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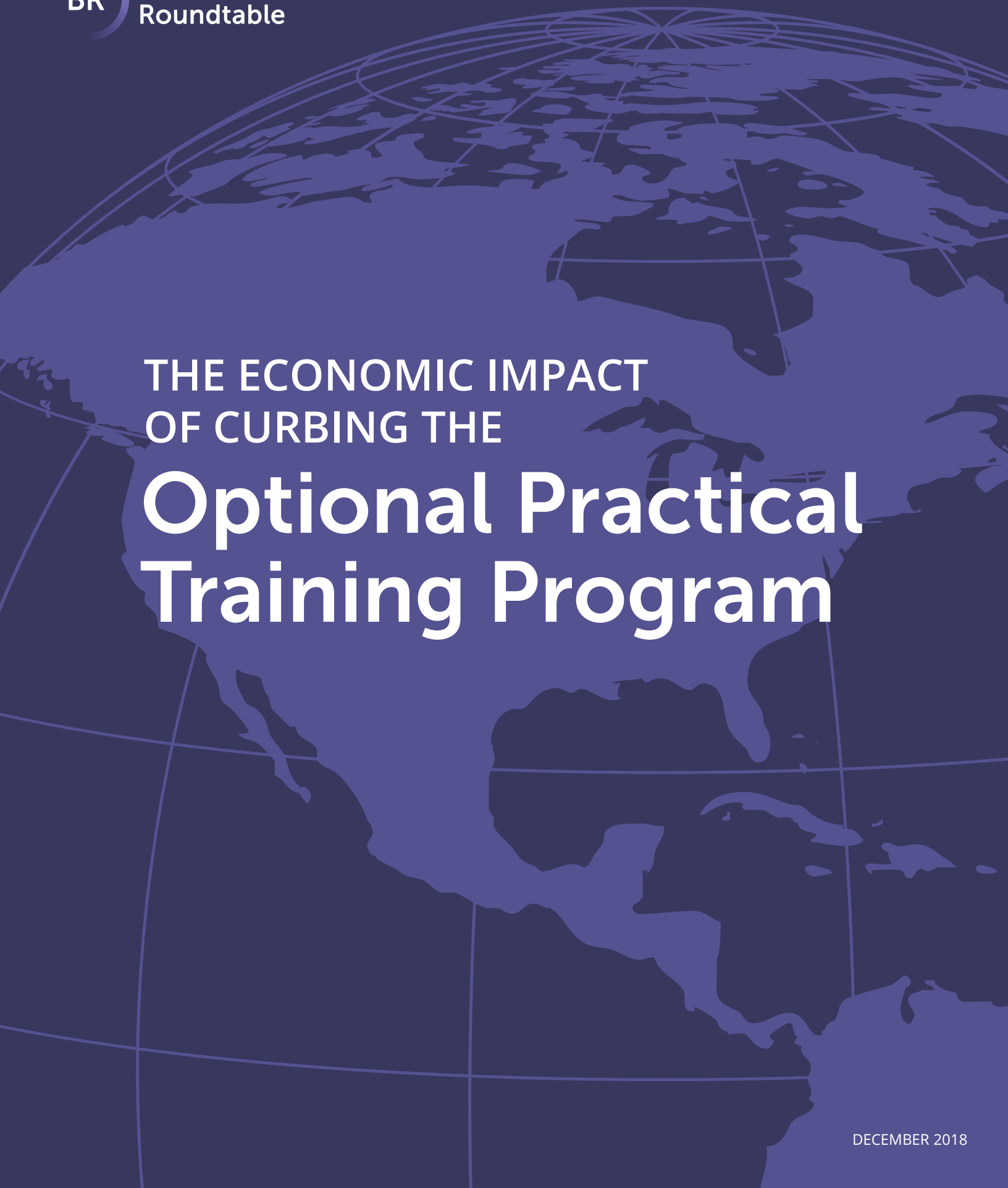

THE ECONOMIC IMPACT OF CURBING THE Optional Practical Training Program

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The Economic Impact of Curbing the Optional Practical Training Program

Contents

Executive Summary

Immigration has long been an engine of growth for the United States. Throughout history, immigrants have strengthened the U.S. economy while enriching the country's culture. America depends on immigrants to complement U.S. workers, open new businesses, and help the United States maintain and strengthen its competitive advantage in the global economy. Indeed, almost 44 percent of Fortune 500 companies in 2018 were founded by immigrants or their children.[1]

A key channel through which high-skilled immigrants contribute to economic growth is the Optional Practical Training (OPT) program. OPT offers temporary employment authorization to international students in the United States, allowing eligible students and recent graduates to gain valuable work experience within their field of study. By infusing the economy with well-educated workers and entrepreneurs who attend and graduate from U.S. colleges and universities, OPT has proven to be a highly successful program with direct benefits for American businesses and consumers.

Nevertheless, the Administration has indicated plans to scale back a variety of existing immigration channels that would directly or indirectly affect OPT, and the program consequently faces an uncertain future. In light of these potential changes, Business Roundtable commissioned a study to quantify their likely effect on the U.S. economy. Specifically, the Roundtable developed and modeled a scenario in which new immigration policies led to a 35 percent reduction in the issuance of foreign-born student visas and a 60 percent decline in OPT participation by 2020. The model illustrates that the effect on the U.S. economy would be negative, including:

- A decrease in real U.S. gross domestic product by about a quarter of a percentage point by 2028. The slowdown in economic growth is caused by a decline in immigrant consumers and workers who would otherwise reduce hiring shortages and fill skills gaps.
- A loss of 443,000 jobs over the next decade — including 255,000 jobs held by native-born workers. This result reinforces the findings of myriad prior studies that show that foreign-born workers actually *create* jobs for native-born workers on aggregate, rather than displace them.
- A 17-cent decline in the average real hourly wage by 2028, due to increased slack in the labor market and fewer productivity gains.

America's business leaders urge policymakers to consider the negative impact of adopting more restrictive immigration policies. Proposed changes that would discourage OPT participation are particularly short-sighted, as the United States should encourage talented foreign-born students to study in the United States and work for U.S. companies after they graduate. As new industries emerge that will play an increasingly important role in the 21st-century economy, it is critical that U.S. immigration policies continue to attract the best and brightest students from around the world. In this way, immigrants can help the United States achieve its full economic potential, to the benefit of all Americans.

Background and Context

Immigrants have played a vital role in growing America's economy since the country's founding. By driving innovation and catalyzing growth, immigrants have helped the United States achieve and maintain its position as a leader in the global economy. Today, more than one in four Americans are either first- or second-generation immigrants, and the benefits of immigration continue to support economic expansion, creating high-quality jobs for immigrants and nonimmigrants alike.[2]

However, an important channel of immigration faces an uncertain future: Optional Practical Training (OPT). OPT is a program that allows international students in the United States to pursue temporary employment while in school or after graduation.[3] Modifications to OPT that make the program less attractive to international students and graduates would not only reduce participation but also deter some international students from coming to the United States to study given that they would have fewer avenues for postgraduate employment. These effects are not trivial; in the 2016–17 academic year, international students added nearly $37 billion to the U.S. economy and created or supported more than 450,000 U.S. jobs, so discouraging foreign students from coming to the United States would cause economic harm.[4]

To assess the full impact of curbing OPT, Business Roundtable partnered with Inforum, an economic modeling group affiliated with the University of Maryland, to model the likely economic effects. This effort is the latest in a series of Business Roundtable reports on the benefits of immigration:

- ***Contributing to American Growth: The Economic Case for Immigration Reform*** (2014) discusses the positive effects immigration has on the U.S. economy, including stronger growth, greater wage gains, increased job opportunities and reduced federal deficits. The study explains how the United States could unlock additional growth opportunities by fixing its broken immigration system through enhanced border security and improved legal immigration channels.[5]
- ***State of Immigration: How the United States Stacks Up in the Global Talent Competition*** (2015) reveals that the U.S. immigration system ranks near the bottom among advanced economies in terms of promoting economic growth. U.S. laws and regulations impose unrealistic numerical limits and excessive bureaucratic rules on hiring foreign-born workers, and as a result, the United States lags in the global competition for talent.[6]
- ***Economic Effects of Immigration Policies: A 50-State Analysis*** (2017) demonstrates the importance of sound immigration policies that recognize the dual need for security and economic growth. The analysis illustrates that a balanced approach to immigration reform would promote economic growth, support job creation and boost America's competitiveness, while an "enforcement only" approach that focuses solely on security concerns without addressing the need for immigrant workers would weaken the U.S. economy substantially.[7]

OPT Overview

OPT was implemented in 1992 as a form of temporary work authorization available to international students pursuing an academic degree in the United States.[8] Initially, eligible students could receive up to 12 months of OPT employment authorization while remaining in the United States under student status, but the law was amended in 2008 to include a 17-month extension of OPT employment authorization for students who earn a degree in certain science, technology, engineering or math (STEM) fields. The STEM extension was expanded to 24 months in 2016, increasing the maximum period of OPT to 36 months for eligible STEM students.[9] Eligible students can use OPT authorization to work while in school (precompletion OPT) or after graduation (postcompletion OPT), provided the work relates to the student's major area of study.[10]

OPT is popular among international students. According to Pew Research Center, nearly 1.5 million international students were approved for OPT between 2004 and 2016, rivaling the number of initial H-1B visa approvals over the same period.[11] While OPT provides valuable opportunities for international students to gain work experience in the United States, the program also benefits the U.S. economy by supplying additional well-educated workers and consumers, which in turn leads to additional job creation through indirect and induced effects.

Economic Benefits of Immigration and OPT

Immigrants help the United States realize its economic potential. Countless studies have shown the economic benefits of immigration in the United States, including stronger gross domestic product (GDP) growth, improved labor market conditions for both native-born and foreign-born workers, and enhanced innovation and business creation.[12] Immigration is widely recognized among economists as a stimulus for economic growth in the United States. While this report illustrates how immigration improves certain aspects of the economy, see the Business Roundtable report *Contributing to American Growth: The Economic Case for Immigration Reform* for additional detail on the economic benefits of immigration.

Immigration's Effects on GDP

There is broad agreement that immigration has a positive effect on U.S. GDP. By infusing the economy with new consumers, immigration increases total consumer spending, which accounts for roughly two-thirds of economic growth. One analysis found that in 2014, immigrants had $927 billion in post-tax disposable income, accounting for more than 14 percent of the total spending power in America.[13] The increase in consumer spending also encourages businesses to expand as overall demand rises, which leads to job creation and additional business investment.

On the supply side, immigration induces growth by enhancing the two key mechanisms for economic output: labor and capital. Immigration increases the supply of labor and, as a direct consequence, boosts overall economic output. Furthermore, immigrants tend to be entrepreneurial and innovative, and by starting new businesses and developing new technologies, immigrants also increase the productivity of capital, which in turn strengthens economic output. In fact, a 1 percent increase in the population of immigrants in the United States is associated with a 1.15 percent gain in GDP.[14] This contribution ratio is higher than the 1:1 ratio achieved by native-born Americans in part because immigrants are more likely to be of working age.[15]

Immigration's Effects on the Labor Market

Immigration provides an important channel for businesses to find and hire needed workers. Contrary to erroneous claims that immigrants take jobs away from Americans, immigration tends to boost total employment in the U.S. economy. By increasing the pool of available labor, immigration reduces labor shortages and fills critical skills gaps, allowing businesses to acquire the skill and talent they need to thrive. This attribute is particularly important in today's labor market, which has more job openings than unemployed workers.[16] In turn, businesses are able to expand, which creates new job opportunities that are often filled by native-born workers. In effect, immigrants help native-born workers by increasing the size of the economic pie, rather than simply competing for a slice.

In addition to increasing total employment in the U.S. economy, immigration induces improvements in productivity in the labor market, which typically leads to wage gains. For example, a recent study found that in cities with greater levels of immigrant diversity, average worker wages are nearly 6 percent higher.[17] Another frequently cited analysis determined that total immigration to the United States from 1990 to 2007 was associated with a $5,100 increase in annual income for the average U.S. worker.[18] While some research suggests that immigrants crowd out jobs for Americans (especially those with lower skill levels) and ultimately dampen wage growth for native-born workers, numerous studies have shown that immigrants and native-born workers generally possess different skills and abilities, allowing them to function as complements rather than substitutes in the labor market.[19] When viewed in totality, the evidence strongly suggests that immigration improves labor market conditions for native-born workers by increasing employment opportunities and boosting wages across the economy.

Immigration's Effects on Entrepreneurship

Immigration is an inherently entrepreneurial act, so it is unsurprising that immigrants in the United States tend to be disproportionately entrepreneurial. Multiple studies have shown that immigrants are more likely to start a business than native-born U.S. citizens.[20] One recent analysis found that immigrants represent just 15 percent of the workforce but account for a quarter of the entrepreneurs in America,[21] and nearly half of Fortune 500 companies were founded by first- or second-generation immigrants.[22] Moreover, U.S. immigrants make up 28 percent of high-quality patent holders, despite comprising less than 20 percent of the labor force above 24 years old.[23] Immigration has helped the United States maintain its competitive edge and has improved the country's ability to serve as a hub for innovation.

OPT-Specific Economic Benefits

The economic benefits from immigration are enhanced when looking specifically at OPT. Because OPT is available only to international students studying in the United States and recent graduates, participants tend to be young, intelligent and hardworking — in other words, perfectly positioned to contribute to economic growth. For America to remain a leader in the global economy, the nation must continue to attract the best and brightest from around the world.

Potential Changes to Immigration Policy

The Trump Administration appears to be planning significant immigration reforms that would likely affect OPT, both directly and indirectly. For example:

- In its National Security Strategy published in December 2017, the Administration indicated its intentions to tighten student visa procedures by "consider[ing] restrictions on foreign STEM students from designated countries to ensure that intellectual property is not transferred to our competitors, while acknowledging the importance of recruiting the most advanced technical workforce to the United States."[24]

- In the Fall 2018 Regulatory Agenda, U.S. Immigration and Customs Enforcement (ICE) published notice that it will propose a rule establishing the maximum period of authorized stay for F-1 visa holders (i.e., international students attending a U.S. college or university) by September 2019.[25] Currently, student visas are valid for "duration of status," meaning international students can remain in the United States as long as they maintain status as a student. However, the planned rule would impose a cap on the maximum amount of time an international student could remain in the United States, which would have implications for OPT and could reduce foreign-born enrollment.

- ICE also published notice in the Department of Homeland Security's Fall 2017 Regulatory Agenda of its intention to reform OPT comprehensively. The suggested rule was described as a way to "improve protections of U.S. workers who may be negatively impacted by employment of nonimmigrant students."[26] Notably, the proposal was reclassified as a "long-term action" in the Fall 2018 Regulatory Agenda, which suggests that ICE does not expect to publish a rule specific to OPT in the next 12 months (though other rules, such as the "maximum period of authorized stay" proposal described above, could reduce OPT participation indirectly).[27]

It remains unclear what policy decisions the Trump Administration will pursue with respect to allowing foreign-born students to study at U.S. colleges and universities and work while they attend school and after they graduate. Based on the nature of the proposals released thus far, however, international students likely will find working in the United States after finishing their studies more difficult, and some may choose to enroll elsewhere.

Modeling Assumptions

Using Inforum's dynamic macroeconomic model, Business Roundtable analyzed the economic impact of scaling back OPT by simulating a reduction in international student enrollment and OPT participation, phased in over a three-year period. Specifically, the modeled scenario assumes a 35 percent reduction in the issuance of F-1 student visas and a 60 percent decline in OPT participation by 2020. While Business Roundtable did not attempt to predict what specific changes to U.S. immigration policy would occur to yield these effects, the modeled scenario is a reasonable projection of future international student enrollment and OPT participation based on recent and historical data trends and the Trump Administration's immigration stance.

A summary of the two key assumptions is provided below, and additional detail is contained the Appendix.

- **35 percent reduction in F-1 student visas by 2020:** Compressing or restricting OPT would decrease employment opportunities for international students. As a result, some international students who would otherwise pursue a college education in the United States would instead attend school elsewhere. Recent enrollment data already show this trend: The number of F-1 visas issued has fallen nearly 40 percent over the last two fiscal years, from a high of 644,000 in FY 2015 to 394,000 in FY 2017.[28]

  As such, the analysis assumes that F-1 visa issuance would continue to decline, falling to around 250,000 by FY 2020 (i.e., an additional 35 percent decrease on top of the 40 percent decrease that has already occurred). This decline would bring the annual number of F-1 visas issued back to Bush-era levels before the STEM OPT extension was implemented.

- **60 percent decline in OPT participation by 2020:** The decline in international student enrollment would reduce the pool of students eligible to pursue a temporary work allowance via OPT. Moreover, of the international students who decide to study in the United States, the share who participate in OPT would likely fall if the program were scaled back, as the Administration has previously indicated it intends to do.

  As such, the analysis assumes that OPT participation would fall from approximately 150,000 in 2017 to around 60,000 by 2020, representing a roughly 60 percent decline. This decrease reflects both reduced international student enrollment (see first bullet) and a decline in the share of international students participating in OPT — which the study assumes would return to levels seen prior to 2016 (i.e., the year the current STEM OPT extension was implemented).

Results

The modeling results reveal that curbing OPT would affect the economy in significant ways. Under the modeled scenario, the decline in international student enrollment and the decrease in OPT participation would reduce U.S. growth, eliminate jobs for both native-born and foreign-born workers, and likely dampen U.S. innovation through decreased entrepreneurship.

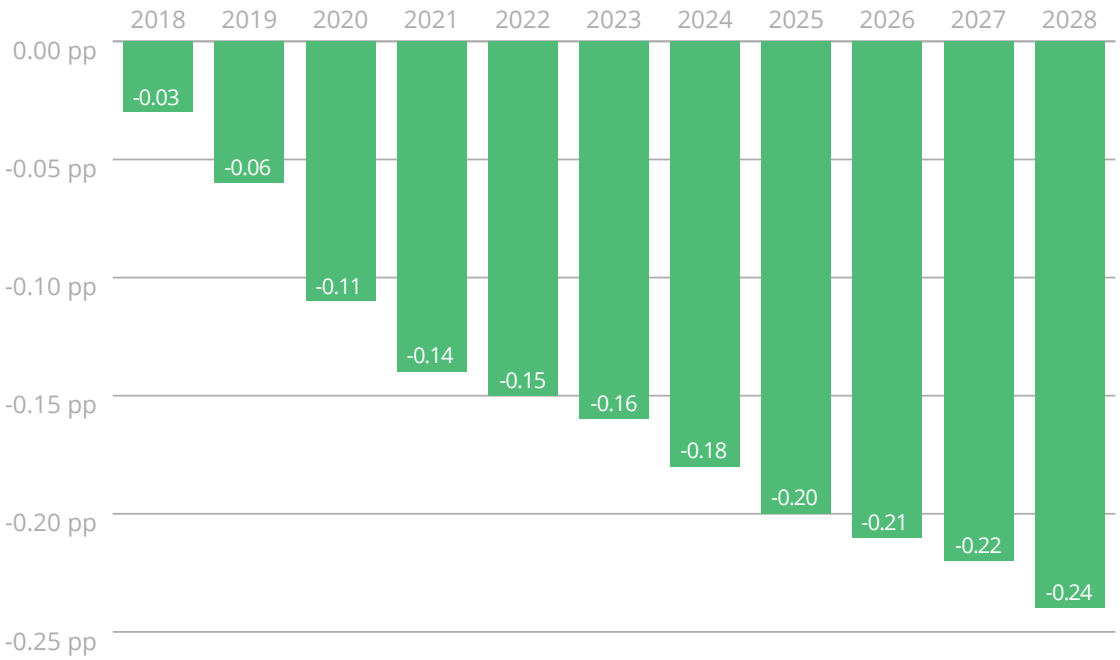
Effects on GDP

According to the Inforum model, the combination of a 35 percent decline in international student enrollment and a 60 percent decline in OPT participation would slow real U.S. GDP growth by about $5 billion annually over the next 10 years, a loss equivalent to removing Ithaca, New York, from the U.S. economy.[29] By 2028, scaling back OPT would reduce GDP by $52 billion cumulatively, or roughly a quarter of a percentage point (see Figure 1).

The lost economic activity is a direct consequence of reduced international student enrollment and OPT participation. Specifically, the decline in OPT participation decreases consumer spending and makes labor scarcer, which in turn reduces the production capacity of U.S. businesses. Furthermore, a decline in international student enrollment leads to reduced spending on tuition and other living costs, harming the education, health care and housing industries most.

Figure 1: Cumulative Loss of Real GDP Due to OPT Reform

Percentage Point Difference Between Baseline and Modeled Scenario

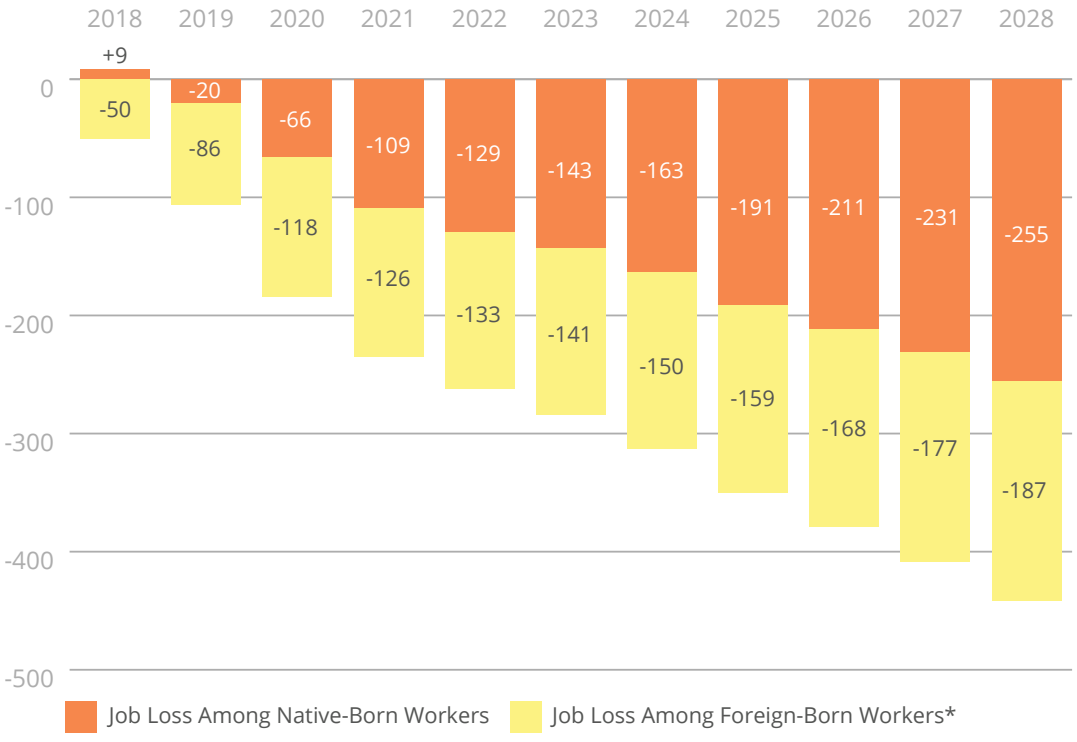


Effects on the Labor Market

Based on the modeling results, in the first year after restricting OPT, employment among native-born workers would increase slightly as some native-born Americans replace the lost foreign-born workers. However, this effect would reverse in year 2 and continue to worsen in subsequent years due to reduced economic activity, and fewer job opportunities would be available to Americans. As shown in Figure 2, a total of 443,000 jobs would be lost in the economy by 2028, resulting in 255,000 fewer positions for native-born workers. The modeled results echo myriad prior studies illustrating that employment in the United States is not a zero-sum game: Foreign-born workers actually *create* jobs for native-born workers rather than displace them. Legal immigrants are new consumers in the U.S. economy, and the increase in total spending creates new jobs. Furthermore, foreign-born workers help businesses acquire the skills and talent they need, which allows businesses to expand and hire additional workers.

Figure 2: Cumulative Job Loss Due to OPT Reform

Thousands of Jobs, Difference Between Baseline and Modeled Scenario



**The foreign-born population includes anyone who was not a U.S. citizen at birth (e.g., legal permanent residents on green cards and temporary migrants such as international students or OPT participants).*

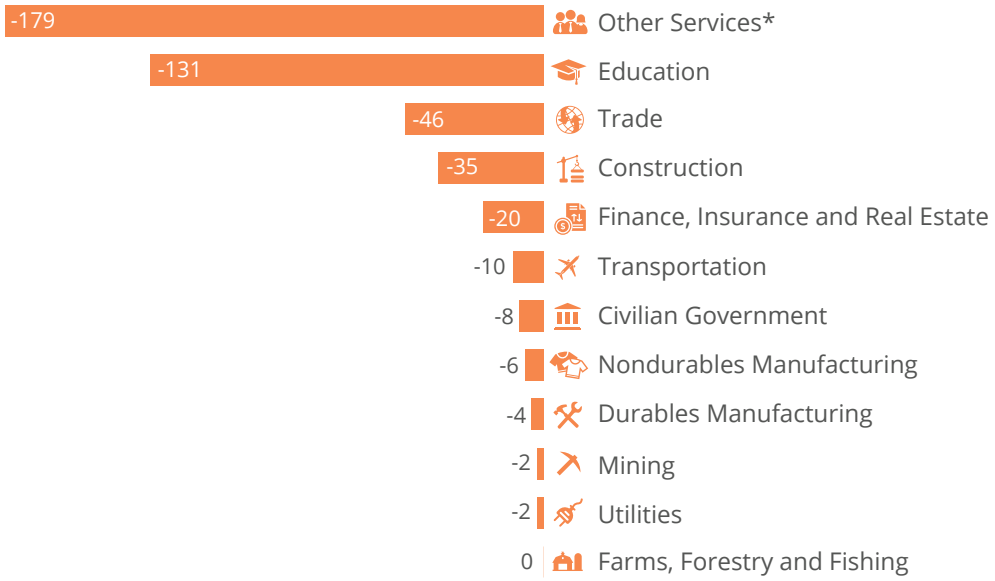
Note: Figures in chart rounded to nearest 1,000 workers.

The education industry would suffer some of the largest job losses due to decreased international student enrollment under a scaled-back OPT program. In total, the education industry would lose 131,000 jobs by 2028, as shown in Figure 3. The "other services" category, which includes health care, communications, professional services, and restaurants and hotels, would also experience substantial job losses, with a combined 179,000 jobs lost in these industries over the next decade. The decline in service-sector jobs as a result of restricting OPT would likely have widespread effects, as the service sector comprises roughly 80 percent of the U.S. economy.

In light of the Administration's anti-immigration rhetoric, international student enrollment has already begun to decline, and some colleges and universities are starting to feel the squeeze as tuition revenue falls. For example, after a 1,500-person drop in international student enrollment in the 2017–18 academic year, the University of Central Missouri was forced to cut instructors for computer programs in which many of the foreign students were enrolled.[30] Curbing OPT would exacerbate budget pressures by reducing international student enrollment further, leading to additional job losses.

Figure 3: Industry Breakdown of Total Jobs Lost Due to OPT Reform, 2018–28

Thousands of Jobs, Difference Between Baseline and Modeled Scenario

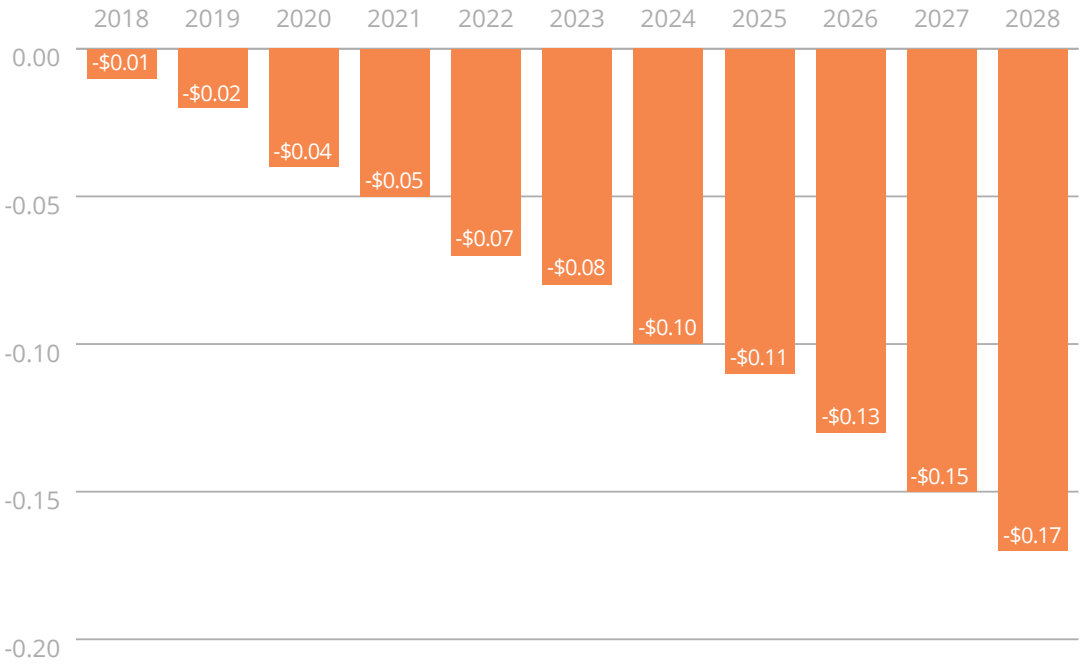


**"Other services" includes industries such as health care, communications and publishing, legal and professional services, entertainment, and restaurants and hotels.*

Contrary to claims that immigrants displace American workers, scaling back OPT would cause the unemployment rate to rise 0.15 percentage point by 2028, a further illustration that immigration increases job opportunities for native-born workers overall. A reduction in foreign-born workers due to curbing OPT would exacerbate existing labor shortages and skills gaps in the U.S. economy, thereby constraining business expansion. The model also finds that average real hourly wages would fall by 17 cents by 2028 as a result of increased slack in the labor market (see Figure 4).

Figure 4: Cumulative Decline in Real Average Hourly Wage Due to OPT Reform

Difference in Real Average Hourly Wage Between Baseline and Modeled Scenario



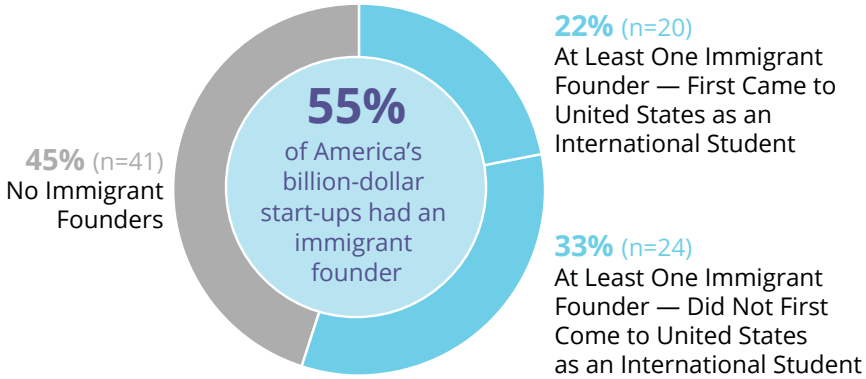
Effects on Entrepreneurship

While the analysis did not model the effects of curbing OPT on entrepreneurship, policies that make it more difficult for international students to work in the United States after they graduate will almost certainly reduce business creation. This reduction is because entrepreneurship among foreign-born workers is significantly higher than among native-born Americans: Research shows that immigrants are more than twice as likely as native-born workers to start a new business.[31] Further, the impetus for foreign-born entrepreneurs to immigrate to the United States is often to further their education: Nearly a quarter of America's private billion-dollar start-ups were founded by immigrants who first came to the United States on an F-1 student visa (see Figure 5).[32]

In addition to starting new businesses, immigrants are also more than twice as likely to file a patent as native-born Americans, and research suggests that a 1 percent increase in immigrant college graduates leads to a 15 percent increase in patents per capita.[33] To enhance America's competitive edge, policies should encourage international students to continue their studies at U.S. colleges and universities and help them remain in the country to work after they graduate if they so choose — not drive them away to America's competitors.

Figure 5: Share of Private, Billion-Dollar American Start-Ups Founded by Immigrants

As of October 1, 2018



Source: National Foundation for American Policy

Conclusion

Immigrants are a key driver of the U.S. economy. Countless studies have shown how immigration produces more economic growth, enhances productivity, creates jobs for both native-born and foreign-born workers, and increases entrepreneurship and innovation. Put simply, America has always benefitted from the contribution of immigrants to maintain its position as a world economic and cultural leader.

However, the Administration's plans to scale back OPT would curb an important channel of immigration, harming the U.S. economy in multiple ways. Scaling back OPT would not only reduce participation in the program but also deter international students from coming to the United States to study, slowing economic growth. Additionally, because immigrants tend to complement native-born workers in the labor market rather than compete with them, the loss of highly educated foreign labor would decrease employment opportunities across the economy and inhibit long-run wage growth. Furthermore, since immigrants are disproportionately likely to start a business or develop and patent new technologies and processes, restricting OPT would likely decrease innovation and dampen America's competitive edge.

For decades, America's higher education system has served as a magnet for bright, creative and driven students from around the world, helping the United States become a global innovation hub and economic powerhouse. To maintain this status and cement the nation's role as a leader in emerging industries that will drive future job creation and economic growth, U.S. immigration policy must continue to encourage international students to come to America to study and work. OPT is a key component of this strategy, and efforts to curtail it under the false notion of protecting American workers will ultimately have the opposite effect, producing negative short-term and long-term economic consequences for U.S. businesses and consumers.

Appendix: Methodology and Assumptions

Description of Inforum Model

To model the economic effects of curbing OPT, Business Roundtable partnered with Inforum, also known as the Interindustry Forecasting Project at the University of Maryland. Inforum is known for pioneering the construction of dynamic, general-equilibrium models that portray the economy in a unique "bottom-up" fashion and specializes in developing and using structural economic models to improve general understanding of the economy.

The analysis employed the University of Maryland's Inforum LIFT (Long-term Interindustry Forecasting Tool) model — a widely used econometric model of the U.S. economy. LIFT is unique among large-scale models of the U.S. economy; combining an interindustry (input-output) formulation with extensive use of regression analysis, LIFT models the behavior of 110 sectors of the U.S. economy, allowing effects to be captured at the detailed industry level. Despite its industry basis, LIFT is a full macroeconomic model that determines macroeconomic quantities from the ground up using underlying industry detail. This "superstructure" contains functions for key indicators that reflect the macroeconomic impacts of curbing OPT.

Modeling Assumptions

This study analyzes the effects of scaling back OPT by comparing the projected economy under a continuation of current policy (the baseline scenario) to an economy in which U.S. immigration policy is reformed in a manner that reduces OPT participation and international student enrollment (the OPT reform scenario or modeled scenario). Note that because OPT is available only to international students present in the United States on F-1 visas, the study limited the scope of OPT reform's impact on international students to those on F-1 visas.[34]

Baseline Scenario

The baseline scenario represents a "steady-state" forecast of the macroeconomy over a 10-year period (2018–28). To set the baseline, the model extrapolates current macroeconomic and demographic trends as well as recent trends in international student enrollment and participation in OPT.

- **F-1 Visas Issued:** Because the baseline scenario assumes that OPT does not undergo any policy changes, the number of annual F-1 visas issued from 2018 to 2028 is projected to continue its recent growth trajectory prior to changes proposed by the Trump Administration. Specifically, under the baseline scenario, F-1 visa issuance would expand at 4.2 percent per year, equivalent to the compound annual growth rate in F-1 visas issued from 2008 to 2016 (see Table 1).
- **OPT Approvals:** OPT participation is largely a function of international student enrollment: As international student enrollment grows or shrinks, so does the pool of potential OPT participants. Therefore, to project the number of OPT approvals over the next 10 years, the baseline scenario relies on the historical ratio of OPT approvals to F-1 visas issued per year. Specifically, the baseline scenario assumes that annual OPT approvals from 2018 to 2028 would amount to 40.3 percent of F-1 visas issued in a given year, equivalent to the average ratio of OPT approvals to F-1 visas in 2016 and 2017 after the STEM OPT extension was lengthened to 24 months. Note that the OPT approval ratio was significantly

lower from 2012 to 2015 (around 24 percent) than in 2016 and 2017, but this earlier period predates the 24-month STEM extension, which likely made OPT a more attractive option for qualifying graduates. As a result, OPT approval data from 2016 and 2017 provide a more relevant and appropriate baseline.

OPT Reform Scenario

While scaling back of OPT appears likely based on various Trump Administration proposals, details of specific policy changes remain uncertain. Therefore, the OPT reform scenario does not attempt to predict a specific policy change but rather models the economic impact of immigration policies that reduce international student enrollment and OPT participation by plausible levels informed by historical data.

- **F-1 Visas Issued:** By design, curbing OPT would decrease employment opportunities for international students. This decrease, in turn, would likely dissuade some international students from studying in the United States. Business Roundtable and Inforum modeled this effect by assuming that restricting OPT would reduce the annual number of F-1 visas issued to levels experienced before the STEM OPT extension was available to F-1 graduates. Specifically, the OPT reform scenario projects that the number of F-1 visas issued each year would return by 2020 to the average level from 2000 to 2007, with a three-year phase-in (see Table 2).

- **OPT Approvals:** Similar to the baseline scenario, projections of OPT approvals under the modeled scenario rely on the historical ratio of OPT approvals to F-1 visas issued. The study assumes that by 2020, OPT approvals as a percentage of F-1 visas issued would fall to 23.8 percent — the average level seen prior to the expansion of the STEM extension (i.e., 2012–15). Therefore, the projected decline in OPT approvals reflects both decreased international student enrollment and a reduction in the share of international students participating in the program.

Additional Modeling Assumptions

The Inforum model required additional assumptions regarding the industry distribution of OPT workers, spending by OPT participants, and tuition and living costs for international students. These assumptions are described below:

- **Industry Distribution of OPT Workers:** To determine the impact of reduced participation in OPT on individual industries, the study estimates the distribution of OPT workers by industry using data from the American Community Survey (ACS) from 2012 to 2016. The ACS data do not reveal whether respondents are participants in OPT, so the distribution of OPT workers is estimated to mirror the distribution of U.S. workers who are noncitizens, are under the age of 35, and have a bachelor's degree or higher. Workers with these characteristics are reasonable proxies for OPT program participants.

- **Spending by OPT Participants:** To assess the amount of consumer spending that would be lost if OPT were scaled back and fewer international students stayed in the United States after they graduated, the study also uses the ACS data to determine the industry-specific average income per worker among the same population defined in the previous paragraph. The average spending-to-income ratio from the Bureau of Labor Statistics' Consumer Expenditures Survey was then applied to the average income in each industry to determine the average spending per OPT worker by industry. Projections rely on historical inflation data to forecast growth in the average spending per worker by industry.

- **Tuition and Living Costs for International Students:** To estimate the amount of consumer spending that would be lost due to decreased international student enrollment, the study uses data published by Brookings to calculate the average annual tuition and living cost per international student from 2008 to 2012.[35] The average tuition cost per international student is assumed to increase each year by the average annual growth rate in total tuition, fees, room and board across all institutions as published by the National Center for Education Statistics.[36] The average living cost per international student is assumed to rise by the average annual growth in the headline consumer price index. Projections of total tuition and living costs paid by international students under each scenario rely on historical data on total international student enrollment from the Institute of International Education's *Open Doors* reports,[37] as well as the projected number of F-1 visas issued shown in Tables 1 and 2.

Table 1: Modeling Assumptions — Baseline Scenario

Year	OPT Program Length[38] (months)	OPT STEM Extension[39] (months)	F-1 Visas Issued[40]	Ratio of OPT Approvals to F-1 Visas Issued	OPT Approvals[41]	
2000	12	—	284,053	—	—	
2001	12	—	293,357	—	—	
2002	12	—	234,322	—	—	
2003	12	—	215,695	—	—	
2004	12	—	218,898	—	—	
2005	12	—	237,890	—	—	
2006	12	—	273,870	—	—	
2007	12	—	298,393	—	—	
2008	12	17	340,711	—	—	
2009	12	17	331,208	—	—	
2010	12	17	385,210	—	—	
2011	12	17	447,410	—	—	
2012	12	17	486,900	23.7%	115,346	
2013	12	17	534,320	23.1%	123,407	
2014	12	17	595,569	22.7%	135,435	
2015	12	17	644,233	25.5%	164,201	
2016	12	24	471,728	43.0%	202,655	
2017	12	24	393,573	37.7%	148,290	
2018	—	—	409,910	40.3%	165,272	PROJECTIONS
2019	—	—	426,925	40.3%	172,132	
2020	—	—	444,646	40.3%	179,277	
2021	—	—	463,103	40.3%	186,719	
2022	—	—	482,327	40.3%	194,469	
2023	—	—	502,348	40.3%	202,542	
2024	—	—	523,200	40.3%	210,949	
2025	—	—	544,918	40.3%	219,705	
2026	—	—	567,537	40.3%	228,825	
2027	—	—	591,095	40.3%	238,324	
2028	—	—	615,631	40.3%	248,216	

Table 2: Modeling Assumptions — OPT Reform Scenario

Year	OPT Program Length[42] (months)	OPT STEM Extension[43] (months)	F-1 Visas Issued[44]	Ratio of OPT Approvals to F-1 Visas Issued	OPT Approvals[45]	
2000	12	—	284,053	—	—	
2001	12	—	293,357	—	—	
2002	12	—	234,322	—	—	
2003	12	—	215,695	—	—	
2004	12	—	218,898	—	—	
2005	12	—	237,890	—	—	
2006	12	—	273,870	—	—	
2007	12	—	298,393	—	—	
2008	12	17	340,711	—	—	
2009	12	17	331,208	—	—	
2010	12	17	385,210	—	—	
2011	12	17	447,410	—	—	
2012	12	17	486,900	23.7%	115,346	
2013	12	17	534,320	23.1%	123,407	
2014	12	17	595,569	22.7%	135,435	
2015	12	17	644,233	25.5%	164,201	
2016	12	24	471,728	43.0%	202,655	
2017	12	24	393,573	37.7%	148,290	
2018	—	—	348,069	33.0%	114,989	PROJECTIONS
2019	—	—	302,564	28.4%	85,913	
2020	—	—	257,060	23.8%	61,061	
2021	—	—	257,060	23.8%	61,061	
2022	—	—	257,060	23.8%	61,061	
2023	—	—	257,060	23.8%	61,061	
2024	—	—	257,060	23.8%	61,061	
2025	—	—	257,060	23.8%	61,061	
2026	—	—	257,060	23.8%	61,061	
2027	—	—	257,060	23.8%	61,061	
2028	—	—	257,060	23.8%	61,061	

Endnotes

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