

United States Economic Outlook

Third quarter 2020



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Closing date: August 12, 2020

1. Editorial

The U.S. is facing one of the most challenging environments in modern history and the next couple of years will prove crucial in determining the fate of the nation for years to come. First, the Covid-19 pandemic exposed major fault lines that were partially hidden by the longest economic expansion on record. Second, it forced draconian measures that caused massive job losses and the worst recession since WWII.

Although it is uncertain how deep and long lasting these effects will be, a return to pre-pandemic conditions or what some would call “normal” is neither likely nor desirable. Instead, this is an opportunity to identify the fault lines and provide solutions to improve the well-being of the nation above and beyond pre-pandemic conditions.

Despite having only 4.3% of the world’s population, the U.S. accounts for around 25% of global Covid-19 cases and deaths. It is unacceptable that the richest country in the world, with vast resources and incomparable biomedical and scientific advantages has insufficient testing and failed to protect its citizens. Experts who have warned policymakers for years on the potential consequences of a pandemic hitting our shores are bewildered by how negligent the government’s response has been. Research from Columbia University finds that the number of reported deaths as of May 3 could have been reduced by 35K if the control measures had been implemented a week earlier and by 58K if interventions had started two weeks earlier.

Bureaucratic missteps by the CDC and the FDA, contradictory messages from elected officials, disregard for intelligence reports, science and experts, lack of medical equipment, years of underfunding public-health departments, spread of misinformation, and private healthcare institutions with misaligned incentives created the perfect storm. Unfortunately, the number of deaths will increase further. According to the Institute for Health Metrics and Evaluation, total deaths could reach 205K to 524K by December 1, implying that Covid-19 will rank as the third leading cause of death in 2020, after heart disease and cancer.

The pandemic exposed the depth and severity of systemic racism and social injustice. Communities of color are more likely to get infected and die from Covid-19. Poor housing and sanitary infrastructure, malnutrition, pollution, low quality education, and lack of access to high-quality and affordable healthcare are only a few of the problems. Without paid sick leave, sufficient savings and a proper safety net, millions of low-income workers in essential sectors like food production and groceries stores had to commute to their places of work, exposing themselves, their families and co-workers to the deadly virus.

Among the millions that lost their job, the vast majority are young, lower-skilled, females and minorities working in the hardest hit service sectors like accommodation and food, retail trade and personal care. According to the Federal Reserve, by late-April, 37% of workers in the bottom quintile of the wage distribution had lost their job while only 10% in the top quintile were out of work; by mid-May, the job losses were 30% and 5%, respectively. Meanwhile, a large share had either no healthcare coverage or lost it after being laid off. According to the Kaiser Family Foundation, the uninsured rate among the nonelderly population is 22% for American Indian and Alaskan Natives, 19% for Hispanics, 11% for Blacks and 8% for whites; minority groups account for 60% of total uninsured.

Unfortunately, the economic consequences of the pandemic will exacerbate poverty and income inequality. The latter has also been fueled by globalization, automation and technological change. Mainstream economics assumes that

inequality is positive for growth as it provides incentives to work harder, invest more, take risks and save more. This leads to higher investment and capital accumulation since the rich have a lower propensity to consume. However, empirical studies show that inequality induces redistributive and distortionary policies, lowers investment in human capital and results in higher social unrest, which in turn leads to lower investment and economic growth.

The combination of inequality and low economic growth limits economic mobility, which could lead to a vicious cycle of polarization, social instability and populism. The Opportunity Insights Team finds that only 25% of children with parents in the lowest income quintile will grow up to earn more than their parents whereas this probability is close to 70% for children with parents in the highest income quintile.

Not surprisingly, anger and frustration from massive job losses, the persistence of the pandemic, and oppressive use of force coupled with structural racism and segregation triggered a wave of protests calling for social justice, police reform and to end discrimination. Taxes, redistributive policies, higher minimum wage and basic income could alleviate inequality while promoting growth provided that they are well designed and implemented effectively, and not ideological. However, the biggest bang for the buck comes from reducing racial biases and discrimination in the criminal justice system while promoting equal opportunity, affordable housing, wealth accumulation and access to quality education.

The pandemic also highlighted the importance of multilateralism and global cooperation. Although unilateral actions like closing borders and limiting trade flows could be effective for a few days at best and mainly for small countries, they harm growth by restricting the flow of technical support and disrupting businesses. For now, almost every country has taken an inward looking approach to fight the pandemic, but eventually international cooperation will be needed to distribute vaccines and medical equipment.

Countries also need to strengthen cooperation since the probability of another global health crisis is almost assured. SARS, MERS, H1N1, Ebola and Covid-19 should serve as examples to improve global preparedness and collaboration. The same logic applies to other global risks such as climate change, nuclear proliferation and authoritarianism. According to Freedom House, 2019 saw the 14th consecutive decline in their Global Freedom Index. With the pandemic, authoritarian leaders took advantage of fear and disappointment with institutions to advance their agenda. Despite the shift in U.S. foreign policy over the last several years, hard and soft powers remain strong and many countries still look up to the U.S. for global leadership.

The time is now for politicians, businesses and civil society to rise to the task and make the right choices to deal with the perils of a broken healthcare system, structural racism, inequality, and global threats. Although this is easier said than done and nothing can guarantee it will happen, the fact that the country overcame major domestic and global challenges in the past such as the Great Depression, civil conflict in the 1960s, Nazism and the Cold War provides hope.

2. U.S. Recovery: To “V”, or not to be

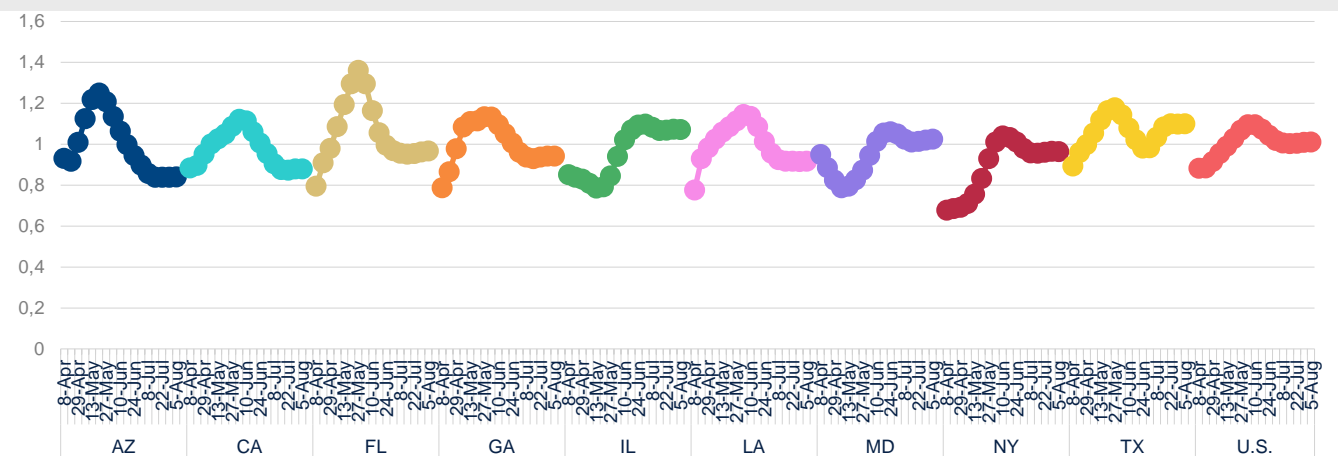
In light of the evolution of Covid-19 in 3Q20, we are maintaining our baseline for growth in 2020 at -5.1% and for 3.5% in 2021. The 1H20 was closely aligned with our post-pandemic outlook of annualized contractions in GDP of -5% and 32% in the first two quarters, respectively. Moreover, we assumed a nontrivial rise in the number of cases in response to the relaxation of social distancing. That said, we now expect more fiscal support, likely in between the Democrats HEROES Act that provides \$3Tn in additional funding and the GOP proposals, which provides closer to \$1Tn in funding. Until an effective vaccine is developed and distributed, the timing, scope and effectiveness of these policies could mean the difference between achieving a V-shaped recovery, or drifting towards a sickle or wave-like scenario.

Containing Covid-19 key determinant in shape of recovery

As we highlighted in our previous outlook, a rise in the level of interaction and relaxation of social distancing increases the probability of an accelerating rate of infections given the functional relationship of viruses, which grow exponentially with respect to the number of infections. Moreover, in some parts of the country the openings occurred with an elevated level of cases and weak guidance on personal protective equipment, which led to a rapid rise of cases in the Sunbelt and elsewhere.

To the upside, even with a significant rise in the number of Covid-19 cases, the death rate relative to the number of cases and the number of hospitalizations has remained well below levels reached in March. Improvements in treatment and therapeutics, and a greater understanding of the relative risk of having a serious complication based on a person’s age and underlying health conditions and enhanced distancing from these populations likely explains the improved outcomes.

Figure 2.1 **EFFECTIVE REPRODUCTIVE NUMBER**



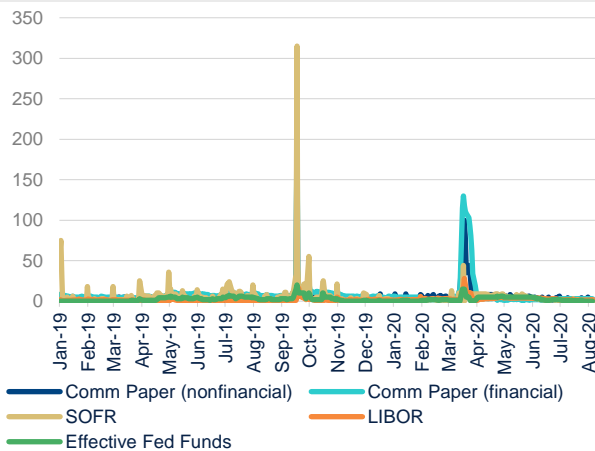
Source:BBVA Research, CDC, ECDC and JHU

That being said, there are obvious concerns about a true second wave given the underlying seasonality present in most coronaviruses and the fact that existing and new cases remain elevated. For example, there are around 50K new cases per day in the U.S., and in states like California, Texas and Florida, while trending downwards, new cases are 7.7K, 8.6K and 7.7K, respectively. On average, that is roughly seven times higher than the number of new cases in Germany, 185 times higher than the number of cases in South Korea and 350 times higher than the number of new cases in China. States like Texas and Florida also have double-digit positivity rates suggesting the virus is not under control and steady rise in cases should be expected. Moreover, several less-populated states are still recording near-peak levels of new cases

Financial conditions

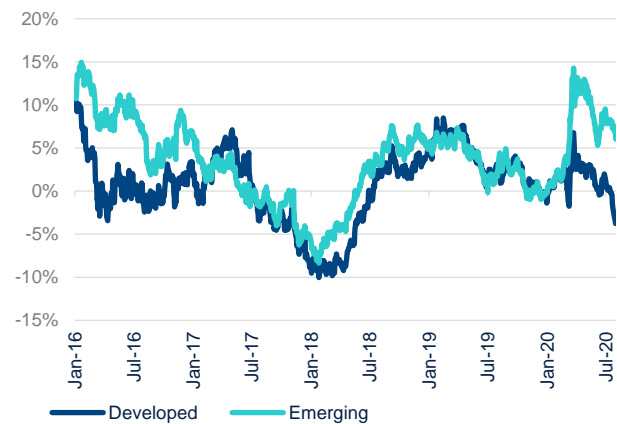
After the massive financial market intervention by the Federal Reserve in March and subsequent guarantees to support the functioning of major credit markets through its lending facilities, financial tensions have faded. Market volatility, as measured by VIX, has declined significantly, as equity prices rebounded. Increased inflows into prime money market funds, which experienced significant outflows during the crisis, also suggests risk appetite has improved with the reduction in uncertainty, pushing corporate bond spreads back to their historical averages. Moreover, short-term money market rates have converged with benchmarks while interbank functioning normalized with the Fed backstop, adjustments to reserve, and capital requirements. Long-term interest rates have also remained stable despite modest declines in the term premium.

Figure 2.2 **INTEREST RATE DIVERGENCE (BP FROM FED FUNDS)**



Source: BBVA Research, Haver Analytics and Baker et al.

Figure 2.3 **NOMINAL TRADE-WEIGHTED EXCHANGE RATE**



Source: BBVA Research and Haver Analytics

That said, the USD has experienced a nontrivial depreciation. Part of the initial weakness reflects a pullback in global demand for U.S. dollars after the early scramble to secure dollar liquidity was assuaged by the Fed's actions to increase dollar funding availability through its central bank liquidity swaps and foreign (FIMA) Repo facility. Many emerging markets currencies that experienced a large overshooting such as the Mexican Peso, the Indian Rupee, the Korean Won and the South African Rand appreciated against the USD following the stabilization of the dollar funding markets, and improved epidemiological and economic outlook. However, the persistent downward drift in the USD

beginning in July seems to reflect a deterioration in confidence given the lack of success containing Covid-19 relative to other major currencies. In fact, the trade-weighted depreciation against advanced economies, particularly the Euro, the Pound and the Swiss Franc, suggests a relative improvement in the expectations of the European recovery after the EU approved enhanced fiscal policy support.

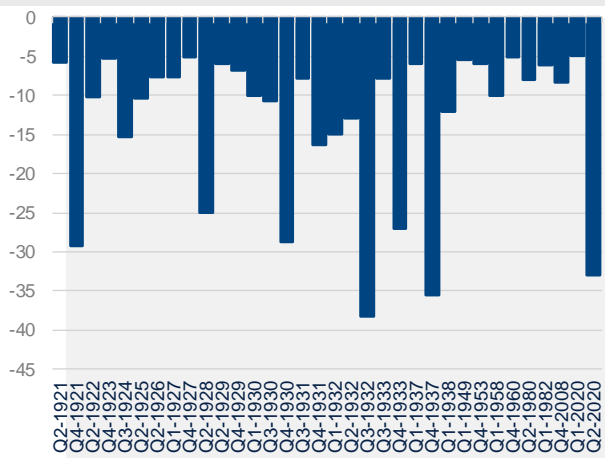
Notwithstanding major policy missteps or a resurgence of the virus in the 2H20 that prompts compulsory lockdowns, we expect financial tensions will remain muted.

2Q20 GDP contracts most since depression

As a result of the widespread lockdowns, enhanced distancing and unprecedented economic uncertainty, GDP growth in 2Q20 fell 33% on an annualized basis, likely the steepest decline in over-the-quarter growth since 1937, in the aftermath of the Great Depression. Since 4Q19, \$2tn in economic output has been lost.

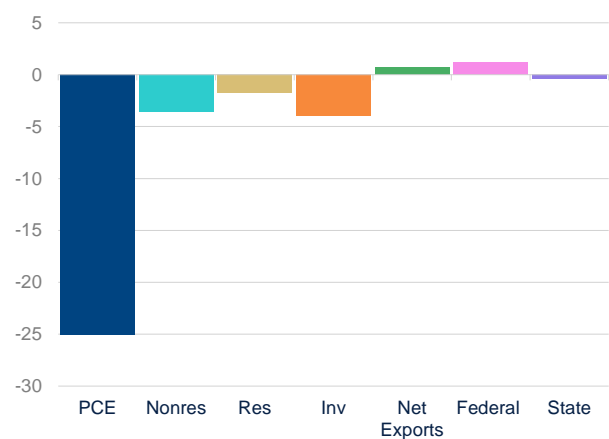
The idiosyncrasies of the Covid-19 pandemic have led to unusual outcomes when compared to traditional business cycles. For example, previous recessions are usually investment-driven unlike the Covid-19 crisis, which produced a 34.6% drop in consumption in the second quarter. Moreover, the majority of the decline is explained by a drop in the consumption of services, which has never happened. In fact, since 1947, the largest drops in service consumption was 2.5% in 2Q80 and 3% in 4Q53 on an annualized basis. Conversely, a shift in behaviors brought about by the pandemic and a boost from large fiscal transfers led to an uptick in consumption of motor vehicles and recreational equipment.

Figure 2.4 **NEGATIVE GROWTH QUARTERS, QoQa%**



*Shaded area=quarterly GNP
Source: BBVA Research

Figure 2.5 **CONTRIBUTIONS TO 2Q20 GROWTH (PP, 2Q20)**



Source: BBVA Research, BEA and Haver Analytics

Notwithstanding some bright spots in household utilities and financial services, the service sector plummeted to its lowest level in four years. Healthcare services experienced a historic drop for the second straight quarter, transportation services dropped 83.9% while recreational services, which includes concerts, parks, sports centers,

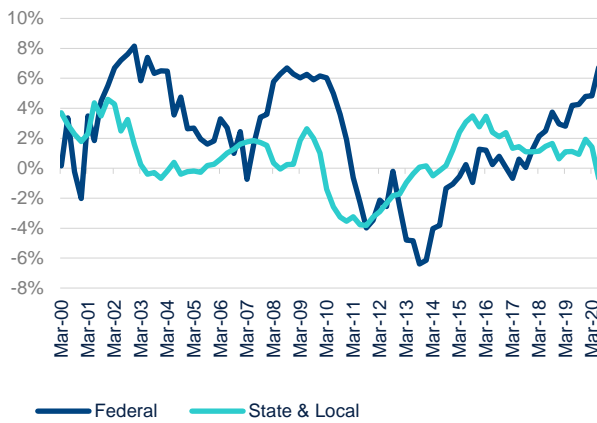
theaters and museums dropped by 93.5%, reaching their lowest level since 2002 while food service and accommodation fell more than 80%.

While the current crisis is clearly a consumption driven downturn, real private investment has also been severely affected by significant uncertainty and the unprecedented nature of the pandemic as well as frictions associated with relocating capital to what will be the most productive sectors in the post-pandemic world. The mining sector has also been affected by both plummeting demand from the reduction in travel and transportation activity and supply-side uncertainty as a result of the brinkmanship playing out between the world's major oil producers.

Residential investment also suffered on account of the lockdowns although the drop in investment was only a fraction of the decline during the housing meltdown in 2006-08. To the upside, the shift to remote working and increased demand for video-conferencing and virtual services, contactless purchases and delivery produced a jump in investment in information processing equipment.

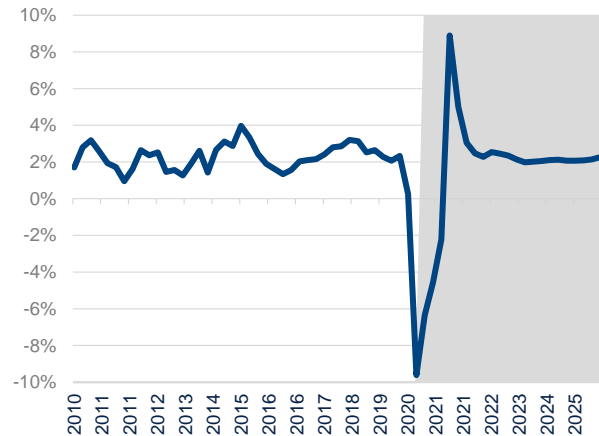
Significant headwinds also dampened trade, with total trade flows falling \$1.1Tn over the quarter on an annualized basis, representing almost 7% of GDP. Four rounds of fiscal stimulus also helped lift nondefense federal spending, which added 1PP to growth.

Figure 2.6 **FEDERAL, STATE AND LOCAL CONSUMPTION & INVESTMENT (YOY %)**



Source: BBVA Research, BEA and Haver Analytics

Figure 2.7 **REAL GDP (YOY %)**



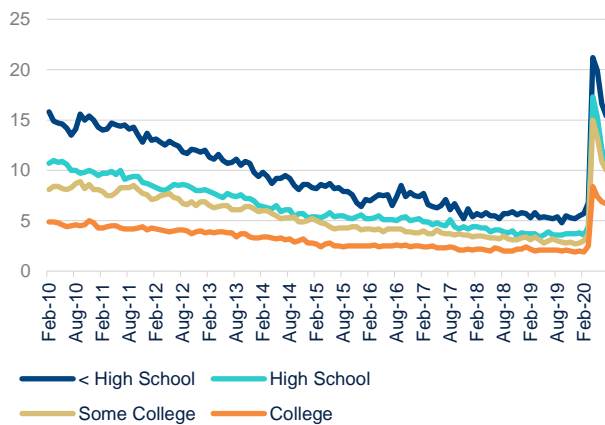
Source: BBVA Research, BEA and Haver Analytics

Overall, we expect consumption and investment will fall 5.6% and 6.7%, respectively in 2020 with total real trade flows falling 29%. We also consider more federal stimulus is likely and thus will continue to be a positive contributor to growth. However, dire state and local level finances will counteract the stimulus at the federal level implying total growth in public spending of around 1.1%, which is below the growth in public spending in 2019. As a result, our baseline assumes growth of -5.1 in 2020 and 3.5% in 2021.

Labor market frictions persist

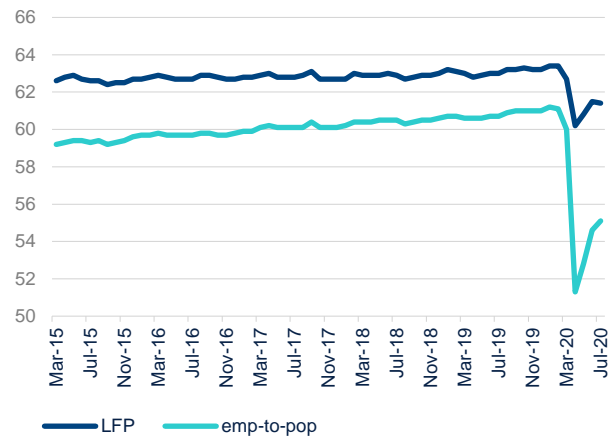
Three months of consecutive job gains and some improvement in broader labor market indicators confirms that the economy is on the mend. Nonfarm payrolls increased by 1.8M in July, after growing a revised 4.8M in June and 2.7M in May, implying a total gain of 9.3M jobs in the last three months and a total loss of 12.9M since February. Moreover, the unemployment rate declined to 10.2%, equivalent to a drop of 4.5pp since its peak of 14.7% in April. Industry employment gains have also been far reaching with near ubiquitous improvement in July. Similarly, the U-6 measure of underemployment that takes into account discouraged workers, all other marginally attached workers and those employed part-time for economic reasons stood at 16.5%, down from 22.8% in April.

Figure 2.8 **UNEMPLOYMENT RATE BY EDUCATION LEVEL (%)**



Source: BBVA Research, BLS and Haver Analytics

Figure 2.9 **LABOR FORCE PARTICIPATION & EMPLOYMENT-TO-POPULATION RATIO**



Source: BBVA Research, BLS and Haver Analytics

However, as in previous months, a share of people employed but not at work should have been classified as unemployed on temporary layoff. Adjusting the official figures by the increase in the number of people that have left the labor force and those misclassified results in 23.1M people unemployed equivalent to a 14% unemployment rate.

Moreover, the labor force participation rate was little changed at 61.4% while the number of people not in the labor force posted the first increase (230K) in three months. Minorities, women and younger workers continue to be disproportionately impacted by the pandemic, as teenage (19.3%), Hispanic (12.9%), Asian (12.0%) and Black (14.6%) unemployment rates remain elevated. Furthermore, the unemployment rate for someone without a high school diploma stands at 15.4%, 8.6pp higher than prior to the pandemic whereas those with a college degree or higher their unemployment rate is only 4.2pp higher at 6.7%.

In terms of wages, average hourly earnings rose 0.2% MoM, but after taking out non-production supervisory roles, wages fell 0.4%MoM, highlighting the bifurcation between higher-skilled and lower-skilled workers and between industries more and less affected by Covid-19. In fact, in the retail and transportation trade sectors, wages for production and nonsupervisory decreased 3.4%MoM and 1.7%MoM, respectively whereas wages for all employees in those sectors rose 1.9% and 1.1%. That said, production and nonsupervisory wage growth in sectors that have been

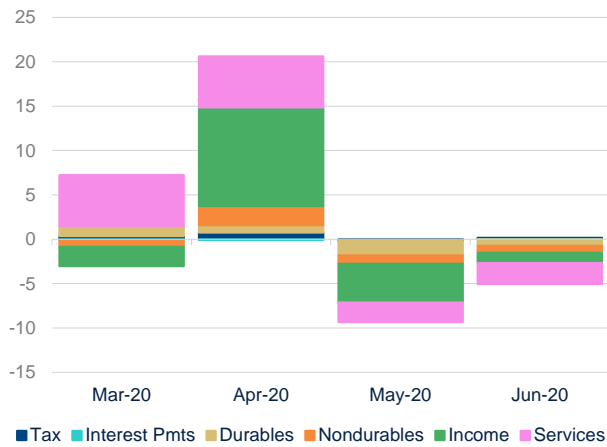
largely unscathed in the post-lockdown period and beneficiaries from the shift in consumer behavior such as durable goods manufacturing and information services has outpaced overall wage growth within the sector.

Going forward, job gains will remain above-average, as sectors such as food service, hospitality and transportation that were the most adversely impacted by the crisis bring workers back as conditions improve. That being said, many of these sectors will remain well below their pre-pandemic levels for the foreseeable future, with other segments possibly never returning those pre-pandemic employment levels. As a result, our baseline assumes the unemployment rate will be 8.6% by the end of this year and 7.4% by the end of 2021. Ultimately, we expect a high degree of labor market friction generated by the crisis that will promote a slower convergence with normal levels.

Savings and credit

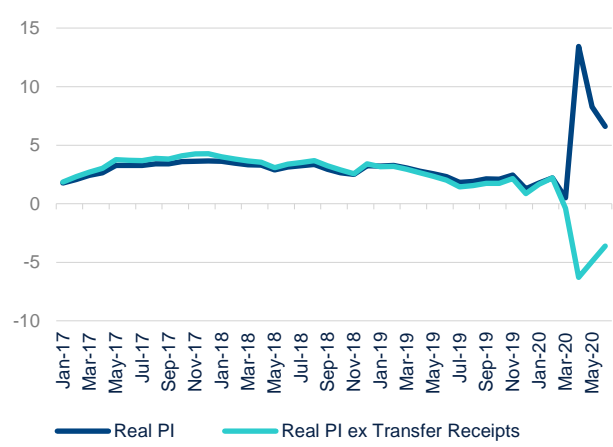
Although labor market conditions remain weak and the negative income shock skewed towards lower-income earners, large government transfers and behavioral impact of the pandemic have had a significant impact on personal savings, driving the personal savings rate to 34% in April. However, with the resumption of economic activity and the expiration of the fiscal measures, the savings rate has started to decline, albeit, it remains well above the pre-pandemic levels at 19.0% (vs. 8.3% pre-pandemic). That said, when government transfers are excluded from personal income the narrative changes. In fact, real personal income would have been 6%, or \$836Bn below its pre-pandemic peak without the transfers and could have fallen nearly \$1.4Tn in the absence of fiscal support.

Figure 2.10 **CONTRIBUTION TO CHANGE IN SAVINGS RATE (PP)**



Source: BBVA Research, BLS and Haver Analytics

Figure 2.11 **PERSONAL INCOME EX TRANSFERS (YEAR-OVER-YEAR %)**



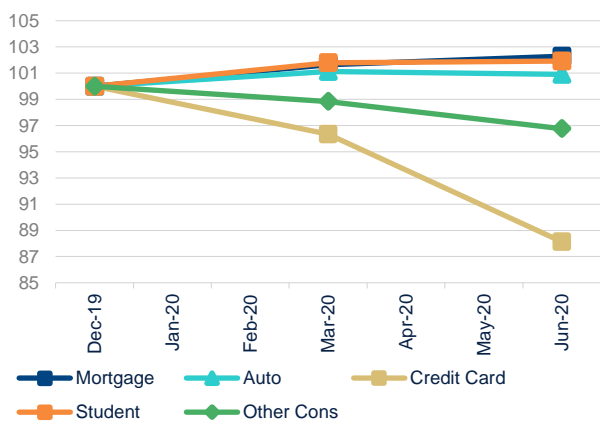
Source: BBVA Research, BEA and Haver Analytics

Although the targeted fiscal response fell short in terms of economic impact, as a large portion was diverted to savings, a nontrivial share of transfers was used to pay down debt. Despite the increase in discretionary income, individuals have refrained from traveling, visiting restaurants and amusement parks and spending on other services even after the ending of compulsory lockdowns in April-May. This trend is not unique to the U.S. In fact, a \$500 stipend for low income individuals in Italy, vouchers in South Korea, Iceland, Taiwan and Thailand nor the “Go To Travel” campaign in Japan have failed to create sufficient incentives for people to risk traveling during the pandemic. Therefore, it is no

surprise consumption has not recovered as quickly as originally anticipated. Moreover, the pace of consumption of longer-lasting pandemic induced purchases such as cars, recreational vehicles, bikes and electronics should slow, as the appetite for many individuals has been satiated. Moreover, labor market uncertainty and virus-related fears imply a higher-degree of precautionary savings for the time being.

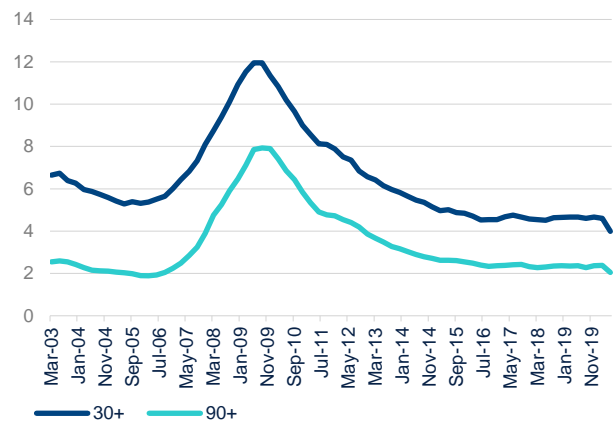
Recent results from the FRBNY credit panel survey, has shown that individuals are also diverting some of the excess savings to paying down debt, particularly revolving loans. In fact, in 2Q20 credit card debt fell \$76bn and 9.0% on a per capita basis, reaching its lowest level since 2017 while outstanding auto debt declined for the first time since 2013, dropping \$150 per person. However, supported by low borrowing costs, the pandemic-driven trend of refinancing existing mortgages or looking for more space and comfort in a new home to ride out the pandemic continued to push up outstanding mortgage balances.

Figure 2.12 **CONSUMER LOAN BALANCES**
(INDEX: 4Q19=100)



Source: BBVA Research, FRBNY and Haver Analytics

Figure 2.13 **CONSUMER DELINQUENCY RATES**
(%)



Source: BBVA Research, FRBNY and Haver Analytics

In terms of credit quality, two countervailing trends emerged with categories that benefited from the CARES Act, and additional legislative and executive actions such as mortgages and student loans improving, while others such as credit cards and consumer loans rising on account of the negative income shocks and weaker labor market prospects. Going forward, while persistent weakness in the labor market and waning fiscal stimulus and support will negatively impact credit quality, 84% of new mortgage originations have been for people that have an Equifax score of 720 or higher. This suggests supply-side conditions are properly adjusting to the potential negative headwinds on the horizon.

Inflation

With the upbeat CPI reports in June and July, the risk of outright deflation seems low, and more importantly the worst of the downward inflationary pressure may have passed. In fact, after declining for three consecutive months, headline consumer prices rose by 0.6% MoM in both June and July, driven by significant uptick in gasoline prices and food. In terms of core prices, there have also been signs of stabilization with medical care, apparel and transportation costs

rising, and home prices remaining buoyant. Stronger incoming data has also pushed up implied inflation expectations over the next 5-years by 1.4pp to 1.5% and by 0.9pp to 1.7% for 5-year forward rates.

The potential for supply-side pressures in areas facing labor shortfalls or quarantine-related production and capacity constraints to generate significant upside risks to prices seems less probable as shortages and rationing have declined with the increased understanding of the Covid-19. As a result, we continue to expect consumer prices to remain low in 2020, but gradually start to move up in the 2H20 notwithstanding a second wave of infections and reinstatement of compulsory stay-at-home orders. Specifically, our baseline assumes CPI growth of 1.1% in 2020 and 1.6% in 2021

Risk balance remains tilted to the downside, upside emerging

Financial Tensions

The combination of quick and forceful intervention from the Fed and a resilient and well-capitalized banking sector have produced fairly sanguine financial conditions in spite of the unprecedented uncertainty and potential threats. However, the limited ammunition still afforded to the Fed, growing concerns about U.S. debt sustainability, risk of capital buffers being tested and the uncertainty surrounding the virus suggest that a renewed period of financial tension and volatility remains a significant risk.

Fiscal Policy

Ultimately, fiscal policy stands to play a far greater role in the direction of risk balance than in normal times given the implications from the rise in Covid-19 cases. Normally, the political and ideological divide between tax and spending is clear. However, continued unemployment insurance benefits, support for state and local governments, specific industries, small businesses, hospitals and healthcare providers, helicopter money, paid sick leave, and funding for testing, vaccinations and therapeutics may be needed in order to avoid a major pullback in consumption and a deterioration in state and local public finances. Failing to do so would greatly increase the downside risks to growth.

However, there is a possibility for a positive surprise on the fiscal front with timely and effective policy making that could help to offset the immense private sector headwinds to growth this year and next. Moreover, keeping people attached to the labor force, providing incentives and support for training while also keeping individuals attached to their current jobs, where reasonable, could positively impact productivity growth and labor force participation, boosting potential GDP during the recovery. It seems the fate of growth in the 2H20 may lie in the hands of policy makers, a first since the Great Depression.

Geopolitical spillovers

After a period of calm during the peak of the pandemic, it appears geopolitical tensions are returning to the recent status quo of increased Sino-U.S. frictions, rising isolationist sentiment, some pandemic-related and other issues linked to lingering trade tensions. Geopolitical frictions are likely to remain elevated, as it is clear the administration believes continuing to take a hardline with China is a successful electoral strategy. Democrats are similarly promoting an American first, with Joe Biden proclaiming that the “future must be made in America.”

Social tensions and growth: seize the opportunity

The explosion of social tensions that followed the killing of George Floyd has brought about concerns that protests and potential lack of social distancing could increase the infection rates in major cities. However, recent research suggests that across 315 U.S. cities the protests did not significantly increase net “stay-at-home” behavior, which is partially explained by the response of non-protesters increasing their social distancing. In fact, Covid-19 case growth was not materially different three weeks following the protests. However, the underlying tensions associated with persistent inequality and systemic racism remain a risk to U.S. growth, productivity, innovation and living standards. In fact, an empirical study by Cook (2014) found that “[t]he increase in scope and intensity of hate-related violence in the late 19th and early 20th centuries depressed patent activity among African Americans by 1% per year, or the equivalent of a year’s worth of African American patent activity.” Addressing these inequities and enhancing the opportunities for minorities has the potential to boost growth and lift productivity, which has slowed considerably in recent decades.

2020 presidential election ramping up

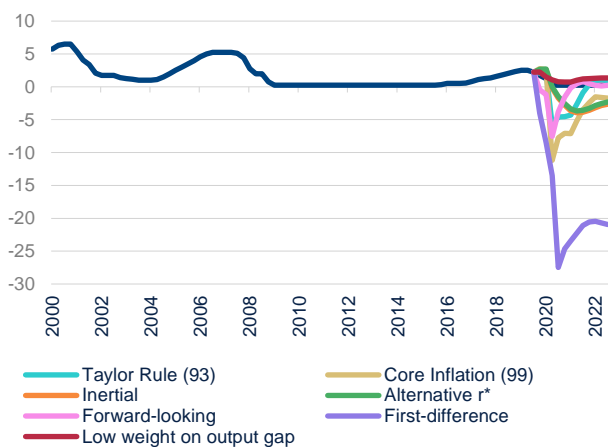
While the outcome of the presidential election in November has the potential to strongly influence the long-term direction of the country, historically short-term economic outcomes have been unrelated to which party holds the White House. What has been shown to be a significant determinant of economic outcomes is the ability to build a filibuster-proof coalition. While there have been calls to end the practice, we still assume the likelihood of either party achieving this is low as well as the dissolution of the filibuster, which has gained in popularity for some factions. As a result, we do not see any major risks to the outlook from the election and thus growth and macro environment should remain largely unchanged with either candidate. That being said, the effects at the industry and regional could vary, as every administration’s policies have redistributive and unintended effects.

3. Fed contemplates their next move

Nearly four years ago today, Chair Yellen delivered a powerful prospectus at the Jackson Hole Economic symposium, laying out what she framed as the past, present, and most importantly future of monetary policy. In that future, policy makers would face challenges and constraints associated with low nominal interest rates and increased likelihood of returning to the Effective Lower Bound (ELB). In fact, she posited that even neutral nominal interest rates at 3% would present significant challenges, as previous FOMCs had between 3 and 10 percentage points of capacity to cut rates in the face of economic headwinds.

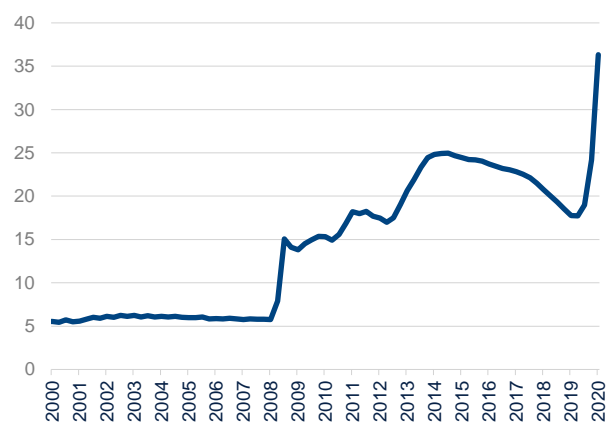
Yet, when the Covid-19 pandemic hit, the effective federal funds rate was 1.58%, significantly below what seemed to be a challenging scenario of nominal rates of 3%. Even in a more traditional business cycle, Chair Yellen said that if neutral rates were closer to 2%, which was the case prior to the pandemic, “asset purchases and forward guidance might have to be pushed to extremes.” Ultimately, the lack of traditional monetary policy capacity and unique challenges presented by this crisis strongly tilt the risk balance for the Fed to the downside.

Figure 3.1 **TAYLOR RULE SIMULATIONS BASED ON BBVA BASELINE (%)**



Source: BBVA Research and FRB of Cleveland

Figure 3.2 **FEDERAL RESERVE ASSETS TO GDP (%)**



Source: BBVA Research and FRB

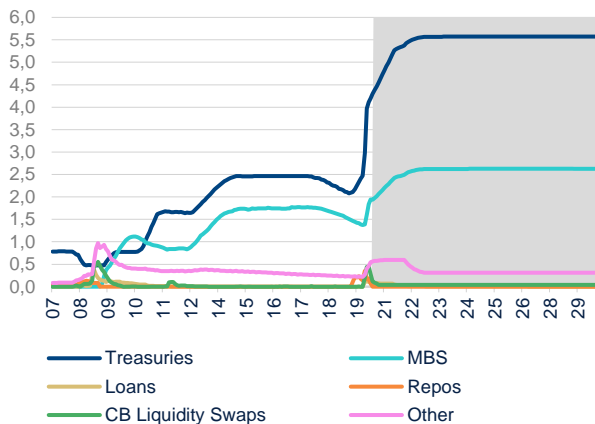
One unforeseen development was the influence that the balance sheet would play in the day-to-day of monetary policy making rather than as a tool for increasing accommodation through Large Scale Asset Purchases (LSAP); in fact, Chair Yellen, famously said that the unwinding of the balance sheet would be like “watching paint dry on the wall.” However, after transitioning from a period of principal reinvestment, which effectively kept the level of the balance sheet constant, to actively draining reserves, the FOMC had to abruptly abandon the strategy of returning the balance sheet to a more normal level in September 2019. The unsuccessful wind down and forced intervention pushed the balance sheet to nearly \$4.1Tn or around 18.9% of GDP in 4Q19. Now, as a result of the pandemic-induced recession, the Fed’s balance sheet as a share of GDP is roughly 36.3%. Excluding the change in Repos, which have been displaced by outright Treasury purchases, around two-thirds of the increase has come from Treasury purchases,

around 23% from Mortgage Backed securities and around nine percent from other line items such as the emergency lending facilities and foreign central bank liquidity swaps.

Although the peak of the health crisis has likely passed, risks remain formidable and the prospects of bringing the labor market back from the crisis remain tenuous. In fact, Powell at his most recent press conference said “[t]his reversal of economic fortune has upended many lives and created great uncertainty about the future.” At 10.2%, the unemployment rate remains at the highest since the Great Depression. What is also going to complicate the accommodation strategy is that a disproportionate number of those unemployed are individuals with lower skills levels in industries that are facing permanent or prolonged dislocations. This suggests that the unemployment rate could remain persistently higher than the natural rate of unemployment. In fact, the unemployment rate for individuals 25 years old and over without a high school diploma is 16.6% as opposed to those with a bachelor’s degree or higher which sits closer to 7%. This presents a unique challenge for the Fed, as these workers, who already faced competition from automation and globalization, are less able to transition within the labor market, meaning that a large number could be at risk of facing prolonged unemployment. This has been shown to decrease labor force participation and even more dire outcomes.

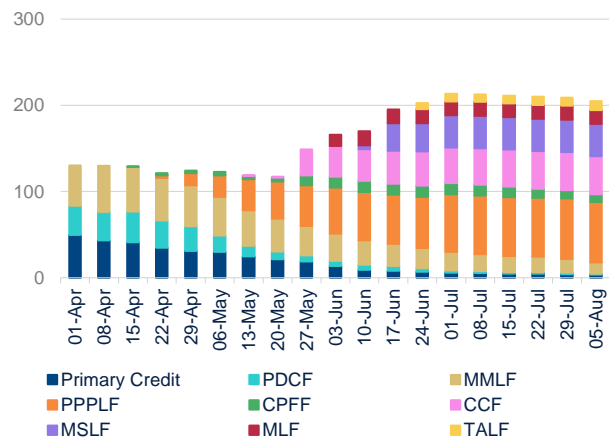
While recent readings on inflation have improved, inflation expectations continue to trend below target. Moreover, the prospects of significant and prolonged labor market slack and a weakened relationship between labor market utilization and inflation implies a lasting undershooting of the 2% inflation target. As such, in spite of the potential upward surprises on the supply side, the outlook for inflation will remain tilted to the downside.

Figure 3.3 **FACTORS SUPPLYING RESERVES (\$TN)**



Source: BBVA Research and FRB

Figure 3.4 **FEDERAL RESERVE LOANS & NET PORTFOLIO HOLDINGS (\$BN)**



Source: BBVA Research and FRB

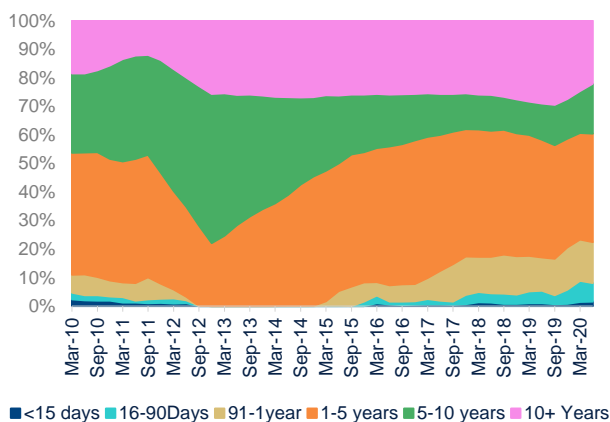
With the Fed having exhausted its two most potent and tested tools- LSAP and interest rates- and with the high likelihood of long-lasting damage to the economy, the question now is how the Fed is going to move from a phase of “stabilization” to one of “accommodation”, and what capacity and willingness there is to implement these untested and riskier tools.

On the usage of emergency lending powers, there seems to be a gap between the Fed's capacity and appetite to utilize these programs and demand. For example, even after expanding the pool of eligible securities and relaxing the restriction on the credit quality, total uptake in the Fed's lending facilities is currently close to \$200bn, well below the risk-adjusted level allowed for by the Exchange Stabilization Fund. While part of this dearth in appetite relates to possible concerns about the conditions associated with usage, it also suggests that private capital markets are functioning at a much higher level relative to the peak of the crisis. Moreover, the remaining capacity could be viewed by the committee as dry powder, which can be used in the event of a future bouts of financial tensions.

As a result, it seems other policies options may need to be implemented to reinforce the policies already in place and to increase accommodation; some within the current scope of the Fed's tools and possibly others outside of its conventional toolkit. First, as commented during the recent post-meeting Q&A, the FOMC could shift its balance sheet strategy from financial stabilization to a more macro-oriented LSAP and maturity extension. While the \$1.9Tn net increase in securities (Treasury and MBS) held outright since March seems to be consistent with targeted LSAP, the Fed has been explicit in its characterization of those purchases as mostly directed at stabilizing financial markets, particularly the Treasury market, which collapsed in March. Going forward this could imply a slightly higher pace of monthly purchases of both Treasury and MBS securities close to \$90bn and \$45bn, respectively; current purchases average around \$80bn for the former and \$40bn for the latter. Moreover, the ability of the Fed to focus on maturity transformation also seems plausible given only 40% of the portfolio matures in more than 5 years, down 40bp since "Operation Twist" in 2013.

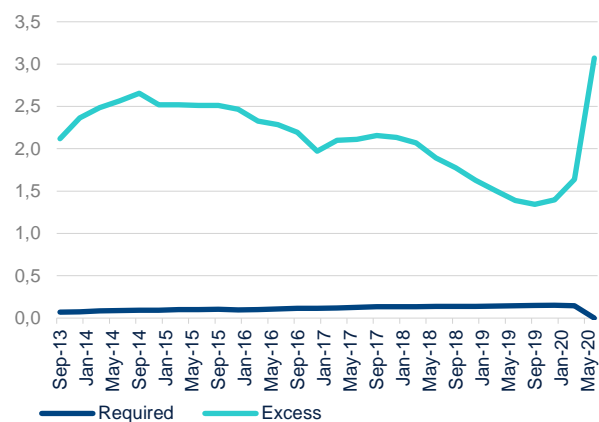
Enhanced forward guidance remains popular among the committee. This could come in the form of a more dovish signal in the interest rate guidance or a commitment to sustained balance sheet expansion. On firming their rate guidance, the committee could enhance "weather recent events" to imply a much longer period of significant accommodation or to alter "is on track" to more explicit quantitative guidance or thresholds or semantically by changing "on track" to has achieved or reached. Given past experience with date-dependent forward guidance, it is unlikely the Fed will move in this direction and conditionality on thresholds for inflation and/or unemployment is more likely.

Figure 3.5 **MATURITY DISTRIBUTION OF FED HOLDINGS (%)**



Source: BBVA Research and FRB

Figure 3.6 **RESERVE BALANCES OF DEPOSITORY INSTITUTIONS (\$TN)**



Source: BBVA Research and FRB

The committee could also use its strategy review, which has been in the works for some time to enhance its forward guidance. Committing to a more aggressive inflation strategy such as flexible inflation averaging, price level targeting, nominal GDP targeting or raising the inflation target could help boost the committee's guidance. For years, the Fed has felt that the 2% inflation target has biased inflation to the downside and that it needs a tool that can help compensate for shortfalls. Given the Fed's cautious approach and lack of appetite for radical changes, average inflation targeting has a higher probability.

Considering that the balance sheet has become a more active policy tool, the committee could also contemplate stronger guidance on purchases-- as they did during the balance sheet wind down- or the duration of the LSAP program. A flow-based LSAP, where purchases continue until certain economic thresholds are met is probably more likely. Using yield curve targeting as a tool to enhance forward guidance is also on the table. Since at least 2010, the Fed has contemplated this option, which presents itself as a more efficient way to keep interest rates low. However, it also implies more uncertainty on the size of the balance sheet.

If the health crisis continues to drag on and economic conditions deteriorate or remain weak for a prolonged period, there are other options. While negative interest rates remain unpopular among the members and loathed by financial markets, there may be a scenario that requires negative nominal administrative rates. Nonetheless, recent examples in other developed countries and the distortions inherent in a negative interest rate policy, particularly with the complexities of U.S. financial markets, suggest this option remains at the bottom of the list.

However, there are alternatives that could be used to encourage lending without penalizing retail savers. For example, the Fed could implement a tiered or quota IOER strategy that penalizes excessive holding of reserves; a number of central banks such as the Swiss National Bank and the Reserve Bank of New Zealand have implemented this system in the post-crisis period. In a similar vein, something akin to the funding-for-lending scheme implemented by the Bank of England could also be an option that encourages consumer and business lending without negative federal funds rates.

Taken together, it seems the recent health crisis and the legacies of the financial crisis have pushed the Fed to its brink in terms of policy making, implying that additional and more lasting accommodation will be needed. These pressures will intensify the more Congress refrains to take action on the fiscal side. As a result, we expect rates to remain at the effective lower bound (ELB) until at least 2023 and for a prolonged period of LSAP, which will bleed into 2021. Moreover, the Fed will stand ready to use its lending facilities if needed. Beyond that, the pleas for additional fiscal support will continue to grow, as evidenced by the former Chair Yellen and Chairman Bernanke trip to Washington and advocacy for actions within the "province of the Congress." Failing to do so could push the Fed to a risky frontier in policy making, which could imply losing its hard fought independence.

4. The return of the yield curve targeting

The challenging economic environment resulting from the Covid-19 pandemic prompted policymakers to employ as much firepower as possible. Under the zero-interest-rate environment, large-scale asset purchase programs (QE) and forward guidance have been the workhorse policies to inject liquidity and boost investor confidence. While they have proved to be effective since the Global Financial Crisis by central banks across the world, new tools are badly needed to increase the Fed's capability of providing additional monetary stimulus.

Moreover, financial markets have been under tremendous pressure. Notably, in early March, the U.S. government bond market had a meltdown: Within two weekdays, yields swung between 0.76% and 0.21% for the 10-year Treasury, and between 1.28% and 0.7% for the 30-year Treasury. Such unusual fluctuations have undoubtedly put the long end of the yield curve on the regulator's map.

Yield curve targets (YCT, also known as yield curve control or yield curve caps) policy is a promising tool to provide more substantial economic stimulus and firmer guidance for longer-term interest rates. Regarding the Federal Reserve's role in preventing market failures and defending the dual mandate, recent discussions within the Fed have centered around the possible adoption of YCT. Based on the minutes from the FOMC's June meeting,¹ participants deliberated the potential usage of YCT policy along with forward guidance and QE. Also, in the same meeting, three previous cases of YCT were discussed in detail:

1. The Federal Reserve's yield curve caps during and following WWII
2. The Bank of Japan's target on 10-year yields of Japanese Government Bonds (JGB) since 2016
3. The Reserve Bank of Australia's target on 3-year yields of Australian Government Bonds (AGB) since March 2020.

Background

The idea of YCT is not entirely new. For example, in the 1940s, to help the U.S. Government finance WWII expenses, the Fed committed to capping Treasuries yields. The front end was anchored at a 0.375% rate and the long end at a 2.5% rate. That is, the Fed promised to clear the market at pre-set yields. In this way, the Federal Reserve ensured that new treasuries would not be sold at heavily discounted prices, and the debt burden on the Government could be minimized. As a result, the Fed's System Open Market Account increased almost eleven-fold between 1941 and 1945.

The Federal Reserve and the Treasury Department announced the end of the yield curve capping in 1951, in what became known as the "Treasury-Federal Reserve Accord," after the Fed decided to prioritize their goal on price stabilization, given the severe inflation after WWII.

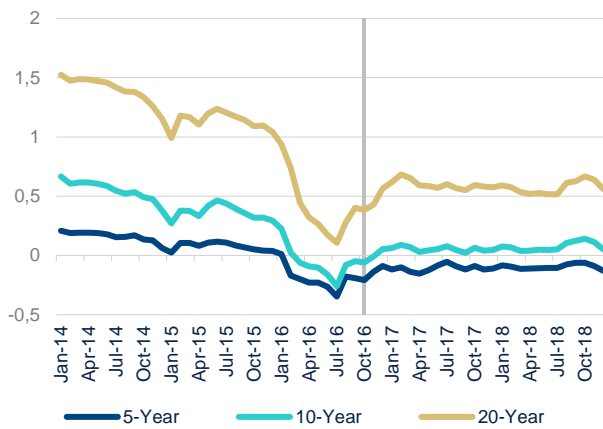
In a more modern context, the idea of using YCT as a tool for monetary policy was revived in a famous speech by former Fed Chair Bernanke (2002),² who argued that "A more direct method, which I personally prefer, would be for the Fed to begin announcing explicit ceilings for yields on longer-maturity Treasury debt..." Later, following the 2007

1: <https://www.federalreserve.gov/monetarypolicy/fomcminutes20200610.htm>

2: Bernanke, B. (2002). *Deflation: making sure "it" doesn't happen here* (No. 530). Board of Governors of the Federal Reserve System.

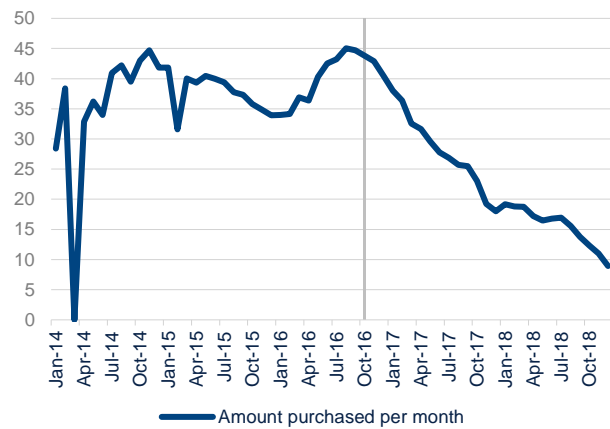
Global Financial Crisis, this idea was further studied by economists and policymakers. In 2016, the Fed released an FOMC memo, showing that YCT was considered a policy tool as early as in 2010.³

Figure 4.1 **JAPANESE GOVERNMENT BOND YIELDS (%)**



Source: BoJ, Haver, and BBVA Research

Figure 4.2 **GOVERNMENT BONDS PURCHASED BY BOJ (TRILLION YEN)**

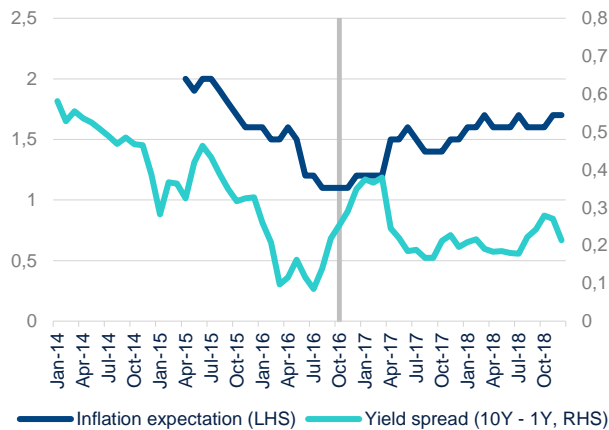


Source: BoJ, Haver, and BBVA Research

However, the Bank of Japan (BoJ) became the first global monetary authority who actually implanted such a policy. In September 2016, after a "comprehensive assessment" of the Japanese economy and monetary policymaking, the BoJ announced that it would set a target level for the 10-year JGB yield at around 0%, the then market level. By that time, the BOJ had implemented Quantitative and Qualitative Easing (QQE) policies for three years. Between 2013 and 2016, the value of treasuries held by the BoJ ballooned almost four times and became a major problem for the policymaker. By committing to maintaining the 10-year treasuries yields around zero percent, the central bank effectively generated a low long-run interest rate without aggressively expanding their balance sheet. In other words, the sheer expectation of infinite intervention was sufficient to convince markets that yields would remain low, even if the central bank did not carry out massive purchases. (Figures 4.1 and 4.2)

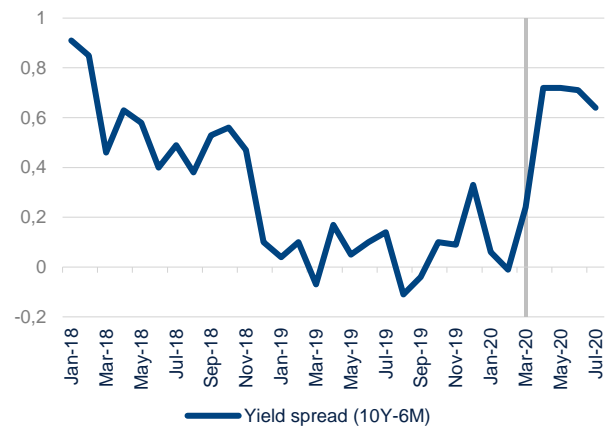
3: Bowman, D., Erceg, C., & Leahy, M. (2010). *Strategies for Targeting Interest Rates Out the Yield Curve*. Board of Governors of the Federal Reserve System.

Figure 4.3 **JAPANESE BOND YIELDS SPREAD AND INFLATION EXPECTATIONS (%)**



Source: BoJ, Consumer Affairs Agency, Haver, and BBVA Research

Figure 4.4 **AUSTRALIAN BOND YIELDS SPREAD (%)**



Source: RBA, Haver, and BBVA Research

After the BoJ announced the new policy framework, JGBs' yields became significantly less volatile, and the pace of the balance sheet expansion considerably slowed down. In other words, the central bank successfully achieved its goal.

However, it is worth noting that a low interest rate for long-term treasuries has a side-effect on inflation expectations. As evidenced by the Japanese experience, the spread between the short- and long-term yields has shaped their inflation expectations in a very narrow range, which is well under the target of 2%. In other words, in a country with a credible central bank, yield curve targeting will firmly guide inflation expectations, which will, in turn, contribute to the actual change in the aggregate price level. Although yields are at low levels, inflation expectations have never risen beyond 2% since the yield curve control policy was implemented. (Figure 4.3)

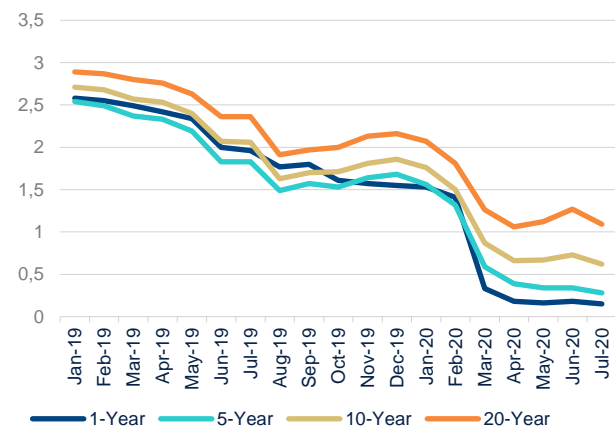
Another example is the Reserve Bank of Australia (RBA), which implemented its version of yield curve control in March 2020 amid the coronavirus pandemic. Learning from Japan's experiences, instead of targeting 10-year Treasuries, the RBA chose to only cap the yield of their 3Y government bonds at around 0.25%, given "its importance as a benchmark rate in financial markets and its role in funding across much of the Australian economy." Once again, the yields were stabilized at the desired level without the central bank purchasing large amounts of government debt. Moreover, the spread between the short- and long-term government bonds actually increased 40 basis points from March to July. (Figure 4.4) Meanwhile, RBA's balance sheet "only" expanded 29%. This result shows RBA successfully achieving its goals with minimal costs.

YCT for the U.S.

As shown in the previous examples from Japan and Australia, by implementing YCT policies, both central banks successfully stabilized the yield curve without aggressively expanding the balance sheet. The "magic" of YCT lies in the credibility of the monetary authority, which influences interest rates through its commitment and expectation, not actual asset purchases. Therefore, YCT can form a powerful combo with QE and forward guidance to maximize monetary stimulus.

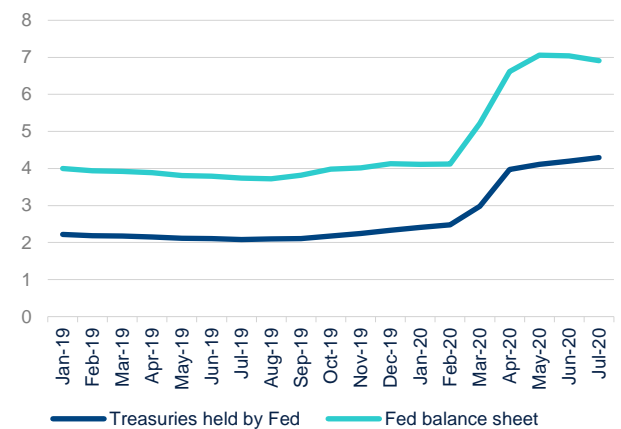
The benefits of YCT is especially valuable amid the unprecedented economic crisis caused by the pandemic. On the one hand, the amount of U.S. Treasury securities held by the Fed surged from 2.5Tn at the end of February to 3Tn at the end of March and to 4.3Tn at the beginning of August - a 72% increase. Meanwhile, the Fed balance sheet rose 66% from 4.2Tn to 7.0Tn in the same period. On the other hand, the volatility of the yields became a problem following the market meltdown in March, while the expansion of the Fed balance sheet did not significantly bring down treasuries yields. (Figures 4.5 and 4.6)

Figure 4.5 **U.S. TREASURY YIELDS (%)**



Source: FRB, Haver, and BBVA Research

Figure 4.6 **FEDERAL RESERVE BALANCE SHEET (TRILLION \$)**



Source: FRB, Haver, and BBVA Research

Prominent economists and policymakers have voiced their support for YCT by the Fed. Notably, Bernanke (2020)⁴ suggests that lowering interest rates throughout the term structure increases the central bank's capability of stimulating the economy beyond QE and forward guidance. However, he also notes that "yield curve control in the Japanese style," that is, pegging very long-term yields, may not work for the US. As the Japanese style YCT requires the Fed to purchase a large share of outstanding bonds, the central bank may suffer significant capital losses. Therefore, he suggested that the Fed only target yields of shorter-term bonds, instead of the whole yield curve.

The idea of targeting the yields of shorter-term bonds is shared by Fed Gov. Brainard (2020).⁵ She argues that "capping interest rates on the short-to-medium segment of the yield curve" could strengthen the effect of forward guidance, as well as reduce the uncertainty caused by asset-purchase programs. Moreover, by not targeting the yield of long-term Treasuries, the policymaker allows more room for inflation expectations to edge up and, ultimately, for inflation to set above the goal of 2%. It is worth noting that this is the view shared in the minutes of the June FOMC meeting. Meanwhile, NY Fed President Williams said in May that policymakers are "thinking very hard" about specific Treasury yield curve targeting.

4: Bernanke, B. S. (2020). The new tools of monetary policy. *American Economic Review*, 110(4), 943-83.

5: Brainard, L. (2020). Monetary Policy Strategies and Tools When Inflation and Interest Rates Are Low: A speech at the 2020 US Monetary Policy Forum, sponsored by the Initiative on Global Markets at the University of Chicago Booth School of Business, New York, New York, February 21, 2020 (No. 87502).

Although YCT policy seems to be a perfect tool for today's economy with the only uncertainty on some specifics of the yield curve, it can also put the central bank in a risky position. That is, with YCT, the Fed will face the danger of further compromising its independence, especially if the Treasury Department issues a large number of bonds that the Fed will have to hold. The central bank can either target the quantity or the price of Treasury securities, but not both. By targeting the yield on treasuries and committing to clearing the market at specific prices, the Fed can no longer decide the size of the balance sheet. Therefore, the cooperation between the monetary and fiscal policymakers becomes critical. In a worst-case scenario, the Fed will be forced to buy a tremendous amount of treasuries if fiscal policy is overly aggressive, as it is the case currently. Between March and July, monthly net Treasury issuance has averaged \$103bn, which is almost four times higher than the historical average. Some policymakers may think that the Fed's balance sheet expansion could be a way to fund massive fiscal policy stimulus, while others may want to have a louder voice inside the Fed.

Bottom line

As QE and forward guidance have become two of the workhorse policy tools for the Fed, it seems that the Fed may choose to target the yield of short-to-medium term Treasuries to further stimulate the economy. Given the recent speech by Chairman Powell on the worrying impact of coronavirus on the U.S. economic recovery, and that the current 5Y Treasury yield is around 0.25%, the likelihood of implementing such a policy tool is rapidly increasing. However, since the success of the YCT policy relies on cooperation between the monetary and fiscal policymakers, their mutual trust, or the lack of it, could play an important role for the Fed to move forward.

5. Tracing the impact of the CARES Act's relief payments towards the Covid-19 crisis recovery

Background

The Coronavirus Aid, Relief, and Economic Security (CARES) Act was signed into law on March 27, 2020 as the third step in careening the sinking U.S. economy in the early days of the Covid-19 crisis. Consumption had all but collapsed as state and local authorities were issuing shelter-in-place orders while fear of the virus further did away with traffic⁶. Total consumer spending continued to fall until the first week of April and slowly rose through the summer of 2020. An upward jut in the recovery of consumer demand is noticeable in mid-April around the time when the CARES provided \$1.7tn in stimulus to small businesses and middle and lower-class Americans in addition to \$500bn granted to the Treasury's Exchange Stabilization Fund as a means to provide direct loans and loan guarantees to air travel, cargo air carriers and businesses critical to national security, and to support the Fed's emergency credit and liquidity facilities for businesses, states, and municipalities.

The effect of transfer payments through efforts to stabilize falling consumption are difficult to measure independently, as stable consumption was the derivative of the Paycheck Protection Program (PPP) loans insofar as they were used to curtail mass layoffs and loss of earnings. The efficacy of actions intended to protect jobs will be best evaluated after the recovery from the Covid-19 crisis as more data becomes available. However, these efforts did provide a unique opportunity to study the impact of scheduled transfers to consumers in the form of an economic stimulus check, which had not been seen en masse since the Great Recession, on top of a temporary increase in unemployment insurance payments. These actions intervened in declining consumer demand and were coincident with sharp increases and sustained recoveries of demand in certain sectors.

Researchers from Harvard and Brown University collected data on consumer spending, the employment situation, earnings and business revenues in order to analyze and share real-time information on the status of the economic recovery. This team's report verified suspected trends resulting from the unique features of the Covid-19 crisis. Most local economies in the U.S. support the following narrative⁷. Reports of the virus' spread in March 2020 causing a behavioral shift primarily in high-income earners which was later codified by local and state mandates. This choking of cash flows affected businesses in high-rent neighborhoods which led to the mass unemployment of low-income earners. This employment crisis then cut-off cash flows to low-rent businesses and other low-income earners, and the cycle began to reinforce itself. Given that realized collapse of consumer spending in both high-income and low-income earners are motivated by different instincts (primarily fear of the virus in the case of higher-income earners and unemployment in low-income earners), we should expect very different reactions between these demographic groups in response to measures put in place by the CARES Act.

6: <https://www.apple.com/covid19/mobility>

7: https://opportunityinsights.org/wp-content/uploads/2020/05/tracker_paper.pdf

These behavioral differences allow us to measure how effective transfer payments to low and middle-income consumers are as a means of fiscal policy, and the considerations we must take in understanding the crisis after the recovery insofar as consumption was bound not only by consumer means but by a perceived existential threat.

Methodology

Using the data published onto the Opportunity Insight Economic Tracker⁸, we are able to track spending, unemployment, and employment and earnings for low, middle and high income earners at the county-level. Given a permanent or temporary shift in the series around the time of enacting the CARES Act and the subsequent distribution of Covid-19 economic stimulus payments and increases to unemployment insurance, we test whether an intervention analysis can largely describe the non-linear movement in the majority of these series. Based on the effect of the intervention, we use a Bayesian estimate of the non-linear coefficient in an otherwise linear ARMA model to describe the magnitude of the intervention, which took place around April 15, 2020,

$$y_t = z_t + \frac{\theta(B)}{\Phi(B)} \epsilon_t$$

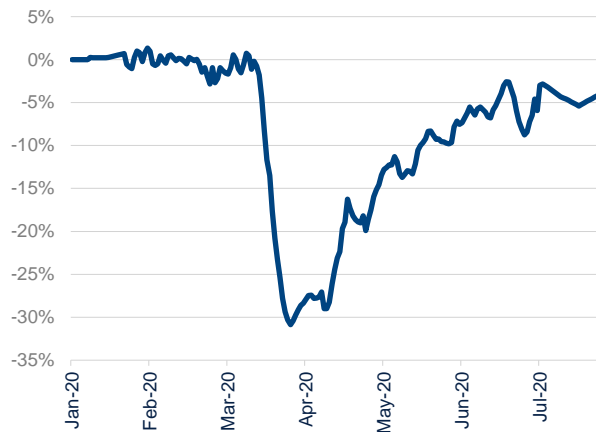
where, y_t is the dependent variable, z_t is the effect of the intervention at time t, and $\frac{\theta(B)}{\Phi(B)} \epsilon_t$ is a fitted ARMA model.

Most variables follow the trend shown in Figure 5.1, of an intervention whose effect gradually levels off for which the speed of recovery is determined by an autoregressive reciprocal factor (z_t) which takes effect simultaneously across all series and is assumed to eventually wear off. The power of this additional factor in explaining the residuals of a standard ARMA model is significantly non-zero, so we choose to apply this model to subseries at the county-level.

The estimate of this reciprocal coefficient lies between zero and one. The closer the coefficient is to one, the greater the effect of the intervention on that series and the faster that series recovered to pre-Covid levels. The exception to this rule is unemployment claims, as it was conjugated since the intervention was assumed to decrease its level as seen in Figure 5.2. Once the effect is calculated for every variable at the county-level, the effect is compared to possibly relevant features of that county's economy in order to describe patterns between these features and the effect of the CARES Act intervention.

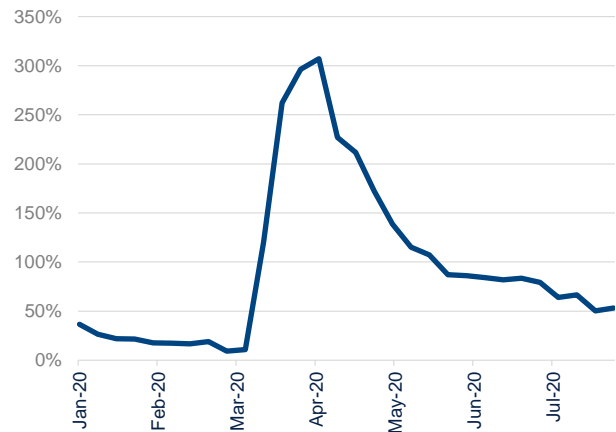
8: <https://tracktherecovery.org/>

Figure 5.1 **RECOVERY OF CONSUMER SPENDING**
(JAN 2020 = 0)



Source: BBVA Research, Harvard, Brown University, U.S. Census Bureau

Figure 5.2 **RECOVERY OF UNEMPLOYMENT**
INSURANCE CLAIMS RATE



Source: BBVA Research, Harvard, Brown University, U.S. Census Bureau

Analysis

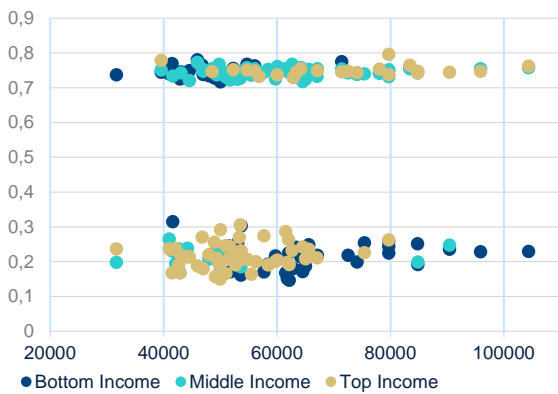
The two main features of each county's economy we choose to focus on is median income and the distribution of wealth as measured by an estimate of a county's Gini coefficient. These features seem important for a surface-level analysis and especially when given the series of events which led to the initial drop in consumer demand; although, we stand to mention other features which deserve future consideration.

The effect on county earnings and county employment naturally trace one another. They form two clusters, counties and populations which responded relatively quickly to stimulus payments, which centers around a coefficient of 0.75 (flat lining around early-May) and those which took much longer to recover, which center around a coefficient of 0.20 (flat lining around mid-July). In this analysis, lower, middle and high income earners correspond to the bottom, middle and top third of household incomes for each county respectively. Given the distribution of household income in the U.S. and qualifications for receiving stimulus checks, most citizens and permanent residents below the 95th percentile of earners qualified from some kind of relief.

At first glance, we would expect low income earners to fall into the group of fast responders to economic stimulus payments and expanded unemployment insurance given that they typically come to mind when we consider which businesses chose to furlough or fire employees once cash flows began to slow. However, low income populations were equally likely to fall into the slower response category regardless of median income or Gini coefficients. This could have several interpretations. Perhaps the nationwide unemployment crisis which described so much economic hardship was highly regional and low-income workers in less affected counties simply did not qualify for unemployment insurance expansions. These counties might have been buffered by their population of essential workers; many of whom worked through the pandemic and only qualified for a stimulus check. Low-income earners in these counties may also consist of immigrants who may appear in the payroll of businesses but who did not qualify for stimulus checks or unemployment insurance. Whatever the explanation may be, this result implies that the aggregate population of low-income earners did not fully recover lost income or employment as a result of a one-time stimulus payment and expansions to unemployment insurance.

Middle income earners almost unanimously fell into the category of populations who greatly benefitted from the CARES Act. Perhaps many fell squarely into the population of employees whose income or job was threatened by the pandemic but who earned enough, either as an individual or as a household, in order to qualify for a stimulus check. Unsurprisingly, high income earners saw very little movement from the CARES Act, as increasingly many fell out of qualifying for any kind of relief payment regardless of whether they lost their job or not. Interestingly, high income populations were more likely to have been positively affected by relief payments if they live in a county with a higher median income or more uniform income distribution which may be the result of a symbiotic relationship between income distribution and reception to aid or stimulus. It is likely that these counties are less economically segregated and higher income earners are more likely to benefit from fiscal policy benefiting low and middle earners.

Figure 5.3 **EARNINGS RATE OF RECOVERY AS COMPARED TO MEDIAN COUNTY HOUSEHOLD INCOME**



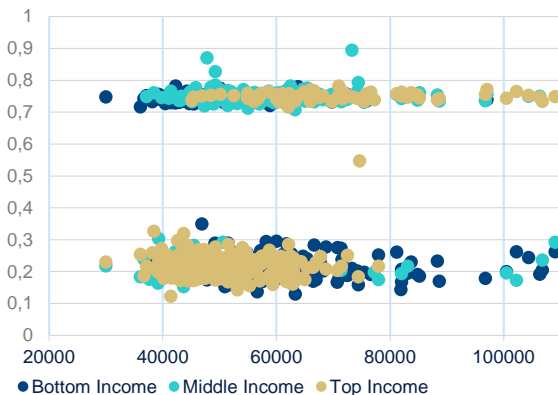
Source: BBVA Research, Harvard, Brown University, U.S. Census Bureau

Figure 5.4 **EARNINGS RATE OF RECOVERY AS COMPARED TO COUNTY GINI**



Source: BBVA Research, Harvard, Brown University, U.S. Census Bureau

Figure 5.5 **EMPLOYMENT RATE OF RECOVERY AS COMPARED TO MEDIAN COUNTY HOUSEHOLD INCOME**



Source: BBVA Research, Harvard, Brown University, U.S. Census Bureau

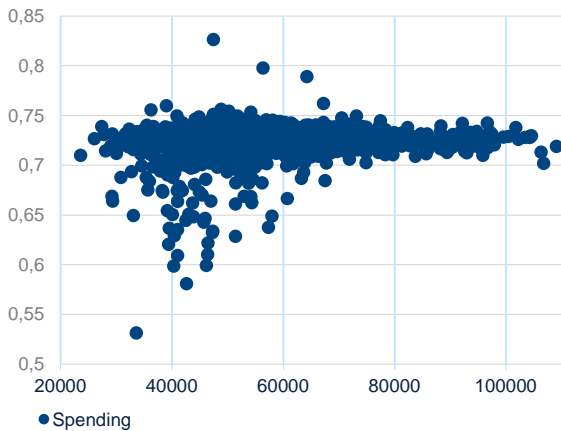
Figure 5.6 **EMPLOYMENT RATE OF RECOVERY AS COMPARED TO COUNTY GINI**



Source: BBVA Research, Harvard, Brown University, U.S. Census Bureau

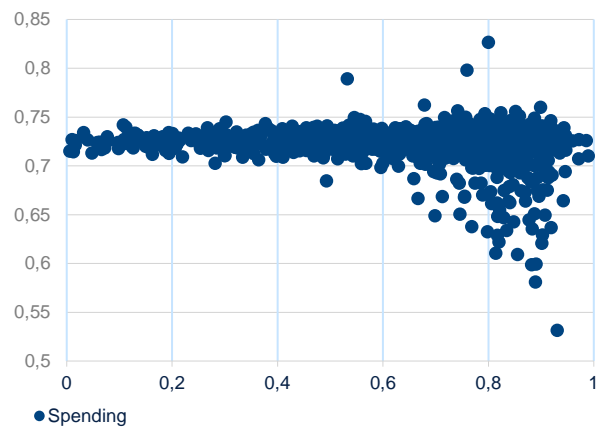
The effects of CARES Act's relief payments on spending is not too surprising. The magnitude at which relief payments stimulated a recovery in spending hovered around 0.72 (flat lining around Early-May). The most interesting pattern in the relationship between income, inequality and the recovery in spending is in its severe heteroscedasticity. Counties with either lower median incomes or higher Gini coefficients had greater variance than richer or more uniform counties. It seems likely that counties with lower median incomes or higher income disparity have a larger population of impoverished people. Perhaps these people were more conservative with their extra income and stimulus checks and chose to save more of it rather than spending it on durable goods like a nontrivial number of low and middle income earners chose to do. These earners may have also spent their relief payments on non-consumer goods and outlays like accrued debt obligations and rent. The implication is of fiscal stimulus which targets low and middle income earners as a means to jumpstart an economic recovery but is blocked by existing structures. Economic segregation and poverty pools cash intended to flow between income groups.

Figure 5.7 **SPENDING RATE OF RECOVERY AS COMPARED TO MEDIAN COUNTY HOUSEHOLD INCOME**



Source: BBVA Research, Harvard, Brown University, U.S. Census Bureau

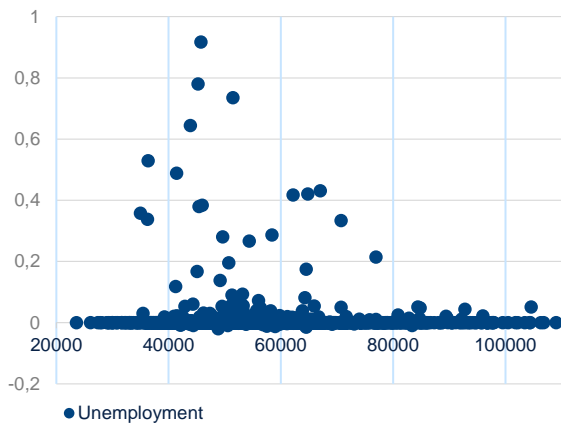
Figure 5.8 **SPENDING RATE OF RECOVERY AS COMPARED TO COUNTY GINI**



Source: BBVA Research, Harvard, Brown University, U.S. Census Bureau

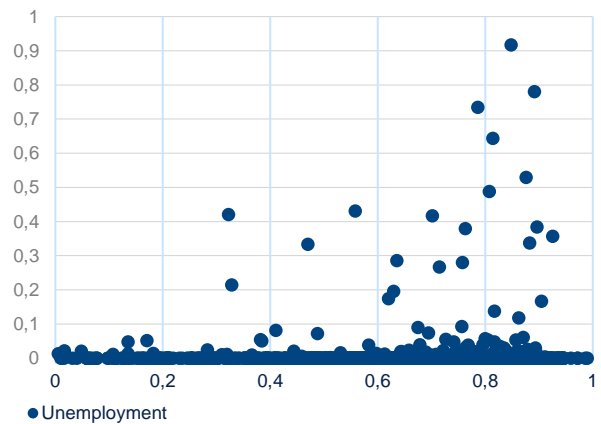
The last variable we considered was the effect of relief payments on unemployment claims. This variable is more difficult to describe in terms of one-time transfers, as claims were starting to inflect around the week relief payments and unemployment insurance expansions were issued. The PPP loans issued in the CARES Act had a sizable role in slowing unemployment insurance claims in mid-April, so any improvement in this period is less likely to be attributed to payments made to consumers but rather to PPP. Nonetheless, as spending recovered in the second half of April, with the economic impact payments, new unemployment insurance claims continued to trend down. In fact, most counties saw a definite and immediate slowdown in claims following the CARES Act. An interesting pattern is that a sizable number of counties with a low median income and high Gini coefficient saw little improvement in claims following the issuance of payments. This pattern disappears with higher median incomes and at the absolute bottom rung of income uniformity and median income. Once again, it seems as if economic structures prevent transfers to consumers from resulting in a recovery in employment.

Figure 5.9 **UNEMPLOYMENT CLAIMS RATE OF RECOVERY AS COMPARED TO MEDIAN COUNTY HOUSEHOLD INCOME**



Source: BBVA Research, Harvard, Brown University, U.S. Census Bureau

Figure 5.10 **UNEMPLOYMENT CLAIMS RATE OF RECOVERY AS COMPARED TO COUNTY GINI**



Source: BBVA Research, Harvard, Brown University, U.S. Census Bureau

These eight variables (earnings and employment across low, middle and high income earners; spending; and unemployment) would be interesting to compare with other explanatory variables aside from income and Gini coefficient. We would likely see some strong patterns emerge from GDP by sector, median age, population and population density and in geographic clustering. These variables are very specific to the Covid-19 crisis but will be very important to consider in order to contextualize the recovery and mitigation in the post-crisis world. Results shed light on how transfers to consumers percolate and how policy as general as an economic stimulus check can target specific affected groups and sectors.

Conclusion

An account of the Covid-19 crisis in which contractions in consumer spending reverberated in the lower and middle classes seems to validate transfers directly to those affected consumers as a kick-start to the economy. Although, we now realize that the behavioral effects of the crisis were too complex to resolve with any single kind of fiscal action, as most goods and services which require one's presence have yet to fully recover to pre-pandemic levels as of August 2020. This is consistent with a narrative in which contractions in consumer spending in the lower classes were motivated by their means rather than from fear of the virus. If it was the intention of policy makers to stimulate economic recovery specifically in the middle classes, then they certainly hit the target with stimulus checks and expansions of unemployment insurance; meanwhile, economic structures such as poverty and inequality prevented transfers from realizing recovery elsewhere.

6. Hydrogen: an essential piece of the clean energy puzzle

Introduction

Hydrogen is the simplest and most abundant element in the universe. It is used in the manufacturing of several products, and like electricity, it is an energy carrier. As pressures to keep global warming under control mount, businesses, scientists, and policymakers are paying attention to hydrogen and its potential role in the transition to a clean economy. Hydrogen is a clean source of energy; when it burns, it produces water instead of carbon dioxide (CO₂). In particular, hydrogen could help decarbonize industries for which greenhouse gas (GHG) emissions are challenging to decrease, such as transportation, aviation, petroleum products, construction materials, and chemical manufacturing. In the following paragraphs, we discuss the potential benefits and limitations of hydrogen as a source of clean energy.

Hydrogen today

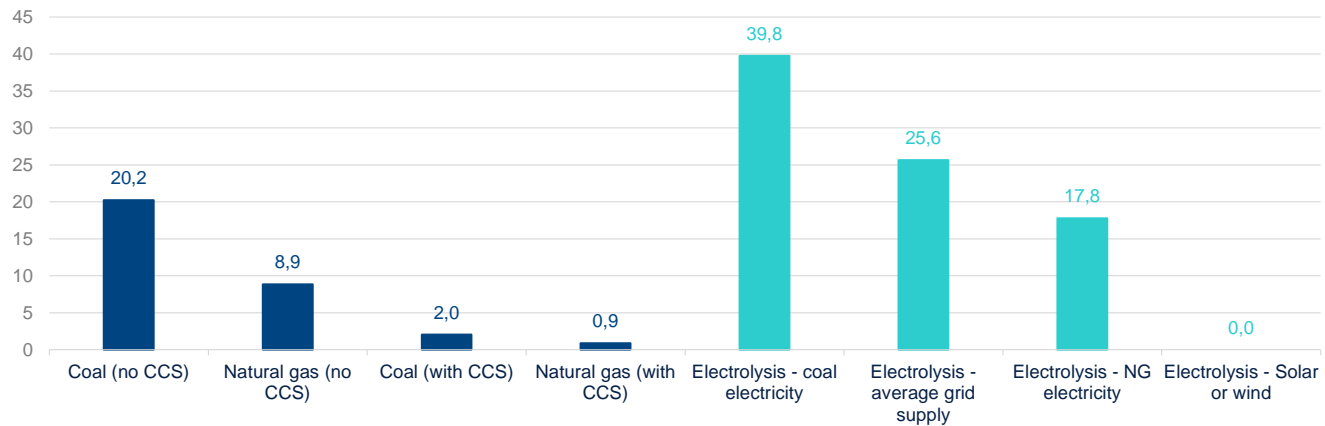
Hydrogen is a well-established global industry with an annual production of ~70 million metric tons and revenues of around \$130bn.⁹ It is used primarily for industrial applications. The refining, chemical, and iron and steel industries consumed roughly three-quarters of the hydrogen produced in the world. Oil refineries employ hydrogen to remove sulfur from refined products. The chemical industry utilizes hydrogen as a feedstock to produce ammonia that is used in the manufacturing of fertilizers and household cleaning products. Hydrogen is also an input in the production of methanol that is used to create fuel, solvents, and antifreeze. Because hydrogen has a very low mass per unit of volume, it is difficult to transport and store. Consequently, 90% of hydrogen is produced in captive plants close to the end-user.

Hydrogen cannot be found in its pure state, so it has to be obtained from other elements. Currently, nearly 95% of the world's hydrogen supply comes from fossil fuels through a process known as steam methane reforming (SMR), in which high-temperature steam is used to produce hydrogen from a methane source like natural gas.

Although the combustion of hydrogen generates zero emissions, its production is highly polluting, generating nearly 830 million metric tons of CO₂ per year (equivalent to the emissions of the UK and Indonesia combined). One kilogram of hydrogen generates about 9 kg of CO₂ if manufactured with natural gas, and 20 kg of CO₂ if manufactured with coal. However, producing hydrogen at a large scale with zero emissions will be possible in the following decades, thanks to the expansion of renewable energy and the development of carbon capture technologies.

9: Source: International Energy Agency and Morgan Stanley

Figure 6.1 **CO2 INTENSITY OF HYDROGEN PRODUCTION (KGCO2/KGH2)**



Source: Bloomberg New Energy Finance, Hydrogen Economy Outlook

The declining cost of renewable energy has made it possible to produce hydrogen with no carbon emissions via water electrolysis. The hydrogen produced by this technique is known as **“green hydrogen”** and currently accounts for 4% (~2.8 million metric tons) of total production. Globally, there are 21 announced green hydrogen projects with a total capacity of 3GW, mainly located in Europe.

Also, innovations such as carbon capture, utilization, and storage (CCUS) could significantly reduce emissions from SMR, resulting in what is known as **“blue hydrogen.”** CCUS technologies prevent emissions by sequestering the CO2 produced by industrial plants, compressing it for transportation, and injecting it deep into rock formations where it can be stored permanently. The CO2 captured by CCUS can also be used for the enhanced recovery of crude oil, the manufacturing of concrete, chemicals, etc. In 2019, there were 51 global CCUS large-scale projects, from which 19 are in operation, four are in construction, ten are in advance development, and 18 are in early development. Together they have the capacity to capture 100 million metric tons of CO2 per year¹⁰, equivalent to the electricity use of 16.9 million homes¹¹. Three of the plants in operation are dedicated to hydrogen production.

Hydrogen beyond existing applications

Hydrogen has proved to be an excellent alternative to decarbonize transportation. Instead of a battery, hydrogen-powered vehicles rely on a fuel cell that uses the energy contained in hydrogen to produce electricity. Fuel-cell electric vehicles (FCEV) have no tailpipe emissions besides water and warm air. Since hydrogen can store three times more energy per unit of weight than gasoline or diesel, FCEVs can yield over 500 miles on a full tank, more than combustion engines and fully-charged battery electric vehicles (BEVs). Contrary to BEVs, FCEVs can be refueled in five minutes, similar to combustion engines. At present, Honda, Toyota, and Hyundai have released models powered by hydrogen.

10: Source: Global CCS Institute

11: Source: EPA Greenhouse Gas Equivalencies Calculator

However, the massive adoption of FCEVs still faces some challenges. Available models are expensive (~\$60,000) and, contrary to BEVs, cannot be charged at home. Thus, the success of FVEs depends on public charging infrastructure, which at this moment is very limited. Moreover, hydrogen is still more expensive than gasoline and electricity. In contrast to passenger vehicles, heavy trucks that move goods and services over long distances appear to be the most promising niche for hydrogen, given its higher energy density relative to electric batteries.

Other sectors where hydrogen has shown potential for emissions reduction are maritime shipping, aviation, high-temperature heat, buildings, and electricity.

Almost 90% of traded goods are transported by sea, and the maritime shipping industry is responsible for 2.5% of CO₂ emissions. Technologies available include fuel cells, ammonia, and hydrogen engines. Switching entirely to hydrogen would require substantial investments in adapting ships and bunkering infrastructure. In the short-run, companies are exploring the possibility of blending hydrogen with fossil fuels currently in use. Another alternative is for ships to use ammonia, a byproduct of hydrogen that is widely moved by ship.

Industries like cement, chemical, iron and steel, and aluminum, could use hydrogen to produce heat. Currently, these industries use fossil fuels (mainly coal) to generate high-temperature heat for different processes such as gasifying and melting, as well as chemical reactions. These industries are likely to continue expanding in the following decades in tandem with population and economic growth. Industrial high-temperature (responsible for 3.3% of total CO₂ emissions) is the hardest activity to reach by clean energy sources.

Similarly, low-carbon fuel options are limited in the aviation industry. Hydrogen-blended fuels could become an alternative for lowering emissions; however, this option is still considerably more expensive than jet fuel. Similarly, hydrogen has been considered an energy alternative for buildings as it can be transported through the same pipeline infrastructure as natural gas. However, hydrogen-only heating and cooling systems would require changes in delivering infrastructure and appliances, which could entail substantial costs for companies and consumers. Another, potentially more affordable option is to blend hydrogen with natural gas.

Hydrogen can also be mixed with natural gas to produce electricity at the utility-scale. This would help utilities to compensate for supply when the production of renewable electricity is low. Moreover, hydrogen from electrolysis can be used to store excess electricity generated by wind and solar when demand is low, and supply is high. This energy can be stored in rock formations similar to natural gas. In the long-run, hydrogen could become a substitute for natural gas in the production of electricity.

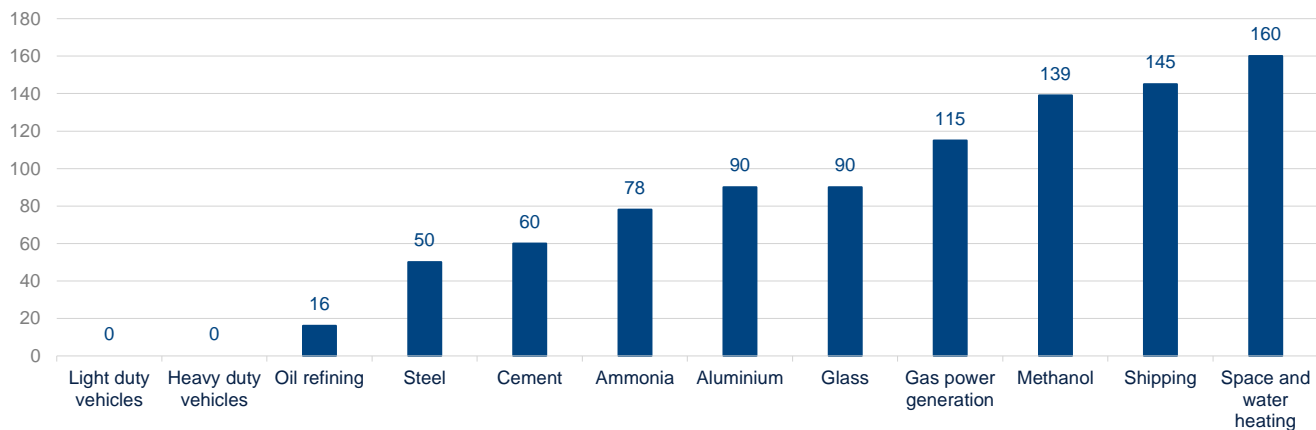
The challenges for large-scale production

Despite its potential as a clean source of energy in hard to abate industries, hydrogen is still expensive. For most of the sectors described above, carbon prices need to be very high for hydrogen to be competitive with fossil fuels under current technologies. For example, according to Bloomberg New Energy Finance (BNEF), carbon prices would have to be in the order of \$160/tCO₂e by 2050 for space and water heating to compete with natural gas, while gas power generation would require a carbon price of \$115/tCO₂e. To put this in perspective, today's carbon prices range between \$1/tCO₂e and \$119/tCO₂e, with half-of the covered emissions priced at less than \$10/tCO₂e.¹² This suggests

¹²: Source: World Bank

that significant government intervention and technological progress are required for blue and green hydrogen industries to succeed. Government intervention could be in the form of subsidies, tax incentives, low carbon regulations, and R&D spending.

Figure 6.2 **CARBON PRICES REQUIRED FOR HYDROGEN TO COMPETE WITH THE CHEAPEST FOSSIL FUEL IN EACH USE CASE, 2050 (\$/TCO₂E)**



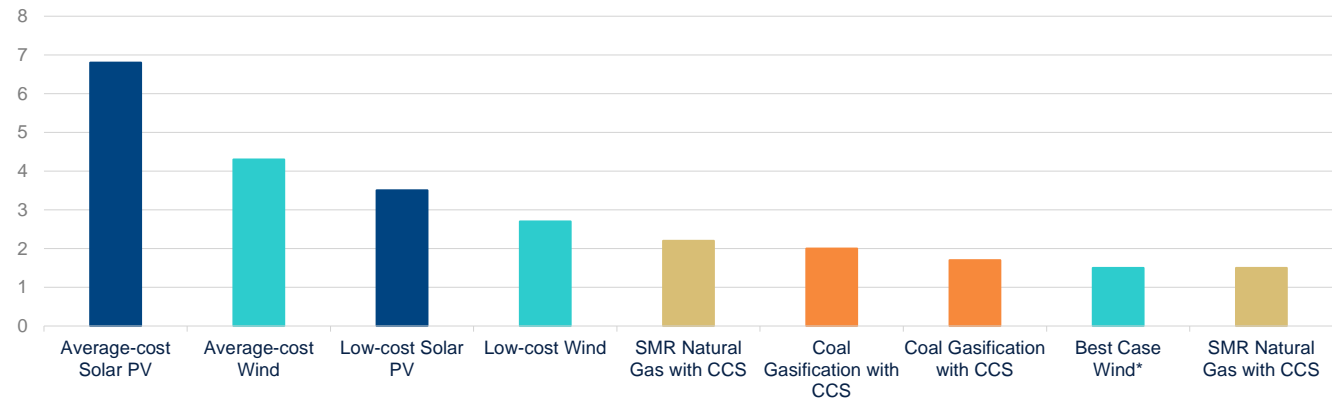
Source: BBVA Research with data from Bloomberg New Energy Finance, Hydrogen Economy Outlook

There are also technical challenges that make the use of hydrogen expensive. Because of its very low density, a significant portion of the energy is lost in production, transportation, and combustion, making hydrogen less efficient than fossil fuels and electric batteries. More R&D and innovation will be needed in the following decades to solve these issues.

Another challenge has to do with production methods. CCUS have not scaled as quickly as expected. Although a new wave of investments seems to be emerging, the adverse economic effects of the pandemic could delay its progress. The Global CCS Institute estimates that for CCUS to meet climate change mitigation targets, the number of large-scale projects would have to increase to 2,000 by 2040.

Today, green hydrogen is also expensive compared to other fossil fuels. But the cost of electrolysis is expected to decline significantly in the following decades. BNEF expects water electrolysis powered by renewable electricity to become the cheapest form of hydrogen production in the long-term due to the declining cost of renewable electricity and electrolyzers. However, vast amounts of land and water would still be needed to produce green hydrogen at large scale, making these types of projects unfeasible in places where land is scarce, and demand for hydrogen is growing like South Korea or Japan.

Figure 6.3 **COST OF PRODUCING HYDROGEN FROM RENEWABLES AND FOSSIL FUELS TODAY**
(LEVELIZED COST OF HYDROGEN, \$/KG)



*Assumes an electrolyzer cost of \$200.

Source: BBVA Research with data from International Renewable Agency, The Future of Hydrogen. Seizing Today's Opportunities

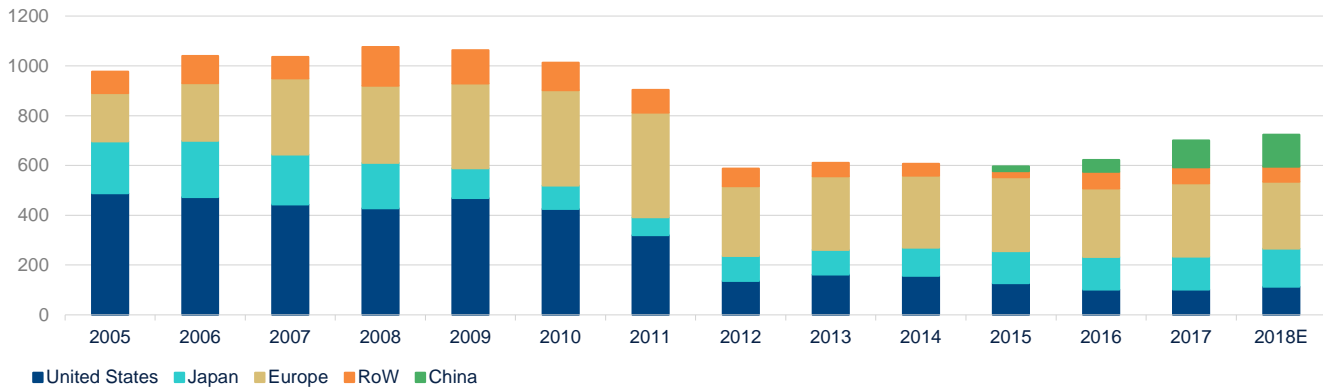
Hydrogen prospects in the United States

The U.S., on the other hand, has everything that is needed to become the global “powerhouse” of hydrogen: capital, land, industry clusters, renewable energy assets, storage capacity, research capabilities, etc. Approximately 95% of the hydrogen produced in the country comes from natural gas via SMR. The country already leads the world in CCUS projects. In Port Arthur, Texas, Air Products’ carbon capture plant produces hydrogen using SMR and CCUS. The plant has mitigated about 5 million metric tons of CO₂. New projects are coming, and the federal government has supported the development of CCUS through section 45Q of the Internal Revenue Code that establishes tax credits for the storage of CO₂. In 2019, the Utilizing Significant Emissions with Innovative Technologies (USE IT) Act, an attempt to provide more certainty to CCUS projects, was introduced to Congress. Meanwhile, California’s Low Carbon Fuel Standard included a CCUS protocol in 2019.¹³ States like Montana, Louisiana, Texas, and North Dakota provide tax incentives for CCUS projects. Blue hydrogen could be a good way for the American oil and gas and other hard to abate industries to thrive in a world that is increasingly looking for alternatives to fossil fuels.

However, the country is lagging behind other advanced economies when it comes to new applications. R&D in hydrogen and fuel cells declined from nearly \$489 million in 2005 to about \$113 million in 2018, and it is currently the lowest amid advanced nations. Most of the projects related to “green hydrogen” are not in the U.S., but in northern Europe and Asia. The EU, for example, recently announced plans to install 40GW of “green hydrogen” capacity by 2030, equivalent to the production of 40 nuclear plants.

¹³ Source: Global CCS Institute

Figure 6.4 **GOVERNMENT R&D BUDGET FOR HYDROGEN AND FUEL CELLS (MILLION 2018 USD)**



Source: BBVA Research with data from Bloomberg New Energy Finance, Hydrogen Economy Outlook

Under the right incentives, the U.S. could turn hydrogen into a profitable export business, replicating the success story of liquefied natural gas (LNG). The country could leverage on existing pipeline infrastructure to transport hydrogen to export terminals and from there to regions where demand is growing. Moreover, as wind and solar continue to expand, the possibilities for green hydrogen increase, particularly in states with the highest installed capacity, such as Texas, Iowa, California, and North Carolina, among others.

Bottom line

Hydrogen could play an essential role in the energy mix needed to achieve a low-carbon economy. In the U.S., the oil and gas industry could exploit the benefits of producing blue hydrogen. At the same time, the expansion of renewable energy and the expected decline in the cost of electrolysis will facilitate the production of green hydrogen at a large scale. However, despite their benefits, hydrogen alternatives are still financially risky to generate a sustained wave of private investments, similar to the one experienced by wind or solar. Therefore, government incentives like tax credits, and carbon taxes, are needed for the industry to flourish. As the success of wind and solar energy proves, these incentives are worth it since hydrogen is probably the only viable alternative that some industries have to significantly lower their carbon footprint. At the same time, the population benefits from lower pollution, improved health conditions, and lower risks of climate-related disasters, thereby making hydrogen a win-win option for all.

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7. Credit standards, deleveraging and bank lending in the aftermath of the Covid-19 crisis

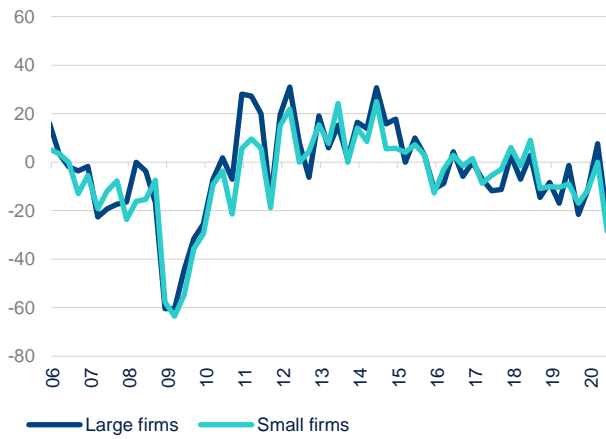
The latest Senior Loan Officer Opinion Survey (SLOOS) shows that in 2Q20 banks continued tightening credit standards for the second consecutive quarter. Historically, a tightening cycle tends to last several quarters, meaning that if this cycle behaves as in previous episodes, credit standards relaxation is not likely to occur before mid-2021. However, given the uniqueness of the pandemic-induced recession, there is elevated uncertainty on the magnitude and duration of the current tightening cycle.

The survey is relevant because credit standards tightening and lower willingness to lend are good predictors of subsequent loan growth and can contribute to deleveraging, leading to lower growth prospects after the recession. Going forward, after a one-off contraction of loans outstanding due to the repayment of the Paycheck Protection Program (PPP) loans, the survey suggests that underlying loan growth will moderate. Obviously, additional fiscal and monetary support that provides ample liquidity and lending on attractive terms could delay or even reverse this outlook.

Latest SLOOS survey results

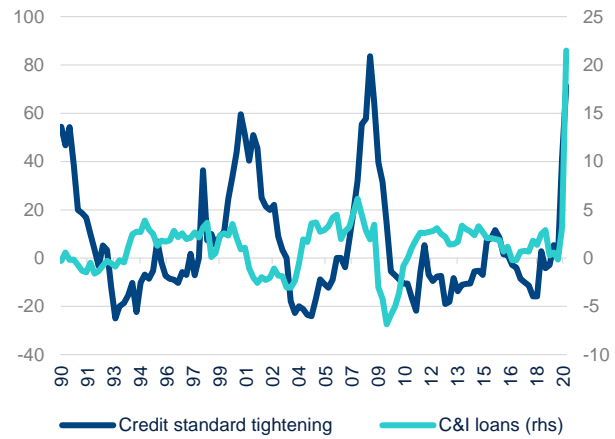
Commercial and Industrial (C&I) loans increased by 21% in 2Q20 relative to the previous quarter due to the PPP support provided by Congress. In this context, it is surprising that respondents reported weakening demand (Chart 7.1), with the only exception being large and middle market firms (annual sales of over \$50mn) borrowing from large banks. This confirms that large companies and large banks are weathering the current recession somewhat better. Still, the decline in net loan demand is small relative to the depths of the Great Financial Crisis (GFC) although it is likely to widen in the following survey with the PPP closing on August 8 and the absence of another round of small business stimulus. Unlike credit demand, credit standards tightening for C&I loans has already reached GFC levels and surpassed the peaks reached in the early 1990s and the 2001 recessions (Chart 7.2). Given that C&I loan growth lags credit standards by three to four quarters, the slowdown in underlying C&I lending at the start of 3Q20 is in its early stages. The reasons provided in the survey for the tightening in 2Q20 were the worsening economic outlook and industry-specific problems, confirming that the economic contraction has not yet affected banks' capital and liquidity positions, which stand much stronger than before the GFC.

Figure 7.1 **C&I LOAN DEMAND**
(NET % RESPONDENTS REPORTING STRONGER DEMAND)



Source: BBVA Research and Federal Reserve

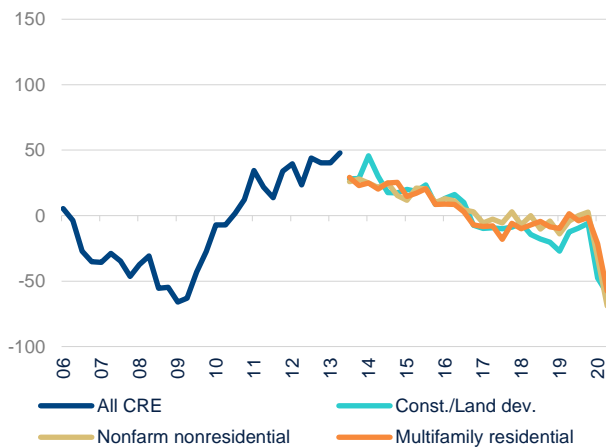
Figure 7.2 **C&I CREDIT STANDARDS AND LOANS GROWTH RATES** (NET % RESPONDENTS REPORTING TIGHTENING AND QOQ %)



Source: BBVA Research and Federal Reserve

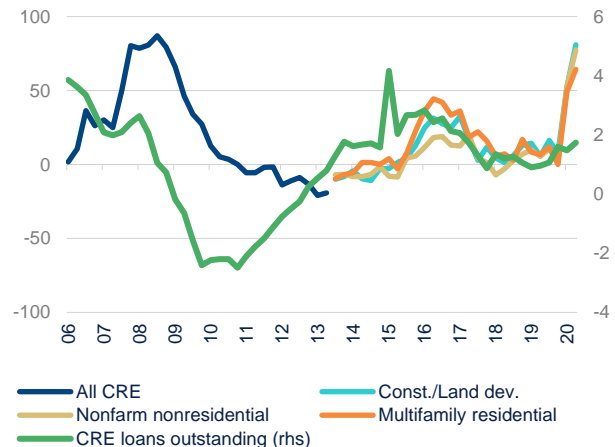
According to the survey, demand for new Commercial Real Estate (CRE) loans collapsed in 2Q20 (Figure 7.3). That said, this is still not reflected in the level of CRE loans outstanding, which in fact increased by 1.7% QoQ. The reason behind the disconnect likely lies in the precautionary drawing of funds from existing credit lines, which is likely to subside in the coming period. Credit standards are close to the levels observed in the GFC (Figure 7.4) showing widespread deterioration, even for multifamily loans, which have experienced double-digit growth and twice as fast as the rest of CRE segments. The survey results imply a significant decline in CRE loans outstanding in the coming 12 to 24 months.

Figure 7.3 **CRE LOANS DEMAND**
(NET % RESPONDENTS REPORTING STRONGER DEMAND)



Source: BBVA Research and Federal Reserve

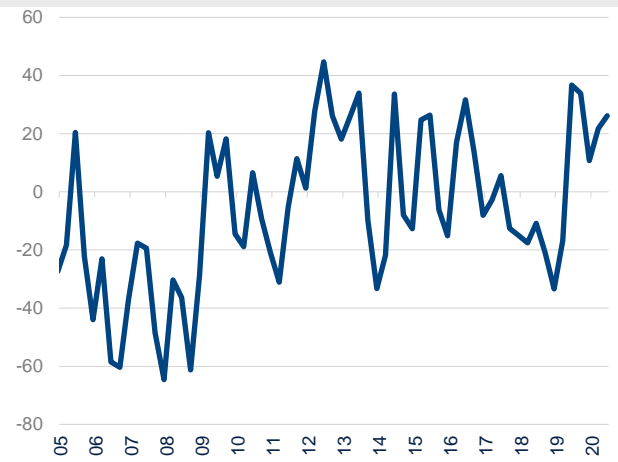
Figure 7.4 **CRE CREDIT STANDARDS AND LOANS GROWTH RATES** (NET % RESPONDENTS REPORTING TIGHTENING AND QOQ %)



Source: BBVA Research and Federal Reserve

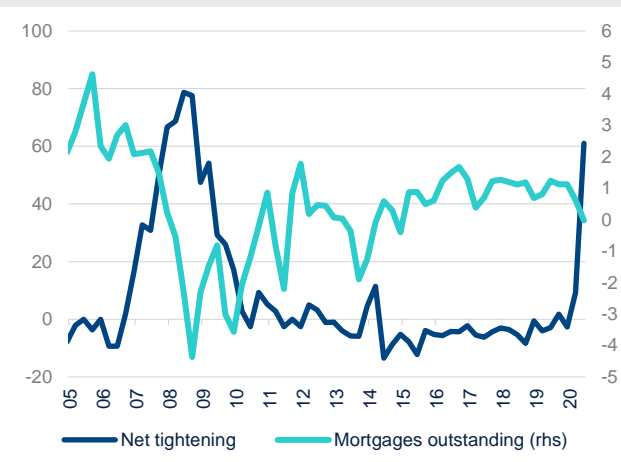
The survey shows different developments in residential mortgages. Despite the economic downturn in 2Q20, credit officers reported an increase in the demand for housing finance (Figure 7.5), for the fifth quarter in a row, which coincides with the decline in mortgage interest rates that started in early 2019. However, mortgage balances outstanding at commercial banks declined slightly compared to the previous quarter, while credit standards tightened (Figure 7.6). While the handicapped spring home-buying season due to the temporary shut-downs limited loan production, the decline in balances is also a result of banks underwriting more GSE eligible mortgages, which are sold to Fannie Mae and Freddie Mac, and less non-eligible mortgages, which tend to remain on the banks' balance sheets. Credit standards by type of mortgage confirm this, as they tightened the most for non-qualifying jumbo loans and the least for Government and GSE-eligible mortgages (Figure 7.7); disregarding subprime mortgages, which tend to not be underwritten in large numbers currently. Current conditions will persist over the next couple of quarters, leading to a further decline in the growth of mortgage balances on banks' balance sheets, but any pullback is not likely to be strong. Household finances remain relatively strong after a period of deleveraging and support of enhanced unemployment insurance and economic impact payments. Also, borrowing rates remain near record lows and affordability is near a four-year peak. Moreover, mortgage delinquencies remain near record low rates (Figure 7.8) buoyed by solid underwriting over the last decade.

Figure 7.5 **MORTGAGES DEMAND**
(NET % RESPONDENTS REPORTING STRONGER DEMAND)



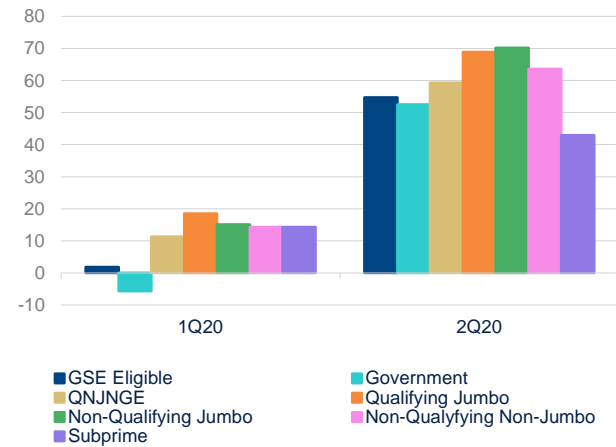
Source: BBVA Research and Haver Analytics

Figure 7.6 **MORTGAGES CREDIT STANDARDS AND GROWTH RATES**
(NET % RESPONDENTS REPORTING TIGHTENING AND QOQ %)



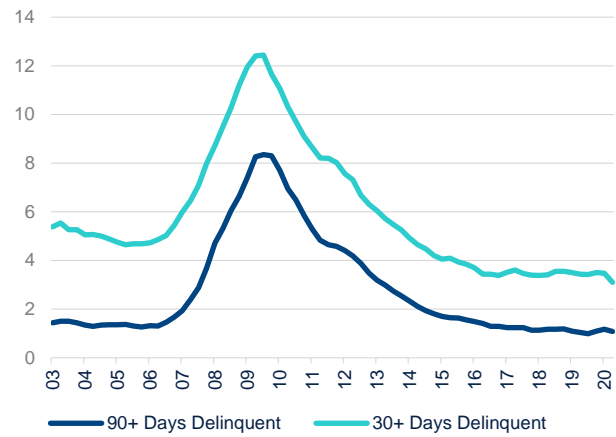
Source: BBVA Research and Federal Reserve

Figure 7.7 **MORTGAGES CREDIT STANDARDS BY TYPE (NET % RESPONDENTS REPORTING TIGHTENING)**



*QNJNGE: Qualifying Non-Jumbo Non-GSE Eligible
Source: BBVA Research and Federal Reserve

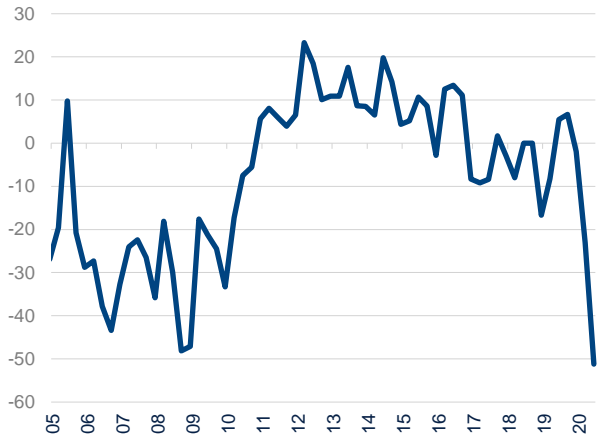
Figure 7.8 **MORTGAGE LOANS NEW DELINQUENT RATE (%)**



Source: BBVA Research and NYFRB

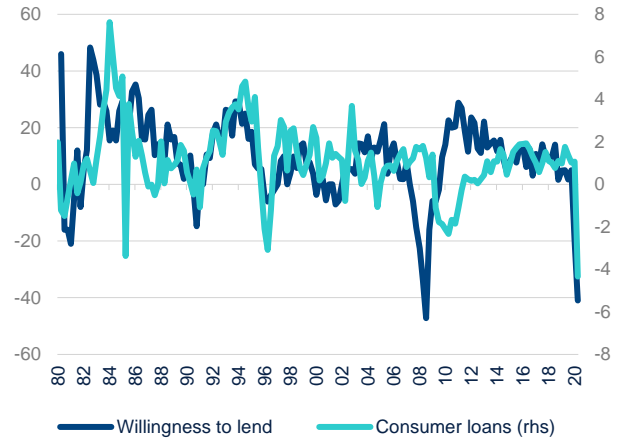
According to SLOOS respondents, demand for new consumer loans and willingness to lend declined dramatically in 2Q20 (Figure 7.9). This is consistent with consumer loan balances declining by 4.3% relative to 1Q20. Most of the movement in consumer loans has been due to a decline in outstanding credit card balances, which contracted 8.4% relative to 1Q20, as consumers increased precautionary savings and paid down parts of their credit card balances. Credit standards tightened across all types of consumer credit (Figure 7.11), with auto loan faring better than credit cards and other consumer loans. Lower tightening in the auto loan segments suggests that these products will be the first to start recovering in the wake of the current downturn. This process will be further supported by solid credit quality, with newly 30+ days delinquent auto loans having also declined last quarter (Figure 7.12). While we expect consumer credit quality to deteriorate significantly due to high unemployment, fiscal support and strong balance sheets of a large segment of the population will limit the downside risks.

Figure 7.9 **CONSUMER LOANS DEMAND**
(NET % RESPONDENTS REPORTING STRONGER DEMAND)



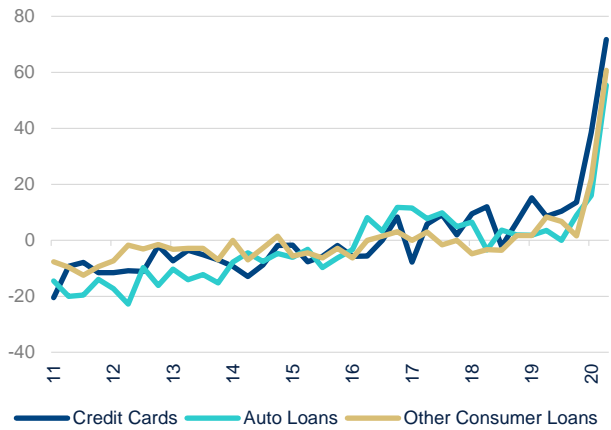
Source: BBVA Research and Federal Reserve

Figure 7.10 **CONSUMER LOANS WILLINGNESS TO LEND AND GROWTH RATES**
(% RESPONDENTS REPORTING HIGHER WILLINGNESS TO LEND AND %QoQ)



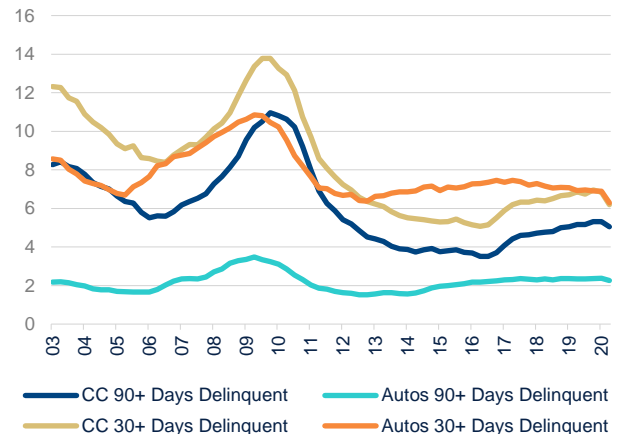
Source: BBVA Research and Federal Reserve

Figure 7.11 **CONSUMER CREDIT STANDARDS BY TYPE**
(NET % RESPONDENTS REPORTING TIGHTENING)



Source: BBVA Research and Federal Reserve

Figure 7.12 **CONSUMER LOANS NEW DELINQUENT RATE (%)**



Source: BBVA Research and NYFRB

Debt deleveraging

Credit standard tightening is related to deleveraging, which is a process of paying down debt by overindebted companies and sectors that usually occurs in the wake of a recession. Large waves of deleveraging tend to happen to sectors that borrowed the most in the run-up to a crisis. For example, households deleveraged massively following the GFC, while nonfinancial businesses deleveraged both after the 2001 recession and the GFC (Figure 7.13). The three primary drivers of the deleveraging process are reduced supply of credit by financial institutions, diminished credit demand because of increased borrowers' caution, and bankruptcies. In light of the current developments with the Covid-19 recession and the evident tightening of credit standards, it is important to understand the three forces and their likely impact on the economy, as large and prolonged deleveraging can substantially weigh down on the post-crisis rate of economic growth.

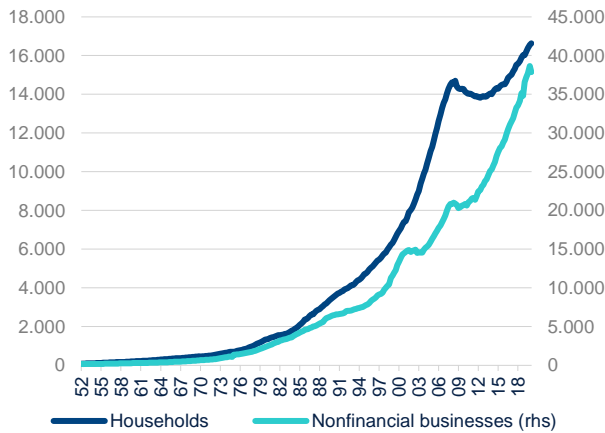
Reduced credit supply can occur when lenders tighten credit supply excessively due to either regulatory changes, high risk aversion, or inability to lend due to weaknesses in their own balance sheets. While the recent tightening of credit standards can lead to a sharp retrenchment in credit supply (Figures 7.14 and 7.15), according to our analysis this is unlikely. Strong capital positions, as evidenced by the latest stress test results from the Federal Reserve, as well as the influx of deposits due to the Federal Reserve's asset purchases, will help banks increase lending to companies and households after the brunt of the recession is behind us. Moreover, ample monetary accommodation has resulted in unusually favorable conditions financial in financial markets despite the sharp recession, as evidenced by low spreads of corporate bonds (Figure 7.16), which allow large companies to raise capital cheaply. By staying afloat and restarting operations, large firms indirectly support smaller companies and households. This implies that the monetary and fiscal authorities have so far been effective in limiting the degree of deleveraging and are preventing a massive credit crunch from developing, albeit at the risk of distorting markets for some time and running the risk of encouraging moral hazard in the future.

Reduced credit demand due borrowers' caution tends to occur after particularly bad leverage busts such as the Great Depression and the GFC. Retail customers are more likely to respond emotionally in this way, whereas businesses are more likely to change their strategy after a change in regulations. While increased caution was likely the cause of the decline in credit card balances in 2Q20, households remain in a relatively solid financial position, assuming a continuation of enhanced unemployment benefits and solid labor market recovery. This lowers the likelihood of curtailment in credit demand because of increased caution that then drives deleveraging in the post-crisis period.

Bankruptcies tend to happen to over-indebted entities that do not generate enough revenues to meet all of their payment obligations. This process tends to deepen when interest rates edge up and risk appetite declines. Market participants that increased their leverage the most in the run-up of the current crisis were nonfinancial business, many of which are now experiencing weaker demand. This suggests that the wave of bankruptcies will be most felt in this segment of the economy. The most at-risk segment are the smaller companies and firms in industries particularly adversely affected by the recession such as oil and gas and those that face structural challenges such as brick-and-mortar retail. Large companies have access to bond and commercial paper markets, which are being directly supported by the Federal Reserve, and are thus able to roll-over debt and push maturity walls. However, smaller businesses have more limited options and primarily rely on commercial banks. While the banking sector is better capitalized than a decade ago and possesses solid liquidity buffers to service borrowers properly, support from programs such as PPP and the Federal Reserve's Main Street Lending Program will also be critical to avoid massive waves of defaults and bankruptcies of small- and medium-size enterprises. With current low interest rates that will remain stable for a prolonged period, government support for small business lending can further improve the ability of

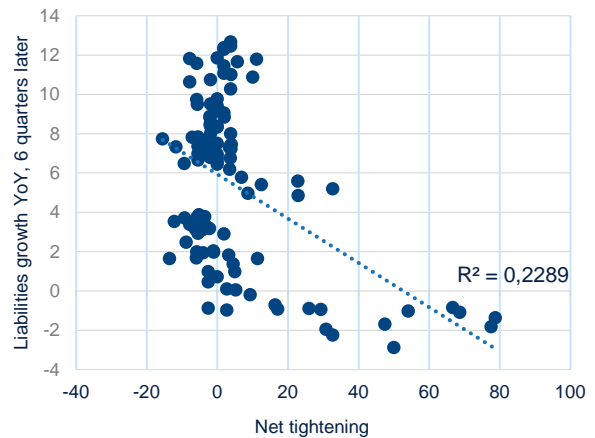
this large part of the economy to weather the current crisis. This is highly important considering that small and mid-size firms employ around half of all private sector employees.

Figure 7.13 **TOTAL LIABILITIES**
(BN \$)



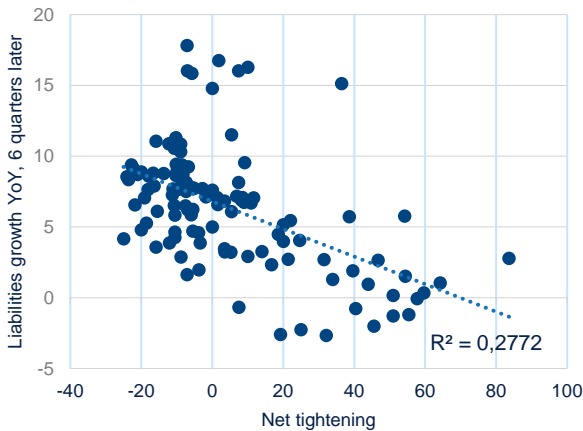
Source: BBVA Research and Federal Reserve

Figure 7.14 **MORTGAGE CREDIT STANDARDS AND SUBSEQUENT GROWTH IN HOUSEHOLD LIABILITIES (% AND % YoY)**



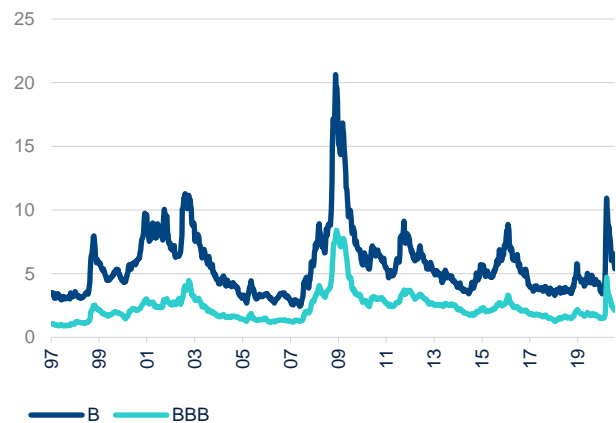
Source: BBVA Research, Haver and Federal Reserve

Figure 7.15 **C&I CREDIT STANDARDS AND SUBSEQUENT GROWTH IN NONFINANCIAL BUSINESS LIABILITIES (% AND %YoY)**



Source: BBVA Research and Federal Reserve

Figure 7.16 **CORPORATE BOND SPREADS OVER 5-YR TREASURY YIELDS (%)**



Source: BBVA Research, ICE/BofA and Federal Reserve

Bottom line

The latest SLOOS confirms that banks have tightened credit standards to levels last seen during the GFC. The resulting decrease in credit availability will particularly weigh down on smaller firms that rely on bank financing without additional support from fiscal authorities. Larger firms, in the meantime, are benefiting from access to credit markets where financial conditions have eased significantly due to the Federal Reserve's intervention over the last six months. Households remain in a relatively favorable position, assuming unemployment benefits remain sizeable and labor markets continue to improve. Depending on the speed of the recovery, credit standards will ease, but some deleveraging will nevertheless occur, especially in the nonfinancial business sector. Most of the deleveraging will occur through bankruptcies of highly leveraged entities and in industries that have been severely affected by the current recession. That said, the degree of deleveraging in the post-crisis period will be narrow. Robust and resilient bank balance sheets will contribute to the recovery as well as monetary and fiscal policy measures. Nonetheless, while the monetary and fiscal support can help ease deleveraging pressures, and is particularly needed for small and mid-size enterprises, they can also become excessive and increase moral hazard risks and result in suboptimal capital allocation going forward. Therefore, both support to the business sector and an effective exit strategy that allows for a smooth transition to the post-pandemic environment remain crucial.

8. Forecasts

 Table 8.1 **U.S. MACRO FORECASTS**

	2013	2014	2015	2016	2017	2018	2019	2020 (f)	2021 (f)	2022 (f)	2023 (f)
Real GDP (% SAAR)	1.8	2.5	3.1	1.7	2.3	3.0	2.2	-5.1	3.4	2.4	2.1
Real GDP (Contribution, pp)											
PCE	1.0	2.0	2.6	1.9	1.8	1.9	1.7	-3.9	3.1	2.1	1.6
Gross Private Investment	1.1	1.0	1.0	-0.3	0.6	1.1	0.3	-2.0	0.4	0.9	0.8
Non Residential	0.5	1.0	0.3	0.1	0.5	1.0	0.4	-1.1	-0.1	0.8	0.7
Residential	0.3	0.1	0.3	0.2	0.1	0.0	-0.1	-0.1	-0.1	0.1	0.0
Exports	0.5	0.6	0.1	0.0	0.5	0.4	0.0	-3.2	-1.6	0.2	0.3
Imports	-0.3	-0.8	-0.9	-0.3	-0.8	-0.7	-0.2	3.8	1.3	-0.5	-0.5
Government	-0.5	-0.2	0.3	0.3	0.2	0.3	0.4	0.4	0.2	-0.3	0.0
Unemployment Rate (% average)	7.4	6.2	5.3	4.9	4.3	3.9	3.7	8.8	7.7	6.9	6.1
Avg. Monthly Nonfarm Payroll (K)	192	250	227	195	176	193	177.8	-801	154	138	107
CPI (YoY %)	1.5	1.6	0.1	1.3	2.1	2.4	1.8	1.1	1.6	2.4	1.9
Core CPI (YoY %)	1.8	1.8	1.8	2.2	1.8	2.1	2.2	1.7	1.6	1.8	1.8
Fiscal Balance (% GDP, FY)	-4.1	-2.8	-2.4	-3.1	-3.4	-3.8	-4.6	-16.4	-7.9	-5.3	-5.0
Current Account (bop, % GDP)	-2.0	-2.1	-2.2	-2.1	-1.9	-2.2	-2.2	-2.2	-2.2	-2.2	-2.3
Fed Target Rate (% eop)	0.25	0.25	0.50	0.75	1.50	2.50	1.8	0.25	0.25	0.25	0.75
Core Logic National HPI (YoY %)	9.7	6.7	5.2	5.4	5.8	5.7	3.6	2.5	0.1	4.9	4.3
10-Yr Treasury Yield (% eop)	2.90	2.21	2.24	2.49	2.40	2.83	1.9	0.78	1.11	1.38	1.87
WTI Oil Prices (dpb, average)	97.9	93.3	48.7	43.2	50.9	65.0	57.0	36.7	47.0	54.2	57.4

(f): Forecast.

Source: BBVA Research

Table 8.2 **U.S. STATE REAL GDP GROWTH, %**

	2014	2015	2016	2017	2018	2019	2020 (f)	2021 (f)	2022 (f)
Alabama	-0.7	1.3	0.7	1.2	2.8	2.3	-6.0	2.8	1.6
Alaska	-2.7	1.0	-2.0	0.0	0.7	2.5	-5.1	2.3	4.2
Arizona	1.3	2.4	3.2	3.5	4.1	3.1	-7.5	2.4	3.5
Arkansas	1.0	0.8	0.6	0.7	1.7	1.8	-7.5	3.4	3.2
California	4.1	5.0	3.0	4.4	4.3	2.6	-7.4	3.6	3.7
Colorado	4.7	4.6	2.4	4.0	3.5	3.5	-3.6	3.7	2.4
Connecticut	-1.4	2.2	0.0	0.4	0.5	1.6	-4.2	3.0	1.9
Delaware	7.3	3.7	-4.2	-0.6	0.0	0.8	-3.3	-0.3	0.8
Florida	2.7	4.2	3.3	3.4	3.2	2.8	-6.7	4.0	3.6
Georgia	3.3	3.4	3.5	3.7	2.4	2.0	-5.6	1.7	2.6
Hawaii	0.3	3.6	2.2	2.3	2.4	1.0	-7.6	0.1	1.1
Idaho	2.6	2.8	3.9	3.5	4.0	2.8	-6.1	3.7	4.4
Illinois	1.4	1.3	0.4	0.9	2.1	1.6	-7.0	1.2	1.2
Indiana	3.2	-0.7	1.6	1.9	2.0	0.8	-10.6	2.1	2.4
Iowa	5.4	2.6	-0.3	-0.3	2.2	0.9	-4.4	6.2	3.4
Kansas	2.1	1.9	2.6	1.0	2.1	0.9	-6.3	1.3	1.3
Kentucky	0.3	0.7	0.7	1.1	1.4	1.1	-9.1	0.2	1.1
Louisiana	3.1	-0.5	-1.8	1.4	2.6	1.3	-8.1	4.1	2.4
Maine	1.7	0.7	2.2	2.2	2.2	1.9	-5.2	2.7	1.7
Maryland	1.1	1.9	3.4	0.9	2.5	1.5	-6.4	2.5	1.7
Massachusetts	2.0	3.8	1.7	2.5	3.1	2.5	-6.1	2.0	1.8
Michigan	1.7	2.5	2.2	1.5	2.5	0.7	-11.6	1.6	2.0
Minnesota	2.9	1.2	1.9	1.9	2.6	1.4	-7.3	1.2	1.9
Mississippi	0.5	0.1	0.4	0.9	1.3	1.3	-4.7	-2.3	0.9
Missouri	0.5	1.3	-0.4	1.0	2.4	2.1	-6.3	4.6	1.8
Montana	1.7	3.9	-1.4	1.7	2.6	2.1	-8.7	2.1	1.5
Nebraska	2.0	2.9	0.4	2.1	0.9	0.6	-6.4	4.0	1.2
Nevada	1.3	4.2	2.9	3.2	4.2	2.9	-14.0	-1.8	2.3
New Hampshire	1.1	2.8	1.8	1.8	2.3	2.7	-4.9	3.3	1.4
New Jersey	0.5	1.8	0.9	0.7	2.2	1.5	-3.0	2.2	1.0
New Mexico	3.2	2.2	0.1	0.1	2.5	3.7	-4.0	2.8	2.0
New York	2.3	1.7	1.3	2.1	1.2	1.8	-11.1	4.9	-0.8
North Carolina	2.2	3.2	1.2	2.1	2.4	2.3	-5.9	3.4	3.0
North Dakota	7.6	-2.9	-7.0	0.0	3.6	2.3	-4.7	1.7	0.6
Ohio	3.8	1.5	0.8	1.6	1.9	1.7	-5.6	1.8	1.8
Oklahoma	5.7	4.3	-3.0	0.8	2.6	2.4	-8.7	2.8	4.4
Oregon	3.4	5.6	4.7	3.8	3.8	2.7	-7.7	3.7	4.1
Pennsylvania	2.3	2.2	1.3	0.6	2.6	2.3	-5.4	2.3	2.6
Rhode Island	0.1	1.8	0.0	-0.2	1.2	2.7	-3.3	2.8	1.5
South Carolina	2.6	3.5	2.9	3.3	2.6	3.0	-6.5	1.5	2.5
South Dakota	1.3	2.9	0.5	-0.1	1.9	0.7	-7.5	5.1	2.8
Tennessee	1.7	3.4	2.1	1.9	3.1	2.2	-7.5	3.3	2.4
Texas	3.5	4.8	0.2	2.9	4.0	4.4	-6.6	2.5	4.1
Utah	3.2	4.1	4.0	3.9	3.7	3.8	-5.7	5.2	3.9
Vermont	0.1	1.3	1.6	0.1	1.2	2.5	-7.5	4.2	2.0
Virginia	-0.2	2.0	0.4	1.8	2.6	1.9	-7.2	4.1	3.5
Washington	3.6	4.4	3.5	5.2	5.8	3.8	-8.5	4.3	3.3
West Virginia	-0.4	-0.2	-1.2	1.5	2.3	1.0	-5.6	3.4	3.3
Wisconsin	2.1	1.8	1.2	1.3	2.4	1.4	-8.1	5.3	2.8
Wyoming	0.6	2.6	-4.2	-0.1	0.1	3.3	-8.6	2.8	3.7

(e): estimated; (f): forecast
 Source: BBVA Research

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