Chapter 11

Policies to Secure Enduring Prosperity

This *Report* analyzes the unprecedented health and economic shock of the COVID-19 pandemic, and the historic policy responses to mitigate its impact on the Nation. The United States is making progress toward emerging from this crisis; however, our country continues to contend with an adverse shock of historic magnitude. The purpose of this final chapter is to review a collection of policy areas highlighted by the COVID-19 pandemic and to analyze potential reforms to meet the ongoing challenges facing the U.S. economy. We introduce these areas in this prefatory section, and then the full chapter presents them in detail.

Strengthening connections to the labor force. The U.S. labor market's recovery since the initial effect of COVID-19 has been unprecedented, with the unemployment rate falling by 8 percentage points in seven months. However, workers with a weaker prior connection to the labor force have experienced a slower recovery. This chapter discusses two important ways in which the tax code discourages lasting connections to the workforce: high effective taxes both on nonprimary earners in families and on low-income earners navigating the various Federal assistance programs.

Supporting balance between work and family. The recent suppression of economic activity has posed particular challenges for families. Parents of children whose schools were closed faced challenges in obtaining childcare while working. Parents who needed time off due to illness or to care for a sick relative faced difficult decisions regarding work and family responsibilities. This chapter discusses how, even in normal times, a lack of accessible paid leave

and childcare for parents can lead to wider detrimental effects on society, and how this challenge could be addressed.

Enhancing international coordination to address 21st-century challenges. Both the health and economic consequences of COVID-19 cross national boundaries, given that disease transmission and supply chain disruptions in one country can have large effects on other countries. This chapter discusses how strong reciprocal trade relationships between the United States and other countries can preserve U.S. consumer access to foreign products and U.S. producer access to global supply chains, while ensuring that American entrepreneurs face an even playing field that protects U.S. economic interests.

Creating a more effective healthcare system. COVID-19 caused a public health crisis that exposed strains on the U.S. healthcare system. This chapter reviews mechanisms that inefficiently drive up costs and reduce access to quality health care. These include restrictions on the supply of healthcare professionals, information problems inherent in balance billing, and a disconnect between Medicare prices and competitive prices for some medical services.

Building a dynamic economy through infrastructure improvement. Continued adjustment to the potential reallocation of economic activity and factors of production in response to the pandemic requires strong and versatile infrastructure. The Federal Government can target investment to increase the productivity of American industry. This chapter discusses the structural factors that inhibit improvements in infrastructure along with mechanisms to resolve them.

Generating a more skilled and resilient workforce. COVID-19 is imposing a large reallocation shock on the U.S. economy because temporarily suppressed output and changes in consumer preferences may weaken some firms and industries and strengthen others. Highly skilled workers will be needed not only to take advantage of these new opportunities but also to create them. This chapter discusses two ways to expand the skilled workforce: moving toward a more transparent and merit-based immigration system, and improving human

capital formation for Americans attending institutions of higher education. This chapter also highlights the success of Historically Black Colleges and Universities.

The American economy faces challenges that not only were exacerbated by the COVID-19 pandemic but also extend into the postpandemic future, as outlined above and as explained in detail below. Meeting these challenges will ensure that the United States not only recovers to its prepandemic levels of prosperity but also builds a more dynamic and resilient economy that will benefit all Americans.

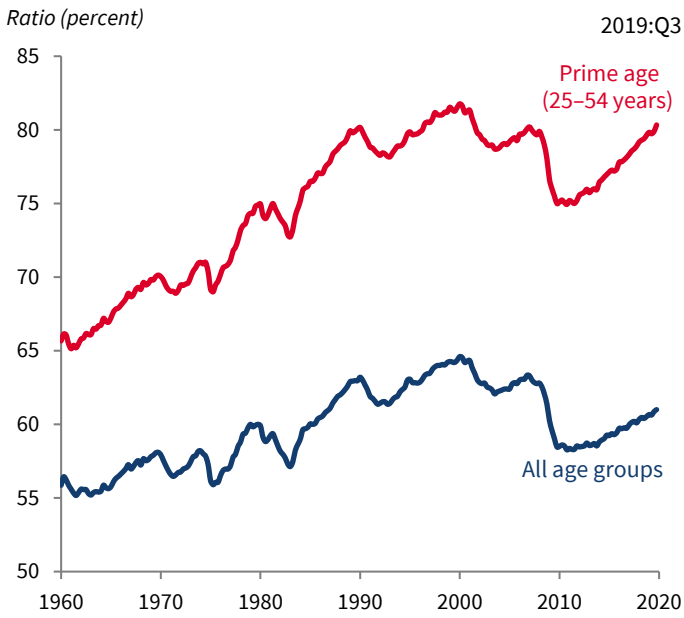
Strengthening Connections to the Labor Force

The COVID-19 pandemic and subsequent economic shock decreased prime-age labor force participation by 3.2 percentage points, erasing the unanticipated gains of the preceding three years and reaching its lowest value in April 2020 since the early 1980s, before partially recovering. Increasing the labor force participation rate will require action addressing the elements of the Federal tax code that disproportionately deter labor force entry and skill upgrading. This section identifies two areas in which Federal policy changes can remove barriers to participation in the workforce. Taken together, these tax reforms would constitute a momentous middle class tax cut.

From the early 1960s until the turn of the century, the United States experienced a sustained and pronounced rise in the employment-to-population ratio—which measures the percentage of the civilian, noninstitutional population that is working—from 55 percent to nearly 65 percent. This trend was driven by the participation of females, many of whom were in two-earner households. However, over the past 20 years, this trend has been eroded by two recessions—in 2001 and 2008-09—and subsequent slow recoveries, coupled with an aging of the population. Even among the prime-age labor force of 25- to 54-year-olds, the employment-to-population ratio fell from a peak of over 80 percent in 2000 to only 75 percent in the immediate aftermath of the Great Recession. Only by 2019 did the U.S. economy nearly return to its 2000s peak under the historically strong labor market conditions that existed before the arrival of the COVID-19 shock. Figure 11-1 summarizes these dynamics.

Abraham and Kearney (2020) discuss several factors behind the stagnation and decline in the employment-to-population ratio between 1999 and 2018. These include the effects of import competition from China, automation, disability insurance programs, childcare costs, and shifting social norms reducing the stigma of not working (especially among men) on labor supply.

Figure 11-1. Employment-to-Population Ratio, 1960–2020



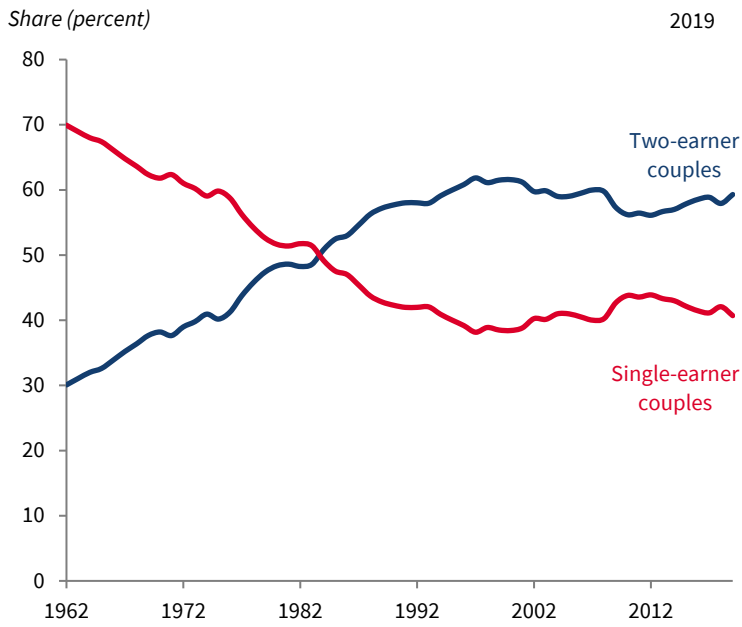
Sources: Bureau of Labor Statistics; FRED (2020).

In addition to these factors, the Federal Government's income tax code is an important impediment to the growth of the labor force due to both the way that second-earners are penalized by the system of joint taxation and the high combined effective marginal rates of Federal and State taxes faced by low-income earners. While the 2017 Tax Cuts and Jobs Act reduced hindrances to investment and brought more low-income earners out of Federal income tax liability altogether by nearly doubling the Standard Deduction, many filers in these two groups continue to face high effective marginal tax rates under the current code. This section discusses the negative effects of family taxation and the causes of the high effective marginal tax rates faced by many low-income earners (estimated to be as high as 70 percent by Altig et al. 2020, when taking into account Federal and State taxes along with phase-outs of credits and deductions). This section also provides a broad outline of possible tax reforms that could spur economic growth by stimulating labor market participation by second-earners and low-income earners, two groups with relatively high responsiveness to labor market incentives.

Dual-Earner Couples

Among married couples, the prevalence of dual-earners increased steadily during the postwar years (figure 11-2). This trend demonstrates the growing

Figure 11-2. Distribution of Joint Filers, 1962–2019



Source: Current Population Survey.

importance of two-earner couples, but also how their growth has stagnated since the 1990s. The female labor force participation rate in countries that do not differentiate between single-earner and dual-earners families, such as Sweden, also stagnated during this period, but remained at a higher level. Guner, Kaygusuz, and Ventura (2012a) find that the participation rate of married women in Sweden is nearly 15 percentage points higher than in the United States. Even though Sweden's overall tax burden on labor earnings is considerably higher, its system of separate taxation, which taxes individuals based on their own earnings instead of penalizing them for the earnings of their spouse, leads to noticeably lower marginal tax rates on second-earners—the individual in a dual-earner couple that has lower earnings. In some cases Sweden has a rate that is nearly 10 percent lower than in the United States, according to Bick and Fuchs-Schundeln (2017).

Before 1948, the United States levied income taxes at the individual level, although couples living in States with community property laws were taxed as if each spouse earned half of household income. As the tax system became much more progressive, concerns began to arise that wealthy husbands could engage in income-shifting to avoid heavy taxation in upper brackets. By transferring some of their assets to their wives (who generally had lower incomes), their transferred asset income being might be taxed in a lower tax bracket. The shift to joint taxation meant that couples added their income together when

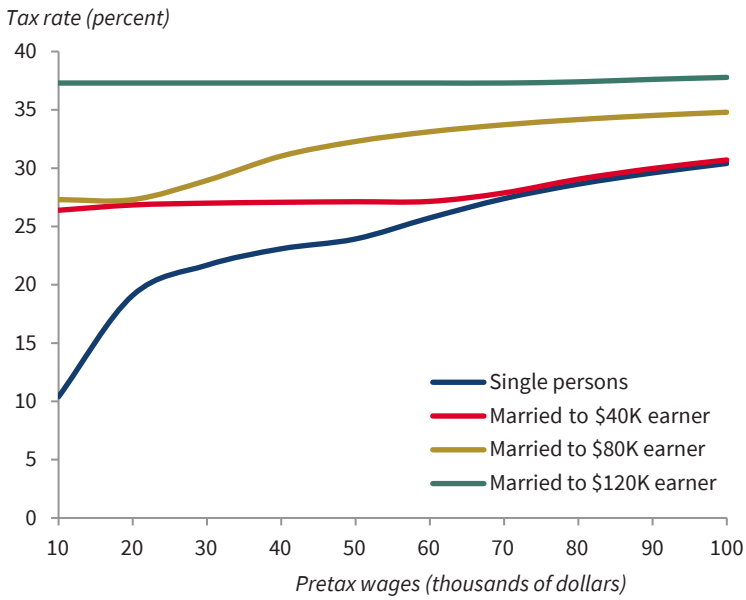
filing taxes. This switch greatly increased marginal tax rates on second-earners because the first dollar of the second-earner is effectively taxed at the marginal rate of the last dollar earned by the primary-earner. A 2008 study suggests that this switch depressed married female labor force participation by 2 percentage points in the postwar period among women most likely to be affected by the law, despite going into effect before the widespread acceptance of women in the workplace (LaLumia 2008). If the move from individual to joint taxation had occurred after the shift in norms, the effect would likely have been considerably larger.

The Marriage Penalty and the Second-Earner Penalty

The second-earner penalty is distinct from the marriage penalty that is more often discussed in that the former deals with marginal taxation and the distribution of work incentives within couples, whereas the latter is related to changes in the total tax burden a couple faces before and after they get married. For example, in 2016, before the 2017 TCJA, the increase in the tax rate from 25 to 28 percent occurred at $91,150 for single persons but at $151,900 for couples. Thus, if two individuals in a relationship each had $90,000 in taxable income, they would each fall into the 25 percent tax bracket before marriage but would be pushed well into the 28 percent bracket after marriage because of their combined $180,000 in taxable income. As a result, they would face a higher total tax bill as a married couple than they faced as individuals in a relationship before marriage (because each new tax bracket for married couples began at an income level at less than twice the income level for single persons). In other cases, a couple may have a marriage bonus if their tax burden under joint filing is lower than their combined tax burden when they filed two separate returns as unmarried individuals. The Office of Tax Analysis at the Treasury Department estimated that before the TCJA, roughly 40 percent of nonelderly married tax filers faced a marriage penalty while 51 percent enjoyed a marriage bonus. The TCJA greatly reduced this tax penalty for the vast majority of married couples by ensuring that the size of the standard deduction and the location of tax bracket thresholds for joint filers were double those for single filers.

In contrast, the second-earner penalty refers to the fact that, under a progressive tax code, joint filing imposes higher tax rates on second-earners than if they were filing taxes as a single person. Figures 11-3 and 11-4 plot the average combined income and payroll tax rate faced by single filers and second-earners without and with children based on current law. Single filers face an average tax rate—defined as total tax obligation divided by total income—that starts near 10 percent. If, however, that person gets married to someone earning $40,000, his or her average second-earner tax rate—defined as the added tax the joint household faces from the second-earner's decision to work divided by the amount of those second-earnings—starts at over 25 percent. If the single filer were to marry someone earning $120,000, he or she

Figure 11-3. Average Tax Rate on the Pretax Wages of Single Persons and Second-Earners (without Children), 2020

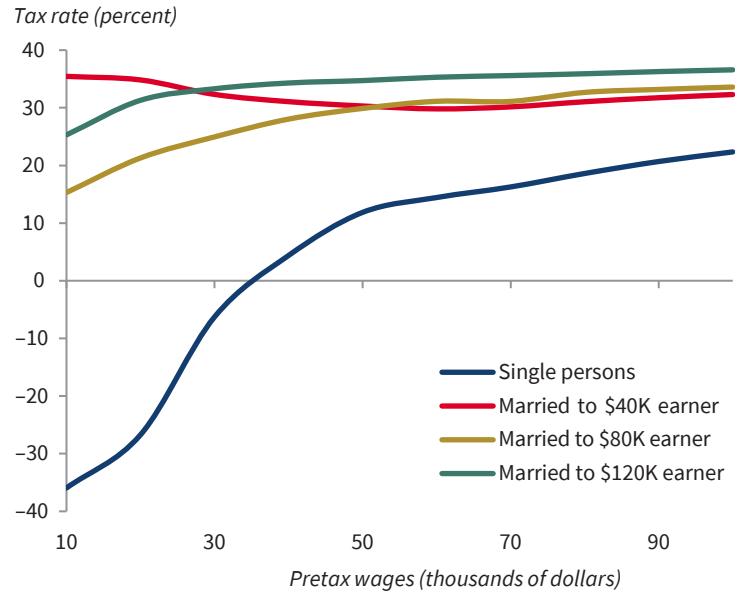


Sources: National Bureau of Economic Research TAXSIM; CEA calculations.

would be subjected to average second-earner tax rates starting at nearly 40 percent, with State income taxes further pushing up this rate. This does not take into account governmental aid programs, which impose a high effective tax rate on individuals who are in the phase-out range for governmental programs, as discussed below.

Figure 11-4 reveals that the second-earner penalty is even starker for people with children because of means-tested provisions in the tax code, such as the Earned Income Tax Credit (EITC), a refundable tax credit that subsidizes the wages of low-income households, especially those with children. The credit gradually rises with income in the phase-in region before eventually leveling off and then phasing out as household income continues to grow. The design of the EITC therefore incentivizes labor force participation. The net result for single filers with less than $35,000 is a negative total tax obligation, with average rates for some below –30 percent (i.e., a subsidy rate of over 30 percent, not including other governmental assistance programs). However, if the single filer gets married to a person earning $40,000, their joint income causes the EITC to shrink in addition to pushing the second-earner into a higher tax bracket—resulting in an average tax rate of about 35 percent, which represents an increase of nearly 70 percentage points for low-income second-earners.

Figure 11-4. Average Tax Rate on the Pretax Wages of Single Persons and Second-Earners (with Children), 2020



Sources: National Bureau of Economic Research TAXSIM; CEA calculations.

The joint nature of the income tax code introduces a bias toward single-earner families, encouraging them to specialize, with one spouse at work in the market and the other engaging in tax-free home production. This may not be an optimal allocation for the individual family or the overall labor force absent such a skewed taxation system. For example, both individuals may wish to work outside the home, but the tax penalty for doing so discourages them. The existence of a second-earner penalty is intrinsic to any progressive income tax code with joint filing, though the magnitude of the penalty can vary—the steeper the rate structure, the larger the second-earner penalty. For this reason, past tax reforms in the United States that lowered marginal rates also mitigated—but did not eliminate—the second-earner penalty.

For example, the 1981 and 1986 tax reforms, which brought the top marginal tax rate down from 70 percent to 31 percent and eliminated loopholes to broaden the taxable base, were responsible for at least one-fifth to one-quarter of the 13-percentage-point rise in labor force participation by married females during the 1980s, according to research by Kaygusuz (2010). This estimate is based only on the direct effects of the tax code change, but after taking into account the contribution of the tax cuts to higher wages, the effect may very well have been much larger. This same research attributes 62 to 64 percent of the rise in participation to rising female wages during the 1980s. Bronson and Mazzocco (2018) also conclude that the primary effect of the Reagan and

George W. Bush Administrations' tax cuts was to increase married female participation. Malkov (2020) finds that—along with the 1986, 2001, and 2003 tax reforms—the 2017 TCJA created welfare gains for married couples and reduced the second-earner penalty because of the overall lowering of the marginal tax rate schedule.

Tax Reforms to Mitigate the Second-Earner Penalty and Boost the Labor Supply

There are two ways to eliminate the second-earner penalty: reduce progressivity—which the Administration does not recommend—or move toward individual taxation. Guner, Kaygusuz, and Ventura (2012a) find large gains in economic output, welfare, and female labor supply (because women are more likely to be second earners) from moving to a proportional income tax. However, Bick and Fuchs-Schundeln (2017) point out that taxing two-earner labor income jointly acts as a greater impediment to female labor supply than does the progressivity of the tax code. They also find that moving completely to a system of individual instead of joint taxation—that is, replacing the current single, head of household, and joint filing statuses with one individual status that features a revamped system of deductions and tax brackets—would boost female labor supply by 7.8 percent. Guner, Kaygusuz, and Ventura (2012b) find a 10.4 percent increase in the supply of married women and 18.1 percent rise for married women with children in response to a shift from joint to individual taxation that eliminates the second-earner penalty. Similarly, Borella, De Nardi, and Yang (2019a, 2019b) estimate that shifting away from joint taxation completely would raise the labor force participation rate of married women by 20 percentage points for women under the age of 35 and by 10 percentage points for women between the ages of 45 and 60. These numbers are high, but research by Crossley and Jeon (2007) indicates that when Canada reformed its tax code in 1988 in a way that reduced the marginal tax rate for certain married women, that group's participation rate increased by nearly 10 percentage points.

Such a complete shift toward individual taxation would mark a dramatic reform for the United States. Moreover, Fruttero and others (2020) point out that eliminating the current joint tax rate schedule entirely could have a negative effect on single-earner households. This finding assumes that the tax rate schedule for the new, unified individual filing status that replaces it would have income brackets between those of the current single and joint brackets (if the new schedule instead adopted the current joint brackets, the static drop in income tax revenues would be larger).

As an alternative to universal individual taxation, the Federal Government could allow second-earners to directly protect their earned income through segmentation, whereby married couples filing jointly have the option of applying the joint rate schedule to the primary earners' income and the rate

schedule for single persons to the earned income of the secondary (lower) earner. Other proposals include allowing a second-earner deduction or credit. Under segmentation, all deductions, credits, and dependents enter into the joint tax calculation based on the primary-earners' income (and any income not derived from wages, salary, or self-employment of the second-earner). The Federal Government could also use means-testing for the EITC to exclude the earnings of the second-earner, reducing the implicit tax in the phase-out region of the EITC for dual-earning couples, because each $1 in higher second-earner wages and salary income has no effect on the EITC amount received by the household.

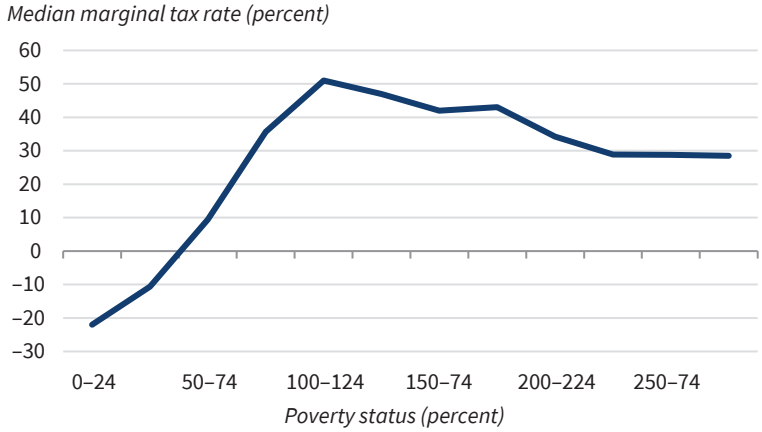
Under this reform, the earnings of the secondary earner would be taxed as if earned by a single person having no children with only the standard deduction applicable. As a result, this tax reform option would allow families to protect the second-earner from tax penalties associated with the income of the primary earner. In other words, second-earners would owe the same amount of tax based on their paycheck income regardless of the earnings of their spouse or other sources of family income, thereby directly eliminating much of the second-earner penalty currently embedded in the tax code. Correcting this disincentive would create a situation wherein second-earners would be able to participate in the labor market on a basis similar to single persons.

High Marginal Rates for Low Earners

Perversely, some of the highest effective marginal tax rates on labor income fall upon low-income earners, individuals making at or slightly above the poverty line. Altig and others (2020) calculate that one in four low-wage workers face lifetime marginal tax rates above 70 percent, taking into account the combination of Federal, State, and local taxation and benefits programs. Over half of low-wage workers face lifetime marginal rates over 45 percent. Chien and Macartney (2019) find that among households just above the poverty line and that have children, the median marginal tax rate is 51 percent, as shown in figure 11-5. Some households face a marginal tax rate above 100 percent. As a result, a low-wage household that increases its earnings by $1 will lose more than $1 to combined explicit and implicit taxation. This mechanism locks households in a cycle of poverty and impedes their ability to climb into the middle class.

This situation is the result of a combination of the structure of benefit programs and Federal and State income taxes. U.S. Federal individual income taxes are progressive and the first 2 bracket rates (10 and 12 percent) are relatively low. States collect most of their revenue from sales and property taxes; however, 41 States also tax individuals' labor income, accounting for 24 percent of State and local government tax revenue. The lowest-bracket State-level income tax is as high as 5 percent in Illinois, Kentucky, Massachusetts, Oregon, and Utah; 5.3 percent in North Carolina; and 5.4 percent in Minnesota—thus

Figure 11-5. The Marginal Effective Rate on Low Earners



Sources: Chien and Macartney (2019); U.S. Department of Health and Human Services; CEA calculations.
Note: This figure shows the marginal tax rates on households below the poverty line after a $2,000 earnings increase. Because households with children are recipients of more government aid programs and, consequently, see a greater reduction in benefits, they pay a higher effective marginal tax than households without children. The most common combination of aid programs is SNAP, EITC, Child Tax Credits, and Medicaid / Children's Health Insurance Program. For a household of two, the dollar value of 100 percent poverty is $17,200 and of 200 percent poverty is $34,400.

increasing the tax burden on low-wage labor income. In addition, complex benefit programs often include phase-outs that can jointly create extreme losses in benefits as a result of gains in income. This reduction in benefits functions similarly to a tax on income. There are also programs in which earning above a certain threshold can result in a sudden large loss in benefits with no gradual phase-out.

Programs such as the EITC, Medicaid, Temporary Assistance to Needy Families (TANF), Supplemental Nutrition Assistance Program, Child Care Assistance, Section 8 Housing Vouchers, Energy Assistance, and Children's Health Insurance Program can provide valuable assistance but at the cost of a large administrative burden to the government and a complex web of procedures that families must navigate to receive aid. In combination, they also impose high costs on the acquisition of earnings-enhancing human capital, effectively punishing families for augmenting their human capital by rapidly withdrawing government assistance.

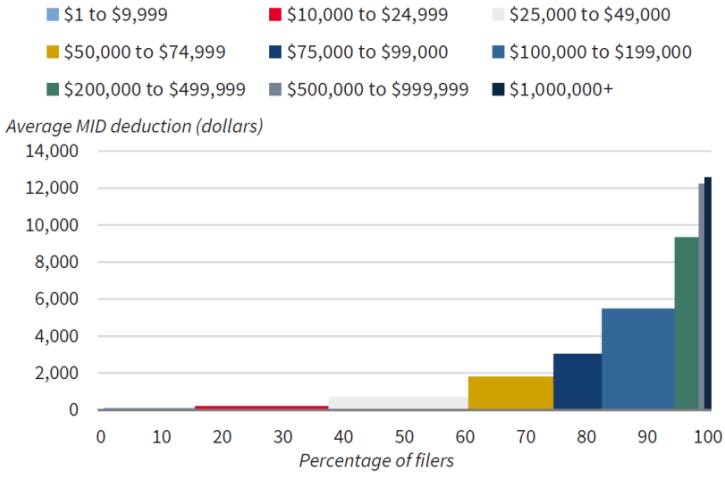
Altig and others (2020) illustrate the benefit cliff faced by a hypothetical mother with two children. She loses access to benefits as her income rises, with notable drop-offs in total benefits after $44,000 in annual earnings. In terms of net resources, she is nearly as well off financially earning $53,000 a year as when she is earning only $11,000 a year. This constitutes a severe impediment to the acquisition of new human capital through labor market advancement.

Box 11-1. Limiting Tax Expenditures to Facilitate Pro-Growth Reform: the SALT+MID Deduction

The 2017 TCJA combined lower taxation on investment, individual rate reductions, an increase in the Child Tax Credit, and a dramatic expansion in the standard deduction with the imposition of tighter caps on the State and local tax and mortgage interest deductions. Specifically, the TCJA increased the standard deduction from $6,500 to $12,000 for single filers and from $13,000 to $24,000 for joint filers while capping the State and local tax (SALT) deduction at $10,000 and reducing the maximum mortgage principal eligible for the mortgage interest deduction (MID) from $1 million to $750,000. These reforms weakened the MID and SALT deduction by both reducing the incentive to claim them relative to the larger standard deduction, and by reducing the maximum MID and SALT deductions that can be claimed.

One reason for limiting these tax expenditures is that they are skewed to high-income households, as shown in figure 11-i. In addition, they each create economic distortions. Specifically, the SALT deduction makes it easier for State and local governments to increase their revenue at the expense of taxpayers in other jurisdictions by diverting taxes that would otherwise be paid to the Federal Government into local receipts. This forces taxpayers in other locales to shoulder a greater share of the burden. Because local taxes are capitalized in local home prices, particularly in supply-inelastic markets, the partial defraying of tax increases causes the SALT deduction to artificially inflate housing prices in high-tax areas. The MID also fuels price increases

Figure 11-i. Pre-TCJA Distribution of MIDs by Adjusted Gross Income



Sources: Internal Revenue Service; CEA calculations.
Note: Excludes those earning less than $1 in adjusted gross income.

while encouraging homeowners to finance their home purchases with debt instead of equity.

During the crafting and passage of the TCJA, some outside groups (e.g., National Association of Realtors n.d.) expressed concerns that the changes outlined above would diminish the tax benefits of homeownership by inducing people to switch from itemization to claiming the standard deduction. Indeed, the share of individual returns that claimed itemized deductions fell from 31 percent in 2017 to only 11.4 percent in 2018. Notably, the individuals who switched to claiming the standard deduction generally benefited, because they chose this option over claiming the still-existent MID. However, the housing market has proven incredibly strong and resilient in the years since passage of the TCJA. Homeownership has *increased* since 2017 after nearly a decade of consistent declines during and in the aftermath of the 2007–9 Great Recession.

As predicted, home price growth did weaken in some areas due to the TCJA reforms. Li and Yu (2020) find that the $10,000 SALT cap caused the growth rate of home values to decline by 0.8 percentage point per year in high-tax areas, with the effects felt most strongly within the medium range of properties on the market. Rappoport (2019) measures the response of house prices to all the deduction provisions mentioned above and estimates a 3 percent average reduction across 269 metropolitan areas. Martin (2018), in turn, finds an even larger average decline, of 5.7 percent, but with variation across zip codes and income classes. Each of these research papers comports with the assertion above that the SALT deduction and MID prop up home values, and thus their removal should create the opposite effect and make homeownership more affordable for Americans.

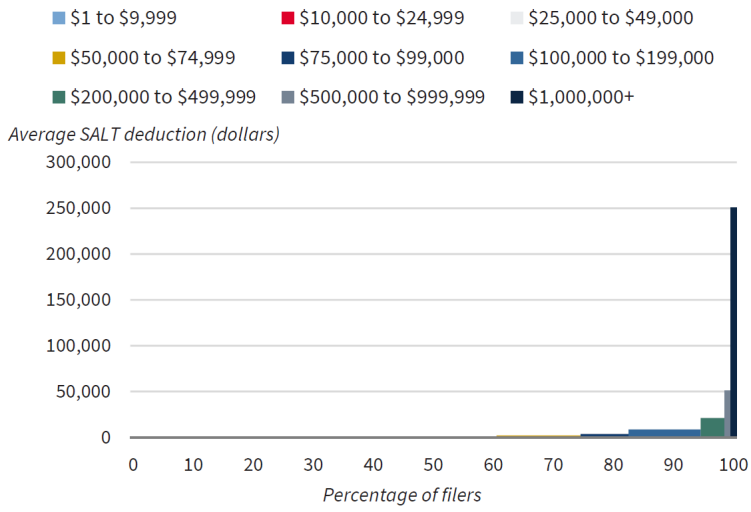
Although slowed home price growth reduces equity increases for incumbent homeowners in high-tax areas, first-time buyers gain easier admission into homeownership by facing more affordable housing choices and being able to make smaller down payments. In fact, 2017 marked the beginning of the turnaround in the U.S. homeownership rate, which had been on a stubborn downward path, from 68.2 percent in 2007 to 63.4 percent in 2016. By 2020:Q1, the homeownership rate had recovered to 67.4 percent. In fact, research by Hilber and Turner (2014) find that the MID has had no discernible effect on the overall level of U.S. homeownership. Sommer and Sullivan (2018) go even further, demonstrating that limiting the MID actually improves homeownership by making housing more affordable, which is particularly relevant to young prospective buyers who lack the accrued savings to make large down payments. Consistent with this finding, the data reveal that households under the age of 35 have experienced the largest homeownership gains.

Looking across states, the CEA finds that the period after the TCJA's enactment evinced relative homeownership gains—not declines—in states with high mortgage income plus State and local tax (MID + SALT) deduction intensity compared with States with lower MID + SALT deduction intensity.

Here, intensity is defined as the ratio of MID + SALT deductions to adjusted gross income in 2016. States with an above-median ratio (which equaled 7 percent in 2016) are considered to have high MID + SALT intensity, and those below the median are categorized as having low MID + SALT intensity.

Using State-level homeownership data from the Census Bureau covering the 2014:Q1 through 2020:Q2 period, the CEA employs regression analysis to measure changes in comparative homeownership dynamics between these two groups of States in the years after the TCJA compared with the years before. This analysis controls for permanent State differences as well as seasonality. The CEA finds that homeownership rates in States with high MID + SALT deduction intensity *increased* by an average of 0.9 percentage point per quarter in the period after the TCJA's enactment relative to States with lower MID + SALT deduction intensity, with the difference growing over time, as shown in figures 11-ii and 11-iii. States with high and lower MID + SALT deduction intensity had statistically indistinguishable homeownership rates in 2018 and the first half of 2019. Elevated homeownership in States with high MID + SALT deduction intensity began in 2019:Q3 (1 percentage point higher than in lower-tax States)—one and a half years after the TCJA's enactment—and was over 3.5 percentage points higher in 2020:Q2. The average 0.9-percentage-point increase in States with high MID + SALT deduction intensity translates into a 1.4 percent gain per quarter relative to the average homeownership rate of 66.2 percent across all States during the analysis period.

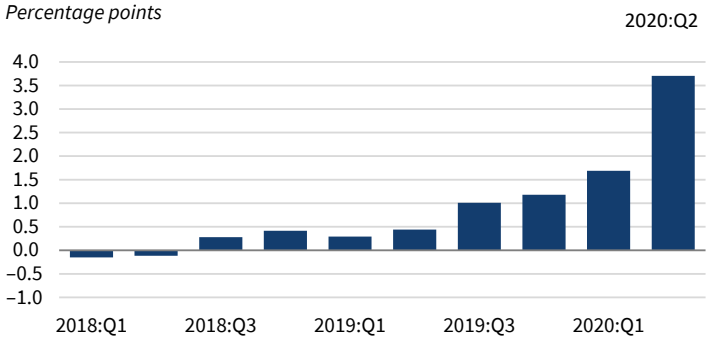
Figure 11-ii. Pre-TCJA Distribution of SALT by Adjusted Gross Income



Sources: Internal Revenue Service; CEA calculations.
Note: Excludes those earning less than $1 in adjusted gross income.

Figure 11-iii. Homeownership Rates in High-Tax Areas Compared with Low-Tax Areas, 2018–20

Percentage points



Sources: Census Bureau; Internal Revenue Service; CEA calculations.
Notes: A State is considered to have a high pre-TCJA MID+SALT deduction intensity if, in 2016, the ratio MID+SALT deduction to adjusted gross income (AGI) was greater than 7 percent, which was the median ratio of total MID+SALT deduction amounts to total AGI amounts across all States in 2016. The height of each bar represents the regression estimate of the average homeownership rate in high pre-TCJA MID/SALT deduction intensity States relative to lower pre-TCJA MID/SALT deduction intensity States for a given quarter-year. An asterisk indicates that the regression estimate is statistically significant. Standard errors account for the possible correlation among observations within the same State over time. The regression includes controls for State dummy variables and month dummy variables.

Reducing the benefit cliffs faced by families receiving assistance can be accomplished by reforming these programs to ensure that there is a low or no penalty for improving wage income. Removing provisions that create nonconvexity and nonlinearity in benefit schedules and consolidating the patchwork of benefits into a more user-friendly system would be a substantial improvement. Allowing a grace period during which an individual maintains benefits after commencing a new job or receiving a raise can smooth the transition to a higher income level. When phase-outs do happen, starting them sooner and having them progress more slowly will reduce the disincentives they create.

Progress toward the goal of skill accrual and independence can be made by reducing the Federal labor tax rate on the lowest income tax brackets. Although it may appear at first glance that the burden of taxation is light on the lowest earners in the U.S. economy, the structure of benefit programs and the income tax system impose a high tax rate on low-earners' wage income. Removing impediments to increasing productivity and earning higher wages is of critical importance for the long-term recovery of the U.S. economy. In the spring of 2020, labor force participation dropped 3.2 percentage points, and has to date only partially recovered, by 1.3 percentage points. Increasing participation among marginalized groups can assist in reversing this trend.

The middle class tax cut discussed above would remove impediments to higher labor force participation and economic growth. However, it would likely reduce Federal tax revenues even when dynamic growth effects are taken into account. In the past, the U.S. has successfully increased fiscal capacity for pro-growth tax reform by coupling rate reductions and other broad-based relief provisions with the elimination or limitation of tax benefits. Such benefits act effectively as a form of spending, even if they are disguised as a broad reduction in tax liabilities. Proposals for reducing these tax expenditures have been subject to claims about pernicious results in the past. However, as detailed in box 11-1, this prediction did not come to pass after the 2017 limitation of the State and local tax (SALT) and mortgage interest deductions (MIDs).

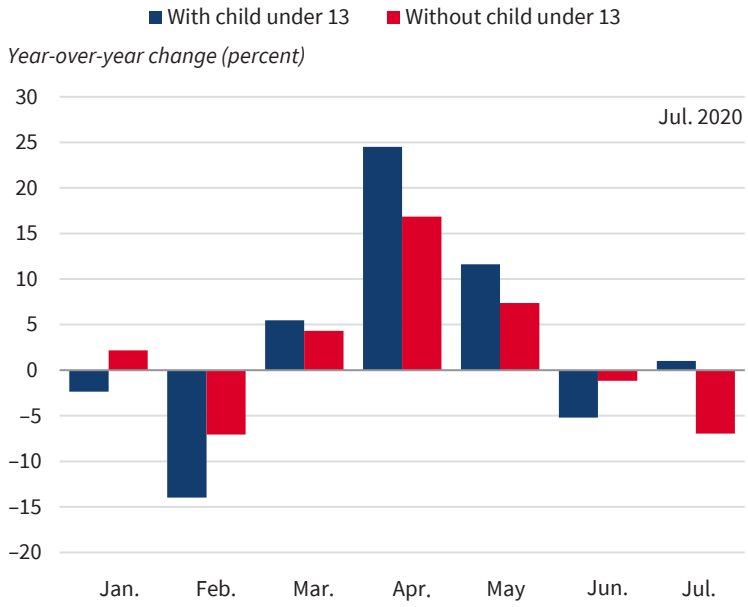
Supporting a Balance between Work and Family

The COVID-19 crisis has had divergent effects on families with children. In April and May 2020, when most schools did not provide in-person learning opportunities, employed workers with children under 13 years of age were more likely than employed workers without children to work fewer hours (figure 11-6). The crisis has also illuminated an underlying issue with the lack of high-quality, affordable childcare and paid family leave. This absence not only hurts the labor market prospects of the parents or family members in question, but also affects the entire U.S. economy.

Family demographic changes and increased participation of women in the workforce have caused the lack of paid family and medical leave to generate costs, not only for workers and their families but also for society. From 1979 to 2019, the labor force participation rate increased for mothers with children younger than three years (+ 21.9 percentage points), younger than six (+ 19.8 percentage points), and younger than 18 (+ 15.3 percentage points). Families are facing increased pressure to balance caregiving needs at home with work demands. Paid family leave (PFL) policies attempt to ease this pressure by allowing families to take time off from work when a baby is born or adopted, or when someone in the family is ill and needs care. The lack of PFL is a serious issue that affects the most vulnerable workers, reducing their ability to engage in the workforce and meet family responsibilities.

This Administration helped to address these issues by offering tax credits to employers that voluntarily offer paid family and medical leave to employees earning below $75,000. Although this provision of the TCJA will sunset at the end of 2020, the COVID-19 pandemic and containment measures have expanded the need for such leave by altering the ways in which many Americans work and attend school. Individuals must look after their children more than before because schools and daycare centers are closed or have limited hours. In addition, the ability to take time off to recover from illness or help others recuperate is critical in containing the virus. The Families First

Figure 11-6. Change in Employed Workers with Actual Hours Lower Than Usual Hours, by Family Type, 2020



Sources: Current Population Survey; Integrated Public Use Microdata Series database; CEA calculations.

Coronavirus Response Act extended paid family and medical leave to employees of businesses with fewer than 500 employees, which allowed workers to take time off when they were ill or needed to care for family members. The act was a temporary action—set to expire at the end of 2020—funded by a refundable tax credit and advanced funds not already on deposit with the Internal Revenue Service. Paid leave remains an important policy issue as Americans continue to navigate the pandemic and look toward the future. However, access to such leave policies is often underprovided by private markets.

The market failure that any Federal paid leave program addresses centers on the positive externalities that paid leave programs generate. A paid leave program accrues some benefit to both the employer and employee, in the form of higher efficiency and productivity. This increase is often not large enough for low-wage workers to receive such benefits from their employers. However, there are additional benefits to provision that spill over and result in a positive externality for society. When workers are unable either to take leave or work while ill (which creates additional problems), they drop out of the workforce, lose income, contribute less in tax revenues and economic growth, become more dependent on the government's safety net, and may even live

shorter lives.[1] Budig and England (2001) estimate that, of the 7 percent wage penalty mothers endure per child, about one-third can be explained by a loss of job experience due to time off or part-time work as a result of childrearing. Staff and Mortimer (2012) similarly conclude that loss in time spent either at work or in school is the greatest factor in explaining the motherhood pay gap. At the same time, these families suffer, and there may be adverse consequences for maternal and family health. Even though workers may realize the cost that such a lack of leave may impose on them, they may not account for external costs to the public healthcare system. Similarly, the costs for society of not giving workers access to paid leave are not internalized by businesses, which are focused on minimizing their own private costs of production. It may also be impossible for small businesses with liquidity and capacity constraints to offer paid leave, even if leave would generate a direct net benefit for their operations.

Aguirre and others (2012) find that if women's labor force participation rates increased to equal those of their male counterparts, U.S. gross domestic product (GDP) could increase by 5 percent. Houser and Vartanian (2012) estimate that women who take paid leave are 39 percent less likely to receive public assistance and 40 percent less likely to receive food stamps in the year after a child's birth, when compared with those who do not take any leave. Not only is paid leave associated with fewer dollars in public assistance spending, it reduces the chance that a family receiving public assistance will increase its use of public assistance after a child's birth.

Unequal Access to Paid Family and Medical Leave

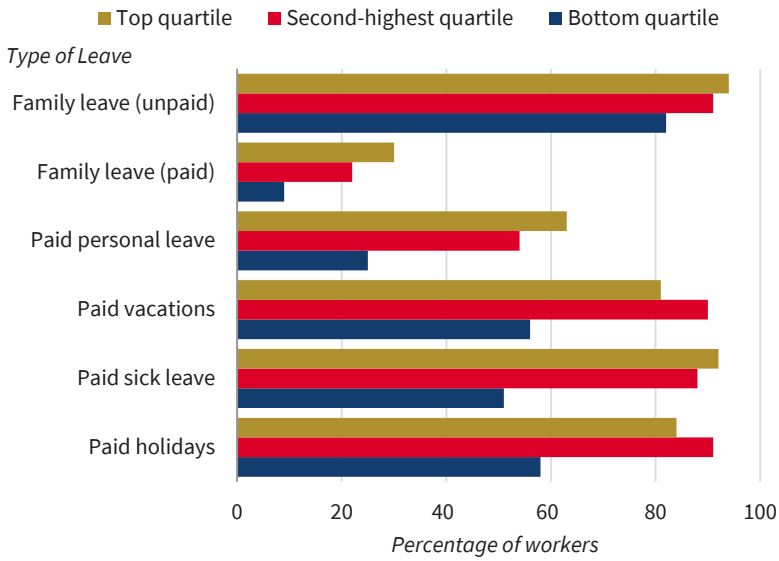
The Family and Medical Leave Act of 1993 (FMLA) guarantees unpaid family and medical leave to 56 percent of American workers (U.S. Department of Labor 2020). The FMLA grants employees the right to take 12 weeks of unpaid leave to care for newborn children, seriously ill close family members, or themselves. Employers are not required by the Federal Government to provide paid leave for employees.

Figure 11-7 shows how access to PFL, regardless of whether provided through the FMLA, varies with wages, as of 2019. Generally, higher-income workers are more likely to have access to PFL; 30 percent of workers in the highest wage quartile have access to PFL, while only 9 percent of workers in the lowest quartile do.

Although the majority of workers were eligible for leave through the FMLA in 2018, access to leave through the FMLA is not uniformly distributed throughout the population. In 2018 those who worked for large employers were more likely to have access to FMLA leave because employers with fewer than 50

[1] Sullivan and von Wachter (2009) find a sharp increase in mortality rates for male workers as a result of work displacement, even 20 years after the displacement takes place. Displaced workers therefore have a lower life expectancy, by about 1 to 1.5 years.

Figure 11-7. Access to Paid Leave by Average Wage



Source: Bureau of Labor Statistics, 2019 Employee Benefits Survey.
Note: Workers are grouped into quartiles by average wages. For example, 30 percent of workers whose averages wages fall in the top 25 percent of all workers have access to paid family leave.

employees are not required to offer it; 59 percent of private sector workers were eligible for FMLA, but they worked at only 10 percent of worksites. Low-wage workers were more likely to have an unmet need for FMLA leave. Nearly 1 in 10 (9 percent) workers who made less than $15 an hour reported that they needed to take leave but did not qualify for FMLA, compared with 6 percent of workers who made more than $15 an hour. Several States have supplemented unpaid leave through FMLA with paid leave programs of their own. As of January 2020, eight States have enacted PFL with divergent requirements and benefits.[2] This creates a patchwork system that generates a complex burden on employees and employers that could be alleviated with a nationwide paid leave policy. Worryingly, Sarin (2016) finds that employers may discriminate against female job candidates if paid leave is offered; prohibiting firms from firing employees for taking State-sanctioned paid family leave reduced the female share of new hires at large firms by 0.6 percentage point, or 1.1 percent. A paid leave program that is not directly paid for by the employer could reduce the incentive for such discrimination.

[2] These States are California, Connecticut, Massachusetts, New Jersey, New York, Oregon, Rhode Island, and Washington. A paid family leave law will be effective in the District of Columbia in July 2020, in Massachusetts in January 2021, in Connecticut in January 2022, and in Oregon in January 2023.

Effects of Paid Leave on Employment and Earnings

Because very few States in the United States have experience offering paid leave programs, the research on paid leave has either relied on household surveys like the Current Population Survey or State-level administrative data on actual take-up of leave. The empirical literature provides evidence that paid leave promotes employment, more hours worked, increased income, and breastfeeding. These factors often disproportionately benefit disadvantaged populations.

Many studies of paid family leave programs find that the programs do increase labor force participation, though some find no or negative effect. Jones and Wilcher (2019) study the effects of State-family leave policies in California and New Jersey and find that access to PFL increases maternal labor market participation by over 5 percent in the year of a birth, an effect that remained significant even five years later. However, Bailey and others (2019) study the short- and long-term effects of PFL in California and find that for first-time mothers who elected to take the paid leave, there was a negative effect on their employment of between 2.8 percent and 3.7 percent in the short term and between 5.4 and 6.9 percent in the long term. Rossin-Slater, Ruhm, and Waldfogel (2012) find that California's PFL initiative doubled the use of maternity leave, from three to six weeks on average. In addition, it increased working hours and wages for mothers of young children by between 10 and 17 percent. This effect was particularly pronounced in disadvantaged groups, a finding backed up by Bartel and others (2019), who find a disproportionately large difference between White and Hispanic access to paid leave and that under California's PFL, fathers of infants were 46 percent more likely to take leave, an effect particularly pronounced for fathers of first-born children. Finally, Bartel and others (2019) note that PFL increases breastfeeding by an average of 18 days, which might lead to long-term health benefits, particularly for disadvantaged families.

The effects of paid family leave on incomes and earnings are mixed. Even with PFL, families may suffer from lower earnings in the long run, although some lower-income women may benefit from a short-run wage boost. Bailey and others (2019) find that the earnings of first-time mothers with access to paid family leave were reduced by between $346 and $549 in the short term and between $541 and $791 in the long term relative to their mean level of pre-birth earnings. For first-time mothers who elected to take paid leave, the negative effect on their earnings was between $1,613 and $2,559 in the short term and $2,522 and $3,685 in the long term. Timpe (2019) similarly finds that expansion of disability insurance programs to cover pregnant women and mothers of infants caused women's wages to fall by 5 percent and led to decreases in family income for families in the middle of the income distribution. In contrast, Campbell and others (2017) study the effect of expanding temporary disability

insurance to new mothers in Rhode Island and find no wage effects for women in households making less than $50,000 as a whole, but positive wage effects in the three years after giving birth for women for households making less than $20,000. For women in households making between $20,000 and $40,000, the wage effect was positive in the year after birth and indistinguishable from zero thereafter. Kleven and others (2020) find no long-term effect on female labor market outcomes, but that leave of longer duration can have a negative effect on the labor force penalty imposed by children.

Although the empirical evidence on paid leave shows varying effects, this could be a consequence of different empirical approaches, data used, and years covered. Analysis on this topic is often hindered by a lack of high-quality data on access to and take-up of paid leave, and the fact that few States currently offer a State paid leave plan. At the same time, while employers are starting to offer paid leave voluntarily, such programs are more common among larger employers in certain industries. Finally, while labor market outcomes are important for measuring the efficacy of paid-leave programs, gains in alternative metrics such as child health quality can be persuasive in determining whether net societal benefit is generated as a result of a program.

Implementation of Paid Leave

The 2017 TCJA incentivized private provision of paid leave by offering a tax credit to employers. Several members of Congress have proposed possible reforms to give more American workers additional access to paid leave. The Federal Employee Paid Leave Act (FEPLA), signed into law December 2019, expands the FMLA's 12-week paid leave benefit for the civil service to cover all FMLA leave, and to allow the Office of Personnel Management to grant an additional four weeks of leave. The FAMILY Act proposal would create a new payroll-tax financed wage insurance program that would pay cash to those caring for a new child or close family member. The New Parents and CRADLE Acts would instead allow those caring for newborn or newly adopted children to receive a portion of their Social Security benefits while on leave. Members

Table 11-1. Congressional FMLA Tax Proposals

Legislation Title	Overview
Advancing Support for Working Families Act	Up to $5,000 advance payment in the year of the child's birth or adoption
The Working Parents Flexibility Act of 2019	Creates tax-advantaged parental leave savings accounts
The Freedom for Families Act	Expands HSAs for family and medical leave use
The Support Working Families Act	Up to $6,000 tax credit for parental leave

Source: Congressional Research Service.
Note: FMLA = Family and Medical Leave Act of 1993 ; HSA = Health Savings Account.

Table 11-2. Annual Cost of Paid Parental and Medical Leave by Take-Up Scenario (billions of dollars)

Type of Leave	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Medical	9.9	5.0	8.3	4.2
Parental	8.6	7.7	7.5	6.8
Total	18.5	12.7	15.8	11.0

Sources: American Enterprise Institute; Brookings Institution; CEA calculations.
Note: The four scenarios refer to assumptions about program use. Scenario 1's participation rates are similar to those observed under programs of the Family and Medical Leave Act. Scenario's 2 participation rates are more consistent with existing State-level paid leave programs. Scenario 3 assumes that half of the workers are on sick leave and 9 out of 10 workers on parental leave would participate. And scenario 4 assumes that 6 in 10 workers receiving paid leave would claim the benefits after four weeks of paid employer-provided leave.

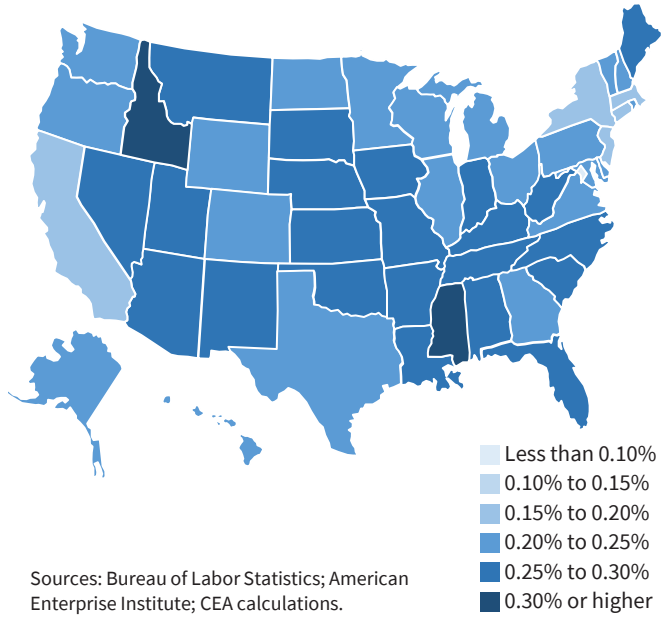
of Congress have proposed four tax policy changes to support new parents, as seen in table 11-1.

The difference between the proposals hinges on the method of financing any new program of paid leave, as well as the scope of that program. In general, some proposals have favored using existing programs, such as Social Security or the Child Tax Credit, and allowing workers to access funds early. In contrast, other proposals have favored new types of financing, such as a new payroll tax on employers and employees, to finance paid leave. The proposal on paid leave sponsored by Senator Bill Cassidy, the Advancing Support for Working Families Act, would allow families to claim an advance payment, paid back over 10 years through lower child credits. This act would provide no additional money to families beyond the value of bringing a future payment forward in time (or qualified delayed or nonrepayment due to unfortunate circumstances faced by the family).

An additional policy to expand paid leave could be financed and distributed by State Unemployment Insurance (UI) programs, as proposed in the President's Budget, and would be scored at $21 billion for a UI-based proposal offering 6 weeks of leave. This estimate depends on the assumptions of take-up rates (table 11-2).[3] The cost ranges from $32 million in Wyoming to $2.3 billion in California, with a median cost of $241 million in Louisiana, using take-up assumptions based on the FMLA experience. The cost as a share of State wages ranges from 0.08 percent of annual 2018 wages in the District of Columbia to 0.32 percent in Idaho and Mississippi, with a median of 0.25 in Georgia, Maine, Missouri, Nebraska, Tennessee, and Vermont (figure 11-8).

[3] Estimates made using the American Enterprise Institute–Brookings Working Group on Paid Family Leave Calculator, available at https://www.aei.org/spotlight-panels/paid-family-and-medical-leave-cost-model/. The CEA further assumed a wage replacement rate of 70 percent, with maximum weekly benefits of $600, a one-week waiting period, and work requirements in line with those from FMLA.

Figure 11-8. Cost of Paid Family and Sick Leave as a Share of State Wages, 2019



Sources: Bureau of Labor Statistics; American Enterprise Institute; CEA calculations.

One potential issue with funding paid leave through State UI systems is that typically State programs vary significantly when it comes to eligibility, wage replacement rates, and the duration of benefits. This can lead to uncertainty and confusion for workers regarding their eligibility for paid leave. It can also be problematic for employers to understand if their employees have access to the State program or not, and can lead to different compliance requirements across states. Therefore, at a very minimum, to guarantee uniformity across states, it would be important to ensure that any leave taken for the explicit purposes of birth, adoption, fostering a child, or medical leave be subject to the same rules across State programs. Tenure eligibility could be similar to the FMLA program, so that workers need to work with an employer for about a year. Finally, as the current COVID-19 crisis has shown, State UI systems can come under significant pressure if additional programs are tacked onto them. Therefore, adopting this approach to paid leave provision would require additional planning and administration, and also an investment in State UI programs.

Paid leave could alternatively be offered through the EITC or the Child Tax Credit (CTC). Allowing parents to access the portion of the EITC and the CTC they normally receive as a tax refund at the time of birth instead of after filing taxes could help parents finance the costs of parental leave. Married parents making between $10,000 and $40,000 a year with two children could receive

between $5,000 and $8,600 in advanced funds to fund parental leave. An additional $2,000 flat payment upon the birth of a child also could give parents of all income levels funds to cover their expenses and to take time off work, at an estimated annual cost of $7.6 billion.

This policy can be illustrated with a hypothetical two-parent, married family with two children under age 13. Both parents work, and it is assumed each parent makes the same amount of income and has only earned income. As noted above, the family can receive payments only from the refundable portion of each tax credit, since the nonrefundable portion can be used only to reduce actual tax liabilities and is not available as a cash transfer. Withholdings can be reduced to take into account these credits, thereby increasing take-home pay.

In 2019, for a family with annual income of $20,000, the EITC contributed $5,828 to their income, while the CTC contributed roughly half that. The combination of these credits could thus provide the family an advanced payment of $8,453, which could be used to meet childcare expenses associated with the birth of a child. In combination with the $2,000 bonus, the family receives over $10,000 toward meeting childcare expenses at the time of a birth or the adoption of a child. For a family earning $20,000, this is a significant means of financial support that enables them to provide care for the child for several weeks, even if they do not have paid leave from their employer.

According to the Centers for Disease Control and Prevention, nearly 3.8 million babies were born in the United States in 2018.[4] Offering a $2,000 baby bonus would cost an estimated $7.6 billion each year. Though this may not involve the need for new funding, advancing the CTC and EITC could increase improper payments and would increase administrative costs. In the past, the take-up rate of the advanced EITC was low, leading to an end to that program. However, that program was not specifically targeted at new parents.

The Lack of Childcare

Although paid leave is important for working parents who need time off immediately after the birth or adoption of a child, affordable childcare is often needed for parents to transition back into the workplace. In an earlier report, the CEA estimated that as of 2016, the high cost of childcare was preventing up to 3.8 million parents from joining the labor force (CEA 2019). Over 71 percent of these parents were married mothers, 21 percent were single mothers, 6 percent were married fathers, and 2 percent were single fathers. In addition to these 3.8 million parents, the CEA estimated that another 6.6 million non-disabled, working-age parents were working only part time and may require childcare to increase their working hours. Each of these 6.6 million parents had

[4] According to the U.S. Department of State, only 4,058 babies were adopted internationally in fiscal year 2018.

a child under age 13 and had no other potential nonworking caretaker in the household.

There are societal benefits to high-quality, affordable childcare that do not accrue solely to the parent and their employer. The positive externalities generated by higher labor force participation at the intensive and extensive margins, such as increased tax payments and reduced enrollment in assistance programs, provide a basis for government interventions that support childcare. Though substantial government assistance for childcare is currently offered through the tax code and transfer programs, the benefits are spread over multiple programs and may not necessarily reflect current childcare costs. The high cost of childcare is also a result of government regulation of childcare centers and providers. And though implementing a high standard of safety for caretakers is of paramount importance, excessive regulation and credentialing reduces the supply of childcare available, raising the costs above what some Americans can afford.

A large body of literature in economics has studied the effect of the high costs of childcare on labor force participation. One Federal program, discussed further below, is the Child Care and Development Fund (CCDF). A recent study by the U.S. Department of Health and Human Services finds that a 10 percent increase in the CCDF leads to a nearly 0.7 percent increase in maternal employment; this conclusion tracks with a meta-analysis (Morrissey 2017) finding that a 10 percent increase in the price of childcare reduces maternal employment by 0.5 to 2.5 percent. The effects were strongest for single mothers, mothers with young children under the age of four, and mothers with low incomes. A tripling of CCDF funds, for example, could bring an additional 300,000 mothers with young children into the labor force. Blau and Kahn (2013) show that the gap in labor force participation between women in the United States and other countries belonging to the Organization for Economic Cooperation and Development (OECD) could be explained by the lack of paid leave laws and childcare availability in the U.S.

An earlier report from the Pew Research Center (2014) showed that for families with working mothers, average weekly childcare expenses rose by 70 percent between 1985 and 2011, and that costs as a fraction of family income were much higher for lower-income families. In addition to its effect on labor force participation, the high cost of formal childcare is a possible reason why the U.S. has a higher reliance on informal care compared with other OECD countries.

Increasing Access to Childcare

As discussed in the last subsection, spending on childcare can be helpful for enabling work and improving labor force participation, especially for women. Today, families receive some support for meeting childcare expenses through the CCDF, as well as through various tax credit programs.

The CCDF is a consolidated block grant to States funded by both discretionary and mandatory Federal dollars that generally funds childcare by providing vouchers to families for use in childcare centers, family childcare homes, before- and after-school care, and in some informal settings. In total, the CCDF provided $8.7 billion in childcare assistance in 2016, with 75 percent of funds coming from the Federal government and 25 percent coming from the States. States additionally subsidize childcare directly through the TANF program. States provide additional funds to eligible families based on TANF rules, which vary by State but generally include only low-income families that meet program requirements. In 2018, $3.8 billion in TANF Federal block grant and State maintenance-of-effort funds were spent on childcare.

In addition to these subsidies, two tax benefits for households specifically subsidize childcare while enabling parental work or educational activities. The larger of these tax benefits is the Child and Dependent Care Tax Credit (CDCTC), which allows taxpayers to take a credit of up to $3,000 per child under age 13 for qualified childcare expenses for up to two children, for a total of $6,000.[5] This credit is worth a fixed proportion, which ranges from 20 to 35 percent of these qualified expenses and depends upon the taxpayer's adjusted gross income, with the higher percentages applying to lower incomes. The second tax benefit specifically tied to childcare is a provision whereby employers may allow employees to contribute up to $5,000 in pretax earnings to flexible spending arrangements, which can then be used to pay for childcare expenses.[6] However, expenses claimed for the exclusion may not be included among the childcare expenses claimed for the CDCTC. In combination, the CDCTC and flexible spending arrangements for childcare expenses benefited 6.9 million families in 2016, for an average benefit of $769 per family. The combined cost of the CDCTC and flexible spending arrangements was $5.3 billion in 2016.

Many of the policy ideas discussed above for funding paid leave could also be used to fund family childcare needs. For instance, tax credits like the EITC and the CTC added over $8,000 for two-parent, two-child families with annual incomes of $20,000 in 2019. If these credits were further expanded so that families could claim them in advance, this would allow families to pull forward money in a time of need. Of these, the EITC is the best targeted at lower-income households and is the most beneficial for covering their childcare costs because it is fully refundable. The CTC is only partly refundable and is not as targeted to lower-income households as the EITC. Its benefits extend well up the income ladder. Modifications of the CDCTC could increase its capacity to

[5] The CDCTC is nonrefundable and thus only kicks in once the taxpayer begins to pay income tax. Crucial to this credit, both spouses (if filing jointly) must earn income or be enrolled in school, and the childcare provider cannot be a spouse, parent, or other dependent. The CDCTC is also available for the care of disabled dependents.

[6] Flexible spending arrangements use the same qualifications for eligible expenses as the CDCTC. Employers may also fund the childcare flexible spending arrangement directly, up to the statutory limit.

cover childcare costs. Currently, the cap on the size of the credit has not kept pace with inflation, which means that while childcare costs have increased, the maximum benefit has not kept pace with these changes. In addition, the dependent care credit is nonrefundable, which means the lowest-income families cannot take advantage of it.

Federal policy could encourage an increase in the supply of high-quality childcare to reduce its cost to American families. Policy changes could allow more individuals to provide noninstitutional childcare to friends and neighbors, either by relaxing regulatory requirements or by ensuring that the burden of credentialing requirements for childcare providers is efficiently achieving the goals of safety and quality. Potential policies could include lowering the educational requirements for caretakers and increasing the ratio of students to teachers when it is consistent with safety and educational benefit to do so. As discussed in chapter 6 of this *Report*, the benefits of deregulation tend to favor households in the lower-income quintiles, and improving access to affordable childcare while maintaining a high standard of quality has the potential to greatly benefit lower-income parents.

Enhancing International Coordination to Meet 21st-Century Challenges

The COVID-19 pandemic caused a historically unprecedented simultaneous global supply and demand shock, reducing the output of each of the Group of Seven economies by about 10 to 20 percent. This section discusses issues with existing international bodies that were underscored during the response to the pandemic. Rather than a one-size-fits-all approach, this section analyzes the benefits of a narrow-deep relationship with the United States' trusted allies and friends, and a broad-shallow relationship with nations that do not share the same value systems as the United States. Incongruity in values takes on profound economic significance because the current global economy is driven by interwoven networks, a prominent example of which is the Internet itself. Although networks possess great economic potential, they also introduce vulnerabilities, and, as detailed below, tend to work best and most securely between trusted participants. These profound differences in fundamental values create distrust, and limit the extent to which it is beneficial to share systems. It is U.S. policy that multilateral institutions are useful, and they continue to be effective for implementing U.S. policy priorities. This section discusses the benefits of supplementing existing institutions with stronger bilateral ties with allies that share U.S. values.

The global economy is in the midst of the most profound technological revolution in history—the information revolution—which continues to transform communication, production, commerce, and conflict. Social and economic transformations continue to accelerate. The continued growth in

connectivity and computing power is driving 5G, artificial intelligence, nanotechnology, three-dimensional printing, and the Internet of Things—each a major revolution. Quantum computing, rapidly advancing biotechnology, and profound innovations in energy—all facilitated by, or a part of, the information revolution—loom on the near horizon. The international order is at a historical inflection point, fraught with both great opportunities and dangers. To ensure success, global and domestic strategies must be grounded in the economic realities of the 21st century. The choices made now will reverberate for a very long time.

The Economics of Networks, Coordination, and Standard Setting

Today's world is driven in large part by the economics of networks, which can be characterized as any economic or institutional relationship in which the greater the number of participants, the more valuable the network's function becomes to each participant. A classic example is a telephone system. If only a few people have access to a telephone system, its usefulness is obviously limited to calls between those few. If, in contrast, the vast bulk of the population of a region has access to the system, then its usefulness to any one user (and to all of them jointly) is vastly increased. Human languages themselves are networks—the more people who use a language, the more beneficial for all users it is to know that language. Any interconnected system of transportation, communication, or technologies constitutes a network, because the more linkages and connections there are, the more useful it is to all users. As noted above, the Internet is a network. Railroads are networks, as is the highway system; if a new, hardtop road more effectively connects a rural village to a superhighway, it also simultaneously more effectively connects the rest of the world to that rural village.

In their foundational work, Katz and Shapiro (1985, 1986) and Farrell and Saloner (1985, 1986) define network effects as positive consumption externalities, such that the benefit that a user derives from consuming a good is increasing in the number of other consumers that use the good. They distinguish between direct network effects, whereby a user's utility is directly dependent on the number of other users such as arise in a telephone system, and indirect or market-mediated network effects, such as arise in markets for operating systems where complementary goods such as software will be in better supply the more users adopt the system. They explain how the benefits of standardization and interoperability are rooted in such network effects. In this subsection, we use a broad definition of network effects to encompass any coordinated network of standards. When countries share the same standards, business is simpler to conduct between these separate jurisdictions, leading to benefits for all participants. The more members are sharing standards, the greater the gains for each participant, leading to a network effect working through the

supply side. This definition of network effects includes any kind of widespread standard that generates benefits from interoperability.

For example, standardizing the manner in which computers can communicate with one another constitutes a network (the more users of the standard, the better for all concerned). If equipment, hardware, machinery, parts, or tools of any sort are standardized, then they constitute a network; for instance, the metric system is a network, and the more tools and machines that are built using the calibrations inherent in this system, the more valuable each of them is, because they are more interoperable. Networks mesh and overlap with one another, and they are used in various complementary combinations. One might use the English language (a communications network) to convey a message within an email message (part of a communications network) about purchasing a train ticket (employing a commercial and transportation network) and an intent to hire a ride-share car upon arrival (coordinated through a communications and commercial network).

Modern market economies are vast networks of networks that pull in entrepreneurs, labor, capital, materials, and legal infrastructure (among other factors) to meet the evolving demands of consumers and governments around the world in real time. What makes this broad network system tick are the many networks enmeshed within it. For example, what facilitates an exchange at arm's length—such as a credit card purchase of a pizza—is a set of trusted networks, including not only the confidence that the money will be moved among the pertinent accounts to render payment but also the legal remedies implied if the ingredients of the pizza are harmful due to negligence.

Similarly, international institutions and standards constitute networks of international trade, investment, communications, regulation, and procedures to resolve disputes. The Organization for Economic Cooperation and Development, which originated in 1948 as the Organization for European Economic Cooperation, was established in its original form to coordinate the administration of the U.S. Marshall Plan, and today serves as a network by which countries identify and discuss common problems (OECD 2011, n.d.). The Society for Worldwide Interbank Financial Transactions network allows financial institutions, including central banks, a secure means by which to communicate and transact (Cook and Soramäki 2014). More recently, the United States–Mexico–Canada Agreement (USMCA) is a network, setting standards for economic activity between the three joining countries (USITC 2019).

Whereas the purchaser of tainted pizza has recourse in U.S. courts, international networks can often fail to enforce standards. This is especially problematic when participants in international networks do not share the values of free societies and exploit these same networks to their advantage, disadvantaging the free societies. As a result, the effectiveness of networks at the international level is reduced. Economic activity will recede when international coordination and standard-setting create uncertainty. This Administration in

particular has been focused on the failure of global networks to enforce intellectual property protection. It is of vital national interest that global networks—such as international trade, capital markets, and anti-money-laundering or antiterrorist financing—are aligned with the values of the United States. This necessitates working alongside like-minded allies and partners individually and within existing international frameworks to ensure that global standards do not disadvantage the United States.

The Current Paradigm for Coordination and Standard Setting

This Administration has both recognized the potential benefits of international coordination yet also highlighted the real limitations faced by international institutions in their coordination and standard-setting efforts. Recent successes include the update to the U.S.-Korea Trade Agreement (KORUS), the U.S.-Japan Trade Agreements, and USMCA. As discussed in chapter 9, trade agreements enhance U.S. firms' access to supply chains and foreign markets, allow U.S. consumers to enjoy a wider variety of goods and services, and generate gains for the U.S. economy.

At the same time, it has become increasingly difficult to work with some existing international institutions. Institutions made up of a broad membership with disparate goals, value sets, and trust structures are most vulnerable to suffer ossification and become ineffective. Although these institutions can and do provide broad value, they often fail to produce deep gains through enhanced cooperation between members, and are unable to allocate gains among competing interests. And though several international institutions are aptly characterized by these circumstances, the trade space provides an appropriate example. Rather than working through the WTO's Doha Round or multilaterally, balancing the interests of many parties, this Administration has focused on achieving gains through narrower agreements, as discussed above. In the case of the WTO, the Office of the U.S. Trade Representative (USTR) has noted in the most recent annual report on the WTO that the Appellate Body "has added to U.S. obligations and diminished U.S. rights" while "several of [the Appellate Body's] interpretations have directly harmed the ability of the United States to counteract economic distortions caused by nonmarket practices of countries like China" (USTR 2020a, 2020b). This is the predictable outcome of a network that includes countries with fundamentally different values and limited enforcement capabilities. More broadly, international organizations have faltered due to a confluence of factors, including the size of the organizations, the emerging multipolarity of international affairs, and the fact that existing organizations largely addressed "low-hanging fruit" early in their tenure. Large institutions contain members with wildly divergent situations and goals, increasing the frictions and transaction costs of achieving gains through coordination.

Table 11-3. Durations of GATT/WTO Rounds

Round	Initiated	Completed	Participants	Duration (months)
Geneva I	Apr. 1947	Oct. 1947	23	6
Annecy	Apr. 1949	Aug. 1949	13	4
Torquay	Sep. 1950	Apr. 1951	38	7
Geneva II	Jan. 1955	May 1956	26	16
Dillon	Sep. 1960	Jul. 1962	26	22
Kennedy	May 1964	Jun. 1967	62	37
Tokyo	Sep. 1973	Nov. 1979	102	74
Uruguay	Sep. 1986	Apr. 1994	123	91
Doha	Nov. 2001		153	> 229

Sources: Moser and Rose (2012); CEA calculations.
Note: GATT/WTO = General Agreement on Tariffs and Trade / World Trade Organization.

To illustrate this first point, consider the durations of the negotiation rounds of the General Agreement on Tariffs and Trade / World Trade Organization (GATT/WTO), shown in table 11-3. These rounds have increased steadily over time, alongside the number of participants—with the Doha round, initiated in November 2001, still outstanding (Moser and Rose 2012). Increased participation, an indicator of broader multipolarity in the WTO, is associated with longer negotiation durations. Measures of productivity, such as average tariff cut per year of negotiations, show a relative stability through the Uruguay round (Martin and Messerlin 2007) though there will need to be large cuts as part of the Doha round for this trend to continue.

This relationship makes clear the trade-off the United States faces in working through some broad international organizations. Though the potential for benefits rises with organization size, so do heterogeneity costs from increased diversity among these states (Posner and Sykes 2013; Bradford 2014). On the margin, a new member must be valued against the cost of reduced cohesion and ability to make decisions. It is important that international organizations reach optimal membership decisions, with failures of judgment resulting in a free-rider problem where countries are unwilling to contribute and unlikely to engage in voluntary arrangements (Buchanan 1965). This is not to say that the WTO or other international institutions would necessarily be better off as a result of a U.S. withdrawal. Aside from working to generate new gains for the U.S. through narrow cooperation, U.S. participation in broad international institutions also serves as an institutional safeguard against the possibility of those institutions taking actions that contradict American values and priorities, or becoming dominated by America's rivals. The United States' participation leverages heterogeneity costs to its advantage, making it difficult for countries

with different values to co-opt existing institutions. The Trump Administration has recognized this, and thus has worked both within existing institutions and outside them to generate gains from deeper coordination.

Evaluating the costs and benefits of admitting new members to an organization or evaluating an agreement is complicated, because of changes in the global landscape and difficulty in enforcing international agreements. For example, the situation in 1947 was quite different than today. Many of the trade agreements of that period were made with a desire to support countries as a strategic counterbalance against totalitarian economies (Martin and Messerlin 2007). At that time, the United States was willing to accept nonreciprocal and unfavorable trade deals to benefit American allies (Baldwin 2006). However, this has proved harmful when international institutions have been unable to enforce compliance. The USTR has noted that "China's entry into the WTO [was] on terms that have proven to be ineffective in securing China's embrace of an open, market oriented trade regime" (USTR 2018, 2019, 2020a, 2020b). As detailed in the 2018 *Economic Report of the President*, the United States has very little negotiating power today within the existing WTO structure because the current U.S. trade barriers are so low. This makes the negotiating process exceptionally difficult for the United States.

Another difficulty is that enforcing agreements is made conditional on a country's accession to an international organization. Consider the case of China's accession to the WTO. As part of this agreement, the WTO engaged in consent tailoring, which involved requiring China to engage in economic reforms as part of the accession process. At the time, it was thought that through accession, China would also engage in economic reform. But this has not come to fruition. Neomercantilist nations, such as China, that engage in industrial policy create dangers in markets characterized by network economics. A government that is heavily subsidizing a champion company for a network niche, as China has been doing with Huawei and 5G, might exploit the dominance of the company to pursue geostrategic interests and might not be a trustworthy steward of a network upon which so many and so much will rely. These issues beg the question of how to proceed toward the goal of free, fair, and reciprocal trade within the broader network of trade agreements and international organizations.

Adam Smith stated in *The Theory of Moral Sentiments* (1759) that to make a market economy work, trust is an essential component. Successfully navigating the challenges inherent in this rivalrous global environment will necessitate economic partnerships with other like-minded and trusted nations in a deeper and more integrated manner than what has been done in the past. As Evensky (2011, 261) states: "When trust is shaken, individuals pull back and the market system contracts. Where trust grows, individual energy and creativity are unleashed and the system grows." This is the great geostrategic and economic challenge that confronts international economic structures today:

how to build, govern, and maintain extensive cross-jurisdictional networks while ensuring that they are secure, reliable, and based on well-founded trust.

Opportunities for Advancing Coordination

To remain nimble, future deep international partnerships must be based on economic and geostrategic interests as well as on shared values. Economic theory suggests a way forward. As opposed to seeking shallow agreements between countries with differing belief systems, the United States can generate gains through deep integration with countries with a similar economic situation and regulatory system (Buchanan 1965). One approach to this integration is to develop narrow collectives like the European Union and African Union that work in parallel to and in support of broad international organizations. These collectives rebalance the cost-benefit analysis by attempting to reduce heterogeneity costs and allowing for gains through deeper integration. This can be done by adopting global rules or creating rules from scratch to advance the goal of borderless markets (Davies and Green 2008).

Another approach is to create bilateral agreements between countries with similar economic values that can later be extended into multilateral agreements such as USMCA. Under this framework, political and monetary action would remain the prerogative of each country. Moreover, regulatory uniformity would not be enforced by an extranational government, but alignments could be achieved through mutual recognition and acceptance of equivalency in the outcome of each system. Nations may pursue two different methods of regulating industry, but can still reach regulatory convergence on key issues such as safe products, fair work environments, and well-stewarded natural resources. For example, in 2008 the United States and Australia entered a limited mutual recognition arrangement for regulatory exemptions that would permit U.S. and eligible Australian stock exchanges and broker-dealers to operate in both jurisdictions, without the need for these entities to be separately regulated in both countries (SEC 2008; Jackson 2015). This foundation of trust provides a model for international cooperation that could provide economic returns not captured by current multilateral efforts, while still constituting a laboratory for eventual broader, multinational efforts (Buchanan 1965).

These approaches have the potential to benefit all the countries involved, by allowing deep integration with aligned nations while maintaining an economic relationship with countries that are unable or unwilling to couple their economies under a framework of shared values and trust. As the importance of these collectives grow, they will offer greater benefits to membership, creating an incentive for countries to meet the criteria for joining (Bradford 2014).

The U.S. has the potential to generate particularly large gains through coordination with like-minded countries to help limit negative externalities from countries with different goals. The enforcement of intellectual property rights provides an example. The U.S. used Section 301 tariffs to enforce

intellectual property rights against China. Intellectual property theft is quite costly: the OECD estimates in a 2019 study that international trade in counterfeit goods amounted to $509 billion in 2016. The IP Commission (2017) estimated in 2017 that the cost to the U.S. economy of counterfeit goods, pirated software, and theft of trade secrets is more than $225 billion a year. Assuming a discount rate of 3 percent, the cumulative cost of inaction is $7.5 trillion. The Office of the Director of National Intelligence estimated in November 2015 that economic espionage through hacking costs $400 billion a year. Although the U.S. has achieved enhanced protection of intellectual property through bilateral negotiations with China (discussed in chapter 9), additional gains could be achieved by working alongside like-minded countries that share the United States' perspective on intellectual property protection. By creating a collective to better enforce intellectual property rights against China, the U.S. can increase the gains and lower the costs.

Reorienting American policy from a broad-shallow framework to include narrow-deep coordination will allow for greater benefits and flexibility in making trade agreements. This will allow for the stagnation of the past decades to be overcome and create a higher-income and more closely linked world. As recovery from the COVID-19 pandemic continues, building international structures for a return to prosperity and prevention of future reoccurrences becomes of paramount importance.

Prospects for U.S.–U.K. Coordination

As an example of this new approach to economic partnerships, the U.S. could explore the potential for an explicit economic and geostrategic deep partnership with the United Kingdom. There are many possible nations with which the U.S. could partner in this way, and this is just one possibility. Although trade agreements like KORUS and USMCA provide excellent templates for future partnerships and highlight important areas of coordination for contemporary economies (see chapter 9 for a discussion of these agreements), future agreements could go beyond a trade deal. Blueprints for such cross-border arrangements have been outlined in depth by Tafara and Peterson (2007) in the context of financial market regulation.

The optimal economic result would be economic integration that increases gross trade flows and innovation. Trade in goods, services, labor, and ideas would be as free as possible, yet consistent with maintaining full sovereign independence. Facilitating this goal would involve intensive bilateral processes, such as a free flow of labor through streamlined processes facilitating citizens of the U.S. and U.K. to work and live in the other's jurisdictions or mutual recognition of financial institutions that would enhance the global reach of both markets. Another area of potential benefit is the security of devices, software, and networks. The U.S. and U.K. would benefit from coordination on determining what types of devices are not secure and pose a risk to

the development of safe networks. Yet another area for enhanced coordination is institutions of higher learning, which provide the foundation for future innovation. A U.S.-U.K. consortium of universities might act as a catalyst for centers of innovation and further collaboration. The exchange and flow of faculty, students, and ideas would build tremendous technological momentum in itself. The U.S. and U.K. could vigorously and jointly prosecute the theft of intellectual property and coordinate remedies—like tariffs, sanctions, and prohibiting the operation of certain firms—to form a truly deep partnership.

The economic benefits of such a partnership could be substantial. As a narrow example, consider the 1958 agreement on automotive industry standards between the European Union, Japan, South Korea, and other countries (though not the United States), which increased automotive trade between partner countries by more than 20 percent through regulatory harmonization. In exploring the elimination of tariffs between the U.S. and the U.K., a 2000 report by the USITC found that U.S. imports from the U.K. would increase 7 to 12 percent, and U.K. imports from the U.S. by 11 to 16 percent, although the aggregate output effects were not substantial (USITC 2000). A broader review of the literature on mutual recognition agreements by the OECD found that, in almost all cases, such agreements boosted international trade flows between partner countries (Correia de Brito, Kauffmann, and Pelkmans 2016). The direct benefits of any agreement will be sensitive to the provisions therein. However, what is both more valuable, and more difficult to value, are the early and future network effects of such an agreement.

The U.S. is positioned to lead in the development of a new generation of flexible, bilateral economic partnerships that protect national sovereignty and interests while seeking to produce gains from cooperation. This stands in contrast to the expansion and sharing of networks with countries with which the U.S. has fundamental disagreements, and with which it does not share sufficient trust to warrant generating the vulnerabilities that are inherent in shared processes. Pursuing deep integration with allied nations will facilitate economic recovery from the COVID-19 pandemic and create a safer world where such a crisis can be addressed in a more coordinated fashion.

Creating a More Effective Healthcare System

The U.S. healthcare system faces several interwoven challenges. The current COVID-19 pandemic is focusing attention on the importance of a resilient and efficient healthcare system for maintaining a strong and vibrant economy. This section discusses several of these challenges and potential reforms that would increase the efficiency of the American healthcare system. Increasing transparency in healthcare markets and increasing the supply of healthcare will help individuals access treatment, both for any direct COVID-19 health effect and also for other diseases and injuries.

Rationalizing the Provision of Healthcare Professionals

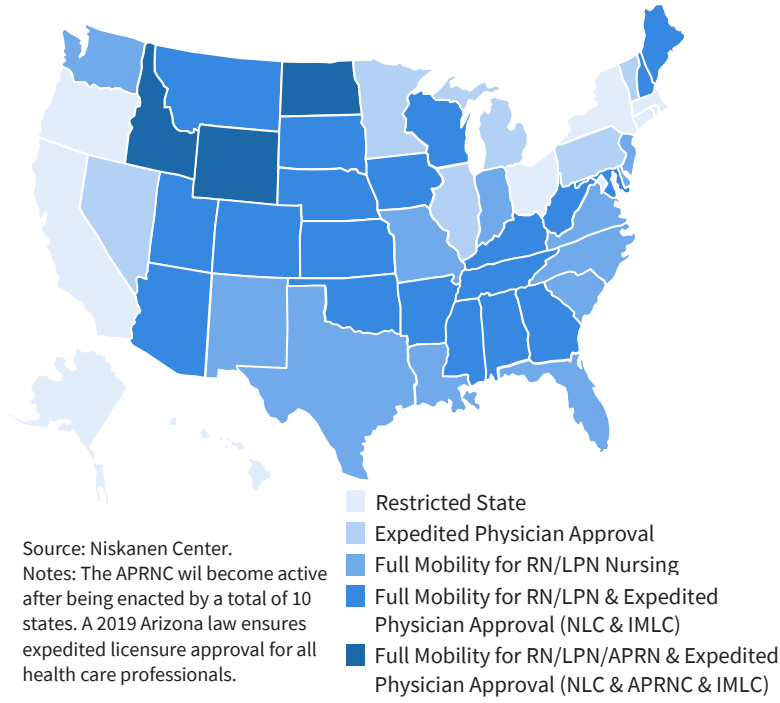
Several elements of the current healthcare market structure impose large distortions on the mobility and training of healthcare professionals. These distortions limit the supply of medical practitioners, especially to underserved rural and low-income populations, artificially increasing medical costs. Alleviating these distortions could generate gains for many Americans.

Medical professionals currently face large hurdles to labor mobility due to restrictive licensing requirements. Because medical licensing is performed at the State level, providers cannot easily move between States as they face both monetary and temporal costs in the form of additional examinations, interviews, fees, and paperwork. This creates a strong distortionary effect on the labor market, which is particularly pronounced in metropolitan areas that cross State lines, where healthcare workers can face major bureaucratic and monetary barriers to taking a job only a few miles away. Such regulatory burdens on employment are associated with lower levels of job-switching, which may decrease upward economic mobility, result in higher rates of unemployment, and ultimately lead to higher prices for consumers.

Efforts are being made to limit the distortionary effects of these regulations within the health sector through interstate licensure compacts. These compacts aim to either provide portability or streamline the acquisition of licensure in other signatory states. However, the effectiveness of such plans is limited by incomplete adoption across states. Figure 11-9 demonstrates the patchwork nature of three of the largest licensing compacts for healthcare providers: the Nurse Licensure Compact (NLC), the Advanced Practice Nurse Compact (APRNC), and the Interstate Medical Licensure Compact (IMLC). The IMLC is further limited because it provides only a streamlined process for physicians to apply for licensure in other states, which decreases some of the bureaucratic obstacles but retains the negative effect of licensure fees on provider mobility. Further complicating the regulatory landscape, there are similar compacts for other healthcare professions, including social workers, mental health professionals, physical and occupational therapists, pharmacists, and dentists.

Efforts to combat the inefficiencies of individual state licensing have been ongoing for decades. When the Federal Government has taken targeted action to remove barriers, it has been successful. The Department of Veterans Affairs (VA) allows licensed physicians to practice in any state to increase the quality and decrease the cost of care, and the Health Resources and Services Administration award grants to State-licensing boards to encourage cooperation, which has resulted in the landscape of interstate compacts that can somewhat ameliorate the issue. More recently, the Centers for Medicare & Medicaid Services (CMS) has taken deregulatory actions spurred by the COVID-19 pandemic that allow licensed providers to care for Medicare patients across

Figure 11-9. The Free Movement of Health Care Labor, 2020



Source: Niskanen Center.
Notes: The APRNC wil become active after being enacted by a total of 10 states. A 2019 Arizona law ensures expedited licensure approval for all health care professionals.

State boundaries to facilitate increased care in hotspot areas and enable a nationwide expansion of telemedicine. The Federal Government may be able to increase the availability of care and decrease the cost of healthcare by playing a coordinating role. Creating incentives for States to either adopt stronger portability of licensure between States or encourage the usage of a Federal licensure system modeled on the approach of the VA are strong steps toward increasing access to care and curbing rising medical prices.

Other supply-side problems include the limited number of medical schools and accredited residency slots for medical school graduates. Of 53,030 medical school applicants, only 22,239 (42 percent) matriculated into a medical school in 2020. Though U.S. medical school enrollment has increased by 31 percent between 2002 and 2018, residency training positions have expanded at a rate of just 1 percent a year.

Reducing the barriers to entry for aspiring doctors and improving the educational process for individuals pursuing a medical profession would ensure that the United States has superior healthcare provision in the years to come. There would be positive feedback effects for patients from adding more doctors in historically underserved areas, because it would enable a lighter burden to be placed on each doctor, reducing burnout and encouraging more

individuals to join the medical field as doctors, nurses, and other healthcare professionals. According to the Agency for Healthcare Research and Quality (2017), in recent years the rising prevalence of burnout among clinicians (over 50 percent in some studies) has led to concerns on negative effects to access care, patient safety, and care quality. Doctors suffering from burnout are more likely to leave their practice, which reduces patients' access to care. Burnout can also threaten patient safety and care quality when depersonalization leads to poor interactions with patients and when affected physicians suffer from impaired attention, memory, and executive function.

To address concerns that funding for graduate medical education (GME) is poorly allocated, this Administration has proposed, since fiscal year 2019, to consolidate all GME spending in the Medicare, Medicaid, and the Children's Hospital GME Payment Program into a new mandatory, capped Federal grant program. The distribution of funding to hospitals through this new grant program would depend on the proportion of residents training in priority specialties as well as other criteria identified by the Secretary of Health and Human Services. Such an improvement in the distribution of GME funds would serve to achieve a better distribution of healthcare specialties, address shortages in healthcare professionals nationally and especially in medically underserved communities, and incentivize better training of healthcare professionals.

Balance Billing

When a patient sees an out-of-network provider, they may be liable for the difference between what the provider charges and the amount their insurer would have paid an in-network provider. This difference, known as the "balance billed" amount, is owed in addition to any other out-of-pocket amounts such as deductibles and copayments. In some cases, patients actively choose to pay this additional amount in order to seek care from an out-of-network provider. When a consumer lacks key information or choice in what they are purchasing, such as when a patient unknowingly receives care from an out-of-network provider or when a patient does not have the ability to select an in-network provider, there is a market failure. This situation can arise even when a patient receives care at an in-network hospital, because different providers within a given hospital independently make decisions on which types of insurance to accept. Adopting network matching at the Federal level would require any provider that takes care of patients at a hospital to bill as in-network any patient who the hospital also considers to be in-network.

The Trump Administration has taken direct actions to address the issue of surprise billing. In June 2019, Executive Order 13877 directed agencies to ensure that patients have access to meaningful price and quality information before the delivery of care. Beginning in 2021, hospitals will be required to publish their real price for every service, and to publicly display—in a consumer-friendly, easy-to-understand format—the prices of at least 300

different common services that are able to be purchased in advance. In April 2020, the Administration began requiring providers to certify, as a condition for receiving supplemental COVID-19 funding, that they would not seek to collect out-of-pocket expenses from a patient for treatment related to COVID-19 in an amount greater than what the patient would have otherwise been required to pay an in-network provider. In May 2020, the Department of Health and Human Services released the Health Quality Roadmap to empower patients to make fully informed decisions about their healthcare by facilitating the availability of appropriate and meaningful price and quality information.

Several States have also taken action on balance billing, though many resort to price-setting or arbitration, which can alter the negotiating power of hospitals, insurers, and physicians. For example, California has attempted to limit patients' cost sharing for all nonemergency physician services at in-network hospitals from out-of-network physicians at the greater of the insurer's local average contracted rate or 125 percent of the Medicare rate for the given service. As a result, physicians have criticized the law for giving insurers the upper hand in negotiations and for decreasing patients' access to care. In addition, New York's arbitration system has been criticized for granting excessive bargaining power to providers in their rate negotiations with insurers, resulting in higher reimbursements and premiums. By contrast, an analysis by the Congressional Budget Office (CBO) found that network matching could actually lower costs by reducing the ability of healthcare providers to negotiate higher rates from insurers, avoiding New York and California's pitfalls by harnessing market forces to address the balance billing issue.

The CEA finds that protecting patients from balance billing could provide an economic benefit of $2.8 billion a year by creating greater predictability in healthcare expenses. A total of 11.1 percent of privately insured patients in a given year will seek emergency room care, and 6.2 percent will be admitted to the hospital. Data from a recent study indicates that, of these patients, about 42 percent can expect to receive a surprise balance bill with an average amount of $628 for emergency room care and $2,040 for inpatient admissions. The elimination of balance billing lowers uncertainty and increases transparency. Based on the statistics above, the actuarial value of this reduction in risk is $82.40 per patient a year, and patients value the elimination of uncertainty at 25 percent of this amount.[7] Thus, 25 percent of $82.40 per patient multiplied by the 137 million adults covered by private insurance yields an aggregate annual economic benefit of $2.8 billion from eliminating balance billing.

[7] This is calculated from the statistic that households willingly pay $1.25 in health insurance premiums for each $1 in average payouts.

Medicare Inpatient Rates

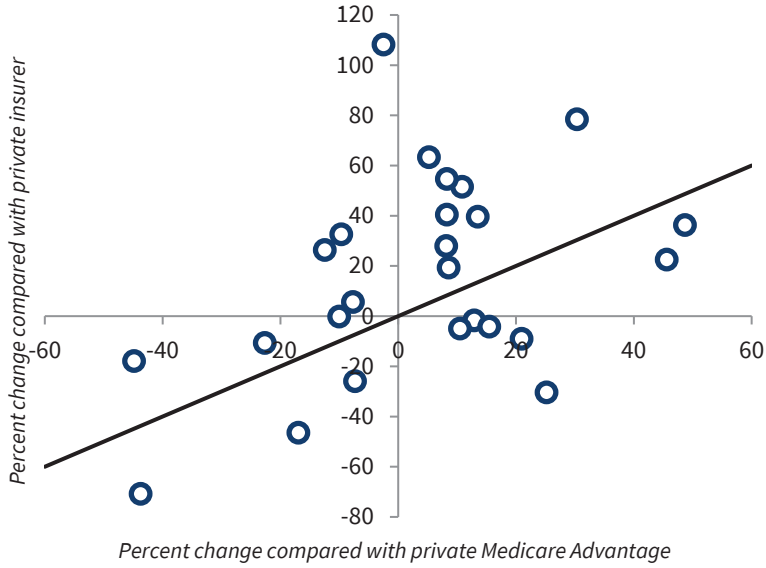
According to data on national health expenditures from CMS, Medicare hospital payment is currently one of the most regulated price mechanisms in the U.S. health economy, accounting for about $300 billion in government expenditures in 2019 alone. A recent proposal for a new Federal rule seeks to better calibrate the price mechanism to market prices. The existing pricing systems rely on estimates of growth rates of costs based on assumptions that often have little bearing on market prices outside Medicare Fee for Service. One proposed solution is to rely on data from Medicare Advantage pricing, which is partly based on private sector negotiations. However, there is a concern that Medicare Advantage pricing is closely linked to Medicare Fee for Service pricing. If the private sector negotiations are using prices set by the government as an anchor, then the price discovery is curtailed and the usefulness of the negotiated price is limited.

The CEA completed an analysis to compare private and government prices for the top 25 inpatient Diagnosis Related Groups (DRGs), based on the inpatient payment system used for Medicare fee for service (FFS) payment. A DRG is a patient classification system that standardizes prospective payment to hospitals and encourages cost containment initiatives. In general, a DRG payment covers all charges associated with an inpatient stay from the time of admission to discharge. Specifically, Medicare FFS average payments are compared with Medicare Advantage and Private Insurer data from 2015 using a publicly available data source (Parente 2018). Figure 11-10 displays the percent change in the relative price of Medicare FFS when compared with Medicare Advantage and Private Insurers. The relationship between Medicare FFS and private insurance payments and Medicare Advantage does not support using Medicare Advantage as a close substitute for competitive market pricing (i.e., prices set by private insurers). If they were close substitutes, the observations would cluster narrowly around the 45-degree line shown in the figure. This analysis supports furthering the development of the proposed Federal rule to integrate pricing that more closely matches competitive market prices.

Future policy analyses will be able to take advantage of the new all-payer insurer synthetic database created by the price transparency Executive Order 138777 of June 2019. This database could easily confirm and extend this initial analysis and provide strong evidence of the need to revisit the economic price control mechanism used to set Medicare FFS inpatient payment prices.

The health reforms discussed above would be complemented by a continuation of the health information technology reforms that took place this year (see box 11-2). Better storage and sharing of information about health care will increase transparency, reduce cost, and improve the experience of patients.

Figure 11-10. Percent Change in Medicare FFS DRG Payments Compared with Medicare Advantage and Private Insurers, Top 25 Diagnosis-Related Groups, 2015



Sources: SynUSA 2018; CEA calculations.

Building a Dynamic Economy through Infrastructure Improvement

The infrastructure of the United States is made up of physical elements like roads and ports, but also of less obvious components, like digital infrastructure. The COVID-19 pandemic highlighted the importance of high-quality infrastructure in responding to the crisis, as well as increasing the productivity of the American workforce. Locally planned and led infrastructure projects are desirable because of their ability to be responsive to the specific needs of local communities. However, when projects are too large for local financing, require coordination between multiple States, or are instrumental in achieving national goals, the Federal Government has a role to play. This section details the infrastructure investment channels in which the Federal Government's intervention would be beneficial.

The Federal Government's Role in Infrastructure Investment

Federal involvement in infrastructure investment can have a beneficial effect as a countervailing force in local politics. Local politicians often face strong incentives to prefer new projects over maintaining existing ones, and they may

Box 11-2. Continuing the Historic Modernization of Health Information Technology Begun during COVID-19

The decentralized nature of the U.S. healthcare system can create challenges for coordination in a national public health crisis. In March 2020, it became evident that more precise health data were needed to coordinate the COVID-19 response. Given the number of agencies needing these data, the Federal Government embarked on an ambitious plan to modernize the national health information technology (IT) infrastructure to facilitate the seamless, secure reporting of critical and sensitive health data from healthcare organizations and IT vendors. This effort led to the creation of the Federal data platform named HHS Protect that has allowed Federal agencies, along with State and local partners, to coordinate using shared data. This platform streamlines processes and connections to ensure data quality while eliminating time-intensive duplicative IT work.

HHS Protect contains, within a single portal, over 3.5 billion data elements across 200 different data sets. This information is available in real time to drive the Federal and State government responses to the COVID-19 pandemic. Having access to this real-time data allows the government to more accurately pinpoint patients in need, to identify regions and healthcare systems that are under strain, and to allocate treatments and resources more rapidly and efficiently. Having granular, hospital-level data in near real time has been critical for developing an understanding of the severity of the disease, the status of capacity and staffing constraints, and the supply and demand of personal protective equipment. The HHS Protect platform has also played a central role in the COVID-19 vaccine trials. Specifically, using data from claims and other sources, it allows analysts to algorithmically identify at-risk populations and locations on the verge of a COVID-19-surge to target data gathering so as to quickly and efficiently meet the necessary benchmarks for trial validity.

No such infrastructure existed before this massive data mobilization and IT modernization. In contrast to the prepandemic status quo, currently 99 percent of hospitals report data consistently and 94 percent report every single day. Similarly, automated connections now exist for case and laboratory reporting from State and local jurisdictions. In addition to the data and platform, the Federal Government has built out new and existing teams of experienced, well-trained analysts from HHS, the CDC, the U.S. Digital Service, and other agencies, as well as leveraging the expertise of trusted external partners to ensure that these data are available in an actionable, interpretable form to inform decisionmaking.

This groundbreaking effort will also prove useful for future pandemics and other health crises. For example, it can facilitate more in-depth exploration of the recent declines in American life expectancy and can target resources to combat opioid overdoses, suicides, and heart disease. One important innovation that has emerged is the creation of Health Information

Exchanges in multiple States that link real-time electronic health records data to track intensive care unit surge capacity for COVID-19 patients. This platform could combine data from public and private insurance transactions to greatly enhance the planning, execution, and response to future pandemics. As mentioned above, one policy proposal advocates the allocation of GME funding to areas with greater medical need. This platform could be adapted to identify those areas and ensure that they receive the healthcare professionals needed to provide a high quality of life for residents. The innovations developed during the fight against the COVID-19 pandemic will continue to serve Americans in the years to come.

also avoid imposing user fees that could be unpopular among frequent users (Kahn and Levinson 2011; Glaeser and Ponzetto 2017).

Over a short time horizon, maintenance is often a more effective use of funds than new capital investment. Keeping existing infrastructure in good repair is likely to have a larger economic effect than building new infrastructure, given that existing infrastructure is already woven into the fabric of high-output economic environments and generates a higher marginal return than new construction. Nadiri and Mamuneas (1996) find no evidence of overinvestment or underinvestment in highway capital by the end of the 1980s, indicating that maintaining the existing stock would ensure the correct amount of infrastructure intensity after that point, with new infrastructure only needing to be built at a rate commensurate with the growth of the population and economic needs. Every $1 spent to keep a road in good condition prevents $7 in costs when it has fallen into a poor condition (AASHTO and TRIP 2009). Given that estimated output multipliers for transfer payments to State and local governments for infrastructure range between 0.4 and 2.2, focusing funding on repair could have a positive effect on GDP (CBO 2015).

According to the CBO (2018), in 2017 the share of Federal spending on maintenance was just 27 percent of total Federal spending on transportation and water infrastructure, and the real dollar amount spent has remained flat since the 1980s, even as the stock of infrastructure has increased. State and local spending have not increased their growth rates to compensate. Currently, the Federal Government primarily funds road infrastructure through the Highway Trust Fund. But this fund is now facing insolvency, with a projected deficit of over $6 billion as soon as 2022. Zhao, Fonseca-Sarmiento, and Tan (2019) estimate that the current cost of deferred repairs might be as large as $873 billion, or 4.2 percent of GDP. Nongovernmental estimates find that $110 billion to $150 billion per year would be needed to cover the infrastructure investment gap through 2025 (McBride and Moss 2020; American Society of Civil Engineers 2016).

Simple and transparent metrics for discretionary grants would allow fulfillment of projects that have difficulty getting local funding because of their size or cross-jurisdictional nature. This would include projects across multiple States and that fulfill significant national goals. The process could expand upon the existing TIGER/BUILD model, which entails federally funded discretionary grants that attempt to achieve national objectives, but could improve on them by emphasizing numerical metrics for economic, safety, and environmental impact by using cost-benefit analysis that follows a consistent and clear evaluation process. The Federal Government can provide technical assistance to avoid biasing the process against smaller applicants and ensure adherence to best practices (U.S. Department of Transportation 2020).

As discussed in chapter 8 of this *Report*, public-private partnerships (PPPs) can enable provision of high value infrastructure at a low cost to the government. Well-designed PPPs are structured to ensure that the private partner has strong performance incentives at the same time that the public interest is protected (Istrate and Puentes 2011). For example, if the same entity builds and manages the project, this can align incentives to minimize operational costs in the design and implementation of the project. Best practices for PPPs include robust competition between private vendors to win the partnership and contractual terms that optimally divide the risk burden between the vendor and the government. If the private entity is allowed to earn a return to the investment through user fees, the partnership contract must carefully consider what, if any, role the public retains in terms of approving or setting the fees. If the infrastructure will be a natural monopoly—as a road on public land with few competing roads nearby—this issue is particularly important to address.

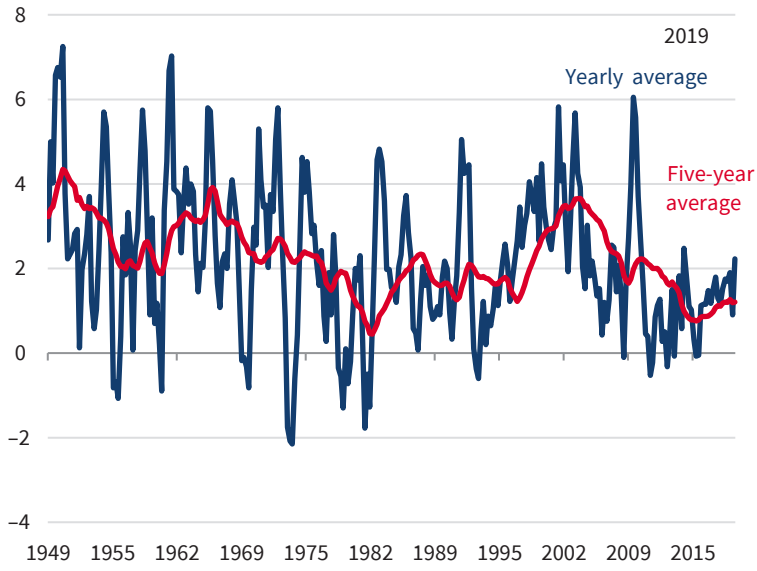
Finally, efforts can be made to avoid deterring private financing of infrastructure investment funded by user fees. The cost of capital of PPPs relative to public risk assumption and funding is high (Arezki et al. 2017). As detailed by Makovsek (2018), the government can take several actions to offset the risk and uncertainty private investors face when contemplating publically beneficial investment. Such hurdles include failure of environmental review, change in political situation, or other regulatory hurdles that introduce additional risk to the process of providing public infrastructure. In addition, the interest on State and local government debt instruments is exempted from taxation and government-owned entities providing infrastructure services are given preferential tax treatment. Offering guarantees against the unavoidable risk of infrastructure provision and equalizing taxation treatment could increase private investment.

Infrastructure and Productivity

Productivity, a measure of the ratio of outputs to inputs, is the result of a complex interaction between infrastructure, education, research, investment, and

Figure 11-11. U.S. Productivity, 1949–2019

Percent change at annual rate



Sources: FRED (2020); CEA calculations.

implementation. Especially important for productivity growth and innovation are public infrastructure investments, because the choice of where and what to build has tremendous implications for the enterprises that rely on them. If productivity increases, an economy can create more with less. This leads to a higher-income economy with more leisure time and less environmental degradation for the same level of economic output.

For decades, there has been concern within the United States regarding a decline in labor productivity growth (Munnell 1990). As shown in figure 11-11, the late 1990s saw a rise in productivity growth as industry implemented new information technologies; but since the Great Recession, productivity growth has remained depressed. This decline in productivity growth does not appear to be due to mismeasurement (Byrne, Fernald, and Reinsdorf 2016; Syverson 2016). Research productivity has been found to be declining as a result of requiring more resources to advance the frontiers of scientific knowledge in existing fields (Bloom and others 2020). New fields such as artificial intelligence, quantum computing, and autonomous vehicles can reverse this trend when their benefits are diffused to the broader economy. However, there is a concern that dynamism is falling for cutting-edge fields. Astebro, Braguinsky, and Ding (2020) find that start-up formation by doctorate recipients in science and engineering has fallen, partly due to increased complexity and administrative costs.

Box 11-3. 5G Infrastructure

The United States has begun the transition to 5G technology for wireless communications. Far from a minor improvement on 4G, the next generation of wireless communications features vastly expanded data capacity and speed unleashing new opportunities for innovation and economic growth. As a simple example, movies will be downloaded over the Internet at speeds more than 10 times faster than is possible today. However, the technology may also enable transformative applications such as self-driving cars, remote surgery, and increasingly intelligent manufacturing. In a 2018 report, the Federal Communications Commission (FCC) describes the country as "at the brink of another technological revolution," in which 5G networks "will make possible once-unimaginable advances" (FCC 2018). The FCC further reports that the wireless industry is expected to invest more than $275 billion over 10 years to deploy infrastructure for 5G, that 3 million jobs will be created, and that the boost to GDP will be half a trillion dollars.

The integration of digital technologies with artificial intelligence and machine learning has been called the fourth industrial revolution (Schwab 2016). This integration will be enabled by 5G technology. Over time, 5G is expected to enable transformative applications through two novel facilities: massive, machine type communications (mMTC); and ultrareliable, low-latency communications (URLCC). The abbreviation mMTC refers to the capacity of the 5G infrastructure to support a very large number of devices in a network of sensors, known as the Internet of Things. For example, "smart cities" may deploy dense monitoring systems that reduce the cost of public services from city lighting to garbage collection by allowing for more efficient provision. URLLC refers to 5G performance standards that are designed to support "mission critical" communications. URLLC provides for data delivery at latencies as low as 1 millisecond with 99.9999 percent reliability. Use cases include automated energy distribution in a factory or energy grid, intelligent transportation systems, and bioelectronic medicine (Rysavy Research and 5G Americans 2020).

Although private providers—such as ATT, Verizon, and T-Mobile—are investing in and building out the 5G infrastructure, the Federal Government is playing a key role in organizing auctions for commercial licenses to the electromagnetic spectrum. This is a complex undertaking because 5G is designed to use different parts of the electromagnetic spectrum in combination. 5G providers will use high-band spectrum (frequencies above 24 gigahertz) to transmit vast amounts of data at high speeds with low latency. However, high-band spectrum does not travel far and cannot, for example, penetrate walls. Providers will use mid-band spectrum (frequencies between 1 and 6 gigahertz) to augment the high band spectrum for broader coverage at somewhat reduced speeds. Finally, providers will use low-band spectrum (frequencies below 1 gigahertz) to efficiently transmit data across very broad geographic areas at lower speeds.

The FCC has made significant progress in implementing its strategy named Facilitate America's Superiority in 5G Technology. In 2019 and 2020, the FCC ran three auctions (auctions 101, 102, and 103) that released almost 5 gigahertz of high-band spectrum to the market (FCC 2020a, 2020b, n.d.). These auctions generated about $10.3 billion in gross bids for just over 20,000 licenses. Winning bidders included ATT, Verizon, T-Mobile, and US Cellular, along with smaller wireless providers. On August 25, 2020, the FCC concluded its first auction (auction 105) of mid-band spectrum for 5G, releasing about 70 megahertz of spectrum in the range of 3.55 to 3.65 gigahertz. The auction generated $4.6 billion in gross bids for 20,625 licenses. Winning bidders included Verizon, the Dish Network, and several large cable companies. The FCC is currently organizing a spectrum auction to repurpose 280 megahertz of mid-band spectrum for use with 5G. The spectrum, which is in the range of 3.7 to 4.2 gigahertz, is currently used by fixed satellite service companies, primarily to deliver audio and video content to cable systems. As part of the auction process, the satellite companies will vacate the spectrum, allowing 5G providers to use it instead.

Despite the disruptions caused by the COVID-19 pandemic, the FCC has pursued an expedited schedule for the auction, finalizing bidding procedures in August, with bidding under way as of December 2020. The FCC is also working on targeted changes to facilitate 5G usage of low-band spectrum. Finally, the Department of Defense has contributed to the government's 5G efforts; in August, it announced that it will release 100 megahertz of mid-band spectrum in the range of 3.45 to 3.55 gigahertz, which was hitherto reserved for military use, to be auctioned in late 2021 with commercial use starting in 2022.

To the extent that the Federal Government can support the infrastructure necessary to ensure that these emerging fields can flourish, this will enhance productivity. However, government support for business structures that are no longer viable will decrease the rate of productivity by preventing "creative destruction," a process whereby innovative firms enter the market and stagnant firms exit (Acemoglu et al. 2018). Consequently, government operates optimally not when it invests in specific enterprises, favoring certain companies over others, but when it provides rules and transparency that allow companies to compete on an even playing field (see box 11-3 for a discussion of how the government allocates spectrum, allowing companies to fairly compete). Judicious government investments in infrastructure can fulfill this goal.

The Costs of Building Infrastructure

Foerster and others (2019) find that the annual rate of GDP growth has fallen more than 2 percentage points since 1950. As they argue, part of the reason for this is a decline in the trend in total factor productivity of the construction

sector of 0.15 percentage point. Although this decline in productivity was reversed after 1999, the trend value of construction sector labor fell by 0.07 percentage point between 1999 and 2016. The cost of building highway infrastructure in the United States has risen 94 percent between 2003 and 2020, according to the National Highway Cost Construction Index. This increase began long before this period, having increased threefold from the 1960s to the 1980s (Brooks and Liscow 2019); these increases are partly driven by increased regulation (see box 11-4).

Labor regulations can also increase the overall cost of building infrastructure. For example, the 1931 Davis-Bacon Act requires the Federal Government to pay wages to construction workers that are no less than what they would earn working on similar projects in that area, known as "locally prevailing wages." This regulation can artificially increase labor costs, which can result in a nonoptimal allocation of capital. Although this was a Great Depression–era attempt to raise wages, Davis-Bacon also increases the burden of regulation, which discriminates against small firms. Reform could ensure that such regulations are achieving an appropriate balance between competing policy priorities.

In addition to the National Environmental Act in 1970, other environmentally focused legislation has increased the difficulty of developing on public lands, such as the 1973 Endangered Species Act and the 1972 Clean Water Act. Citizen organizations and environmental nonprofits have also increased since the 1970s, often opposing some development projects. Environmental impact reviews can delay projects or force developers to take expensive routes to fulfill the project, increasing overall costs (Brooks and Liscow 2019). While ensuring that new investment does not "steal" from the public by despoiling public goods is crucial, a rapid and transparent approval process could ensure that the capital is not tied up, but, if rejected, can be repurposed for alternate, more environmentally friendly projects.

Another factor in rising infrastructure costs is a lack of transparency and competitive processes. This limits public oversight and leads to wasteful and corrupt spending, which reduces the return on investment. For example, the Long Island Rail Road project has paid $3.5 billion for each mile of track, a rate seven times the world average. Schwartz and others (2020) estimate that 15 percent of advanced economy infrastructure investment is lost to waste.

The Critical Importance of User Fees

Certain goods have characteristics that are not amenable to pricing, and therefore must be financed by general revenues. Clean air, for example, cannot be priced for use because there is no practical way to exclude those who do not pay from breathing it. Moreover, there is no cost from additional consumption, as one's breathing it does not reduce another's ability to do so by a notable amount. Economists refer to such goods as "nonexcludable and nonrivalrous."

Box 11-4. Reforming the NEPA Process

The National Environmental Policy Act (NEPA), which was signed into law in 1970, requires Federal agencies to assess the environmental effects of their proposed actions and prepare an environmental impact statement (EIS) for actions that will significantly affect the quality of the human environment. For such actions, agencies must consider ways to minimize significant effects through reasonable alternatives or mitigation. The lead Federal agency must also solicit and consider public comments on potential environmental effects and alternatives. If it is completed, the entire EIS process takes about four and half years to complete on average, and averages over 600 pages in length.

The Council on Environmental Quality (CEQ) finalized reforms in 2020 to modernize its NEPA regulations and reduce delays in the environmental review and decisionmaking process. Changes include establishing a presumptive two-year time limit for the process, clarifying definitions and procedural requirements, codifying efficient agency practices to reduce unnecessary paperwork and delays, and updating the regulations to reflect current technologies. CEQ's updated NEPA regulations also include aspects of the Administration's One Federal Decision policy, established by Executive Order 13807, which addresses major infrastructure projects that require multiple agencies to approve permits. The One Federal Decision Executive Order, which is codified in the updated regulations, requires agencies issuing multiple permits for a project to develop a joint permitting schedule, develop one EIS, and then issue a joint record of decision for the project.

By reducing the time for completing NEPA reviews from 4 to 2 years, the CEA estimates that these policies will lead to $739 billion in benefits from infrastructure projects over the next 10 years. The benefits come from earlier completion and lower costs of financing projects, leading to improved infrastructure and amenities. The CEA bases the estimate on the $2.35 trillion in roads, airports, waterways, pipelines, and utility investments that are needed to modernize infrastructure in the next 10 years (American Society of Civil Engineers 2016). Though it is not clear that all these projects would require review under NEPA or preparation of an EIS, the CEA estimate is conservative in assuming that delays under the current NEPA permitting process are only 4 years rather than 4.5 years. Research by the CEA has shown that public infrastructure investments provide a marginal product to society at a rate of 12.9 percent a year.

Accordingly, the value of moving the benefits of $2.35 trillion in investments forward two years is $479 billion. An additional benefit of the reduced delay in the permitting process is that developers of this infrastructure do not need to hold loans for as many years, incurring interest on the principal loaned to undertake the project. The estimated reduction in financing costs is $260 billion for loans made on a principal of $2.35 trillion, or the difference in interest payments on a 4-year versus a 2-year loan. If the decision is made

to not approve a proposed project, those resources can more quickly be reallocated to a more beneficial use.

The benefits from reform could be even larger than we have estimated because some permits are not just delayed by some years but instead are never issued at all, because the company requesting them moves into financial hardship while awaiting a response. Bear Lodge mine in Wyoming is one example. Rare Element Resources attempted to open a mine for rare earth minerals, which have been designated as a critical mineral, on U.S. Forest Service (USFS) land. The company submitted its plan of operations to the USFS in November 2012. In September 2013, the USFS accepted the initial plan and started the process of finding a contractor to undertake the EIS. In January 2016, Rare Element Resources suspended permitting efforts because the company had run out of money waiting for the project to be approved.

With so much attention being paid to reshoring critical industries (see chapter 9), simply capitalizing domestic natural resources responsibly would ensure access to many key commodities, improving the U.S. trade balance, mitigating U.S. reliance on vulnerable commodity supply chains, and ensuring that resources are extracted and used in a sustainable way. This would allow for more sustainable trading partnerships without imposing distortionary trade barriers that disrupt supply chains and impose costs on American consumers. It would also allow commodities to be produced in a more sustainable way than is often done in other countries.

However, when it is possible to exclude users and when additional consumption imposes costs on others, setting a price on a good can efficiently internalize the costs associated with its use. Roads, canals, and bridges are examples of goods that are both excludable and rivalrous, and therefore would benefit from pricing plans.

As detailed in the 2018 *Economic Report of the President*, it is optimal when the users of a public good are those who pay for it. This prevents overconsumption of public goods by ensuring that the costs of using them are borne by the users, and provides a source of funding for the maintenance and upkeep of these goods. Without a clear and sustainable funding stream, infrastructure can become a burden on future generations.

Although Federal gasoline taxes partly fund Federal infrastructure projects, and so partly align the users with the costs of use, most of these projects are financed through general revenues. Because drivers are not bearing the costs of driving on public roads and bridges, they do not have any incentive to economize their use of them, leading to congestion and high maintenance costs. User fees, such as tolls or fees based on vehicle miles traveled (with both scaled to the damage the use does to the infrastructure), reduce congestion and help provide a stable source of funding for infrastructure. Expanding

their use, and other forms of congestion pricing, would yield further economic benefits.

The Federal Government has implemented several kinds of user fees over many decades to finance public infrastructure, although these have not adequately addressed the problems of depreciation and congestion. The Federal Government passed a gasoline tax in 1931, initially set at 3 cents a gallon, which then was roughly 10 percent of the price of gasoline. The Federal Highway Act and Highway Revenue Act of 1956 attached user fees explicitly to the Interstate Highway System. These included taxes on gasoline, diesel fuel, tires, and heavy vehicle use, though the vast majority of the Highway Trust Fund revenues depend on fuel taxes. However, these taxes are not pegged to inflation, and the Federal gasoline tax in particular has not been raised since October 1993, although the general price level (price index for GDP) has increased by a multiple of 1.65. The gasoline tax is now 18.4 cents a gallon, which was 17 percent of the cost of gasoline in 1993, and is currently roughly half that.

In addition, higher-mileage vehicles, including electric vehicles, render the gasoline tax an incomplete and flawed user fee. Higher-mileage vehicles depreciate physical assets, such as roads and bridges, as much as lower-mileage vehicles of equivalent mass, but pay less per mile when fuel taxes are utilized as a user fee. Though a gasoline tax may generate ancillary benefits by reducing pollution and greenhouse gas emissions, dependence on this tax to fund the maintenance of Federal roads and bridges is inadvisable.

Alternatively, Federal, State, and local governments could consider increasing their use of toll roads to finance public infrastructure and reduce congestion. These toll roads could vary their charges based on the vehicle type. One example of these is high-occupancy toll (HOT lanes). HOT lanes charge low occupancy vehicles a fee, while buses and emergency vehicles can use the lanes free of change. Currently, there are 10 HOT lanes operating across 8 States. Some academics and government officials have advocated converting high-occupancy vehicle (HOV) lanes, which restrict use to only qualifying vehicles, to HOT lanes to increase usage and reduce congestion in other lanes.

Research on the effectiveness of HOT lanes has been mixed, however. If the toll is set too low, a HOT lane may actually reduce the incentive to carpool and therefore generate more congestion, given that single occupants may be content to simply pay the toll to access the lane (Burris et al. 2014; Konishi and Mun 2010). In HOV lanes, these single-occupant vehicles would typically have been excluded. However, toll prices that are set optimally can reduce congestion and finance the maintenance of the public asset.

Governments could also consider varying toll prices based on the time of day. Variable tolls, as opposed to flat-rate tolls, charge drivers more during peak travel hours to reduce congestion. In Fort Myers, Florida, a 50 percent discount on the toll was offered on the Midpoint and Cape Coral bridges for a

short period before and after the rush hours. Survey data revealed that, among those eligible for the discount, there was an increase in traffic of as much as 20 percent during the discount period before the morning rush hour, with corresponding drops in the rush hour itself.

A handful of cities and countries have embraced "cordon pricing," which charges drivers for entering certain areas. Instead of traditional tollbooths, vehicles are charged through transponders that are scanned by overhead antennas to detect entry. Currently, 70 to 80 percent of toll fees are collected this way in the United States. In Germany, highway authorities use Global Positioning System technology to administer truck tolls on its autobahns. An in-vehicle device records all the charges based on the location of the vehicle, and then the owner of the vehicle uploads the charge to a processing center. The costs of such systems are as much as $500 per vehicle in Germany, but their presence reduces the need for roadside equipment and labor for toll collection.

Cordon pricing has had considerable effects on congestion. Table 11-4 details the cities and countries that have embraced this form of congestion pricing, and summarizes the economic effects. In the year after implementation, traffic congestion fell in London by 30 percent. Bus service increased by 23 percent due to improved reliability and reduced travel times. Of the thousands of car trips that no longer traveled into the cordon zone, 50 percent shifted to public transit, 25 percent were diverted to other parts outside the cordon area, and the remainder shifted to carpooling, walking, biking, and traveling outside peak hours. These results have been sustained over time, despite nearly 20 percent population growth in London since 2000. The city has also achieved concomitant public health benefits, as carbon dioxide emissions declined 16 percent from 2002 to 2003. In Stockholm, traffic in the cordon area has fallen 20 percent and carbon dioxide emissions have fallen 14 percent.

Singapore's road pricing plan reduced congestion by 20 percent from 1975 to 1998, and generated revenues that were nearly nine times the costs of investment. When Singapore switched to its current electronic road pricing system in 1998, this reduced congestion even further, despite strong population growth since then. Congestion in the inner city has fallen by 24 percent, while average speeds have increased by more than 30 percent, and bus and train usage have increased by 15 percent. Revenues have been used to support public transit; street safety; and bus, rail, and bicycle infrastructure projects. However, Singapore also introduced stringent measures to restrict car ownership, requiring the purchase of a certificate that can cost as much as $37,000 that must be recertified every 10 years. Since 2018, Singapore has required new drivers to bid on existing certificates, as it will not allow any increase in car ownership.

Although most economists agree that congestion pricing would make the average person better off, many States and localities are reluctant to adopt such pricing mechanisms because of the system's perceived inequities. As of

Table 11-4. Congestion Pricing Initiatives Worldwide

City	Year Implemented	Policies	Impact
London	2003	8 square miles inside the city's Inner Ring Road Traffic cameras capture license plate numbers upon entry/exit; pay within next day Flat daily fee from 7 a.m.–6 p.m., Monday–Friday	Annual operating cost/net revenue: £130 million / £137 million 30 percent reduction in traffic congestion Bus ridership reached 50-year high in 2011
Stockholm	2006	Automatic tolling at main entry points to inner city Fees levied between 6:30 a.m. and 6:30 p.m. Monday–Friday, varying based on demand	Annual operating cost / net revenue: 100 million krona / 1.3 billion krona Traffic delays decreased 30–50 percent 80 percent resident opposition reversed after successful pilot; citizens voted to keep permanent
Gothenburg, Sweden	2013	Automatic tolling at main entry points to inner city Fees levied between 6:30 a.m. and 6:30 p.m. Monday–Friday, varying based on demand	Traffic declined 12 percent during charged hours Public transit use jumped 24 percent for commuters
Milan	2008	Flat daily charge applies to drivers entering the city between 7:30 a.m. and 7:30 p.m. Residents exempt for first 40 entries, then pay reduced charge Electric and hybrid cars exempt	More than 30 percent reduction in traffic 33 percent drop in black carbon emissions
Singapore	1975	Variable pricing scheme adjusts to congestion levels in real time from 7 a.m.-8 p.m., Monday–Saturday Vehicles equipped with dashboard devices storing fare Car ownership certificates (limited) can cost $50,000	Annual operating cost / net revenue: S$25 million / S$150 million Since 1998, traffic in inner city have dropped 24 percent Greenhouse gas emissions in cordon area reduced 10–15 percent
New York City	2021*	E-ZPass system—already used for bridge and tunnel tolls—charges vehicles entering Manhattan south of 60th Street Tax credits for residents earning less than $60,000 annually In addition to preexisting congestion fees for taxis and rideshares	

Note: New York City congestion pricing plans are still tentative.
Sources: Tri-State Transportation Campaign; European Commission; *New York Times*; Bloomberg CityLab.

Box 11-5. Digital Infrastructure

The COVID-19 crisis has revealed inadequacies in medical information systems, with some officials relying on fax machines to relay critically important health data (Kliff and Sanger-Katz 2020). Box 11-2 above details the digital infrastructure investment made in response to this need. As the American public suffered job losses of unprecedented scope, dated computer software was overwhelmed by skyrocketing State Unemployment Insurance claims.

Government agencies could be better served by modernizing data storage. For example, the Department of Veterans Affairs (VA) began creating an in-house records system amid the advent of personal computing in the 1970s. Though state-of-the-art in its prime, the VA's system continues to draw criticism from lawmakers concerned about maintenance costs and security issues related to commercially tested software alternatives. As currently implemented, despite several modernization attempts and billions of dollars in annual spending, the VA's information technology fails to adequately support its services and protect against security threats. However, a recent change in policy will allow veterans to have more access to private healthcare, which will require the VA to coordinate with other healthcare providers and reinforces the necessity of updating its outdated IT systems (Steinhauer 2019).

Without modernization, critical infrastructure like regional power grids and hospital medical records remain at risk for potentially catastrophic cyberattacks (GAO 2018). In 2017 alone, Federal executive branch civilian agencies reported more than 35,000 security incidents, ranging from email phishing to malicious software installations. The Government Accountability Office finds that legacy systems at the Department of Homeland Security pose 168 "high- or critical-risk" network vulnerabilities (GAO 2019). In many cases, foreign intelligence agencies spearhead such intrusions. As recently as October 2020, the Department of Justice indicted six Russian military officials for disrupting the 2017 French elections and the PyeongChang Winter Olympics, among other attacks (DOJ 2020).

Standardized data storage and streamlined information-sharing processes would foster more efficient interagency collaboration on government-wide initiatives like coronavirus relief. In addition, providing information for public use once it has been scrubbed of identifying characteristics would significantly benefit scientific research. Academics argue that providing direct access to administrative data can further strengthen the position of the United States on the forefront of academic progress (Card et al. 2011).

New digital infrastructure will also be needed in cutting edge sectors such as the autonomous vehicles industry. The Federal Government can ease the entry of new players in such sectors, thereby supporting competition, by supporting infrastructure investment. For the autonomous vehicles industry, this will involve ensuring that localities have the infrastructure in place to support autonomous vehicle technology for passenger cars, long-haul trucking, and short-range drones in a consistent and universal manner. Investing in

unmanned traffic management systems and streamlining regulatory approval for engineers seeking airspace to test their inventions will be a major step toward a future of half-hour package deliveries and decongested roadways. Federal intervention can facilitate the development of robust national-scale systems instead of a State-by-State patchwork.

Altogether, advances in digital infrastructure could generate tremendous economic gains for the United States. The autonomous vehicle industry alone is expected to increase output by $1.2 trillion, or roughly $3,800 per person (Clements and Kockelman 2017). A Virginia Tech study found in a cross-sectional analysis of three large U.S. cities that drone delivery could produce $583 million in total time savings for consumers each year in those cities (Lyon-Hill et al. 2020).

2008, only 1 percent of roads in the United States used some type of congestion pricing beyond traditional tollroads. However, the Federal Government could incentivize State and local governments to adopt such policies by offering to match infrastructure investments if such pricing is adopted, or offer Federal support to help compensate low-income populations that might be adversely affected by congestion pricing.

An additional area in which government and private interests alike could benefit from increased Federal investment is in digital infrastructure. Relevant projects involving improved data gathering, enhanced security, and revolutionized computing efficiency. These public goods will increase the productivity of private industry and the well-being of the American citizenry (box 11-5).

Investing in Port Infrastructure

America's seaports serve as our economy's gateways to the vast maritime network that transports more than 90 percent of global trade tonnage. These 360 American ports facilitate more than 70 percent of America's international trade by weight and nearly 50 percent by value. They are absolutely vital for American prosperity and economic security. However, America's ports now lag far behind the competitiveness and productivity of the world's leading ports. As a result, increased transportation costs place American companies at a significant disadvantage, effectively locking the U.S. economy out of the world's lowest-cost trade routes. Over time, the poor state of the Nation's ports has taken a significant toll on America's position in global trade and manufacturing, and has adversely affected net exports. Because maritime commerce is the dominant global trade mode, competing nations have prioritized enhancements to their seaports to improve the flow of trade. Increasing the efficiency and productivity of ports decreases transportation costs and expands trade opportunities. Capital investment to modernize American ports is long overdue and would yield substantial returns for the Nation's trade and manufacturing

competitiveness by supporting net exports, as high-quality port infrastructure benefits exports more than imports through supply chain interactions.

Container ships spend less time making port in Taiwan (0.46 day), China (0.62 day), Japan (0.35 day), Spain (0.66 day), and Norway (0.33 day) than in the United States, where it takes a full day on average. U.S. ports take longer than the world average in five out of six market segments (UNCTAD 2020). Deep channels, round-the-clock automated cargo handling, and constant competitive improvement enable nearly frictionless trade. Ports with these features serve, allowing tremendous economies of scale and complex supply chains to flourish. Low transportation costs are pivotal for the production of goods that require the movement of many players. For large parts and bulk goods—such as those required in aerospace, automotive, and industrial production—waterborne commerce often offers a transportation mode for intermediate inputs.

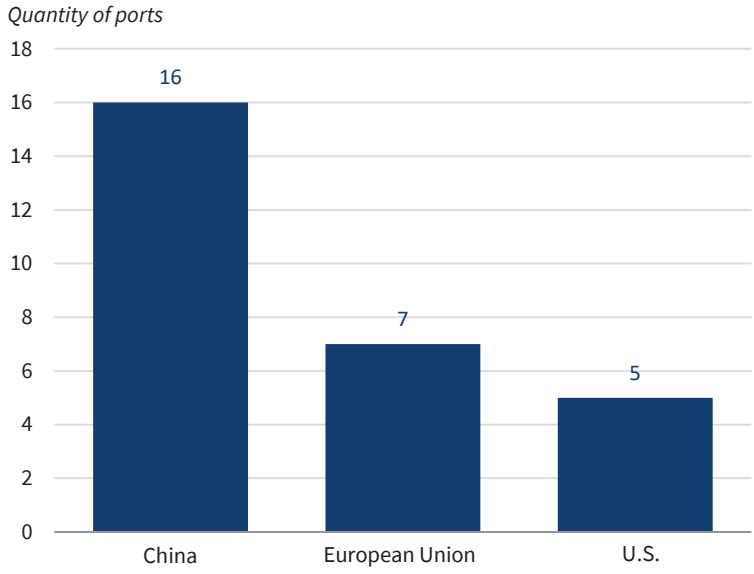
Conversely, higher transportation costs resulting from poor maritime infrastructure relegate host nation economies to favor less complex supply chains, the exporting of primary goods, and the importing of intermediate and finished goods. Over time, this can have the effect of deindustrializing a nation. Poor maritime logistics, (including the absence of entire classes of bulk transportation legs) leads to situations where hog farmers in North Carolina import feed grain from Brazil instead of America. The United States also leads the world in exporting scrap metal because the existing water transportation modes cannot move this cheap and abundant domestic strategic commodity to American minimills.

Half of all goods, by value, entered the U.S. in 2017 through maritime ports, and the Federal Maritime Commission estimates that these ports generated nearly $4.6 trillion in economic activity in 2014. Increased investment in infrastructure at U.S. seaports would speed the flow of goods, expand trade, and increase U.S. GDP. For example, the World Bank (2020) gives the United States a rating of 5.8 out of 7 on its port infrastructure and ranks the Netherlands number 1, with a 6.8 rating. Extrapolating from an analysis by Munim and Schramm (2018), the CEA finds that increasing the United States' port infrastructure by 1 point (to 6.8 out of 7) would increase U.S. real GDP by 0.3 percent ($56 billion).

In 2018, 5 of the 50 busiest seaports in the world were located in the United States (figure 11-12). By contrast, 16 were located in China, and 10 of these were busier than the United States' busiest port—Los Angeles. Whereas U.S. ports processed an average of 7 million 20-foot equivalent units of container traffic annually, Chinese ports averaged 38 million units.

Infrastructure investment plays a role in this discrepancy. The average service life of U.S. airports and seaports is 38 years, below the global average, and the required port investment forecast through 2040 is 90 percent higher than current port investment trends, according to a 2017 analysis by Oxford Economics, which concluded that the United States' gap between needed

Figure 11-12. Number of Seaports by Country among the Top 50 Busiest Seaports in the World, 2018

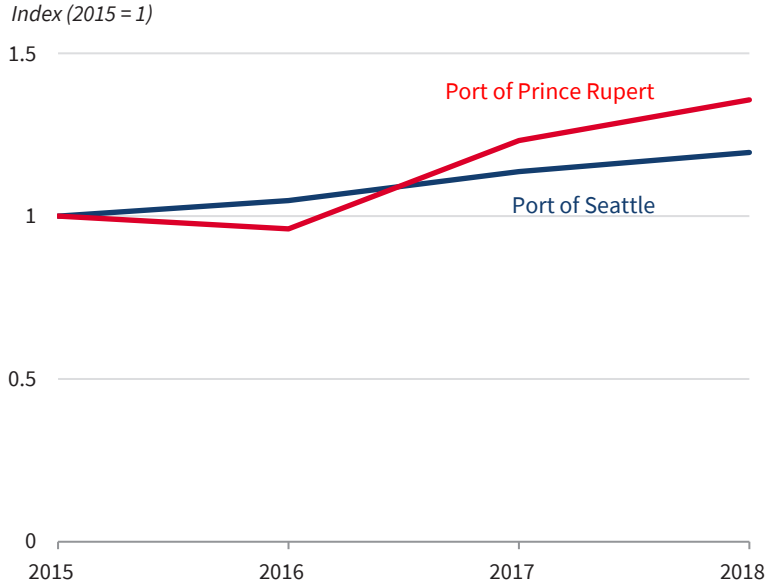


Source: World Shipping Council.
Note: The busiest seaports are as measured by tonnage.

and actual investment is one of the highest in the world. Over the last decade, increased trade volume has led to busier maritime ports and increased congestion. In 2014, the top three container ports alone accounted for nearly half of all containerized trade in the United States. The slower throughput caused by congestion has started to affect the performance of U.S. ports relative to other countries' ports and has begun to divert trade away from American ports through increasingly competitive Canadian and Mexican ports. Figure 11-13 shows the tonnage shipped out of the Port of Seattle against that shipped from the Port of Prince Rupert (one of the main ports on the West Coast of Canada). Although the Port of Seattle has seen increased traffic over the last four years, the growth in the Port of Prince Rupert's traffic is almost double that of Seattle. The Federal Maritime Commission estimates that if trade volumes at maritime ports continued to grow between 5 and 7 percent annually, the average growth rates for the East Coast and Gulf Coast ports since 2009, port capacity would need to double in the next decade to accommodate this growth.

The depth of shipping channels plays a significant role in the volumes and rates of the trade a port can facilitate. If a waterway is too shallow, large vessels benefiting from low unit transportation costs will be unable access the foreland infrastructure through the adjacent port. Many American ports are too shallow to facilitate trade with the large ships regularly used in the lowest cost trade routes internationally. Overall, due to inadequate dredging and

Figure 11-13. Cargo Volumes of the Port of Seattle Compared with the Port of Prince Rupert, 2015–18



Sources: Prince Rupert Port Authority; U.S. Department of Transportation; CEA calculations.

insufficient port depth, the U.S. likely forgoes $376 billion in trade annually, according to the U.S. Army Corps of Engineers (2017). This has become a major challenge for American energy producers in particular. Increased oil production in the United States has elevated the demand for oil transportation services via very large crude carriers (VLCCs) across Gulf Coast ports. However, all but one American oil export terminal have insufficient depth to handle VLCCs. As a result, Gulf Coast ports need to use smaller tankers to carry out costly and inefficient ship-to-ship oil transfers, thus loading VLCCs in open water, many miles offshore. Russian and Saudi producers are able to load VLCCs directly, reducing their oil's price per barrel and dramatically increasing their pace of exporting to market. This inefficient method of loading American oil exports generally adds several extra days and $1 million to shipping costs for each shipment of American oil exported from the Gulf Coast. This inefficiency translates into an additional $0.50 to $0.80 cost per barrel for American oil (Huchzermeyer 2018; Miller 2019). Updating and upgrading U.S. maritime laws to ensure adequate dredging capacity could therefore generate substantial economic gains.

Improving American trade competitiveness can be accelerated by leveraging the Nation's unique comparative advantages. The United States has rapidly emerged as the world's leading producer of natural gas and is becoming one of the world's top liquefied natural gas (LNG) exporters. Concurrently, the global deep-sea shipping industry has begun a seismic shift toward LNG

as a marine propulsion fuel. Because fuel costs are typically the leading driver of operating expenses for vessel owners, the 15–30 percent reduction in costs realized by shifting from fuel oil to LNG has become a superior alternative. In addition to fuel conversions, dual-fuel- and LNG-powered vessels are becoming increasingly ubiquitous. This shift toward LNG as a marine fuel has not been matched with investment in the bunkering infrastructure that is necessary to fuel LNG-powered vessels except in the most modern competitive ports in Asia and Europe. Investing in U.S. port infrastructure to enable LNG refueling terminals would make American ports more attractive.

Other Federal regulations have exacerbated congestion at the ports. One of the largest amplifiers of this situation is the shortage of trailer truck beds, or chassis. Once the goods arrive at maritime ports, trucks are typically used to transport the goods to other destinations. Stricter Federal safety requirements introduced in 2009 were factors in creating a situation in which providing a chassis is too cost-prohibitive for ocean carriers. Known as the "roadability rule," this regulation placed the burden of the safety inspection of a chassis on drivers, increasing regulatory compliance costs. As a result, many of the carriers sold their chassis to third-party leasing companies, which now provide the majority of chassis at ports. Truckers must now make multiple trips to pick up and return chassis, leading to delays in the availability of chassis at any one time. This limits the amount of goods truckers can move in a timely manner. For example, in January 2019, chassis shortages led to large backlogs at the Los Angeles and Long Beach terminals.

Research demonstrates that improving port infrastructure increases trade. Countries that enhance their seaport efficiency can decrease shipping costs by up to 12 percent, leading to increased trade (Clark, Dollar, and Micco 2002). Cheaper shipping both increases firm sales and helps spread new technology (Lakshmanan 2011). These outcomes allow firms to scale up their activities and increase domestic output, which has positive spillover effects into the labor market and the rest of the economy.

There is also evidence that port infrastructure investment not only boosts total trade but also provides a larger boost to exports than imports. Improved port infrastructure increases exports by $4 for every $1 increase in imports (Wilson, Mann, and Otsuki 2004; Korinek and Sourdin 2011). Physical infrastructure has an even higher positive effect on exports as income grows (Portugal-Perez and Wilson 2012). Improved port efficiency has increased incomes in communities around ports by up to 70 percent (Brooks, Gendron-Carrier, and Rua 2018).

Generating a More Skilled and Resilient Workforce

As a result of the COVID-19 pandemic, an unprecedented fall in economic activity occurred in 2020. Although this was met by a rapid and massive policy response that focused on maintaining the social capital of employee-employer relationships, there is still work to be done. Improving the productivity of the U.S. workforce is more important than ever as the country recovers from the pandemic-induced recession. This section outlines two ways in which this can be done: increasing the skills of the immigrants who contribute to this country, and improving the institutions of higher-learning that equip millions of Americans for the labor market.

Points-Based Immigration

In contrast to other developed countries—such as Canada, Australia, and Japan—the United States immigration system limits the ability of high-skilled workers to immigrate to the United States if they do not have existing family relationships. Under current U.S. law, immigrants obtain lawful permanent resident (LPR) status (i.e., green cards) through immigration categories for familial relations, employment, the diversity lottery, and the refugee and asylum programs. Table 11-5 shows the distribution of those receiving LPR status in fiscal year 2018. The U.S. distribution of immigrant visas diverges significantly from countries with merit-based points systems where over half of permanent immigration visas were granted based on the employment or skills of the applicants (figure 11-14).

Points-based immigration systems select their employment-based immigrants by awarding points based on factors such as age, education, and earnings that are associated with positive outcomes. For example, Canada's merit-based immigrants earn more than other Canadian immigrants. Abbott and Beach (2011) find that the median 10-year average earnings of Canada's merit-based immigrants are 35 to 56 percent above the median 10-year average earnings of all immigrants in the most recent cohort they consider. The CEA's estimates, which are discussed below, and a review of the economic literature suggest that there is strong evidence that shifting the U.S. immigration system toward a merit-based system would lead to benefits for the U.S. economy—increasing growth, wages, and tax revenue.

Estimated Economic Benefits

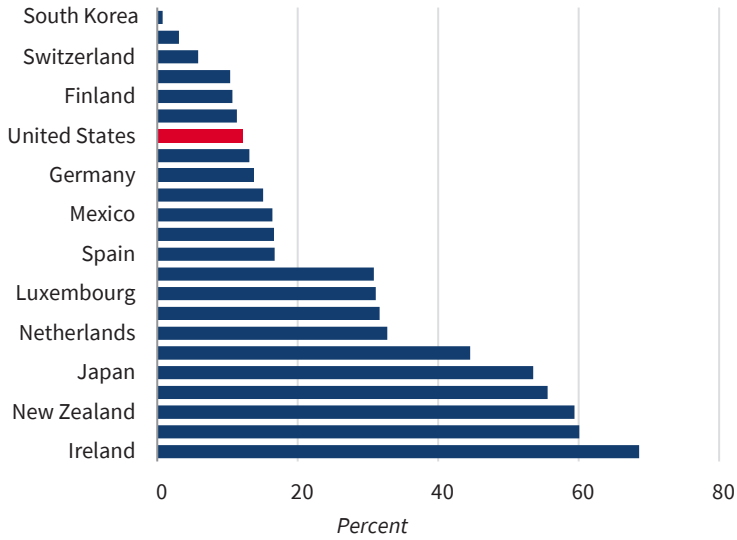
In this subsection, the CEA estimates the economic and fiscal benefits if the United States prioritized the highest-skilled workers within the applicant pool and allocated 56 percent of green cards to high-skilled applicants, thereby putting the U.S. in line with the average percentage of employment-based visas offered by Japan, Australia, and Canada. In this modeling, it is assumed that

Table 11-5. Lawful Permanent Resident (LPR) Status Obtained by Broad Class of Admission, Fiscal Year 2018

Broad Class of Admission	Number of LPRs	Percentage of LPRs
Immediate relatives of U.S. citizens	478,961	44
Family-sponsored preferences	216,563	20
Employment-based preferences	138,171	13
Diversity	45,350	4
Refugees	155,734	14
Asylees	30,175	3
All other	31,657	3
Total	1,096,611	100

Sources: U.S. Department of Homeland Security; CEA calculations.

Figure 11-14. Share of Permanent Legal Immigration Based on Employment, 2017



Sources: OECD International Migration Outlook 2019; CEA calculations.
Note: Data are for calendar year 2017. Employment base includes accompanying family members on work visas. Totals exclude permanent immigration from free movements.

immigrants receiving new high-skilled green cards would bring their spouse and dependent children and that these dependents would count against the total number of green cards. The total amount of immigration would remain consistent with the current flow.

The characteristics of recent immigrants to the United States are identified using data from the three most recent years of the American Community Survey from the Census Bureau from 2016 through 2018, as provided by the Integrated Public Use Microdata Series (known as IPUMS) database (Ruggles et al. 2019).

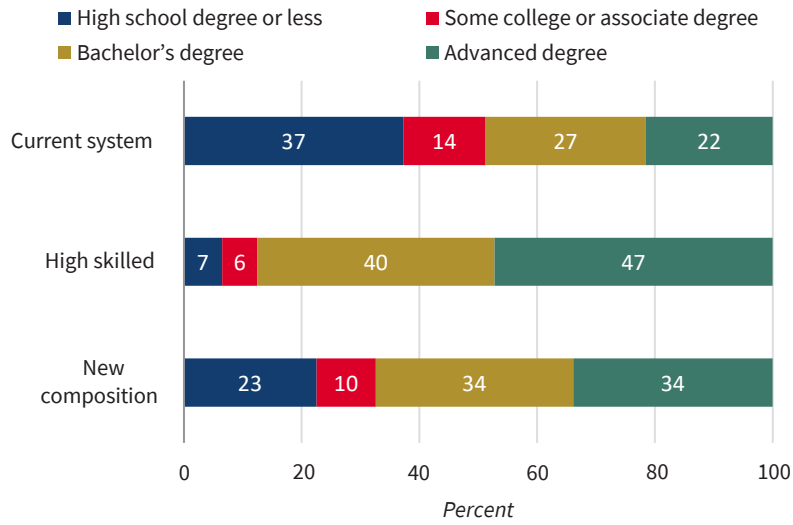
Figure 11-15 shows the educational characteristics of recent immigrants under the current system, among those admitted as new high-skilled workers, and among the anticipated composition resulting from a policy shift. Two assumptions are made. First, it is assumed that immigrants below the 85th percentile of wage earners continue to have the same characteristics despite their percentage of the overall immigration flow being smaller. Second, it is assumed that new immigrants on merit-based green cards match the characteristics of immigrants whose earnings are above 85th percentile in the American Community Survey.

Although 51 percent of recent immigrants have less than a bachelor's degree, increasing the share of green cards awarded to high-skilled immigrants suggests that the share with less than a bachelor's degree would fall to 33 percent (figure 11-15). By allocating a larger share of visas based on employment and skill, the employment rates of recent immigrants would also increase. Even including those arriving on non-skills-based visas, along with the spouses of new employment-based visas who may not be working, the employment rate of new immigrants rises by 8 percentage points from current rates (from 60 percent to 68 percent) and the average wage of employed recent immigrants increases from $49,000 to $94,000.

To estimate the effect of increased high-skilled immigration on national income and national income per capita over the next 10 years, the CEA approximated the contribution to national income of immigrant workers to the economy as their total compensation. For the subset of visas converted to high-skilled green cards, the existing employment and earnings rates are compared with those projected. Among new high-skilled recipients and their families, additional increases in employment rates in future years is not assumed.

Having determined the total wages of recent immigrants under the current system and in the new system, total compensation is estimated based on the Bureau of Labor Statistics' Employer Costs for Employee Compensation survey. The employer share of payroll taxes and fringe benefits (insurance, retirement benefits, and legally required benefits) represent over 20 percent of compensation. Thus, dividing wages by 0.8 leads to an estimate of total compensation. The change in total compensation from the introduction of additional high-skilled workers represents our estimate of national income growth in a single year. To project the contributions of immigrants in future years, it is assumed that the nominal compensation of new and recent immigrants grows by 3 percent a year, which is consistent with recent overall wage growth trends from the Bureau of Labor Statistics' Current Employment Statistics.

Figure 11-15. Estimated Educational Attainment of Recent Immigrants Age 25 Years and Older, 2016–18



Sources: American Community Survey, 2016–18; Integrated Public Use Microdata Series database; CEA calculations.
Note: Estimates assume that the total visas issued remain at current levels. Estimates for recent immigrants are based on noncitizens who have been in the United States between one and three years.

Given that shifting toward high-skilled immigrants increases both innovation and the productivity of the existing U.S. workforce and capital, additional increases in national income are expected. While recognizing that there is substantial uncertainty about the magnitude of these productivity gains, the same 0.3 percent long-run increase in the productivity of domestic workers (about 0.03 percent increase a year) is included in the analysis of wage gains given above. This effect is slightly more than half the long-term productivity gains estimated by the CBO for the Border Security, Economic Opportunity, and Immigration Modernization Act.

Using this approach, the total increase in nominal national income in 2029 would be about $570 billion above the baseline (pre-COVID-19) forecast under the current immigration system. Relative to the baseline national income growth projections, this reflects an increase in national income growth of about 0.20 percentage point a year. In addition, using the baseline population forecast, and recognizing that the exercise does not change the total number of immigrants arriving legally in the United States, this increases nominal national income per capita by about $1,600 in 2029 (table 11-6). If, instead, these new immigrants have average characteristics that match those of the top 30 percent of recent immigrants, as opposed to the top 15 percent, national income per capita would still be nearly $1,200 above the baseline forecast. The

Table 11-6. National Income Increase from a Merit-Based Immigration System

	Increase in 10-Year Average National Income Growth (percentage points)	Increase in 2029 National Income per Capita (2029 dollars)	Increase in 2029 National Income (billions of 2029 dollars)
Projected change	0.15–0.20	1,200–1,600	430–570

Sources: American Community Survey, 2016–18; Integrated Public Use Microdata Series database; CEA calculations.

Notes: The CEA bases these estimates on pre-COVID-19 national income projections. The estimate of national income per capita is rounded to the nearest $100. Aggregate national income estimates are rounded to the nearest $10 billion.

average growth of national income per year would be 0.15 percentage point, and the total increase in nominal national income in 2029 would be $430 billion above the baseline national income growth projection.

Estimated Effects on the Wages of Domestic Workers

Through this shift to a merit-based immigration system, low- and middle-skilled existing U.S. workers would face less competition from substitutable foreign workers for employment. As of December 2019, there were 42 million people age 25 and older in the labor force with a high school degree or less, 37 million with some college or an associate degree, and 62 million with a bachelor's degree. The shift in the makeup of the immigrant population, along with the emigration of 2 to 3 percent of recently arrived immigrants each year (based on estimates from Schwabish 2009), means that after 10 years, there would be roughly 600,000 fewer permanent adult immigrants in the labor force with a high school degree or less. There would be 200,000 fewer immigrants with some college or an associate degree and 1.4 million more immigrants with at least a bachelor's degree. These changes represent a decline in the size of the labor force with less than a high school degree and with some college of about 1.5 percent and 0.4 percent, respectively, whereas the size of the workforce with at least a bachelor's degree would increase by about 2.3 percent.

Using de Brauw and Russell's (2014) updated elasticity from Borjas (2003) as the upper end of the likely wage elasticity from immigration—and using Longhi, Nijkamp, and Poot's (2010) estimate of the lower end of the likely range—wage effects before capital adjustments and any long-run productivity gains are estimated. The result is that the revised immigrant flows from this exercise would increase wages for those with some college by up to 0.1 percent and for those with a high-school degree or less by up to 0.3 percent. The reform would reduce the wages of existing U.S. workers with at least a bachelor's degree by between 0.1 and 0.5 percent after a decade, indicating that there

would be some redistribution from highly educated workers to less educated workers as a result.

An alternative approach to estimate the change in relative wages between workers at different levels of education is to consider the effects on relative wages from a shift in relative supplies of labor. Based on the estimates by Katz and Murphy (1992) that log relative wages increase by about 0.1 percent for a 1.5 percent decline in relative supply, there would be a 0.15 percent decline in wages for workers with at least a bachelor's degree, a 0.1 percent increase in wages for workers with a high school degree or less, and a 0.03 percent increase in wages for workers with some college or an associate degree. These estimates are within the range of short-run relative wage changes using the wage elasticities from the immigration literature.

The CEA anticipates productivity gains once capital has adjusted, resulting in additional wage gains for individuals at all education levels. This is consistent with the estimates of the CBO (2013) finding that wage gains from changes in immigrant flows increase once capital adjusts to the number of workers. In its analysis of the Border Security, Economic Opportunity, and Immigration Modernization Act, which substantially increased both high-skilled and low-skilled immigration, the CBO (2013) projected that the proposal would increase productivity and result in a long-run increase in wages of 0.5 percentage point. These productivity gains would, consequently, mitigate and possibly reverse any shorter-run wage declines among high-skilled domestic workers, while further increasing the wage gains for low- and middle-skilled domestic workers. The CEA estimates that the productivity gains would be just over half of those estimated by the CBO for the larger changes in immigration flows in the 2013 Border Security, Economic Opportunity, and Immigration Modernization Act, and it is assumed that these productivity gains are distributed equally throughout the distribution, causing overall wages to increase by 0.3 percent.

The CEA expects the overall effect on wages for those with a bachelor's degree or above to be between a 0.2 percent decline and a 0.2 percent increase. Wages of those with a high school degree or less would increase by 0.3 to 0.6 percent, and wages of those with some college would increase by 0.3 to 0.4 percent. For a typical high school graduate working full time, this would result in an additional $130 to $230 per year of earnings. Furthermore, consistent with the observations by Moretti (2013) and Borjas (2017) that shifting toward high-skilled immigration would likely lead to a reduction in income inequality, this distribution of wage gains would reduce wage inequality among current U.S. workers.

These estimates are also broadly consistent with the long-run wage effects found by Chassamboulli and Peri (2018) from a shift in the composition of immigration flows toward high-skilled employment-based immigrants. In addition to these wage effects, they also find that the shift toward skilled

Table 11-7. 75-Year Net Present Value of Fiscal Benefits from Proposed Changes to the Permanent Legal Immigration System (billions of dollars)

	Federal Benefits	State and Local Benefits	Total
Projected change	840–1,320	260–300	1,010–1,620

Sources: National Academy of Sciences, Engineering, and Medicine (2017); American Community Survey, 2016–18; Integrated Public Use Microdata Series database; CEA calculations.
Note: Estimates assume that the total visas issued remain at current levels. Estimates are rounded to the nearest $10 billion.

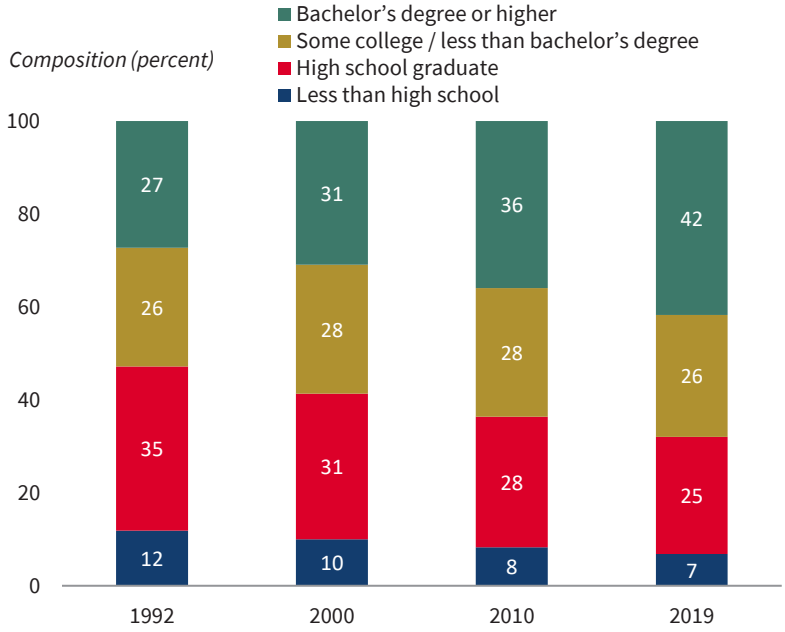
immigration will decrease the unemployment rate for native workers at all skill levels. This suggests an even more positive effect on the outcomes for U.S. citizens than is seen through wages alone, and one that is especially important in light of high unemployment rates resulting from the economic consequences of COVID-19.

Estimated Effects on Government Revenue and Expenditures

The CEA estimates that tax revenues would rise and outlays for social welfare programs would fall as a result of these wage, productivity, and employment gains. Using average tax rates (JCT 2019), the proposed changes could increase tax revenues by $470 billion in the CEA's primary forecast, and by $340 billion in the conservative forecast. These estimates do not include potential gains for domestic worker productivity, and they are broadly consistent with those that would be derived by multiplying the total increase in national income over the 10-year budget window from the higher-skilled immigrants by the 16 percent revenue-to-GDP ratio in 2018. However, the actual revenue gains are larger once the progressivity of the U.S. tax system is accounted for, which means that the higher-income immigrants would pay a higher share of their income in taxes than the lower-income immigrants who arrive in the United States under the current system.

To estimate the long-run fiscal effects of this new composition, the CEA uses the average 75-year fiscal benefits of immigrants by education level, as estimated by the National Academy of Sciences (2017). This approach is similar to that taken by Borjas (2019) to illustrate the substantial increase in U.S. wealth that would result from increasing the education profile of the immigrant population. Although changes in the education levels of parents arriving in the United States will likely also increase the education levels of children arriving with them, only the long-run fiscal costs and benefits of adult immigrants age 25 to 64 and those 65+ are included. Based on these estimates, shifting the composition of permanent immigration toward more highly educated and younger individuals will, after 10 years, result in a net present value of between $840 billion and $1.3 trillion of fiscal benefits from immigration for the Federal Government (table 11-7). In addition, it will result in a further $260 billion to $300 billion in fiscal benefits for State and local governments.

Figure 11-16. Employment by Educational Attainment



Sources: Bureau of Labor Statistics; CEA calculations.

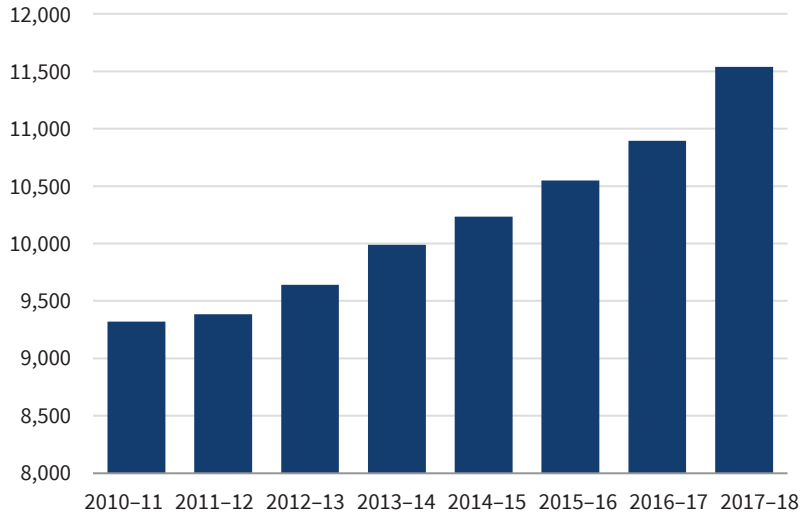
Improving Postsecondary Education and Skill Development

Postsecondary education and skill development are integral to the health of the U.S. economy. As shown in figure 11-16, an estimated 68 percent of all jobs require a postsecondary education, of which 42 percent require at least a bachelor's degree and an additional 26 percent require an associate degree or some form of higher education less than a bachelor's degree. In comparison, in 1992 only 53 percent of all jobs required a postsecondary education.

Wage premiums and job security often accompany education and skills attainment; however, the rising cost of college and increases in student loan balances erode the overall return that accompanies a college degree. Through the Higher Education Act of 1965, and subsequent reauthorizations since that time, the Federal Government has taken action to address the costs of higher education by subsidizing both students and educational institutions. Figure 11-17 shows the growth in the average level of student aid from Federal and other sources awarded to undergraduate students since 2010. As shown in figure 11-11 above, this took place during a time of stagnant productivity. Improved allocation of human capital investments could generate an increase in productivity and may be hindered due to distorted decisionmaking at higher education institutions.

Figure 11-17. Average Federal, State, Local, Institutional, or Other Sources of Grant Aid Awarded to Undergraduate Students, 2010–18

Dollars (current)



Sources: National Center for Education Statistics; CEA calculations.
Note: This includes four-year public and private nonprofit universities.

Federal regulatory reforms of higher education could better hold institutions accountable for the economic return that they provide to students, as well as assist students and families to make more informed decisions regarding their educational options. This section explains how this could be done by increasing incentives for schools to improve the economic return to students and by improving Federal support for educational programs that directly help more Americans secure well-paying jobs. This section also highlights the success of Historically Black Colleges and Universities (HBCUs) and illustrates the lessons of their experiences for the higher education system as a whole.

Increasing Incentives for Schools to Improve the Economic Gains of Students

Increased institutional accountability could improve the economic return to students. Investing in higher education generally provides substantial value for students and taxpayers. However, when an institution fails to deliver the type of high-quality education that enables students to repay their Federal student loans, this institution is not held responsible for losses. Instead, taxpayers are left to foot the bill. Institutions that lack a focus on generating positive value for their students exacerbate an increased rate of student loan default and stress throughout a student's career.

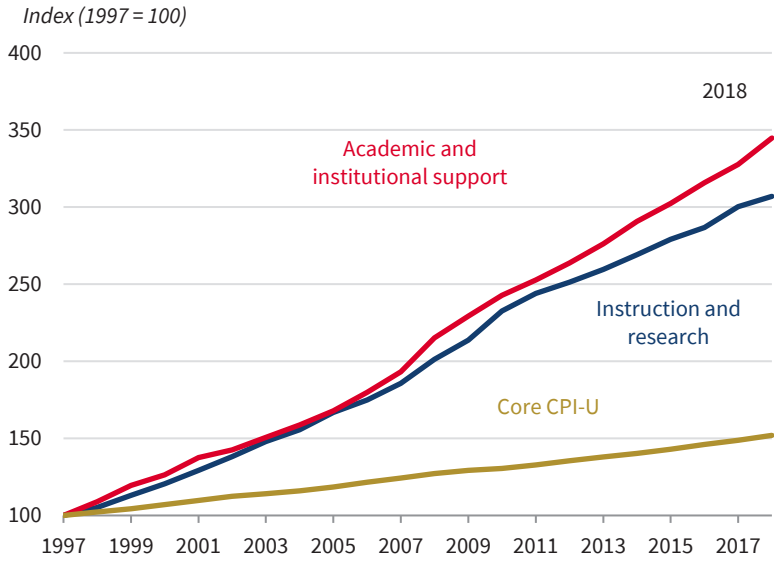
As currently configured, the credit risk associated with student loans is not efficiently distributed between all parties related to the transaction—that is, borrowers (students and parents), taxpayers, and the higher education institutions. The burden of repayment currently rests solely with the borrowers, who may face daunting loan payments if the expected education premium underdelivers, and with taxpayers, who foot the bill when the borrowers default or the loan is forgiven. Institutions of higher education bear none of the direct expenses of such failed outcomes and thus have limited incentive to assist students in optimizing educational skill development and career paths. The U.S. Department of Education (2020) provides useful institution-level data—such as annual costs, average earnings, and graduation rates—to help students avoid making poor investments in education. However, better accountability by the institutions themselves could further limit failed outcomes.

A reformed system could require postsecondary institutions that accept taxpayer funds to share in the financial responsibility associated with student loans. Such a risk-sharing arrangement could require postsecondary institutions to pay a small percentage of the value of the loans on which their former students have defaulted, or alternatively require institutions with worse repayment outcomes to pay fees. Such fees could be adjusted to account for variation in the composition of student intake so as to align institutions' interests with their students and incentivize them to improve repayment outcomes, but without disproportionately penalizing institutions serving higher-risk students.

There have been three major pieces of Federal legislation pertaining to risk-sharing on Federal student loans in recent years. A bipartisan bill, the Student Protection and Success Act, first introduced in 2015, would create a program where institutions are responsible for paying a percentage of the cohort nonrepayment balance, 2 percent in the 2019 version of the bill, for loans that had not paid down at least $1 of principal in three years. The legislation factors in the national unemployment rate and includes a list of exceptions for loans in deferment and mandatory forbearance. A Republican-sponsored bill, the PROSPER Act, introduced in 2017, would make changes to provisions for repayment of Federal student aid if a student withdraws from an institution of higher education, shifting 90 percent of the repayment responsibility to the institution (U.S. House of Representatives 2018). A Democratic-sponsored bill, the Protect Student Borrowers Act, first introduced in 2013, would require covered institutions to make risk-sharing payments on defaulted loans on a sliding scale based on the default rates of their students.

As shown in figure 11-18, education expenses have grown faster than inflation, with expenses for academic and institutional support (which includes expenses associated with noninstructional activities, such as admissions, student activities, libraries, administrative activities, and executive activities) growing faster than expenses for instruction and research. This trend may be driven by instances of mismanagement such as those uncovered in a 2017

Figure 11-18. Growth in Four-Year Public and Private Universities' Expenses by Selected Category, 1997–2018



Sources: National Center for Education Statistics; Bureau of Labor Statistics; CEA calculations.
Note: Core CPI-U = Consumer Price Index for All Urban Consumers.

State audit of the University of California (2017). The audit found that the university's Office of the President had spent over $2 million on meeting and entertainment costs over five years and had awarded salaries and benefits to personnel far higher than salaries awarded for other comparable positions. As measured by the 2019–20 AAUP Faculty Compensation Survey, the salary for the average category I chief academic officer was $383,000, compared with $160,000 for a full-time professor.[8] The quantity of these hires has increased as well. Administrative hires increased 50 percent faster than classroom instructors between 2001 and 2011.

Improving Support for Educational Programs That Promote Skill Development

The Federal Government could also improve outcomes for students by better aligning education with the needs of today's workforce. The higher education system has been slow to adapt to the changing nature of work. In recent years, millions of jobs have remained unfilled, in part due to a lack of Americans with appropriate skills. Federal policy could better align higher education with the needs of today's workforce in multiple ways.

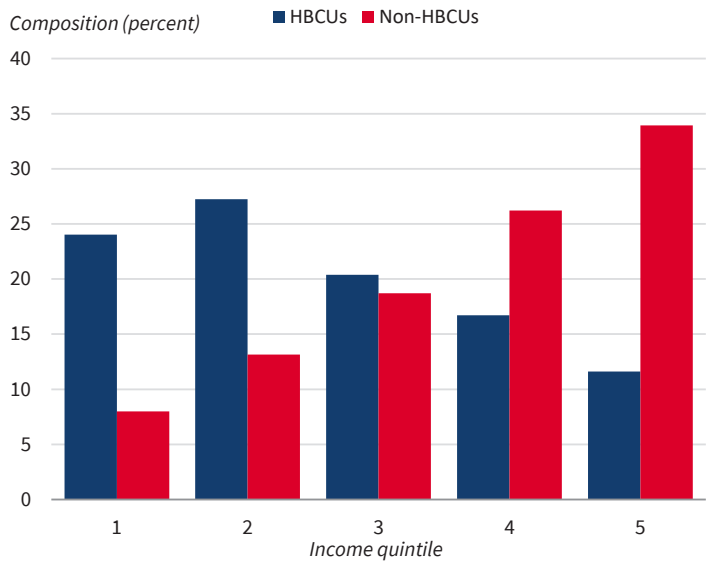
[8] This includes institutions that grant 30 or more doctoral-level degrees annually from at least three distinct programs. See AAUP (2020, n.d.).

Box 11-6. Historically Black Colleges and Universities

One example of higher education institutions delivering a high return for their students is that of Historically Black Colleges and Universities. HBCUs have played a crucial role in expanding educational opportunity for all students, especially for the African American students who make up 76 percent of their student populations. As of 2019, there were 101 accredited HBCUs across the United States. HBCUs enroll over 300,000 students, including around 80,000 non–African Americans (National Center for Education Statistics 2020). According to a 2017 economic impact report produced by the United Negro College Fund, HBCUs generated an employment contribution of 134,090 jobs, work-life earnings of $130 billion for HBCU students, and a total economic contribution to the U.S. economy of $14.8 billion.

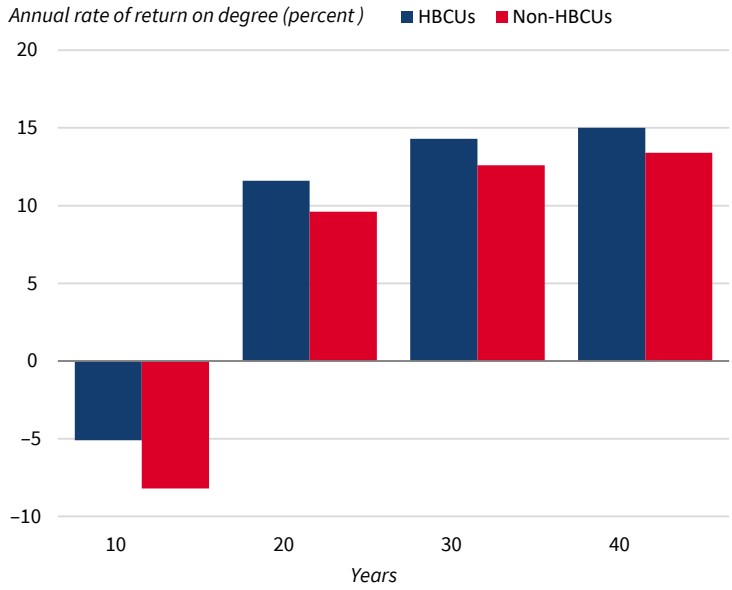
HBCUs historically have served distinct student populations. HBCU students are largely low-income, first-generation-college students (nearly three in five students), and over a quarter of HBCUs are open admission. Open admission enrollment implies that all qualifying students (students with a high school degree or general education development certificate) are welcome to apply and enter the program without additional qualifications or performance benchmarks. This appeal to low- and moderate-income, first-generation students suggests that HBCUs have lower barriers to entry (e.g., costs of attendance, required test scores) than many comparable non-

Figure 11-iv. Composition of Student Body Population by Income Quintile



Source: Nathenson, Samayoa, and Gasman (2019).
Note: HBCUs = Historically Black Colleges and Universities.

Figure 11-v. Comparative Rates of Return for a Four-Year Degree



Sources: Integrated Postsecondary Education Data System; CEA calculations.
Note: Based on the most recent institution-level data as of June 1, 2020. HBCUs = Historically Black Colleges and Universities.

HBCU institutions. HBCUs draw 24 percent of their student body's population from the lowest 20 percent of incomes. By this measure, HBCUs serve more economically disadvantaged populations than non-HBCU institutions, which are composed of only 8 percent of students in the bottom 20 percent.

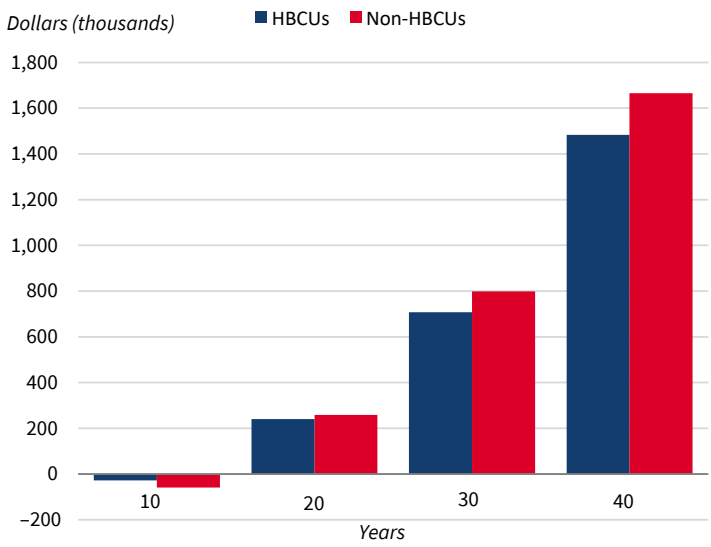
Although HBCUs account for a mere 10 percent of the African American college student population, in 2014 they represented 17 percent of bachelor's degrees and 24 percent of STEM (science, technology, engineering, and mathematics) degrees earned by African Americans. From 2002 to 2011, the top eight institutions where African Americans earned PhDs in science and engineering were HBCUs.

Here, the CEA estimates the rates of return on an education from the HBCU system. The estimates use traditional approaches and are in keeping with the work of Mincer (1958), Schultz (1961), and Becker (1962) on differences in earnings across persons resulting from levels of human capital, accumulated primarily through education and training. Using institutional-level data obtained from the U.S. Department of Education's (2020) College Scorecard and the Federal Reserve's 2019 Survey of Consumer Finance, the CEA estimates the comparative rates of return over 40 years for graduates of four-year HBCUs and comparable non-HBCU institutions (figure 11-iv). Comparable institutions are located within the same commuting zone of at

least one of these HBCUs and are of similar institutional selectivity, according to the Barron's Selectivity Index. The long-term rates of return for graduates receiving a college education at an HBCU are significantly positive and track those of graduates from a non-HBCU school. Short-term rates of return for students of HBCUs and non-HBCUs are significantly negative and vary largely to the extent that forgone income for non-HBCU graduates tends to be larger than it is for HBCU graduates. However, as time passes, both cohorts experience income growth and thus see an increase in their rates of return.

Although non-HBCU graduates initially benefit, on average, from higher incomes than do HBCU students, HBCU graduates tend on average to experience greater annual growth in income than non-HBCU graduates (figure 11-v). Thus, over the long run, alumni of HBCUs will tend to experience rates of return comparable to those for non-HBCU alumni. This shows that from a productivity standpoint, HBCUs can deliver comparable returns at a lower cost. HBCUs have a slightly lower level of earnings, which is attributable to the different student composition (e.g., the presence of first-generation students, and the selection of college majors). Figure 11-vi shows that graduates of HBCUs also track closely with graduates of non-HBCUs in cumulative earnings over time.

Figure 11-vi. Comparison of Real Cumulative Median Net Earnings



Sources: Integrated Postsecondary Education Data System; CEA calculations.
Note: Based on the most recent institution-level data as of June 1, 2020. HBCUs = Historically Black Colleges and Universities.

One approach would be for Congress to expand Pell Grant eligibility to include high-quality, short-term programs that provide students with a credential, certification, or license in a high-demand field and that demonstrate strong employment and earnings outcomes. Pell Grants are typically used to support students in traditional two- or four-year degree programs. Though some certificate programs are eligible for Pell Grants, programs must cover at least 15 weeks of instruction. Expanding support to shorter-term programs designed to teach skills specific to well-paying jobs could better meet the needs of students with near-term employment goals.

Federal program requirements could also encourage, rather than limit, partnerships between higher education providers and employers. Employers are most aware of the skills needed to succeed in the workplace. Congress could reform the Federal Work Study program to support workforce- and career-oriented opportunities for low-income undergraduate students. Work-based learning improves students' chances of developing important workplace skills, yet the Federal Work Study rules favor campus-based jobs.

Building on the successes of the National Council for the American Worker (NCAW) could promote multiple pathways to career success. Since January 2017, the NCAW has enrolled more than 750,000 apprentices; has modernized the Perkins Career and Technical Education Act to increase dual enrollment, work-based learning, and employer engagement; and has encouraged more than 400 companies to commit to providing 16 million employees with the training, reskilling, and career opportunities needed to increase productivity.

Improving the four-year degree to generate greater skill increases for students, as well as providing alternative paths for human capital accumulation, can avoid a one-size-fits-all approach that leaves individuals and groups behind. Apprenticeships, training programs, and four-year degrees are all paths to a more productive workforce and a higher quality of life for millions of Americans. Historically Black Colleges and Universities (HBCU) demonstrate how large gains from a high-quality education can be successfully provided to underserved groups (see box 11-6).

Conclusion

In this final chapter of the 2021 *Economic Report of the President*, the Council has identified various challenges for the American economy that not only were exacerbated by the pandemic, but also extend beyond the COVID-19 crisis into the postpandemic future. The policy ideas discussed here to potentially address these challenges can lead to a more resilient and prosperous economy for all Americans.

We have examined workers' connections to the labor force—relationships that COVID-19 strained and in millions of instances severed during the economic crisis—and how provisions of the tax code may discourage and

disrupt these connections and their reconstitution. Reforming the provisions that disproportionally place the tax burden on second-earners and low-income earners could rebuild employees' relationships with their employers and therefore strengthen the current economic recovery.

In addition, we have discussed the importance of paid leave and childcare, not only in the context of the global health crisis, but also as a way to support a stronger workforce after the pandemic abates. These provisions have become especially relevant during the COVID-19 crisis as sick family members have required care at home and children have attended virtual school from home, creating barriers for working parents to return to their jobs. Although the Federal Government has passed temporary measures to mitigate the lack of access to paid leave and childcare during this crisis, this chapter demonstrates that permanent policies to provide such access would increase labor force participation and earnings beyond the current pandemic recession.

Furthermore, we have analyzed the effects of negotiating reciprocal trade agreements on consumers' and manufacturers' access to the international market and how deepening trade integration with like-minded U.S. allies can allow for future flexibility in negotiations and can assist the Nation in achieving its trade goals. In working to preserve America's economic interests on the world stage, the economy can achieve real gains from trade while protecting the economic security of American enterprise.

We have illustrated the strain COVID-19 has placed on the U.S. healthcare system in this *Report*. Historic financial relief from the Federal Government alleviated the worst of the crisis for hospitals and patients. Nevertheless, the COVID-19 pandemic has revealed persisting issues within the healthcare system that create distortions in the healthcare market. This chapter has examined how to increase the supply of healthcare and remove opaque pricing structures, which will provide patients and doctors alike with benefits.

We have also highlighted the Federal Government's role in participating in the creation and maintenance of a world-class infrastructure system. Fostering public-private partnerships to lower taxpayer costs, targeting funds to high-productivity areas such as ports, and reforming the country's ever-more-important digital infrastructure have all been explored in this chapter. Investing in infrastructure projects would not only increase the productivity of the American economy in and of itself, but would also have spillover benefits for all sectors of the economy.

Finally, we have showed that the American economy could support a more resilient workforce by shifting the U.S. immigration system toward a merit-based system for higher-skilled immigrants and by realigning the goals of higher education institutions to better equip students seeking nontraditional career paths. This would lead to increases in economic growth, wages, and tax revenue, and thus to prosperity for all Americans.

The policy reforms discussed in this chapter are designed to support the American economy and the American people long after the COVID-19 pandemic subsides. These policies would boost productivity for manufacturers, increase investment in workers, enhance labor force participation, and grow families' earnings. In accordance with its mandate to "recommend national economic policy to promote employment, production, and purchasing power under free competitive enterprise," the Council of Economic Advisers has used this chapter to analyze reforms that could provide substantial economic benefits for Americans in every walk of life. Solving the issues and challenges articulated in this chapter would aid in restoring the American economy to its prepandemic levels of prosperity and would offer a solid foundation upon which to build an even greater and more resilient economy for all Americans.