BBVA Research

Creating Opportunities

United States Economic Outlook

Fourth quarter 2019

Index

Closing date: November 8, 2019

1. Editorial

Policymakers have known for decades the catastrophic consequences from global warming. However, despite overwhelming scientific evidence, bi-partisan public support and a number of viable solutions, politicians have failed to take action at the scale needed to mitigate these risks. Experts believe that the impact of extreme weather events will only increase in frequency and magnitude and that it may already be too late to avoid cataclysmic outcomes. This means that the country faces two options: do nothing and bear the cost of inaction, or respond at the scale needed to confront this challenge.

If politicians finally chose to take bold actions, there are options. One that has drawn significant attention in recent months is the Green New Deal (GND); proposed by a group of progressive Democrats. The GND is a proclamation, rather than a detailed blueprint, of policies and aspirations with climate change at the center of a much broader social and economic strategy. The GND intends to be the largest economic mobilization since WWII, aimed toward a 100% transition to clean, renewable and zero-emission energy sources in 10 years. This would require massive investments and subsidies to build a national energy-efficient smart grid, decarbonize manufacturing and agricultural industries, propel the U.S. into a leading position on green technology, industry, products and services, and upgrade transportation systems. The proposal also calls for removing pollution and greenhouse gas emissions as well as restoring and protecting natural ecosystems. The GND also targets the creation of millions of good high-paying jobs, access to healthcare and housing, economic security and social justice.

Critics contend that the GND represents a major threat to the country's economic prosperity. Although calculating an accurate cost-estimate is impossible given the lack of details in the proposal, preliminary analyses suggest that implementing the environmental component could cost between $11tn and $20tn during the first 10 years. This would require massive tax and/or debt increases, thereby resulting in a significant decline in private investment and major disruptions in the allocation of resources. Opponents argue that the GND would reduce competitiveness and productivity growth and eventually living standards. In addition, given the implied increase in the scope of government intervention, the proposal would obliterate free markets and consumer choice.

Defendants of the GND play down the estimated fiscal burden arguing that the low interest rate environment could continue for a prolonged period. Moreover, they claim that the cost estimates fail to take into account the benefits that would accrue from its implementation. In other words, the savings from reducing the costs of natural disasters, worsened air quality, lost labor, damage to coastal property, temperature-related deaths, agricultural output declines, lost winter recreation revenues, and damages to ecosystems, imply that the GND would either be paid by itself or at the very least, cost significantly less than what the critics argue.

Supporters also contend that even under a "no-action" scenario, the spending needed to maintain the business-as-usual model behind our infrastructure, transportation, energy, housing and modern-life needs, is similar to the "action" scenario. That is, the GND would at least end up costing the same as doing nothing, with the added advantage of helping create more and better jobs, develop new technologies and increase productivity.

Those that defend moderate solutions champion carbon-pricing initiatives such as cap-and-trade and a carbon tax. From an economic perspective, setting a price on carbon is the most efficient solution because carbon fuel prices do not properly account for climate change costs.

According to W. Nordhaus, a carbon tax has to be around $300 a ton or even higher. The U.N., World Bank, OECD and IMF all endorse setting a price on carbon emissions to get global warming under control. More than 40 countries (including the EU) and 10 states in the U.S. have done it either through direct taxes on fossil fuels or cap-and-trade programs. However, setting an effective price on carbon has proven challenging as evidenced by the social unrest and political tensions in Australia, Finland, Canada, France and the Netherlands.

Therefore, implementation needs to be gradual so that businesses and individuals have time to adapt. For example, the IMF suggests a $75 a ton price. This tax would raise electricity and gasoline prices in the U.S. by 53 and 20%, respectively, but it would cut emissions by almost 30%. While this proposal may not be consistent with the goal of no more than 2^0C warming, it is far greater than the current global average of $2 a ton. The revenues, which would reach 1% of GDP, could be redirected back to the taxpayers to avoid a disproportionate impact on low-income families and minimize the backlash.

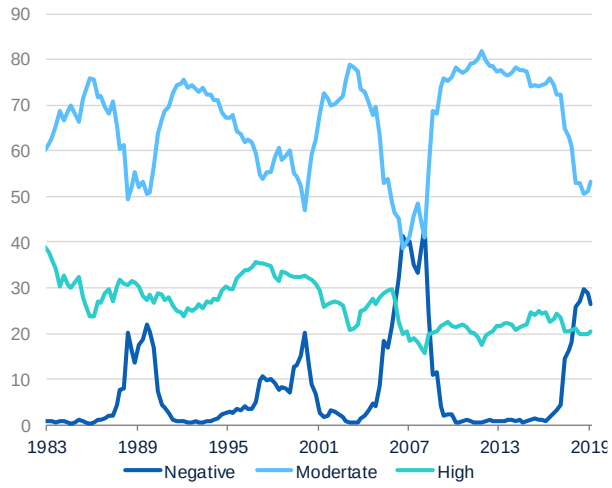
Given the conflict between effective carbon pricing and the urgency to avoid the worst consequences of climate change, some combination between carbon pricing, regulation and industrial policy may be required to tackle effectively the climate crisis. Although politicians usually prefer safer short-term bets that hide the true costs to voters, the GND –despite being an extreme alternative- may incentive individuals, businesses and policymakers to take bolder actions to mitigate the risks from global warming, rather than continue kicking the can and pushing back the costs to the next generations.

2. Three-parts accommodation, one-part trade détente baked into 2020 outlook, but is it enough to avoid a downturn?

While our outlook for the U.S. economy now assumes a more rapid convergence to trend, tail risks threatening to derail the current expansion appear to be fading. A “mid-cycle” adjustment, a Xi-Trump truce and a sanguine scenario for Brexit have improved global sentiment. As a result, our model-based estimates for the likelihood of a U.S. recession have declined significantly; in fact, estimates of the risk of recession over the next 12 months are the lowest since 2018. In addition, excluding soft readings on manufacturing sentiment and subdued domestic investment, incoming data remains consistent with our view of ongoing moderation in economic activity. As such, we are maintaining our baseline scenario that assumes 2.3% growth in 2019 and 1.8% in 2020.

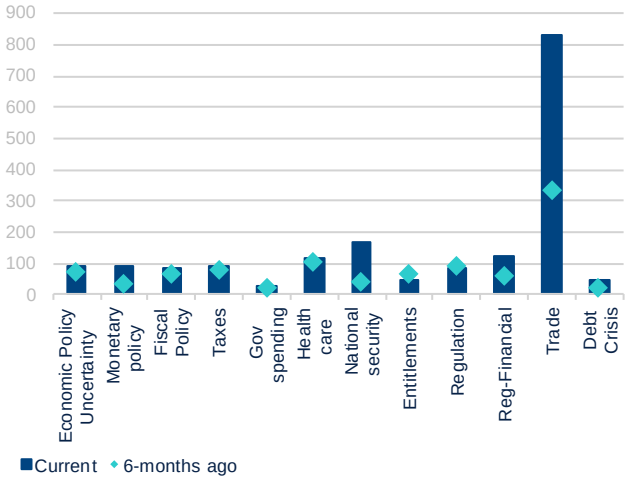
Heading into 4Q19, uncertainty over the UK’s eventual divorce from the EU, the simmering trade tensions between the U.S. and China, paltry trade data, slowing manufacturing activity and geopolitical tensions in emerging markets weighed on market sentiment. In addition, divergent opinions among the FOMC participants and lack of clarity on the operational framework of a “mid-cycle” adjustment led to a surge in monetary policy uncertainty and decrease in short-term interest rate expectations.

Figure 2.1 **GROWTH PROBABILITY REGIMES** (%)



Source: BBVA Research

Figure 2.2 **CATEGORICAL UNCERTAINTY** (1985-10=100)

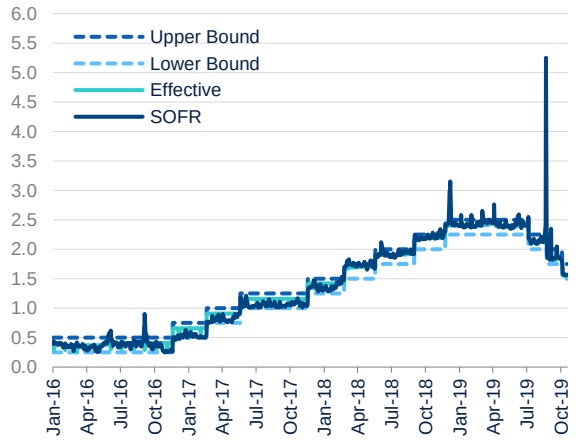


Source: BBVA Research and EPU

As a result, bond yields continued to fall across the yield curve, and equity prices in emerging markets whipsawed while corporate borrowing costs rose relative to U.S. treasuries. In addition, weak global growth expectations and low commodity prices pushed up the dollar in real effective terms. To add to the pessimism, money market interest rates spiked as a result of a liquidity shortfall and surge in reserve hoarding that occurred on the date of a major corporate tax filing deadline and the buildup of cash balances at the U.S. Treasury. While it appears regulators were caught off-guard by the dramatic shift in bank's preferences for reserves during a liquidity crunch, efforts by the Fed to shore up the Repo market and bank reserves while providing confidence have been successful thus far. If a similar situation were to arise, market participants seem confident in the Fed's tools and its willingness to provide liquidity through outright Treasury bills purchases, increased access to Repos and sustained open market operations.

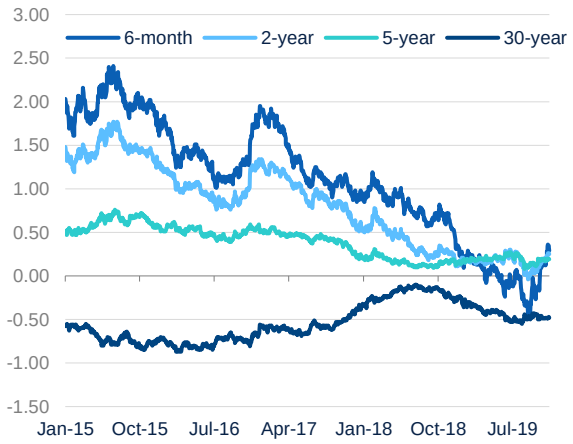
Even though the agreement between the U.S. and China lacks an enforcement mechanism and has only been agreed to in principle, market sentiment has improved on the expectation of a "phase one" compromise. Furthermore, markets are now aligned with our view that the Fed will pause for the remained of the year and most likely throughout 2020, allowing time for the committee to assess the impact of the previous three cuts and to leave some "dry powder" for a potential downturn.

Figure 2.3 **FED FUNDS & REPO RATES** (%)



Source: BBVA Research & Federal Reserve

Figure 2.4 **10-YEAR YIELD SPEADS** (PP)



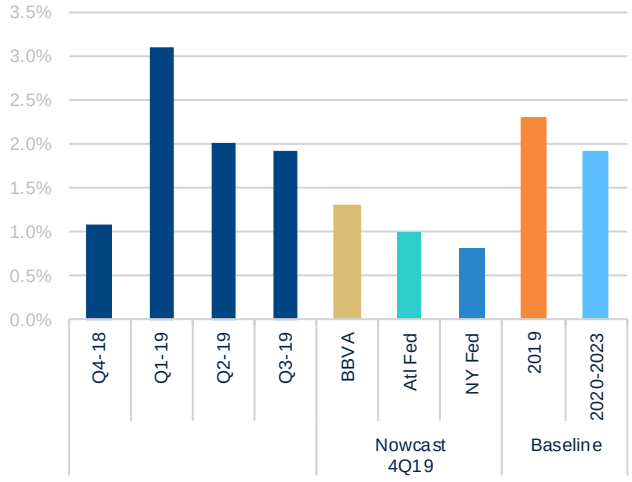
Source: BBVA Research & Haver Analytics

Equity prices have also recovered and continue to test historic highs—the S&P 500 broke out in October beating prior July highs. Yields have also surprised to the upside with the 10-year Treasury yields surpassing 1.9% for the first time since July. Going forward, if risks to global growth remain muted, Brexit happens in an orderly and suitably predictable fashion, and China remains willing to provide fiscal and monetary policy support, we expect pressures on the dollar to ease, corporate spreads to decline, asset prices to rise and the modest steepening of the yield curve to continue.

Headwinds abate, but for how long?

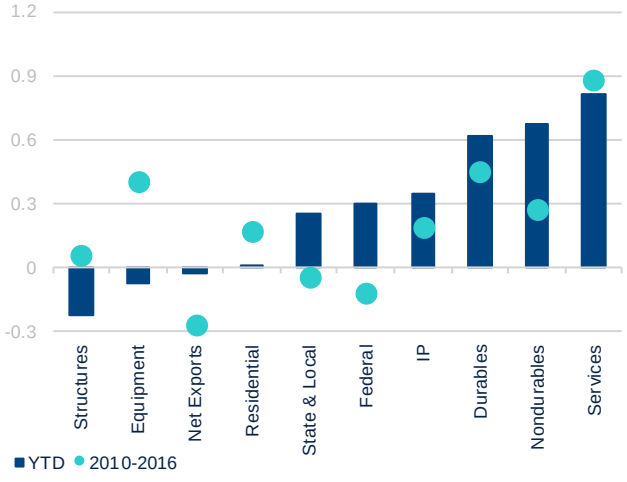
The easing of tensions in financial markets and improved outlook on trade have yet to pass through to sentiment indicators. For example, as of 3Q19, c-suite surveys such as Duke's Fuqua School of Business and the Business Roundtable are at lows not seen since 2016; a period in which the global economy was in a mining-led recession. Moreover, according to the NFIB survey, small business optimism, which had seen an unprecedented rise under the current administration, has been eroded by the ongoing trade and monetary policy uncertainty. That being said, ISM data from October could presage a turning point, as the index, while still below the threshold of expansion and contraction, improved to 48.3, after dropping to 47.8 in September.

Figure 2.5 **GDP GROWTH AND FORECASTS** (% ANNUALIZED)



Source: BBVA Research & BEA

Figure 2.6 **GDP COMPONENTS** (% ANNUALIZED)



Source:

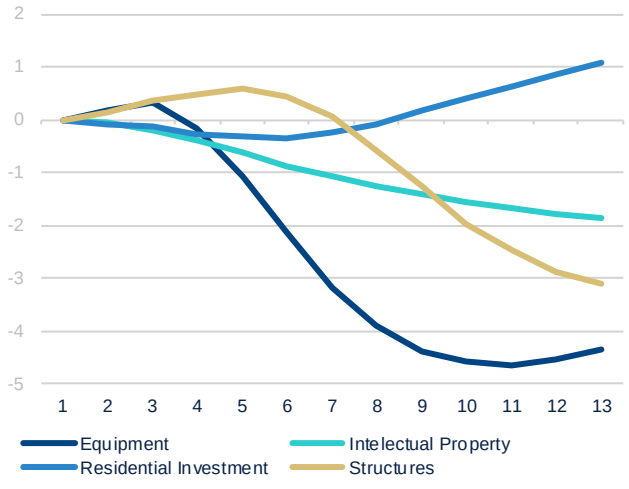
However, other indicators remain consistent with our scenario of ongoing moderation rather than recession. For example, GDP growth in 3Q19 decelerated, increasing 1.9% QoQ in the third quarter after growing 2.0% in the previous period. Consumption, public expenditures and investment in intellectual property continued to provide support, respectively contributing 1.9, 0.4 and 0.3pp while nonresidential investment in structures and equipment declined 4.0 and 3.8% QoQ, respectively. Net exports dragged growth down by 0.1pp in 3Q19, but exports showed some signs of improvement, possibly implying that the trade détente, lower policy uncertainty and global policy interventions have had a positive impact on global sentiment.

Through three quarters, average annualized growth is around 2.3%— in line with our baseline scenario. The bulk of this has been accounted for by consumption of services, nondurables and durable goods, adding 80bp, 70bp and 60bp, respectively. Investment in intellectual property and contributions from federal, state and local governments have also contributed positively to growth. In contrast, investment in nonresidential structures has shaved 20bp off year-to-date annualized growth while investment in equipment has subtracted 10bp.

While real private fixed investment remains positive on a year-over-year basis, the sectoral weakness in investment has been a major drag to growth. In the counterfactual, assuming that investment conditions were consistent with those observed in 2010-2016, growth could have been 80bp higher all things equal. Moreover, while residential investment recovered in 3Q19, its contribution has been about 20bp less than during this period in 2010-2016. While the larger contributions from public spending have offset private sector headwinds, growing frictions in Washington, widening deficits and the looming 2020 election suggests that the probability of further fiscal expansion is low.

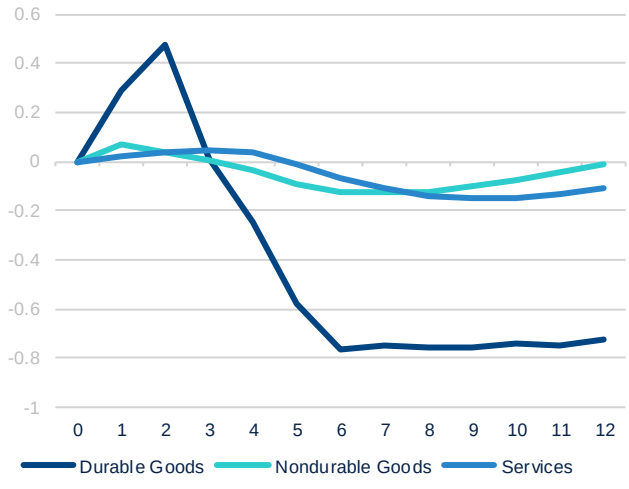
With trade likely to remain a key contributor to policy uncertainty, it is important to understand how trade uncertainty shocks can influence consumer and business expectations and behavior. As has been the case thus far, we found that trade uncertainty shocks impart the largest influence on expectations rather than on real outcomes. However, we do find that trade-based uncertainty shocks have a more direct impact on investment in equipment, and impart persistent but less negative headwinds in nonresidential structures and intellectual property investment. With respect to non-trade related shocks, we found that unlike trade shocks, which are transmitted primarily through reduced expenditures on equipment, structures are worse off in terms of growth.

Figure 2.7 **IMPACT OF TRADE UNCERTAINTY SHOCK ON INVESTMENT** (YOY%)



Source: BBVA Research

Figure 2.8 **IMPACT OF TRADE UNCERTAINTY SHOCK ON CONSUMPTION** (YOY%)

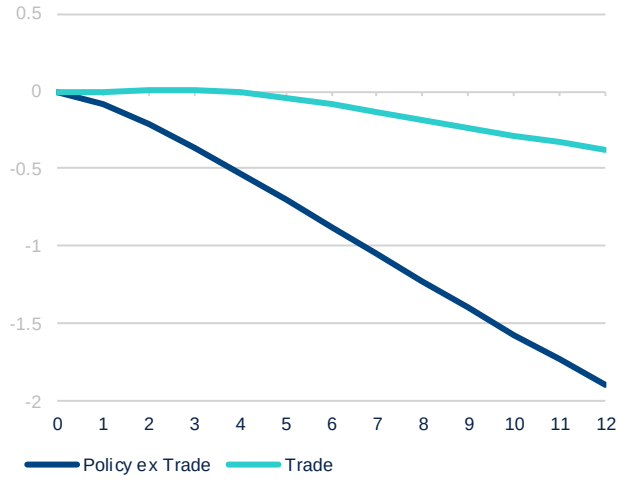


Source: BBVA Research

For consumers, the implications of a high trade policy uncertainty regime are more benign. While consumer expectations about future growth tend to deteriorate rapidly when trade policy shocks are present, consumption of nondurable goods and services are effectively unchanged. With respect to durable goods, consumers also seem to respond in a manner consistent with intertemporal decision-making. In fact, our results suggest that consumers tend to spend more in the period just after the shock (four quarters) in anticipation of higher prices for tradable goods and consume less when faced with higher real or implied prices with the adjustment for tariffs. Moreover, our results show that residential investment is unaffected by trade uncertainty, as life-cycle choices such as home buying are largely immune to temporary idiosyncratic shocks.

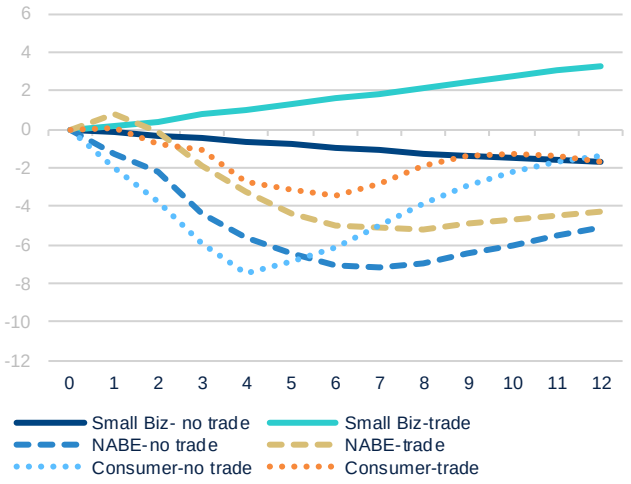
In terms of interest rates, historically the Fed has not reacted strongly to high levels of trade policy uncertainty. In fact, over 12 quarters the cumulative impact of a trade policy uncertainty shocks on the Federal funds rate is around -35bp, implying only one full rate adjustment. However, that relationship may be changing. A highly integrated global financial system and complex global value-chains have increased the importance of trade and cross-border flows for the U.S. economy. Moreover, despite the fact that the largest share of the direct effect of lower trade flows falls on foreign countries, weaker global trade and growth dynamics radiate back to the U.S. in the form of tighter financial conditions, increased uncertainty and decreased business and consumer optimism. In addition, there is evidence that social media communications from the President that are critical of the stance of monetary policy, can create a feedback loop between federal funds futures markets and U.S. monetary policy accommodation. While the independence of the Fed is unquestionable, there is a risk that the global interconnectedness and hyper connected world we live in could alter the links between monetary policy and trade.

Figure 2.9 **IMPACT OF UNCERTAINTY ON FEDERAL FUNDS RATE** (%)



Source: BBVA Research

Figure 2.10 **IMPACT OF UNCERTAINTY ON EXPECTATIONS**



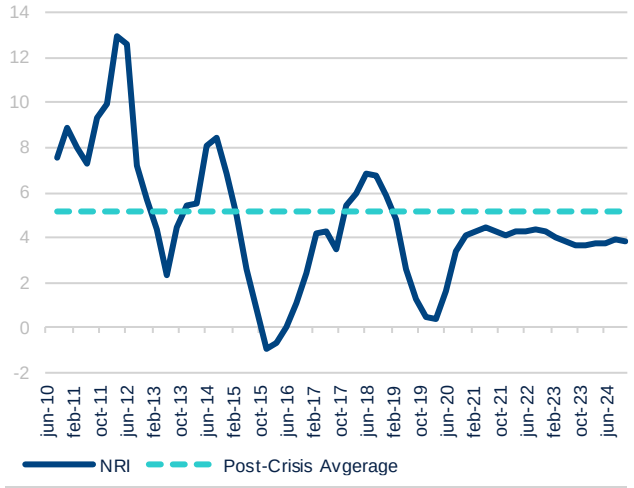
Source: BBVA Research

Looking beyond 4Q19 and into 2020, the question, after the glancing blow of mid-cycle headwinds, is if the marginal impact from lower interest rates and more accommodative forward guidance can compensate for the impact that persistent trade policy uncertainty is having on nonresidential investment and whether recent momentum within residential investment can be sustained with a cooling labor market. In addition, consumer expectations have declined for three consecutive months amid a rising savings rate, suggesting that consumers may begin to think twice about large irreversible purchases —home goods, recreational purchase and autos— a trend that could present downside risks to the outlook.

With respect to the consumer, our baseline continues to assume that consumption will decelerate, reaching 2.1% by the end of 2020, after reaching 3.4% YoY in 3Q18. While late cycle headwinds continue to build, consumers remain in a much stronger position relative to past business cycles. Household leverage remains well below the pre-crisis peak and in spite of the prolonged consumption cycle, household balance sheets are not getting stretched at a time when risks are rising. In fact, interest burdens, which had been growing at double digit rates during the Fed tightening cycle

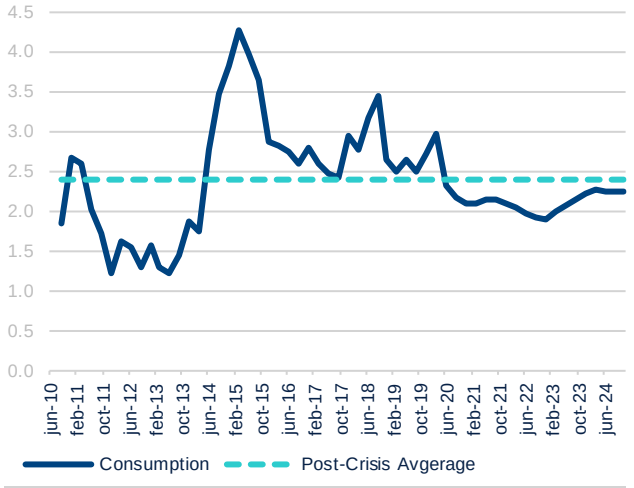
(2017-2018), have eased somewhat, lowering the risks that rising interest burdens would erode borrower's ability to pay down existing principal balances. As a result, survey data from the 4Q19 showed an increase in demand for consumer loans–decidedly more for automotive and credit card loans— in spite of the fact that bank lending standards remain tight.

Figure 2.11 **NONRESIDENTIAL INVESTMENT** (YOY%, 2012$)



Source: BBVA Research & BEA

Figure 2.12 **PCE** (YOY%, 2012$)



Source: BBVA Research & BEA

When considering the tailwinds present in 2018 and additional impetus from the generational changes to the corporate tax code, domestic investment has disappointed. In fact, some of the more optimistic estimates suggested that changes in the business tax code could boost growth by 1.7% in the long-run as a result of the marginal increase in business investment, higher wages and employment. However, as of 3Q19, our estimates suggest that investment in sectors that should have benefited the most from the lower cost of capital and more favorable depreciation schedules such as structures, transportation, residential and information equipment are below potential. In contrast, investment in intellectual property and federal expenditures are well above potential levels as of 3Q19; areas that were not expected to outperform other categories. These divergent trends are more closely aligned with long-term structural rebalancing towards more intangible-based growth than tax-policy stimulus. Therefore, we expect nonresidential private fixed investment to continue to grow at a modest pace of 2.3% and 4.3% in 2020 and 2021, respectively.

While Congress needs to authorize funding and appropriations by November 21 to avoid repeating last year's government shutdown, the debt ceiling has been suspended until July 2021 and the sequester-level discretionary caps were raised in 3Q19. Assuming Congress and the White House agree, Federal expenditures should rise by around $217bn in real terms. While outlays will fall short of 2019 levels, the budget agreement should continue to contribute positively to growth. In fact, we assume federal, state and local expenditures will account for about 20bp (13%) of growth in 2020.

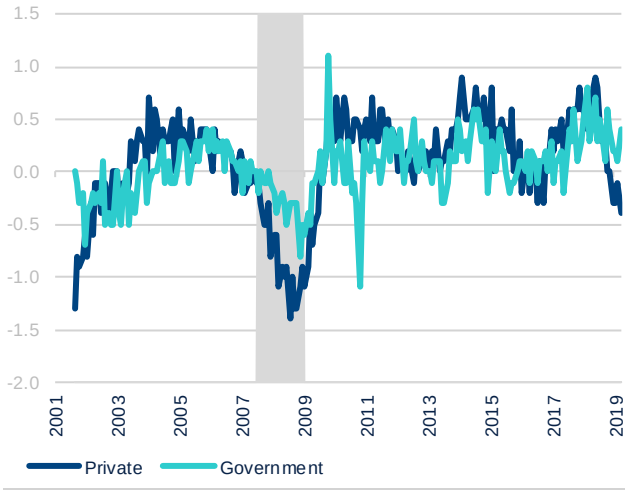
As a result, our baseline assumes GDP growth will continue to moderate in 4Q19, but rebound to 2.1% QoQ in 1Q20. Assuming changes in fiscal policies remain on hold and trade tensions do not escalate, we maintain that GDP growth will be 2.3% in 2019 and 1.8% in 2020.

Underlying labor market frictions grow as momentum slows

The evolution of the labor market over the first three quarters of the year has been closely aligned with our view of ongoing moderation in economic activity and job creation. After the mixed labor market report in September, data from the October survey was more upbeat. For example, besides the solid job creation rate of 128K, payrolls were revised up by 51K and 44K, respectively, in August in September, assuaging fears of a more pronounced labor market slowdown. In addition, despite more moderate job growth rates, the unemployment rate (UR) remains at historically low levels at 3.6%.

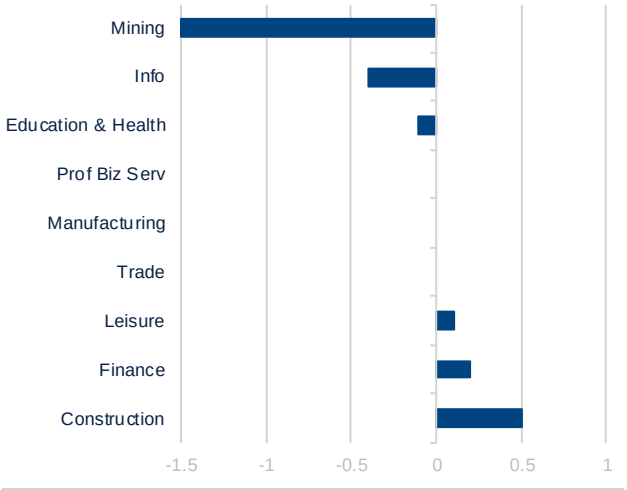
In addition, outside of the sectoral frictions produced by the global slowdown and trade tensions, job growth has remained robust. Since January, employment growth has been strong in education and health services, construction, leisure and hospitality and professional business services. However, data on U.S. job openings and quits rates suggest there is a bifurcation in the labor market with quits rates falling in industries facing headwinds such as mining and manufacturing, but rising in financial services, leisure and hospitality, and construction. That being said, the bottoming out of the year-over-year change in openings in the private sector could also be an encouraging sign of abating risks to trade and global growth.

Figure 2.13 **JOB OPENINGS RATE** (YOY, PP)



Source: BBVA Research & BLS

Figure 2.14 **INDUSTRY QUITS RATE** (CHANCE SINCE MARCH 2019, PP)



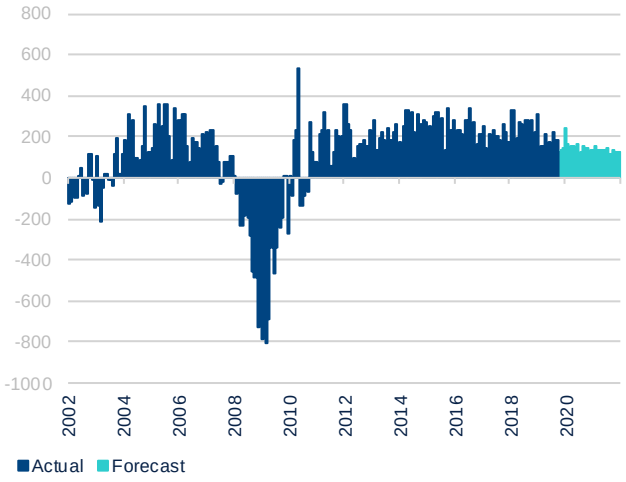
Source: BBVA Research

While the pass through from the weaker growth in the domestic goods producing sectors could hold back labor market gains in professional business services and financial services, solid domestic demand-side conditions and favorable interest rates should minimize the duration of these headwinds. As a result, our baseline assumes job growth will be around 140K per month in November and December, before declining to 130K by year-end 2020. In this scenario, we continue to assume moderate labor force inflows and limited downside for the UR, averaging 3.7% in 2020.

With such high levels of labor market utilization and with the Fed expressing a willingness to run a high-pressure labor market in an effort to increase the number of opportunities available to low-to-moderate income individuals, the persistent lack of wage pressures continues to bemuse. In fact, in October, average hourly earnings for all workers was 3.0%, down from the high of 3.4% in February. At the industry level, data from 2019 is also consistent with aggregate

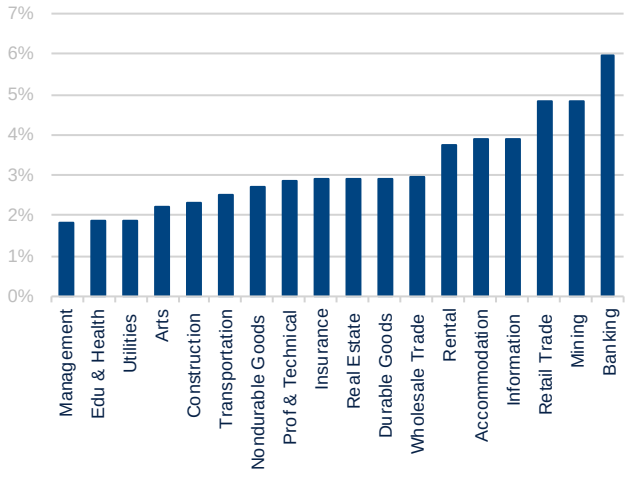
level data, showing little relationship between industry labor market tightness and wage growth. For example, in the insurance industry, the unemployment rate has been 1.9% on average, but wage growth has been tepid at 2.5% in 2019. In real estate, an industry with a similar unemployment rate, wages rose by 3.8%.

Figure 2.15 **NONFARM PAYROLLS** (K)



Source: BBVA Research & BLS

Figure 2.16 **AVERAGE HOURLY EARNINGS** (YOY %)



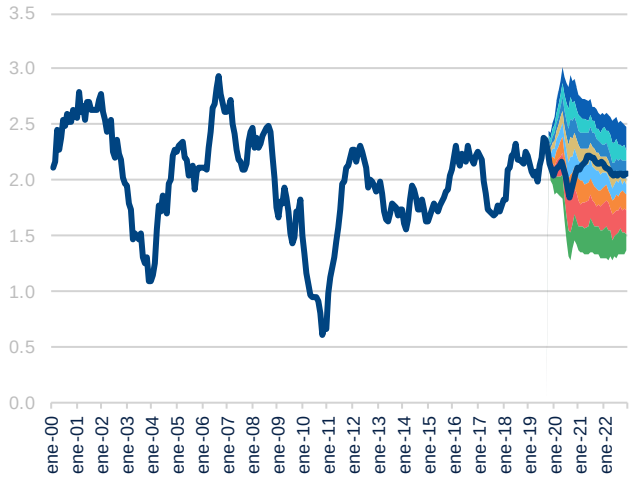
Source: BBVA Research

Downside risks to inflation easing

Incoming inflation data has firmed throughout 2019, in spite of the muted wage pressures, but with momentum slowing and with core PCE persistently below the Fed's target, there continues to be a risk that inflation expectations will drift further to the downside. In fact, while headline CPI was unchanged in September and the MoM increase in core CPI slowed to 0.1%, after increasing 0.3% over the previous three months. Furthermore, the pass through of higher tariffs to producer prices has proved transitory, on account of the gains in the dollar in 2019. As a result, core prices remain firmly rooted in a stable, but modest inflationary regime. Energy prices have also stabilized after declining throughout most of 2019, reflecting weak demand side conditions in a well-supplied oil market. Given that oil prices are near equilibrium levels, our baseline assumes risks to energy prices are balanced.

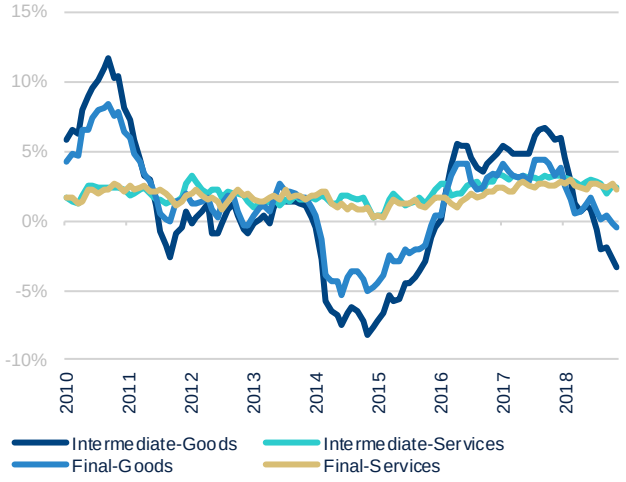
To the upside, shelter continues to be a strong contributor to consumer price increases. Over the last 12 months, shelter prices have increased 3.5%, nearly surpassing the highs of 2016. With respect to healthcare and education, which outside of shelter costs, explains much of the upward pressure on prices, inflation remains above average. However, the pace of growth in tuition and school fees has eased somewhat, at a time when health care service costs are accelerating. A closer look at the data reveals that the majority of the above average growth in healthcare costs is explained by double-digit growth in the cost of health insurance, which increased 18.7%YoY in September. While the upswing has the potential to erode household purchasing power on discretionary items, insurance super-cycles of this magnitude did occurred in 2012 and 2016, without much of an impact on aggregate inflation.

Figure 2.17 **CORE CPI** (YOY%)



Source: BBVA Research

Figure 2.18 **PPI** (YOY%)



Source: BBVA Research & Haver Analytics

Given that we do not anticipate the exponential growth in health insurance costs to continue, prices pressures within healthcare should ease somewhat. If tariffs are taken off the table as a result of a successful “phase one” agreement, the risk of tariffs directly impacting final consumer prices should be eliminated, or reduced significantly. Furthermore, with little evidence of any major pass-through from the tariffs on intermediate goods to consumer prices, we expect inflationary pressures will remain muted. As a result, we expect core PCE inflation will be 1.9% and 2.0%, in 2020 and 2021.

Open in case of emergency

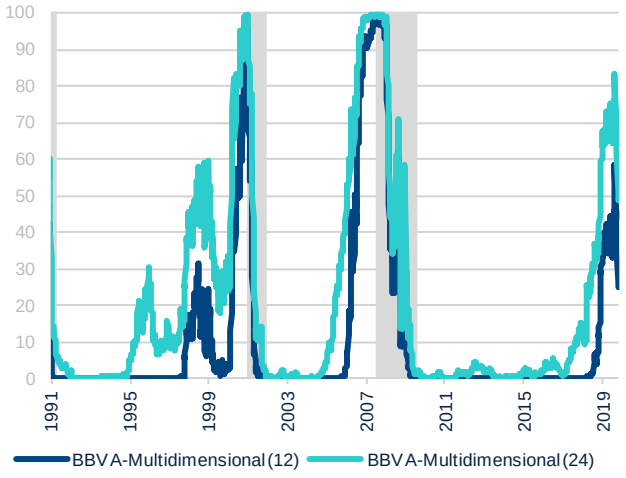
Notwithstanding the potential for idiosyncratic supply-side shocks, the risks of deflation remain remote. Along similar lines, the risk of recession appears to be on the decline. In fact, according to our weekly recession probability indicator, since August 13th, the probability of recession over the next 12 months has dropped 30bp. At 49%, the risk of recession over the next 24 months is the lowest it has been since November 2018; it is also the first time that the indicator has been below 50% in 47 weeks.

Lower trade tensions and the mid-cycle adjustment seems to explain a nontrivial share of the drop, as there has been no major change in the debt fundamentals of individuals or nonfinancial corporations, wages nor in cyclically-adjusted price-to-earnings ratio. However, given that the transmission channel has been through financial market sentiment, any significant deterioration in market could send recession risks skyrocketing once again.

Looking outside of the trade policy risks, Congress and the White House now need to agree on appropriations for fiscal year 2020 after the passage of the budget in August. Failing to do so would cause the government to shut down and could derail the recent economic momentum. With cooler heads prevailing in the Brexit negotiations and a strong appetite for policy intervention in China, U.S. policy risks are likely to grab increasing attention in 2020, despite the fact that, historically, elections have had trivial impacts on economic growth. Nonetheless, there are a number of structural

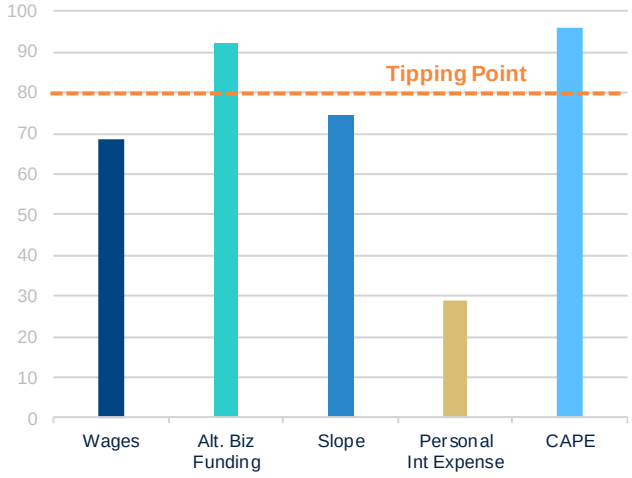
challenges in both developed and emerging economies as well as geopolitical frictions that pose far greater risks to global economic and financial stability than the 2020 U.S. elections.

Figure 2.19 **RECESSION PROBABILITY** (%)



Source: BBVA Research

Figure 2.20 **RECESSION FACTORS** (Percentile)



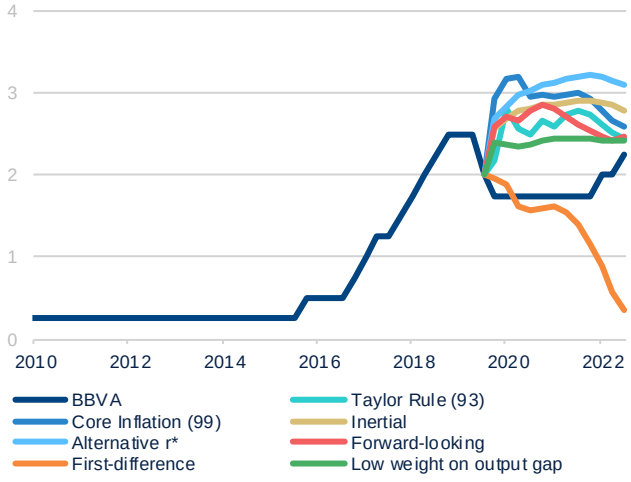
Source: BBVA Research

3. Fed's Art of War: Let your plans be dark and impenetrable as night, and when you move, fall like a thunderbolt

After the Fed's summer monetary policy blitz, we expect the committee will pause, possibly leaving rates unchanged throughout 2020. In the 3Q19, the Federal Reserve was caught in a multi-front offensive. On one flank, the committee had to align the market's pessimistic outlook with the risk management approach to a mid-cycle adjustment that was complicated by a prolonged and escalating trade war and a sharp slowdown in global economic growth. On another flank, whipsawing money markets and unwanted upward pressure on benchmark rates, forced the Fed to intervene in the Repo market and commit to a substantial increase in outright Treasury bills purchases without an explicit shift in its stance of accommodation. In what could be considered the last line of defense, the Fed also has had to move monetary policy in a more accommodative direction without the perception of a breakdown in monetary policy independence amid fierce criticism from the President.

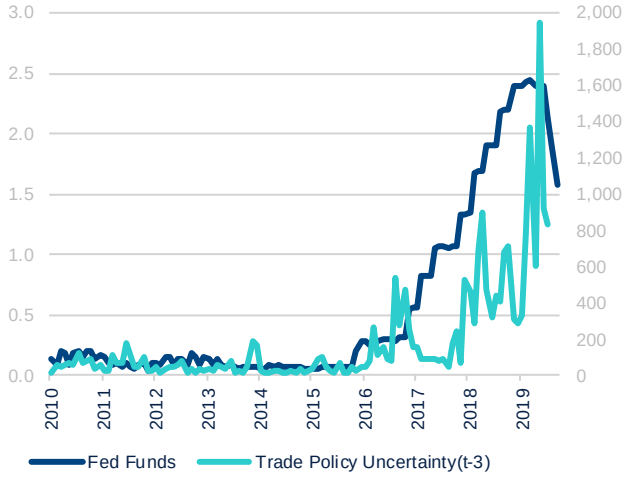
During this period, the Fed has cut rates three times, lowering the target range of federal funds rate 75bp to 1.5-1.75%. With the unemployment rate at historic lows and with growth converging with potential, the committee justified the adjustments with the worrisome inflation outlook, global crosscurrents and heightened trade policy uncertainty. In fact, at the press conference, following the first cut in July, the theme was extremely trade-centric with the Chairman mentioning trade policy uncertainty 8 times and trade 30 times.

Figure 3.1 **FED FUNDS RATE AND MONETARY POLICY RULES** (%)



Source: BBVA Research & Cleveland Fed

Figure 3.2 **TRADE POLICY UNCERTAINTY & FED FUNDS RATE** (1985-10=100)



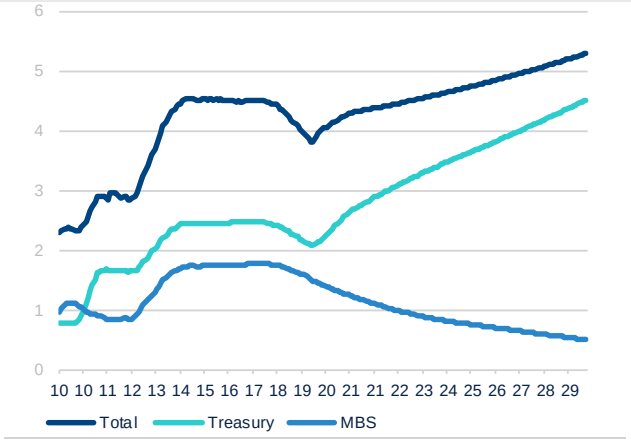
Source: BBVA Research

After reaching its peak in August, trade policy uncertainty has declined. Tariffs on final goods from China, set to take effect in October and December, have been delayed indefinitely, and while still possible, the threats of across-the-board tariffs on autos are being slow played by the administration. As a result, the Chairman gave a strong signal of the committee's desire to pause, in order to allow for time to assess the impact of the lower interest rates.

In fact, Chair Powell said that monetary policy was "likely to remain appropriate" if incoming data was in line with current conditions and that it would require a "material reassessment of our outlook" to alter the committee's stance. With respect to past precedent, three 25bp cuts followed by a pause is consistent with Greenspan Fed's two mid-cycle monetary policy adjustments in the 90s. Moreover, with rates edging closer to the zero lower bound (ZLB) and downside tail risks subsiding, it seems prudent for the committee to save some ammunition, despite the Chairman's bias toward risk management and not leaving any dry powder.

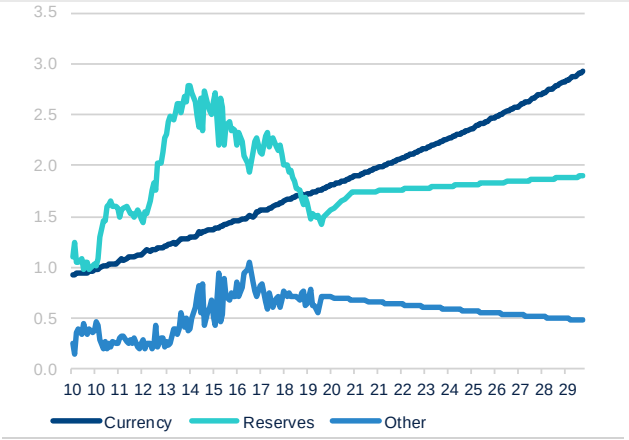
On the balance sheet, the committee seems to be comfortable with its strategy that is akin to changing a car's tire while driving. While an often-used metaphor in corporate transformations, it is hard to believe that this strategy will meet their own standards and objectives, which state that monetary policy should be "well understood and systematic."

Figure 3.3 **FACTORS SUPPLYING RESERVE FUNDS** ($TN)



Source: BBVA Research & Federal Reserve Board

Figure 3.4 **FACTORS ABSORBING RESERVE FUNDS** ($TN)



Source: BBVA Research & Federal Reserve Board

The move to shore up money market with large temporary open market operations forced the committee into a position where they now have to disentangle "technical" adjustments of the balance sheet with changes in policy accommodation. How the Fed convinces markets that its current balance sheet strategy and Large Scale Asset Purchases (LSAP) differ is still debatable. In principle, LSAP and Maturity Extension Programs (MEP) were used to reduce risk premiums in longer term yields to incentivize borrowing, lending, risk taking and boost overall economic activity. In contrast, purchases of short-term Treasuries are seen as a technical step to manage benchmark interest rates and given their shorter tenor, should only have a transitory impact on the balance sheet. Ultimately, the success of this approach will depend on the level of reserves that is needed to be considered ample by market participants. Any shortfalls will require either an expansion in reserve assets or reduction in reserve liabilities.

Since the level of reserves prior to the volatility in September ($1.45Tr) were given as reasonable targets by the Chairman, our baseline assumes that outright bond purchases and the increase in reserve balances will continue

indefinitely. Doing so will allow the committee to limit the ambiguities around balance sheet policy and the implementation of a “floor system” with the stance of monetary policy. Failing to do so could dampen the effectiveness of quantitative easing in future downturn.

Recent evidence in money markets suggest that the linkages between balance sheet accommodation, regulation and the demand for bank reserves has grown. Regulatory changes have increased the appetite for risk-free assets and evidence from floor systems in other countries suggests that they tend to be associated with reserve hoarding, particularly in times of stress. These issues intensify when a few banks hold the vast majority of reserves, as it is the current environment.

Although not indistinguishable, bank reserves and short-term government debt are close substitutes if both are valued as highly-liquid risk-free assets. Given that banks are required to hold high quality liquid assets for both liquidity coverage purposes and to meet capital requirements, it is not surprising that when faced with a potential liquidity shortfall, banks hoard reserves. Besides the fact that bank reserves are potentially less risky that short-term government debt, there is some anecdotal evidence that regulators favor excess reserves over Treasuries.

Addressing these issues will require a solution outside replenishing bank reserves to levels seen prior to September (~1.45Tr). First, if reserves continue to be a preferred asset of banks, there will not be a static terminal level of reserves that satisfies aggregate demand amid ongoing growth in nominal assets. This implies a reserve policy that grows by a factor linked to economic growth, similar to currency in circulation. Second, there is a high likelihood that reserve preferences are not stable and thus could be very different in baseline and stress scenarios. As a result, building up buffers in the baseline may never meet the demand that would be present in a stress scenario. Likewise, increasing reserves consistent with a potential stress scenario may increase financial instability risks during normal conditions and encourage government borrowing.

Third, if banks are unwilling to provide liquidity in a stress scenario non-bank market participants may face similar liquidity shortfalls, which would limit the Fed’s ability to transmit monetary policy through administered rates. Ultimately, while some replenishment of bank reserves could reduce volatility in money markets in similar events, to fully address the underlying issues plaguing money markets the Fed will need to increase access to standing Repo facilities, find-tune existing liquidity and capital requirement, or some combination of the two. It is worth noting that a key component of the Fed’s ample reserve regime was specifically to avoid complex open market operations, as was the case before the financial crisis, and a smooth functioning of interbank markets.

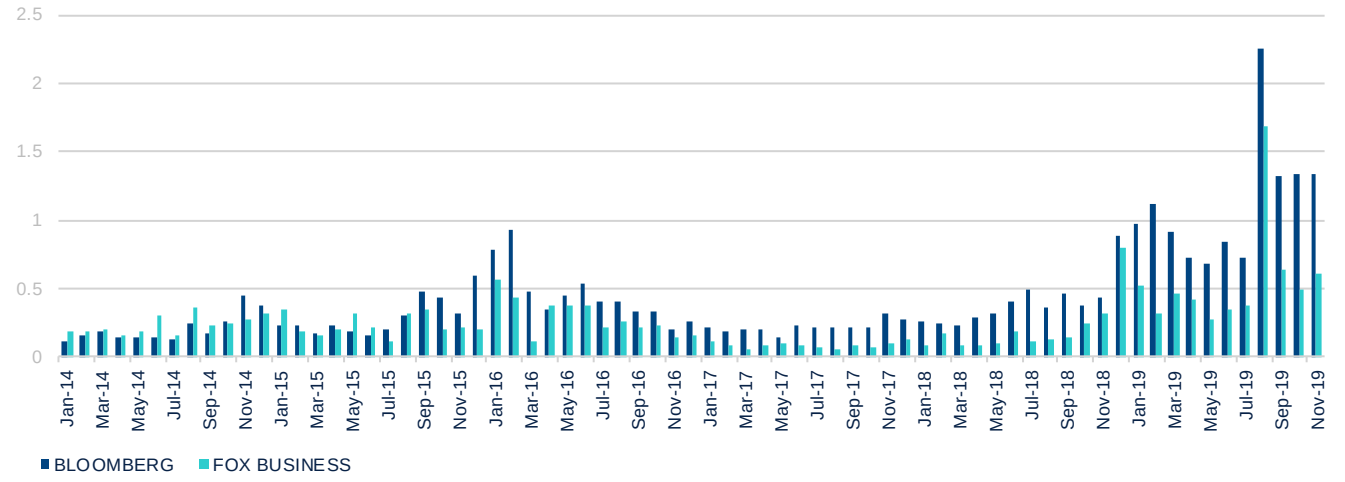
As the Chairman noted, the risks to the U.S. economy are moving in a “positive” direction after the phase 1 handshake agreement between the U.S. and China, lower probability of a hard Brexit and improvement in sentiment in emerging and developed markets. At the most recent press conference, the questions were unable to pin the Chairman to a measurable definition of “material”. However, the subtext suggested that the bar was rather high, meaning that small bouts of volatility would fall short of the threshold needed to cut rates again in December.

As a result, we expect the FOMC to keep rates unchanged in the short-term. While global uncertainty has declined somewhat, it remains elevated at a time when many developed and emerging market economies have built up fragilities with limited capacity for policy responses. Moreover, some cracks are beginning to emerge in domestic labor markets and the industrial recession is having a larger-than-expected impact on some components of nonresidential private investment. As a result, while there is a chance that the Fed could resume cutting rates in 2020, as we view it, this would likely involve the realization of their risk scenario —an imminent U.S. recession– implying a return to the zero lower bound and the implementation of additional unconventional monetary policy tools.

4. Negative interest rate: how viable is it for the U.S.?

Recently, the unprecedented longevity of the current economic expansion sparked many discussions of economic downturns and financial market corrections (Figure 4.1). Given how close the current federal funds rate is to zero, many market participants are wondering about the possibility and the implication of negative interest rate policy (NIRP) in the U.S.

Figure 4.1 **PERCENTAGE OF AIRTIME WHEN "ECONOMIC DOWNTURN" OR "RECESSION" ARE MENTIONED** (%)



Source: Internet Archive Television News Archive, GDELT, and BBVA Research

Before the 2008 crisis, not many economists seriously considered that nominal interest rates would fall below zero. The reason for non-negative interest rates is famously stated by Hicks (1937)[1]:

- "If the cost of holding money can be neglected, it will always be profitable to hold money rather than lend it out, if the rate of interest is not greater than zero. Consequently, the rate of interest must always be positive."

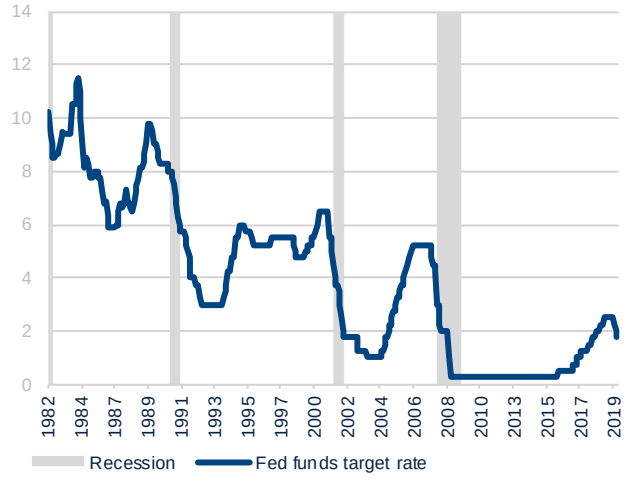
However, in 2009, the Swedish central bank (Riksbank) became the first monetary authority to introduce a negative interest rate policy (NIRP). Between 2014 and 2016, amid elevated risks of recession and deflation, the European Central Bank (ECB), the Danmarks Nationalbank, the Swiss National Bank, and the Bank of Japan all implemented NIRP.[2] As a result, NIRP became a standard option within the global central banks' toolbox. In this section, we examine the effect of NIRP and shed light on the viability of this policy in the U.S.

1: Hicks, J.R., 1937. Mr. Keynes and the" classics"; a suggested interpretation. *Econometrica: Journal of the Econometric Society, pp.147-159.*
2: The overnight deposits rate for Sweden, the deposit facility rate for the Euro Zone, the certificate of deposits rate for Denmark, the 3-month LIBOR target rate for Switzerland, and the uncollateralized overnight call rate for Japan. All can be viewed as the equivalence to the Fed's interest on reserves for the U.S.

Theories behind negative interest rate policy

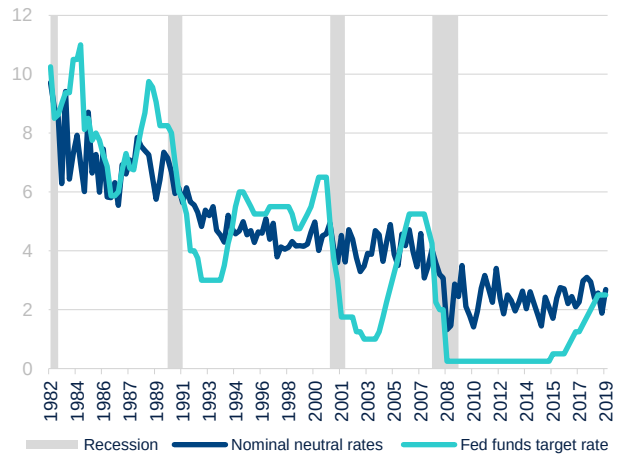
When economic growth slows down, conventional monetary stimulus comes from interest rate cuts by the central bank. Although monetary policymaking generally utilizes highly sophisticated models, the idea of exploiting the negative relationship between the interest rate and output preceded the usage of quantitative models. One explanation is from the textbook IS-LM model. During an economic downturn, the central bank can increase the money supply through open market operations. That is, the central bank will purchase bonds with cash, which will push up bond prices, reduce the interest rate, buoy up the price level, and bring down the real wage. Consequently, the marginal cost of production will decrease, which will ultimately boost investment, employment, and output. In addition, from a financial perspective, lower interest rates imply lower costs of funding, and thus firms can afford investment projects that would not have been profitable otherwise. In the past, significant interest rate cuts were one of the must-dos for the Federal Reserve during economic contractions. The average cut during the last three recessions is 310 basis points from the start to the end of the recession (Figure 4.2).

Figure 4.2 **FED FUNDS TARGET RATE SET BY THE FOMC** (%)



Source: BEA, Haver, and BBVA Research

Figure 4.3 **NEUTRAL RATES AND FEDERAL FUNDS RATES** (%)



Source: BEA, New York Fed, Haver, and BBVA Research

After the FOMC October meeting, the current federal funds target rate stands at 1.75%, and there is no plan to increase it on the horizon. Therefore, if a recession happens in the next few quarters, the Federal Reserve will be unable to cut the rate as deeply as before, unless they are willing to implement NIRP. A recent working paper from the Federal Reserve Bank of San Francisco[3] argues that negative interest rates could be useful to both boost economic growth and raise inflation. The intuition behind this claim is straightforward: The policy rate needs to be significantly lower than the "neutral" rate to provide a meaningful boost[4]. If the neutral rate were close to zero, an above-zero policy rate would be ineffective for economic recovery. Therefore, the central bank should keep cutting the interest rate until it is significantly lower than the neutral rate, regardless of its sign.

3: Curdia, V., 2019. How much could negative rates have helped the recovery? *FRBSF Economic Letter, 4.*
4: The concept of the neutral rate comes from Wicksell (1898) and roughly resembles the real return of capital in production. For more details of the neutral interest rate of the US, please refer to our earlier economic analysis: https://www.bbvaresearch.com/en/publicaciones/u-s-natural-interest-rate-uncertainties-and-policy-implications/

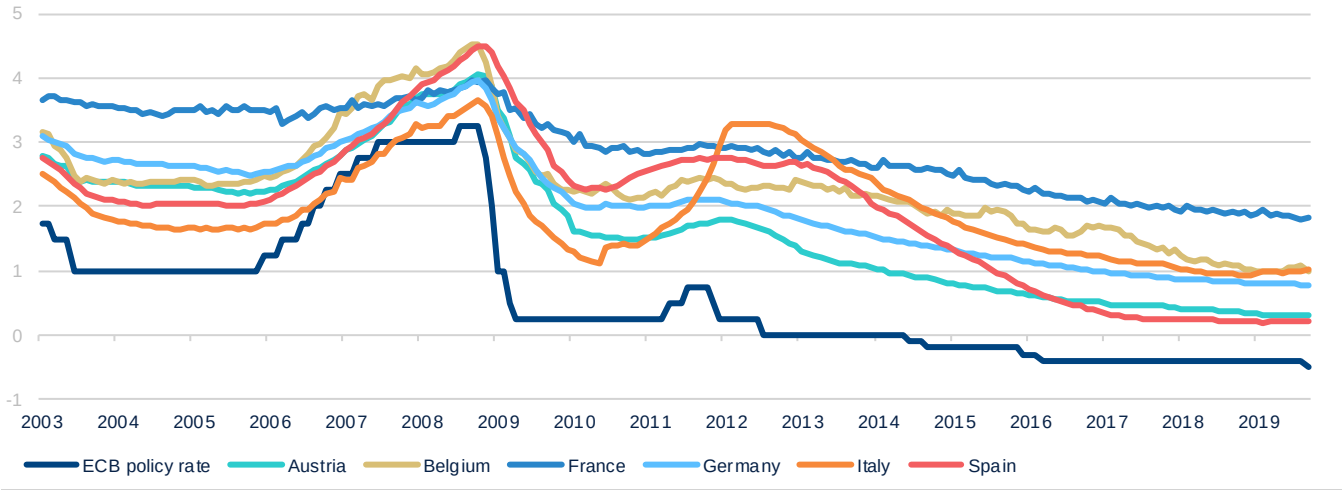
Supporters of this theory include the central banks that have implemented NIRP. They argue that storage costs are not negligible. Therefore, depositors are willing to save their money in the bank, as long as the fees that the bank charges are lower than the storage costs of cash. Under the NIRP environment, the nominal interest rate no longer has a zero-lower-bound (ZLB). Instead, it has an effective-lower-bound (ELB), at which depositors are indifferent between storing cash by themselves and saving money in the bank.

Empirical evidence from Europe

Because households and firms do not have access to the central bank, negative policy rates have to pass through financial intermediaries to affect the real economy. In most macroeconomic models, such as the one used in Curdia (2019), perfect pass-through from the policy rate to the deposit rate and other market rates is an implicit assumption; there is only one single "nominal interest rate," which is commonly used by households, firms, and the central bank. Under conventional monetary policies, complete pass-through is a sensible assumption that significantly simplifies the calculation without loss of generality. However, under unconventional monetary policies, such as NIRP, this assumption seems cavalier and is susceptible to criticism.

Current empirical studies on interest rate pass-through under NIRP show mixed results and demonstrate complex dynamics of banks and firms. On the one hand, some studies show that banks with healthy balance sheets can charge negative deposit rates on their clients. For example, with a confidential dataset from the euro area, Altavilla et al. (2019)[5] find that some "sound banks" do pass negative rates to corporate depositors without losing much funding. Furthermore, firms with high assets receiving negative rates from commercial banks tend to increase their investment and reduce their cash holdings to avoid the costs linked to negative rates.

Figure 4.4 **POLICY AND DEPOSIT RATES**
(SHORT-TERM, HOUSEHOLDS AND NON-FINANCIAL CORPORATIONS, WEIGHTED AVERAGES, %)



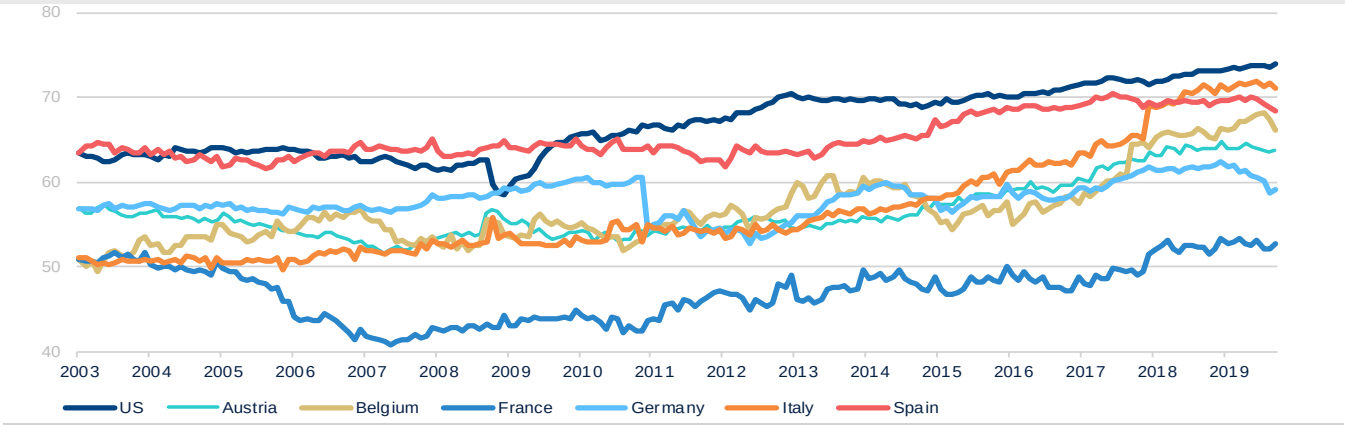
Source: ECB, Haver Analytics, and BBVA Research

5: Altavilla, C., Burlon, L., Giannetti, M. and Holton, S., 2019. Is there a zero lower bound? The effects of negative policy rates on banks and firms. *European Central Bank Working Paper Series* No.2289.

On the other hand, given the diversity of banks and depositors, the implementation of the NIRP can significantly reduce the level of interest rate pass-through at the aggregate level. As Figure 4.4 shows, although the ECB deposit facility rate has been below zero since 2014, short-term deposit rates in Euro Area commercial banks all stayed above zero. In addition, the spread between deposit rates and policy rates significantly shrank. Using a unique, micro-level dataset of Swedish banks, Eggertsson et al. (2019)[6] extensively document responses of deposit rates to the central bank policy rates. The authors find a significant lack of pass-through from the policy rate to the deposit and lending rates when NIRP is implemented. Similarly, in another study by Eisenschmidt and Smets (2019)[7], the two ECB economists also confirm that household deposit rates do seem to have a zero lower bound, although other interest rates, such as short-term government bond yields, have no problem going negative.

The reason for the lack of negative policy rates pass-through to deposit rates is that some commercial banks heavily rely on household deposits for cheap funding (Figure 4.5). In addition, the dependence increased after 2008 since global regulatory reform put heavy restrictions on wholesale funding. Therefore, to comply with new regulations and in fear of losing clients, many banks hesitated to pass the negative rates to deposit rates. The lack of pass-through implies that banks have to absorb the loss from negative policy rates, and lower profitability combined with the deleveraging financial cycle reduces the risk appetite for the banking sector. In other words, the NIRP environment seems to discourage investment and is counterproductive for economic recovery.

Figure 4.5 **DEPOSIT TO TOTAL ASSET RATIO FOR COMMERCIAL BANKS** (%)



Source: ECB, FRB, Haver Analytics, and BBVA Research

In addition, some studies suggest NIRP can prompt banks to cut their loss from negative policy rates by reducing their excess reserves. Demiralp et al. (2017)[8] analyze the cross-sectional variation in banks' funding structures jointly with that in their excess liquidity holdings and conclude that banks highly exposed to NIRP tend to take higher risks and thus grant more loans. Rostagno et al. (2019)[9] conclude that besides NIRP flattening the forward curve and reducing the term premium, it results in banks' balance sheet adjustments whereby the excess liquidity is absorbed by creating

6: Eggertsson, G.B., Juelsrud, R.E., Summers, L.H. and Wold, E.G., 2019. *Negative nominal interest rates and the bank lending channel* (No. w25416). National Bureau of Economic Research.
7: Eisenschmidt, J. and Smets, F., 2019. Negative interest rates: lessons from the Euro Area. *Central Banking, Analysis, and Economic Policies Book Series, 26, pp.013-042.*
8: Demiralp, S., Eisenschmidt, J. and Vlassopoulos, T., 2017. Negative interest rates, excess liquidity and bank business models: Banks' reaction to unconventional monetary policy in the euro area. *Excess Liquidity and Bank Business Models: Banks' Reaction to Unconventional Monetary Policy in the Euro Area (February 1, 2017).*
9: Rostagno, M., Altavilla, C., Carboni, G., Lemke, W., Motto, R., Saint-Guilhem, A. and Yiangou, J., 2019. *A Tale of two Decades: The ECB's Monetary Policy at 20*, ECB Working Paper.

new and riskier loans or purchasing securities. The study also shows that lending and deposit volumes for banks that sometimes charge negative rates in the Euro Area increased at a faster pace than banks that never had negative rates. Not surprisingly, the ECB views that non-standard measures of monetary policy, including NIRP, have lowered yields and bank's funding costs and increased credit availability, GDP, and inflation. However, it is worth noting that this balance sheet effect is constrained by post-2008 regulations and the soundness of the banks. For many banks without top-quality assets, they may have to rely on excess reserves to meet stress test requirements, and the negative return on their excess reserves will further affect their decision-making.

Unconventional monetary policies for the U.S.

The debate around NIRP in the U.S. is not new. Back in 2010, a Fed staff memo evaluated the effects of cutting the interest rate on reserves below zero. The main concerns were operational (software requirements and a potential increase in the demand for currency) as well as legal (the authority to pay interest rates as set in the statues vs. *negative* interest rates). Besides, given the greater importance of money market funds (MMF) as providers of liquidity in the U.S. vs. the EU, Japan, and other countries, NIRP could force MMF to break the buck or shut down. The memo also highlighted potential negative consequences on banks' profitability and dislocations in the federal fund market that would limit the ability of the Fed to use the Fed funds rate as a policy rate.

In a recent article[10] by Janet Yellen, the former Federal Reserve Chair stressed the role of forward guidance and advocated for the "lower-for-longer" commitment. The idea behind her policy proposal is that instead of pursuing NIRP, the central bank can promise a lower (read: zero) interest rate policy that would last much longer than the economic slowdown. Such commitment would boost inflation expectations and eventually "allow the economy to boom." Moreover, at the post-FOMC meeting on September 18, Chair Powell stated, "I do not think we'd be looking at using negative rates, I just don't think those will be at the top of our list." Powell added, "If we were to find ourselves at some future date again at the effective lower bound, again not something we are expecting, then I think we would look at using large scale asset purchases and forward guidance."

In addition to forward guidance, the usage of the Quantitative Easing (QE) programs after 2007 proved their importance in the Federal Reserve's toolbox. Currently, the U.S. still has much room for new asset purchase programs. The Federal Reserve's balance sheet to nominal GDP ratio is 18%, significantly lower than its peak of 25% in 2015. Meanwhile, the ECB balance sheet is over 40% of Eurozone GDP, and the same ratio is above 100% for Japan. The relatively healthy balance sheet of the Federal Reserve suggests that quantitative easing should continue to play an essential role in the next economic contraction.

Bottom line

To sum up, the existing empirical evidence from Europe suggests that negative interest rates may be counterproductive for economic recovery unless they are paired with other aggressive non-standard monetary measures. Given the strong credibility and healthy balance sheet of the Federal Reserve, forward guidance and asset purchasing programs will likely be the two main monetary policy tools to combat the economic slowdown, and the Fed will not resort to NIRP unless it concludes that all other tools have been exhausted.

10: Yellen, J., 2018. Comments on monetary policy at the effective lower bound. *Brookings Papers on Economic Activity*, pp.573-588.

5. Speculative-grade corporate debt distress: Is there a reason for concern?

According to different analyses, corporate debt represents a major risk to the current expansion. The primary reason for this is the significant increase in corporate leverage coupled with a meaningful deterioration in credit quality. Since 2010, the growth rate of business debt has outpaced nominal GDP by a substantial degree, particularly for firms in the highest risk segment. As a result, both corporate liabilities to GDP and long-term liabilities to GDP now stand at record levels (Figure 5.1).

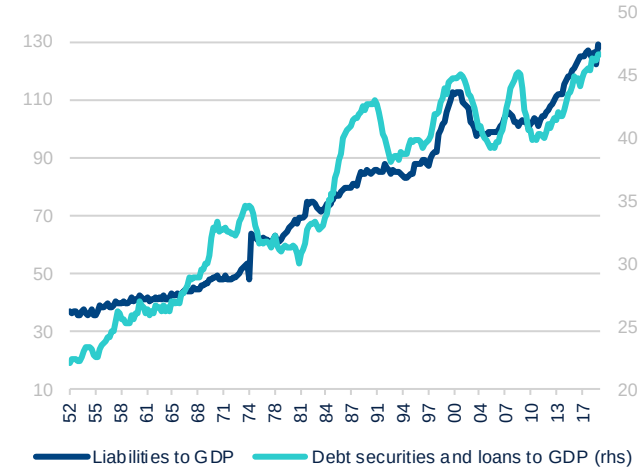
Not surprisingly, the spreads in the highest risk segment of the credit market have lately diverged substantially from the rest of the corporate debt universe. With the economy decelerating slowly and some sectors facing structural headwinds, a continuation of the bifurcation in credit spreads should be expected, posing a substantial risk to some of the most exposed businesses.

While our previous analysis (link) suggests that corporate leverage is not likely to cause a financial crisis as household leverage did in the 2000s, it still has the potential to precipitate an economic downturn. The BBVA Research Corporate Debt Distress Index, a leading indicator of corporate credit quality, points to a likely increase in delinquencies going forward. This could potentially cause a major adjustment in expectations and asset prices, which in turn could negatively impact investment, hiring, and output.

Risk premiums and debt distress

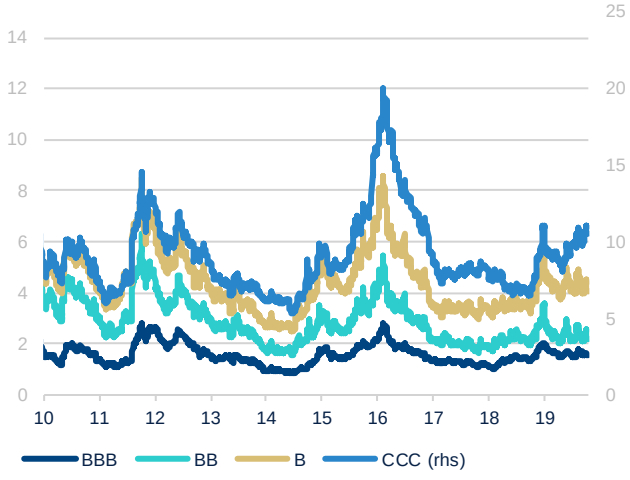
Since the beginning of May of this year, the spreads of bonds rated CCC or worse have been on an almost continuous rise, unlike the spreads in other risk buckets (Figure 5.2). At the beginning of October, the spreads of CCC bonds relative to AAA bonds surpassed 1,000 basis points - a level previously recorded during the peak of the December 2018 market jitters. While the CCC spreads have declined somewhat since then and are far from the levels reached in 2016, if the upward trend continues, the most leveraged market participants will find it more difficult to refinance their debt obligations. Moreover, unlike in 2016 when most of the distress was concentrated in the O&G sector, this time it is likely that a multitude of industries like retail, food and beverages, healthcare, IT and accommodation will be affected.

Figure 5.1 **CORPORATE DEBT TO GDP** (%)



Source: Federal Reserve and BBVA Research

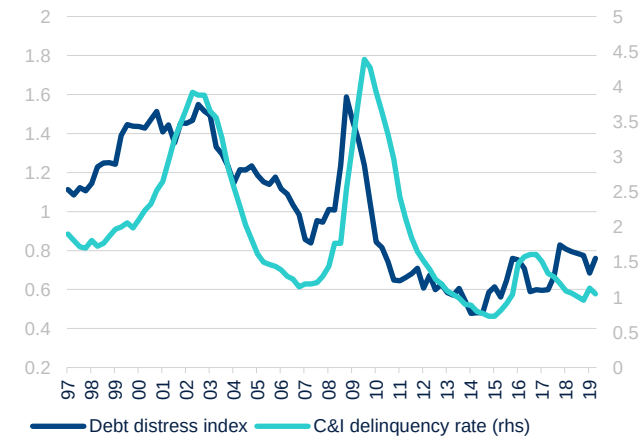
Figure 5.2 **EFFECTIVE YIELD SPREADS ON CORPORATE BONDS RELATIVE TO AAA** (PP)



Source: ICE BofA and BBVA Research

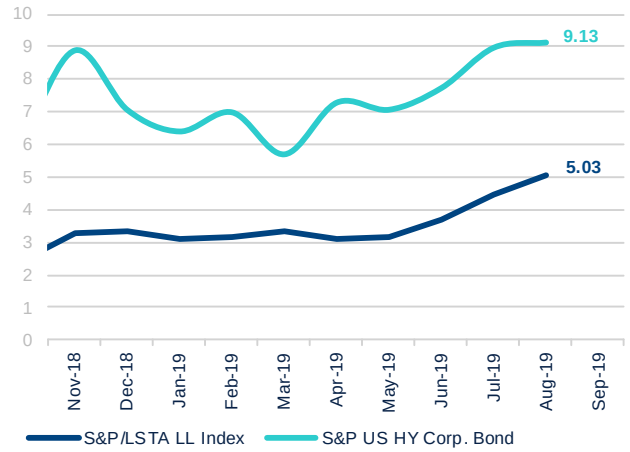
The BBVA Research Debt Distress Index, while still at relatively benign levels, has been on an upward trend since mid-2017 (Figure 5.3). The indicator reflects trends in earnings, leverage and interest rates at publicly listed companies and leads the C&I loan delinquency rate by about three quarters. The measure suggests that while companies are generally able to meet their debt service obligations, conditions are tightening compared to the 2011-2017 period. Most of the deterioration in performance seems to be concentrated in the lower credit quality segments, as evidenced by the increase in distress ratios in the high yield bonds and leveraged loans (Figure 5.4).

Figure 5.3 **BBVA DEBT DISTRESS INDEX** (1=AVERAGE) **AND C&I LOAN DELINQUENCY RATE** (%)



Source: BBVA Research and Federal Reserve

Figure 5.4 **HIGH YIELD BOND AND LEVERAGED LOANS DISTRESS RATIOS, BY NUMBER OF ISSUERS** (%)



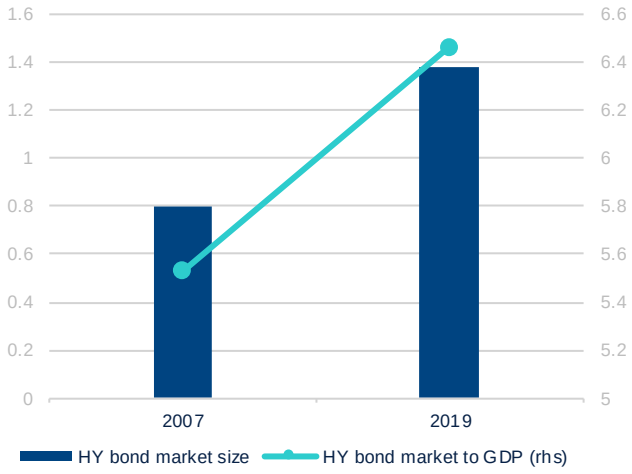
Source: LCD/S&P and BBVA Research

The latest sign of increased stress in parts of the corporate debt space is the rise in default rate forecasts by multiple rating agencies for high-yield bonds and leveraged loans for year-end 2020. For example, Fitch Ratings increased its high yield bond default forecast from 2% to 3.5% and its institutional leveraged loan default forecast from 2% to 3% in October of this year. The rating agency cited an expected increase in defaults in the energy, retail, telecom and broadcasting/media sectors, as well as by firms that are subject of litigation due to the opioid crisis. These figures represent a substantial increase from the non-recessionary averages for high-yield bonds and leveraged loans of 2.3% and 1.8% respectively.[11]

High yield bonds

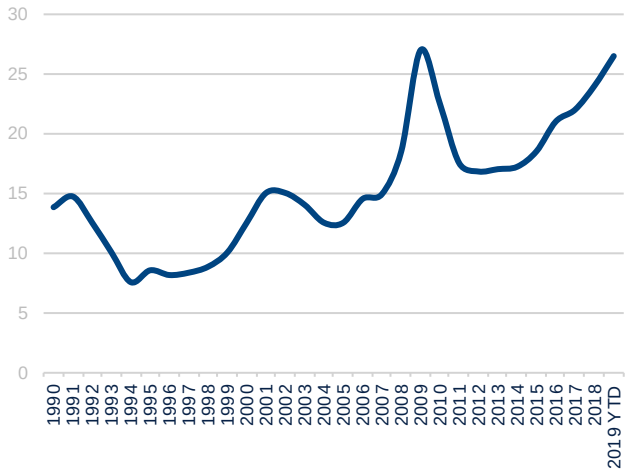
The outstanding value of high-yield bonds has increased substantially during the current expansion, in both absolute and relative terms (Figure 5.5). Moreover, this has gone hand-in-hand with a deterioration in the ratings mix. According to Standard and Poor's (S&P), the proportion of speculative-grade bonds rated B- or below has reached the previous high of 28% that occurred in March 2009 (Figure 5.6). While the ratings mix is based on the number of issuers and not debt outstanding, and a growing number of smaller companies have arguably been tapping high-yield capital markets, it is still concerning that the ratings mix deterioration is occurring against a still somewhat favorable macroeconomic backdrop. While the deterioration in the O&G industry has likely contributed to the increase in B- and below rated bonds, the primary driver seems to be the increasing number of issuers whose first rating tends to be B- and below. As the two sectors with the highest ratio of debt rated B- and below are the tech/IT and telecom industries[12], it seems that the search for yield by return-hungry investors betting on a sustained growth of these knowledge-intensive industries is also a cause of this concerning trend.

Figure 5.5 **U.S. HIGH YIELD BOND MARKET SIZE** ($T AND %)



Source: BBVA Research estimates based on SIFMA, S&P and Bloomberg Barclays data

Figure 5.6 **RATING MIX OF HY BONDS BY NUMBER OF ISSUERS** (SHARE OF B- AND BELOW)



Source: S&P and BBVA Research

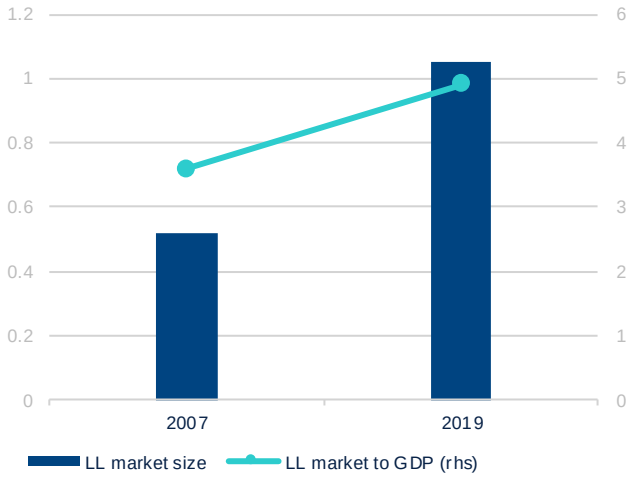
11: Bloomberg. Fitch Ratings: 2020 U.S. High Yield Default Rate Forecast Bumped to 3.5% and Fitch Ratings: 2020 Leveraged Loan Default Rate Up to 3% on Opioid Litigation.
12: S&P Global Market Intelligence. 3Q 2019 US High Yield Market: Feast or Famine.

The large number of B- and below issuers, as well as the ongoing downgrade momentum that has taken hold, is contributing to the increase in the number of high-yield bond “weakest links”, a trend that is also occurring in leveraged loans. Weakest links are a metric by S&P consisting of issuers rated 'B–' or lower with negative outlooks. With 263 weakest link debt issuers last August, the metric has reached the highest level since November 2009. As, according to S&P, the default rate of weakest links is nearly eight times greater than that of the broader speculative-grade, the metric underscores the prospects of increased credit defaults going forward.[13]

Leveraged loans and CLOs

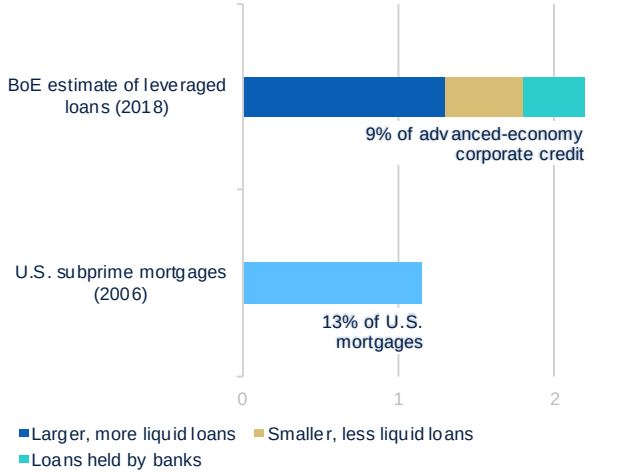
Leveraged loans are the floating rate counterpart of high yield bonds and considered particularly risky,[14] as they are often extended to companies with a significant degree of leverage. These loans as well as the instruments that are created through their securitization, the so-called Collateralized Loan Obligations (CLOs), have attracted particular attention in the past couple of years, especially due to the fast rate of growth of this type of corporate debt. Institutional investors, in particular, have doubled their holdings of these instruments over the last twelve years, which now stand at over $1 trillion (Figure 5.7).

Figure 5.7 **U.S. LEVERAGED LOAN MARKET SIZE, INSTITUTIONAL INVESTOR HOLDINGS** ($T & %)



Source: BBVA Research estimates based on BIS and LCD/S&P data

Figure 5.8 **GLOBAL VOLUME OF OUTSTANDING LEVERAGED LOANS**



Source: Bank of England and BBVA Research

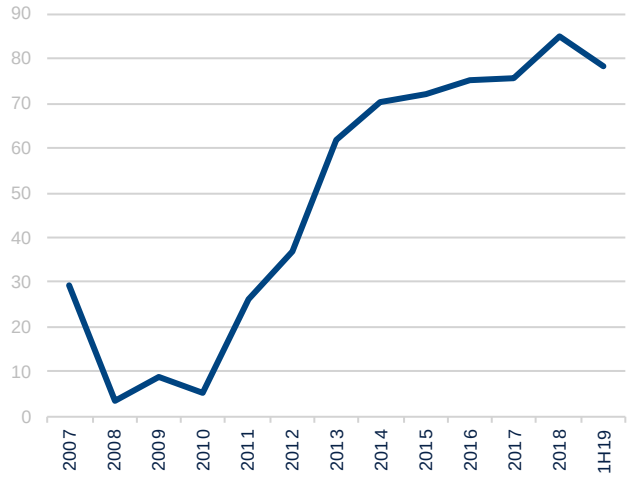
Institutional investor holdings are only one part of the leveraged loan market. Recent research by the Bank of England[15] (BoE) found that the volume of outstanding leveraged loans worldwide is much higher when considering smaller less liquid loans not held by institutional investors. According to the BoE: “when we account for smaller, less liquid loans, as well as lending facilities that are held by banks, the size of the [global] market is more like US$2.2

13: S&P. S&P 'weakest links' tally at 10-year high, suggesting more defaults. October 18, 2019. https://bit.ly/2CmpVvv
14: LCD by S&P considers a loan to be leveraged if it is rated BB+ or lower or it is not rated or rated ‘BBB-‘ or higher but has (1) a spread of LIBOR +125 or higher and (2) is secured by a first or second lien (https://bit.ly/2Cb2GnQ)
15: Bank of England (2019). How large is the leveraged loan market? https://bit.ly/2qomTnP

trillion. Around US$1.8 trillion of this is typically held by non-bank institutions" (Figure 5.8). Assuming that U.S. borrowers account for 86%[16] of the global market, we estimate the U.S. corporate debt underwritten in the form of leveraged loans to be at a higher level than that of high yield bonds and close to $1.9 trillion, or almost 9% of GDP. This compares to around $1.2 trillion in subprime mortgages in 2006, which at that time also represented close to 9% of GDP.

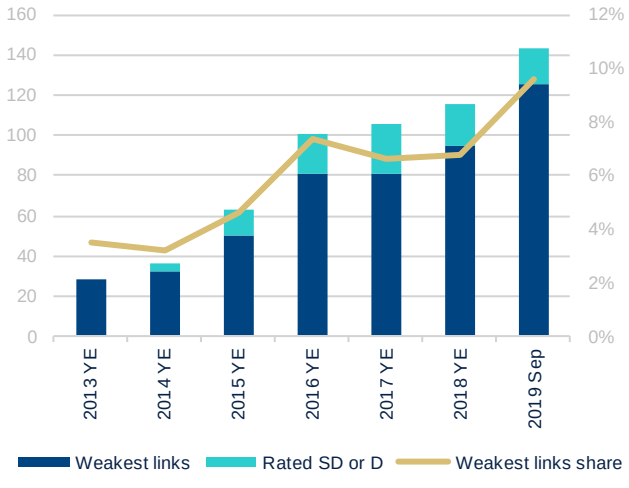
The second reason for concern related to leveraged loans is the progressive dilution of covenants and thus borrower protection over time (Figure 5.9). While there has been some improvement in this regard over the current year, the overwhelming majority of leveraged loans outstanding is now covenant-lite. This situation is a result of a combination of an extended period of very low delinquency rates and a hunger for yield by many investors amid a high liquidity and low interest rate environment, providing borrowers with a strong bargaining position. The somewhat opaque underwriting and securitization processes have also been contributing factors.

Figure 5.9 **SHARE OF COVENANT-LITE LOANS IN TOTAL U.S. LEVERAGED LOANS ISSUANCE** (%)



Source: LCD/S&P and BBVA Research

Figure 5.10 **LEVERAGED LOAN "WEAKEST LINKS"** (COUNT OF ISSUERS AND %)

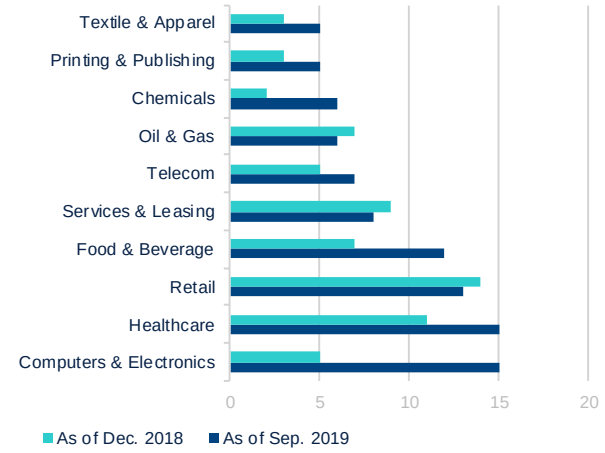


Source: LCD/S&P and BBVA Research

With the U.S. economy gradually decelerating since mid-2018, it is not surprising that signs of stress in the leveraged loan market have started to appear. According to LCD/S&P, the number of U.S. leveraged loan weakest links in September 2019 stood at the highest level by far since LCD began tracking this metric in 2013[17] (Figure 5.10). LCD's weakest links are loans underlying the S&P/LSTA Index that have a corporate credit rating of B– or lower and a negative outlook from S&P Global Ratings. While actual defaults or restructurings were limited, the increase in the number of weakest links came from a large jump in downgrades. The sectors with the largest number of weakest links were computers and electronics, and healthcare (Figure 5.11). Moreover, the increase in downgrades in September was not an isolated event, but rather a continuation of a long term trend that started several years ago and intensified significantly in 3Q19 (Figure 5.12).

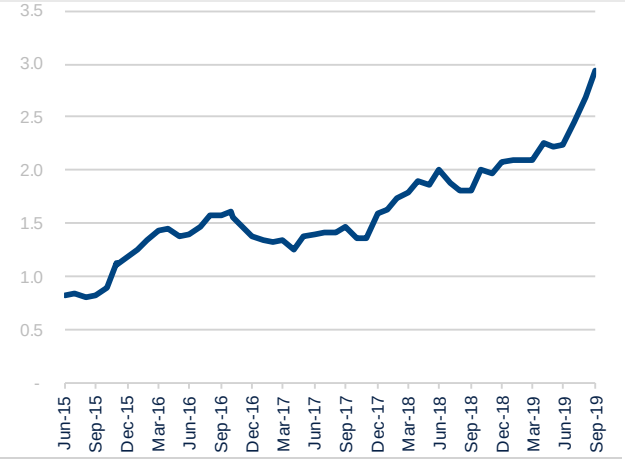
16: Ratio value taken from S&P/LSTA data on U.S. domiciled borrowers' share of the institutional loan market in 2017
17: LCD/S&P Market Intelligence. Loan Weakest Links accelerate in 3Q amid raft of downgrades. October 31, 2019.

Figure 5.11 **WEAKEST LINKS, LEVERAGED LOANS, TOP 10 SECTORS** (COUNT)



Source: LCD/S&P and BBVA Research

Figure 5.12 **DOWNGRADES TO UPGRADES IN THE LEVERAGED LOAN INDEX, ROLLING 12 MONTHS** (RATIO)



Source: LCD/S&P and BBVA Research

The increase in leveraged loan financing during the current expansion and the deterioration in performance of some parts of the market are undeniably a red flag, particularly when it comes to CLOs. According to the Bank for International Settlements (BIS), questions remain "about the potential financial stability risks posed by CLOs, which share some similarities with the collateralized debt obligations that were at the center of the Great Financial Crisis".[18] On a positive note, while CLOs bear a lot of similarity with collateralized debt obligations (CDOs), they are less likely to represent a systemic risk to financial stability as CDOs did a decade ago. First, CLOs are backed by arguably more diversified collateral than CDOs were in the past. Second, there has been minimal re-securitization, synthetic securitization and maturity transformation, which were prevalent a decade ago and acted as strong amplifiers of financial stress when the credit cycle turned.[19] Lastly, traditional financial institutions hold a small share of corporate bonds and CLOs, while their capital ratios are much higher than leading into the Great Recession.

Bottom line

Given our expectation of slower economic and corporate profit growth, increased stress in the riskiest corporate debt markets is likely, coupled with a rise in default rates. The bifurcation of CCC spreads over the rest of the market segments is an early sign of concern on the side of investors, and we expect it to continue. As the increase in CCC yields continues and possibly spreads to the other risk segments, some of the most leveraged companies will face problems rolling over their long-term liabilities. Low delinquency rates and accommodative monetary policy have so far provided supportive financial conditions. However, while the unprecedented level of global monetary policy stimulus can contain pressures in the high yield bond and leveraged loan markets, it can aggravate the systemic risks that these instruments pose over the mid- and long-term if more liquidity flows into higher-risk debt financing.

18: BIS Quarterly Review, September 2019. (https://bit.ly/2Ng5eaR)
19: Ibid

6. Turf trade war: A regional analysis of the U.S.-China trade war

What started as protectionist policies covering domestic goods and a demand for greater intellectual property protections has since ballooned into a tit-for-tat conflict; in which, many trade goods have been punished, and the rest remain at risk. With the U.S.-China trade war well into its second year, international firms have been forced to consider their supply-chain; attached consumer goods have absorbed the increase in costs; and the public has been handed a case study on the effects of isolationism on a globalized economy.

Economic studies suggest that the conflict has served to depress U.S. real GDP by 0.3-0.5% and the potential increase in payroll by 300,000-450,000 jobs, yet the U.S. economy is growing faster than other developed countries and in spite of a poor global outlook. One might consider that the majority of the U.S.'s tariffs on Chinese imports have been framed as retaliatory either in response to unfair trade practices supported by the Chinese government or to China's subsequent counter-duties. However, these barriers were constructed by an administration that has championed trade protectionism and the reinvigoration of waning domestic producers. For this reason, we stand to consider what effects the international conflict has had on regional U.S. economies and to what extent the U.S. can claim the rewards and pangs associated with protectionist policies.

Given the availability of comprehensive regional data covering one year of effective tariffs, we have conducted a comparative analysis between regional economic conditions in the year prior to the start of the conflict and the year proceeding it. We compare variables such as the payroll between industries whose supply-chains were shocked by the introduction of tariffs and those who were not. We also consider the trade balance of affected goods in order to describe these economic conditions. Our goal is to isolate the effects of the ongoing trade war on states, metropolitan areas, and the generic consumer. Moreover, we consider the critical juncture on which the conflict sits, as tariffs on an additional $300bn of imports are on hold and talks of de-escalation are underway. Based on these two outcomes and the realized effects of the past year, we describe two likely scenarios going into 2020.

U.S. states and trade balance

Following the release of each Section 301 tariff list by the U.S. Trade Representative, the U.S. was met with an attempt to match counter-tariffs in kind. As of November 2019, the U.S. has placed an effective tariff rate of 14.4% on $336.6bn worth of goods and China has returned fire with 11.8% on $90.2bn. While these protectionist trade policies likely served to repatriate the production of goods directly covered by duties, retaliatory measures by China have served to negate increased demand for domestic exporters with large volumes to China and abroad.

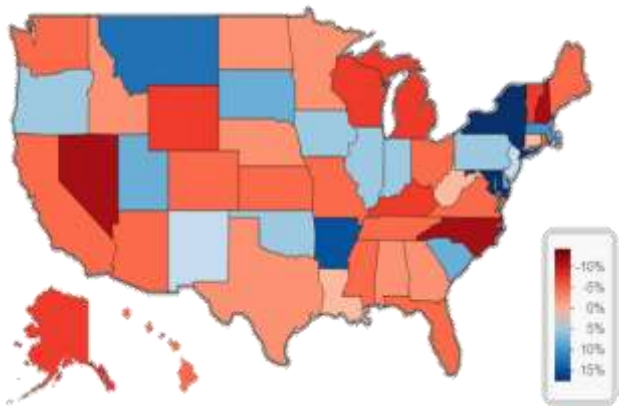
In order to evaluate the net effect of tariffs and their matching counter-tariffs on a state, we might consider the change in the trade balance of affected goods. An optimistic outcome for protectionist trade policies is the reshoring of domestic production, which outweighs a decrease in exports from retaliatory measures. In states where this is the case, we should expect to find an increase in payroll or production when controlling for the prevailing trend in demand. Of course, this benefit can be undermined by the diversion of imports to other countries or by a decrease in consumer spending resulting from an increase in prices.

Most states saw a decrease in the inflow of affected Chinese imports. Texas and California saw the largest decrease in absolute terms at $5.8bn and $13.8bn respectively; however, both of these states proved resilient and made up a sizable portion of this loss by increasing imports from Southeast Asia. This net loss in imports was relatively small compared to the state's total import of affected goods. Smaller states were not as successful in diverting imports elsewhere. States closer to the West Coast like Idaho, Washington state, and Oregon saw relatively large dips in the demand of affected imports which were not diverted to other countries.

Overall, demand for affected Chinese imports decreased by nearly $36.7bn. Southeast Asia ultimately gained from American tariffs on Chinese goods seeing an increase in exports to the U.S. of $13.5bn. Accounting for all redistributions of affected imports between the U.S.'s trading partners, the net decrease in affected imports came out to just over $16bn. This amount was either repatriated for domestic producers, or it was lost as a result of increased consumer prices.

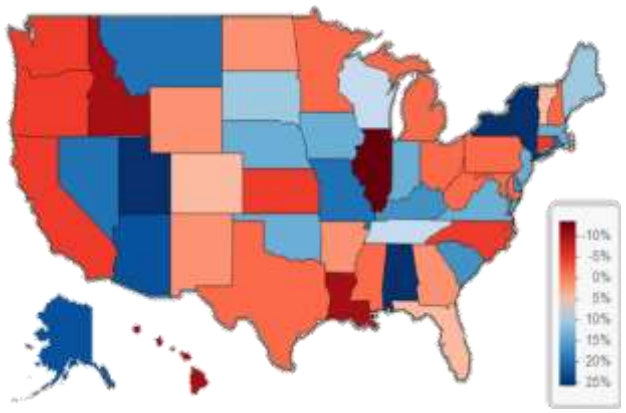
Texas, California, Illinois, and Michigan saw the largest decrease in exports affected by Chinese counter-tariffs. For each of these states, the decrease in exports exceeded $1.3bn. These losses were fueled by decreased demand from China, Mexico, Canada, and Latin America, which were all targeted by protectionist U.S. trade policies. Texas and California made some effort to divert targeted exports to other trading partners, namely Europe, Africa, and Southeast Asia; however, Texas and California still experienced a net decrease in affected exports of $1.3bn and $1.7bn respectively. Only states with relatively little dependence on Chinese consumers or proximity to alternatives such as Pennsylvania, Maryland, Montana, and New Mexico were able to increase exports of goods caught in the crossfire. In all, exports affected by counter-measures decreased by $10bn over this period contributing $6.4bn to the U.S. trade balance.

Figure 6.1 **CHANGE IN AFFECTED EXPORTS** (% YoY)



Source: U.S. Census and BBVA Research

Figure 6.2 **CHANGE IN AFFECTED IMPORTS** (% YoY)



Source: U.S. Census and BBVA Research

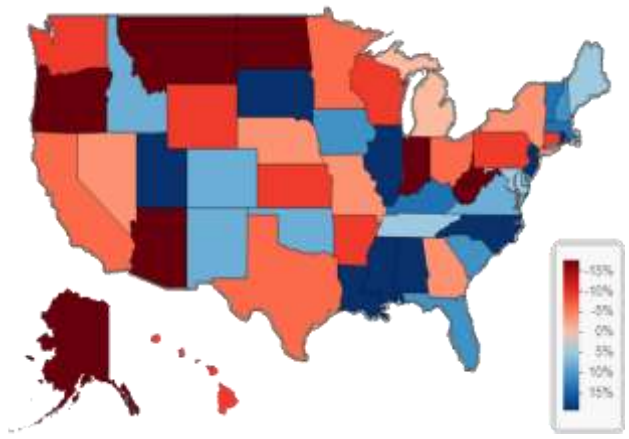
This result is consistent with research on the effects of international policy on trade balance. A study conducted by the U.S. International Trade Commission prior to the start of the trade war found that an increase in protectionist trade policies results in the temporary improvement of a country's trade balance in conjunction with increased demand for domestic production. However, these results evaporate within a year because of these policies' residual effect on welfare and consumer demand.

In the absence of updated production data for individual items targeted by tariffs, we defer to industry payroll as a proxy for the response of domestic producers to shifting international conditions. The relationship between products at the HTS10 level and NAICS industry codes is fine enough to describe the relative impact of tariffs on producer expectations and realized consumer demand via firm payroll.

Tariffs imposed by both countries primarily affected agriculture, mining, construction, manufacturing, wholesale trade, and retail trade. When we isolate those domestic firms that produce goods subject to Section 301 tariffs via HTS to NAICS concordance, we find that the payroll of these firms increased by 0.35pp since the start of the trade war; whereas, comparable unaffected firms decreased their payroll by around 0.02pp. This difference suggests that tariffs resulted in the reshoring of jobs attached to tariffs during the first year of the trade war.

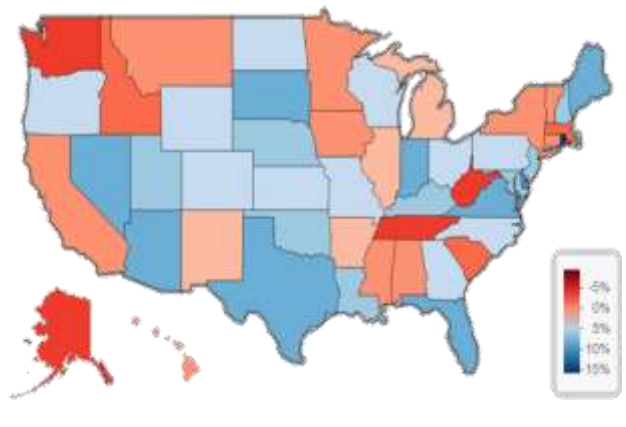
Incorporating the change in net exports into various models that predict change in payroll, we find a consistent, albeit weak, positive relationship between changes in net exports resulting from shifting international relations and affected payroll employment. Based on these models, we can attribute between 5-6% of the increase in these industries' payrolls to an increase in its net exports.

Figure 6.3 **CHANGE IN TRADE BALANCE** (% YoY)



Source: U.S. Census and BBVA Research

Figure 6.4 **CHANGE IN AFFECTED PAYROLL** (% YoY)



Source: U.S. Census and BBVA Research

Metropolitan areas and industrial payroll

Our previous observation linking increased payrolls to firms that produce goods subject to Section 301 tariffs is even more evident at the metropolitan level. Metropolitan firms whose goods were caught in the cross-fire saw an increase in payroll employment of 1.06pp since the start of the trade war; whereas, related but unaffected firms saw their payroll decrease by 0.26pp.

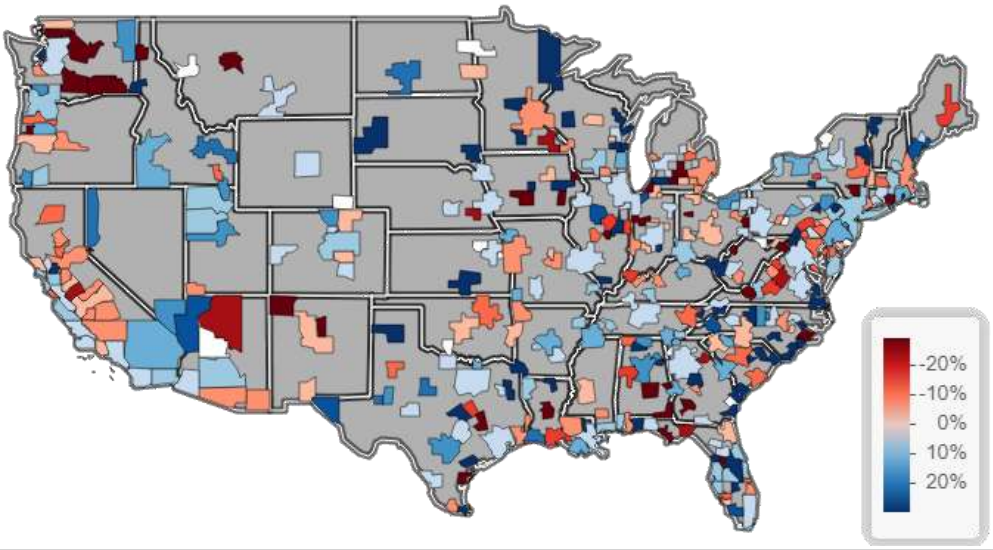
This divergence might be attributed to the effects of tariffs on agriculture, as both targeted and untargeted agriculture saw a large decrease in payroll of 5.44pp and 5.16pp respectively during the first year of the trade war. Metropolitan regions have a larger concentration of manufacturing jobs, which saw an overall increase in payroll of 1.68pp and of 2.64pp inside of metropolitan areas alone, whereas nonmetropolitan areas have a large concentration of agriculture.

This disparity between agriculture and manufacturing is to be expected, as China was the largest importer of American crops, and it was easily able to redirect its imports to other countries like Brazil. Moreover, agricultural lacks large enough margins to absorb sudden changes in price and demand.

In terms of a regional analysis, there are few prominent geographical patterns. Unsurprisingly, the change in a metro's payroll corresponds to the distribution of its labor-force between industries. Consider the disparity between the performance of agriculture and manufacturing. Metros with a large proportion of agricultural workers saw a larger contraction in overall payroll than one biased towards manufacturing.

The West Coast seems to be the only region that is uniformly depressed by tariffs. Central California is experiencing contractions specifically in agriculture, which is spurred by tariffs on non-grain farming and livestock. Washington State has experienced the largest contraction stemming from the trade war. A large portion of the state's activity comes from trade logistics, which is shrinking as U.S. trade volumes continue to contract. Non-coastal metro areas saw a reduction in transportation of over 50%. The overall decrease in international trade has depressed West Coast port cities whose imports from and exports to China before the trade war made up 35% and 20% of the U.S.'s total trade with China respectively.

Figure 6.5 **CHANGE IN AFFECTED PAYROLL** (% YoY)



Source: U.S. BLS and BBVA Research

Some geographical patterns do arise with respect to economic proximity. The metro areas around the border between Alabama, Georgia, and Florida saw a uniform decrease in employment resulting from losses from machine-parts manufacturing. Whereas, New England saw a relative boom in manufacturing which was bolstered by gains in electronics and semiconductor manufacturing.

Most industries that are affected by either domestic or foreign tariffs are regional, and their performance in one metro is predictive of performance in adjacent metros. The one industry that serves as the exception is construction, which is usually the weakest performing industry in metros that have benefitted from duties. Moreover, construction is relatively unaffected by increases in import prices as compared to all other industries which deal with tradable goods.

Effects on domestic consumers and producers

Trade balance and payroll only serve to describe the reaction of producers to international duties; however, these reactions are informed by the anticipated consumer reaction to increases in the price of affected goods. Consumers will only really feel the impacts from this conflict if tariffs are transferred to final prices rather than being absorbed elsewhere in the supply chain. Amiti, Redding and Weinstein (2019)[20] analyzed the relationship between prices of consumer goods and subsequent demand in order to estimate the cost of the ongoing conflict to domestic consumers and producers.

In tracking the CPI of imports relative to the increase in their effective tariff rate, the study was able to conclude that almost all increases in the cost of the supply chain were passed through to domestic prices. When calculated at the

20: Amiti, M., Redding S. J., & and Weinstein, D. (2019). The Impact of the 2018 Trade War on U.S. Prices and Welfare. *National Bureau of Economic Research*.

HTS6 level of international trade, a 10% increase in tariffs is associated with a 9.95% increase in the final price of affected goods. They estimate that the deadweight loss resulting from this increase in domestic prices was around $1.4bn per month as of November 2018 on top of tariff payments made by importers.

Domestic producers, as intermediaries of consumers and foreign producers must also bear the brunt of increased tariffs. They estimate that producers increase their prices by a factor of 1.8 in proportion to the percentage of exposed variable cost in their operations per pp increase in the tariff rate. Domestic producers were also shown to increase their prices in response to output tariffs or an associated increase in price by foreign competitors. The coefficient of this price increase is 0.49 times the proportion of a firm's exposed variable costs per pp increase in output tariffs. The back-and-forth nature of the trade war is estimated to have resulted in U.S. manufacturers increasing their prices 1.1pp more than had tariffs not been implemented.

The combined effects of increased prices by foreign and domestic producers resulted in an estimated deadweight loss of $6.9bn through 2018, and a loss of $12.3bn from the collection of tariffs.

Outlook of current relations

As of the beginning of November 2019, trade tension between the U.S. and China has plateaued. There is a general sense of optimism expressed by both markets and government officials, as the intent to remove existing tariffs has been announced by both sides. However, this peace is built on an unsteady foundation, as, just three months prior, both countries flirted with increasing existing tariffs and doubling the list of affected goods. Resolution is on the horizon, yet given the catastrophic nature of all previous negotiations, we have reason to consider the effect of both explicit outcomes on regional economies.

Let us first consider the de-escalation of trade tensions. U.S. officials have signaled at anticipated reductions in tariffs. If the U.S. government does not back down from the initial demands, the only likely scenario that restores conditions existing prior to the start of the trade war would involve agreements in which the Chinese protect U.S. intellectual property interests. Chinese officials have yet to mention this as an option and have stated that any concession on their part must be matched by the U.S.

Since domestic prices have absorbed nearly the entirety of a good's tariff, we might assume that domestic and foreign prices will decrease in tandem with retractions. Though, it is more likely that price reductions trail behind tariff retractions, as many firms have sunk large investments in redirecting their supply-chains since the beginning of the trade war. In any case, we can estimate the upper-bound of the benefits from a reduction in tariffs via the model described in the previous section.

Each percent decrease in tariffs imposed on a good can result in a 6% increase in the import of that good. The same elasticity holds for exports given an equal reduction in counter-tariffs. In all, for each percentage point decrease in the U.S. average tariff rate, the U.S. can expect a reduction in the monthly deadweight loss of around $400mn in addition to the decrease in tariffs paid by domestic producers and consumers. A 1pp decrease in the effective tariff rate would involve reversing most of the U.S.'s List 3 tariffs (10% on $200bn) or all previous tariffs lists including the steel and aluminum tariffs put in place during April 2018.

In terms of the regional effects from lifting tariffs, it is difficult to say which states or metropolitan areas will benefit, as this is largely a function of the list of tariffs to be removed. Until this point, each Section 301 list has been populated with neither rhyme nor reason. What can be said with confidence is that agricultural exports will likely return to pre-war expansion; while, the temporary boost in demand for domestic manufacturing will shrink as international supply-chains are restored. The employment gap between affected and unaffected industries is already closing and will continue to close assuming there is no escalation in the conflict.

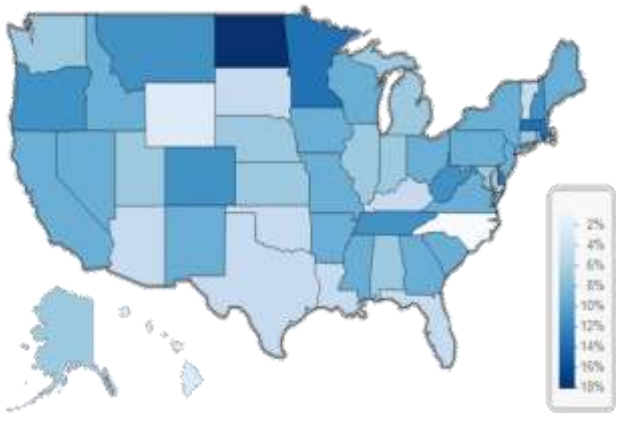
Finally, let us suppose that negotiations fall through, tensions reignite and the threats made in August 2019 are implemented starting in 2020. According to the U.S. Trade Representative, this new list covers almost all goods not already covered by Section 301 tariffs save a few goods (approximately $300bn) with a 15% import duty and raises all existing 25% duties to 30%. Chinese officials retaliated by threatening to impose a 10% tariff on an additional $75bn worth of goods.

Assuming that each country acts on their threat, these measures would result in almost all targeted imports from China being diverted internationally and a reduction in exports to China on par with the effects of list 3 tariffs (about 54%).

As Chinese counter-measures fail to match the coverage of American threats, the implementation of these “List 4” tariffs is likely to disproportionately affect importers. Assuming consumer demand does not collapse as a result of price increases, we should expect the disparity between manufacturers and agriculture to persist.

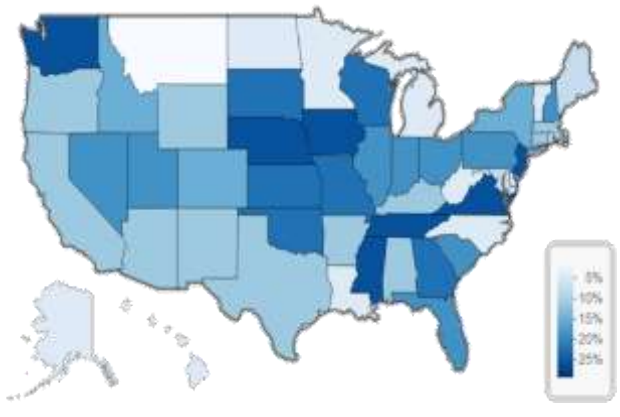
China’s remaining tariffs on agricultural products will disproportionately affect the West Coast and would likely contribute to continued contractions like those seen over the past year. The United States’ leverage in combination with temporary boosts to domestic manufacturers of affected goods presents a slight benefit to certain regions. The Great Lakes region and American Mid-West, having an exceptionally high dependence on Chinese imports and concentration of affected manufacturers, would likely experience a large temporary boost in production and payroll.

Figure 6.6 **EXPORTS SUBJECT TO LIST 4 COUNTER-TARIFFS** (%)



Source: U.S. Census and BBVA Research

Figure 6.7 **IMPORTS SUBJECT TO LIST 4 TARIFFS** (%)

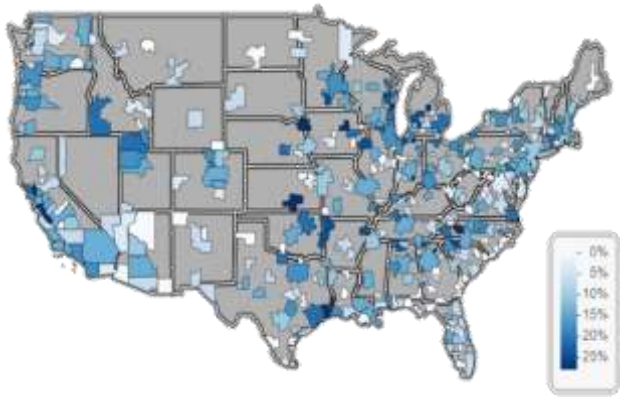


Source: U.S. Census and BBVA Research

Figure 6.8 **PAYROLL EXPOSURE TO LIST 4 AFFECTED AGRICULTURE** (%)

Source: U.S. BLS and BBVA Research

Figure 6.9 **PAYROLL EXPOSURE TO LIST 4 AFFECTED MANUFACTURING** (%)



Source: U.S. BLS and BBVA Research

Conclusion

Most case studies have found that protectionist trade policies can serve to restore production, yet this comes at a greater aggregate cost to the economy than job repatriation would otherwise produce. The exhaustive selection of imports targeted by U.S. tariffs has resulted in an overall loss for domestic consumers and producers; however, we have seen regional patterns arise which extend past the explicit goals of the trade war.

Tariffs on Chinese goods do seem to have increased the payroll of affected domestic manufacturers. This is in line with research linking protectionist policy to a temporary increase in domestic production, yet it seems that the initial boost to U.S. manufacturing has finally worn off. The same could not be said for American agriculture, which suffered more from decreased international demand. Trade tensions seem to be easing, as the leaders of both countries struggle to justify the continuation of the conflict amid fears of further economic weakness. While the course of de-escalation is uncertain, the public can be assured that concessions made by both parties can only serve to benefit consumers and boost most regional economic outlooks. Still, an obvious question to ask is, was it worth it?

7. Sustainability: If it looks like meat and tastes like meat, then it probably is… alternative meat!

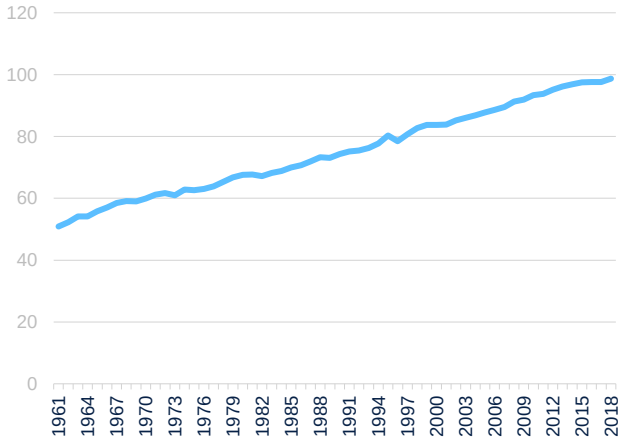
Introduction

Disruption has reached the meat industry. A group of companies in the biotechnology space has effectively developed meat made from plants or from the in vitro cultivation of animal cells. Alternative meat is not new. However, what makes the new generation of products unique is that their creators achieved what just some years ago seemed impossible, that is, to replicate the texture and flavor of the meat without slaughtering animals. If the innovation succeeds, these companies will revolutionize the food industry in a way comparable to how Amazon and Tesla transformed the retail trade and auto landscape.

Meat consumption as a sign of progress

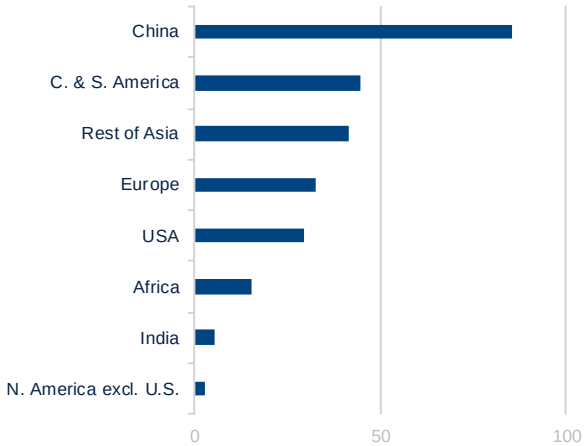
Humanity is eating meat like never before. Based on data compiled by the Food and Agriculture Organization of the United Nations (FAO), we estimate global consumption of meat (excluding fish and seafood) increased from 71.3M metric tons in 1961 to 341.6M metric tons in 2018.[21] Part of this growth reflects a 4.7 billion increase in the world's population during the same period. However, population growth is just part of the story. In fact, during these 57 years, meat demand increased faster than the population (2.8% vs. 1.6% per year), leading to an increase in consumption per capita of 1.1% per year. Today, the average person consumes around 99lb (45kg) of meat per year, about 44lb (20kg) more than sixty years ago.

Figure 7.1 **GLOBAL MEAT CONSUMED** (POUNDS PER CAPITA)



Excluding fish and seafood. Source: FAO

Figure 7.2 **GLOBAL MEAT CONSUMED** (CHANGE, MILLION METRIC TONS 1961-2017)



Excluding fish and seafood. Source: FAO

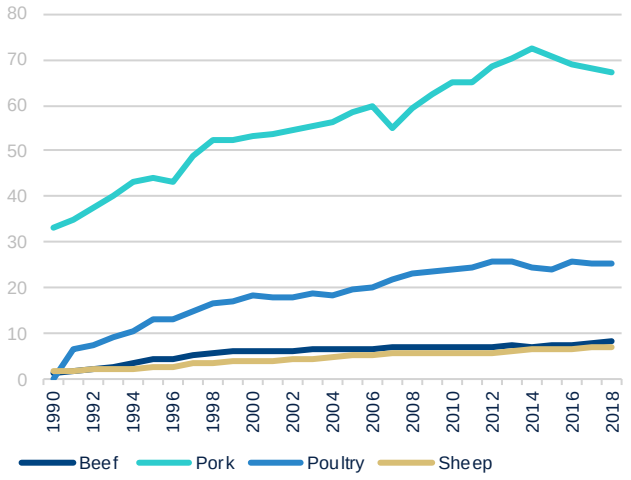
21: FAO Data is as of 2017. A metric ton is equivalent to 1000kg.

From an economic perspective, this can be considered “good” news as it means that disposable incomes have increased around the world, particularly in developing countries. There is a positive correlation between higher income and meat consumption. As households get wealthier, they tend to get more of their protein needs from meat, poultry, and other dairy products, and less from food staples.

According to the OECD, China’s meat consumption (beef, pork, poultry, and sheep) per capita increased by 3.1% per year, going from 36.3 to 107.8lb (16.5 to 48.9kg) between 1990 and 2018. Although pork continues to be the primary source of animal protein in the country, consumption per capita of beef and poultry has also increased. [22]

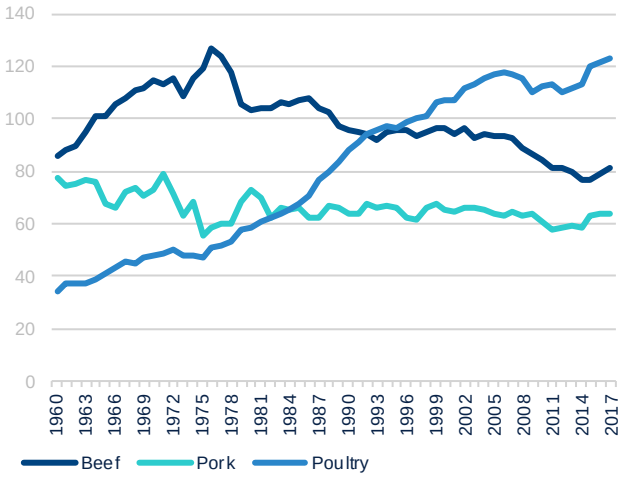
In the U.S., data from the U.S. Department of Agriculture shows a 0.4% annual increase in the per capita availability of red meat and poultry (a proxy for meat consumption), from 211.3 to 269.6lb (95.8 to 122.3kg) in the aforementioned period. However, contrary to the upward trend observed in other countries, average meat consumption per person peaked in 2004. Moreover, Americans have also changed the composition of their meat intakes. As a share of total consumption per person, beef peaked in 1976, while consumption of chicken has reached record heights.

Figure 7.2 **CHINA MEAT CONSUMPTION** (PER CAPITA, POUNDS)



Source: OECD

Figure 7.3 **U.S. MEAT CONSUMPTION** (PER CAPITA AVAILABILITY, CARCASS WEIGHT, POUNDS)



Source: U.S. Department of Agriculture

According to the North American Meat Institute, in 2017, the meat and poultry industry processed 9 billion chickens, 32.2 million cattle and calves, 241.7 million turkeys, 2.2 million sheep and lambs, and 121 million hogs in the country.[23] The industry’s economic output is estimated to be around $1 trillion.

22: OECD (2019), Meat consumption (indicator). Doi: 10.1787/fa290fd0-en. Accessed November 8, 2019.
23: The United States Meat Industry at a Glance. https://www.meatinstitute.org/index.php?ht=d/sp/i/47465/pid/47465

The problem with unsustainable meat production

Although higher meat consumption is a sign of economic progress, it also has significant adverse effects on the environment.

As population is projected to reach 9.7 billion by 2050, meat production would have to double to keep consumption per capita constant. Fulfilling the global demand for meat would put a significant amount of stress on the environment and derail efforts to mitigate the effects of climate change. Livestock production is a major contributor to deforestation, desertification, erosion, water and air pollution, greenhouse gas (GHS) emissions, and loss of biodiversity.

Livestock production competes directly and indirectly with ecosystems for vital resources. Roughly, a third of the ice-free terrestrial surface of the planet is used for livestock grazing, while one-third of arable land is used to cultivate crops to feed livestock.[24] Cattle ranching is the most important cause of deforestation in the Amazon rain forest, accounting for 80% of deforestation rates. [25] In the U.S., around a third of the land in the contiguous 48 states is used for pasture. Together, pastures and cropland to produce feed cover 41% of U.S. land in the contiguous 48 states.[26]

Approximately 90% of the water footprint of humanity is related to agriculture; from this, 30% relates in one way or the other to animal products. Around the world, most of the water consumed by livestock comes from rain (~83%). Consumption of surface and groundwater has a smaller share (7%), but depending on the region, it could be significant enough to have an impact on aquifers and aquatic ecosystems. Yet, the biggest pressure on water resources comes from how the animals are fed. Of the water needed to produce meat, 1.1% is for drinking, 0.03% is for mixing the feed, and 0.75% is for maintaining the farms.[27] Thus, 98% of the livestock water footprint lies in the production of feedstuff. The industrial production of livestock pollutes surface and groundwater through the mismanagement of manure and the runoff of fertilizer and pesticide compounds employed in the production of forage and grains. [28]

Unsustainable livestock production exacerbates climate change as it generates the three most important GHS (carbon dioxide, nitrous dioxide, and methane), and is the primary source of methane emissions to the atmosphere. Livestock production is responsible for 15% of CO2 equivalent emissions primarily through deforestation and manure.

Industrial livestock production also affects biodiversity through deforestation and the spread of diseases to wild species. It also contributes to the mass extinction of animal and plant species. One example is the presence of a “dead zone” in the Gulf of Mexico (the largest in the world), an area that covers between 6,000 and 7,000 square miles, where oxygen is so limited for marine life to survive. The dead zone is located at the mouth of the Mississippi River, and it was created by vast amounts of nitrogen and phosphorous resulting, to a large extent, from farming activities.

24: H. Charles, J. Godfray, Paul Aveyard, Tara Garnett, Jim W. Hall, Timothy J. Key, Jamie Lorimer, Ray T. Pierrehumbert, Peter Scarborough, Marco Springmann, Susan A. Jebb (2018). “Meat Consumption, health and the environment.” Science. Vol. 361. Issue 6399. Jul 20. DOI: 10.1126/science.aam5324.
25: Yale School of Forestry & Environmental Studies. “Cattle Ranching in the Amazon.” Available at: https://globalforestatlas.yale.edu/amazon/land-use/cattle-ranching
26: Dave Merrill and Lauren Leatherby (2018). “Here’s How America Uses Its Land. Bloomberg. July 31. Available at: https://www.bloomberg.com/graphics/2018-us-land-use/
27: H. Charles, J. Godfray, Paul Aveyard, Tara Garnett, Jim W. Hall, Timothy J. Key, Jamie Lorimer, Ray T. Pierrehumbert, Peter Scarborough, Marco Springmann, Susan A. Jebb (2018). *Op. Cit.*
28: P.W. Gerbens-Leenes, M.M. Mekonnen, A.Y. Hoekstra (2013). “The Water footprint of poultry, pork and beef: A comparative study in different countries and production systems.” Water Resources and Industry 1-2, pp. 25-36. Available at: www.elsevier.com/locate/wri

Neither vegan nor vegetarian but flexitarian

Can meat be produced efficiently without raising and slaughtering animals? Can we avoid the environmental consequences of eating meat without giving up on it? Shifting to veganism or vegetarianism is not an option for most omnivores. Nevertheless, a series of biotech firms may have come with better answers. These companies are seeking alternatives to change the way meat fundamentally is produced.

One of these alternatives and perhaps the most viable now is plant-based meat. Although there are several companies around the world, including some of the big names in the food industry, trying to develop plant-based alternatives to red meat, poultry, and even fish and seafood, Beyond Meat and Impossible Foods (both located in California) outstand for their accomplishments. Both companies have gained ample support form technology investors, as well as the food industry itself.

Although meat substitutes have been in the market for decades, advancements in biotechnology have allowed these two companies to recreate the molecular composition of meat using fats, carbohydrates, and minerals that are also present in plants. Both companies gained notoriety when they were able to produce burger patties that resemble and taste like animal meat.

The public has well received their plant-based burgers and both companies have grown considerably in just a few years. Beyond Meat, became public in 2019 and had a market capitalization of $4.8 billion as of November 8; meanwhile, Impossible Foods has raised $687.5 million over multiple rounds of funding.[29] Both companies have successfully brought their products to U.S. and international markets thanks to a series of partnerships with restaurants, fast-food chains, and grocery stores.

Demand is growing fast. According to the Plant Based Food Association and The Good Food Institute, retail sales of plant-based foods increased by 11% in 2018, with the market valued at $4.5 billion. The meat segment alone was worth $800 million.[30] There have been instances when both Beyond Meat and Impossible Foods have struggled to meet demand.

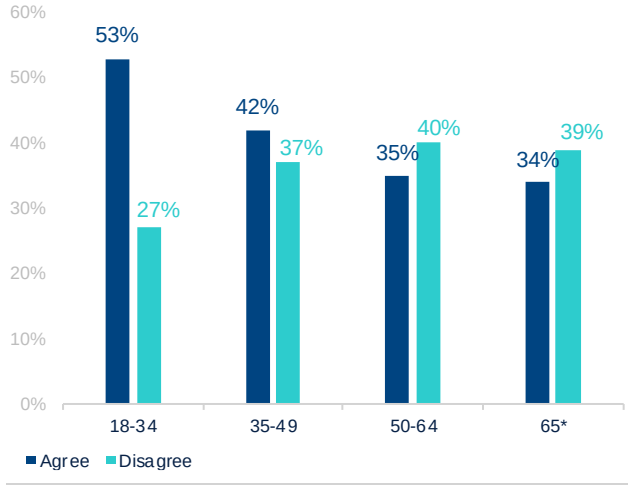
Cleary, consumers were ready for plant-based meat. In the U.S., the demand for red meat has trended down, reflecting increasing concerns about health, sustainability, as well as animal and employee welfare. As a result, a new class of consumer has emerged: the flexitarian.

Flexitarians eat mostly plants but sometimes eat meat and poultry. They are not looking to become vegetarians or vegans, but they increasingly want their protein to come from sources other than animal products. They want to feel good about their food choices without having to make drastic changes to their diets.

Currently, this group is comprised primarily of young and wealthy individuals. Approximately 15% of Gen Z and 10% of Millennials fit this category, compared to 6% of Baby Boomers. Households that favor meat alternatives tend to be college-educated and, according to the Food Marketing Institute, 54% of plant-based meat shoppers belong to families with annual incomes above $70,000.

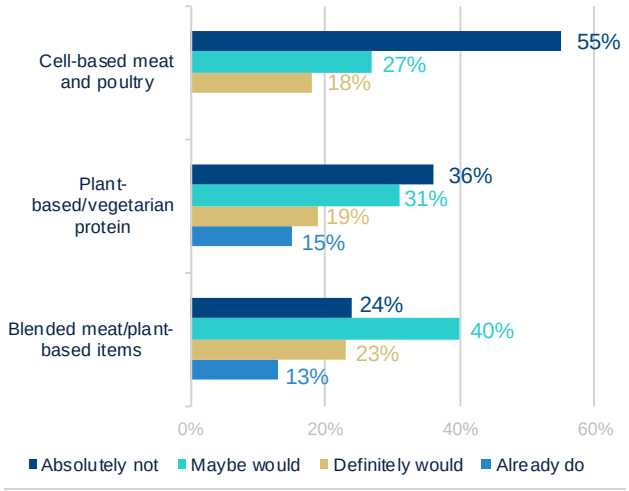
29: Source: www.crunchbase.com
30: Figures as of July 12, 2019. Source: www.plantbasedfoods.org

Figure 7.4 **RESTAURANTS SHOULD OFFER MORE VEGAN/VEGETARIAN OPTIONS** (SHARE OF US ADULTS)



Source: YouGov

Figure 7.5 **WOULD YOU PURCHASE…**



Source: Teaganne Finn (2019), "Food Labels Made for Meat Frustrate Plant-Based Food Advocates." Bloomberg. October 30, with data from the Food Market Institute.

A brief note on cultured-cell meat

Another way to produce meat without killing animals is to grow it in vitro directly from animal cells. Meat grown in labs is the next frontier in the race to develop the perfect substitute for animal meat. It is a high-tech endeavor that uses some of the same techniques already applied in regenerative medicine. However, because of its R&D intensity and high cost of development, prototypes have not been commercialized yet.

Moreover, another critical challenge for cultured-cell meat is consumer acceptance. According to a survey conducted by the Food Marketing Institute, 55% of respondents would "absolutely not" purchase cell-based meat and poultry compared to 36% for plant-based/vegetarian protein, and 24% for blended meat/plant-based items.[31]

Would alternative meat make a difference?

The consumption of alternative meat could bring multiple benefits to the environment. For instance, a typical plant-based or lab-grown burger patty requires significantly less land and water and generates less GHS emissions than a conventional beef burger. This, together with efforts to make other industries free of emissions, could significantly help mitigate the effects of climate change and save thousands of species around the globe. According to National Geographic, 1 pound (0.5kg) of beef requires 1,799 gallons (6,810L) of water, while the Environmental Working Group estimates that 1 pound of beef (0.5kg) produces 27lb (12.3kg) of CO2 equivalent emissions.

31: Teaganne Finn (2019), "Food Labels Made for Meat Frustrate Plant-Based Food Advocates". Bloomberg. October 30. Available at: https://www.bloomberg.com/news/audio/2019-10-31/labels-for-meat-frustrate-plant-based-food-advocates-radio

Table 7.1 **THE ENVIRONMENTAL BURDEN OF MEAT**

		Green-house gas emissions (kg of CO_2 equivalent per kg)	Fresh water withdrawals (litres per kg)	Land use (m^2 per kg)
Meat*	Beef	99.5	1451	326
	Pork	12.3	1796	7.8
	Chicken	9.9	660	6.7
Beyond burger		3.5	9.7	2.7
Imposible burger		3.5	107	2.5

*Global average, 1kg of fat and bone-free meat and edible offal. Source: The Economist (2019). "Plant-based meat could create a radically different food chain", Oct. 12, with data provided by Ron Milo, Weizmann Institute and Alon Shepon, Harvard University

From a health perspective, plant-based meat could be healthier than animal meat, but it is certainly not a panacea. Meatless meat lacks some harmful components like cholesterol or gluten, but it contains fats and high concentrations of sodium. The good news is that advancements in biotechnology allow for improvements to the recipes, making them healthier. Plant-based meat consumption could help reduce the incidence of cardiovascular disease and cancer associated with the consumption of red meat. Another positive aspect of both plant-based and cultured- meat is that it could help reduce resistance to antibiotics in humans resulting from the use of antibiotics in livestock production.

From an economic perspective, a new value chain is expected to emerge in the following years. Already, startups are producing sophisticated ingredients (proteins, flavors, etc.) that Beyond Meat and Impossible Foods need to manufacture their products. The potential economic benefits of meatless meat will encourage substantial investments in R&D. And since the alternative meat industry is essentially a high-tech endeavor, it promises to create STEM jobs and intellectual property. In the U.S., states that produce the inputs for plant-based products would benefit, while those specialized in livestock production and meat packaging may suffer, including the thousands of workers employed in cattle ranching and meat processing.

Not surprisingly, the food industry is moving fast to harness the business opportunities coming from alternative meat, in particular, plant-based options. Big meat producers like Tyson Foods or Cargill have made investments in the plant-based value chain. The former was an early investor of Beyond Meat[32], while the latter owns Prius, the largest pea protein producer, and supplier of Beyond Meat. Big names in the processed food industry, such as Unilever or Kellogg's, have invested in companies or developed their brands of plant-based products. In August, Burger King launched the Impossible Whopper (using Impossible Foods patties) and is planning to add more plant-based variants to its menu. In September, McDonald's started testing a new plant-based burger in Canada using Beyond Meat patties. Carl's Jr. and White Castle have also launched their versions of plant-based hamburgers.

However, the only way alternative meat can have a meaningful impact is by reaching the plates of billions of people around the world. Companies like Beyond Meat and Impossible Foods have tried to tackle this problem by partnering with restaurants and fast-food chains. However, more investments will be needed to bring their products to supermarkets and other points of sale around the world. Prices also need to go down. As we prepare this report, the

32: The Economist (2019) "Plant-based meat could create a radically different food chain." October 12.

retail price of a Beyond Meat burger patty is about $3, while a ground meat patty could cost less than a dollar. Although animal meat is still expensive for many people, producers have also become more efficient, which would keep them competitive for a while.

Another no less important challenge has to do with culture and preferences. For many people around the world, meat is an essential element of culture and identity. Therefore, meatless chicken nuggets, sausages, or burger patties have to be almost perfect substitutes to attract consumers who will never give up on meat. However, expanding the availability of products will not be easy. Replicating the form and texture of different types and cuts of meat promises to be a major technological challenge.

Regulation still needs to evolve to provide certainty to investors and safety to consumers. Luckily, this process seems to be moving fast with the FDA and USDA agreeing on working in a standard set of rules. Labeling is perhaps the most contentious issue facing the industry right now. Regulators need to come up with clear definitions for meatless meat. “Plant-based,” “animal-free,” “cell-based,” “lab-grown” are just some examples of how complex the issue of labeling could be. Definitions are not trivial since labeling could have a profound impact on consumers’ behaviors and attitudes towards these products.

The livestock industry itself will challenge the growing alternative meat industry. In the U.S., meat producers have lobbied to prevent the use of the word “meat” to name products that do not come from an animal carcass. Currently, nine states have agreed on this restriction. Resistance will increase as the new industry flourishes.

Summing up

A growing number of people are looking to lower their consumption of animal meat. Health and ethical concerns drive this trend. Meat substitutes have been around for several years, but it was not until very recently that a group of biotechnology startups backed by some of the most influential investors was able to reproduce the taste, texture, and appearance of some types of meat without killing an animal.

If these efforts prove successful, these companies have the potential to alter the human food chain and revolutionize the way natural resources are used to feed a growing population, with positive implications for the environment and human health.

As the technology behind alternative meat progresses, new generations will have a different view of what eating meat is about. They will continue experiencing the same sensory reactions when eating a hamburger, perhaps even better. However, the practice of killing an animal to produce that juicy patty, while wasting vast amounts of natural resources in the process, will be seen as something of the past, an extended practice among their less civilized ancestors.

8. Forecasts

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

	2012	2013	2014	2015	2016	2017	2018	2019 (f)	2020 (f)	2021 (f)	2022 (f)
Real GDP (% SAAR)	2.2	1.8	2.5	2.9	1.6	2.4	2.9	**2.3**	**1.8**	**1.9**	**1.9**
Real GDP (Contribution, pp)											
PCE	1.0	1.0	2.0	2.5	1.9	1.8	2.1	**1.8**	**1.7**	**1.5**	**1.4**
Gross Investment	1.6	1.1	1.0	0.9	-0.2	0.8	0.9	**0.4**	**0.3**	**0.7**	**0.7**
Non Residential	1.2	0.5	1.0	0.3	0.1	0.6	0.9	**0.3**	**0.3**	**0.6**	**0.6**
Residential	0.3	0.3	0.1	0.3	0.2	0.1	0.0	**-0.1**	**0.1**	**0.0**	**0.0**
Exports	0.5	0.5	0.6	0.1	0.0	0.5	0.4	**0.0**	**0.1**	**0.4**	**0.5**
Imports	-0.5	-0.3	-0.8	-0.9	-0.4	-0.8	-0.8	**-0.3**	**-0.4**	**-0.7**	**-0.7**
Government	-0.4	-0.5	-0.2	0.3	0.3	0.1	0.3	**0.4**	**0.2**	**0.1**	**0.0**
Unemployment Rate (%, average)	8.1	7.4	6.2	5.3	4.9	4.4	3.9	**3.7**	**3.7**	**3.8**	**4.0**
Avg. Monthly Nonfarm Payroll (K)	181	192	251	227	193	179	223	**163**	**151**	**135**	**113**
CPI (YoY %)	2.1	1.5	1.6	0.1	1.3	2.1	2.4	**1.8**	**2.0**	**2.2**	**2.1**
Core CPI (YoY %)	2.1	1.8	1.8	1.8	2.2	1.8	2.1	**2.2**	**2.0**	**2.2**	**2.1**
Fiscal Balance (% GDP, FY)	-6.8	-4.1	-2.8	-2.4	-3.2	-3.4	-3.8	**-4.6**	**-4.6**	**-4.5**	**-4.9**
Current Account (bop, % GDP)	-2.6	-2.1	-2.1	-2.2	-2.3	-2.3	-2.4	**-2.5**	**-2.7**	**-2.7**	**-2.8**
Fed Target Rate (%, eop)	0.25	0.25	0.25	0.50	0.75	1.50	2.50	**1.75**	**1.75**	**1.75**	**2.25**
Core Logic National HPI (YoY %)	4.0	9.7	6.7	5.3	5.4	5.9	5.7	**3.5**	**3.1**	**3.1**	**3.2**
10-Yr Treasury (% Yield, eop)	1.72	2.90	2.21	2.24	2.49	2.40	2.83	**1.61**	**1.78**	**2.04**	**2.41**
Brent Oil Prices (dpb, average)	111.7	108.7	99.0	52.4	43.6	54.3	71.1	**64.1**	**56.9**	**60.8**	**60.0**

(f): Forecast.
Source: BBVA Research

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

	2014	2015	2016	2017	2018	2019 (f)	2020 (f)	2021 (f)	2022 (f)
Alaska	-2.8	0.7	-1.8	-0.2	-0.3	3.8	1.6	1.0	1.4
Alabama	-1.0	1.3	0.5	1.8	2.0	2.2	1.6	1.5	1.4
Arkansas	0.8	0.4	0.5	0.9	0.9	1.3	1.1	1.2	1.2
Arizona	1.2	2.2	3.3	3.0	4.0	4.0	2.6	2.5	2.2
California	4.0	5.0	3.0	3.6	3.5	2.7	2.8	2.9	3.1
Colorado	4.4	4.4	2.4	3.1	3.5	3.8	3.2	3.1	3.0
Connecticut	-1.5	1.8	-0.2	-0.6	1.0	2.3	1.3	1.2	1.1
Delaware	7.7	3.0	-2.9	-0.1	0.3	3.2	2.0	1.6	1.6
Florida	2.6	3.9	3.4	2.5	3.5	3.1	2.8	2.7	2.5
Georgia	2.9	3.3	3.3	2.9	2.6	3.6	2.8	2.6	2.5
Hawaii	0.3	3.4	2.3	1.6	1.0	1.3	1.0	1.0	1.0
Iowa	5.2	2.1	0.4	-0.3	1.4	2.2	2.3	2.0	1.9
Idaho	2.6	3.0	3.7	2.4	4.1	3.3	3.3	3.1	2.8
Illinois	1.3	1.0	0.3	0.6	2.1	2.0	1.2	1.2	1.2
Indiana	3.0	-1.0	1.7	1.6	1.9	1.5	1.0	1.0	1.0
Kansas	1.9	1.2	2.3	0.8	1.9	1.8	0.8	0.9	0.9
Kentucky	0.2	0.5	0.5	1.1	1.4	1.5	0.7	1.0	1.0
Louisiana	2.3	-0.2	-1.2	0.1	1.1	2.7	2.4	1.1	0.7
Massachusetts	1.9	3.6	1.7	2.2	2.7	2.3	2.2	2.0	1.9
Maryland	1.1	1.7	3.1	2.0	1.6	1.7	2.1	2.1	2.1
Maine	1.7	0.4	2.1	1.7	1.9	2.1	1.6	1.4	1.2
Michigan	1.5	2.3	1.9	1.6	2.7	2.3	1.3	1.1	0.9
Minnesota	2.5	1.0	2.0	2.1	2.2	2.5	1.9	1.8	1.7
Missouri	0.3	1.1	-0.9	0.9	2.3	2.0	1.2	1.1	1.1
Mississippi	-0.2	0.4	0.3	0.5	1.0	1.2	0.8	1.0	0.9
Montana	1.6	3.8	-1.1	0.4	0.9	2.3	2.0	2.0	1.9
North Carolina	1.9	3.1	1.1	1.9	2.9	2.7	2.4	2.3	2.1
North Dakota	7.2	-3.0	-7.1	-1.6	2.5	4.2	2.3	1.5	1.8
Nebraska	2.0	2.4	0.5	0.3	1.5	2.4	2.5	2.4	2.3
New Hampshire	1.0	2.4	1.9	2.0	2.2	2.3	2.3	2.3	2.2
New Jersey	0.3	1.6	0.7	1.3	2.0	1.7	1.2	1.1	1.0
New Mexico	3.1	1.9	0.1	0.0	1.8	4.0	1.2	0.8	0.8
Nevada	1.1	4.2	2.4	2.5	3.2	3.5	3.3	3.1	2.9
New York	2.2	1.5	1.4	1.4	2.1	2.5	1.9	2.0	2.0
Ohio	3.6	1.2	0.7	1.6	1.8	2.8	1.6	1.4	1.2
Oklahoma	5.9	3.5	-2.8	0.2	1.8	2.8	1.9	2.3	2.2
Oregon	3.5	5.3	4.6	3.2	3.4	3.3	3.0	2.6	2.4
Pennsylvania	2.1	2.0	1.1	1.7	2.1	2.3	1.3	1.3	1.3
Rhode Island	0.2	1.5	0.0	0.8	0.6	0.8	1.6	1.6	1.6
South Carolina	2.4	3.2	2.8	2.6	1.6	2.2	1.9	1.8	1.7
South Dakota	1.1	2.6	0.3	-0.4	1.3	4.4	4.2	3.3	3.0
Tennessee	1.6	3.1	1.9	2.4	3.0	3.0	2.2	2.0	1.9
Texas	2.7	5.1	0.2	2.0	3.2	4.6	3.1	3.1	3.1
Utah	3.0	4.0	3.9	2.7	4.3	3.9	4.1	3.9	3.7
Virginia	-0.2	1.9	0.3	1.8	2.8	2.7	2.2	2.1	2.0
Vermont	0.0	1.1	1.6	1.3	1.2	1.6	1.4	1.5	1.5
Washington	3.5	4.2	3.8	4.1	5.7	3.7	2.7	2.5	2.3
Wisconsin	1.8	1.4	1.1	1.4	2.5	2.0	1.5	1.6	1.5
West Virginia	-0.4	-0.5	-1.2	1.4	2.4	3.7	1.2	1.1	0.9
Wyoming	0.1	2.6	-3.8	0.5	0.3	3.3	0.1	0.6	0.9

(f): forecast
Source: BBVA Research

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BBVA Research

Creating Opportunities

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