Rodriguez, "Care To Do Better: Building trust to leave your people and your business net better off" (Accenture, 2020).

Table 3 shows how college-educated immigrant and native workers view their workplace from this job-quality perspective. U.S.-born college graduates were more likely to report having work flexibility: The share of these workers reported having a high or very high degree of flexibility over how they choose or change their work was 55 percent compared to 48 percent for immigrant workers. Notably, the differences between immigrant and native workers on other indicators of job quality studied here were small to none. Immigrant workers were slightly more likely to say that they have managerial duties: 43 percent of immigrant college graduates are managers, versus 40 percent of their native-born counterparts. The overwhelming majority of employed workers with college degrees regardless of their nativity held stable jobs: 78 percent of immigrants and 81 percent of U.S. born say their job does not require a contract or if they have one, it is indefinite. Additionally, close to 90 percent of college-educated workers hold only one job, and a large share of both immigrant and native respondents reported high levels of satisfaction with their current job (82 percent each).

While these findings may bode well for companies who wish to keep their workers happy, the fact that most college-educated workers—immigrants and native alike—reported that they can do more at the workplace is worth highlighting. When asked if they feel that they have the skills to perform more demanding duties than those required at the current job, more than 90 percent of workers said that they do, suggesting a high perceived level of skill underutilization.

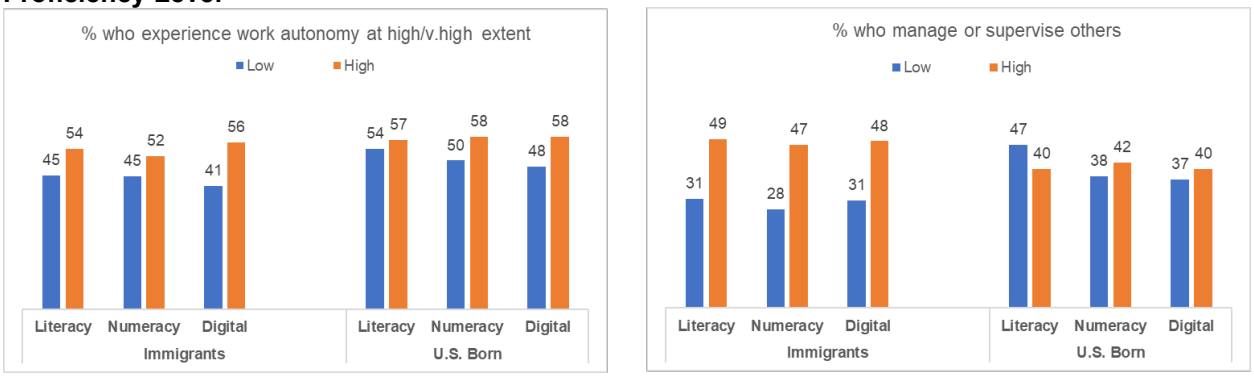
TABLE 3
Job-Quality Characteristics of College-Educated Workers, by Nativity

	Immigrants	U.S. Born
Job quality (%)		
Experience relative autonomy of work (1="high/very high extent"; 0="some extent/little")	48	55
Share with managerial duties (1=manages others; 0=do not manage others)	43	40
Type of employment contract (1=an indefinite contract/no contract; 0=other contracts)	78	81
Share working only one job (1=one job; 0=multiple jobs)	89	88
Job satisfaction level (1=satisfied; 0=other)	82	82
Not challenged enough: Share with skills to handle more demanding duties (1=yes; 0=no)	92	93

Source: Authors' tabulation of pooled 2012/2014/2017 PIAAC, provided by NCES.

The researchers also examined the relationship between these six workplace characteristics and respondents' cognitive skills (see Figure 4). By and large, skills are associated with greater work flexibility and to the opportunity to manage others. Skills premiums are especially high for immigrants. For instance, only 28 percent of immigrants with low proficiency in numeracy were managers versus 47 percent with high proficiency, a gain of 19 percentage points. With regard to having greater flexibility at work, 41 percent of immigrants with low digital skills said the extent of autonomy at work is high or very high, compared to 56 percent of immigrants with high proficiency. The relationship between skills and other workplace characteristics was not as pronounced (see Table B.2. in Appendix B)

FIGURE 4
Share of College-Educated Workers by Job Quality Characteristics, by Nativity, Skill, and Proficiency Level



Notes: *Work flexibility* was based on the following question: "To what extent can you choose or change how you do your work?" *Managing other employees* was based on this question: "Do you manage or supervise other employees?" Estimates showing the shares of adults with middle proficiency are not displayed in this figure but are included in Table B.2 in Appendix B.
Source: Authors' tabulation of pooled 2012/2014/2017 PIAAC, provided by NCES.

IV. Skills and Labor Market Outcomes

This analysis shows that on average both native and immigrant college graduates had higher labor force participation rates, higher earnings, and lower rates of skill underutilization if their literacy, numeracy, and digital skills were high (see Table 4). Immigrants in particular stand to improve their economic outcomes as their literacy, numeracy, and digital skills rise.

For instance, immigrants with high proficiency levels on literacy and numeracy were much more likely to participate in the labor market than those with lower measured level of skills on these two domains. Monthly earnings of immigrant college graduates at high proficiency levels were almost double those of graduates who scored at low levels ($8,300 versus $4,400). Immigrants' economic outcomes seem particularly sensitive to proficiency levels. For example, immigrants who had low literacy levels were four times more likely than those with high scores to be underutilized (45 percent versus 11 percent). For natives, those with low scores were twice as likely to be underutilized (19 percent versus 38 percent).

TABLE 4
Labor Market Outcomes of College-Educated Immigrant and U.S.-Born Adults Performing at Each Proficiency Level in Literacy, Numeracy, and Digital Skills

	Immigrants			U.S. Born		
	Low	Middle	High	Low	Middle	High
By literacy levels						
Share in labor force (%)	81	87	87	78	87	90
Average monthly earnings*	$ 4,445	$ 6,007	$ 8,314	$ 5,352	$ 5,538	$ 6,767
Share underutilized** (%)	45	28	11	38	26	19
By numeracy levels						
Share in labor force (%)	81	88	86	84	87	91
Average monthly earnings*	$ 5,277	$ 6,195	$ 8,080	$ 4,489	$ 5,636	$ 7,020
Share underutilized** (%)	44	27	12	35	24	18
By digital skill level						
Share in labor force (%)	91	87	84	76	88	90
Average monthly earnings*	$ 6,106	$ 7,100	$ 7,422	$ 5,186	$ 5,939	$ 6,909
Share underutilized** (%)	44	22	14	37	23	19

* Refers to average (mean) monthly earnings of full-time employed workers. ** Refers to the share of workers in civilian labor force who are employed in jobs that require a high school diploma or less or workers who are unemployed.
Source: Authors' tabulation of pooled 2012/2014/2017 PIAAC, provided by NCES.

The above descriptive analysis documents a positive relationship between cognitive skills and three labor market outcomes for immigrants and the U.S. born. Do these effects remain when other factors are taken into account? Regression analyses allow researchers to examine the labor market returns to cognitive skills while holding constant other variables also known to affect economic outcomes.[39] These factors (or independent variables) include other human capital characteristics such as degree major and level of education, and in the case of immigrants, oral English proficiency. Additional independent variables typically used in the analysis of economic outcomes include race and ethnicity, gender, and presence of young children, and in the case of immigrants, length of U.S. residence. Tables 5-7 present the summary results when all independent variables are included in the models.[40]

In terms of the *direction* of the effect, as expected, higher levels of human capital are associated with better economic outcomes for U.S. adults: By and large, higher cognitive skills, advanced degrees, STEM or health degree majors are associated with a higher likelihood of being engaged in the labor force, higher monthly earnings, and lower likelihood of working in a job that requires no more than a high school diploma or being unemployed.

However, when the *statistical significance* of the independent variables is considered, the story for immigrants becomes more complex. The main finding seen in Tables 5[41] is that once immigrants' spoken English proficiency is taken into account, the effect of cognitive skills is small, and the association

[39] Gustave Goldmann, Arthur Sweetman, and Casey Warman, "The Portability Of New Immigrants' Human Capital: Language, Education and Occupational Matching," Queen's Economics Department Working Paper, No. 1271 (2011), Queen's University, Department of Economics, Kingston (Ontario).
[40] Altogether the researchers ran 27 regression models separately for immigrants and the U.S. born (the detailed regression results are available upon request). Logistic regression models were estimated for two of the three economic outcomes, labor force participation and skill underutilization (each coded as 1 or 0). In logistic regressions, the odds ratio is a way to describe the strength of association between an outcome (being in the labor force, e.g.) and an explanatory variable (literacy level, e.g.). If the odds ratio is greater than 1, odds of being "in the labor force" as opposed to "out of the labor force" are higher as the literary score goes up. An ordinary least squares (OLS) regression model was used to estimate full-time workers' monthly earnings (natural log of positive earnings). The same set of independent variables was used in each modeling exercise, as shown in Tables 5-7.
[41] Another finding is that regardless of nativity, college-educated women are less likely to be in the labor force than men. Further, among full-time workers, women earn less than their male counterparts all other things being equal.

between cognitive skills and other human capital variables and the labor force participation is not statistically significant.

The coefficients for literacy and graduate level of education on monthly earnings remain statistically significant (in Table 6), and so does the effect of digital skills on the likelihood of being underutilized (in Table 7). In contrast, increases in spoken English proficiency among college-educated immigrants are strongly associated with better economic outcomes (seen in Table 5, 6, and 7). Because literacy, numeracy, and digital problem-solving assessments were completed in English, these variables overlap with oral English skills of U.S. immigrants for whom English is a second language, so their effect is "picked up" by another variable. In the case of the U.S.-born college graduates, the relative effect of literacy, numeracy, and digital skills on the economic outcomes remains statistically significant (in almost all models) even when other variables are held constant.

TABLE 5
Logistic Regression Predicting Labor Force Participation among Immigrant and U.S.-Born Workers

	Immigrants			U.S. Born		
	Literacy	Numeracy	Digital	Literacy	Numeracy	Digital
	Odds ratio	Odds ratio	Odds ratio	Odds ratio	Odds ratio	Odds ratio
Cognitive skills	1.002	1.004	0.995	1.004	1.005 *	1.005 *
Other human capital characteristics						
STEM/Health degree major (other degree majors=0)	1.113	1.114	1.511	0.889	0.889	0.873
Graduate level degree (BA=0)	1.335	1.342	1.421	0.971	0.981	0.981
U.S. education (international degree=0)	0.779	0.739	0.601	-	-	-
Fluent in English (speak English less than 'very well'=0)	2.469 *	2.445 *	2.392 *	-	-	-
Demographic controls						
Female (male=0)	0.219 ***	0.233 ***	0.301 **	0.383 ***	0.410 ***	0.372 ***
Age group (25-34 category=0)						
35-44	1.497	1.504	1.323	1.042	1.054	1.128
45-54	1.663	1.703	1.267	1.009	1.021	1.164
55-65	0.573	0.587	0.371	0.344 ***	0.348 ***	0.438 ***
Have children under 18	3.822 **	3.846 *	5.257 **	1.336	1.337	1.338
Race & ethnicity (white/other==0)						
Latino	2.437	2.767	3.774	1.090	1.130	1.299
Black	6.920	7.953	4.698	1.270	1.400	1.250
AAPI	2.749 **	2.859 **	2.348 *	0.707	0.711	0.661
Years in the U.S. (0-9 years=0)						
Between 10 and 19	1.909	1.865	2.295	-	-	-
20 or more	1.894	1.928	3.090	-	-	-
N	520	520	460	3,030	3,030	2,880

Note: Coefficients are reported as odds ratios ($Exp(b)$) relative to the reference category (=0). Latinos can be of any race, while the other racial groups (Black; Asian American & Pacific Islander; Other race; and White) refer to non-Latinos.
*p < .05. **p < .01. ***p < 0.001.
Source: Authors' tabulation of pooled 2012/2014/2017 PIAAC, provided by NCES.

TABLE 6
Ordinary Least Squares Regression Predicting Monthly Earnings* among Full-Time Immigrant and U.S.-Born Workers (with positive earnings)

	Immigrants			U.S. Born		
	Literacy	Numeracy	Digital	Literacy	Numeracy	Digital
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Cognitive skills	1.003 **	1.002	1.002	1.003 ***	1.003 ***	1.003 ***
Other human capital characteristics						
STEM/Health degree major (other degree majors=0)	1.116	1.110	1.091	1.116 **	1.115 **	1.107 **
Graduate level degree (BA=0)	1.277 **	1.290 **	1.336 **	1.003	1.009	1.019
U.S. education (international degree=0)	1.167	1.232	1.160	-	-	-
Fluent in English (speak English less than 'very well'=0)	1.283 *	1.332 **	1.308 *	-	-	-
Demographic controls						
Female (male=0)	0.805 **	0.819 *	0.803 **	0.784 ***	0.818 ***	0.776 ***
Age group (25-34 category=0)						
35-44	1.389 ***	1.396 ***	1.366 **	1.370 ***	1.378 ***	1.387 ***
45-54	1.300	1.293	1.278	1.469 ***	1.477 ***	1.506 ***
55-65	1.381 *	1.344	1.371	1.480 ***	1.477 ***	1.560 ***
Have children under 18	1.122	1.125	1.119	0.986	0.991	1.001
Race & ethnicity (white/other==0)						
Latino	0.950	0.942	0.882	1.009	1.008	1.010
Black	0.799	0.804	0.762	0.890 *	0.931	0.887 *
AAPI	1.127	1.108	1.082	1.041	1.056	1.040
Years in the U.S. (0-9 years=0)						
Between 10 and 19	0.987	0.962	1.027	-	-	-
20 or more	1.065	1.015	1.071	-	-	-
N	290	290	270	1,880	1,880	1,820

Note: In the models the dependent variable was the natural log of monthly earnings, however the coefficients in this table are exponentiated coefficients to make them easier to interpret. Latinos can be of any race, while the other racial groups (Black; Asian American & Pacific Islander; Other race; and White) refer to non-Latinos.
*p < .05. **p < .01. ***p < 0.001.
Source: Authors' tabulation of pooled 2012/2014/2017 PIAAC, provided by NCES.

TABLE 7
Logistic Regression Predicting Skill Underutilization among Immigrant and U.S.-Born Workers in the Civilian Labor Force

	Immigrants			U.S. Born		
	Literacy	Numeracy	Digital	Literacy	Numeracy	Digital
	Odds ratio	Odds ratio	Odds ratio	Odds ratio	Odds ratio	Odds ratio
Cognitive skills	0.989	0.990	0.978 **	0.992 ***	0.991 ***	0.992 ***
Other human capital characteristics						
STEM/Health degree major (other degree majors=0)	0.638	0.647	0.544	0.643 ***	0.645 ***	0.652 ***
Graduate level degree (BA=0)	0.602	0.580	0.422	1.299 *	1.284 *	1.288 *
U.S. education (international degree=0)	1.145	1.072	1.503	-	-	-
Fluent in English (speak English less than 'very well'=0)	0.274 **	0.257 **	0.280 *	-	-	-
Demographic controls						
Female (male=0)	0.628	0.558	0.454	0.867	0.772 *	0.884
Age group (25-34 category=0)						
35-44	0.535	0.511	0.356	0.550 ***	0.545 ***	0.518 ***
45-54	0.890	0.908	0.530	0.669 *	0.658 *	0.587 **
55-65	1.685	1.710	0.985	0.640 **	0.637 **	0.523 ***
Have children under 18	1.349	1.376	1.587	1.366	1.348	1.346
Race & ethnicity (white/other==0)						
Latino	1.346	1.220	1.128	1.352	1.322	1.402
Black	3.120 *	2.790	2.176	1.166	1.021	1.160
AAPI	0.477	0.482	0.409	0.740	0.729	0.822
Years in the U.S. (0-9 years=0)						
Between 10 and 19	1.625	1.651	1.301	-	-	-
20 or more	0.888	0.952	0.958	-	-	-
N	400	400	350	2,390	2,390	2,290

Note: Coefficients are reported as odds ratios ($Exp(b)$) relative to the reference category (=0). Skill underutilization is expressed as the share of college-educated workers in the civilian labor force who reported that they were in a job requiring no

more than a high school education or that they were unemployed. Latinos can be of any race, while the other racial groups (Black; Asian American & Pacific Islander; Other race; and White) refer to non-Latinos.
*p < .05. **p < .01. ***p < 0.001.
Source: Authors' tabulation of pooled 2012/2014/2017 PIAAC, provided by NCES.

V. Conclusion

The extent to which the education and skills of college-educated immigrants are rewarded in the labor market relative to their native-born counterparts is an important policy issue in countries that receive large numbers of highly skilled immigrants such as the United States, Australia, and Canada.[42] This report aims to contribute to the literature on immigrant integration by focusing on college-educated immigrants in the United States, a population that is growing both in numbers and labor market prominence. It also seeks to improve our understanding of the role skills and qualifications play in shaping immigrants' integration outcomes. The researchers analyzed the unique dataset from OECD's international assessment of adults' literacy, numeracy, and digital problem-solving skills (2012/2014/2017 PIAAC).

The analysis finds that immigrants with four-year college degrees differ in important ways from the U.S. born: over 70 percent of immigrant graduates are racial and ethnic minorities compared to 19 percent of the U.S. born. While 41 percent of immigrant college graduates are Asian Americans and Pacific Islanders, substantial shares are also Latino (19 percent) and Black (9 percent). The substantial, if incomplete economic integration of this largely minority population represents an important measure of progress toward racial and ethnic equity and stands in sharp contrast to the stereotyping of immigrants based on race and origin that afflicts much of current immigration discourse.[43]

The paper reports the fact that Immigrant college graduates are more likely to have advanced degrees than their U.S.-born counterparts. Additionally, their degrees are more heavily concentrated in the high-demand fields of STEM and health than those held by the U.S. born (51 percent versus 36 percent, respectively).

PIAAC data show that immigrants' literacy, numeracy, and digital skills lagged the U.S. born. That is, their proficiency scores were more likely to fall in the low performance range and less likely to fall in the high-performance range: results that held across tests of literacy, numeracy, and digital skills. The nativity gaps in the share of adults in the high-performance group were widest in literacy and narrowest in digital skills. The latter result owes in part to the low proficiency levels of both natives and immigrants regarding digital skills. Within the immigrant population, the scores across three skills domains of immigrants who received their degrees in the United States were higher than those of immigrants who earned their degrees abroad. While PIAAC offers a unique opportunity to assess U.S. adults' foundational skills and explore the relationship between these skills and economic outcomes, it should be noted that the skill assessment was conducted only in English. This limitation means that immigrants without full English proficiency could be at a disadvantage in demonstrating the actual level of their foundational skills, which could explain in part the nativity gaps in skills observed.

Independent of their correlation with skills, several comparative findings regarding economic outcomes reported in the PIAAC are notable. Overall, immigrant and U.S.-born college graduates experienced

[42] Andrew Clarke and Mikal Skuterud, "A Comparative Analysis of Immigrant Skills and Their Utilization in Australia, Canada, and the United States," *Journal of Population Economics*, vol. 29, pages 849–882 (2016).
[43] Catarina Saraiva, "Inequality Has Cost the U.S. Nearly $23 Trillion Since 1990," *Bloomberg*, September 28, 2021.

equivalent levels of underemployment (at about 21 percent). Perhaps most strikingly, immigrant college graduates had higher average monthly earnings overall than their U.S.-born counterparts, ($7,000 versus $6,500). This result may reflect their higher rates of degree holding in high-demand fields and the greater likelihood that they have earned advanced degrees. Regarding job quality, immigrant graduates reported that they were as likely, or almost as likely, as the U.S. born to act autonomously at work, to manage others, and to express high levels of job satisfaction.

The analysis shows a strong correlation between foundational skill levels and a range of important economic outcomes. Higher skills were associated with higher labor force participation rates, lower underutilization rates, and higher average monthly incomes. Outcomes for immigrant college graduates were especially sensitive to tested skill levels. For example, immigrants who had low literacy levels were four times more likely than those with high scores to be underutilized (45 percent versus 11 percent). For natives, those with low scores were twice as likely to be underutilized (19 percent versus 38 percent). Similar patterns hold for skill levels and economic outcomes related to numeracy and digital skills

Overall, the PIAAC-based results also suggest that most immigrant college graduates, especially those who are U.S. educated, are integrating successfully in the U.S. labor market. Many are trained to work in high-demand areas of the economy, and the literature demonstrates that immigrant graduates are disproportionately represented in professions that range from medicine to engineering to the biosciences. A major study by the National Academies of Sciences defined integration as "the process by which members of immigrant groups and host societies come to resemble one another."[44] According to the PIAAC-based results discussed in this report, many immigrant college graduates seem to be making—or exceeding—this mark.

However, despite these largely favorable outcomes, a fifth of immigrant college graduates—as well as a fifth of U.S.-born college graduates—remain underutilized. This brain waste reinforces policymakers' need to focus on the often-overlooked issue of underemployment of college graduates in the United States even in an era of labor shortages and low unemployment. MPI researchers have written extensively on policies that address this issue with a special emphasis on the college-educated immigrant population.[45] Given that English language skills are among the strongest predictors of economic outcomes, helping immigrants boost their ability to understand and use written text in English (cognitive skills) and communicate in English would remove a major obstacle to their economic mobility.[46] Additional remedial policies could include more flexible recognition of education and occupational credentials earned abroad, creation of "bridge" courses that efficiently fill gaps in workers' prior schooling and experience, and expansion of options to test occupational English in selected professions (e.g., nursing).[47] In some cases, reforms that benefit underutilized internationally educated

[44] The National Academies of Sciences, *The Integration of Immigrants into American Society*, p.2.
[45] Jeanne Batalova and Michael Fix, *Tapping the Talents of Highly Skilled Immigrants in the United States: Takeaways from Experts Summit* (Washington, DC: MPI, 2018). See additional MPI research on the topic of brain waste and credential recognition here: Brain Waste & Credential Recognition | migrationpolicy.org.
[46] Batalova and Fix, *Leaving the Money on the Table;* Amanda Bergson-Shilcock and James Witte, *Steps to Success: Integrating Immigrant Professionals in the U.S.* (New York: World Education Services, 2015).
[47] Margie McHugh and Madeleine Morawski, *Unlocking Skills: Successful Initiatives for Integrating Foreign-Trained Immigrant Professionals* (Washington, DC: MPI, 2017); World Education Services (WES), *Opening Pathways to Practice for Internationally Trained Physicians: State Policy Options* (New York: WES, 2021).

immigrants—such as the deregulation of some occupations where licensing regimes introduce inefficiencies—will have spillover benefits for underemployed U.S.-born adults.[48]

The PIAAC survey underscores the impact of strong foundational skills on economic outcomes—even among college graduates. As the number of U.S. adults with college degrees continues to grow, in part due to immigration, helping underutilized workers acquire these skills and transition into jobs that fully tap them represents an important strategic investment in building the nation's talent base and competing internationally.

[48] Emma Goldberg, "'I Am Worth It': Why Thousands of Doctors in America Can't Get a Job," The New York Times, February 23, 2021.

Appendix A. Data and Methodology

PIAAC Dataset

For the purposes of this report, the PIAAC survey provides several distinct advantages. First, PIAAC's background questionnaire provides information on survey participants' educational attainment level and their majors at the highest degree level. In contrast, the U.S. Census Bureau's American Community Survey (ACS) only provides information on participants' degree major at the Bachelor's level. PIAAC uniquely documents several dimensions of job quality, largely unavailable in other U.S. surveys, including measures of workers' job autonomy and job satisfaction. Third, coupled with these detailed background data, the survey uses advanced psychometric tests to directly assess and to provide reliable estimates of adults' proficiency in English literacy, numeracy, and problem solving in technology-rich environments. PIAAC's measurement strategies have been amply and well documented.[49] The data provide a unique opportunity to explore how directly assessed (as opposed to self-assessed) skills relate to social and economic outcomes.

Scores on PIAAC tests range from 0 to 500 in each domain, corresponding to six proficiency levels for literacy and numeracy, and four levels for digital skills.[50] Each additional year of education can be associated with approximately seven score points.[51] With regard to proficiency levels, one proficiency *level* translates roughly into seven years of education or 50 score points.[52] Full proficiency in general requires scoring at Levels 3-5 for literacy and numeracy and Level 2-3 for problem-solving. The researchers followed NCES reports' language and guidelines[53] and grouped the skill levels for each of the three skill assessments into the following three categories (see Table A.1):

TABLE A.1
Definitions of Proficiency Levels and Corresponding Cut Scores

Population group by proficiency	Levels on Literacy and Numeracy Assessment	Levels on Problem Solving in Technology-Rich Environments (or Problem Solving) Assessment
Lower performance level	Level 1 and Below Level 1 *Cut scores: 0-225*	Below Level 1 *Cut scores: 0-290*
Middle proficiency	Level 2 *Cut scores: 226-275*	Level 1 *Cut scores: 291-340*
High proficiency	Level 3-5 *Cut scores: 276-500*	Level 2-3 *Cut scores: 341-500*

[49] See American Institute for Research, *PIAAC A New Strategy to Assess Adult Competencies and Their Social and Economic Impact in the United States and Internationally*, Institute of Education Sciences, National Center for Education Statistics.
[50] Each proficiency level is represented by a range of tasks. Each score denotes a point at which a respondent has a 67-percent chance of successfully completing tasks that are associated with a similar level of difficulty. See OECD, *OECD Skills Outlook 2013: First Results from the Survey of Adult Skills* (Paris and Brussels, 2013).
[51] OECD, *The Survey of Adult Skills (PIAAC): Implications for Education and Training Policies in Europe*, (Brussels: OECD, 2013).
[52] Ibid.
[53] Welcome to PIAAC Results (ed.gov)

PIAAC Sample

To increase the sample size and thus improve the robustness of the estimates, the researchers used a pooled 2012/2014/2017 PIAAC data provided by NCES. The overall sample size of the college-educated adults with available scores on each domain and who provided valid answers on the country of birth question was 3,560, including 530 immigrants.

Definitions of Select Variables

Variable	How the variable was constructed and the relevant population universe
Immigrant/U.S. born	The term refers to people who reported that they were born outside of the United States on the PIAAC questionnaire. The term "immigrants" is used interchangeably with "foreign born" and "first generation" in this report. To be consistent with OECD and NCES reports that employ PIAAC data, the researchers used the above definition. Note that this definition is slightly different from the U.S. Census Bureau's, which defines the foreign born as people who had no U.S. citizenship at birth. In other words, the Census Bureau's definition excludes children who were born abroad to at least one U.S. citizen parent from the population of the "foreign born," whereas the OECD definition – that we use here – would count them as "foreign born." The term "U.S. born" (or "native" or "native born") refers to people who stated that they were born in the United States. PIAAC variable name: J_Q04a (Were you born in the United States?)
Place of education	Although the PIAAC background survey included a question about one's place of education, the results revealed many missing data. Following an OECD approach as outlined in Bonfati and Xenogiani's "Migrants' Skills" chapter,[54] the researchers created a "U.S. education" qualification by comparing the year when immigrant respondents obtained their highest degree to the year of their arrival in the United States. If the difference was at least one year, then we assumed that the degree was earned in the United States. One limitation of this approach is that it may misclassify immigrants who obtained a degree in the United States, left for a while, and then came back while reporting only the last year as their date of immigration. Another limitation is that we cannot estimate the number of U.S.-born adults who earned their degrees abroad, a number that remains small but is on the rise. PIAAC variable names: B_Q01C2 (Highest qualification - Year of finish); J_Q04C2 (Year of immigration)
Three Economic Outcomes	
Labor force participation	Share of employed and unemployed persons among all adults *Universe:* all adults (ages 25-65) PIAAC variable name: C_D05 (Current status/work history - Employment status)
Monthly earnings	Average (mean) monthly earnings as reported in PIAAC *Universe:* full-time workers with positive earnings

[54] Sara Bonfati and Theodora Xenogiani, "Migrants' Skills: Use, Mismatch and Labour Market Outcomes. A First Exploration of the Survey of Adult Skills (PIAAC)", in *Matching Economic Migration with Labour Market Needs*, (Paris: OECD, 2014).

	PIAAC variable name: EARNMTHALLUS_C (Monthly earnings including bonuses for wage and salary earners and self-employed)
Skill underutilization	Two original PIAAC variables were used. 1) The PIAAC survey asks workers to report the qualifications they consider necessary to get their job today. The question is: "If applying today, what would be the usual qualifications, if any, that someone would need to get this type of job"? 2) PIAAC also asks people about their labor force status, including being unemployed. Skill underutilization refers to the share of people who reported that their jobs required no more than a high school diploma or who reported that they were unemployed. *Universe:* persons in the civilian labor force PIAAC variable names: D_Q12AUS (Current work - Requirements - Education level); C_D05 (Current status/work history - Employment status)
Job Quality	
Work autonomy	Question: To what extent can you choose or change how you do your work? *Universe:* employed workers PIAAC variable name: D_Q11B (Current work - Work flexibility - How to do the work)
Managing other employees	Question: Do you manage or supervise other employees? *Universe:* employed workers PIAAC variable name: D_Q08A (Current work - Managing other employees. Question: Do you manage or supervise other employees?)
Type of contract (job security)	Question: What kind of employment contract do you have? Is that ...An indefinite contract, a fixed term contract, a temporary employment agency contract, an apprenticeship or other training scheme, no contract or other? *Universe:* employed workers PIAAC variable name: D_Q09 (Current work - Type of contract)
Number of jobs	Question: In the last week, did you have one job or one business or was there more than one? *Universe:* employed workers PIAAC variable name: C_Q06 (Current status/work history - Last week - Number of jobs)
Job satisfaction	Question: All things considered, how satisfied are you with your current job? *Universe:* employed workers PIAAC variable name: D_Q14 (Current work - Job satisfaction)
Skills to cope with a more demanding job	Question: Do you feel that you have the skills to cope with more demanding duties than those you are required to perform in your current job? *Universe:* employed workers PIAAC variable name: (F_Q07a Skill use work - Not challenged enough)

Appendix B. Additional Tables

TABLE B.1.

Socio-Demographic, Educational, and Linguistic Characteristics of College-Educated Workers by Nativity

	Immigrants	U.S. Born
Sample size	530	3,030
Demographics		
% Female	52	53
Age (%)		
25-34	25	27
35-44	30	24
45-54	30	24
55-65	15	25
Race and Latino origin (%)		
Latino	19	6
Non-Latino White	28	81
Non-Latino Black	9	9
Non-Latino Asian American/Pacific Islander	41	2
Other race (non-Latino)	2	2
Years of U.S. residence (%)		
Under 10	20	-
Between 10 and 19	25	-
20 or more	53	-
Age at immigration (%)		
Before 25	57	-
At 25 or older	42	-
Share with children under 18 (of all adults)	13	10
Educational attainment and English proficiency		
Highest level of formal education obtained (%)		
Bachelor's degree	40	47
Master's degree/higher (inc. professional degree)	60	53
International education (immigrants only)	33	-
Degree majors (of highest qualification)		
General programmes	5	5
Teacher training and education science	7	14
Humanities, languages and arts	10	12
Social sciences, business and law	20	28
Science, mathematics and computing	23	14
Engineering, manufacturing and construction	13	8
Agriculture and veterinary	-	1
Health and welfare	14	14
Services	5	4
Self-assessed spoken English proficiency (%)		
Speak English only or very well	63	97
Speak English well	30	3
Speak English not well/not at all	7	-

Notes: Latinos can be of any race, while the other racial groups (Black; Asian American & Pacific Islander; Other race; and White) refer to non-Latinos.
Source: Authors' tabulation of pooled 2012/2014/2017 PIAAC, provided by NCES.

TABLE B.2.

Share of College-Educated Workers by Workplace Characteristic, Nativity, and Skill Proficiency Level

	Immigrants			U.S. Born		
Literacy proficiency levels	**Low**	**Middle**	**High**	**Low**	**Middle**	**High**
% who experience autonomy at work at "high/very high extent"	45	39	54	54	47	57
% who manage others;	31	37	49	47	37	40
% with no contract or an indefinite contract (as opposed to temporary/fixed-term/other contracts)	86	79	75	85	79	82
% working only at one job/business	93	89	87	88	88	87
% satisfied/very satisfied with current job	85	80	82	80	79	83
% stating that they have skills to handle more demanding duties	91	90	94	90	92	93
Numeracy proficiency levels	**Low**	**Middle**	**High**	**Low**	**Middle**	**High**
% who experience autonomy at work at "high/very high extent"	45	43	52	50	47	58
% who manage others;	28	42	47	38	35	42
% with no contract or an indefinite contract (as opposed to temporary/fixed-term/other contracts)	88	76	76	83	79	82
% working only at one job/business	92	89	87	87	89	87
% satisfied/very satisfied with current job	84	82	81	78	80	83
% stating that they have skills to handle more demanding duties	92	93	92	91	93	93
Digital skills proficiency levels	**Low**	**Middle**	**High**	**Low**	**Middle**	**High**
% who experience autonomy at work at "high/very high extent"	41	43	56	48	51	58
% who manage others;	31	43	48	37	41	40
% with no contract or an indefinite contract (as opposed to temporary/fixed-term/other contracts)	88	77	79	80	79	82
% working only at one job/business	92	90	87	84	88	87
% satisfied/very satisfied with current job	74	84	83	82	82	82
% stating that they have skills to handle more demanding duties	94	93	93	90	92	94

Source: Authors' tabulation of pooled 2012/2014/2017 PIAAC, provided by NCES.

About the Authors

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Jeanne Batalova is a Senior Policy Analyst at the Migration Policy Institute (MPI) and Manager of the Migration Data Hub, a one-stop, online resource for the latest facts, stats, and maps covering U.S. and global data on immigration and immigrant integration. She is also a Nonresident Fellow with MPI Europe. Her areas of expertise include the impacts of immigrants on society and labor markets; social and economic mobility; and the policies and practices regulating the immigration and integration of highly skilled workers and foreign students.

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MICHAEL FIX

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