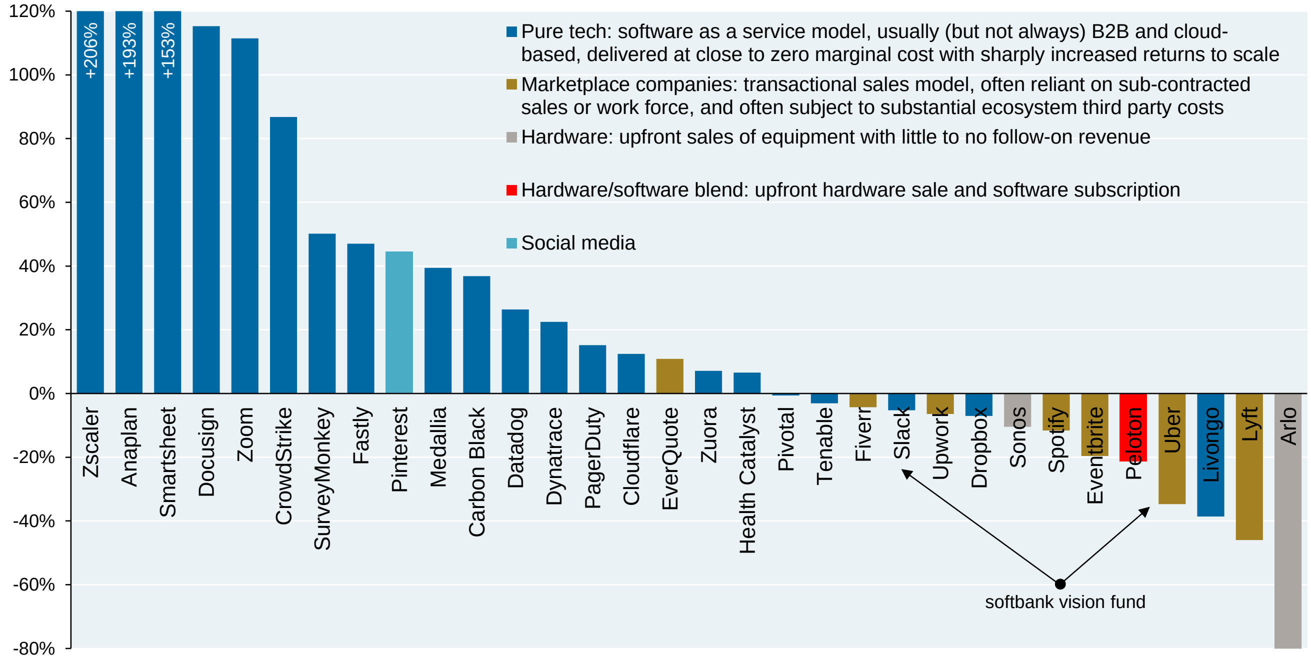
Topics: US technology IPOs; Rising risks of Trumpism as China exhausts its welcome in DC; and a look at Progressive Democratic policy proposals given Senator Warren's rise

The struggles of some US technology companies in the IPO market and in the pre-IPO market have gotten a lot of headlines recently. **What's lost in the shuffle**: most *real* technology IPO's are doing just fine, as shown below. "Tangential tech" companies included in the broad tech category but which are not pure tech are for the most part the ones that are struggling. Many companies on the right side of the chart also fail the simple "rule of 40%" test on the sum of revenue growth and free cash flow margins (in the case of Uber, Arlo, Eventbrite and Pivotal, the rule of 40% test actually yields a negative number, and for Zuora and Upwork, the rule of 40% test yields a positive number but one that is below 20%).

What's wrong with the performance of 2018/2019 tech IPOs?
Not much, as long as what you're buying is actually a real technology company
Performance relative to IPO price (or direct listing price)



Sources: Bloomberg, Company financials, Stratechery.com, JPMAM. Oct 4, 2019. The companies above are shown for illustrative purposes only. Their inclusion should not be interpreted as a recommendation to buy or sell. The use of the above companies is in no way an endorsement for J.P.Morgan Asset Management investment management services.

Additional comments on IPOs and the tech sector:

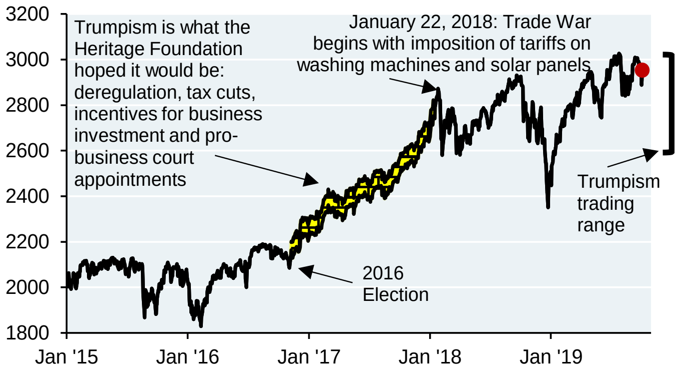
- **Diversified multi-sector IPO investing since 2010 hasn't done much for investors**. The latest study[1] we've seen takes two approaches. The first is a portfolio that owns 200 IPOs, with proceeds to buy each new IPO sourced from selling the worst performers. Since 2010, its relative performance has been flat to the market. The second looked at relative performance of IPOs since 2010 assuming a 2-year hold. *Median* IPO performance was 20% below the market. *Average* returns were better but still just matched market returns, benefitting from the 2% of IPOs that delivered returns > 200%. IPO underperformance can be attributed to healthcare, the largest issuing and worst performing sector in the US IPO market since 2010
- Not directly related to the chart above, but I think it's worth pointing out: **Moore's law** improvements in computer processing power have slowed to just a few percent per year, and there has been no improvement in clock (microprocessor) speed since 2004. Components may have reached atomic dimensions which now act as a natural limit to further improvements due to the end of a phenomenon known as Dennard Scaling

[1] "*What Matters for IPOs*", Goldman Sachs Global Strategy Paper, September 4, 2019

The latest on the Trade War as China wears out its welcome in DC

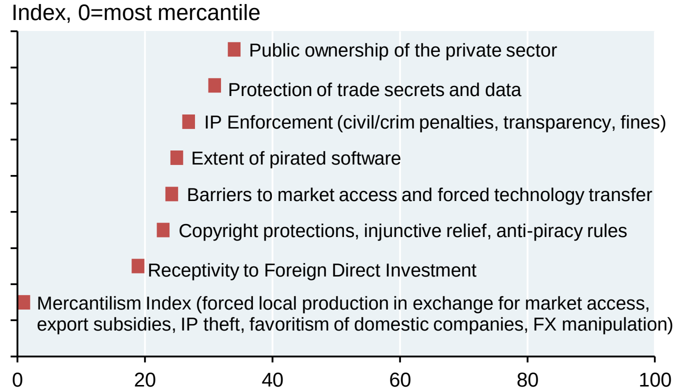
As we wrote in the Labor Day *Eye on the Market*, we believe that US equity markets are now range-bound by Trumpism, and that the upper end of that range is ~3,000 on the S&P 500. The latest news on the trade war includes Senator Rubio's proposals to delist Chinese companies that do not comply with US accounting and securities regulations (par for the course: a 2013 agreement allowing US regulators to request audit working papers in China has not been effectively implemented), and a proposal to ban Federal retirement accounts investing in products with China exposure. At this point, the most important chart on the Trade War may be the second one below. With almost two decades elapsed since China joined the World Trade Organization, China is still the most mercantile country in the world, with few friends in Washington on either side left to defend them and with many detractors in the private sector as well. The best outcome I can imagine for now is a narrow deal based on mutually beneficial agricultural trade, particularly since China is considering a release of its strategic frozen pork reserves after the death of 100 mm pigs.

So Long Yellow Brick Road: Trumpism shows its true colors to investors, S&P 500 Index level



Source: Bloomberg, J.P. Morgan Asset Management. October 4, 2019.

China: the most mercantile country in the world
Index, 0=most mercantile

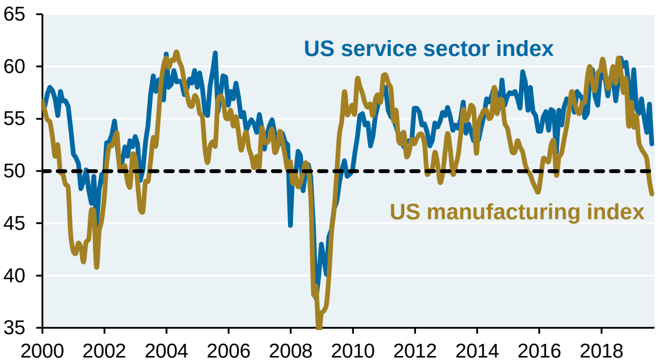


Sources: OECD, BSA, GIPC, ITIF, Fraser Institute, JPMAM. 2019.

Last week, the WTO authorized the US to apply tariffs on certain European products as recompense for unfair EU subsidies to Airbus. The US trade representative said it would impose tariffs starting October 18, with 10% on jetliners and 25% duties on whiskies/wine/cheeses. The maximum amount of goods that can be tariffed is very small ($7.5 billion), but it could lead to retaliation by the EU.

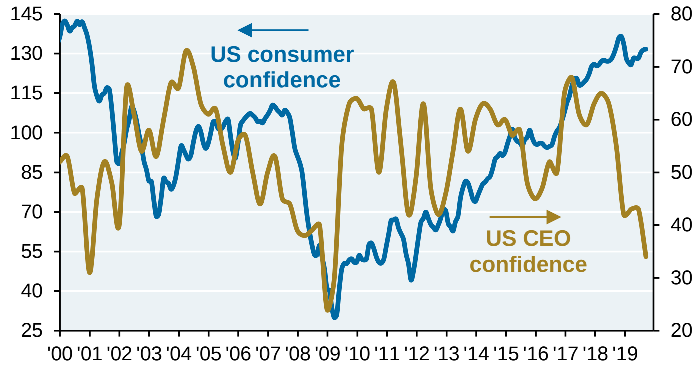
The impact of the trade war is growing, as indicated by weakness in US manufacturing surveys and CEO confidence, no growth in US corporate profits in Q2/Q3, and falling global cross-border capital spending and M&A activity. US capital spending has also weakened from 5.5% growth to around 2%, but this appears to be more a reflection of Boeing aircraft drags and a declining rig count in the oil sector. So far, the US consumer and related services are holding up much better (vehicle sales, retail sales, employment, confidence, etc). **Trump is playing with fire here, since the gap between the two cannot be sustained indefinitely.** In fact, last week the US service sector survey declined, a possible sign that the gap may already be closing. I expect a modest growth and earnings rebound in the months ahead as a recession is avoided, but the Trumpism trading range shown on the prior page still holds.

Services holding up, manufacturing falling
50+ = expansion



Source: ISM, Bloomberg. September 2019.

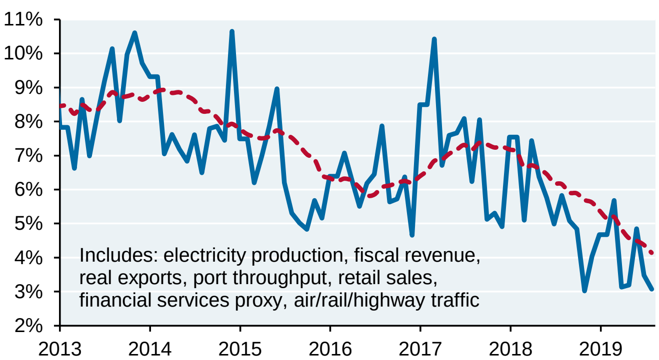
Consumer optimistic, CEOs retrenching
Index, 1985 = 100, 3m moving avg | 50+ = positive outlook



Source: Conference Board. September 2019.

European business surveys are weaker than in the US given its higher reliance on exports. On **China**, a one-year measure of coincident growth has fallen from 7% in January 2018 to just 4% in August 2019.

China activity coincident tracker
y/y %

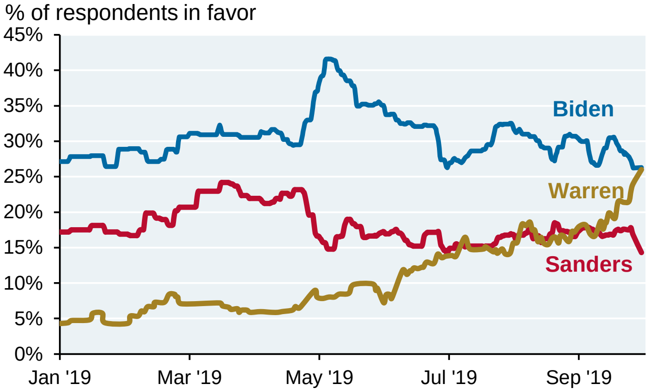


Source: Bank of America Merrill Lynch. August 2019.

Warren Peace: Progressive Democrats battle the status quo

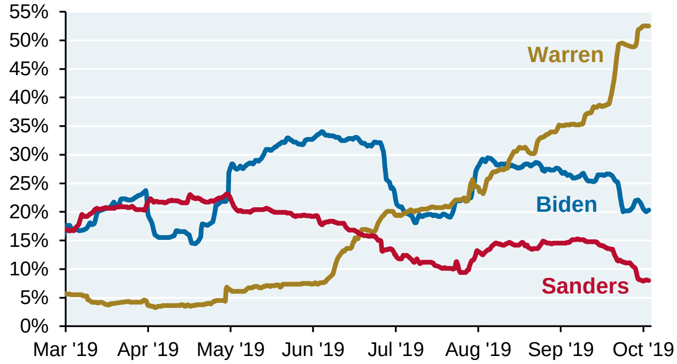
Given Senator Warren's rise in the polls and in betting markets, it's time to review proposals advanced by Senator Warren and by other candidates whose ideas she might also adopt if she becomes President.

2020 Democratic presidential poll
% of respondents in favor



Source: Real Clear Politics. October 2019.

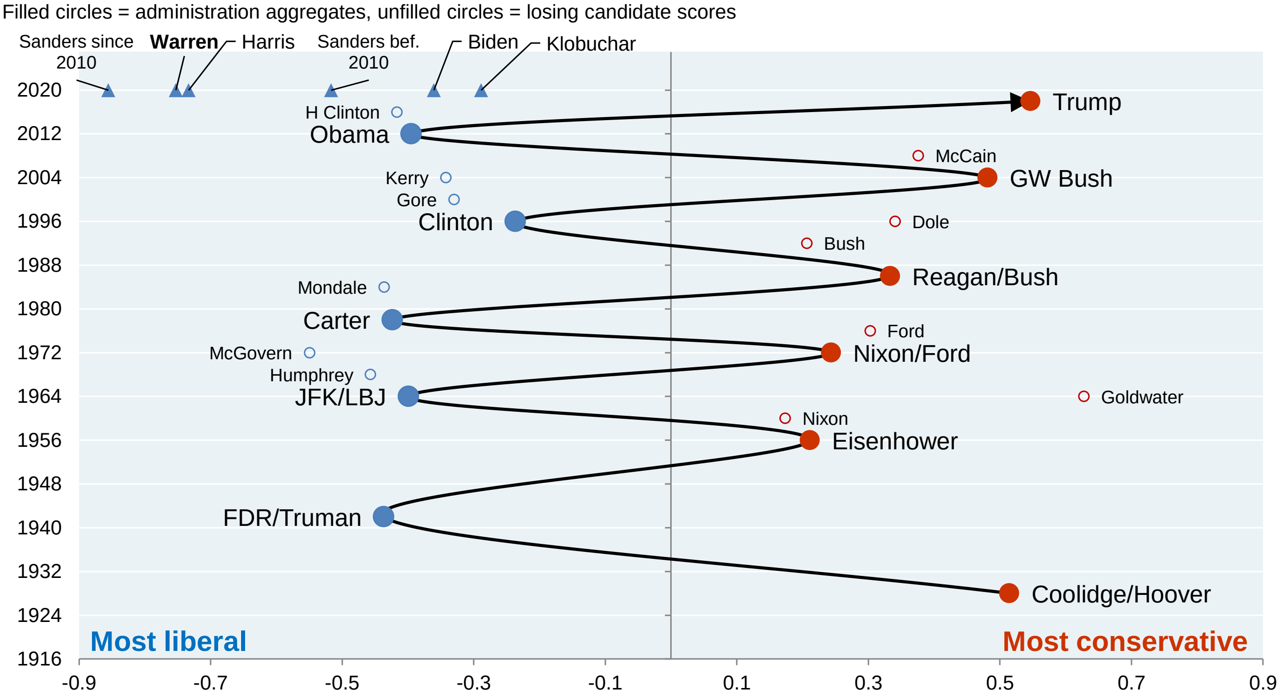
Betting odds for potential 2020 Democratic candidates
% chance of winning nomination



Source: Real Clear Politics. October 2019.

On the next few pages, I included some charts and tables that review these policies. This exercise is a political Rorschach test, since some people will like most of the things that they see, and others won't. One thing is clear: the breadth of current progressive proposals are in line with a chart we first showed last December. **Senator Warren occupies a place on an empirically derived political spectrum that is considerably to the left of 20th century Democratic Presidents, and to the left of Democrats who aspired to become President as well**.

Political ideology of Presidential administrations, and a look at 2020
UCLA Voteview Liberal-Conservative scores, derived from Congressional voting histories
Filled circles = administration aggregates, unfilled circles = losing candidate scores



Source: Voteview Congressional Roll-Call Votes Database, JP Morgan Asset Management. 2019. See page 11 for details on how this chart was constructed, including a list of politicians with Congressional voting histories that were included in each administration's aggregate score.

Progressive Policy Review

The table outlines progressive proposals on taxation, the corporate sector, labor, energy, healthcare, investment and student debt, most of which have been put forward by Senator Warren. We take a closer look at a few of them on pages 6-10. For many of these proposals to be adopted, Democrats would have to take control of the Senate and not just the White House, *and* the new Senate Majority Leader would have to agree to put these proposals on the docket, *and* Democrats might have to end the filibuster. However, in the wake of recent precedents (Trump unilateral actions on environmental, trade and border issues), some could be enacted through Executive Action and regulation rather than through legislation.

Progressive Democratic Agenda		
Taxation	**Corporate**	**Labor**
Double capital gains tax rate on earners over $1mm	Curb or prohibition on stock buybacks (see p.6)	Ban on state 'right to work' laws, 'fair share' fees to allow unions to collect fees from non-members
Eliminate step-up in basis on death	Break up big banks, reverse Trump dereg. on capital/liquidity, impose financial transaction taxes	Eliminate secret ballots in worker union elections
Tax unrealized capital gains (see p. 8)	Break up big tech, reinstate Net Neutrality	Worker election of 40%+ of board members (co-determination)
Treat cap gains and dividends as ordinary income for tax purposes	Federal charter required by public companies with revenues >$1bn, must produce "material public benefit"...	Industry-level sectoral bargaining
Wealth tax of 2% over $50mm	…and "material positive impact on society" to obtain charter from Dep't of Commerce	Reduced classification of independent contract workers
Top estate tax rate of 77%	"Office of US Corporations" and State Attorney Generals can sue to revoke charters	Penalties for Federal contractors with gender pay disparities
New payroll tax of 12.4% > $250k in income	Political expenditures subject to 75% approval by all shareholders	NLRB penalties on companies and executives for violating worker rights and wrongful termination
Eliminate corporate tax cuts, surtax on corporate profits over $100mm (see p.7)	Private equity firms must guarantee repayment of debt and pensions of acquired companies	Increased protections for striking workers
Healthcare	**Energy**	**Student debt**
Medicare for All with no deductibles or copays	Ban hydraulic fracturing on private land and fracturing/drilling on federal land (see p. 9)	Reduce student debt for 95% of Americans with student debt (45 million people)
Ban private health insurance	Ban fossil fuel exports, no new nuclear power plants	Wipe out student debt entirely for 75% of students with debt
Drug price caps, gouging penalties, and reimportation allowances	Repeal traditional energy friendly tax provisions	Universal free public college education
Allow HHS to manufacture/sub-contract generic drugs	$1 trillion over 10 years to subsidize transition to 100% clean energy	Estimated cost = $955 billion

Source: Cornerstone Macro Research, CNBC, warren.senate.gov. 2019

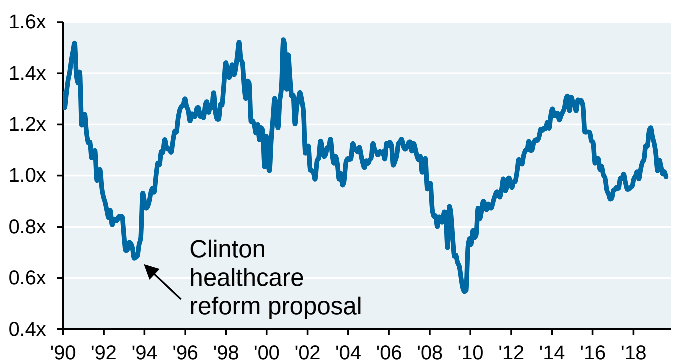
Redistribution, equity market sector risks and a ban on stock buybacks

Before getting into the details, a brief comment on **redistribution**. I don't think redistribution is inherently positive or negative for the economy; it depends on a lot of factors, such as the impact of higher tax rates on propensities to invest and consume at different income levels, the efficiency with which the Federal government allocates tax revenue to productive/unproductive programs, the impact of redistribution on consumer and investor sentiment, and the degree to which Federal revenue-raising targets are affected/circumvented by changes in corporate or individual behavior. Even so, I do think that the broader a redistribution agenda is, the greater the chance that it adversely impacts the private sector in unanticipated ways. In our June 2019 analysis of Nordic countries, we found that in some ways, Nordic countries are even *more* business-friendly than the US; that their tax systems rely primarily on consumer (VAT) and payroll taxes to finance entitlements; and that their healthcare systems generally require both co-pays and deductibles to manage cost. **In other words, even the most progressive countries need a vibrant private sector and incentives for citizens to invest in new businesses and capital projects in order to afford redistribution in the first place.**

Equity market sector implications. When thinking about potential implications of a **Democratic sweep**, it seems to me that the greatest valuation risks would be in store for the following, in alphabetical order: banks (large and mid-sized), biotech, chemicals, energy E&P, healthcare managed payers/service providers, independent power producers, integrated oil & gas, medical devices, megacap internet, payment processors, branded specialty pharmaceuticals and specialty/consumer finance. With respect to **healthcare**, while a lot of negative sentiment is priced in already, many proposals are essentially based on eliminating private sector rents in the healthcare system, so I could imagine additional downside risk depending on the details.

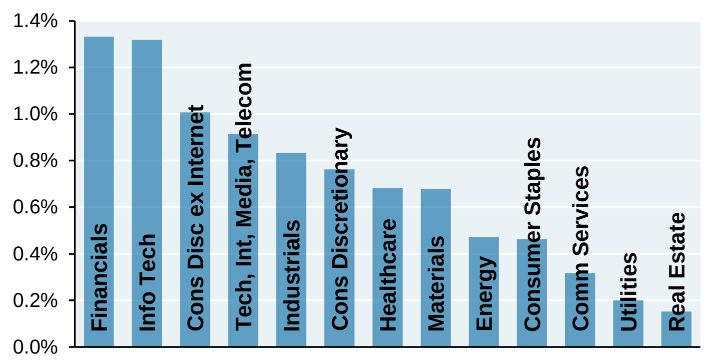
While there is little evidence that companies pursue stock buybacks *instead* of hiring and capital spending, there appears to be broad progressive Democratic support for **stock buyback restrictions or an outright ban**. The chart on the right shows the sectors most reliant on buybacks as a contributor to investor returns.

S&P 500 healthcare versus S&P 500 valuations
Ratio of P/Es



Source: Bloomberg. October 4, 2019.

Quarterly buyback yield by S&P 500 sector
% of market cap repurchased, 4 quarter average



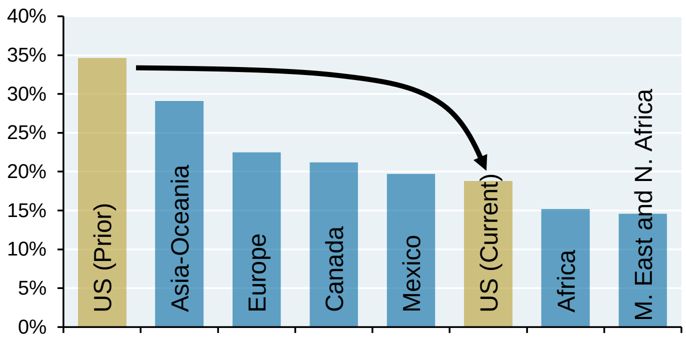
Source: RBC Capital Markets. October 2019.

Repeal of the 2017 corporate tax bill and additional windfall taxes on the corporate sector

In 2016, the US had the highest marginal effective corporate tax rate within the G-7 and within the 34 countries in the OECD. The 2017 tax bill lowered US corporate tax rates to be in line with other countries. As a result, a repeal would push effective US corporate tax rates back to where they were before: higher than most other developed and developing nations.

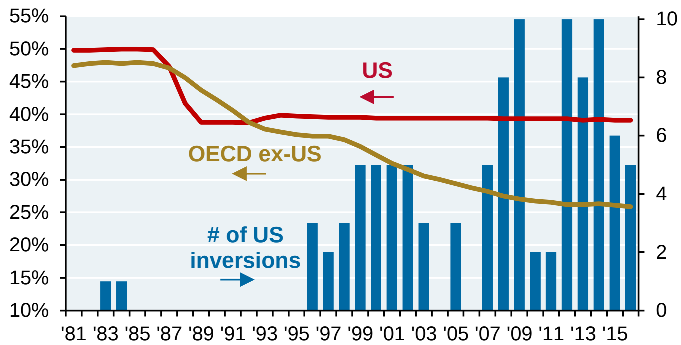
Reducing corporate tax rates *used* to be a Democratic agenda item as well. President Obama's Bipartisan Commission on Fiscal Reform in 2010 proposed a switch to a territorial system (from a Roman worldwide system), as did the President's Export Council, the President's Manufacturing Council, and the President's Jobs Council, with the Fiscal Commission writing that "the current system puts US corporations at a competitive disadvantage against foreign competitors. A territorial tax system should be adopted to help put the US system in line with other countries, leveling the playing field". **A shift to higher corporate taxes[2] would be a marker of changing economic views within the Democratic Party**.

Marginal effective tax rate
%, effective tax rate on new investment in manufacturing & services



Source: University of Calgary School of Public Policy, Mintz & Bazel. Corporate tax rates are GDP weighted. December 17, 2017.

Tax rates and inversions out of the US
Corporate income tax rate | Number of US inversions



Source: Mercatus Center at George Mason University. 2016

In terms of the **impact on markets**, the corporate tax cuts boosted S&P earnings on a one-time basis by 8%-10% in 2018. Assuming a 17.5x multiple, a corporate tax cut repeal[3] could in isolation reduce the fair value of the S&P 500 by the same amount. This assumes a complete repeal of the corporate tax cuts, but does not include proposals by Senator Warren to impose an additional 7% windfall profit tax on earnings over $100 mm to finance a renewable energy transition. Sectors that benefitted the most from tax cuts in terms of declines in effective tax rates: communication services, consumer discretionary and financials.

From a **corporate finance perspective**, the 2017 tax bill reduced incentives for corporate **inversions** (expatriations) by narrowing the tax gap with the rest of the OECD. On top of that, US companies that had already inverted actually suffered from the new bill. A repeal of the 2017 act could result in a renewed spike in inversions, the history of which is shown above. As a reminder, before the new tax law, no company ever inverted *into* the US, which was a sign of a non-competitive US corporate tax system.

[2] On **financial transactions taxes**, a Georgetown finance professor released a paper which you can read if you're interested. The primary conclusions: FTTs have often not been very successful (and have often been repealed) in other jurisdictions due to location-switching (much less revenue raised than projected); also, costs tend to be passed along to consumers, taxpayers and investors rather than being absorbed by the financial system. Source: "*Financial transactions taxes: A tax on investors, consumers and taxpayers*", James Angel, Georgetown University, 2019.

[3] A full corporate tax reversal would raise rates back to 35% and also narrow the corporate tax base, since the 2017 bill broadened the base through interest expense limitations. An increase to 28% with no change in the base could be similar economically to a full repeal.

"*Treat Wealth Like Wages*": how the Federal government might tax unrealized capital gains each year

Since Senator Warren's wealth tax proposal could be subject to constitutional challenges (that we discussed here), I would not be surprised if her campaign eventually adopted the proposal by Senator Wyden (D-OR, ranking member of the Senate Finance Committee) to tax existing and future unrealized capital gains on an annual basis. Here are the things you need to know about the "*Treat Wealth Like Wages*" proposal:

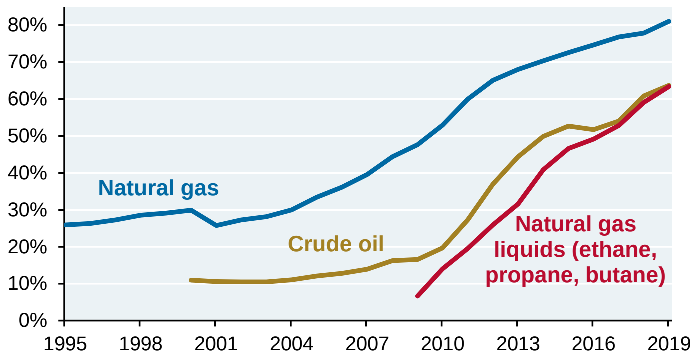
- It would tax all capital gains as ordinary income
- Wealthy taxpayers would have to use "**anti-deferral accounting rules**" that require mark-to-market taxation of gains and losses on publicly tradable securities, and lookback taxation of non-tradable assets
- Who qualifies as "wealthy"? Anyone with income over $1 mm *or* assets over $10 mm in 3 consecutive years, with both figures adjusted annually for inflation
- What counts towards the asset threshold? Cash, stocks, partnership interests, bonds, futures, options and other derivatives; real property; acquired patents, copyrights and intangibles; and also collectibles
- How do the rules work for tradable securities? Taxes on unrealized gains (or deductions on losses) are paid (received) yearly. The year-end market-to-market value establishes the basis in the asset for the next year
- How do the rules work for non-tradable assets? The proposal recognizes the administrative complexities of annual appraisals of non-tradable assets for which no market price is available[4]. Instead, taxpayers would be subject to a **lookback charge** when they *do* sell the asset that would be intended to eliminate the benefit of having deferred the income tax. One possible approach: an interest charge on the deferred tax, similar to penalties applied to taxpayers filing late
- Exemptions**:** The first combined $2 mm of primary and secondary residences would not count towards the $10 mm asset threshold and would be exempt from the lookback charge. The first $5 mm of the combined value of family farms would also be exempt. In addition, the first $3 mm of retirement account assets would not count towards the $10 mm asset threshold, and no amount in any retirement account would be subject to the mark-to-market or lookback charges
- Would mark-to-market and lookback rules apply to **current** unrealized capital gains? Yes. All capital gains, even those that accrue before enactment of this proposal, would be captured by year-end mark-to-market or lookback charges. Because this may result in very large tax bills in the first year, the proposal would include transition rules allowing taxpayers to pay the tax over several years
- For pass-through entities, rules apply at the partner or shareholder level. The pass-through entity will be responsible for reporting shares of mark-to-market gains/losses and lookback charges. The rules do *not* apply to publicly-traded C corporations, but the proposal acknowledges that the plan will have to include anti-abuse rules to prevent taxpayers from using private C corporations to circumvent them
- Unlike Warren's wealth tax, Wyden's plan works within the framework of the existing tax system. While there may be court challenges as to whether unrealized gains really constitute taxable "income", the current tax code already imposes mark-to-market taxation of some unrealized gains. Examples include mark-to-market on certain derivative contracts under §1256, mark-to-market accounting for securities dealers under §475, and the "exit tax" on expatriates under §877A. Similarly, precedent for the lookback charge on non-tradable assets exists in the passive foreign investment company excess distribution rules under §1291. By using a lookback charge for gains on non-tradable assets, Wyden's proposal would also avoid many of the complexities inherent in Senator Warren's plan, which would require annual valuations of such assets

[4] The progressive Institute on Taxation and Economic Policy had an idea as to how non-tradable real estate could be taxed under an annual wealth tax regime. Legislation creating a federal wealth tax could instruct that whenever a taxpayer challenges an assessment of real estate by the IRS, the Treasury Department would provide the taxpayers' own appraisal of their real estate to any state or local government that could then acquire the property through **eminent domain** and claim they are paying "just compensation". **Yes, this is really what they wrote.**

The impact of an immediate ban on hydraulic fracturing

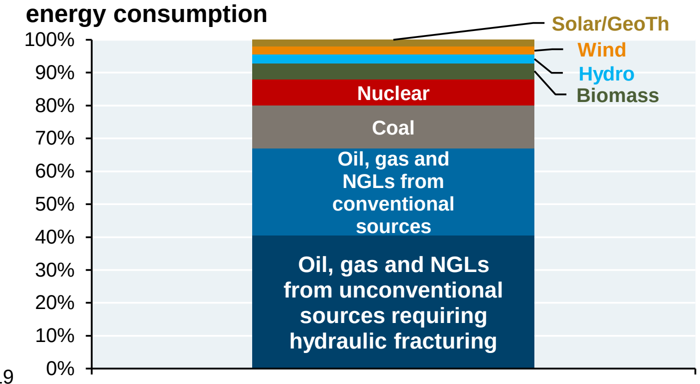
Hydraulic fracturing now accounts for 60%-80% of US oil, natural gas and natural gas liquid (NGL) production. As a result, domestically produced oil and gas derived from hydraulic fracturing also accounts for an enormous 40% of total US primary energy consumption. While US renewable power generation is growing, the pace is almost certainly not fast enough to immediately abandon fractured natural gas and oil given US goals of decommissioning aging coal and nuclear power plants, and of reducing reliance on foreign oil. In the absence of an interconnected, nationwide electricity grid and cheap energy storage (see 6th chart below), natural gas is a critical complement to intermittent renewable energy.

Percentage of US oil and gas production derived from hydraulic fracturing



Source: EIA, US Department of Energy, JPMAM. 2019.

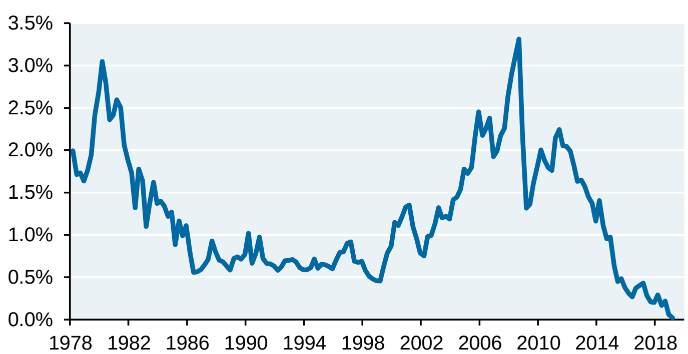
Hydraulic fracturing accounts for 40% of all US primary energy consumption



Source: EIA, BP, Society of Petroleum Engineers, S&P Platts, JPMAM. 2018.

US net energy deficit, in dollar terms

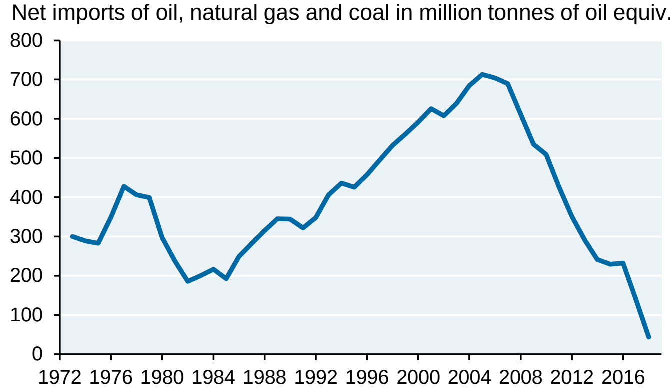
Energy imports - energy exports, % of GDP



Source: Bureau of Economic Analysis, Haver Analytics, JPMAM. Q1 2019.

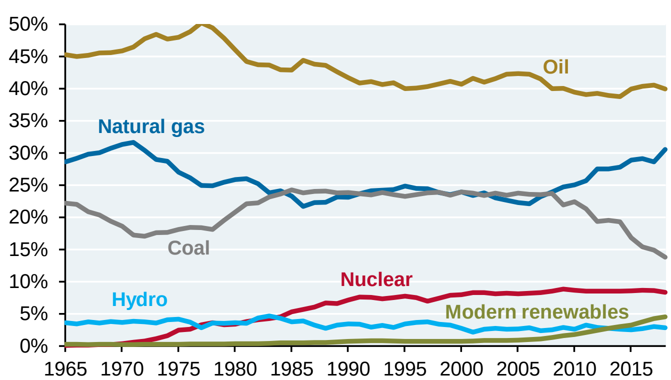
US net energy deficit, in energy terms

Net imports of oil, natural gas and coal in million tonnes of oil equiv.



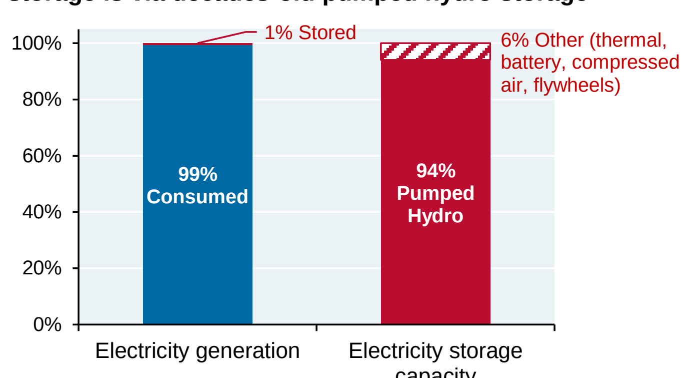
Source: EIA, JPMAM. 2019.

US sources of primary energy consumption



Source: BP Statistical Review of World Energy. 2019.

Only 1% of US electricity generation is stored, and most storage is via decades-old pumped hydro storage

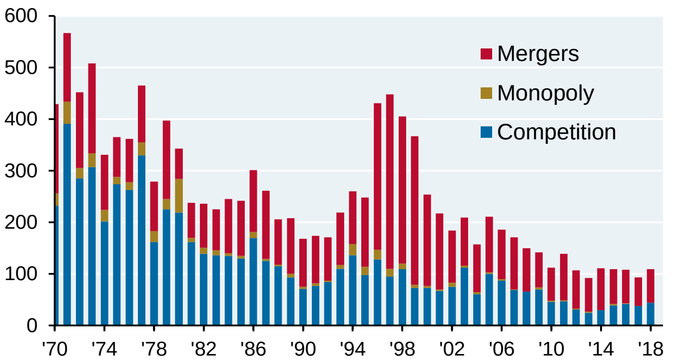


Source: EIA, EPA, JPMAM. 2018.

Anti-trust and the tech sector

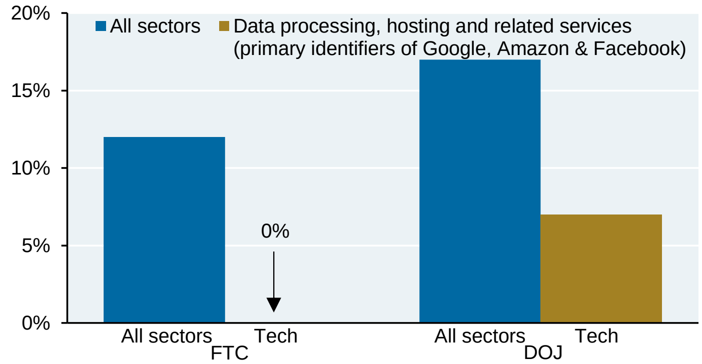
There's a vigorous debate as to whether tech giants are adversely affecting consumers, and/or if they are adversely impacting potential competitors. We will not debate that here[5]; the regulatory table below shows that after a 50 year decline in anti-trust investigations (particularly on the tech sector), many politicians now believe that the answer to one or both of these questions is "yes". To the extent that this negatively impacts the tech sector, it could have an adverse impact on investors since tech has almost doubled the return on the rest of the stock market since 2010 (3rd chart), and since the largest tech companies have been very active acquirers of both revenues and intellectual capital (4th chart).

Number of Department of Justice antitrust investigations initiated



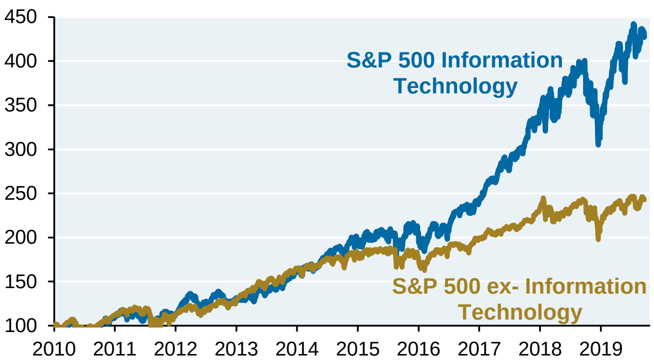
Source: United States Department of Justice. 2018.

Lower FTC/DOJ antitrust enforcement rates on tech sector
Rate of agency challenges



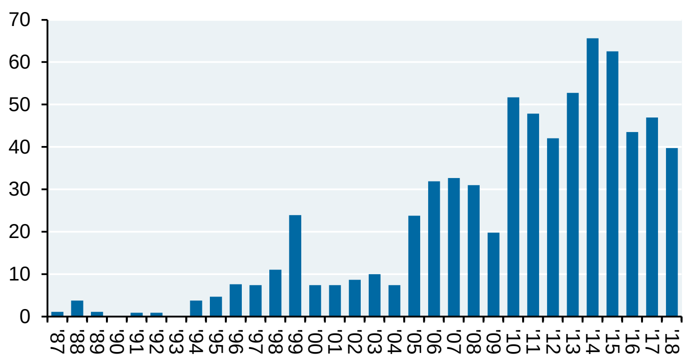
Source: Dr. Diana Moss, American Antitrust Institute. 2019.

S&P tech vs S&P ex tech total return performance
Jan 2010 = 100



Source: Bloomberg. September 30, 2019.

Big tech acquisitions
Number of acquisitions



Source: Dr. Diana Moss, American Antitrust Institute. 2018.

Technology sector / anti-trust (red = already implemented)	
Companies affected	**Action**
Facebook, Google	New York/Texas launch antitrust investigations; 48 states sign onto Google investigation
Amazon, Apple, Facebook, Google	House Judiciary Committee requests tech executives' emails in antitrust probe
Amazon	FTC launches antitrust investigation over anti-competitive behavior
Amazon, Facebook, Google	Broad Department of Justice antitrust investigation
FAANG	Warren proposes to break up tech companies, designate tech platforms as utilities separate from other businesses, and reverse anti-competitive mergers
California tech	"Digital data dividend" paid by tech companies to users whose data is monetized
Amazon, Uber, Lyft	California passes bill to reclassify gig-economy contract workers as employees
Facebook	Federal Trade Commission fines Facebook $5 billion for privacy practices
Qualcomm	Ruling that Qualcomm violated antitrust law
Amazon, eBay, Airbnb	Require online platforms to collect local taxes

Source: Bloomberg, Cornerstone Macro Research, LA Times, The Hill, FTC, WSJ, NYT. 2019

[5] The consultancy Oliver Wyman wrote a piece in 2018 (reportedly funded by Facebook) that argued that Facebook, Google and Amazon do not have a material impact on overall VC markets. Critics argued that when narrowing the analysis to companies that compete directly with Facebook, Google and Amazon, there is in fact a "**kill zone**" of reduced venture capital activity (e.g., Oct 2018 report from Ian Hathaway, non-resident senior fellow at Brookings).

Our political spectrum pendulum chart

Each administration's score is based on politicians we selected (see list below), which include members of its Executive Branch with Congressional voting histories, and prominent members of Congress that supported major legislative initiatives of that administration, and/or defended its political and governing principles. The degree of liberalism/conservatism for each politician is based on Voteview data, which essentially reflects how frequently each politician voted with their respective bloc. Voteview data has been used in peer-reviewed studies of polarization and Congressional history since the 1980's, and includes ideological scores for all Congressional politicians since the first Congress in 1789. The project began with pioneering work done by Keith Poole at the University of Georgia and Howard Rosenthal at NYU/Carnegie Mellon ("*The Polarization of American Politics*", 1984), and is now maintained by UCLA's Department of Political Science. We first discussed this chart in our December 10, 2018 *Eye on the Market* (which you can find here), where we also illustrated how the decline in moderate politicians coincided with a decline in US long-term growth.

Who's included in each administration's score:
Trump admin: Cotton, Graham, Hatch, McCarthy, Meadows, Paul, Perdue, Ryan, Scalise, Sessions
Obama admin: Biden, Durbin, H. Clinton, Kennedy, Kerry, Obama, Pelosi, Reid, Waxman
GW Bush admin: Ashcroft, Blunt, Cheney, DeLay, Kyl, McConnell, Santorum
Clinton admin: Bentsen, Carper, Chiles, Gephardt, H. Ford, Nunn, Robb
Reagan/Bush admin: Baker, Bush, Dole, Kemp, Latta, Laxalt, Lugar, Michel
Carter admin: Bayh, Byrd, Hawkins, Mondale, O'Neill, Wright
Nixon/Ford admin: Ford, Lott, Percy, Rhodes, Sandman, Scott, Wiggins
JFK/LBJ admin: Bolling, Humphrey, JFK, Johnson, Mansfield, McCarthy, McCormack
Eisenhower admin: Dirksen, Dulles, Flanders, Nixon, Saltonsall, Smith, Taft
FDR/Truman admin: Barkley, Black, Byrns, Garner, Guffey, McCormack, Robinson, Sabath, Truman
Coolidge/Hoover admin: Curtis, Hawley, Longworth, Moses, Tilson, Watson

Acronyms of the week
B2B Business to Business; **DoJ** Department of Justice; **E&P** Exploration and Production; **EU** European Union; **FAANG** Facebook, Amazon, Apple, Netflix, Google; **FTC** Federal Trade Commission; **FTT** Financial Transactions Tax; **FX** Foreign exchange; **IP** Intellectual property; **IPO** Initial public offering; **IRA** Individual Retirement Account; **NLRB** National Labor Relations Board; **OECD** Organization for Economic Cooperation and Development; **VAT** Value Added Tax; **WTO** World Trade Organization

Purpose of This Material: This material is for information purposes only. The views, opinions, estimates and strategies expressed herein constitutes Michael Cembalest's judgment based on current market conditions and are subject to change without notice, and may differ from those expressed by other areas of J.P. Morgan. **This information in no way constitutes J.P. Morgan Research and should not be treated as such.**

GENERAL RISKS & CONSIDERATIONS

Any views, strategies or products discussed in this material may not be appropriate for all individuals and are subject to risks. **Investors may get back less than they invested, and past performance is not a reliable indicator of future results.** Asset allocation / diversification does not guarantee a profit or protect against loss. Nothing in this material should be relied upon in isolation for the purpose of making an investment decision. You are urged to consider carefully whether the services, products, asset classes (e.g. equities, fixed income, alternative investments, commodities, etc.) or strategies discussed are suitable to your needs. You must also consider the objectives, risks, charges, and expenses associated with an investment service, product or strategy prior to making an investment decision. For this and more complete information, including discussion of your goals/situation, contact your J.P. Morgan representative.

NON-RELIANCE

Certain information contained in this material is believed to be reliable; however, JPM does not represent or warrant its accuracy, reliability or completeness, or accept any liability for any loss or damage (whether direct or indirect) arising out of the use of all or any part of this material. No representation or warranty should be made with regard to any computations, graphs, tables, diagrams or commentary in this material, which are provided for illustration/reference purposes only. The views, opinions, estimates and strategies expressed in this material constitute our judgment based on current market conditions and are subject to change without notice. JPM assumes no duty to update any information in this material in the event that such information changes. Views, opinions, estimates and strategies expressed herein may differ from those expressed by other areas of JPM, views expressed for other purposes or in other contexts, and **this material should not be regarded as a research report**. Any projected results and risks are based solely on hypothetical examples cited, and actual results and risks will vary depending on specific circumstances. Forward-looking statements should not be considered as guarantees or predictions of future events.

Nothing in this document shall be construed as giving rise to any duty of care owed to, or advisory relationship with, you or any third party. Nothing in this document shall be regarded as an offer, solicitation, recommendation or advice (whether financial, accounting, legal, tax or other) given by J.P. Morgan and/or its officers or employees, irrespective of whether or not such communication was given at your request.

J.P. Morgan and its affiliates and employees do not provide tax, legal or accounting advice. You should consult your own tax, legal and accounting advisors before engaging in any financial transactions.

LEGAL ENTITY, BRAND & REGULATORY INFORMATION

In the **United States**, bank deposit accounts and related services, such as checking, savings and bank lending, are offered by **JPMorgan Chase Bank, N.A.** Member FDIC. **JPMorgan Chase Bank, N.A.** and its affiliates (collectively "JPMCB") offer investment products, which may include bank-managed investment accounts and custody, as part of its trust and fiduciary services. Other investment products and services, such as brokerage and advisory accounts, are offered through **J.P. Morgan Securities LLC** ("JPMS"), a member of FINRA and SIPC. Annuities are made available through Chase Insurance Agency, Inc. (CIA), a licensed insurance agency, doing business as Chase Insurance Agency Services, Inc. in Florida. JPMCB, JPMS and CIA are affiliated companies under the common control of JPMorgan Chase & Co. Products not available in all states.

In **Luxembourg** this material is issued by J.P. Morgan Bank Luxembourg S.A. (JPMBL), with registered office at European Bank and Business Centre, 6 route de Treves, L-2633, Senningerberg, Luxembourg. R.C.S Luxembourg B10.958. Authorised and regulated by Commission de Surveillance du Secteur Financier (CSSF) and jointly supervised by the European Central Bank (ECB) and the CSSF. J.P. Morgan Bank Luxembourg S.A. is authorized as a credit institution in accordance with the Law of 5th April 1993. In the United Kingdom, this material is issued by J.P. Morgan Bank Luxembourg S.A– London Branch. Prior to Brexit,(Brexit meaning that the UK leaves the European Union under Article 50 of the Treaty on European Union, or, if later, loses its ability to passport financial services between the UK and the remainder of the EEA), J.P. Morgan Bank Luxembourg S.A– London Branch is subject to limited regulation by the Financial Conduct Authority and the Prudential Regulation Authority. Details about the extent of our regulation by the Financial Conduct Authority and the Prudential Regulation Authority are available from us on request. In the event of Brexit, in the UK, J.P. Morgan Bank Luxembourg S.A.– London Branch is authorised by the Prudential Regulation Authority, subject to regulation by the Financial Conduct Authority and limited regulation by the Prudential Regulation Authority. Details about the extent of our regulation by the Prudential Regulation Authority are available from us on request. In Spain, this material is distributed by J.P. Morgan Bank Luxembourg S.A., Sucursal en España, with registered office at Paseo de la Castellana, 31, 28046 Madrid, Spain. J.P. Morgan Bank Luxembourg S.A., Sucursal en España is registered under number 1516 within the administrative registry of the Bank of Spain and supervised by the Spanish Securities Market Commission (CNMV). In Germany, this material is distributed by J.P. Morgan Bank Luxembourg S.A., Frankfurt Branch, registered office at Taunustor 1 (TaunusTurm), 60310 Frankfurt, Germany, jointly supervised by the Commission de Surveillance du Secteur Financier (CSSF) and the European Central Bank (ECB), and in certain areas also supervised by the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin). In Italy, this material is distributed by J.P. Morgan Bank Luxembourg S.A– Milan Branch, registered office at Via Cantena Adalberto 4, Milan 20121, Italy and regulated by Bank of Italy and the Commissione Nazionale per le Società e la Borsa (CONSOB). In addition, this material may be distributed by JPMorgan Chase Bank, N.A. ("JPMCB"), Paris branch, which is regulated by the French banking authorities Autorité de Contrôle Prudentiel et de Résolution and Autorité des Marchés Financiers or by J.P. Morgan (Suisse) SA, which is regulated in Switzerland by the Swiss Financial Market Supervisory Authority (FINMA).

In Hong Kong, this material is distributed by **JPMCB, Hong Kong branch**. JPMCB, Hong Kong branch is regulated by the Hong Kong Monetary Authority and the Securities and Futures Commission of Hong Kong. In Hong Kong, we will cease to use your personal data for our marketing purposes without charge if you so request. In **Singapore**, this material is distributed by **JPMCB, Singapore branch**. JPMCB, Singapore branch is regulated by the Monetary Authority of Singapore. Dealing and advisory services and discretionary investment management services are provided to you by JPMCB, Hong Kong/Singapore branch (as notified to you). Banking and custody services are provided to you by JPMCB Singapore Branch. The contents of this document have not been reviewed by any regulatory authority in Hong Kong, Singapore or any other jurisdictions. This advertisement has not been reviewed by the Monetary Authority of Singapore. JPMorgan Chase Bank, N.A., a national banking association chartered under the laws of the United States, and as a body corporate, its shareholder's liability is limited.

JPMorgan Chase Bank, N.A. (JPMCBNA) (ABN 43 074 112 011/AFS Licence No: 238367) is regulated by the Australian Securities and Investment Commission and the Australian Prudential Regulation Authority. Material provided by JPMCBNA in Australia is to "wholesale clients" only. For the purposes of this paragraph the term "wholesale client" has the meaning given in section 761G of the Corporations Act 2001 (Cth). Please inform us if you are not a Wholesale Client now or if you cease to be a Wholesale Client at any time in the future.

JPMS is a registered foreign company (overseas) (ARBN 109293610) incorporated in Delaware, U.S.A. Under Australian financial services licensing requirements, carrying on a financial services business in Australia requires a financial service provider, such as J.P. Morgan Securities LLC (JPMS),

to hold an Australian Financial Services Licence (AFSL), unless an exemption applies**. JPMS is exempt from the requirement to hold an AFSL under the Corporations Act 2001 (Cth) (Act) in respect of financial services it provides to you, and is regulated by the SEC, FINRA and CFTC under US laws, which differ from Australian laws**. Material provided by JPMS in Australia is to "wholesale clients" only. The information provided in this material is not intended to be, and must not be, distributed or passed on, directly or indirectly, to any other class of persons in Australia. For the purposes of this paragraph the term "wholesale client" has the meaning given in section 761G of the Act. Please inform us immediately if you are not a Wholesale Client now or if you cease to be a Wholesale Client at any time in the future.
This material has not been prepared specifically for Australian investors. It:

- may contain references to dollar amounts which are not Australian dollars;
- may contain financial information which is not prepared in accordance with Australian law or practices;
- may not address risks associated with investment in foreign currency denominated investments; and
- does not address Australian tax issues.

With respect to countries in **Latin America**, the distribution of this material may be restricted in certain jurisdictions. We may offer and/or sell to you securities or other financial instruments which may not be registered under, and are not the subject of a public offering under, the securities or other financial regulatory laws of your home country. Such securities or instruments are offered and/or sold to you on a private basis only. Any communication by us to you regarding such securities or instruments, including without limitation the delivery of a prospectus, term sheet or other offering document, is not intended by us as an offer to sell or a solicitation of an offer to buy any securities or instruments in any jurisdiction in which such an offer or a solicitation is unlawful. Furthermore, such securities or instruments may be subject to certain regulatory and/or contractual restrictions on subsequent transfer by you, and you are solely responsible for ascertaining and complying with such restrictions. To the extent this content makes reference to a fund, the Fund may not be publicly offered in any Latin American country, without previous registration of such fund´s securities in compliance with the laws of the corresponding jurisdiction. Public offering of any security, including the shares of the Fund, without previous registration at Brazilian Securities and Exchange Commission–CVM is completely prohibited. Some products or services contained in the materials might not be currently provided by the Brazilian and Mexican platforms.

References to "J.P. Morgan" are to JPM, its subsidiaries and affiliates worldwide. "J.P. Morgan Private Bank" is the brand name for the private banking business conducted by JPM.

This material is intended for your personal use and should not be circulated to or used by any other person, or duplicated for non-personal use, without our permission. If you have any questions or no longer wish to receive these communications, please contact your J.P. Morgan representative.