Retrain, Retool & Compete

A Ten-Point Plan for Success for the American Worker

By Roger Scher

Learning from Other Countries -- a Country Risk Project…

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Has America lost its mojo?

It's hard to tell because of the polarization of opinion today. President Trump and his minions point to the jobs boom under way. The Democrats running for president counter that the economy works only for the rich. Cable news takes one side or the other, and social media echoes with whatever it is you want to hear.[1] How do we sort this out? A critical first step is to distinguish between long run drivers of prosperity and short-run stimulus.

Poor education outcomes, sluggish productivity growth, high income inequality. Declining national savings, a lurch toward protectionism, climate change denial. These trends suggest that the future for the American worker looks grim. The prospects for doing something about it look grimmer still – given dysfunction in American politics today. Are America's best days in our rearview mirror?

The economy appears to be doing well – like a prizefighter who has been doping. Economic growth has surged above its long-run average. Unemployment has fallen to historic lows. A rising tide really has lifted all boats -- with higher wages and jobs available for skilled and unskilled workers; men and women; white, black and Hispanic workers; and the long-term unemployed.[2] Meanwhile, as the decade of the 2020s dawns, the nation sits riveted in a darkened movie theater, watching a blockbuster film Tarantino could have made, starring Donald Trump as the brawling champion known for his below-the-belt counterpunches, taking on opponents around the world and up and down Pennsylvania Avenue. Thumbs-up, feel-good entertainment for nearly half the electorate – scoring over 90 percent on Rotten Tomatoes, a tragedy of Shakespearean proportions for the rest of us.

It is a drama that will come back to haunt the nation with an unsustainable debt burden. Government debt -- already high due to the bailout of the economy during the Global Financial Crisis – is now on a trajectory to the stars.[3] Belt-tightening will be required. The stock market bubble – like a sudden swelling on a fighter's face – will be pricked and deflated, undermining business confidence. Financial market volatility in the U.S. could reverberate around the globe.[4]

The coming attractions feature the American worker on the ropes -- a faded contender, unable to "float like a butterfly, sting like a bee". This is evidenced by the fact that labor productivity – output per hour, the only lasting driver of higher wages – though blipping up since 2018, is growing below its long-run average.[5] Likewise, economic inequality makes life difficult for workers – with half the population holding zero net wealth and labor's share of national income near historic lows. Meanwhile, financial markets and real estate power higher, making the rich richer.[6] There is no one in the American worker's corner.

Enough with the boxing metaphor.[7] Still, the language of the ring lends itself well to a description of a nation embroiled in a fight for its future -- the struggle to agree on a set of government policies that will empower workers. The language of Hollywood likewise befits the fantasy that much of the nation is captivated by, preferring an orange superhero on the big screen to streaming an art film in their living room.

The American worker's future will not be bright without sustained improvements to education, basic research, and the social safety net. Essential as well will be higher national savings in order to fund retraining and retooling – something that Republicans who like to cut taxes and Democrats who like entitlements expansion need to understand. Otherwise, globalization – which cannot be reversed – will get the better of us. High-skilled, well-paid jobs will go to other countries where planning for the future is integral to public policy.

The choice America faces does not have to be between extremes – between libertarianism and socialism, Trumpism and Sanders-economics. Two rival camps armed with starkly different narratives depict their opponents as existential threats – sometimes more menacing than foreign foes.

Policies we cannot afford -- such as deep tax cuts or Medicare for All -- win support today. Sound measures get no traction – such as offsetting a business tax cut by rolling out a carbon tax and closing loopholes; or fixing, rather than replacing, the Affordable Care Act, which has cut the percentage of the population that is uninsured in half.[8] The left proposes a Green New Deal that seeks to transform the U.S. economy toward a low-carbon future -- a laudable goal. Yet a key driver of reducing carbon in the atmosphere – carbon-capture technology – is left out because it has the support of industry. Likewise, cap-and-trade and other market mechanisms are excluded. The initiative contains unrelated and expensive add-ons such as jobs and pensions for all. Meanwhile, Trump's rollback of Obama-era emissions cuts and other safeguards aggravates the problem.[9] In America these days, it seems it's either revolution or counter-revolution – off with their heads, or off with *their* heads. Good government -- solutions rooted in science, economics and management principles – is hard to come by. Voters are pushed into the arms of populists offering answers that produce short-run gains while undermining long-run performance.

This paper actually is not very cinematic. It applies an analytical approach used in business called "country risk analysis" to the U.S. case. Country risk analysis is a risk management field that examines public policy and economic performance across the 200-plus countries of the world in order to sift out best practice for achieving country success. Country risk analysis is comparative. This is the lens -- the value-added -- of this approach. The author worked in the private sector for many years – most recently as Global Head of Country Risk at G.E. Capital. Typically, the country risk analyst advises business leaders whose companies operate across borders on where it is safe and where it is profitable to invest.[10] Schooled in economics and politics, the country risk analyst spends more time assessing political risk than most economists do. S/he focuses less on a country's daily political intrigues than most political analysts do. The good country risk analyst takes a holistic view – assessing the long-run drivers of consensus and prosperity – honing in on those countries where business can flourish and workers can improve their standard of living.

The national priorities of Savings / Education / Exchange -- the latter referring to the free exchange of goods and services, capital, people and ideas – emerge from this process. Retrain and retool, as featured in the title – that's the Education piece. Compete – that's the Exchange piece. And, Savings – that's how you pay for it all.

Strategic planning – led by government and harnessing the energies of the private sector – is how you reach these goals. Political systems that produce consensus – often embodied in a centrist plan of action – tend to outperform more contentious systems at planning for the long term.

The center of American politics could agree on a strategic plan to assist workers, but it has descended into quicksand. Centrist candidates are deterred from running for office by gerrymandered districts, partisan campaign finance and primaries, and polarized media.[11] Divisions on issues ranging from immigration to abortion to gun violence are entrenched. Centrist leaders meet in the basement of the Capitol in Washington D.C. to form gangs of six, eight or fourteen and fail. Bipartisan "problem solvers" caucus together to bridge the divide – with meager results.[12]

Both the right and the left have contributions to make. The genius of the center-right is its focus on the market economy and low government debt. The genius of the center-left is its focus on empowering workers, inclusion, and a social safety net. The center – if energized – could cull the best of both worlds.

Of course, the center is not always the answer. When Dr. Martin Luther King, Jr. argued in the 1960s "why we can't wait", articulating the strategy of nonviolent resistance to racism and segregation, this was not a plan of action from the center. Yet Dr. King's approach was itself moderate and effective.

Through persistent protest and acts of civil disobedience – achieved through rigorous training in non-violent direct action – civil rights activists confronted entrenched racism in America. The struggle continues today -- with setbacks occurring in spite of progress made. Because the center is not always the place to be, the centrist must keep an open mind and an ear tuned to other options.[13]

America remains a strong and vibrant country, albeit with some deterioration over the last decade. No “Bash America First” argument is contained herein. Self-improvement is not self-hate. Patriotism is not the province of the far right.

“The size, diversity, and dynamism of the U.S. economy leaves it especially well poised to benefit from… trade and investment liberalization,” asserted the International Monetary Fund (IMF).[14] The United States has demonstrated a remarkable capacity over a hundred years to accumulate and broadly distribute wealth.[15] It boasts efficient markets, competitive businesses, and innovative people – leading the world in creating opportunity. With a $20 trillion economy – the largest in the world, 328 million people – the third most populated, and over $62,000 in per capita income, the U.S. is the richest major advanced economy with the fastest economic growth rate.[16]

On the political front, Freedom House -- the non-partisan U.S. global democracy watchdog – has said: “The United States is arguably the world’s oldest existing democracy. Its people benefit from a vibrant political system, a strong rule-of-law tradition, robust freedoms of expression and religious belief, and a wide array of other civil liberties.” [17] America has in the past provided the world with standards of best practice in both economics and politics, and demonstrated a capacity for reform. Yet the country is slipping. The drivers of future prosperity have hit the skids.

It is not time to throw in the towel. By learning from other countries, the United States could fix its weaknesses and build on its strengths. “It is not rocket science,” a country risk analyst at a major rating agency once said about the field.[18]

Country risk analysis draws on data compiled by international agencies to score the drivers of success. Now, you understand that this is no Tarantino movie. An index can be constructed, and countries around the world ranked. The index completed for this paper covers the quality of a country's political institutions, its business conditions and global competitiveness, education outcomes, and the government's financial strength.[19] The United States – the world's most powerful country – ranked just 16th best of 68 countries fully covered by the data – barely in the top quarter of the sample.[20]

In addition to ranking countries, the analyst can complete "deep dives" on successful countries for insights. America is falling behind top-ranked Singapore, Canada and Germany, but comes out ahead of China – though each year that country moves up the ranks.

Singapore, ranked number 1 by the country risk index, has achieved success by going all-in on globalization and emphasizing education. Both 3rd-ranked Canada and 8th-ranked Germany are democracies that have had success building consensus on economic policy – reducing income inequality and avoiding the degree of polarization found in the U.S. China -- ranked 31st -- deploys strategic planning effectively -- powering the country forward in only forty years from a closed, impoverished society to a great power.[21]

These countries have all engaged in strategic planning – led by government and harnessing the corporate sector -- within different political contexts.[22] There is no such strategic planning going on in the United States today. These countries – discussed below -- are not without their weaknesses – including in areas where the U.S. is strong -- such as efficient markets and dynamic businesses. The argument is not that these countries do everything better than the U.S. They do not. Like most countries, they possess risk "fault lines" that, if unaddressed, could lead to problems in the future. Singapore is much less free than the United States from a political standpoint. Canada is less dynamic from an economic standpoint. Germany's risk aversion slows the pace of economic reform. And, China's one-party state maintains an excessive presence in the economy, commits human rights abuses, and aggravates global tensions. The internal contradiction between political monopoly and economic pluralism cannot last forever. Moreover, China – like the U.S. – is a heavy carbon emitter.

The country risk analyst asks the following jam-packed question: Given globalization and the reaction against it, how can a country in the 21st century grow its economy, educate its kids, deploy technology, distribute prosperity broadly, encourage diversity and innovation, protect its citizens, protect the environment, minimize the risk of financial crisis, foster happiness and social peace, all the while accomplishing this without threatening other countries?

This paper rolls out a ten-point plan for U.S. success. America's future will be challenging unless politics and policies change -- unless they are reoriented toward the priorities of Savings / Education / Exchange – S.E.E. Then, the American worker can get her mojo back.

S.E.E.-ing Straight

Savings – the excess of income over consumption – are channeled into investment in technology, equipment, factories and people. How much a country saves each year drives future economic growth. It also provides a financial cushion against bad times.[23] A nation's savers place their funds in banks or the financial markets, which direct them to investors (largely firms). Low national savings often means high national debt – including a portion owed to foreigners. Excessive foreign debt can be ruinous for a country. A debt overhang – as occurred in the U.S. following the Global Financial Crisis (GFC) of 2009 – can hold back growth for years. So, thrift is a critical component of country success. U.S. national savings equals about 19 percent of GDP per year, lower than in most countries and much lower than Germany's 28 percent. America relies on foreign savings to fund a portion of its investment. America's low savings ratio is driven by poor savings behavior of both households and the federal government. The ratio has declined under Trump due to tax cuts and wider deficits.[24]

Education is investment in people. This is how a country increases the value-added of its workforce. The design of the iPhone in California adds more value than does its assembly in China.[25] The more educated a nation's workers are, the more value they add to production, the better they are paid, and the richer the country becomes. Lifelong training keeps the labor force at the cutting edge and extends its working life. Research and development (R&D) produces innovation, thereby increasing worker productivity and equipping the nation to handle challenges such as climate change. Strong education drives country success. Math scores of American high school students ranked 40th of 71 countries in the latest Program for International Student Assessment (PISA), a widely-followed international examination.[26] This is a very poor result in a skill set indispensable in today's digital, data-driven world.

Compared to other countries, the U.S. pays its teachers poorly. America's standards for achievement and testing fall short of international best practice. And, the way the country funds education (locally, instead of nationally) perpetuates inequality. Making education priority #1 – in terms of funding and strategic planning – may be the only way forward for the U.S.[27]

Exchange of goods and services, capital, people and ideas increases a nation's productivity and wealth.[28] Countries specialize – engaging in economic activities where they are comparatively more productive -- and they trade.[29] Countries access low-cost, high quality goods from around the world. They cooperate on the international rules of the game and tool up to compete. Governments can negotiate hard on behalf of their people, without taking a wrecking ball to global agreements. Trade can be messy, with some countries seeking advantage in specific products. Disputes occur, but the rules provide a process for dispute settlement. More can be done to penalize cheaters, but the most effective way to do so is to act multilaterally with like-minded countries. Closing off to the rest of the world never works, never has worked throughout human history.[30] Bullying may at times reap short-run gains, but always ushers in disaster. Exchange also involves engagement – countries working together to solve global problems, such as climate change.

The International Trade Commission – a U.S. federal agency – found that in the two decades to 2015, trade agreements the U.S. has been party to have raised economic growth, increased jobs, improved the trade balance, lowered prices for consumers, and enhanced intellectual property (IP) protections and revenues in the United States.[31] President Trump's trade war with China, tariff threats worldwide, and undermining of multilateral institutions such as the World Trade Organization (WTO) harm the U.S. economy and could push the world to the kind of unilateralism that led to the Great Depression. Senator Bernie Sanders and his heirs on the American left likewise oppose globalization.[32]

Although exchange increases prosperity, it can be disruptive to individual actors. That is why adjustment assistance and adequate health care can provide a safety net to workers who are negatively impacted. This is not socialism. A social safety net provides breathing space to workers so they can retrain, retool and compete.[33]

Strategic Planning

Strategic planning – long-term and at the country-level – is critical to success. Companies do it. Why not countries? This is also not socialism. It is leadership. An important government role -- without erecting a massive welfare state -- is prudent. The U.S. government can help set national priorities, without giving up its favorable business climate – including its low tax burden. Other countries achieve this -- for example, low-tax, pro-business Singapore. Strategic planning is even possible in decentralized systems – such as Canada and Germany -- where coordination takes place at lower levels of government. This has occurred intermittently in the U.S. at the level of the National Governors Association (NGA) -- a vehicle the U.S. should use more.[34]

Many American private sector successes have occurred as a result of strategic planning led by government, but this has been driven almost exclusively by national security. The defense needs of the Second World War helped transform Detroit into the assembly line of the world.[35] During the Cold War, the Defense Department (DoD) pushed R&D that ultimately yielded commercial success in semiconductors, commercial aircraft, GPS, lasers, IT, and social media.[36] NASA's Commercial Orbital Transportation Services program (COTS) has likewise led to the emergence of strong private manufacturers and launchers of rockets and spacecraft – such as SpaceX.[37] Because such projects have had something to do with national security, there has been no political backlash. Most successful countries do not carry the ideological baggage of opposition to government action that is currently embedded in American libertarianism.

For its part, the American left wears blinders regarding the potential positive role corporations can play. With government deploying both carrot and stick, the vast resources of corporate America can be brought to bear. When FDR convinced automakers to shift assembly lines to tanks and planes, American arms could not be stopped.[38] Similar action could be taken against climate change. President Obama understood this when he brought the U.S. into the Paris Climate Agreement, arguing that, if governments commit to a low carbon future, private investment in green technologies will be unleashed.[39]

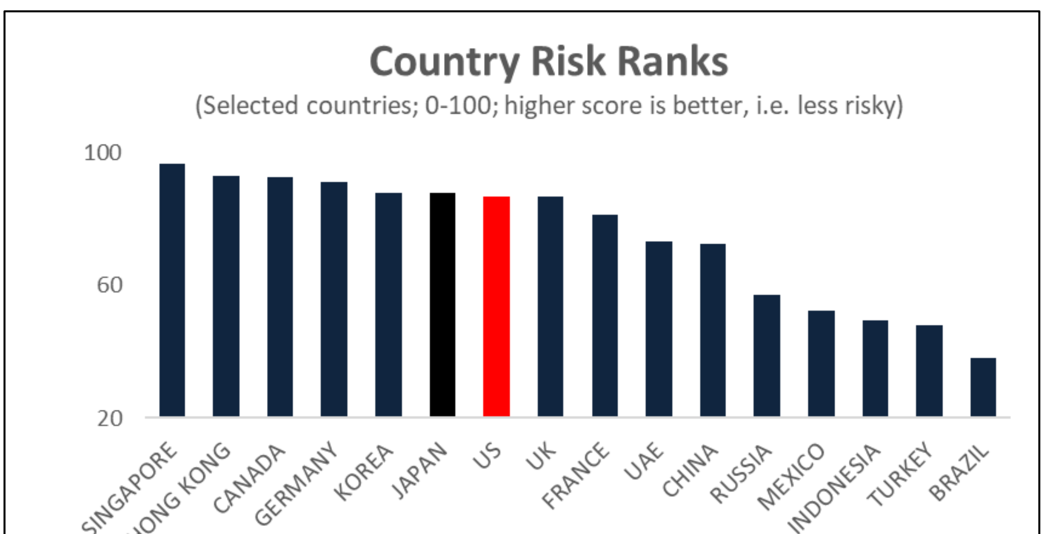
Other countries are deeply engaged in strategic planning. Germany rolled out a government-led hi-tech plan in 2013 focusing on smart machines, and a plan in 2019 to build strong European competitors in the industries of the future.[40] China produced a comprehensive industrial policy – Made in China 2025 -- targeting hi-tech sectors for growth.[41] Singapore's government-led Future Economy Council, launched in 2016, focuses on knowledge acquisition, productivity and global integration.[42]

Canada laid out an agenda in 2016 for raising productivity – including by attracting foreign talent, financing innovation, and targeting key sectors such as Artificial Intelligence (AI).[43]

Strategic planning involves the government providing what economists call "public goods" -- education, training, basic R&D, and a social safety net -- but also national security and law and order. Almost no one objects to a government role in the latter two – which provide protection -- while free market ideologues oppose a government role in the first four – which are nonetheless crucial to country success. Public goods tend to be underprovided by markets because it is not profitable in the short run -- even though society as a whole benefits.[44]

The Country Risk Index

The index developed for this paper is not complicated. It averages five separate country rankings drawn from the World Bank, the World Economic Forum (WEF), the OECD, and the three major bond rating agencies.[45] It distinguishes itself by assigning a heavy weight to education outcomes – student performance on international tests – in order to look to the future.[46] The objective of the Country Risk Index is to identify areas of improvement for a country.[47] See the results for selected countries below.



Note: score reflects institutions, business climate, competitiveness, sovereign credit risk, education outcomes
Sources: World Bank, World Economic Forum, Moody's, S&P, Fitch, OECD (2015-18)

Weighing down the U.S. ranking are:

- *The country's education outcomes*, as evidenced in low test scores for high school students that place the U.S. outside the top ranks of countries in math, science and reading – averaging 31st of 71 countries on these three tests in the OECD's 2015 PISA exercise. Its worst ranking was in math as noted above. Results in other international tests, such as TIMSS, likewise do not place the U.S. among the best-performers. And, the trend in the U.S. through 2017 has not been improving.[48]
- *A deterioration in U.S. institutions* – notably, in the quality of American democracy. The World Bank's World Governance Indicators put the U.S. 27th best on average of 202 countries – averaging results for democracy, political stability, government effectiveness, rule of law, corruption and regulatory quality. Likewise, Freedom House – the non-partisan U.S. democracy watchdog -- ranked American democracy 52nd best on political rights and civil liberties, among 212 countries, well below Canada's 4th and Germany's 18th ranks – with the U.S. deteriorating in 2018 due to erosion of democratic norms under President Trump.[49] The U.S. ranks 92nd of 140 countries in the WEF sample on the number of homicides occurring annually as a percentage of the population.[50]
- *Low national savings*. The U.S.'s sovereign credit rating was downgraded by Standard & Poor's in 2011 to AA+ -- due to low savings as well as political divisions. Moody's and Fitch have kept the U.S. rating at AAA (the highest rating). Ten other countries – including Singapore, Canada and Germany -- have AAA ratings with all three rating agencies. Many of these countries are net creditors – they have high savings and lend to other countries -- while the U.S. is a large net debtor.[51]

America's strengths include:

- *<u>The country's business climate</u>* -- reflected in the U.S. ranking of 8th of 190 countries in the World Bank's Ease of Doing Business survey – with favorable ranks for contract enforcement, bankruptcy resolution, and credit markets.
- *<u>The country's competitiveness</u>* -- reflected in the U.S. ranking of number 1 of 140 countries – just ahead of Singapore and Germany -- in the WEF's Global Competitiveness Index.[52] The U.S. is notable for its large and free markets, as well as its innovative businesses.

America's strengths are formidable, but tend to reflect the current state of affairs. The U.S.'s #1 ranking in the WEF's competitiveness scale relies heavily on the perceptions of corporate executives of current conditions – today's markets and businesses. Country risk analysis indicates that the drivers of future prosperity – Savings / Education / Exchange -- and the politics required to strengthen these -- are areas of weakness for the United States.

Country Deep Dives

Singapore *– All-in on Globalization*. An island-nation of fewer than six million inhabitants situated along the busy sea lanes of Southeast Asia, Singapore has made the leap from developing to advanced economy faster than almost any other country on the planet – making its population rich along the way. Singapore's number 1 ranking on country risk reflects its number 1 ranking in education outcomes, top rankings for business climate and competitiveness, and strong finances. The Singapore model is based on free trade, a global financial center, and insertion in the global value chain. The country boasts a high national savings ratio of 46 percent of GDP, reflected in government budget and current account surpluses that provide an ample financial cushion against economic shocks.[53] The rule of law -- especially courts known for fairness in commercial cases -- is conducive to business. Proactive government action promotes safe and smooth functioning of markets. On the other hand, a mixed political system (with authoritarian and democratic aspects) yields its least favorable ranking of the five index components – 18th in the World Bank's Governance Indicators. This still outperforms the U.S., given Singapore's highly effective government.[54]

A key lesson for the U.S. from Singapore is that government can play a leading role in strategic planning, public goods provision and regulation -- without damaging the country's status as a pro-business, low-tax location. No libertarian legislative veto of government action exists in Singapore.[55]

The country boasts free markets, while providing high quality public goods such as infrastructure, education and health care at moderate cost. It has become a global leader in electronics manufacturing, transport, logistics, technology and banking. Its business climate ranks second in the world, reflecting a light touch of regulation. Unlike other Asian nations, Singapore has managed to temper a real estate bubble in recent years through skilled bank supervision.

The country's tax burden is low -- just below the level of U.S. federal taxes. Singapore keeps a tight lid on government spending, yet Singaporeans have a fully-funded pension plan and health savings accounts – based on mandatory household savings. This way the government channels private savings into key priorities, but is not reluctant to provide additional funding from the budget as needed. And, the government has run consistent budget surpluses that have generated assets in sovereign wealth funds that exceed by a wide margin the value of GDP. So, even with an aging population and rising health care and retirement expenses, Singapore has the wherewithal to meet future spending needs.[56] Nevertheless, the government made the prudent decision to raise taxes against future spending. By contrast, U.S. entitlement spending – Social Security and health care – is expected to rise and deplete trust fund assets over the period 2026-34. Meanwhile, the U.S. government has just implemented deep tax cuts that generate large deficits.[57]

Singapore's education system is characterized by central direction, lifelong teacher training, and national standards for achievement -- while allowing local autonomy for schools to reach their goals. The Ministry of Education periodically reassesses education strategies – partnering with other government agencies, industry and universities to design programs aligned to a changing global economy. The last two reassessments focused on adapting to the knowledge-based economy – with significant investments made in technology and toward achieving core student competencies. In 2015, Singapore was ranked number 1 in all three OECD PISA international exams of 10th graders – math, science and reading; as well as in the TIMSS international math and science exams for both 4th and 8th graders.[58] On technology, Singapore is ranked 4th in the world in adoption of information and communication technologies (ICT), behind three other East Asian nations.[59]

Active strategic planning is exemplified in the Future Economy Council (FEC), a government-led collaboration with business that focuses on digitalization, skills upgrading, and firm-level innovation.[60] Singapore has fallen short of other countries – notably the U.S. and Germany -- in business dynamism and innovation. This is reflected in weaker productivity growth in recent years and perceptions of a less favorable climate for R&D, entrepreneurship and start-ups.[61]

What is striking about Singapore is that such lessons are integrated quickly into the country's strategic plan. Government spending on FEC programs includes: credits to individuals to cover the costs of lifelong training; a National Research Fund to finance innovation and start-ups, as well as tax incentives for R&D and Intellectual Property (IP) registration; and, a National Productivity Fund to support "industry transformation maps" that assist firms in raising productivity through technology adoption and other efficiencies. The government assigns specific ministries to work with key industry clusters – including manufacturing, trade and connectivity, and professional services – in order to rationalize regulations, digitalize, and help small and medium enterprises "scale up" – that is, form global partnerships with foreign firms in order to offset Singapore's small size.[62]

Government-led strategic planning is such an integral part of the political culture that it produces overlapping initiatives. The FEC is led by the finance ministry and draws members from government, industry, labor and academia. A Smart Nation initiative, run out of the prime minister's office, oversees digitalization of government and society, partnering with another committee that deals with cybersecurity. SkillsFuture Singapore is an agency under the education ministry that promotes and funds lifelong skills acquisition. While Singapore's government is ranked number 1 in the world in "government effectiveness", so has the capacity to handle such complexity, the number of government planning committees and initiatives raises the question as to whether efficiencies could be achieved through consolidation.[63]

Singapore falls well short of the U.S. and other countries in political participation, captured in a low democracy score with the World Bank and in Freedom House's designation of Singapore as "partly free". Its government has been run by one party since independence – dominated by one family – with election rules tilted in the party's favor. Likewise, civil liberties – notably, press freedoms -- are curtailed. The government does not appear inclined to introduce greater pluralism – though increased access of Singaporeans to on-line news sources could lead to bottom-up pressures.[64] Singapore's authoritarian characteristics make it vulnerable to social unrest in the event of a sustained economic downturn – a stressor that the city-state has not experienced for decades. Recent protests – centered on the issue of migrant workers – turned violent in at least one case.[65] The lack of pluralism in the political culture can negatively impact risk-taking in the economic sphere – representing a key risk fault line for Singapore.

Furthermore, Singapore has room to reduce its carbon footprint – with emissions per capita and carbon intensity of output (i.e. emissions per dollar of GDP) higher than the E.U. average, while lower than the U.S. and Canadian ratios.[66]

Singapore's strategy is difficult to replicate in larger countries like the United States. Its experience might be more relevant for other global cities – such as Hong Kong, London or New York – and for less democratic societies. The U.S. economy is complex, requiring greater decentralization than is warranted in Singapore. Public policy techniques used in Singapore -- such as mandatory savings for retirement and health care -- are more challenging to implement in large democracies and may be unconstitutional in the U.S. That said, the drivers of Singapore's success – evidenced by per capita income rising from under forty percent of the U.S. level to parity in under two generations -- are worth examining. By identifying weaknesses and pulling together stakeholders to draw up and implement a strategic plan, the government of Singapore focuses on success over the long term – a perspective elusive in the U.S. context. Pursuing excellence across all measures of country success – as Singapore very nearly achieves – should become an American goal. And, the Singapore case demonstrates that full engagement with the wider world can drive success.

Canada – *Strong Democracy Empowers Centrists.* Sharing with the United States the world's longest border, resource-rich Canada is ranked 3rd in the country risk rankings after Singapore and Hong Kong. This reflects Canada's top ranks in education outcomes and the quality of political institutions. Likewise, small budget deficits and declining government debt are drivers of Canada's AAA sovereign rating, though a high level of private debt could weaken the country's finances.[67] The world's tenth largest economy, Canada is ranked lower than peers – such as the U.S. -- on business climate and competitiveness.[68]

A key lesson for the U.S. from Canada is that democracy can work – with positive results in education, fiscal policy, immigration and international trade. Like the U.S., Canada is diverse, pluralistic and decentralized. Yet Canada boasts a more durable political consensus, in spite of tensions among its provinces and over issues such as immigration and climate change. Rules and practices in politics tend to moderate, rather than exacerbate, divisions. Changes of government in Canada tend to produce tweaks to the country's economic model, rather than U-turns.[69]

Canadian politics is currently undergoing a test. A scandal engulfing Prime Minister Justin Trudeau -- alleging political interference in the prosecution of a politically-connected corporation for corruption – could tarnish Canada's sterling reputation for the rule of law. The most resilient democracies emerge from such tests strengthened. Nevertheless, Canada's high institutional scores could slip modestly in next year's rankings.[70]

Canadian politics is likewise not immune to the global uptick in populism and polarization. Canadians – like others in advanced economies -- have endured painful adjustments due to technological change and globalization – impacting employment, regional economies, and housing affordability. Following the victory in national elections in 2015 of Trudeau's Liberal Party – positioned on the center-left – over two other major parties -- the center-right Conservatives and the left-wing New Democrats, there has been increasing energy on the right.[71] The tone of Canada's political discourse has deteriorated – punctuated by criticism of political and media elites and claims of racism and corruption, with some Conservatives mimicking Trump's rhetoric. A general election due in October 2019 will test the country's commitment to consensus and centrism, with the Liberals and Conservatives neck-and-neck in the polls and increasingly pulled to the extremes by the parties on their flanks.

Thus far, the system has acted to contain the fallout. An effective Westminster parliamentary system – in which the majority party in the legislature forms the government -- yields governments empowered to enact reforms. Canada has no separation of powers between the executive and legislative branches, so gridlock is avoided. Canada's press is less polarized than America's. Of Canada's ten provinces and three territories, Ontario has the largest population (totaling 14.4 million or just under 40 percent of the nation), giving it more than a third of the seats in the federal legislature and providing a center of gravity to government that eludes the more dispersed U.S.[72] The main parties in the federal legislature are relatively strong and unified – with none straying too far from the center. Andrew Scheer, the Conservative running against Trudeau, currently appears to be holding populists in his party at bay. For an analogy, Scheer is more Mitt Romney than Donald Trump.[73]

Canada's electoral rules promote consensus. Federal funding of elections – as well as limits on private funding and on overall election spending -- diminishes the impact of special-interest money. This financial constraint, plus party leadership conventions instead of primaries, makes Canadian elections much shorter and less partisan. Canada has a "single-member plurality" system – like the U.S. -- where the candidate winning the greatest number of votes in an election district wins the seat. That, coupled with candidate vetting by party leaders, strengthens political parties and leaders.[74]

Consensus is likewise driven by a lower concentration of wealth than in the U.S. – fostered by redistributive policies -- including equalization payments between rich and poor provinces, health care coverage broadly available, and education and immigration policies that promote fairness. Poverty and income inequality measures are lower than in the U.S.[75]

On education, Canada is a standout in terms of fairness. It joins a small group of countries that achieve both high performance and fairness in outcomes in the OECD PISA tests (that also includes Japan, Estonia and Finland).[76] What makes Canada unique is that it is the only country in this group with a high proportion of immigrants in the student population.[77] The proportion of immigrants in the student population in Canada was 30 percent in 2015, vs. 23 percent in the U.S., where unlike Canada there is a substantial gap in performance between immigrants and non-immigrants. Canada's singular achievement -- coupling educational equity with high immigration rates -- reflects the country's liberal – though skills-based -- immigration system, acceptance of multiculturalism, and proactive programs to facilitate immigrant education.[78]

Fairness in Canada's education system is also advanced through its funding structure. While many OECD peers employ a national funding structure that tends to equalize education outcomes by lifting up poorer school districts, Canada achieves this through provincial funding. By contrast, U.S. education funding is more unequal – based on local (city and village) property taxes – providing an advantage to wealthier school districts. The OECD has concluded that countries with active policies to improve education outcomes among disadvantaged students tend to perform better overall in international tests.[79]

In 2015 in reading (an exam that assesses critical thinking), Canada's PISA score was tied for second with Hong Kong and behind only Singapore. In math and science, Canada was further back in the field (at 10th and 7th respectively) – but well ahead of the U.S.[80]

Education reform -- advanced in Ontario in the mid-2000s -- has been coordinated with other provinces through the Council of Provincial Education Ministers. Ontario's reforms focused on teacher professional development, province-wide standards and testing, and improving access for disadvantaged students. Reforms have yielded results. In 2004, 54 percent of Ontario's students in grades 3 and 6 met provincial standards; but by 2016, that figure rose to 72 percent. Likewise, in 2004 68 percent of high school students graduated within 5 years; whereas by 2016, that figure was 86 percent.[81]

Teachers are relatively well-paid in Canada. Teacher salaries represented 118 percent of salaries of workers with comparable education -- vs. 76 percent in the U.S., 111 percent in Germany, and an OECD average of 103 percent.[82]

Canada has a shortage of tech workers – given that only about a quarter of Canadian university graduates obtain diplomas in STEM (science, technology, engineering and math).[83] Immigration has helped pick up the slack. The Canadian government has taken measures to attract tech talent -- including increasing access to temporary visas and pathways to permanent residency, giving employers more input into immigrant selection, additional funds for pre-arrival services and settlement, easing immigrant access to regulated professions, and language training.[84]

Canada's high annual inflow of immigrants is set to rise further -- to close to one percent of the population per year. Immigration is expected to make up all of Canada's population growth by 2033, alleviating the demographic challenges seen in other countries. Canadian politics has thus far not produced the level of polarization on immigration seen in other countries – due in part to the country's geography and merit-based immigration rules, but also to a more centrist electorate. However, recent polling indicates a rise in the percentage of Canadians perceiving immigration levels as too high.[85] Anti-immigrant rhetoric has been rising on the right – which could help power a Conservative victory in October 2019.

A lesson Canada could learn from the U.S. is to foster a more competitive business climate. Ongoing weakness in competitiveness is a risk fault line for Canada. Consequently, its favorable country risk ranking may overstate the country's prospects. Translating its political strengths, favorable education outcomes, effective immigration program, and free trade agreements into economic growth is essential to future success. Dismantling barriers to trade among the provinces and implementing policies that enhance productivity are critical.

In an open letter to political leaders in May 2019, the CEO of the Canadian Chamber of Commerce said: "Today, Canadian businesses face obstacles our competitors do not. We call them the seven burdens of business: over-regulation, a complex and outdated tax system, the difficulty finding and retaining skilled workers, the need for improved technology infrastructure, lack of support for SMEs, insufficient trade tools and proposed changes that may undermine employer-provided healthcare.” [86]

Canada’s high degree of provincial autonomy is an integral part of its political culture. However, while providing a safety valve for release of political tensions, on balance this has been negative for competitiveness. Provinces maintain their own standards, rules and regulations for products and industries. Provincial government procurement policies are independent and disadvantage companies outside each province. Reforms were passed in 2017 to reduce these barriers, though much work remains to be done.[87] Furthermore, in spite of an open economy on trade and immigration, Canada restricts foreign investment, which dampens growth by limiting access for Canadian companies to foreign capital and technology.[88]

The productivity boost from free trade with the U.S. that Canadians had hoped for has not materialized. The productivity of the Canadian worker has remained at about three-quarters of the U.S. level – resulting in per capita income in Canada that is nearly $15,000 lower. This reflects lower levels of R&D and technology, as well as smaller, less efficient firms.[89] Canadian manufactures – including autos and aircraft – have become less competitive in global markets, due in part to foreign competition -- notably from China and Mexico. Ontario – Canada’s manufacturing hub – has been hit hard – one reason why the Liberals were tossed out of office in 2018.[90]

To address these productivity challenges, the Trudeau government has drawn up a strategic plan. This includes: an Advisory Council on Economic Growth that engages the private sector; funding innovation and skills acquisition and an infrastructure bank; deregulation; programs to increase female labor force participation and to promote gender pay equality; and, the support of “super clusters” in AI, advanced manufacturing, digitalization, marine vehicles, and agricultural technology.[91] Canada already has a strong presence in AI – driven by decades of government funding and evidenced by labs opened in

Canada recently by Google, Facebook and Samsung. It is an important player in the cutting edge field of neural networks – computer modeling that simulates the human brain. The country's open-labs approach pulls in scientists from around the world.[92]

Climate change has become a source of division in Canada. The carbon intensity of the economy (emissions per dollar of GDP) is high and comparable to America's. Per capita carbon emissions are comparable to America's and three times the world average. The Liberal Party attempts to tread a fine line between exploiting the country's ample hydrocarbons and gradually shifting toward a low carbon future. Three oil-producing provinces – joined by the populist government in Ontario -- have rejected Trudeau's ambitious climate plan, which includes a carbon tax phased in by 2022. Opposition to the plan is a central plank of the Conservative election strategy.[93] Pipeline construction in order to further exploit the country's hydrocarbon resources pits left-leaning British Columbia against Alberta -- now run by Conservatives -- which produces over four-fifths of Canada's oil and gas.

The U.S. can learn from Canada's focus on education outcomes, embrace of globalization, deep-seated commitment to democratic institutions, and consensual politics, buttressed by lower income inequality.[94] Yet Canada's political model is not entirely applicable to the U.S. America's political culture is more polarized and may tilt further to the right than Canada's. Separation of powers in the U.S., recent Supreme Court rulings on campaign finance and gerrymandering, and electoral rules tend to divide rather than unite. That said, it is possible for the U.S. to move toward a Canadian-style consensus – tweaking electoral rules and improving the social safety net.

Germany – *Fairness Leads to Consensus*. The fourth largest economy in the world – with GDP of $4 trillion and 83 million inhabitants – a country Henry Kissinger called "too big for Europe, too small for the world" -- is ranked 8th in the country risk rankings. Germany outperforms the three largest economies -- the U.S., China and Japan – due to solid scores across all country risk metrics.[95] Germany has one of the strongest sovereign balance sheets in the world, a result of its conservative fiscal policy. It is highly open to trade. The government keeps political polarization at bay by creating a prosperous economy and reducing income inequality. Of the seven economies ranked ahead of Germany, almost all are small like Singapore, and so are not strictly comparable to large, complex countries.[96] So, in many respects, Germany is the best run large country -- and the U.S. can learn from it.

A key lesson for the U.S. from Germany is that fairness -- in terms of income distribution -- can create the consensus needed for reform. In order to build social cohesion, the German government provides a broad social safety net – pensions, health care, and equalization payments across Germany's states.[97] Its welfare state is more generous than Canada's and among the most generous in the world -- fully funded through taxes. As a result, reforms -- designed to improve economic performance – obtain a broad-based buy-in. This is needed because reforms risk upsetting the applecart -- by for example shaking up labor markets and the education system and mandating green energy policies. Such an approach – building consensus around a centrist agenda – is a useful lesson for the U.S.

The Gini index of income distribution indicates how well a country's income is distributed throughout society – the higher the number, the more unequal is the country's income distribution. Germany's Gini is 29 vs. the U.S.'s 39.[98] The index can be calculated both before and after taxes and transfers (i.e. social spending). Before taxes and transfers, both the U.S. and Germany start out with a similar Gini index of about 50, whereas Germany's tax and transfer policies result in a fairer income distribution. This is largely due to America's more modest anti-poverty programs.[99] As a result, Germany's poverty rate is much lower than America's -- at 10 percent of the population vs. nearly 18 percent.[100] Inequality of income and wealth can be a major driver of political polarization, as lower income groups perceive the economy as rigged.[101]

Over the long term, an effective way to durably combat inequality is by raising productivity – output per worker. Worker productivity can be increased by adding capital – factories and equipment – as well as through innovation. Innovation is driven by education, training, R&D and technology. When workers are more productive, they are paid more -- and so, inequality is reduced.[102] Innovation can be reflected in an economic indicator called "total factor productivity" (TFP) growth – essentially, the portion of economic growth that is due to doing things better. Germany has outperformed the U.S. – and most OECD countries -- in TFP growth -- that is, in innovation -- over the last three decades. U.S. TFP growth does outperform many other advanced economies.[103]

The U.S. and German economies are both relatively dynamic – reflected in the WEF's ranking of the U.S. and Germany as the first and third most competitive countries in the world in 2018.[104] Germany's favorable economic performance has occurred in spite of a higher tax burden. German government revenues total about 45 percent of GDP -- while U.S. revenues total only about 31 percent of GDP. Higher taxes have allowed Germany to run budget surpluses, while the U.S. runs deficits. The argument made by American libertarians that a lower tax burden unleashes economic dynamism falls flat in the comparison with Germany. German economic growth rests on a more stable foundation of national savings. U.S. growth is fueled by debt -- and comes at the cost of greater inequality.[105]

Germany has been a standout among large, advanced economies for its thrift. A country's thrift – national savings -- can be reflected in a metric called the Net International Investment Position (NIIP) – defined as a country's foreign assets less its foreign liabilities.[106] Germany's NIIP is equivalent to a large *positive* 60 percent of German GDP.[107] This is essentially the excess of what foreigners owe Germany over what Germans owe foreigners. By contrast, America's NIIP -- after decades of foreign borrowing -- is a large *negative* number, equal to more than 45 percent of U.S. GDP. That is, the U.S. is a debtor nation -- owing other countries nearly $10 trillion more than what they owe the U.S.

Why is Germany so thrifty? German households save over 10 percent of their income each year, while U.S. households save under 7 percent. Government debt is approximately 60 percent of GDP and falling, versus over 100 percent of GDP and rising in the U.S. Debt levels throughout the German economy – including government, households and firms -- are substantially lower than in most advanced countries. Thrift provides Germany a cushion against potential financial responsibilities -- such as losses in partner European countries.[108]

Thrift matters because eventually foreign creditors can stop lending to a country, triggering a financial crisis. This is what happened to Germany in the early 1930s, after the U.S. stock market crash pushed the global economy into depression. At that time, American banks stopped lending to German banks, and the German economy (and political system) went into free fall. This lesson from history has become a pillar of modern German political culture.

A similar shock is not imminent for the U.S., not least because the U.S. dollar remains the world's principal reserve currency and dominates international payments. The dollar is the world's preferred vehicle for investment and exchange.[109] This makes it easy for U.S. residents – including the government -- to borrow abroad. Great Britain at one time had the world's reserve currency – the pound sterling -- but lost its "reserve currency status" by the middle of the 20th century. In 1947 – due to heavy debts incurred during two world wars – Britain experienced a huge capital outflow. To stay afloat, the country turned to the U.S. for a loan with conditions attached.[110] Pound sterling went from being the world's principal reserve currency to a currency that financial markets wanted to unload. A great power can be forced by the financial markets to climb down from its perch -- due to years of poor policies and declining competitiveness. "Germany 1930" and "Britain 1947" provide a lesson for America for the coming decades.[111]

Regarding Germany's carbon footprint, like the rest of the E.U., per capita emissions and the carbon intensity of GDP are below OECD averages and the U.S. and Canadian ratios. Europe has become a leader in combatting climate change. Within the E.U., however, Germany's carbon footprint is not small. And, as one of the world's leading manufacturer of cars, its impact on global emissions is sizable.

Germany's export-oriented economy has been a motor of growth for Europe -- evidenced in the production of sophisticated machinery and equipment, automobiles and aircraft, chemicals, metals, optical equipment and medical devices, and pharmaceuticals in German-managed value chains spanning the region. German products are in high demand around the world – including in China and the U.S. Germany remains the world's third largest exporter -- after these countries.[112] The country's competitive position has been underpinned by its leading scientific research institutes, inventions and patents, and strong infrastructure. Yet export orders and economic growth began declining in 2018 -- given China's economic slowdown, U.S. tariff threats, and political shocks such as Brexit and Italian populism.[113]

German caution is therefore not a cure-all.[114] The IMF has argued that Germany saves too much, that the economy would grow faster if firms and the government would invest more and take more risk. German investment levels have fallen below levels in other advanced E.U. countries.[115] Germany's business climate is not considered among the most favorable in the world.[116] Burdensome regulatory hurdles, restrictive business practices, and limited access to venture capital inhibit entrepreneurship and start-ups. Connectivity is low. Germany's response to problems can be sluggish, because consensus-building takes time. When roused, however, the country identifies weaknesses and acts.

In the early 2000s -- due to high unemployment and large budget deficits -- Germany was known as the "sick man of Europe". German high school students were scoring below average on international tests. Consequently, by the middle of the decade, reforms were rolled out.[117]

Gerhard Schroeder, Germany's center-left Social Democratic chancellor from 1998-2005, offered Europe – in partnership with Tony Blair's New Labour in the U.K. -- a "third way" – that is, a fiscally-sound, market-oriented alternative to the traditional policies of left and right.[118] Schroeder put forth labor market reforms in 2003 designed to revamp German competitiveness in a manner that helped working people.[119] The Hartz reforms – named for the auto executive who chaired a committee including government, business and labor – helped lower Germany's unemployment rate from over 11 percent in 2005 to around 5 percent today. Government finances improved as well, due to lower outlays for unemployment and welfare benefits.[120]

The reforms featured: a reduction in -- and a means-testing of -- Germany's generous long-term unemployment benefits which had enabled workers to stay out of the job market and retire early; tougher job search requirements to encourage a return to work; and, a relaxation of firing restrictions to provide flexibility for firms. Implementation took place against a favorable external climate, aided by the internationalization of the German economy following the end of the Cold War. Wage pressures were contained, given greater access of German firms to workers in emerging markets. German labor unions agreed to wage restraint in exchange for lower unemployment.

Low-skilled German workers may have experienced lower lifetime incomes and higher job insecurity as a result of both the Hartz reforms and globalization. Such negative effects have been addressed through job training and anti-poverty programs. Center-right governments since 2005 have adopted Hartz. French President Macron – in pursuit of higher growth and lower unemployment -- has pursued a Hartz-style program.[121]

Germany also experienced its "PISA shock" in the early 2000s. An OECD report in 2001 showed a below-average performance of German high school students on PISA exams – as well as a wide socioeconomic disparity. In 2003, Germany ranked 19th in math performance out of 38 countries. In

2004 German state governments – which oversee education policy – convened the Education Ministers Conference, arriving at a consensus on reforms that included a program of nation-wide standards and testing -- designed to unify the country's fragmented system. Subsequently, German students improved their performance and socioeconomic disparities were reduced. Math scores rose, exceeding the OECD average and approaching Canada's results. Germany moved up the ranks to 16th in math of 71 countries in 2015, versus a U.S. ranking of 40th.[122]

Germany more recently has deployed strategic planning to advance industrial modernization. "Industry 4.0" (a strategy to develop "smart machines" -- intelligent networks in manufacturing) was launched in 2011 at Germany's annual trade fair -- the Hannover Messe, an important forum for sharing ideas that brings together industry innovators from around the world. A working group involving the German government, industry, labor and academia made recommendations on how to leverage the country's manufacturing prowess in the digital era through the Internet of Things (IoT).[123]

In early 2019, the German ministry of economy produced a strategic plan -- "Industrial Strategy 2030"-- designed to improve the country's competitiveness -- noting that Europe lacks internet companies like in the U.S. and China and faces a widening technology gap with these countries.[124] While recommitting to multilateralism, the plan seeks to prepare European companies for competition. A key priority is to protect national and European champions and allow Europe-wide mergers. A national objective for Germany is to keep its leading position in manufacturing from falling prey to foreign firms. A specific worry is the loss of Germany's prominence in the auto sector. Germany currently holds about an 80 percent share of the world's premium auto market. Its leaders worry about being outcompeted by producers from Asia and the U.S. that combine battery production with a strong internet platform.[125] Likewise, Germany's well-known leadership in specialized manufactures – often produced in family-owned companies -- could be lost to giant global firms – and in the case of China, with state-backing.[126]

A key goal in this strategic plan is the capture of a "closed value-added chain" in Europe. This heralds a new tone for Germany – representing almost a counterpunch to similar efforts under way in the U.S. and China. Made in China 2025 and Trump's "America First" pivot have caused Germany to argue for a level playing field.[127] Industrial Strategy 2030 – while still only a blueprint – may represent Germany moving away from its traditional risk aversion.[128]

That is Germany's strategic plan. However, in terms of tangible policy action in recent years, Chancellor Angela Merkel's grand coalition -- formed after the 2017 elections -- which includes her center-right Christian Democrats (CDU-CSU) and the center-left Social Democrats (SPD), the two largest party groups in Germany -- has implemented a modest reform package to improve productivity.[129] More aggressive action is hampered by coalition negotiations, as well as administrative hurdles that slow action in Germany's decentralized federal system. However, unlike in the U.S., there is broad agreement among most of the parties on the thrust of economic policy.[130]

Germany's political outcomes since World War II have been moderate and tilted center-right, reflecting a risk-averse electorate and similarly disposed leaders, who have generally been highly competent. This came after the country's high-risk, high-stakes gamble for world domination that lasted nearly the entire first half of the 20th century, culminating in the criminal launching of two aggressive wars in a quarter century – the first, the result of extreme militarism; the second, a maniacal, far-right, genocidal race war on all fronts – ultimately leading to total defeat, territorial dismemberment, the temporary extinguishing of sovereignty, and decades of relegation to junior partner status in the Western alliance. This national trauma resulted in the transformation of Germany's political culture. Like Japan – Germany has morphed into a cautious, peace-loving, merchant state.[131] The downside of this is that risk aversion has become a risk fault line for Germany.

The rules of modern German politics have remained remarkably similar to those prevailing during the Weimar Republic. Germany is still a parliamentary democracy based on proportional representation, albeit with tweaks to the rules -- such as a minimum five percent threshold for party entrance into the Bundestag. This has reduced the risk of returning to the unwieldy multi-party coalitions of the interwar period. The durability of two centrist parties since 1949 has reflected the electorate's preference for moderation – reinforced by the favorable economic conditions prevailing in the world and in Germany. That said, the end of the Cold War, the reunification of Germany, globalization's rise and retreat, technological change, setbacks in European integration, political instability on Europe's borders resulting in migration pressures, climate change, and most recently the abdication of Germany's superpower ally -- the U.S. -- from its traditional role leading alliances and rules-based institutions have resulted in a breakdown of postwar assumptions underpinning German politics. Consequently, new parties have entered the Bundestag. These include: the leftist and environmentalist Greens in the 1980s; the far-left Die Linke in the 1990s that arose out of the East German Communist Party; and the far-right, anti-immigrant, Eurosceptic Alternative für Deutschland (AfD), which is currently the third largest party, with its strongest appeal in the former communist east.

Like other advanced countries, Germany's difficulty finding new sources of growth has stressed democratic legitimacy -- perhaps more so than at any time since the nineteen thirties. Ineffective democracies lose credibility and can fail – evidenced during the Weimar period when coalitions led by the Social Democrats couldn't get the people's business done. Today, discredited ideologies of the far-right and far-left are gaining traction in Germany and elsewhere.

In majoritarian democracies – such as in the U.S., U.K. and Canada – the pull to the extremes can affect the major parties.[132] In proportional systems -- such as in Germany, the Netherlands, Austria and Sweden - fringe parties can be seated in parliaments. Sometimes they enter coalition governments;

sometimes they are excluded. Germany is particularly wary of allowing fringe parties into coalitions -- given its history.[133] Angela Merkel's CDU-CSU seeks coalition partners with either the SPD or smaller mainstream parties -- such as the center-right, pro-business FDP or the Greens. A coalition among Merkel's faction and the FDP and Greens foundered in 2017 over immigration and climate change. A German coalition including the AfD cannot be ruled out.[134] To neutralize the appeal of populists and extremists, German centrists will have take more decisive action to raise productivity and distribute economic gains broadly, as well as to respond to the electorate's preferences on immigration.

Lessons from German politics for the U.S. include: government action to reduce inequality can help build a consensus for centrist reforms; federal systems can achieve goals by engaging lower levels of government through bodies such as Germany's Education Ministers Conference; policies based on the expert judgment rather than ideology can emerge from strategic planning; and, cross-party negotiations are the only way to achieve durable consensus. In addition, reformist parties should be careful not to get out too far ahead of their electorate – as Merkel did in 2015 when the government agreed to accept a million migrants – lest they be defeated at the polls and open the door to populists.

***China** – Strategic Planning Drives Innovation*. The world's second largest economy -- ranked 31st on country risk -- boasts competitive exports, a modern infrastructure, and favorable education outcomes. Its ecosystem of technology and manufacturing is unique in today's global economy.[135]

Tim Cook -- CEO of Apple – said recently: "China has moved into very advanced manufacturing, so you find in China the intersection of craftsman kind of skill, and sophisticated robotics and the computer science world. That intersection, which is very rare to find anywhere, that kind of skill, is very important to our business because of the precision and quality level that we like. The thing that most people focus on if they're a foreigner coming to China is the size of the market, and obviously it's the biggest market in the world in so many areas. But for us, the number one attraction is the quality of the people." [136]

President Xi Jinping -- China's paramount leader, after coming to power in 2012, commented on the failure of communism in the Soviet Union: "Finally, all it took was one quiet word from Gorbachev to declare the dissolution of the Soviet Communist Party, and a great party was gone. In the end nobody was a real man." [137]

These quotes raise important questions. Will China's economic success ultimately overwhelm its political monopoly -- either through a disorderly transition away from authoritarianism or a gradual shift to pluralism? Will the dynamism of its technology sector allow China to grow out of its legacy of state-led resource misallocation and high debt? And, will China integrate as a responsible partner into the global community, or will it continue to antagonize its trading partners? The base case is that, yes -- while there may be economic and political setbacks – China's rise -- and its transformation into a technology powerhouse – will proceed, establishing the country as a powerful competitor and world power – if not the dominant superpower of the second half of this century. A downside scenario is not to be dismissed. With the Chinese Communist Party's (CCP) legitimacy based largely on economic performance, if doubts are raised about its stewardship of the economy, a disorderly political transition could ensue -- unleashing competing – and long pent-up – social and political demands.[138] The match that lights the forest fire is a key uncertainty, as protests in Hong Kong in 2019 highlight.

China has been extraordinarily successful growing at breakneck speed over the last four decades -- with real GDP growth averaging 9.5 percent per year, versus U.S. growth of 2.6 percent. [139] This has enabled the Chinese economy to become over thirty times larger than it was in 1980 -- when Deng Xiaoping, the Chinese leader who succeeded Mao Zedong, launched market reforms and opened the country to trade, following three decades of economic mismanagement.[140]

There are doubts about the quality of China's growth. The central government sets ambitious targets each year -- which all levels of government, state-owned enterprises (SOEs), and banks do their best to meet.[141] As a result, China -- in its race to the top – has over-invested on a monumental scale. Still, the country has industrialized, saved a large windfall from trade surpluses, and pulled over 800 million of its citizens out of poverty.[142]

Like most countries, China acquires technology from abroad. To a large extent, China's efforts to acquire foreign know-how – at times flouting international norms and even stealing industrial secrets – are not that different from what other countries have done in the past – including the U.S. Many advanced economies industrialized behind tariff walls, subsidized industries, protected agriculture, limited foreign investment, engaged in industrial espionage, and have had to compensate other countries for unfair trade practices.[143] The main difference is China's size – and of course its timing. The country has become a colossal competitor and a recent disruptor of labor markets.[144] This size differential – in conjunction with possibly a higher degree of unfair competition, as well as the difficulty knowing where the Chinese state begins and ends – makes China different. Therefore, efforts to pressure China to play by the rules should be applied robustly. However, the best way to accomplish this is multilaterally with likeminded nations.[145]

China is not a country known for freedom. The regime is authoritarian, with the Chinese Communist Party (CCP) exercising a political monopoly as complete as almost anywhere on the planet. CCP rule is characterized by a pervasive domestic security apparatus that stifles opposition. Under President Xi, the CCP has tightened its grip.[146]

Yet China encourages freedom in its technology sector. The country boasts cutting-edge innovation -- featuring open labs and rapid prototyping of new manufacturing concepts. Collaboration attracts foreign entrepreneurs who feel more constrained in other parts of the world.[147] As debates rage in the U.S. over the right to bear arms, to have low taxes, access to health care and reproductive services – in China, freedom is about risk-taking and economic success. Political leaders turn a blind eye to -- and later take credit for – disruptive innovations bubbling up from below.

China today may be experiencing a "perfect storm" in the southeast outside of Hong Kong -- where many CCP rules on the movement of labor and capital are informally ignored. Advanced robotics, sophisticated drones, e-cars, precision equipment, touch-screen displays on clothing and household goods -- these are some of the products that may soon roll off the Chinese assembly line.[148] In the frontier sectors -- such as e-commerce and fintech -- China is leading.[149] China's perfect storm of innovation centered in the city of Shenzhen is arguably not unlike the revolution of steam power that occurred in Britain over two hundred years ago, allowing machines to triumph over muscle, or the mass production juggernaut that emerged in Detroit in 20th century America that won a world war and created a world in which one human in five owns a car. These two industrial revolutions spawned the world's last two economic superpowers – and the next one is stirring in China.[150]

China's economic model is unique in that it combines features of both the East Asian and American models. China has followed in Japan's and Korea's footsteps – with state-led capitalism that subjects national firms to the discipline of international markets. "Export or die" is the credo. Huawei is an example of a private Chinese company – though currently well-connected with the government – that had to prove itself competitive in international (and domestic) markets as a provider of smart phones and telecom equipment, before benefitting from government largess. This was not unlike how successful Japanese and Korean companies were supported by their governments in the 20th century.[151] The East Asian model utilizes a heavy dose of non-market mechanisms – government subsidies, credit allocation, SOEs, regulation, and capital controls.

China has also taken a page from America's playbook. In the latter part of the 19^{th} century, America began exploiting its uniquely large domestic market – fostered by a modern transport and communications infrastructure and protected behind a tariff wall, which ultimately enabled U.S. companies to become global champions.[152] With a domestic market of 1.4 billion consumers, China is deploying the American model on steroids.

A key lesson for the U.S. from China is that strategic planning led by government can advance innovation, but that the excesses of state intervention should be avoided.[153] Paradoxically, China's industrial research clusters may be a platform for among the freest exchange of ideas on technology and manufacturing anywhere in the world, whereas U.S. firms keep R&D silo-ed, limiting cross-fertilization.

China's free-wheeling in the southeast may ultimately bump up against political rule from Beijing. In fact, the CCP has seats on corporate boards. Jack Ma, the founder and chairman of Alibaba – the country's answer to Amazon in e-commerce -- is a CCP member.[154] A balance has been struck between CCP political control and private sector dynamism, although such a contradiction may be untenable in the long run.

China's biggest risk -- apart from politics – is its debt burden – totaling more than 250 percent of GDP (including the government, corporations and households), high for a country at China's level of development and rising. The downside of state-led growth in China – which stresses investment, infrastructure and real estate – is that it has created a large stock of bad debts in SOEs. Private firms – which currently produce the lion's share of China's output and an even higher proportion of its exports -- are efficient and less leveraged.[155] State-owned banks have channeled credit toward government priorities – many unprofitable. Credit expansion has been rapid -- increasing over 100 percent of GDP in the last ten years. [156] China's banks need to write down bad debts, and the government must use public resources to recapitalize them. With a large portion of borrowers and lenders in the state sector, adjustment could be stage-managed in a way unachievable in a market economy. To date, however, China's banks have largely postponed the inevitable by refinancing bad debts. Banking sector problems could cause volatility in China's financial markets and a sharp economic slowdown. China's penchant for gradualism on reform – in order to avoid job losses and social unrest – suggests that the bad debt cleanup will proceed slowly.

The country's sovereign ratings -- currently at "A+" at all three agencies – reflect these financial risks. While still favorable, China's rating is four notches below the highest rated countries. China is not wealthy relative to advanced economies – with per capita GDP of about $10,000. The country has a dual economy – with vast stretches of the interior underdeveloped, and the people living there poor.[157] China's rise has been fueled by coal and oil – making it the leading carbon emitter in the world by far, with a carbon intensity of GDP about double the world average.[158]

China's low country risk ranking reflects political institutions that score low -- notably, one of the lowest scores in the world for democracy, as well as mediocre scores for rule of law and corruption. On "effective government", however, China scores in the top third of countries. Furthermore, although China remains a semi-market economy with endemic state intervention, its business climate and competitiveness scores are in the top one-quarter of countries. It bests the U.S. on high-speed fiber internet connectivity -- behind Korea, Japan and Singapore -- and is ranked high for scientific research, and transport and electrical connectivity.[159] Keeping it out of the top spots on competitiveness are its restrictive conditions for private firms (unless favored by the government), comparatively high tariffs on trade, and limited market access for new players.[160] China ranks 10th in the world on education outcomes, well ahead of the U.S., though the full country is not covered in these tests.[161] China is advancing in higher education -- Tsinghua University awarded 1,385 doctorates in 2017, vs. MIT's 645.[162]

By establishing priorities for the long run and making sure key public goods such as infrastructure and education are provided, China's government channels national energies into innovation. Strategic planning is more art than science. Whereas German industrial policy provides policy support – tax breaks, research funding, infrastructure, training – China gets more involved – with state funding of operations, domestic content requirements, market share targets, protection from competition, and picking winners. China has its successes, but strategic planning has also produced overcapacity in coal, steel and real estate, heavy pollution, and the bad debt mess.[163]

China launched its "Made in China 2025" initiative in 2015, designed to channel some $800 billion to create national champions in robotics, aerospace, electric vehicles, and biotechnology, as well as increase local-content to up to 70 percent.[164] Though patterned on Germany's Industry 4.0, China's plan goes further -- developing a "closed value chain" on shore and enormous state funding.

On R&D spending, China may soon take the lead. According to a report of the U.S. National Science Foundation (NSF), the U.S. still led the world in R&D spending in 2015 – with $495 billion of the world's $1.9 trillion of R&D, vs. China's $409 billion. The U.S. share was down to 26 percent of the total from 37 percent in 2000. Of the growth in global R&D from 2000-15, China was responsible for 31 percent, vs. the U.S.'s 19 percent and the E.U.'s 17 percent.[165]

China has jumped to the top of the league tables for articles in international scientific journals in the physical sciences, engineering and math, exceeding the U.S. total in 2016. When similar articles in Chinese language journals -- as well as articles written by Chinese people outside the country -- are included, China's share nearly doubles.[166] Furthermore, two Chinese universities (Tsinghua and Harbin) are among the top three universities in the world (along with Stanford) with the most papers in math and computing that are in the top 1 percent most cited. The Chinese government ensures progress by lavishing funding on academics who have articles cited in scientific journals.[167]

The NSF reports that the U.S. accounted for slightly more than half of global venture capital (VC) investment in 2015, but its share has been declining, with China's share rising. Recently, VC flows in China have exceeded those in the U.S.[168] China is already attracting 50 percent of global investment in AI startups, ahead of the U.S.[169] China leads the U.S. in VC in fintech.[170]

China has achieved other milestones in science and technology, including being the third nation to land on the moon (and the first to land on the far side) and becoming a leader in genome-sequencing. Likewise, China has applied quantum computing to satellites, offering the potential for gains in satellite cybersecurity, overcoming the limitations of digital computing's binary code.[171]

In spite of positive signs for technology in China, the portion of economic growth coming from innovation has been slowing due to overinvestment in the state sector. Economists Harry Wu and David Liang found that total factor productivity (TFP) growth turned negative in China in the period 2007-12, after growing consistently after 1981. As a result, over 80 percent of China's economic growth since the early 1980s has been due to investment – rather than to productivity growth or a growing labor force. This is not surprising given China's excessive investment rate – which averaged over 40 percent of GDP per year since the early 1980s, compared to a U.S. average of 22 percent.[172]

On the positive side, Wu and Liang found that China's tech sectors –when examined separately -- continue to produce positive TFP growth in spite of a lack of innovation elsewhere in the economy. This supports the view that China's dynamic tech firms could enable the country to grow out of its problems. China's heavy investment in R&D, technology, and education suggests promise for future productivity.[173]

A rising power like China peacefully assuming an enhanced power position relative to the status-quo countries -- such as the U.S. and Europe -- is not always a given.[174] The rest of the world should feel a sense of success for having helped bring China in from the cold. Anchoring China in the international community -- in institutions such as the WTO, the IMF, the UN, and the G-20 -- has enabled the world's most populous country to peacefully share in the fruits of globalization.[175] China's addition to the world economy has likewise contributed to global prosperity -- through provision of a great variety of low-cost goods and higher global demand. A good deal of the credit for this historical pivot – i.e. China joining the global community -- goes to China itself for opting out of Maoism.

One lesson for the U.S., then, is to continue acting multilaterally to secure responsible participation of all nations in the rules-based global economy that it leads. Cooperation with the other nations of the world in applying pressure on China to adhere to rules and norms – via the WTO, the TPP agreement, and other forums – would be more effective than unilateral action. China has benefited so handsomely from the current open trade regime over the last two decades that it is time the country recognizes the concerns of its trading partners.[176]

Other countries have lessons for the United States as well. Developing countries face challenges that are often quite different from what advanced countries face – including weak institutions and an urgent need for human capital development. However, how these countries handle problems can offer lessons. For example, Indonesia – the fourth most populous country in the world -- is poor, with per capita GDP of about $4,000. Yet Indonesia, under the leadership of President Jokowi, who secured a second term and a legislative majority in fair elections in 2019, is making progress on reforms that could improve the business climate and foster skills acquisition. Jokowi is a pro-democracy, anti-corruption leader in a multiethnic, Muslim-majority country – demonstrating that liberalism can be successful in developing countries -- even as the world overall is experiencing heightened populism and polarization.

In India, victory in elections for Prime Minister Modi bodes well for market-oriented reforms as well, though Modi lacks a majority in the upper house. India, the world's second most populous country and very poor (per capita GDP of about half Indonesia's), is a long-standing and stable democracy. However, the electorate has now twice made the devil's bargain: Modi leads a Hindu nationalist government elected for a second five year term in a country with a large Muslim population -- potentially aggravating sectarian tensions. Brazil, the fifth most populated country in the world, has made a similar bargain. President Bolsonaro, who came to power in 2018, has also promised market reforms -- though his government too has an uncertain majority in a fragmented Congress. Yet Bolsonaro's far-right rhetoric is seen as threatening to human rights and his policies on the Amazon rainforest potentially catastrophic for climate change.[177]

Turkey has deteriorated under President Erdogan, who like Russia's Putin, has set about weakening democracy in his country -- by amassing power in the presidency, jailing opponents, forcing reruns of lost elections, and firing the central bank governor to get interest rates down. By contrast, South Africa remains a robust democracy, albeit under stress due to the corruption of President Zuma, current President Ramaphosa's predecessor. The newly elected reformist will be challenged to push through policies to address the country's poverty, income inequality, and slow economic growth. Nevertheless, South Africa has a legacy of enlightened and moderate leadership -- put in place by the country's first post-Apartheid president, Nelson Mandela, who proved in 1994 that even the most intractable social problems can be resolved peacefully. A quarter of a century later, this provides the ruling party a foundation of legitimacy, buying time to implement reforms. A lesson for the U.S. from these countries is to vigilant against signs of "democratic backsliding". Sound policies are required to safeguard democratic institutions.

Regarding technology, it is useful to highlight the cases of Israel, Korea and Japan -- who, in spite of their weaknesses, outperform on technological innovation. Israel, a small country with difficult geopolitical challenges and a dysfunctional democracy, is known internationally for its tech start-ups, venture capital, and skilled labor – with breakthroughs evident in green, health care, defense, and agricultural technologies. Israel – like Korea and Japan -- spends a high proportion of GDP on R&D.[178] Korea is also first in the world in terms of technology adoption. In education outcomes, it comes out ahead of Germany and China and just behind Canada. And, in spite of the North Korean threat, it is ranked among the top five for business climate, ahead of the U.S. Japan, the world's third largest economy and 10th most populated country, is plagued by one of the highest government debt burdens in the world and worrying demographic trends. Yet it scores the highest of large countries on international tests, and is tied for first on the number of patents produced. It is third in the world in technology adoption, and is in ranked highly for infrastructure, life expectancy, and innovation. It also has large and relatively free markets. The lesson for the U.S. from these three countries is that, in spite of other weaknesses – geopolitics, government debt, demographics – if a country focuses on education, R&D, and innovation, it can achieve success.[179]

Ten Point Plan for the American Worker

From five themes -- Strategic Planning, the three Policy Priorities of Savings / Education / Exchange, and Politics – emerges a ten-point plan for the United States.

1. **<u>Strategic Planning</u>: Establish a Presidential Council on the Future Economy.** The President of the United States should establish a council charged with formulating a strategic plan for the future. Chaired by a cabinet secretary (Treasury or Commerce), the Council on the Future Economy (CFE) will be comprised of government officials, with an associated Advisory Board that will include industry and labor leaders and other private citizens. Finding new sources of economic growth – sustainable, low-carbon, high value-added, and human capital-intensive – will be the challenging remit for this Council. A White House Office of the Future Economy will be established, with a Director appointed by the President and confirmed by the Senate. The Director will have a small staff, drawing on other White House resources, including the National Economic Council and the Office of Science and Technology Policy. The president shall consider folding such offices into the CFE.[180]

   Members of the CFE will also include: the Chair of the President's Council of Economic Advisers; the White House Senior Advisor for Political Affairs / Strategy; senior representatives of the following departments -- Education, Trade, Labor, Energy, the Environmental Protection Agency

(EPA); and, all or a workable subset of: the important innovation agencies -- such as the NSF, the National Research Council (NRC) of the National Academies, NASA, the ARPA's (Advanced Research Projects Agencies), and the National Oceanic and Atmospheric Administration (NOAA).[181]

The Advisory Board should include business leaders drawn from the technology, high value-added services, advanced manufacturing, and green energy sectors -- in addition to private citizens representing labor, education, job training, and academia. The private sector leader of the Advisory Board would effectively act as Deputy Chair of the combined group -- essentially the CFE's "innovation czar". S/he would be tasked with busting silos across the economy in order to facilitate the sharing of ideas, and with identifying synergies and linkages in emerging technologies ("megatrends") that could yield disruptive breakthroughs. A model for this role could be Steve Jobs. The dynamic required is Jobs' legendary success in the 2000s combining three pivotal technology trends into a rollout of the smart phone: 1) MP3 / audio technology and music industry developments; 2) computers and software; and, 3) the internet.[182] The Deputy Chair would form an Innovation Subcommittee including about five other private sector representatives; as well as government representatives of the innovation agencies, including: the NSF, the National Academies, the ARPAs, and the environmental agencies such as EPA, NOAA, and Energy. Tech and green innovation must work in tandem.

Promoting trade and industry fairs – similar to Germany's Hannover Messe -- would be an objective of the CFE as well, creating an opportunity for silo-busting. Open labs – as practiced in Shenzhen, China and elsewhere – would be encouraged.

The CFE likewise would convene subcommittees on Savings / Education / Exchange, chaired by appropriate leaders from government agencies. Planning for a low carbon future would require a separate subcommittee.

Finally, a Political Subcommittee will be required for political reform. The Chair would empower the White House Senior Advisor for Political Affairs, assisted by the White House congressional liaison, to pull together a bipartisan group, including party leaders from both houses of Congress and the NGA to address reforms that would support consensus-building and intergovernmental coordination. This Political Subcommittee should recommend rules changes in Congress that would fast-track legislation with broad bipartisan support. These could include Problem Solvers Caucus suggestions -- including a rule that any bill with support of two-thirds of House members moves to a floor vote within thirty days; or, “closed rules” -- with no amendments -- that apply to bills with three-fifths’ support. Discussions should seek to formalize procedures for “deliberative negotiation” – expanding on the Congressional “gang” approach – which have pulled together bipartisan groups of moderates to flesh out compromises. This should involve members of both houses of Congress and relevant staff.[183] Strategies to address issues like gerrymandering and partisan campaign finance – including legislative and judicial strategies – should be considered. The remit of the Political Subcommittee would be to forge consensus over economic policy, so that the CFE’s strategic plan could be implemented.

To avoid “picking winners” – that is, when government chooses industries and companies to favor -- the CFE should focus on empowering workers and funding basic research, and carefully avoid conflicts of interest. This is why the CFE and Advisory Board will remain separate, and all final CFE recommendations will be made to the President and Congress by government officials.

The CFE’s approach should be to leverage U.S. strengths – such as its formidable technology groups, startup culture, and free markets -- while identifying and correcting weaknesses. In order to address weaknesses, a research group in the Office of the Future Economy will be charged with “learning from other countries” – that is, formally conducting “country risk analysis” and reporting on what other countries are doing well.

2. **<u>Strategic Planning</u>: Produce a U.S. Strategic Plan.** The CFE will produce an annual report to the President and Congress focusing on long term goals for the country regarding: skills acquisition, R&D, infrastructure, technology, regulatory reform, trade and investment liberalization, reduction of inequality, raising national savings, and a low carbon transformation. It will roll out and track specific performance metrics: labor productivity and TFP growth; education outcomes; adoption of the Common Core curriculum; pre-K enrollment levels; participation in STEM programs at key grade levels; reduction in education disparities by socioeconomic, racial, and other factors; improvements in inequality and poverty measures; worker participation in lifelong training programs; teacher performance and compensation levels; non-military basic R&D spending; patents registered and science & tech articles published and cited; ICT adoption; health care coverage levels and improvement in health care outcomes; benchmarks for national savings -- including for government debt and deficits and the NIIP; and, specific annual emissions reduction and renewables outcomes.

   The Office of the Future Economy would designate a writing team, draft the report and track metrics. The Director would ensure that key products and services are covered in the report and addressed by appropriate subcommittees. Such products could include: AI, new materials, medical technology, autonomous vehicles, e-commerce and fintech, social media, cybersecurity, robotics, advanced manufacturing, renewables and green tech.[184]

3. **<u>Policy Priority</u>: Increase National Savings.** America's finances are not well-managed.[185] Economy-wide debt – including government, households and corporations – is high at over $57 trillion, or nearly 3x U.S. GDP. It would be prudent to fund economic growth on the basis of savings rather than debt. The U.S. debt problem lies squarely at the doorstep of the federal government. So, the most effective policy lever to raise national savings is fiscal policy. The U.S. should use the "happy days" the economy is experiencing today to reduce government deficits.[186]

The non-partisan Congressional Budget Office (CBO) has laid out options for reducing the federal deficit, forecasting that 2-3 percent of GDP in cuts per year will be needed to stabilize or lower the government debt-to-GDP ratio.[187] A sound plan – drawn largely from CBO options -- follows.

On the spending side, this plan includes: means-testing of and raising the retirement age for Medicare and Social Security benefits; means-testing for subsidized housing and college loans; greater restraint in defense spending; and, containing highway funding (to free up space for green transport options). On the tax side, revenues need to be raised in a way that does not impair growth in the long run. The U.S. corporate tax rate should be raised to 25 percent from 21 percent. The rate was reduced from 35 percent as part of the Trump tax plan – a sound move that has improved U.S. business competitiveness – however, the rate could increase by several percentage points, bringing it in line with other advanced economies, without sacrificing competitiveness.[188] Revenues could also be raised by closing corporate tax loopholes, raising the federal gasoline tax, and implementing a carbon tax, a federal value-added tax, and a financial transactions tax.[189] Other tax measures include: higher capital gains taxes on less productive investment such as real estate; higher taxes on inheritances; higher rates on top income tax brackets; tighter restrictions on wealthy individuals avoiding tax on income by characterizing it as pass-through business income or as carried interest; increasing Medicare and Social Security payroll taxes (and raising the ceiling on earnings taxed for Social Security); and, higher fees on federal mortgage guarantees. These measures would reduce inequality without hurting growth. Tax proposals from America's political parties should be considered as well, while making sure negative growth impacts are limited.[190]

With a robust revenue-raising program, national savings can rise at the same time as fiscal space is created for spending programs that support long-run, sustainable growth. The U.S. tax intake – at all levels of government -- barely reaches above 31 percent of GDP and is declining –

versus a 36 percent median for peer countries – which limits America's capacity to provide essential services that raise labor productivity.[191] Most country success stories have found an appropriate role for government at a higher level of taxation. While there is room for the U.S. to raise the tax intake and to reverse the excessive benefits the Trump tax cuts gave the wealthy, the U.S. should not give up its low tax climate.[192] There is a sweet spot for U.S. taxes -- at around 35 percent of GDP or above, but no higher than Germany's 45 percent.[193]

Spending increases for the U.S. that would be supportive of long-run prosperity include: increasing the Federal Department of Education (DoEd) budget for key priorities; increasing funds for basic research channeled through the NSF; funding programs that will allow the U.S. economy to shift to lower carbon emissions; increasing direct transfers to alleviate poverty; making sure social programs avoid "cliffs" in coverage for the working poor, which deter work; funding job training programs and temporary income support targeting low-income families and regions negatively impacted by technology and globalization; and, means-testing paid family leave and child care assistance in order to increase labor force participation.[194] The government should also expand eligibility and funding of the Earned Income Tax Credit (EITC), which reduces the tax liability of the working poor. Broadening and offering a more generous EITC would offset in part Trump's unfair benefits to high income brackets.[195]

Key to worker productivity is also adequate health care. The government should avoid compromising the gains in coverage achieved by the Affordable Care Act (ACA). Individual and employer mandates, taxes and subsidies, and Medicaid expansion should remain in place or be restored. ACA reform is essential – in order to protect gains in coverage without having to move to a Medicare for All plan that the country cannot afford. ACA reforms include: allowing more insurance rate differentials between young and old participants, providing subsidies for older people, reinstating the excise tax on medical devices, allowing Medicare to negotiate down drug and medical device prices, tort reform and bundled payments, and anti-trust investigations of drug and insurance companies and hospitals to counter higher prices. Strides made in health care reform by the states – such as Washington and Massachusetts – should be considered for best practice. Additional funding to combat the opioid crisis is needed.[196] Broad student loan forgiveness is currently too expensive, although means-testing partial loan forgiveness, payment reduction, and Pell grants make sense. The U.S. needs to build a savings cushion against financial crises.[197]

As part of the Strategic Plan, the U.S. should include medium term fiscal objectives based on CBO baseline projections that target debt reduction.[198] This would instill market confidence in U.S. policy. The economic policy course for the U.S. is straight-forward: deploy public resources to promote long-run growth and economic change, while managing finances conservatively.[199]

4. **Policy Priority**: **Make Education Priority #1.** "An innovative, knowledge-based economy requires a workforce with high-levels of science and engineering skills and an education system that can produce such workers in sufficient numbers," an NSF report stated.[200] The U.S. scores below average in international tests in math and science -- a wakeup call for the nation. Results of tests conducted by the U.S. Department of Education (DoEd) completed through 2017 show flat performance in math over the last decade. DoEd also found that lower-income students and minorities achieved lower scores in math and science on average. These tests also indicate that Red states (leaning Republican) tend to lag Blue states (leaning Democrat) in performance.[201]

A common formula for success among countries ranked higher than the U.S. combines central direction of education policy with school autonomy in reaching goals. National standards of achievement, a funding structure that ensures broad access to quality education, healthy funding of teacher salaries, and a high priority given to math and science are commonalities of success. A robust role for the U.S. DoEd is crucial. Nevertheless, any national education strategy in America should take into account the country's political culture, which features a preference for local government control over education. So, coordination of education policy across states and localities is important. The National Governors Association (NGA) – which represents the states – should take the lead here.[202] The NGA has attempted this in the past, but American politics has undermined its efforts. NGA leadership must be empowered and insulated from partisanship on this issue.

A federal role in education began essentially in 1965, with passage of the "Elementary and Secondary Education Act" (ESEA), as part of Lyndon Johnson's Great Society.[203] With a mandate to correct disparities across racial, ethnic and income groups, ESEA sought to guarantee full educational opportunity to all, providing grants to low income localities. ESEA Title I Grants to Local Educational Agencies remain one of the largest items in the DoEd's budget. However, in spite of good intentions, Title I funding falls short of what is needed.[204]

America's funding of education has historically been based on property taxes, which vary by the wealth of local communities. This perpetuates educational inequality, resulting not only in a disparity of outcomes, but also in overall national underperformance. Many OECD peers have employed national funding (or, in the case of Canada, provincial funding) that tends to equalize outcomes by lifting up poorer schools. In America, local funding cannot be scrapped overnight, but enhanced budgetary support from DoEd could help offset these inequities.

In 2002, George W. Bush's "No Child Left Behind Act" (NCLB) sought to address inequity by testing and tracking student performance -- including disadvantaged students -- to make sure that schools were not failing them. Schools had to make progress in test scores and graduation rates, and if they did not, they had to submit plans for improvement to the DoEd. Schools could lose federal funding if they missed goals.[205]

Although NCLB was passed with bipartisan support, a broad-based opposition to it ultimately arose. On the left, the teachers' union (the National Education Association) objected to unfunded federal mandates -- the fact that schools had accountability without funding and that failing schools in poor neighborhoods lacked sufficient resources. This funding restriction was required in order to secure initial buy-in from conservatives. Also, to get conservatives on board, school choice and charter schools were promoted, which liberals argued would encourage privatization of public schools.[206]

The Common Core Initiative -- a set of national standards similar to practices found in highly-ranked countries -- was an example of an organic solution that fit U.S. political realities. Launched in 2010 by the NGA, Common Core includes a curriculum for English and math – requiring students meet benchmarks at each grade level. The OECD concluded that Common Core -- if rigorously implemented – could result in improving U.S. education outcomes. With NGA leadership, states were encouraged to adopt the standards.[207]

The Obama administration supported Common Core by rewarding states that adopted standards with federal funding and waivers on certain NCLB requirements.[208] Nevertheless, due to broad opposition to NCLB -- aggravated by some failings of the initiative -- President Obama signed the "Every Student Succeeds Act" (ESSA) in 2015 with bipartisan support.[209] This was a flawed reform that rolled back important NCLB measures. ESSA requires that the DoEd remain neutral as to whether states adopt Common Core -- a victory for conservatives. Federal leverage over states on education through waivers and remedies was largely abolished. [210] Efforts to repeal Common Core in some states gathered pace. Still, a look into the post-ESSA period indicates that common standards for math and English remain more widespread than before 2010 -- a qualified victory for education in America.[211] Likewise, since the 1970s, education outcomes have improved in disadvantaged districts receiving Title I resources – often the result of Civil Rights and education legislation, sometimes mandated by the courts.[212]

The Trump administration has sought to sharply cut the federal government's role in education – calling for deep funding cuts for teacher development, after-school programs for disadvantaged students, and needs-based college assistance. However, Congress – on a bipartisan basis -- has largely maintained funding levels for these programs, and thus far, Trump has signed DoEd budgets into law.[213]

National education planning is essential to raising labor productivity and promoting innovation. The U.S. must become an "education nation" -- implementing balanced solutions. These include: deploying national standards like the Common Core, while allowing local autonomy to reach them; demanding accountability, while funding mandates; and, committing to improving public schools, while allowing some competition, such as charter schools. Senator Cory Booker's approach -- when he was mayor of Newark, New Jersey – is sound. This involved a commitment to public schools, while permitting greater school choice such as through charter schools.[214]

Push back against the Common Core includes the reasonable complaint that the focus on testing skills -- such as reading comprehension -- can come at the expense of abandoning traditional teaching methods such as building knowledge and vocabulary. "Teaching to the test" can hinder students in developing context and understanding, knowledge that helps in reading comprehension and critical thinking. Public schools seeking to maintain federal funding may abandon building knowledge, while private "progressive" schools continue to give their students a leg up by employing this approach. The focus of initiatives like Common Core on transferrable skills such as critical thinking and reading comprehension does have value. A balance between teaching such transferrable skills and building knowledge (in history, science and other subjects) should be struck. School autonomy in deploying teaching strategies and achieving goals is required. Education innovation should be encouraged.[215]

U.S. education spending should be increased, and the lion's share should be channeled to primary and secondary education. At over 6 percent of GDP – education spending in the U.S. is among the highest in the OECD; however, the portion represented by the DoEd budget is small at 0.5 percent of GDP. This is just 2-3 percent of the federal budget -- versus 15 percent for defense and 67 percent for entitlements.[216] The DoEd's budget is split roughly evenly between primary and secondary education on the one hand and higher education on the other. The biggest line item has been for grants and loans for college tuition – essentially a middle class program.[217] The budget for primary and secondary education is concentrated in grants for disadvantaged schools and special education.

Primary and secondary education outcomes are a predictor of future performance in knowledge-based industries and ultimately in worker productivity and economic growth. The U.S. is ranked only 27th in technology adoption worldwide.[218] Ramping up STEM spending is a no-brainer.

Budgetary line items that should get higher funding include: grants to disadvantaged primary and secondary schools (Title I grants) -- subject to NCLB-style performance monitoring; "21st century learning centers" – after-school programs in reading and math for disadvantaged students; teacher training and performance bonuses such as the "Teacher Incentive Program" -- provided to the best teachers and principals; "Math and Science Partnerships" -- designed to upgrade teachers' math and science skills; and, funding of: universal pre-K nationwide, successful education innovation programs, and an increase in teacher salaries across the board -- especially in Red states and poorer school districts.[219]

Teachers are poorly paid in the U.S. compared to similarly trained professionals. By contrast, relative to peer countries, salaries for principals and superintendents are high in the U.S.[220] The teaching profession -- given its critical role in the nation's future -- should be accorded the esteem it is in other countries. A good start would be to recalibrate the education budget in favor of teachers.

Funds for college education should not be neglected, although better targeting is required. This includes means-testing college loans and grants and offering targeted student loan subsidies, principal reduction and forgiveness that rewards national and military service, green careers, and high-value, but low-compensation, professions such as teaching and first-responders.

The NEA teachers' union should show more flexibility – including by greenlighting Common Core and a return to NCLB conditionality; agreeing to the closing of defunct schools; and, considering a shift to the ACA for teachers in order to alleviate funding pressures for health care for strapped school districts.

Education reform in America has proceeded with two steps forward and one step back -- inadequate to the task of remaining globally competitive. Recently, in some Red states under Republican governments, heavy tax cuts have resulted in a chronic underfunding of schools, including low teacher salaries and benefits. Some states have moved to a four-day school week to save funds and allow teachers to work second jobs.[221] A robust role for NGA in education is indispensable to reversing these woeful trends in some Red states.

The Japan case has lessons for the U.S. Japan placed first in international exams among large, highly populated countries like the U.S. – averaging third in the world on the PISA test, behind Singapore and Hong Kong.[222] Japan ranks 3rd in technology adoption, after Korea and Hong Kong. How does Japan achieve this? Universal pre-K is nearly complete in Japan, with coverage of 92 percent of the 3-5 year-old cohort, versus only 66 percent in the U.S.[223] Japan spends less on education as a percentage of GDP than the U.S., but it devotes a larger share to primary and secondary education. Japan commits substantial funds to after-school learning. The authorities also make sure that school districts with a high proportion of disadvantaged students are at least as well-equipped as other schools. Japanese schools have somewhat more autonomy than American schools -- within a framework of decision-making at higher levels of government (notably at the regional and central government levels). The division of responsibility occurs without the political drama that characterizes the U.S. education debate. Nearly three-quarters of education decision-making takes place at the local government level in the U.S., versus only about one-fifth in Japan.[224]

The IMF in its annual report on the U.S. economy (2018) recommended the U.S. take the following actions to improve education: better prioritize spending on early childhood education and institute universal pre-K; provide greater support for STEM programs; redesign the funding model for public schools to reduce funding differences across districts and provide more resources to schools with a high concentration of students from low-income households; expand apprenticeship and vocational programs to offer attractive, non-college career paths to workers of all ages; to improve the current relatively unimpressive levels of college degree attainment, the U.S. should focus more on preparing students for college and fostering retention once they are enrolled; and, explore alternative federal financing options for tertiary education (including income contingent repayment loans and an expansion in needs-based grant programs) to increase access for students from low- and middle-income households.[225]

5. **Policy Priority: Provide Lifelong Learning for Workers.** The U.S. must also become a "job training nation". Labor economist Harry Holzer explained the importance of lifelong learning: "New forms of automation will likely require workers to adapt to keep their old jobs, while many will be displaced or face less demand for their work (while others benefit)… Policy makers should provide incentives for firms to train current employees, rather than replace them, and should encourage schools and colleges to teach flexible, transferable skills, as the future workforce will likely need to adapt quickly to new and changing job requirements. Lifelong learning accounts for workers could help. Expanding wage insurance and improving unemployment insurance and workforce services could help workers adapt after suffering job displacement. Policies that make work pay, like the EITC, and others designed to increase labor force attachment, like paid family leave, could help mitigate declines in

the labor force. Reforms in immigration and retirement policy will help as well, as would policy experimentation at the state and local level (with federal support)." [226]

The U.S. government should roll out Lifelong Learning and Training Accounts (LLTAs). The Aspen Institute has proposed the creation of LLTAs that millions of Americans could access in order to tool up -- funded jointly by workers, employers and the government.[227] Such a program could cover 23 million American workers, nearly 80 percent of them low-wage earners, and cost the government approximately $25 billion over ten years. Similarly, U.S. Congressman Seth Moulton has proposed a $24,000 training credit for workers – paralleling the SkillsFuture Credit pioneered in Singapore. This is an idea whose time has come.

Jobs in science and engineering (S&E) pay more than other jobs, reflecting the higher value-added of the knowledge-based economy. The number of S&E college and post-graduate degrees awarded and of S&E researchers and jobs created has grown more rapidly in Asia than in the U.S. S&E degrees have represented about one-third of bachelor's degrees awarded in the U.S., while about half of bachelor's degrees awarded in China and Japan in recent years were in S&E.[228] Of the S&E bachelor's degrees awarded in the U.S., a higher proportion were in the social sciences, psychology and the life sciences, than in engineering, math, and computer science.[229]

The U.S. has come to rely increasingly on foreign-born workers for S&E jobs, especially in computer science, math and engineering, where greater than 50 percent of the holders of PhDs were foreign-born in 2015, a large proportion from Asia. S&E jobs have grown faster than the broader workforce in the U.S., but job growth in these categories is estimated to be much higher in Asia.[230]

A top-ranked education system – including an increasing focus on S&E skills acquisition in higher education -- is important to the competitiveness of the American workforce. Likewise, life-long learning training credits and other supports could help ensure that the American worker can go the distance.

6. **<u>Policy Priority</u>: Fund Basic Research.** America should also aspire to be an "R&D nation" in order to stay globally competitive. One of the best ways to do this is to increase funding of the NSF. R&D spending growth in the U.S. has generally exceeded GDP growth, but it has slowed.[231] The breakdown of U.S. R&D suggests there is room for the government to ramp up spending – with the need largest in basic research in non-defense areas.

U.S. R&D expenditure in 2015 consisted of: $84 billion of basic research -- research to gain knowledge of scientific phenomena, which ultimately leads to applications; $97 billion of applied research -- research geared toward specific applications; and, $315 billion of development -- product / process development or improvement. The federal government financed about one-quarter of this total (~$129 billion), while business financed two-thirds.[232]

The breakdown is different between government and business. The federal government does the heavy lifting in basic research. Business is reluctant to fund basic research due to the long time lag to product development. Basic research is where scientific breakthroughs occur, rather than further down the chain at the level of product development. About half of all basic research was undertaken at academic institutions and 44 percent of that was funded by the federal government.

Of the U.S. government's budget for R&D, about half goes to DoD. More than half of that is channeled to the defense industry. So essentially, U.S. federal R&D spending has been heavily directed toward subsidies for defense firms. About half of DoD R&D goes into development -- mostly of combat systems. While defense research has spawned commercial applications in the past, a higher share of federal research dollars should go to non-defense areas.

The next largest recipient of federal R&D funds is Health and Human Services (HHS), which receives about one-quarter. About half of HHS's budget is for basic and half for applied research -- almost all going to the National Institutes of Health on its way largely to academic institutions. The Department of Energy and NASA receive the next largest shares -- each with about 9 percent of total federal R&D dollars. More than three-quarters of Energy's budget is spent in the department, with a portion going into defense-related activities – i.e. nuclear security. NASA's budget was more than half for development -- nearly three-quarters channeled to outside parties (largely firms).

The NSF budget is modest -- less than 5 percent of total federal R&D dollars, or $5.7 billion. Ninety percent of that is channeled into basic research.[233] The NSF is underfunded, even though it is the U.S. agency charged with pushing the frontiers of science. By bolstering basic research – that is, by increasing NSF funding -- the U.S. government could support intellectual property (IP) development across the economy – a key component of competitiveness in knowledge-based industries. Investment in IP in the U.S. – including R&D and software development – has grown at a rapid clip since the beginning of 2018, and the U.S. government should engage in ensuring that this trend continues and is strengthened.[234]

A substantial ramping up of federal spending on R&D – with much of the increase going into NSF basic research, and the balance directed to climate research at the NOAA, EPA and other agencies – would be good policy.[235]

7. **<u>Policy Priority</u>: Go All-in on Globalization.** Exchange means going all-in on globalization. Openness is how a country acquires best practices. Sure, countries have at times protected domestic industry, providing assistance to give firms time and space to compete.[236] Subsidies are better than tariffs, but even these should be deployed sparingly – and only in the early stages of development. Otherwise, protection will be used as an excuse to protect inefficient firms. Strong, confident countries like the U.S. shouldn't hide – they should retrain, retool and get back into the ring.

"Slowbalization" is a term coined to reflect the negative reaction to globalization. Electorates have become angry about labor market disruptions. Pressure on political leaders to pull up the drawbridges and close the gates has intensified. As a result, trade growth has slowed. Cross-border capital flows are down. FDI is lower. Investment has fallen due to the uncertainty created by Trump's trade wars. There has been strong reaction around the world against immigration as well.[237]

Yet globalization presents a win-win opportunity for all, rather than the zero-sum game advanced by populists. Sure, there are winners and losers at any given time. However, the global pie grows larger – offering opportunities and resources to retrain those who are not benefitting. The IMF found in a May 2017 study that trade with China -- while disruptive to certain labor markets -- was responsible for about 15 percent of the increase in productivity achieved in advanced economies (including the U.S.) over nearly two decades.[238] Engaging the massive Chinese market -- while putting some Americans out of work -- netted benefits to the U.S. economy as a whole.

The IMF analysis came in response to the pathbreaking work of Autor, Dorn and Hanson – economists who studied the impact of the rise of Chinese manufacturing on labor markets. They argued that local labor markets and regions in the U.S. were decimated by import competition – resulting in lower wages, employment, labor force participation and lifetime incomes. Furthermore, over the decade after the China shock began – the authors argued -- the gains from trade – including employment gains in export-oriented or non-tradable sectors – may not have materialized the way trade theory predicts. The distributional consequences of the China shock have likewise been large and disruptive.[239] The authors concluded that, "Developing effective tools for managing and mitigating the costs of trade adjustment should be high on the agenda for policymakers…" [240] The IMF – while countering this research by quantifying the gains from trade – nonetheless agreed with its conclusion.[241] Job training and adjustment assistance are critical components of globalization.

The nature of globalization is changing too, and it may be to America's advantage. A labor-cost advantage in manufacturing – which China benefitted from -- may no longer be the key driver of trade. Trade in services -- a U.S. strength -- is understated by half in trade statistics and is growing 60 percent faster than trade in goods.[242] U.S. exports of services have grown faster than exports of goods over the last 10 years (4.6 percent per year, versus 3 percent for goods). The U.S. is competitive in financial services; IP, R&D and technology services; and, business services, including architectural, engineering, management consulting, legal, accounting, public relations, and advertising services.[243] This is why market access for services exports is more important than the high-profile trade battles that Trump loves to fight -- over goods such as steel and autos.[244]

The Trans-Pacific Partnership (TPP) -- the signature trade deal of the Obama years – put a heavy emphasis on market access for services. This deal -- negotiated with 11 other Pacific nations (excluding China) -- was designed to cajole the Asian behemoth into playing by the rules on services and IP protections. The thinking was that when China understood what it stood to lose by being outside TPP – which included large economies besides the U.S. like Japan, Canada, Australia and Mexico -- it would agree to the protocols and apply to join. Instead, China is today promoting its own protocols for Asia, which exclude the U.S.[245] Rules-based multilateral agreements are designed to wield both carrots and sticks. Withdrawal from TPP in January 2017 was President Trump's first policy blunder. But, let us recall that opposition to TPP originated on the left. Bernie Sanders led the assault on TPP in 2015-16, forcing candidate Hillary Clinton to equivocate on an issue she had previously supported.[246]

Economists have estimated that TPP would have raised growth in U.S. GDP and exports. It was a trade agreement that favored the American worker – in spite of what Sanders and his heirs will tell you -- by offering more gains to labor than to capital. All signatories to the deal stood to benefit, with the U.S. expected to register gains in services (including financial, technology, and logistics), communications (including big data), agriculture, and advanced manufactures (including electrical equipment). On the other hand, the U.S. was expected to increase its imports of other manufactures (e.g. autos, textiles, apparel) and energy. U.S. priorities -- including IP protection -- were addressed in TPP.[247] Likewise, the Transatlantic Trade and Investment Partnership – TTIP – a deal under negotiation between the U.S. and the E.U. during the Obama years – has been shelved.[248] The U.S. should re-engage with these initiatives.[249]

A bias toward manufacturing does not make sense.[250] Data from Singapore show that value-added per worker in services often exceeds that of manufacturing.[251] Why is selling oil, grain, steel, a toy or a car better than selling IT services, customized software, engineering or financial services? Technology may in fact lead to faster growth in services trade than goods trade. The demand for knowledge-intensive services worldwide is rising.[252] This plays to America's strengths.

In terms of getting tough on trade within a rules-based framework, the Obama administration brought 18 complaints against China to the WTO – challenging Chinese government support of domestic industry – resolving 11 of them by 2016. In fact, the U.S. has been the most active user of the WTO's Dispute Settlement Mechanism (DSM), filing 110 complaints from 1995-2016, about a fifth of all complaints and a bit less than the number filed against the U.S.[253]

As for Trump's assertion that bad trade deals are the cause of U.S. current account deficits – most economists don't agree. These deficits are driven by excess aggregate demand and low national savings -- a result of America's loose fiscal policy. U.S. current account deficits – the broadest measure of trade -- would fall if the government raised taxes and cut budget deficits.[254]

President Trump has misused his executive power to invoke national security as a justification for tariffs against the E.U., Canada, Japan and Mexico – U.S. allies all. The national security exemption is intended for the rare event of a crisis such as war. Trump has flouted norms by invoking this exemption as a pretext to apply pressure in trade disputes, rather than following the process for lodging and resolving disputes, such as through the WTO's DSM. Not only is this a pernicious action against the spirit of multilateral rules taken by a WTO member, it is an abdication of the global leadership role the U.S. has played in the past – with bipartisan support – which has underpinned peace and prosperity since World War II.[255] Congress could claw back its authority over trade, but it would have to have a veto-proof majority – unlikely in today's Congress.[256]

There are legitimate national security issues to deal with in today's global economy. Concern about the dominance of Huawei, China's telecoms giant, in 5G equipment is not unreasonable. The possibility that Huawei equipment could possess a "backdoor" to allow the firm – and potentially the Chinese government – to spy is a reason for caution. Australia, Japan, Taiwan and others have excluded Huawei from supplying 5G telecoms. The U.K.'s approach is to invite the firm in but to test its systems in an open lab staffed by U.K. cybersecurity personnel. Germany and France may follow the U.K.'s lead. Mexico already uses Huawei. There are alternatives to Huawei – e.g. Sweden's Erikson and Finland's Nokia. Exploring 5G alternatives should be part of the U.S. Strategic Plan.[257]

The free flow of people also tends to maximize output around the globe. Yet immigration is a hot button political issue, as residents of almost any country can feel threatened – for their jobs, their culture, their national values. Advanced economies with low birth rates that heavily restrict immigration – in Asia and Europe, for example – have a different problem. They have a demographic problem due to an aging population. This ultimately leads to a declining labor force and a rising dependency ratio.[258] Also, some countries have labor shortages in specific areas – both skilled and unskilled. Immigration can help solve these problems. That is why it would make sense for the U.S. to pursue a merit-based, open immigration policy similar to Canada's. Deploy technology at the border to control the inflow, yes. Deal with the existing issue of illegal immigration by passing "Dreamers" legislation, yes. Such policies would allow an inflow of immigrants that supports growth in the labor force and the economy, without giving up control over the border. Employers should be given greater input into immigration policies so as to meet the needs of the labor force.

Deepening globalization will be challenging. Harmonizing regulations to support services trade and liberalizing non-tariff barriers – e.g. discriminatory practices in government subsidies and procurement – are not as easy as tariff reductions. The WTO has become unwieldy due to its practice of unanimous assent among all 164 members.[259] Alternatives that are more flexible must be pursued – including plurilateral deals – in which smaller groups of likeminded countries agree on a less comprehensive set of measures, while remaining open to other WTO members eventually joining. Regional initiatives are common as well – such as NAFTA, the E.U., and TPP (now CP-TPP, which excludes the U.S.). These should be supported.[260]

The U.S. needs to recommit to the WTO -- starting by naming adjudicators to the DSM, the panel that hears trade disputes, which is currently short of judges because the Trump administration is holding up approval. The U.S. should pursue its claims of unfair trade practices through the DSM and other levers. And, the U.S. should negotiate re-entry into TPP and complete TTIP. These actions would be a good place to start to get globalization back on track.[261]

8. **Policy Priority:** **Plan for a Low Carbon Future.** Exchange means engagement to combat climate change. “We seek an agreement that gives businesses and investors the certainty that the global economy is on a firm path towards a low-carbon future,” said President Obama at the Paris Climate Change Conference in December 2015, “because that will spur the kind of investment that will be vital to combine reduced emissions with economic growth.”

By signing the Paris accord, Obama committed to cutting U.S. carbon emissions by more than one-quarter by 2025.[262] Obama’s comments demonstrated an understanding of a key principle of reform -- that government must lead so that the private sector can channel resources for change. Nevertheless, the right in America objects to a government role in the economy and to climate science itself; while the left does not trust markets to play a constructive role and has added unrelated spending to its Green New Deal.

The Trump administration has sought to roll back the strides Obama made in the fight against climate change – abandoning the Clean Power Plan (CPP), neutralizing restrictions on the release of toxins into the environment, freezing automobile fuel efficiency standards, opening up federal land – including the Arctic National Wildlife Refuge -- to fossil fuel development, and pulling out of the 195-nation Paris accord. The CPP was promulgated in 2015, mandating that states reduce power plant carbon emissions by 32 percent by 2030. Trump's EPA replaced CPP with a weaker regulation designed to eliminate the emissions cuts without violating the Clean Air Act.[263]

The EPA in 2011 had issued a regulation to limit the release of toxins by power plants -- called the Mercury and Air Toxics Standards (MATS). State governments and industry filed law suits against MATS, so the Supreme Court ruled that the EPA must weigh the costs to industry against the benefits to society. The Trump EPA has argued that the costs to industry of MATS – nearly $10 billion – outweigh the benefits to society - $6 billion, whereas the Obama EPA had sized MATS health benefits at $80 billion.[264]

In 2016 the Obama EPA ruled that the oil and gas industry must reduce methane emissions – a potent greenhouse gas that results from hydraulic fracturing (or "fracking"). Trump's EPA wants to encourage fracking, so it intends to relax this regulation.[265]

Trump dropped the federal government's calculation of the "social cost of carbon" (SCC) – an assessment of the damages caused by climate change due to emitting a ton of CO2 into the atmosphere. Calculation of the SCC began under Obama in order to assess the carbon impact of federal policies.[266] The IMF argues that the world's SCC is a lot higher than what is implied by market prices for fossil fuels today due to heavy subsidies: "Globally, subsidies remained large at $4.7 trillion (6.3 percent of global GDP) in 2015 and are projected at $5.2 trillion (6.5 percent of GDP) in 2017. The largest subsidizers in 2015 were China ($1.4 trillion), United States ($649 billion), Russia ($551 billion), European Union ($289 billion), and India ($209 billion)… Efficient fossil fuel pricing in 2015 would have lowered global carbon emissions by 28 percent and fossil fuel air pollution deaths by 46 percent, and increased government revenue by 3.8 percent of GDP." [267]

Since the Industrial Revolution began over a century and a half ago, the U.S. has earned the dubious distinction as the world's largest cumulative carbon emitter -- estimated to bear responsibility for nearly a third of the carbon released into the atmosphere since then. The U.S. amount is slightly in excess of the E.U.'s level and twice what China has emitted. However, China currently is the world's largest annual carbon emitter, spewing 1.8 times more in 2015 than the U.S. -- nearly 30 percent of the world's annual emissions. On a per capita basis, Americans emit more carbon per year than most countries -- pumping out over two times more CO2 per person than the Chinese, more than three times the world average, and well in excess of the OECD and E.U. The carbon intensity of U.S. GDP – that is, the amount of CO2 emissions required to produce one dollar of GDP – exceeds most peers, is comparable to Canada's, but less than China's.[268]

After declining for three years, U.S. carbon emissions began to rise again in 2018 due largely to economic growth – putting the U.S. off track from meeting its Paris targets.[269] Coal-fired power generation in the U.S. has been in decline for years as a result of CPP and market pressures from lower-cost natural gas. Hundreds of aging coal-fired plants have been retired, so that coal's share of power generation has fallen to 28 percent, versus an increase in the share of natural gas to over a third. Renewables' share is only 17 percent. Note that the reduction in coal in the U.S. – a dirtier source of power -- resulted from the combination of government policy and market pressures

– a message to both the right and the left. This trend in lower power sector C02 emissions since the 2007 highs has put transportation – automobiles, trucks and planes – in the position of the largest source of CO2 emissions in America. Higher airline miles and use of jet fuel, as well as a booming trucking sector -- not passenger car travel -- have driven CO2 transportation emissions higher.[270]

Improvement in auto and power plant emissions are not enough. To meet its Paris accord commitments, the U.S. would have to decrease emissions at least twice as fast over the next seven years than was achieved from 2005-17 – a tall order.[271] The U.S. has an obligation – as a major carbon emitter -- to lead on this issue.

By law, the U.S. government must produce a National Climate Assessment every four years. This includes a report -- the Climate Science Special Report -- designed to capture the current state of scientific knowledge about climate change, lead-authored by three federal scientific research agencies -- NOAA, the NSF and NASA – and reviewed by America's top scientists. It is widely accepted as authoritative on climate science. In 2018 the report concluded that: global warming has occurred due to human activity; global temperatures could rise 3.6 to 9 degrees Fahrenheit by the end of the century; the world's oceans have warmed and acidified; sea levels have risen and could rise by 1 to 8 feet by the end of the century; rainfall, severe storms and coastal flooding are expected to increase; and, Arctic temperatures have risen more than twice as fast as the global average – with sea ice, glacial and permafrost melting likely to accelerate global warming trends.

The National Climate Assessment also lays out the expected effects of climate change on the U.S. These include: the destruction of infrastructure and property – especially in coastal communities; damages to agriculture, water and air quality; increased risk of disease; destroyed ecosystems; and, an increased occurrence of drought, wildfires and flooding. National security would also be compromised.[272] Other studies point to millions of climate refugees worldwide, which could dwarf migration numbers seen in recent years that have already caused a political backlash – including the election of Donald Trump.[273]

The government should convene an interagency climate change committee – involving EPA, NOAA, NSF, NASA, the National Research Council (NRC), the Energy Department's ARPA-E (its technology research arm), and other agencies – to roll out policy recommendations and work closely with allies and the U.N.'s Intergovernmental Panel on Climate Change (IPCC). This committee should slot right into the CFE's Subcommittee on a Low Carbon Future and be responsible for drafting this portion of the U.S. Strategic Plan. Higher R&D funding for low carbon projects should be channeled through the relevant agencies. Energy's ARPA-E and Office of Fossil Energy Innovation and Research should be converted immediately into low-carbon research vehicles. Adequate funding for agencies engaged in climate science and policy must be appropriated, including for the EPA and its Office of Science and Technology, the NOAA, and the NRC's climate research. Thinking outside the box on silo-busting, by for example encouraging ARPA-E to work with corporate innovators on sustainability, is critical to success -- protestations by the left's "environmental justice" groups notwithstanding.[274]

A bold, but doable low carbon plan for the U.S. should focus on carbon pricing, carbon capture and negative emissions, renewable energy, and emissions reductions. A carbon price (like the SCC) should be assessed as a tax on fuel. This tax could be assessed on suppliers of coal, oil, and natural gas, which is relatively easy to implement and could be passed on to emitters (consumers). Increasing fuel taxes directly -- such as via the gasoline tax paid at the pump – is administratively easy as well. A carbon tax (and a broader greenhouse gas tax) could also be assessed on a broad set of activities that increase emissions -- such as forestry, cement, transportation, mining and drilling. Cap-and-trade programs (where emissions limits are set and companies trade them) also effectively set a carbon price.[275] Getting the right SCC is tricky and the range of estimates is wide -- reaching as high as ~$130 per metric ton of CO_2 in Sweden, which assumes a downside scenario. Scientific literature has suggested a price of $75, while U.S. (Obama-era) figures put the price at around $45. An IMF article argues that $35 per metric ton (close to Canada's suggested carbon price) would imply that most countries would meet their Paris accord pledges. By contrast, carbon pricing and cap-and-trade programs in the world today result in a woefully low average carbon price of $2 per metric ton. The U.S. government should set a carbon price at least $35 -- implementing it with a combination of taxes, moving the price up step-wise each year.[276]

The U.S. tax code should be reformed to eliminate tax breaks, loopholes, and subsidies to the fossil fuel industry. In addition to national goals for emission reductions – accomplished in large part by rejoining the Paris accord and reaffirming Obama's CPP – goals for raising renewables as a share of total power generation should be part of the low carbon plan. Reaching the current E.U. share of renewables of 30 percent of total power generation should be a near-term goal.

Reducing carbon and greenhouse gases already in the air is critical. So, carbon capture and storage (CCS) technology – i.e. targeting emissions from fossil fuel power plants -- and negative emissions technologies (NET) – designed to take CO_2 out of the atmosphere and store it (in soils, wetlands, plants, minerals and rock formations) are in various stages of R&D.

Tax incentives and budgetary support at multiple levels of government are required for: CCS / NET; renewables development; coal-fired plant closings; gas turbine emissions cuts; the rollout of more hybrid power plants that increase use of intermittent power sources (renewables) supplemented by natural gas; aircraft engine fuel efficiency upgrades; methane capture at landfills; and, development of low carbon transportation systems. High speed rail and transit, e-cars and nationwide charging stations, and investment funding for EV manufacturing should be supported. An attractive trade-in plan for gasoline-powered cars; e-vehicles purchased for the federal fleet;

support for e-buses, e-car share fleets, and night delivery services and parcel lockers in urban areas should be provided. The development of hydrogen-powered fuel cell cars should likewise be incentivized. Phasing out of advertising for gasoline-powered vehicles – either voluntarily or regulated by government – would be positive. R&D efforts to obtain cost declines in lithium-ion battery storage, and into in potential renewables storage such as molten salt are worthwhile. Tax exemptions should be allowed on e-bonds -- for green infrastructure -- similar to municipal bonds.

Energy efficiency upgrades for existing buildings -- and a national zero carbon standard for new buildings -- are needed. Similar emission standards for schools and appliances would be positive. Tax breaks to homeowners to switch home heating and air conditioning to renewables would be worthwhile. Electricity transmission and grid modernization to handle renewables; distributed (decentralized) energy resources – such as from rooftop solar panels -- and aggregation of power from microgrids; the use of smart grid meters to conserve energy are all useful goals for the electricity sector.

Adoption nationwide of best-practice low carbon policies already deployed in the states – e.g. in California, Washington, New York, New Jersey and Massachusetts -- would be wise. A shift to carbon-sensitive agriculture; a return to the Obama fuel efficiency tightening schedule, MATS and methane commitments, land use restrictions are also key. Adopting Congressman Seth Moulton’s green national service corps makes sense – to get college graduates and unemployed workers involved – with student loan reduction and lifelong learning credits provided in return. Investing in the “new plastics economy” – including targeting the E.U.’s 55 percent recycling goal by 2030, and funding R&D into sustainable (biodegradable) plastics will be important to the world’s oceans. Action on a low carbon plan is urgently needed.

9. **<u>Politics</u>: Reduce the Threat of Populism.** Populism is an approach to politics that champions the common person over elites -- which is its appeal -- but usually descends into economic mismanagement. Populist policies win elections, but sacrifice the future for the present. If democracy cannot accomplish the nation's business – providing the economic gains citizens have come to expect, maintaining order, protecting the homeland – the door opens to populism.[277]

A populist economic plan often involves a combination of large tax cuts and high government spending -- financed by debt and money creation -- geared towards maximizing consumption and jobs in the short run. Measures to protect domestic industry -- such as tariffs – are part of the program.[278] Populism offers a dose of patriotism, "rally around the flag" rhetoric, that can result in foreign adventures or foreign policy mistakes.

Populism can undermine democracy when the leader -- elected democratically -- deploys power to tilt institutions in his / her favor – political parties, the press, law enforcement, the courts. When these institutions function independently, this can get in the way of the populist's direct connection to the people. President Trump accuses political opponents and law enforcement of treason and attacks the press as "the enemy of the people" and the courts as "a total disaster". Senator Sanders claims the U.S. political system is "rigged" against him and in need of a "revolution".[279] Politics is a rough sport, but the populist crosses the line when s/he seeks to undermine institutions.

Vilification of government in America today is too common.[280] There is no reason to believe that government officials are any more corrupt than the rest of us, or that business leaders any more noble. The "swamp" is at least as common in the boardroom as it is in the congressional hearing room. [281] This verbal assault – most heavily against the U.S. Congress and civil servants (and the press) -- put forth because it helps win elections, hamstrings public policy by discrediting government. Decency in political discourse must return; vitriol in political advertising must stop.[282]

As part of the effort to clean up the political discourse, the nation must strengthen its cyber defenses, including through: regulatory pressure on social media firms to counter extremism, police political advertising, and detect and close down disinformation campaigns; the FBI working with state governments to strengthen cybersecurity defenses against hacking the U.S. election infrastructure, and with the major political parties to prevent 2016-style hacking operations; and, passing legislation that penalizes, prosecutes and sanctions individuals and nations involved in disinformation or hacking efforts, and requires campaigns to notify the FBI if approached by foreigners seeking to interfere in elections.[283] Such efforts could limit the potential of bad actors to exploit American's internet platforms to influence and disrupt our democracy.

The American electorate has become fertile ground for populism. A narrative which can be called (awkwardly): "the negative narrative of a people who have been wronged" is common to many countries about go down the rabbit hole.[284] Such a narrative depicting the American people as cheated by foreigners is on offer today from Donald Trump, who in his inaugural address in 2017 -- the infamous "American carnage" speech -- blamed America's woes on "the ravages of other countries making our products, stealing our companies, and destroying our jobs." Populists on the left also heap blame -- which they reserve for corporations and the rich. Getting distance from negative narratives is critical to reducing the threat of populism in America.[285]

"American exceptionalism" is the belief that America is different, that it has a special mission, possesses a unique goodness. This notion is rooted in the pride Americans feel in their democracy, their successful economy, and their history. This American myth – like all national myths - is rooted in some legitimate historical experience. It also reflects a highly sanitized version of

American history. This is a history that includes the realities of slavery and Jim Crow; the displacement and persecution of the people who lived in North America before the 16th century; and, the maltreatment of other minorities – including internment of Japanese-Americans during World War II. America was hatched from the egg of British colonialism, which spawned the world's first global economy -- based not only on liberal economic principles, but also on the slave trade and exploitation of foreign peoples. The American experiment was a child of the European Enlightenment – that emphasized reason, the scientific method, and self-government – but also furnished the tools of colonialism and world war. Americans feel good about themselves, and at times, that they are better than the rest of the world.[286] The U.S. is a diverse society, so not all Americans feel this way. And, it is true that the American story is characterized by an impressive capacity for reform, altruism, and a tolerance for diversity.[287]

Still, from a country risk standpoint, American exceptionalism has resulted in a bedrock belief that the U.S. is the source of international best practice and has little to learn from other countries. This prevents the U.S. from getting its mojo back.

The unparalleled international consensus during the second half of the 20th century for sound economic policies and cooperation that followed the Great Depression and World War II -- with Soviet Communism as a catalyst -- is weakening.[288] The world's collective memory is fading. Millennial socialism – a kind of repackaged populism -- is on the rise. Fifty-one percent of Americans aged 18-29 have a favorable view of socialism, though it is unclear if they agree on what that means.[289] The realities of last century's socialism – state control, limited economic freedom and dynamism, corruption, economic collapse – are being forgotten. Millennial socialist notions are problematic. For example, "Modern Monetary Theory" suggests that because inflation is low, money creation should finance unlimited government deficits. This magical thinking -- that any entity, including government, can borrow beyond what it can repay -- must be dismissed.[290]

Millennial socialist goals – the reduction of inequality and a greater stake for all in the economy – are sound, but these would be better served by doubling down on globalization and technology. A skills-based increase in labor productivity is the only lasting way to increase a worker's wage.[291] A safety net should not be neglected, because it reduces populism's appeal.[292] Converting millennial socialists into millennial moderates is a worthy goal for American politics.

10. **<u>Politics</u>: Reverse Polarization.** Polarization is at the root of the dysfunction in American democracy. Other democracies aggregate interests and manage discord better than the U.S. Political scientists Mickey, Levitsky and Way in a 2017 *Foreign Affairs* article discussed the potential for "democratic backsliding" -- a weakening of institutions -- in the U.S. due to polarization.

America only became a "full democracy" in the second half of the 20th century -- in the sense that universal adult suffrage and protection of civil and political rights were broadly provided. Passage of the Voting Rights and Civil Rights Acts in the 1960s finally enfranchised African-Americans in the South -- a region that had practiced a form of authoritarian rule since Reconstruction. Single party rule under the Democratic Party had disenfranchised African-Americans and many poor whites. Paradoxically, the democratization of the South increased the polarization of America's political parties – with southern whites identifying heavily as Republicans and African-Americans largely aligning with progressives in a reformed Democratic Party.[293]

Implicit in this analysis is a concern that America's political parties could polarize further, so that political opponents increasingly view each other as existential threats. Rising income inequality, slower economic growth, immigration fears, and regional economic differences could increase polarization.[294] Income and wealth inequality is higher in the U.S. than in other advanced economies and to an extent aligns with the Red State / Blue State divide.[295] Cities and towns dominated by "old economy" manufacturing and retail feel the negative impact of technology and trade. Blue states (leaning Democratic, dominant on the coasts) have a high proportion of "new economy" firms.[296] Wages and labor force participation in Red states (leaning Republican) have been lower than the national average.[297] Many workers in Red states are under stress, while households there appear to benefit less from the country's real estate and stock market gains.[298] With the new economy likely to drive growth, this gap could widen and with it the Red state / Blue state divide.[299]

Gerrymandering of election districts – where state governments draw district maps with lopsided majorities ensuring safe seats – aggravates polarization.[300] Closed party primaries dominated by activists tend to favor partisan outcomes too. Some states have experimented with open primaries -- in which independents can participate. Nebraska, a Red state, has open non-partisan primaries for the state legislature, resulting in policies not generally associated with conservative Republicans – such as raising the state gasoline gas, granting driver's licenses to undocumented aliens, and abolishing the death penalty.[301]

Partisan campaign financing aggravates polarization. The average level of election spending in the House of Representatives nearly doubled in the 2000s.[302] As a result, politicians often spend more time fund-raising than legislating – which means interacting with wealthy partisans. Likewise, the polarization of news sources and commentary -- increasingly fragmented by social media -- hinder compromise.[303] Voters – who may not have been polarized on the issues initially – are pulled to the extremes.[304]

Rules and behavior in the federal government have fostered polarization as well.[305] The separation of powers creates hurdles to reaching decisions. When the branches of government and the houses of Congress are controlled by different parties, a large number of elected leaders have to agree on reforms.[306] The Senate's filibuster and supermajority requirement and the presidential veto prevent centrist majorities from passing legislation. Since 1980, the electoral strength of the two major parties has been more closely matched --- increasing the temptation to game legislation ahead of elections. Rather than compromising on reforms, parties engage in "strategic disagreement" – in which they blame the opposing party for failure in order to define their brand. Prolonged polarization regionally, racially, culturally and politically that hamstrings government can lead to democratic backsliding, and in extreme cases, to open conflict and civil war, or slide into authoritarianism.[307]

More immediate than the demise of American democracy is the reluctance of America's partners and adversaries to negotiate with the U.S., and of investors to invest here. Uncertainty about rules regarding taxes, trade, immigration, foreign policy, health care, and climate change makes it difficult for business leaders to forecast and foreign leaders to trust the U.S.

Diversity has become a risk fault line for the United States. America's political culture celebrates diversity. The Statue of Liberty – looking out from New York Harbor -- represents a beacon to all yearning to be free, yearning to be American. The country has a history of comparatively high immigration levels and, more recently, of progress on civil rights. The record on diversity remains mixed, however. U.S. borders are not always open to refugees and immigrants. Discrimination by race and other factors has not been expunged. Equality of opportunity is not fully realized, and the narrowing of economic outcomes has stagnated.[308]

Still, relative to many other countries, America's encouragement of diversity is a core strength. Belief in the "America Dream" – in the potential for socioeconomic mobility -- fosters patriotism. Yet diversity could emerge as a tragic flaw for the U.S. if it ultimately feeds political polarization. "Our diversity is our strength. Our unity is our power," points out Nancy Pelosi, Speaker of the House.[309]

American diversity could still become the driver of American -- and global -- innovation, prosperity and inclusion -- but only if the country can unify.[310]

Practically speaking, how can America reduce polarization? There is no substitute for leadership – centrists stepping up. Policy measures can help too. Reducing inequality through the tax code, adjustment assistance, affordable health care, anti-poverty programs, and education and training initiatives could reduce polarization. Procedures for negotiation and compromise have become urgent. Efforts to empower congressional committees – especially committee chairs and ranking opposition leaders – to negotiate deals could help. Building the center through rules changes that reward consensus and fast-track legislation with supermajorities would be positive.

Deliberative negotiation is essential. When the "regular order" of the committee process fails, then the congressional "gang" approach should be deployed. With an appropriate number of senior U.S. members of Congress involved, also including executive branch leaders – and the President at the appropriate time – deals could be negotiated and closed. Deliberative negotiation procedures should include: regular meetings of members to create a climate of trust and partnership; utilization of non-partisan expert commissions to suggest reforms; linkage of low priority issues on which a party can concede with high priority issues that they require, creating a win-win dynamic; and, ultimately the involvement of the NGA to keep states and local governments in the loop and to cull best practices from around the country.[311]

In spite of the broad involvement of multiple stakeholders in the gang process, at the final "closing of the deal", the number of deciders should be kept small and senior and they should have the autonomy to make decisions. The final deliberations should occur behind closed doors and avoid leaks. While transparency is an important goal, this has to be balanced against bridging partisan divides. The presence of cameras tends to increase posturing and polarization and constrain innovation and horse-trading. Bipartisanship lends political legitimacy to any result. This way, policies in the interest of the nation over the long run – such as implementation of a Strategic Plan on the Future Economy – could be negotiated and implemented.[312]

Other reforms include: moving to open primaries that are less partisan; shortening the duration of election campaigns; fixing a single date for non-presidential primaries nationwide; limits on campaign contributions (if constitutionally possible); greater transparency of campaign finance data; measures to prevent voter suppression; automatic voter registration for driver's license holders; supermajority selection of congressional leaders to produce moderate leadership; and, elimination of the federal debt ceiling to avoid brinkmanship – replacing it with debt and deficit targets. Another good idea would be the formation of a non-partisan centrist watchdog group to: issue centrist ratings of members of Congress; fund bipartisan Get-Out-The-Vote operations for centrist candidates; and, track and rate candidates' negative advertising. This would be a sort of extension of the the remit of "No Labels" – the political group that backs centrist candidates and legislation. Other moderate outside organizations worthy of support include: Third Way and the New America Foundation; legislative groups such as the Problem Solvers Caucus, Tuesday Group, New Democrat Coalition, and Blue Dog Democrats. Fact-checking organizations such as Factcheck.org are worthy of support – and extending this concept to fact-checking cable news would be useful.[313]

The success of centrist policies and candidates would create a positive feedback loop that could increase social cohesion. Centrists must work at this or risk sliding back into populism and polarization. The country needs robust centrist parties of both the right and the left. Center-left partisans fed up with the Republican Party in the era of Trump have a strong interest in a resilient party of the right that seeks to achieve center-right objectives -- such as control of the borders and immigration, conservative values and economics – but that fully accepts the rules, customs and values of democracy. Likewise, center-right partisans should feel the same way about a robust center-left Democratic Party. History shows that if the center-right or center-left fail, portions of the electorate will migrate to the extreme.[314]

Initiating a national discussion on core values that a broad cross-section of society could agree on sounds like a castle in the air, but may be the only way to sort out issues such as which hymn to sing, which monuments to keep, which colonial flags to wave, and how to increase the overall level of decency in America. Americans could begin to perceive themselves as in the same boat with regard to the challenges ahead, rather than retreating to opposing camps. Human beings crave recognition. Much human conflict has been caused by the struggle over territory and material goods – but also by people not recognizing each other for who they are. What is needed is an interpersonal encounter where individuals, groups, races, religions -- all groups -- are recognized – recognized for *their* conceptions of themselves, not how others define them. A mutual, gratifying recognition can lead to a lasting agreement on a set of American values and on policies for the country to get its mojo back – to retool the American worker -- so the country could begin to S.E.E. again.[315]

[1] The attack on the news media has to stop. Cable news and social media have become polarized. This in no way diminishes the heroic work investigative journalists do – notably at newspapers – on line and paper – such as the Washington Post, the New York Times, Politico, Vox, BCC and others. In spite of attacks on journalists from, among others, President Trump, these investigative journalists – exposing and reporting on stories across broad issue areas – are nothing short of heroes, providing the transparency and information society needs in a democracy.

[2] See Economist, jobs briefing, May 23, 2019, and U.S. Bureau of Labor Statistics, jobs report, July 5, 2019, inflation report, July 11, 2019.

[3] GFC 2009-10. Put in government debt estimates – Trump, Bernie.

[4] If the left takes power, the impulse will be to sharply increase entitlement spending. In the wake of a financial crisis, the pressure on the left could be overwhelming to break up the banks and impose controls -- which could undermine one of America's strengths – deep and efficient financial markets that intermediate savings to investment.

[5] Recent signs of wages picking up - but likely temporary. Cite labor productivity data.
Muhammad Ali quote. On Ali, see The Guardian, June 4, 2016, at https://www.theguardian.com/sport/2016/jun/04/muhammad-ali-greatest-quotes-sting-butterfly-louisville-lip. Ali refused to be drafted in 1967 citing his religious beliefs as a Muslim, which made him a conscientious objector. By 1971, the U.S. Supreme Court in an 8-0 vote threw out the case. Boxing vernacular courtesy of "Title Boxing" at https://www.titleboxing.com/boxing-dictionary. See Bureau of Labor Statistics, USG, Labor Productivity (output per hour) 1988-2018, at https://www.bls.gov/lpc/#tables. Growth in U.S. labor productivity (output per hour) averaged 2% per year in the 30 years to 2018, and spiked nicely in 2018 to 1.8%, though the three years and five year to 2018 averaged only 1.2% and 0.9% respectively (and even the 2 ¼ years since Trump became president, only 1.5%). That said, the five quarters to 1Q19 since the tax cuts (TCJA) averaged 2.1% slightly better than than the 30Y average, but below the 2.4% average since 1948 when full quarterly labor productivity data were taken. Nevertheless, 1Q19 revised labor productivity data showed an impressive 3.5% quarter on quarter annualized growth rate. Furthermore, total factor productivity growth (also called multifactor productivity growth), growth due to innovation, not to adding capital or labor, has slowed, totaling 0.9%, 0.6%, 0.5% per year in the 30y, 10y and 5 years to 2018.

[6] Data on labor's share of GDP. Such a massive fiscal stimulus is usually reserved for emergencies such as the Global Financial Crisis (GFC) of 2009. See Economist on jobs and Leonhardt on real wage growth in last 12 months, May 9 2019. Workers have been doing better lately.
See IMF Article IV Staff Report for the U.S., June 2019, pp. 11, 18-19.
The last time an unsound procyclical fiscal expansion like this was implemented was during the Johnson Administration, and though strides were made on civil rights and poverty reduction at that time, fiscal deficits triggered financial turmoil. In the late 1960s, the combination of a progressive social agenda and the cost of the Vietnam War widened the federal deficit and helped cause inflation to surge, the U.S. dollar to depreciate, and ultimately turmoil in the financial markets and a deep recession. In spite of the laudable social programs of the Great Society, designed to address injustice and inequality, as well as the need to be a world leader in the Cold War, even if – as some argue -- the Vietnam War was a policy mistake. Footnote IMF and Bernanke comments. Amid the lax monetary settings still in place since the GFC, that the Fed is trying to normalize, which risks market volatility due to years of easy money fueling financial bubbles, probably unavoidable due to the severity of the GFC. On Johnson administration comment – procyclical Trump tax cuts and spending hikes not being as large since the Johnson administration – see chart on p. 9 of IMF Article IV Staff Report for the U.S., July 2018. Define full employment. Discuss employment trends. Discouraged workers, etc. Experiment. A huge fiscal stimulus with an economy already booming – Johnson's "guns and butter" – Vietnam-era defense spending hikes and Great Society social programs – ultimately helped cause the hangover of stagflation – high inflation and recession in the 1970s. Not coincidentally the last time unemployment reached the lows seen in 2018 (e.g. 3.6% in April 2019) was half a century earlier, during the Johnson Administration. See BLS release Fri. May 3, 2019.

Olivier Blanchard article, Journal of Economic Perspectives, Winter 2018, "Should We Reject the Natural Rate Hypothesis?"
Tax cuts at full employment and rising government debt. Brookings Tax Policy Center paper on TCJA (Tax Cuts and Jobs Act), June 8, 2018: "The tax overhaul allows for 100 percent bonus depreciation (full expensing) for qualified property for five years. Bonus depreciation then phases down in 20 percentage-point increments beginning in 2023 (80 percent in 2023, 60 percent in 2024, 40 percent in 2025, 20 percent in 2026, and 0 in 2027). Under prior law, bonus 6 depreciation was allowed for 50 percent of adjusted basis in 2017, decreasing in subsequent years and fully eliminated after 2020. The small business (section 179) expensing limit was doubled to $1,000,000 (with a $2,500,000 phaseout threshold) for qualified property."
Equipment investment picked up nicely in 2018 – which was expected given the temporary 100% expensing of depreciation of such equipment investment allowed by the TCJA. However, 1Q19 GDP results and weak leading indicators such as capital goods orders in 2Q19 indicate the economy will be experiencing an investment hangover, having upfronted the capital spending artificially in 2018 in order to take advantage of Trump's stimulus measures. On the positive side – investment in Intellectual Property Products – including for software and R&D – an important indicator of innovation-led economic growth -- has been buoyant for years and seems to be remaining so. See BEA GDP releases, 1Q19, and Morgan Stanley economic commentary – Feb. 28, Apr. 26 & 29, May 24 & 29, June 21.

[7] There is a lot of unnecessary brutality in boxing which should not be glorified -- in spite of the impressive athletic prowess of its contenders.

[8] To under 9%. See IMF Article IV Staff Report for the U.S., June 2019, p 16.

[9] Carbon capture technology pulls CO2 out of the atmosphere and stores it. See https://www.theatlantic.com/science/archive/2019/02/aocgreen-new-deal-new-era-millennial-climate-politics/582295/: "Yet the Intergovernmental Panel on Climate Change says that the world can keep global warming below 1.5 degrees Celsius only by deploying carbon capture." See also:
https://apps.npr.org/documents/document.html?id=5731829-Ocasio-Cortez-Green-New-Deal-Resolution,
https://apps.npr.org/documents/document.html?id=5729035-Green-New-Deal-FAQ,
https://iopscience.iop.org/article/10.1088/1748-9326/aafe25/pdf,
https://www.cnn.com/2017/03/28/politics/climate-change-obama-rules-trump/index.html,
https://www.theguardian.com/us-news/2019/jan/15/trump-replacement-obama-climate-plan,
https://www.politico.com/story/2019/02/09/gop-sees-political-advantage-in-green-new-deal-1160725, .

[10] The author worked in the private sector for nearly two decades – including as Global Head of Country Risk at G.E. Capital and Head of Sovereign Ratings for the Americas at Fitch Ratings – and has taught country risk to Master's degree students for years – at New York University, Seton Hall University, and the Johns Hopkins University School of Advanced International Studies (SAIS).

[11] Journalists heroes note.

[12] WAPO article, other Problem Solvers articles. They fail not least because some problem solvers are joiners just to get bipartisan cred in purple districts while voting over 90 percent along partisan lines. Politico article on Justice Democrats' insurgency from the left plotting to topple centrist Democrats in primaries. See https://www.politico.com/magazine/story/2019/02/04/the-insurgents-behind-alexandria-ocasio-cortez-224542.

[13] Dr. Martin Luther King, Jr., *Why We Can't Wait*, Harper & Row, July 1964, and "Letter from Birmingham Jail", April 16, 1963.

[14] See IMF Article IV Staff Report on the U.S., July 2018, p. 25

[15] For business climate and economic competitiveness, the U.S. scores quite well: World Bank Doing Business ranking of 94%; World Economic Forum's (WEF) Competitiveness ranking of 97%. As discussed below, in terms of income distribution, inequality has increased lately in the U.S. and does not compare well with indicators of more equal societies. However, given the level of wealth in the U.S. and the history of progressive public policy and social development, such as the advent of labor unions and collective bargaining, the New Deal and Great Society social welfare programs, albeit reflecting a welfare state not as generous in other advanced countries, and given America's sizable middle class, one has to consider that one of America's successes, over the long sweep of history, has been the broad distribution of the country's high level of wealth. That said, with inequality rising and consequent social stresses emerging, this is not a laurel the U.S. can rest on. World wars, social revolutions, sovereign defaults and economic collapse, hyperinflations, etc.

[16] Although America has accomplished this economic success with perhaps the world's largest carbon footprint. Other major advanced economies. Growth rate since 1982. Per capita GDP in U.S. forecast in 2018 at $62,518, higher than any major advanced economy – on both market and PPP basis. Some countries are higher, but are all relatively small countries. See IMF WEO, Oct. 2018. China larger in PPP terms, and to be larger at market exchange rates by 2030.

[17] Freedom House, Freedom in the World, 2018. UPDATE TO 2019 OR FIND IN 2019 REPORT

[18] By one measure of GDP (at market exchange rates), the U.S. is the largest economy and China the second largest; by another (at "purchasing power parity" or PPP), the U.S. is the second largest economy and China is the largest. At market exchange rates, U.S. GDP was $19.4 trillion in 2017 vs. China's $12 trillion. At PPP, China's 2017 GDP -- according to the IMF WEO in April 2018 -- was estimated at $23.2 trillion, making it a larger economy than the U.S. at $19.4 trillion (which is the baseline, so its GDP is not adjusted for purchasing power – all other countries' are). These calculations are impacted by exchange rates -- with a weakening of the U.S. dollar, U.S. per capita Gross Domestic Product (GDP, or output, calculated as the sum of all goods and services sold in the country in a year) would compare less favorably to other countries' GDP. Adjustment for "purchasing power parity" corrects for under- and over-valued exchange rates, but also price differences across countries – a haircut in China may not be priced as it is in the U.S. PPP estimates attempt to adjust exchange rates and prices so that internal and external purchasing power of currencies are equal. This adjustment by economists introduces potential human error. This text therefore tends to rely more on GDP at market exchange rates. That said, the PPP calculation suggests that the Chinese economy may in fact be larger than the U.S. economy in terms of the sheer volume of goods and services it produces. That is probably an accurate statement.

[19] Country Risk Ranking is as follows: SINGAPORE, HONG KONG, NEW ZEALAND, FINLAND, CANADA, NORWAY, GERMANY, DENMARK, SWITZERLAND, NETHERLANDS, SWEDEN, TAIWAN, AUSTRALIA, JAPAN, UNITED STATES, UNITED KINGDOM, KOREA, REP., ESTONIA, AUSTRIA, BELGIUM, FRANCE, LUXEMBOURG, IRELAND, POLAND, ICELAND, CZECH REPUBLIC, SLOVENIA, UNITED ARAB EMIRATES, LITHUANIA, ISRAEL, SPAIN, PORTUGAL, LATVIA, CHILE, CHINA, MALAYSIA, SLOVAK REPUBLIC, ITALY, MALTA, QATAR, HUNGARY, BULGARIA, THAILAND, RUSSIAN FEDERATION, CROATIA, ROMANIA, COSTA RICA, GEORGIA, VIETNAM, CYPRUS, URUGUAY, KAZAKHSTAN, MEXICO, TURKEY, INDONESIA, PERU, COLOMBIA, MONTENEGRO, GREECE, TRINIDAD AND TOBAGO, ALBANIA, JORDAN, MOLDOVA, ARGENTINA, BRAZIL, TUNISIA, DOMINICAN REPUBLIC, LEBANON. 5 components are used – World Bank World Governance Indicators, Oct. 2018, covering 170 countries; World Bank Doing Business Rankings, Oct. 2018, covering 170 countries, World Economic Forum Global Competitiveness Index, Oct. 2018, 137 countries, and Organization for Economic Cooperation and Development's (OECD's) Program of International Student Assessment (PISA), 2015, 70 countries. Each of these 5 components is ranked and assigned a 20% weight. WGI is average of 6 governance components percentage rank and then ranked. Doing Business is Ease of Doing Business rank. WEF is WEF percentage rank. PISA is average score of Math, Reading, Science, ranked. Moody's Sovereign Rating assigns score of 95 and and below at 5 point intervals to 13 notch rating agency ranking, starting at AAA down to D.
On the quality of political institutions, the U.S. ranks 25th in the world on the World Bank Governance Indicators that assess how effective, clean and representative a country's institutions are – below Singapore, Canada and Germany and only higher than China in the countries covered in this article.[19] As noted above, when ranked solely on political freedom, the U.S. scores below Germany and Canada, but well above Singapore and China in the Freedom House assessment. Furthermore, U.S. democracy and politics scores have deteriorated in recent years.
On business climate and competitiveness, the U.S. compares more favorably. In the World Bank's "ease of doing business" assessment, the U.S. ranks 6th in the world, behind Singapore but better than Canada, Germany and China. On the World Economic Forum's Competitiveness Index – which assesses a country's capacity to deliver prosperity and productivity -- the U.S. is a standout, ranking number 1 in the world, just ahead of Singapore and Germany and well-ahead of Canada and China.
One caveat on U.S. performance in the WEF index: Although the index is comprehensive and useful, it suffers from two drawbacks that appear to favor U.S. performance: 1) the index rests heavily on the WEF's survey of over 16,000 business executives worldwide; and, 2) metrics are not forward-looking enough. While just under half of WEF components are the result of the executive survey, over 70 percent of the metrics where the U.S. scores strongest reflect the WEF survey of business leaders, rather than external data. For example, the WEF metrics on education and training rely heavily on the survey, rather than on the hard data of international student test results discussed in this article – which do not show U.S. students in the most favorable light.

The WEF rolled out a new competitiveness index in 2018 – tweaking the previous version in a way it feels better reflects the capacity for productivity gains in a more digital, data-driven world. Nevertheless, the WEF index is still centered heavily on indicators of current competitiveness – rather than fully reflecting drivers of future country success. The U.S. performs comparatively worse on drivers of future success – such as national savings, education outcomes, globalization, and good politics – not captured fully, nor adequately weighted, in the WEF index. That said, the current state of America's vibrant economy – large and efficient markets and an advanced economy with sophisticated businesses – is well-reflected in the index.[19]
On the creditworthiness of the national government – a key driver of country risk -- the U.S. federal government maintains the highest credit rating (AAA or equivalent) at Moody's and Fitch, two leading rating agencies, and a rating one notch worse at AA+ at Standard & Poor's. Singapore, Germany, and Canada, by contrast, possess AAA ratings (or equivalent) at all three major rating agencies. This difference reflects America's relatively high government debt to GDP ratio, as well sharp divisions among the two political parties over fiscal policy -- which resulted in government shutdowns and near-sovereign defaults during the last decade. With U.S. government deficits and debt rising, there is scope for further deterioration in America's sovereign credit ratings.
The U.S. scored lower than average among 35 OECD countries participating in the international PISA exams of high school students in 2015 -- the latest assessment date. The U.S. scored 470 in math, versus the OECD average of 490. Top-ranked Singapore scored 564, Canada 516, and Germany 506.
[20] The Country Risk Index -- like all indices -- is not the last word on country success, but it can help the analyst identify where a country needs to improve.
[21] By one measure of GDP (at market exchange rates), the U.S. is the largest economy and China the second largest; by another (at "purchasing power parity" or PPP), the U.S. is the second largest economy and China is the largest. At market exchange rates, U.S. GDP was $19.4 trillion in 2017 vs. China's $12 trillion. At PPP, China's 2017 GDP -- according to the IMF WEO in April 2018 -- was estimated at $23.2 trillion, making it a larger economy than the U.S. at $19.4 trillion (which is the baseline, so its GDP is not adjusted for purchasing power – all other countries' are). These calculations are impacted by exchange rates -- with a weakening of the U.S. dollar, U.S. per capita Gross Domestic Product (GDP, or output, calculated as the sum of all goods and services sold in the country in a year) would compare less favorably to other countries' GDP. Adjustment for "purchasing power parity" corrects for under- and over-valued exchange rates, but also price differences across countries – a haircut in China may not be priced as it is in the U.S. PPP estimates attempt to adjust exchange rates and prices so that internal and external purchasing power of currencies are equal. This adjustment by economists introduces potential human error. This text therefore tends to rely more on GDP at market exchange rates. That said, the PPP calculation suggests that the Chinese economy may in fact be larger than the U.S. economy in terms of the sheer volume of goods and services it produces. That is probably an accurate statement.
[22] Of course, strategic plans of different countries have different emphases on these objectives.
[23] Savings funding investment is an economic simplification – given the question, where is the dividing line between consumption and investment goods. But the concept is sound, in that, what we save can be invested in future economic growth – investment in a business, technology, education. One of the most indelible examples of such a financial buffer for the future is Norway's Sovereign Wealth Fund (SWF) – for Norwegians' future pensions. Norway, a small oil-rich nation - 5.3 million people, $396 billion in GDP, the third richest country in the world on per capita GDP at market rates after Luxembourg and Switzerland with ~$75,000 per person, ranked 6th best in this book's country risk rankings based on strong institutions, government finances, and business climate, though not ranking among the highest on education outcomes -- possesses the largest Sovereign Wealth Fund, a government-owned investment vehicle, that usually invests foreign exchange reserves offshore. Norway's SWF's assets at March 31, 2018 were valued at over $1 trillion (or 2.6x annual GDP). See Norges Bank Investment Management at https://www.nbim.no/en/the-fund/market-value/; and, https://www.swfinstitute.org/fund-rankings/; and, Yahoo Finance for currency quotes at https://finance.yahoo.com/quote/NOK=X?p=NOK=X. Financial buffers can be useful during an economic downturn, financial crisis, and coming shocks from climate change, as well as other unforeseen pressing needs. Savings are channeled to investment, whether into illiquid investment such as long term loans or fixed investment, or into liquid investment – securities – bank balances, stocks and bonds – which constitute a financial buffer and can be used immediately in a crisis.
[24] See IMF WEO, April 2019. See IMF Article IV Staff Reports for the U.S. (p. 4) and Germany (p. 41), 2018. These were projections for 2018, personal savings as a percentage of disposable income – which is income after taxes.

National savings consists of savings by the government, households and private firms. In the U.S. low savings are caused by government deficits (dissaving) and declining household savings relative to household's disposable income (income after taxes). Household savings as a percentage of DI have been in decline since the 1970s (from 10-12% of D.I. to below 7% in recent years. Larry Summers posited that advanced economies could be entering a period of secular stagnation because since the GFC savings rates have risen (due to concerns about inequality, saving against longer life expectancy, uncertainty about the future, and also affected by CA surpluses and higher FX reserve accumulation overseas, capital flight from China into advanced economies, household deleveraging). He also argued that investment rates were flagging, so that the neutral real interest rate was falling. So, monetary policy should not tighten and fiscal policy should be aggressive to replace the aggregate demand decline created by the lower consumption implied by higher savings rates. That's on the demand side, but it was also argued that lower investment affects the supply side – the stock of capital for long run economic growth. Bernanke critiques Summers conception by saying that low real interest rates will encourage investment. An IMF WP from June 2018 shows statistically that since 2013, the rise in household savings in the U.S. caused by the uncertainty, higher unemployment, negative wealth effects and lower income of the GFC, the household savings behavior has reverted back to its pre-2008 rates. See IMF WP 18/128 June 2018, "The U.S. Personal Savings Rate", by Ouliaris and Rochon, and Lawrence Summers, Business Economics. Vol. 49, No. 2, "U.S. Economic Prospects: Secular Stagnation, Hysteresis, and the Zero Lower Bound," Feb. 24, 2014, and Ben Bernanke at https://www.brookings.edu/blog/ben-bernanke/2015/03/31/why-are-interest-rates-so-low-part-2-secular-stagnation/. It his argued in this paper that the uncertainties created by higher debt levels – both of the U.S. government and the large negative Net International Investment Position created by borrowing abroad by all U.S. sectors, the lack of a financial cushion that low savings implies against unforeseen shocks – financial, political, demographic, etc., and the additional risk (and higher risk premia) caused by higher debt levels will deter investment, fund what investment is done on a riskier footing of debt, and limit resources available for education and training, R&D, innovation, infrastructure and other public investment, and capital deepening. These will be negative for long-run GDP growth. Higher national savings funding higher public and private investment – in people, technology and infrastructure – would be a better use of income and wealth (and borrowing) – than excessive consumption and excessive investment in dwellings by households.

[25] More value per worker. See Tim Cook comment from CNBC, Jan. 3, 2019 article: "If you look at the products that we are manufacturing, they're manufactured everywhere. We have significant content from US market, from Japan to Korean to many countries. Great content from China as well. There are many hands in the products, the vast majority of R&D is in the U.S.," he said according to a transcript of the call online… See article: https://www.cnbc.com/2019/01/03/tim-cook-on-china-after-revenue-forecast-slashed.html

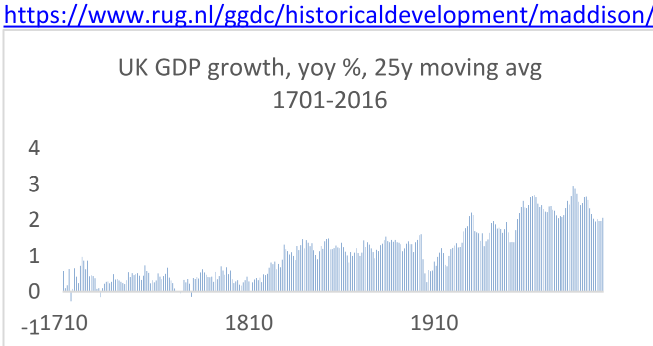
[26] PISA test is coordinated by the Organization for Economic Cooperation and Development (OECD), see OECD PISA 2015

[27] To be competitive in new technologies, such as blockchains, artificial intelligence (AI), neural networks, machine learning, biotechnology, e-commerce, energy storage and carbon capture technologies, and the as yet unknown next wave of innovation. See McKinsey Global Institute, Twenty-five Years of Digitization, May 2019, pp. 9-10: "The next wave of digitization is coming through new frontier technologies including general ledger technologies like blockchain, automation, and a large set of smart, artificial-intelligence (AI)- based technologies. Europe was a pioneer here with the first autonomous car, a German Mercedes; 35 percent of deep learning models were developed in Europe.28 However, Europe's leadership in this sphere appears to have been short-lived. China is already attracting 50 percent of global investment in AI startups according to CB insights, ahead of the United States. Europe's diffusion of AI lags behind that of the United States in domains such as advanced neuronal algorithms, and voice and video recognition tools; the only type of AI technology where Europe does not lag behind the United States is smart robotics." See McKinsey's Sustainability Blog, April-May 2019.
See Klaus Schwab, The Fourth Industrial Revolution.

[28] IMF study: "Trading With China: Productivity Gains, Job Losses," Working Paper, WP/17/122, JaeBin Ahn & Romain Duvall, May 2017. The 12% figure was that portion of the gain in Total Factor Productivity growth due to trade with China over the period studied for the median country-sector, that is of 18 advanced countries and 18 sectors (the countries included Australia, Austria, Canada, Czech Republic, Finland, France, Germany, Hungary, Ireland, Italy, Japan, Korea, Netherlands, Slovenia, Spain, Sweden, United Kingdom, United States of America. The period covered is from 1995 to 2007. Abstract: "We analyze the impact on productivity in advanced economies of fast-growing trade with China between the mid-1990s and late-2000s, separately identifying the export and import

channels. We use country-sector-level data for 18 advanced economies and, similar to Autor, Dorn, and Hanson (2013), exploit exogenous variation in trade with China in a given country-sector by instrumenting imports from (exports to) China in a given country-sector with the average imports from (exports to) China in the same sector in other advanced economies. Our estimates point to large productivity gains from trading with China—the (exogenous) rise of China in global trade may have increased the level of total factor productivity by about 1.9 percent, or 12.3 percent of the overall increase over the sample period, in the median country-sector. By contrast, using a similar empirical strategy, we find adverse employment effects of Chinese imports in exposed country-industries, consistent with previous studies. Taken together, these findings point to large gains from free trade, while underscoring the scope for a more active policy role in redistributing them, particularly by easing workers' transition between jobs and industries." This portion of growth in Total Factor Productivity (productivity increase due to innovation, rather than to adding more capital or labor) in the median country-sector (18 countries, 18 economic sectors), was due to trade with China. See pp. 1-5.
See Press release and full report, June 29, 2016, at https://www.usitc.gov/press_room/news_release/2016/er0629ll625.htm: "This group of agreements encompasses the Uruguay Round Agreements, the North American Free Trade Agreement (NAFTA – Canada and Mexico), and U.S. bilateral or regional trade agreements with Australia, Bahrain, Canada, Chile, Colombia, the Dominican Republic and five Central American countries (Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua), Israel, Jordan, Korea, Morocco, Oman, Panama, Peru, and Singapore." Full report and p. 127.

[29] See growth rates of per capita GDP rising with the Industrial Revolution and after: See the Maddison Project Database, Angus Maddison, University of Groningen, Groningnen Growth & Development Project, at https://www.rug.nl/ggdc/historicaldevelopment/maddison/releases/maddison-project-database-2018.



[30] Numerous examples throughout human history demonstrate this. Give examples – China, Japan. Burning the ships, etc. ISI, USSR etc. – more recently. Ian Morris.

[31] See Press release and full report, June 29, 2016, at https://www.usitc.gov/press_room/news_release/2016/er0629ll625.htm: "This group of agreements encompasses the Uruguay Round Agreements, the North American Free Trade Agreement (NAFTA – Canada and Mexico), and U.S. bilateral or regional trade agreements with Australia, Bahrain, Canada, Chile, Colombia, the Dominican Republic and five Central American countries (Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua), Israel, Jordan, Korea, Morocco, Oman, Panama, Peru, and Singapore." Full report and p. 127.

[32] During the 1930s, countries raised tariffs and devalued currencies. Trade collapsed, output contracted, unemployment soared, and the world went to war. An ominous trend today in the major players in the global economy – notably, the U.S. and China – is the effort to reverse the rationalization of production around the world by capturing more of global supply chains on-shore.
See "The WTO", Backgrounder by James McBride, September 12, 2016, at https://www.cfr.org/backgrounder/world-trade-organization-wto. "Perhaps the WTO's most successful attribute has been its trade dispute mechanism, a forum that has been used extensively over the past two decades, helping to avoid unilateral responses to disputes and potential trade wars. Since 1995, members have filed more than five hundred disputes with the WTO. Most of these are settled by consultations or mutual agreement before advancing to litigation. Upon joining, all members agree to a Dispute Settlement Mechanism (DSM) in which WTO-appointed trade experts can render a binding judgment. When one member files a complaint against another, the countries must first attempt to resolve the issue through consultation, and only if that fails is a panel chosen by the WTO's Dispute Settlement Body to hear the case. A panel ruling's recommendations, if not overturned on appeal, must be implemented by the offending

country. If a country fails to respond, the plaintiff can then take targeted retaliatory measures such as blocking imports or raising tariffs. The United States is the most active participant in the system, having filed 110 complaints and served as defendant in 126 cases. Since 2009, the Obama administration has filed twenty disputes, eleven of them against China, which quickly became a target for disputes after it joined the WTO in 2001. China has drawn thirty-six complaints, more than any other developing country. The United States, in particular, has used the WTO process to challenge Chinese government support for domestic industries, restrictions on imports, and other state-led trade policies. Eleven of the eighteen total U.S. complaints against China have been settled."

The use of tariffs to force countries to change trade policies In terms of getting tough on trade within a rules-based framework, the Obama administration brought 18 complaints against China to the World Trade Organization (WTO) – challenging Chinese government support of domestic industry – successfully resolving 11 of them. In fact, the U.S. has been the most active user of the WTO's Dispute Settlement Mechanism, filing 110 complaints from 1995-2016, about a fifth of all complaints filed and a bit less than the number filed against the U.S.

See Charles Kindleberger, "An Explanation of the 1929 Depression", in *The World in Depression* (1973); and, Robert Gilpin, *Global Political Economy*, 2001, chapters 1 and 4.

See US Dept. of Labor, Bureau of Labor Statistics, https://data.bls.gov/timeseries/LNS14000000, https://data.bls.gov/timeseries/LNS11300000, https://data.bls.gov/timeseries/LNS12032194, https://www.bls.gov/news.release/empsit.t01.htm.

By contrast, during periods of open markets and cooperation, economic growth has moved higher and democracy and peace have stood a better chance of success. See Thomas D. Lairson and David Skidmore, International Political Economy, The Struggle for Power and Wealth, Third Edition, 2003 Thomson Wadsworth, pp. 43-63; and, Joseph Stiglitz, Globalization and Its Discontents, 2002 W.W. Norton & Co., New York (and its forthcoming update, due out in 2017); and, Dani Rodrik, The Globalization Paradox: Democracy and the Future of the World Economy, 2011 W.W. Norton & Co., New York; and, and, Jagdish Bhagwati, In Defense of Globalization, 2007 Oxford University Press, New York. See Democratic peace theory – Immanuel Kant, Perpetual Peace, 1795; Michael W. Doyle, "Kant, Liberal Legacies and Foreign Affairs", 1983.

Sanders trade references. Justice Democrats, Democratic Socialists, Ocasio-Cortez etc. Sanders -- like Trump -- opposes most trade deals. Sanders -- not Trump -- led the initial assault on President Obama's signature trade initiative -- the Trans-Pacific Partnership (TPP). This was a regional deal with 11 other Pacific nations (excluding China), which economists forecast would have raised growth in U.S. GDP and exports, while favoring American labor by offering more gains to labor than to capital. All signatories to this deal stood to benefit, with the U.S. seen as likely to register gains in services (including financial, technology, and logistics services), communications (including data-driven industries), agriculture, and advanced manufactures (including electrical equipment), while increasing imports of other manufactures (e.g. autos, textiles, apparel) and energy. U.S. priorities -- including intellectual property protection -- were addressed in TPP.

Even more important -- this agreement would have put pressure on China to adhere to international rules, if it wanted to join the trade group in the future to avoid the trade diversion it would suffer due to the agreement.[32] This could have resulted in a leveling of the playing field with the world's second largest economy, notably in areas where China has been accused of cheating – intellectual property, government procurement, subsidies, and anti-trust. It could have reasserted American leadership in Asia of a group of countries pursuing a rules-based economic system. Instead, China is offering its own regional trade deal that excludes the U.S. and asserting leadership of Asia as the U.S. has stepped back from the region under Trump.

In spite of these potential gains, Bernie Sanders said: "Let's be clear: the TPP is much more than a 'free trade' agreement. It is part of a global race to the bottom to boost the profits of large corporations and Wall Street by outsourcing jobs; undercutting worker rights; dismantling labor, environmental, health, food safety and financial laws; and allowing corporations to challenge our laws in international tribunals rather than our own court system." Sanders has attacked international trade across the board. He claims that U.S. trade deals, "have forced American workers to compete against desperate and low-wage labor around the world. The result has been massive job losses in the United States and the shutting down of tens of thousands of factories. These corporately backed trade agreements have significantly contributed to the race to the bottom, the collapse of the American middle class and increased wealth and income inequality."

Bernie Sanders and his heirs just can't quit their negative animus toward corporations -- as responsible for the unbridled exploitation of people all over the world, rather than as a source of jobs, technology, competitiveness and prosperity. Reality – as is usually the case -- is somewhere in between, but certainly not the bogeyman Sanders and his allies conjure up. President Trump – for his part -- recognizing a winning issue when he sees one, even if it originates on the left -- withdrew the U.S. from TPP by executive order in his first full day of work on January 23, 2017, hailing his action as a "great thing for the American worker…" A year later, the other 11 Pacific nations -- including Canada and Singapore -- signed a modified version of TPP, covering just 14 percent of global GDP, instead of the 40 percent it would have covered with the U.S. TPP could have served as a the core of a global deal on trade liberalization, which would have served to jumpstart global economic growth.

Other successful politicians on the left of the Democratic Party – Bernie Sanders' heirs -- such as Alexandria Ocasio-Cortez who won an important primary election in New York City for the U.S. Congress in June 2018 and has helped energize the left – largely echo his populism. Ocasio-Cortez is a member of the Democratic Socialists of America, which advocates socialism – that is, public ownership of the means of production -- articulating a similar class warfare message to Sanders that seeks to "weaken the power of corporations". On the heels of her victory, she joined Sanders in the summer of 2018 to campaign for "hard-left" Democratic primary candidates around the country. There is a good deal of energy bubbling up as you move further out on the American left – powered by both the resistance to Trump and the Sanders insurgency against Hillary Clinton in 2016. The notion that Mrs. Clinton's defeat against Trump represented the failure of the strategy of Democrats tacking to the center is a powerful recruitment tool. Launched in 2017, the Justice Democrats – a collection of Democratic candidates who pledge to adhere to Sanders' priorities and to not accept financing from corporations -- are part of this phenomenon. In the runup to her Democratic primary victory, Ocasio-Cortez was quoted as saying, "My opponent is the institutional Democratic Party." The Young Turks Network – a populist left news organization – is given credit for giving air time to her campaign, while mainstream media such as CNN barely noticed and were caught flat-footed. There are strong linkages among these groups on the far left, including leaders in common. These are the heirs to Bernie Sanders and many follow his brand of populism. There is no doubt some nuance among "progressives" – for example, Democratic nominee for Governor of Florida, Andrew Gillum, was endorsed by Sanders but has taken some independent decisions.

[33] "The consequences for trade-affected U.S. workers should not be ignored and policy efforts should focus on mitigating the downsides through training, temporary income support, and job search assistance (including through a broader deployment of the existing trade adjustment assistance program)," said the IMF in 2018. See IMF Article Staff Report for the United States, July 2018, p. 25

[34] See https://www.nga.org/about/. Common Core State Standards as of 2008 was sponsored by the National Governors Association and the Council of Chief State School Officers (CCSSO). See "Benchmarking for Success: Ensuring U.S. Students Receive a World-class Education," 2008, of the NGA, CCSSO and Achieve, Inc., a bipartisan, non-profit organization to raise educational standards. As of 2019, 41 states plus D.C. (out of 50 states plus 5 districts and commonwealths) voluntarily adopted the standards for math and English.

In Canada, education policy has been coordinated through the Council of Provincial Education Ministers. In Germany in 2004 state governments, through the Cultural Ministers Conference, approved reforms that included nation-wide education standards and testing of 3rd and 8th graders. Find Canada and Germany references in OECD PISA docs.

[35] See PBS special on the Roosevelts – FDR during WWII.

[36] Including intelligence, energy, and homeland security. See discussion of DARPA, and the ARPA model at https://www.nap.edu/catalog/24778/an-assessment-of-arpa-e. See also Thomas Oatley, *International Political Economy*, Fifth Edition, pp. 103-17 on semiconductors and aircraft. On the internet, see Washington, Nov. 4 2013, at https://www.washingtonpost.com/news/fact-checker/wp/2013/11/04/a-cautionary-tale-for-politicians-al-gore-and-the-invention-of-the-internet/?utm_term=.c6714bedbddf. See NBER paper, June 2018, at https://urldefense.proofpoint.com/v2/url?u=http-3A__papers.nber.org_tmp_61816-2Dw24674.pdf&d=DwIBAg&c=slrrB7dE8n7gBJbeO0g-IQ&r=kpd4vxPJx2HiXuhGIuTwFg&m=PZxPdza6UKo-KiMPn54HaVr8ennoJPNxv9I1fKhPgEQ&s=AuoowR-HZthnkuCOx8XhO8HnLM6RPiaK4-DKWgp3O_g&e=.

[37] SpaceX supplies cargo and crew at low cost to the International Space Station. See https://www.nasa.gov/commercial-orbital-transportation-services-cots; https://www.nasa.gov/content/nasa-releases-cots-final-report; https://www.spacex.com/; and, https://spacenews.com/nasa-will-pay-more-for-less-iss-cargo-under-new-commercial-contracts/

[38] See https://www.smithsonianmag.com/smart-news/when-detroit-was-arsenal-democracy-180962620/

[39] See Obama Dec. 2015 Paris press conference.

[40] Such as Artificial Intelligence (AI), autonomous vehicles, and medical diagnostics See "Industry 4.0, Smart Manufacturing for the Future" at http://www.gtai.de/GTAI/Content/EN/Invest/_SharedDocs/Downloads/GTAI/Brochures/Industries/industrie4.0-smart-manufacturing-for-the-future-en.pdf; and, National Industrial Strategy 2030, Germany Ministry of Economic Affairs, at https://www.bmwi.de/Redaktion/DE/Downloads/M-O/national-industrial-strategy-2030.pdf?__blob=publicationFile&v=4.

[41] Including IT, robotics, aerospace, maritime, transport, pharmaceuticals and medical technology. Called "Made in China 2025" plan -- see https://www.csis.org/analysis/made-china-2025. "…the plan highlights 10 priority sectors: 1) New advanced information technology; 2) Automated machine tools & robotics; 3) Aerospace and aeronautical equipment; 4) Maritime equipment and high-tech shipping; 5) Modern rail transport equipment; 6) New-energy vehicles and equipment; 7) Power equipment; 8) Agricultural equipment; 9) New materials; and 10) Biopharma and advanced medical products."

[42] See OECD PISA Country Note on Singapore, PISA 2015 High Performers, at http://www.oecd.org/pisa/PISA-2015-singapore.pdf. See https://www.economist.com/news/asia/21722865-city-states-success-offers-much-admire-little-emulate-how-foreigners-misunderstand. See https://www.gov.sg/microsites/future-economy/about-us/about-the-five-futures.

[43] IMF Article IV Staff Report on Canada, 2018, pp. 26-29

[44] Adam Smith -- the architect of free markets -- argued in *The Wealth of Nations* in 1776 for a government role in supplying public goods. Such as infrastructure (roads, bridges, harbors, etc.), education and training, the courts and police, national defense, regulation of industry, and monetary policy. See Adam Smith, *The Wealth of Nations*. Economist Jacob Viner listed Smith's public goods in 1928 – see http://www.economistsview.typepad.com/economistsview/2010/03/adam-smith-and-the-role-of-government.html.

Gilpin or other. Public goods involve non-rivalrous and non-excludable consumption. You don't compete with others to consume these goods, nor can you exclude them from consuming. A lighthouse or a public park are also examples. One ship's use of a lighthouse doesn't diminish the consumption of the lighthouse's service for other ships, nor can you exclude passing ships from seeing the light of the lighthouse. Similarly, one citizen's benefitting from national security does not diminish another's "consumption" of it, nor can you exclude another citizen from benefitting from national security. All citizens tend to benefit from public goods and services. Private entities cannot easily charge for use of these services – due the non-rivalrous and non-excludable nature of them – so the government steps in to provide it and all of society – including private firms – benefit. That is why they pay taxes to government. Equally, an well-educated population provides a skilled workforce. Private firms might train their individual workers, but none will adequately educate all citizens, even though a well-trained workforce benefits all firms. It can be argued that "social cohesion" – fostered by wealth redistribution that reduces inequality – is a public good that benefits everyone, even the wealthy who count on a low level of social conflict and smoothly functioning labor markets in order to generate wealth.

Oatley, pp. 28-29. "A public good is defined by two characteristics: non-excludability and non-rivalry. Non-excludability means that once the good has been supplied no one can be prevented from enjoying its benefits… Non-rivalry means that consumption by one individual does not diminish the quantity of the good available to others…Public goods are undersupplied relative to the value society places upon them. Undersupply is a result of a phenomenon called free riding. Free riding describes the situation in which individuals rely on others to pay for a public good." Because these goods are a value to society but undersupplied by the private sector, there is a role for government to provide these goods, funding this provision through broad taxation.

[45] Moody's, Standard & Poor's, and Fitch. Numbers of countries in each of the sub-rankings varies. The ranking that limits the number of countries most is the OECD PISA examinations of high school students which cover 71 countries. The World Bank WGI is the broadest group, covering 202 countries. The World Bank Doing Business survey covers 190 countries. The WEF covers 140 countries, and the rating agency sovereign ratings cover between 115 and 145 countries. Describe each of 5 scores. The inability of the U.S. government to strengthen its finances was a key factor in the decision of one major credit rating agency -- Standard and Poor's -- to downgrade its rating of U.S. government bonds below AAA, the best sovereign rating. Moody's maintains a Aaa and Fitch a AAA, the highest ratings in their ratings scales. Furthermore, U.S. debt is set to increase due to recent federal tax and spending decisions, while the country's institutional scores may not yet fully reflect the period since the election of

Donald Trump. A weakening of America's political institutions in recent years has shown up in the World Bank's governance rankings, which assess the quality of institutions that exercise authority in a country. The average U.S. ranking has slipped, now in the top 15% of countries, versus the top 6-8% for comparable advanced economies. Further deterioration is a concern. The deterioration in the U.S. democracy rank, called "Voice & Accountability", from in the top 9% (91% rank) to in the top 17% (83% rank), on a 3-year moving average basis from 2004 to 2016, obviously does not include any apparent deterioration in political participation and the freedoms of association, expression, and the press sustained since Donald Trump's assumption of the presidency.

See OECD PISA report (Program for International Student Assessment) for the U.S., 2015 (http://www.oecd.org/pisa/pisa-2015-United-States.pdf); and, TIMSS report for the U.S. (Trends in International Mathematics and Science Study (of the International Association for the Evaluation of Educational Achievement – IAE), 2015 (https://nces.ed.gov/pubs2017/2017002.pdf).

See S&P Global Ratings, Foreign Currency and Local Currency LT Issuer Credit rating of AA+ / Stable Outlook since August 5, 2011 (https://www.standardandpoors.com/en_US/web/guest/ratings/entity/-/org-details/sectorCode/SOV/entityId/108458). S&P Sovereign Ratings list August 2018 at https://www.capitaliq.com/CIQDotNet/CreditResearch/RenderArticle.aspx?articleId=2094866&SctArtId=460712&from=CM&nsl_code=LIME&sourceObjectId=10686413&sourceRevId=1&fee_ind=N&exp_date=20281001-19:20:54.

See Fitch Ratings, Sovereign Data Comparator, June 2018, Private Credit / GDP plus Gross General Government Debt / GDP, and Federal Reserve – Financial Accounts of the United States, Z.1. Fitch Sovereign Ratings list, Dec 2018 at https://www.fitchratings.com/site/search?request=&content=entity&filter=MARKET%20SECTOR%5ESovereigns%20%26%20Supranationals%5ESovereigns#page=4.

Details follow in the text on U.S. tax and spending initiatives since President Trump took office. An estimate of the impact on U.S. government deficits of and debt of tax and spending decisions made in 2017-18 is approximately $7 trillion. U.S. national savings and negative net international investment position could deteriorate as a result as well.

See Moody's Sovereign Ratings List Dec. 2018 at https://www.moodys.com/research/Sovereign-Supranational-Rating-List--PBC_186519.

Country Risk Ranking is as follows: SINGAPORE, HONG KONG, NEW ZEALAND, FINLAND, CANADA, NORWAY, GERMANY, DENMARK, SWITZERLAND, NETHERLANDS, SWEDEN, TAIWAN, AUSTRALIA, JAPAN, UNITED STATES, UNITED KINGDOM, KOREA, REP., ESTONIA, AUSTRIA, BELGIUM, FRANCE, LUXEMBOURG, IRELAND, POLAND, ICELAND, CZECH REPUBLIC, SLOVENIA, UNITED ARAB EMIRATES, LITHUANIA, ISRAEL, SPAIN, PORTUGAL, LATVIA, CHILE, CHINA, MALAYSIA, SLOVAK REPUBLIC, ITALY, MALTA, QATAR, HUNGARY, BULGARIA, THAILAND, RUSSIAN FEDERATION, CROATIA, ROMANIA, COSTA RICA, GEORGIA, VIETNAM, CYPRUS, URUGUAY, KAZAKHSTAN, MEXICO, TURKEY, INDONESIA, PERU, COLOMBIA, MONTENEGRO, GREECE, TRINIDAD AND TOBAGO, ALBANIA, JORDAN, MOLDOVA, ARGENTINA, BRAZIL, TUNISIA, DOMINICAN REPUBLIC, LEBANON. 5 components are used – World Bank World Governance Indicators, Oct. 2018, covering 170 countries; World Bank Doing Business Rankings, Oct. 2018, covering 170 countries, World Economic Forum Global Competitiveness Index, Oct. 2018, 137 countries, and Organization for Economic Cooperation and Development's (OECD's) Program of International Student Assessment (PISA), 2015, 70 countries. Each of these 5 components is ranked and assigned a 20% weight. WGI is average of 6 governance components percentage rank and then ranked. Doing Business is Ease of Doing Business rank. WEF is WEF percentage rank. PISA is average score of Math, Reading, Science, ranked. Moody's Sovereign Rating assigns score of 95 and and below at 5 point intervals to 13 notch rating agency ranking, starting at AAA down to D.

On the quality of political institutions, the U.S. ranks 25th in the world on the World Bank Governance Indicators that assess how effective, clean and representative a country's institutions are – below Singapore, Canada and Germany and only higher than China in the countries covered in this article.[45] As noted above, when ranked solely on political freedom, the U.S. scores below Germany and Canada, but well above Singapore and China in the Freedom House assessment. Furthermore, U.S. democracy and politics scores have deteriorated in recent years. On business climate and competitiveness, the U.S. compares more favorably. In the World Bank's "ease of doing business" assessment, the U.S. ranks 6th in the world, behind Singapore but better than Canada, Germany and China. On the World Economic Forum's Competitiveness Index – which assesses a country's capacity to deliver prosperity and productivity -- the U.S. is a standout, ranking number 1 in the world, just ahead of Singapore and Germany and well-ahead of Canada and China.

One caveat on U.S. performance in the WEF index: Although the index is comprehensive and useful, it suffers from two drawbacks that appear to favor U.S. performance: 1) the index rests heavily on the WEF's survey of over 16,000 business executives worldwide; and, 2) metrics are not forward-looking enough. While just under half of WEF components are the result of the executive survey, over 70 percent of the metrics where the U.S. scores strongest reflect the WEF survey of business leaders, rather than external data. For example, the WEF metrics on education and training rely heavily on the survey, rather than on the hard data of international student test results discussed in this article – which do not show U.S. students in the most favorable light.

The WEF rolled out a new competitiveness index in 2018 – tweaking the previous version in a way it feels better reflects the capacity for productivity gains in a more digital, data-driven world. Nevertheless, the WEF index is still centered heavily on indicators of current competitiveness – rather than fully reflecting drivers of future country success. The U.S. performs comparatively worse on drivers of future success – such as national savings, education outcomes, globalization, and good politics – not captured fully, nor adequately weighted, in the WEF index. That said, the current state of America's vibrant economy – large and efficient markets and an advanced economy with sophisticated businesses – is well-reflected in the index.[45]

On the creditworthiness of the national government – a key driver of country risk -- the U.S. federal government maintains the highest credit rating (AAA or equivalent) at Moody's and Fitch, two leading rating agencies, and a rating one notch worse at AA+ at Standard & Poor's. Singapore, Germany, and Canada, by contrast, possess AAA ratings (or equivalent) at all three major rating agencies. This difference reflects America's relatively high government debt to GDP ratio, as well sharp divisions among the two political parties over fiscal policy -- which resulted in government shutdowns and near-sovereign defaults during the last decade. With U.S. government deficits and debt rising, there is scope for further deterioration in America's sovereign credit ratings.

The U.S. scored lower than average among 35 OECD countries participating in the international PISA exams of high school students in 2015 -- the latest assessment date. The U.S. scored 470 in math, versus the OECD average of 490. Top-ranked Singapore scored 564, Canada 516, and Germany 506.

[46] Country risk and sovereign credit risk measures and models are aplenty – in rating agencies, in banks, in subscription services such as the Economist Intelligence Unit, Roubini, IHS Global. This is not an exhaustive list. Eurasia Group also produces indices, but generally specializes in the sub-category of country risk called political risk. Many of these indices and models draw on indices from the World Bank and other sources.

This book's index of country risk is not the last word on country risk. Despite what some purveyors of indices might say in sales pitches, an index is an index, which provides a guide to, not a final grade on, a subject such as country risk. You can slice and dice data and come up with different results, but that does not change the basic message about the U.S. coming out of this scoring exercise – that below-average education outcomes, a modest deterioration of institutions and politics, and high debt and low savings indicate a rising level of country risk and raise concerns about the country's capacity to map a course to success. Define WB, OECD, IMF, WEF, rating agencies.

[47] Other country indices focus on other deliverables for stakeholders depending on the user's needs – e.g. portfolio investors concerned with market risk, returns; FDI investors in long-term fixed assets such as in the power sector concerned about expropriation, taxation, regulation. Companies building up cash in foreign banks concerned about capital and exchange controls, etc.

[48] See TIMSS report for the U.S. (Trends in International Mathematics and Science Study (of the International Association for the Evaluation of Educational Achievement – IAE), 2015 (https://nces.ed.gov/pubs2017/2017002.pdf). U.S. NSF comment on TIMSS and PISA: "TIMSS and PISA give different impressions of the United States' standing relative to other countries, with TIMSS results placing the United States in a higher relative position compared with PISA. This disparity can be traced, in part, to differences in the design and purpose of the assessments. TIMSS focuses on academic content, whereas PISA is designed to measure students' ability to apply their mathematics and science knowledge to real-world situations. The two tests also vary in other fundamental ways, including age of the students tested and number of participating nations, making direct comparisons difficult." On p. 1-29 of the 2018 NSF report, TIMSS approach is compared to PISA's: "Two international assessments—the Trends in International Mathematics and Science Study (TIMSS) and the Program for International Student Assessment (PISA)—compare U.S. students' achievement in mathematics and science with that of students in other countries. TIMSS and PISA give different impressions of the United States' standing relative to other countries, with TIMSS results placing the United States in a higher relative position compared with PISA. This disparity can be traced, in part, to differences in the design and purpose of the

assessments. TIMSS focuses on academic content, whereas PISA is designed to measure students' ability to apply their mathematics and science knowledge to real-world situations. The two tests also vary in other fundamental ways, including age of the students tested and number of participating nations, making direct comparisons difficult. TIMSS and PISA have sampling requirements to ensure that student populations are similar across countries and report when countries do not meet these guidelines. TIMSS and PISA samples include students from public and private schools in the United States. This section presents an overview of each assessment, examines longterm trends in performance on both assessments, and provides a detailed look at the latest data from 2015. The Trends in International Mathematics and Science Study TIMSS includes two assessments: TIMSS for students in grades 4 and 8 and TIMSS Advanced for students in their final year of high school. First conducted in 1995, TIMSS assesses the mathematics and science performance of fourth and eighth graders every 4 years. Since its inception, TIMSS has been administered six times, most recently in 2015, when 20,000 fourth and eighth grade students in approximately 500 schools across the United States participated (Provasnik et al. 2016).[4] TIMSS Advanced was administered in 1995, 2008, and 2015. It is designed to assess the advanced mathematics and physics achievement of students in their final year of high school who are taking or have taken advanced courses.[5] The United States participated in the 1995 and 2015 administrations."

For National Assessment of Educational Progress (NAEP), see https://nces.ed.gov/nationsreportcard/about/: "The National Assessment of Educational Progress (NAEP) is the largest nationally representative and continuing assessment of what America's students know and can do in various subject areas. Assessments are conducted periodically in mathematics, reading, science, writing, the arts, civics, economics, geography,U.S. history, and in Technology and Engineering Literacy (TEL). In 2017, NAEP began administering digitally based assessments (DBA) for mathematics, reading, and writing, with additional subjects to be added in 2018 and 2019."

For 2017 results for 4th and 8th graders see https://www.nationsreportcard.gov/reading_math_2017_highlights/.

For NAEP alignment with international assessments, see https://nces.ed.gov/nationsreportcard/about/international.aspx.

The next OECD PISA results (for 2018) are due to be released in late 2019.

[49] Canada and Germany had democracy scores of 99 and 94 respectively (100 being the best possible score). See 2018 report at https://freedomhouse.org/report/freedom-world/2018/united-states: "The United States' political rights rating declined from 1 to 2 due to growing evidence of Russian interference in the 2016 elections, violations of basic ethical standards by the new administration, and a reduction in government transparency."The 2018 scores were maintained in Freedom House's 2019 report: https://freedomhouse.org/report/freedom-world/freedom-world-2019/map: "…in recent years its democratic institutions have suffered erosion, as reflected in partisan manipulation of the electoral process, bias and dysfunction in the criminal justice system, flawed new policies on immigration and asylum seekers, and growing disparities in wealth, economic opportunity, and political influence."

[50] See WEF's GCI, 2018. The U.S. had 5.4 intentional homicides per 100k population reported in the 2018 report that draws on data from the U.N. Office of Drugs and Crime, vs. Japan's #1 ranking with 0.3 homicides, Singapore ranked #3, Canada ranked #54, Germany #38, and China #15.

[51] These ten with three AAA sovereign ratings at Fitch, S&P and Moody's are: Australia, Canada, Denmark, Germany, Luxembourg, the Netherlands, Norway, Singapore, Sweden, and Switzerland. S&P also rates Liechtenstein AAA, while the other agencies do not rate this sovereign. S&P rates the U.S. AA+. Moody's also rates New Zealand Aaa (Moody's equivalent of AAA), whereas the other two agencies rate it AA, a two-notch difference.. , See S&P Global Ratings, Foreign Currency and Local Currency LT Issuer Credit rating of AA+ / Stable Outlook since August 5, 2011 (https://www.standardandpoors.com/en_US/web/guest/ratings/entity/-/org-details/sectorCode/SOV/entityId/108458). S&P Sovereign Ratings list August 2018 at https://www.capitaliq.com/CIQDotNet/CreditResearch/RenderArticle.aspx?articleId=2094866&SctArtId=460712&from=CM&nsl_code=LIME&sourceObjectId=10686413&sourceRevId=1&fee_ind=N&exp_date=20281001-19:20:54. See Fitch Ratings, Sovereign Data Comparator, June 2018, Private Credit / GDP plus Gross General Government Debt / GDP, and Federal Reserve – Financial Accounts of the United States, Z.1. Fitch Sovereign Ratings list, Dec 2018 at https://www.fitchratings.com/site/search?request=&content=entity&filter=MARKET%20SECTOR%5ESovereigns%20%26%20Supranationals%5ESovereigns#page=4. See Moody's Sovereign Ratings List Dec. 2018 at https://www.moodys.com/research/Sovereign-Supranational-Rating-List--PBC_186519.

America's national savings ratio is forecast to decline further, buffeted by Republican tax cuts. Likewise, the policies advocated by Senator Bernie Sanders and his heirs on the populist left – notably, full government funding of health care (known as Medicare for All) and other spending plans -- would push government deficits higher and negatively impact the national savings ratio further.
Details follow in the text on U.S. tax and spending initiatives since President Trump took office. An estimate of the impact on U.S. government deficits of and debt of tax and spending decisions made in 2017-18 is approximately $7 trillion. U.S. national savings and negative net international investment position could deteriorate as a result as well.
Trump D/GDP to 120% in next 10 years – IMF, Scher; Sanders 140% -- Romer and Romer and Tax Policy Center, Scher forecasts. Net government debt is an important concept. Canada's gross government debt in 2017 at 90% is relatively high, vs. 105% in the U.S. But, Canada's net debt is low at 28%, vs. the U.S.'s 79%, because of the large assets held for Canadian pensions (what is called Social Security in the U.S.). Further, the IMF estimates that with the U.S. unfunded pension liability – future Social Security payments that will require higher revenues – U.S. debt was higher than 124% of GDP. See p. 36 of the IMF Article IV Staff Report on the U.S. 2018. With these liabilities and Sanders' proposals in ten years, U.S. government debt to GDP could approach 155-160% of GDP, not far below Greece's 180% of GDP, and that country recently defaulted on its government debt.

[52] For business climate and economic competitiveness, the U.S. scores quite well: World Bank Doing Business ranking of 94%; World Economic Forum's (WEF) Competitiveness ranking of 97%. As discussed below, in terms of income distribution, inequality has increased lately in the U.S. and does not compare well with indicators of more equal societies. However, given the level of wealth in the U.S. and the history of progressive public policy and social development, such as the advent of labor unions and collective bargaining, the New Deal and Great Society social welfare programs, albeit reflecting a welfare state not as generous in other advanced countries, and given America's sizable middle class, one has to consider that one of America's successes, over the long sweep of history, has been the broad distribution of the country's high level of wealth. That said, with inequality rising and consequent social stresses emerging, this is not a laurel the U.S. can rest on. World wars, social revolutions, sovereign defaults and economic collapse, hyperinflations, etc.

[53] The current account of the balance of payments can be considered the "broad" trade balance, in that it includes exports and imports of goods and services, current income such as profits and interest, workers' remittances (wage earnings of workers sent abroad) and other current credits and debits, but not capital and financial flows such as borrowing and equity investment. Singapore also has a positive Net International Investment Position (NIIP) of nearly 250% -- making the country a large net creditor. The NIIP can be defined as resident holdings of foreign assets (including debt and equity) less non-resident holdings of domestic assets. A positive NIIP generally means the country is a net creditor to the world; an negative NIIP, as the U.S. has, means the country is a debtor to the rest of the world. Discuss pc income at market exchange rates and PPP, which is higher for Singapore at $80k.

[54] Singapore's ranking in index subcomponents were as follows: World Bank's World Governance Indicators – 18th; World Bank's Doing Business – 2nd; Sovereign credit rating it is among the top 10 countries with three AAA ratings; World Economic Forum's Global Competitiveness Index – 2nd; and, OECD PISA exams 2015 – 1st. Within the World Bank Governance Indicators, Singapore is ranked a poor 118th out of 202 countries for "Voice and Accountability", a measure of political participation and civil liberties.

[55] As is found in the U.S. House of Representatives, where the Republican Freedom Caucus can stop compromise legislation.

[56] Singapore does not regularly publish the balances of its Government Investment Corporation and Temasek holdings. These sovereign assets plus the CPF are estimated in a range of $590 bln to over $1 trillion. When these are subtracted from gross debt of 111% of GDP, Singapore has net general government debt of *negative* 72% - *negative* 208% of GDP! Singapore's economy-wide debt net of government assets could be as low as 14% of GDP. See Singapore chapter below. This comparison of gross debt is inaccurate as it overstates the government debt problem for some countries – especially for Singapore. Singapore runs budget surpluses year after year, so does not need to borrow, but issues debt in order to fully fund pensions and other items (social security) for Singaporean retirees and families. Also Singapore's budgetary surpluses year after year have resulted in large holdings of assets in government-owned Sovereign Wealth Funds (SWFs), which invest in overseas assets. As a result, Singapore's government debt net of assets is negative, indicating that government financial assets exceed debt by a large amount. The Singapore government's debt issuance is done as well to provide a benchmark in the financial markets for corporate bond issuance. Singapore does not regularly publish the balances of its

Government Investment Corporation and Temasek holdings. These sovereign assets plus the CPF are estimated in a range of $590 bln to over $1 trillion. When these are subtracted from gross debt of 111% of GDP, Singapore has net general government debt of *negative* 72% - 208% of GDP! See Singapore chapter below. Some analysts estimate an additional 20-30 percent of GDP in debt in China due to the so-called "shadow banking sector". See Fitch etc.

[57] See IMF Article IV Staff Reports on Singapore and the U.S., 2018, in addition to the same for Canada and Germany, and U.S. Congressional Budget Office (CBO) reports. Singapore's central government tax burden is only a little bit lower than America's. Singapore pulls in an estimated 14.5 percent of GDP in taxes, and the U.S. federal government about 16.5 percent (including social contributions such as Social Security and Medicare). Singapore's central government spends about 18 percent of GDP, but does not run a deficit because it has enormous investment income every year of an estimated 16 percent of GDP. This is because Singapore has run budget surpluses year after year and therefore has significant investment holdings. The U.S. federal government spends about 21 percent of GDP, running large deficits because it does not have such investment income. Furthermore, technically U.S. federal taxes are under 10% of GDP (mostly income taxes), whereas social contributions, such as Social Security and Medicare, total about 6% of GDP. Singapore, on the other hand, has a fully-funded pension plan and health savings accounts – based on mandatory household savings designed to avoid the disincentives to work of entitlement programs. These funds are drawn from wages – a percentage paid by workers, and a percentage paid by employers – and placed in the Central Provident Fund, a statutory board separate from the treasury. The U.S. by contrast funds social security and health care payments on a pay as you go basis, largely out of current contributions to the U.S. Treasury. Statutory boards include the Housing and Development Board, the Central Provident Fund, the Port of Singapore Authority, the Industrial Training Board, the Family Planning and Population Board, and the Singapore Muslim Religious Council (Majlis Ugama Islam Singapura), and are generally self-financing. So, the contribution to the Central Provident Fund – in addition to taxes – represents a higher overall tax burden in Singapore than U.S. federal taxes. However, as a large complex economy, the U.S. government sector doesn't stop at the federal government. Additional taxes and spending occur at the state and local government level, so that what is called general government revenues (including taxes) totals an estimated 31 percent of GDP, lower than Canada's 39 percent and Germany's 45 percent. So, the U.S. has a lower tax burden than these countries – though perhaps in line with Singapore's when all charges are considered. However, U.S. government spending is not much lower than Canada's and Germany's at an estimated 37 percent of GDP, vs. Canada's 40 percent and Germany's 44 percent – resulting in enormous U.S. budget deficits. On statutory boards, see IMF Art. VI Report for Singapore, 2018, p. 18, and http://countrystudies.us/singapore/47.htm. On raising the Goods and Services Tax (GST) against the recommendations of the IMF in order to fund health care – see IMF Art. IV Report on Singapore, 2018, p. 18.

On trends in U.S. Social Security and Medicare Trust funds see CPBB at https://www.cbpp.org/research/social-security/policy-basics-understanding-the-social-security-trust-funds, and https://www.cbpp.org/research/health/medicare-is-not-bankrupt. And, trust fund reports at https://www.ssa.gov/oact/TR/2017/tr2017.pdf, and

[58] Insert reference. Explain difference between PISA and TIMSS.

[59] The three ahead of Singapore are Korea, Hong Kong and Japan. The U.S. is ranked 27th, Canada 34th, Germany 31st, and China 26th. See WEF, 2018, pp. 39, 616-17, and 636. ICT adoption, which reflects the degree of diffusion of information and communications technologies (ICTs) throughout society, includes metrics on mobile voice and data subscriptions, high-speed internet including fiber optic subscriptions and internet users in the population. According to the WEF: "ICTs reduce transaction costs and speed up information and idea exchange, improving efficiency and sparking innovation. As ICTs are general purpose technologies increasingly embedded in the structure of the economy, they are becoming as necessary as power and transport infrastructure for all economies." It may be easier for smaller urban countries such as Hong Kong and Singapore to connect their populations. That said, large countries that include rural areas, such as Japan and Korea, are highly ranked on ICT adoption. There is work to be done on this matter – and a role for government in connecting disadvantaged citizens – in the U.S., Canada and Germany.

[60] See OECD PISA Country Note on Singapore, PISA 2015 High Performers, at http://www.oecd.org/pisa/PISA-2015-singapore.pdf. See https://www.economist.com/news/asia/21722865-city-states-success-offers-much-admire-little-emulate-how-foreigners-misunderstand. See https://www.gov.sg/microsites/future-economy/about-

us/about-the-five-futures. Singapore's Future Economy initiatives has sub-committees on corporate capabilities, growth industries and markets, connectivity, urban issues, and jobs and skills.

[61] A lower level of risk-taking and entrepreneurship could be due in part to a lower degree of individualism tolerated in Singapore's political culture. Likewise, given its small domestic market and lack of control over global supply chains, Singapore needs to "scale up" in order to compete – developing linkages to people and companies worldwide.See World Economic Forum's Global Competitiveness Report 2018, OECD MFP (multifactor or total factor productivity growth) figures and Singstat MFP figures. Singapore's recent productivity figures reflect this innovation challenge. Economic growth due to innovation -- what economists call "total factor productivity growth" (TFP) -- fell to an average of 0.1 percent per year in the ten years to 2016. This is below America's 0.5 percent and Germany's 0.6 percent per year. That looks particularly bad when considered against Singapore's 30-year average TFP growth rate of 1.4 percent -- versus the U.S.'s 0.9 percent and Germany's 1.1 percent. In fact, productivity growth due to innovation turned positive in Singapore in 2017 for the first time since 2011.That portion of GDP growth due to innovation (rather than to adding more labor or capital). TFP also called Multifactor Productivity growth (MFP). See OECD MFP figures, and Singstat MFP figures. See IMF WEO April 2018.

[62] List the 6 industry clusters. IBID – Report on FE, Feb. 2017; IMF Art IV 2017. Investment in intellectual property (IP) has risen markedly in recent years – by nearly 12 percent per year in the last ten years – much of it in technology and data-intensive sectors.E.g. in the computer and electronics manufacturing and the information and communication sectors. See IMF Art IV, 2018, Staff Report, pp. 7-8. And 23-27. See footnote: "The System of National Accounts, 2008, defines IPP capital stock as comprising research and development; mineral exploration and evaluation; computer software and databases; entertainment, literary and artistic originals; and other IPPs."

[63] See The Diplomat, Oct. 12, 2017, at https://thediplomat.com/2017/10/how-singapore-encourages-lifelong-learning-and-workforce-resilience/. See https://www.smartnation.sg/,
https://ash.harvard.edu/files/ash/files/282181_hvd_ash_paper_jj_woo.pdf,
https://www.skillsfuture.sg/AboutSkillsFuture#section5,
https://www.malaymail.com/news/world/2019/04/01/singapore-forms-committee-to-review-data-security-practices-across-the-publ/1738473.

[64]See World Bank WGI, "Voice and Accountability" is the term used for democracy, reflecting an assessment by survey participant's of a country's level of political participation and civil liberties.

Ranked 123rd by Freedom House of 195 countries. See Freedom House, Freedom in the World 2018, Singapore Report. In the subcategory of press freedom, Singapore was classified as "not free", as most media outlets are controlled by the government, though foreign news services and independent on-line content are becoming widely available.

See The Economist, December 22, 2018, Letters, "Singapore Responds". The government plans to pass a law allowing it to take action against on-line news sources that are seen as propagating "fake news" or falsehoods. See https://sg.news.yahoo.com/singapore-government-introduce-law-giving-082300373.html

[65] Resulting in the allocation of non-resident work permits being sharply reduced. See Government of Singapore at https://www.population.sg/population-trends/demographics. See BBC Country Profile May 2018:

"**2012** November - Singapore experiences its first strike since the 1980s. Chinese bus drivers walk out complaining their pay is lower than local or Malaysian drivers.

2013 May - Demonstrators hold an unusually large rally to protest against government plans to boost the population, mostly with foreign workers. **2013** December - A riot involving some 400 foreign workers breaks out following the death of an Indian migrant worker knocked down by a bus. It is the first rioting in Singapore in more than 30 years."

[66] See World Bank (data from Oak Ridge National Laboratory, Environmental Sciences Division, TN) at https://data.worldbank.org/indicator/en.atm.co2e.pc.

[67] Canada's provinces are responsible for much of Canada's public debt and nearly all of the deficit, vs. the federal government. This is the reserve of the case in the U.S. where the federal government, not the states and local governments, are responsible for the lion's share of debt and deficits. Nevertheless, in Canada, most provinces are seeking to improve their finances -- largely in line with a national consensus on fiscal policy. Large provinces are running operating surpluses or balance, though some like Alberta have seen this metric deteriorate. Provincial health care liabilities are forecast to rise, and with it, provincial debt. See IMF Article IV, 2018, pp. 12-13. Unlike in the U.S. where there is greater divergence among the states Kansas, Arkansas vs. Canada, NY. Canada's net general

government debt was only 28% of GDP in 2018, vs. a gross GG debt figure of 91%, the difference being GG assets, largely assets held against pension liabilities. The situation is much worse, especially at the net level, where net GG debt was 81% vs. gross GG debt of 106% in 2018.
Regarding the country's high level of private debt and property price appreciation, Canada's financial regulators have been vigilant. Household mortgages are partially insured by the government – which could put at risk the government's favorable financial profile. A sharp correction in property prices – in conjunction with higher unemployment -- could derail economic growth.

[68] Canada is ranked lower than the U.S. and the U.K. on business climate, and the U.S., Germany, Japan and the U.K. on competitiveness. Canada's ranking in index subcomponents were as follows: World Bank's World Governance Indicators (WGI) – 6th; World Bank's Doing Business rankings – 22nd; Sovereign credit rating it is among the top 10 countries with three AAA ratings; World Economic Forum's Global Competitiveness Index – 12th; and, OECD PISA exams 2015 – 7th. Among the ten largest economies in the world (U.S., China, Japan, Germany, the U.K., France, India, Italy, Brazil and Canada), Canada has the highest rank in the WGI; is only bested by the U.S. and U.K. in the Doing Business ranking; shares the distinction of three AAA ratings with only Germany; is bested in the WEF competitiveness ranking by the U.S. Germany, Japan and the U.K.; and, is bested by only Japan in the OECD PISA ranking.
Canada currently receives high marks for its parliamentary government, civil liberties, free press, rule of law and independent judiciary. Freedom House, Freedom in the World 2018. Canada scores a 99, on pint less than the best. This loss of a point for Canada is due to the continued, though reportedly diminishing, discrimination against indigenous peoples. Canada's 3 out of 4 score. Equal treatment before the law: "while the indigenous population comprises about 4 percent of Canada's population, they represent close to one-quarter of all inmates." Canada scores a 99, versus perfect scores of 100 in Sweden, Norway, and Finland, and an 86 in the U.S.

[69] This has included referenda for secession from French-speaking Quebec province that have thus far failed – the last occurring in 1995, where those supporting continuing union with Canada only garnered 50.6% of the vote. The victory of a new right-wing party in Quebec – Coalition Avenir Quebec – in Oct. 2018 on a platform of staying in Canada but reducing immigration levels to Quebec reduces the risk of a future Quebec secession. See The Guardian, Oct. 2 2018, at https://www.theguardian.com/world/2018/oct/02/quebec-election-results-caq-victory-francois-legault. Western provinces complain about climate change policies and equalization payments, and argue for greater control over their natural resources. Atlantic provinces argue for more resources to address their lower wealth levels. In the Canada case, you cannot rule out at some point in the future the tail risk of a break-up of the union, esp. involving Quebec.

[70] See https://www.macleans.ca/politics/ottawa/the-philpott-earthquake/. There is the potential – as in any country examining the extent of private "capture" of the state for profit – that if political meddling in prosecutions is given a pass, the country's reputation – and institutions – could suffer. See https://www.oecd.org/canada/oecd-will-follow-canadian-proceedings-addressing-allegations-of-political-interference-in-foreign-bribery-prosecution.htm: "11/03/2019 - The OECD Working Group on Bribery is concerned by recent allegations of interference in the prosecution of SNC-Lavalin that are subject to proceedings in the House of Commons Standing Committee on Justice and Human Rights. The Canadian engineering and construction group is the subject of an ongoing prosecution into allegations of the bribery of Libyan officials to obtain a Can$ 58-million contract to restore a water pipeline. As a Party to the Anti-Bribery Convention, Canada is fully committed to complying with the Convention, which requires prosecutorial independence in foreign bribery cases pursuant to Article 5. In addition, political factors such as a country's national economic interest and the identity of the alleged perpetrators must not influence foreign bribery investigations and prosecutions. In February 2019, two procedures were swiftly launched in Canada to respond to the allegations of political pressure. The Federal Conflict of Interest and Ethics Commission opened an investigation into potential violation of Canada's Conflict of Interest Act, and the Parliamentary Commons Justice Committee initiated a Parliamentary inquiry. The OECD Working Group on Bribery is encouraged by these processes, and notes that the Canadian authorities stress that they are transparent and independent. The Working Group recognises Canada's willingness to keep it fully informed of developments in the proceedings, including at its next meeting in June 2019. The OECD Working Group, which brings together the 44 Parties to the Anti-Bribery Convention, will closely monitor Canada's updates, and has also sent a letter to the Canadian authorities confirming its concerns and next steps in this matter. For further information, journalists are invited to contact Daisy Pelham of the OECD's Anti-Corruption's Division (+33 (0)1 45 24 90 81)."

See https://www.cbc.ca/news/canada/montreal/snc-lavalin-trial-corruption-bribery-1.5153429

[71] 2018-19 (by July 2019) witnessed the victory of a populist Conservative in Ontario's provincial election; the formation of breakaway right-wing party by a former Conservative politician; the victory in Quebec of a party based on reducing immigration; and, a lop-sided Conservative victory in energy-rich Alberta. See The Guardian, Oct. 2 2018, at https://www.theguardian.com/world/2018/oct/02/quebec-election-results-caq-victory-francois-legault, and The Economist, The World in 2019, p. 48, "Populism moves north". Coalition Avenir Quebec advocates reducing immigration to Quebec by 20 percent and tightening up language and values requirements. Allegations of flouting democratic norms surrounds the province of Ontario's populist premier – Doug Ford – elected in 2018

[72] Parliamentary government with first-past-the-post voting in single-member legislative districts (i.e. a majoritarian, rather than a proportional, system) fosters strong political parties. Voters in national elections tend to vote for the party of the prime minister they prefer, also empowering parties over individuals. The federal government deploys expenditures to impact policy in the provinces, such as through financing universal health care. U.S. dispersion is counterbalanced by rules that promote hold the federal structure together, including the electoral college and the U.S. Senate, allowing geographically dispersed regions a considerable voice in the federal government, rather than giving overwhelming dominance to highly populated states and cities in New York, CA and elsewhere.

[73] Add footnote on centrism of Scheer and capacity to withstand populism of the right. Scheer is as if Mitt Romney were the head of the GOP instead of Trump.

[74] Single member plurality is also called "first-past-the-post". Proportional systems usually produce more parties in the legislature, often weaker than the major parties in majoritarian systems. See https://www.vox.com/2016/10/27/13425702/why-american-elections-campaigns-last-so-long; and, See http://www.elections.ca/content.aspx?section=res&dir=ces&document=part1&lang=e#p11.

[75] See Canada, IMF Article IV, July 2017, p. 28; https://www.economist.com/news/americas/21730905-country-has-made-virtue-out-limited-resources-how-canadas-unique-research-culture-has. See OECD income distribution figures, including the 90/10 disposable income measure of 4.1 for Canada, vs. the U.S. ratio of 6.3 in 2016. This measure takes the income of the top 10% of income earners over the bottom 10%.

[76] See Japan OECD PISA 2015 report, p. 6

[77] In Japan, 0.2 percent of those taking the PISA tests were immigrants. See US OECD PISA 2015 report, p. 45 Including a high 37% in Ontario.

[78] See OECD PISA NOTE Ontario, 2010, p. 71 for a discussion of this policy in British Columbia.

[79] See OECD PISA Country Note United States 2015, pp. 44-57. U.S. federal education programs and court rulings since the civil rights legislation of the 1960s offset this imbalance with funds directed toward disadvantaged schools. See OECD PISA 2015 report.

[80] See US OECD PISA 2015 report, p. 12. Canada was comparable to U.S. in performance in TIMSS, which tests knowledge of the curriculum, versus the OECD PISA tests which test the application of this knowledge to real world cases. Moreover, PISA covers more countries. TIMSS tests 4th and 8th graders. In fact, U.S. performance was favorable at the 4th grade level, where American 4th graders outperformed those in both Canada and Germany. U.S. TIMSS performance compares less favorably at the 8th grade level, more aligned with Canada's (Germany is not tested in the 8th grade TIMSS). Furthermore, when combined with U.S. 10th graders' below average performance in the OECD PISA exams, it appears that the U.S. education system is failing its students as they progress in secondary school education.

Still, only half of 6th graders in Ontario met math standards in 2017, compared to over 80 percent for reading. See Globe and Mail, Jan. 2, 2018, Rohan Mahimker at https://www.theglobeandmail.com/report-on-business/careers/leadership-lab/addressing-canadas-tech-talent-shortage-with-an-innovative-approach/article37432734/.

Performance of U.S. and Canadian students was more closely aligned in another international test -- the TIMSS exercise -- though both countries still fell behind top-performing countries in East Asia in that assessment. See Highlights from TIMSS, 2015, pp. 6 and 18 (for 8th graders' performance in science and math). U.S. achieved average scores of 530 and 518 in science and math, vs. Canada's 526 and 527 respectively. Compare these results to the 2015 OECD PISA scores for 10th graders, where the U.S. achieved 496, 470 and 497 in science, math and reading, vs. Canada's 528, 516 and 527 respectively. Observers indicate that the TIMSS exercise emphasizes an assessment of students' knowledge of the required curriculum, whereas OECD PISA seeks to assess students' capacity to apply knowledge to real-world cases.

[81] Regarding lessons on education outcomes Canada, from the 2015 PISA report: "Canada is a federated system where education is a provincial responsibility. it is the only country in the developed world that does not have a federal department or ministry of education, though provinces collaborate closely through the Council of Provincial education ministers. Despite this, the country has achieved excellent standards in educational attainment across its ten provinces and three territories. Canada's largest province, Ontario, educates about 2 million public school students (or around 40% of the country's total), while Quebec (1.2 million), Alberta (612 000) and British Columbia (540 000) have the next largest public school student populations (statistics Canada, 2015). Ontario and British Columbia provide particularly interesting lessons for the United States, because these two provinces have initiated a series of reforms aimed at improving equity and excellence. Ontario is a high performer on PISA and has strong equity outcomes. This is particularly interesting given Ontario's high proportion of immigrant students: 37% of students who do the PISA assessment in Ontario are first-generation or second-generation immigrants. Starting in 2003, Ontario began a series of education reforms that have led to widespread positive results. In 2004, only 54% of students in grade 3 and grade 6 met provincial standards, and only 68% of high school students graduated within five years. In 2016, 72% of students in grade 3 and grade 6 are meeting provincial standards, and 86% of students are receiving their high school graduating certificate within 5 years. This systemwide turnaround in student achievement was driven by sustained reforms targeting teacher quality, school improvement planning and coherent leadership at the school, district and provincial level." "British Columbia has had close to two decades of work building the capacity of teachers and school leaders to deeply understand student learning. In 2000, British Columbia released Voluntary Performance Standards, which set in motion a greater focus on student learning progressions and formative assessment practices. The province also instituted specific policies to support immigrant and indigenous students. Both British Columbia and Ontario have emphasized systemic capacity building through inquiry-based collaborative networks which still exist today."
See OECD PISA Country Note United States 2015, pp. 44-57. Check this is the right source

[82] From OECD Education at a Glance, 2018: http://www.oecd.org/education/education-at-a-glance-2018-data-and-methodology.htm. US teacher salaries (with 15 years experience) relative to workers with comparable education in 2017 was 0.76, vs 1.18 in Canada, and 1.11 in Germany, 1.03 for the OECD average, and 0.96 for the EU22 average. Statutory salaries of teachers with 15 years of experience and most prevalent qualification, relative to earnings for full-time, full-year workers with tertiary education (ISCED 5 to 8), Upper secondary, general programmes.
See also p. 50 2015 PISA report: "One of the primary ways to recruit stronger teachers is to raise teacher salaries. higher teacher salaries (relative to those of similarly educated workers) are associated with higher teacher skills in numeracy and literacy (Hanushek, Piopiunik and Wiederhold, 2014). Canada, Germany and Hong Kong (China) ensure relatively high salaries for teachers. the ratio of salaries for lower secondary teachers (with typical training) after 15 years of experience to per capita GDP is 1.63 in Hong Kong (China), 1.53 in Germany and 1.50 in Canada, while the ratio is 1.16 in the United States." And, see NSF, "Science and Engineering Indicators 2018" at https://www.nsf.gov/statistics/2018/nsb20181/, p. 1-83: "Teachers' salaries are associated with the attractiveness of teaching as a profession. The relative earnings in teaching and nonteaching professions correlate with career choices, and there is less attrition among teachers with higher salaries (Feng 2014; Gilpin 2012; James et al. 2011; OECD 2005). The United States ranks low among developed countries with respect to the ratio of teachers' salaries to the salaries of other tertiary educated workers. For primary school teachers, the U.S. ranking is 20th of 23 countries. For lower and upper secondary school teachers, the United States is 21st of 23 countries."

[83] See https://www.ictc-ctic.ca/wp-content/uploads/2017/04/ICTC_Outlook-2021.pdf. This shortage is forecast to reach into the hundreds of thousands in the coming years.

[84] Increasing immigration restrictions in the U.S. under Trump could benefit Canada in filling tech vacancies. The favorables for foreign tech labor in Canada include a lower cost of living in Toronto and Montreal than in Silicon Valley, high-quality and low-cost health care, easier rules on permanent residency and spousal employment, shorter visa processing times, and a supportive government. See The Economist, Dec. 22 2018, p. 89
On the negative side, WEF GCI, 2018, Labor market, ease of hiring foreign labor rank was 81 out of 140 in Canada, a poor result these measures seek to address.

[85] The challenges of an aging population facing other nations, including Japan, Singapore, Germany and China – are less pronounced in Canada, such as eventual labor force contraction and rising dependency ratios.
Research suggests that views opposed to immigration are often underestimated in polls. See https://www.cbc.ca/news/politics/canadians-favour-limiting-immigration-1.5177814. See https://torontosun.com/opinion/columnists/lilley-poll-suggests-public-support-for-immigration-is-divided; and,

See IPSOS poll from Dec. 2018 at https://www.ipsos.com/en-ca/news-polls/canadians-nervous-about-impact-of-immigration-on-canada. See Leger and Angus Reid polls: https://www.scribd.com/presentation/348921795/Diversity, https://vancouversun.com/news/staff-blogs/what-do-canadians-think-about-immigration-levels-three-poll-results, http://angusreid.org/canadian-immigration-trend-data/. Leger found in 2017 that 38% of respondents surveyed thought immigration levels were too high (with higher percentages found in some western provinces), and 51% too low or about right. Angus Reid in 2018 found that 49% of respondents believe immigration levels should decrease – the highest percentage in over 40 years of surveys, while 37% said that immigration levels should stay the same or increase. The Liberal Party immigration plan may find itself out of whack with public opinion in the coming years. Research suggests that poll numbers might overstate positive attitudes on immigration. See https://www.jstor.org/stable/42956441?seq=1#page_scan_tab_contents. On the other hand, the polarization of politics and the media in the U.S. may well exaggerate attitudes on immigration not reflected in recent polls. A Gallup Poll in the US on immigration attitudes finds surprising results given the intensity of the debt – in 2018 28% percent of respondents said immigration should be increased from current levels, 29% said decreased, and 39% said maintained at current levels. Further, the percentage saying immigration should be increased has been rising in recent years, and the percentage for decreasing immigration falling. Polarization of political parties and the media would suggest that American attitudes were more at the extremes – than, say, nearly 40% in favor of current immigration levels.

More broadly, the level of diversity in terms of race, ethnicity, religion and national origin is considerable (and similar) in Canada and the U.S., relative to many other advanced economies, though the makeup is not the same. In terms of race, while they are both white majority countries, African-Americans form a higher proportion of the U.S. population, and Asians a higher proportion of the Canadian population. That said, political divisions by race appear to run deeper in the U.S. than in Canada -- due to history, political culture, rules and practices – and there are reports that bigotry is on the rise.

CIA Factbook, Canada and U.S., 2019. Most of the population of Canada is of European descent – nearly 50 percent with origins in the British Isles or Ireland, and another 30-40 percent from elsewhere in Europe – with Quebec containing much of the nearly 16 percent of the population that is of French extraction. There is also a substantial minority of indigenous Canadians, as well as of Chinese immigrants (both groups 4-5 percent of the population each). Racially, Canada is approximately 80% white, 3.5% black, 12% Asian, and 4.9% Native peoples. In the U.S. 72.4% are white, 12.6% African Americans, 4.8% Asian, 6.2% other, 0.9% Native American, and 2.9% more than one race. Of these U.S. totals 16.3% identify as Hispanic. Regarding religion, Canadians are mostly Christian – the largest group being Catholic (39%), then Prostant (20.3%) and other Christian (~8%); – with 23.9% claiming no religious affiliation, 3.2 percent of the population Muslim, and 4% other Asian religions (Hindu, Sikh, Buddhist). The U.S. balance is more towards Protestantism (46.5%), with Catholics at 20.8%, Mormons at 1.6%, Jewish at 1.9%, Muslim at 0.9%, and unaffiliated at 22.8%. Migration per 1000 population was 5.7 in Canada (18th highest in the world) and 3.9% in the U.S. (30th highest).

On the U.S. see Mickey, Levitsky and Way, Foreign Affairs, May 2017; and, The Globe and Mail, Oct. 22, 2018, Tavia Grant, https://www.theglobeandmail.com/news/national/cracks-in-the-narrative-confronting-the-harsh-truths-of-racism-in-canada/article32070545/.

See https://www.npr.org/2018/08/09/637230082/unite-the-right-rally-forced-charlottesville-to-rethink-town-s-racial-history; and, https://www.cnn.com/2018/10/28/us/pittsburgh-synagogue-shooting/index.html; and, https://www.cnn.com/2019/01/21/opinions/march-for-life-maga-hat-teens-native-american-protest-morson/index.html.

Freedom House, Freedom in the World 2018. Canada scores a 99, one point less than the best. This loss of a point for Canada is due to the continued, though reportedly diminishing, discrimination against indigenous peoples. Canada's 3 out of 4 score on F4. Equal treatment before the law: "while the indigenous population comprises about 4 percent of Canada's population, they represent close to one-quarter of all inmates." Canada scores a 99, versus perfect scores of 100 in Sweden, Norway, and Finland, and an 86 in the U.S.

Economic stress or the spread of xenophobia could alter Canada's traditionally more muted dynamic. This is why – with regard to immigration -- the IMF recommends that in Canada: "immigrant flows need to be carefully managed to maintain public support for the program." See IMF Article IV Staff Report, Canada, 2018, p. 27-29

[86] See http://www.chamber.ca/media/news-releases/Open_letter_from_200,000_businesses_to_all_party_leaders/

[87] Including reducing the list of exemptions for protected industries.The harmonization of provincial regulations was driven by Canada's free trade agreement with the European Union. Without reform, the agreement with the E.U. -- also signed in 2017 -- would have had the odd result of providing E.U. companies advantages over Canadian ones.
Including by dismantling trade barriers between the provinces See https://www.economist.com/news/americas/21720644-barriers-will-fall-slowly-canada-agrees-free-trade-itself. See IMF Article IV Staff Report on Canada, July 2017.
[88] Sectors that do so include electricity, air transport, retail, and professional services. IMF Article IV Staff Report on Canada, 2018. Professional services include accountancy, law, architecture, engineering, and IT services.
[89] Canada's per capita GDP at market exchange rates was $14.7k below the U.S. in 2017, only $11.4k below on a PPP basis. IMF Article IV Staff Report, on Canada, 2018, pp. 26 and 41; NAFTA, CRS Report, May 24, 2017, pp 23-24; and, OECD MFP data, showing Canada's multifactor productivity growth (growth due to innovation) only expanding 17.9% in the 30 years to 2016, vs. 29.4% in the U.S. and 36.8% in Germany.
Canada is ranked only 34th in the world on technology adoption -- vs. 27th for the U.S.
[90] Canada's hydrocarbon riches have had a negative impact on Canadian manufacturing. The Canadian dollar – which floats freely -- has appreciated in value when oil prices (and exports) have been rising, undermining the competitiveness of the non-oil sector. Unlike in the past, non-oil exports have not recovered when the Canadian dollar has weakened in line with lower oil prices, d
Trump's tax and trade policies are likely to deter investment in Canada as well, though Canada recently matched Trump's full expensing of investment in order to stay competitive. Canada's alignment with the U.S. economy – which takes three-quarters of its exports -- once viewed as an important asset – has become a potential liability.
[91] IMF Article IV 2018, pp. 16, 27-28; Dept of Finance, Canada, Budget 2018, Feb. 27, 2018. Economist, Mar 1, 2018, What Next for Canada's Economy
[92] Versus Silicon Valley research that has traditionally been silo-ed by company. See The Economist, Nov 4, 2917
A criticism of the Trudeau government's actions to promote competitiveness is that the complexity of these initiatives could hamper swift adoption. See https://www.macleans.ca/politics/ottawa/in-trudeauland-who-makes-all-the-decisions/.
[93] Oil producers, Alberta, Saskatchewan, and Manitoba, are supported by the new populist government in Ontario. See CBC, Nov. 30 2018. The Ontario Conservatives called Trudeau's plan an "intervention into inter-provincial rules and rights." See The Economist, The World In 2019, p. 48, "Populism moves north"; and CBC, CBC articles, Nov. 30 2018 and Oct 23 2018. See CBC articles, Nov. 30 2018 and Oct 23 2018. Carbon emissions #4 in the world on a per capita basis, #9 in absolute terms. See IMF report on Canada carbon pricing plan. IMF estimates that Canada will fall short of meeting 2030 goal of 30% reduction in greenhouse gas emission from 2005 levels, though the plan itself is robust. See The Economist, Dec 2018. See Maclean's at https://www.macleans.ca/politics/ottawa/canadas-carbon-fight-heats-up/.
Including a minimum carbon price of about US$38 per metric ton of CO2 released into the atmosphere Canada has also made a stringent pledge to reduce emissions as part of the Paris Climate Change Agreement of 2015. See Ian Parry, "What is Carbon Taxation?", IMF Finance & Development, June 2019, p.55
[94] Reflected in a World Bank Gini coefficient of 34 vs. the U.S.'s 41 – a higher value means a more unequal income distribution. See World Bank GINI coefficient (http://wdi.worldbank.org/table/1.3). Results given are for 2013, unless otherwise mentions. The U.S. score of 41 (higher means more income inequality) is up from 38 in 1986, and well above most advanced economies in the low-mid 30s, including Canada's 34, Germany's 31, and France's 33. In 2012, China's Gini coefficient was 42. "Gini index measures the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution. A Lorenz curve plots the cumulative percentages of total income received against the cumulative number of recipients, starting with the poorest individual or household. The Gini index measures the area between the Lorenz curve and a hypothetical line of absolute equality, expressed as a percentage of the maximum area under the line. Thus a Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality."
[95] Germany's ranking in index subcomponents were as follows: World Bank's World Governance Indicators – 15th; World Bank's Doing Business – 24th; Sovereign credit rating it is among the top 10 countries with three AAA ratings; World Economic Forum's Global Competitiveness Index – 3rd; and, OECD PISA exams 2015 – 12th.

As noted, the U.S. falls short of Germany most notably on education outcomes, sovereign creditworthiness, and the quality of democratic institutions. Japan falls well short on sovereign creditworthiness -- given an off-the-charts sovereign debt burden of 231% of GDP (though much lower net of assets and public sector cross-holdings, though still about as high as indebted Italy), and relatively low sovereign ratings of A+/A/A1 vs. Germany's AAA/AAA/Aaa and U.S.'s AA+/AAA/Aaa – and on business climate with a World Bank Ease of Doing Business percentile ranking of 79.4 (39/190 countries), vs. Germany's 87.4 and the U.S.'s very strong 95.8 – given heavy bureaucratic obstacles and challenges starting and running a business in Japan.

Kissinger, as quoted by Andreas Kluth, Handelsblatt, in The Economist, The World in 2019.

[96] Canada is the exception, but it is still less than half the size of Germany and falls short on competitiveness. With globalization in retreat and investor optimism about Europe waning, Germany's economy has begun to stall.

[97] Finanzausgleich are equalization payments, effectively transfers from rich to poor states in Germany (16 Länder), which involves the federal, state and local governments. It is not unlike similar equalization payments among the provinces in Canada. Although it causes some tension – especially dissatisfaction among the richer states – by reducing inequality it can facilitate social cohesion and unity within a federal system. See Economist, Feb. 9, p. 42: estimates that "finanzausgleich" transfers among the German states and localities totaled a large 12.4% of tax revenue in 2010.

[98] See OECD, https://data.oecd.org/inequality/income-inequality.htm#indicator-chart, latest available -- Germany, U.S. 2016.

[99] The tax code in the U.S. is actually more progressive than in Germany and in many other advanced economies. However, America's social spending falls short of peers. Because the U.S. has no value-added tax (VAT) – a tax on consumption deployed in many advanced economies -- the tax burden on the poor and middle class in the U.S. is actually lighter. U.S. states charge sales taxes, but they tend to be lower than other countries' VAT. The lower and middle classes tend to consume a higher proportion of their income than do wealthier classes; so, they pay a lot in VAT. Nevertheless, paltry anti-poverty programs in the U.S. more than offset this tax advantage.

[100] The poverty rate is the percentage of the population below 50% of the median household income in a country. The U.S. is on average a richer country than Germany in income terms – with German per capita GDP at about 85 percent of U.S. levels, so the poverty rate is a relative measure of inequality across countries. Those captured by the poverty rate in a poorer country will be poorer than those captured by the poverty rate in a richer country. See OECD Stats at https://stats.oecd.org/index.aspx?queryid=66670 for Germany's pre and post tax & transfers GINIs of 50 and 29 in 2015, and the U.S.'s 0f 51 and 39 in 2016. Canada's in 2016 was 43 and 31, respectively. China's in 2011 was 55 and 51, respectively. Singapore's post tax & transfers GINI was 35.6 in 2017, according to its Ministry of Finance, reported in Straits Times. Germany's poverty rate in 2015 pre-tax & transfers was 33.5%, post-tax & transfers was 10.1%, vs. U.S. in 2016 of 26.6% and 17.8%, respectively; Canada's in 2016 of 24.5% and 12.4%, respectively; and, China's in 2011 of 34.5% and 28.8%, respectively.

Definition of Gini index from the World Bank at https://datacatalog.worldbank.org/search?search_api_views_fulltext_op=AND&query=GINI&nid=&sort_by=search_api_relevance&sort_order=DESC: "**Gini** index measures the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution. A Lorenz curve plots the cumulative percentages of total income received against the cumulative number of recipients, starting with the poorest individual or household. The **Gini** index measures the area between the Lorenz curve and a hypothetical line of absolute equality, expressed as a percentage of the maximum area under the line. Thus a **Gini** index of 0 represents perfect equality, while an index of 100 implies perfect inequality."

See OECD poverty rate definition at https://data.oecd.org/inequality/poverty-rate.htm: "The poverty rate is the ratio of the number of people (in a given age group) whose income falls below the poverty line; taken as half the median household income of the total population. It is also available by broad age group: child poverty (0-17 years old), working-age poverty and elderly poverty (66 year-olds or more). However, two countries with the same poverty rates may differ in terms of the relative income-level of the poor." U.S. median income is likely higher than Germany's however – the basis of the poverty rate calculation – given that per capita GDP in the U.S. was $62,518 (at both market and PPP exchange rates) forecast for 2018; Germany's per capita GDP at market exchange rates was $48,670 and at PPP $52,897; Canada's at market exchange rates was $46,733, and at PPP $49,936; and, Singapore's was $61,230 and $98,255, respectively. See IMF WEO, Oct. 2018.

See Economist, Nov. 25 2017, "Redistribution, For richer for poorer", p. 23. The U.S. tax code is not as "regressive" as other in advanced economies, because the U.S. lacks a high national value-added tax (VAT), a tax on consumption, as many countries have, though states and localities have less onerous sales taxes. But spending on the poor is much lower proportionally in the U.S. Medicaid, health care for the poor, the largest portion of the budget for the poor, would have been cut sharply in the coming years if the Obamacare "repeal and replace" plan of the Republican Party in 2017 passed, according to the Economist.
Germany spends about 24% of GDP on social benefits (including nearly 9% on pensions), while U.S. spending on social programs is considerably lower. See IMF Article IV, Germany, 2018 p. 40 and CBO, Federal Budget in 2017 An Infographic at https://www.cbo.gov/system/files?file=115th-congress-2017-2018/graphic/53624-fy17federalbudget.pdf. The U.S. spends 13.1% of GDP on federal entitlements, and states spend on social transfers as well, but the total falls well short of Germany's social transfers (total state and local government spending in the U.S. on all categories of spending is 15.1% of GDP). See IMF Article IV, U.S., 2018, p. 36.

[101] See WAPO at https://www.washingtonpost.com/news/wonk/wp/2015/10/07/these-political-scientists-may-have-discovered-the-real-reason-u-s-politics-are-a-disaster/?utm_term=.385d7ffa4e04; and, Hernan Winkler, "The Effect of Income Inequality on Political Polarization: Evidence from European Regions: 2002-2014" (hwinkler@worldbank.org); and, "Political Polarization and Income Inequality", Nolan McCarty (Columbia University), Keith T. Poole (University of Houston), and Howard Rosenthal (Princeton University). Get Bernie Sanders' quote on rigged economy.

[102] See http://www.oecd.org/eco/OECD-2015-The-future-of-productivity-book.pdf, and, Gabriela Ramos, OECD, OECD Yearbook 2016, at http://www.oecd.org/social/productivity-equality-nexus.htm. Other inequality studies – BLS, OECD, etc.
An economy can grow over the long run by adding capital and labor, or by using capital and labor better -- that is, by increasing productivity. Adding capital – i.e., plant and equipment – allows workers to produce more goods. Savings and investment drive increases in capital. Adding labor – more workers – also grows the economy. This can be achieved through immigration, a higher fertility rate, or policies that expand the labor force -- the latter achieved through gender pay equality and expanded child care, which can increase female labor participation, as well as through extending the working life of older workers through lifelong training. Other measures include lifelong training that allows older workers. Shares of labor and capital on GDP. Collective bargaining and trade unions to ensure labor gets a fair share of output.

[103] 0.4% and 0.8% per year in the five years to 2017 in the U.S. and Germany respectively. See OECD, Multifactor productivity growth, another name for TFP, at https://stats.oecd.org/Index.aspx?DataSetCode=PDB_GR. German TFP expanded 0.8%, 0.5%, and 1.1% per year in the 5y, 10y, and 30y to 2017; vs. U.S. figures of 0.4%, 0.5%, and 0.9%; Japan's 0.9%, 0.5%, and 0.9%; Canada's 0.9%, 0.5% and 0.6%; France's 0.4%, 0.1% and 0.7%; Italy's 0.3%, -0.3%, and 0.2%; and, Korea's 1.3%, 1.8%, and 3%, respectively. See OECD MFP figures through 2017. Improvement in education, poverty reduction and adequate health care, and greater R&D spending for process / product breakthroughs could improve innovation going forward. The U.S. BEA reports that TFP grew a strong 1% in 2018, though 2017 was revised down to 0.4% from 0.8%.
IMF Article IV Staff Report on Germany, July 2018, p. 11 shows a chart in which labor productivity from 2002-16 expanded significantly more in the U.S. than in Germany due largely to greater "capital deepening", but also to TFP which performed similarly over that period to Germany's which is not inconsistent with the OECD data discussed above (which was a source for the IMF chart). Capital deepening being so much higher is interesting, esp. since both countries have been investing 20-23% of GDP per year in recent years. It does point up an important point that there is scope for increased German investment in plant and equipment as well as infrastructure to enhance labor productivity.
See BLS article July 2018, Brill et al: https://www.bls.gov/opub/mlr/2018/article/multifactor-productivity-slowdown-in-us-manufacturing.htm "What is multifactor productivity? Multifactor productivity (MFP), also known as total factor productivity, relates the change in an industry's real output to the change in combined inputs used in producing that output. Multifactor productivity is related to the economic concept of a production function. A production function describes how firms optimally combine inputs (also known as factors of production) in order to produce output. Multifactor productivity is a quantifiable statistic that describes the change in the production function over time. The MFP statistic describes the efficiency gains (or losses) associated with growth (or decline) in output that is not a result of changes in measured inputs. Increases in MFP can result from improvements in

technology, improvements in managerial practices, reallocation of resources from sectors that are less productive to those which are more productive, and other unmeasured factors." See OECD MFP. Multifactor productivity growth (also called total factor productivity growth) is growth in productivity due to innovation not to adding more capital per worker. It results from better ways of doing things – i.e. innovation. MFP growth was only 1.7% in the US in the 5 years to 2016, vs. 2.8% in Canada and 3.5% in Germany.

[104] See WEF, Global Competitiveness Index, 2018. The second most competitive country was Singapore.

Per capita income growth – a measure of how rich a country's people are getting on average – has been about the same in both Germany and the U.S. – and better than in many peer countries.

In spite of its lower productivity growth, the U.S. economy has managed to expand faster than Germany's -- due largely to growth of the labor force. A relatively liberal policy on immigration, in conjunction with a higher fertility rate, have supported labor force expansion in the U.S. Except Canada on immigration, where net migration was 5.7 per 1000, vs 3.9 in the U.S., and Germany's 1.5 in 2017. See CIA Factbook. On fertility, according to the World Bank, the U.S. had 1.8 births per woman, vs. 1.6 in Canada and Germany's 1.5 in 2016. Per capita income is calculated as GDP divided by a country's population. Per capita income growth strips out the effect of population growth. With overall GDP growth averaging 2.5% per year in the U.S. in the 30 years to 2017, vs. 1.8% in Germany; and, population expanding on average 1% per year in the U.S. vs. 0.3% in Germany over that time frame; per capita GDP growth in real terms averaged 1.5% per year in both the U.S. and Germany. See IMF WEO, Oct. 2018 and the OECD's March 2019 economic update that reflected a worse than expected 2H18 in Germany, yielding 1.4% 2018 economic growth that year, vs. the IMF's previous estimate of 1.9%, vs. a U.S. outturn of 2.9%, driven by an irresponsible procyclical fiscal stimulus. In spite of similar per capita GDP growth in Germany and the U.S. in the 30 years to 2018, the U.S. is richer on average – in PPP terms, by ~$9,000, and in market exchange rate terms, ~$15,000 – in 2018, per capita income of ~$60,000 in the U.S., vs. Germany's ~$51,000 on a PPP basis, and ~$45,000 at market exchange rates.

Canada's GDP expanded 2.3% on average and population 1.1% on average, and per capita GDP growth 1.2% on average over that time frame. France's GDP grew 1.8% per year on average, population 0.5%, and per capita GDP growth 1.2% on average during that time period.

[105] That said, U.S. growth over 30 years has been more dynamic at 2.5% per year, vs. Germany's 1.8%. See IMF WEO Oct. 2018. That said, excessive taxation can stifle economic growth. This is evident in countries where the tax intake is exceptionally high – like in France, where it has reached 54 percent of GDP. Consequently, TFP growth and per capita GDP growth in France trend below what is achieved in both Germany and the U.S. Nevertheless, in the U.S., a high tax burden is not the problem – taxes are already low. Holding back growth are structural factors – namely, shortfalls in Savings, Education, and Exchange. In fact, too low of a tax intake impairs America's ability to provide important public goods – such as education, R&D and infrastructure. Investment in these public goods would raise economic growth over the long run.

[106] NIIP includes both debt and equity claims. Define NIIP. Explain in terms of flow from the CA balance. Equity and debt components. Movements with currencies and asset prices. The U.S. is a debtor nation on a net basis, because it owes more than it is owed. Define NIIP BEA etc. Q218. Besides Germany -- Singapore, Canada, and China all owe less than what the rest of the world owes them. Their NIIPs are positive – though not as large as Germany's. They are also creditor nations. The NIIP was positive in Japan (68 percent of GDP), Germany (58 percent), China (15 percent), and in Singapore (nearly 250 percent of GDP). See OECD and/or IMF Article IV reports.

[107] A sizable portion of what foreigners owe Germany includes claims the country has on its European partners, such as Italy and Spain. Repayment of these claims depends on the success of European integration, which would be at risk with a sudden exit of a major country from the Euro Area, which includes the 19 countries that have adopted the euro as their currency: Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Slovakia, Slovenia, and Spain. See https://ec.europa.eu/info/business-economy-euro/euro-area_en.

Germany's wellbeing is served by a strong Europe. Much needs to be done to reduce the risk of a destabilization of the euro that could occur through a sudden exit of one of the major participants. Germany needs to work with partner countries to: allocate more resources to common European funds that can support sovereign bond markets and banks in a crisis, as well as for ongoing investment and job creation in depressed regions; deepen existing E.U. institutions – to further banking, capital markets, fiscal and political union; allow greater policy diversity on migration and other issues to ease tensions; and, renew efforts by member governments to meet fiscal benchmarks, clean up weak banks, and enhance productivity. Greater political coordination between north

and south and east and west in Europe is likewise required to counter the forces of division. As evidenced in the Hanseatic League and the Visegrad Group Define Hanseatic League and Visegrad groups, see footnote 83etc.
[108] Totaling about 1 ¾ times GDP in Germany, versus 2 ½ times in the U.S. See IMF Article IV Staff Reports, U.S. Federal Reserve Flow of Funds Report, and especially IMF Global Debt Database 2018.
According to IMF Global Debt Database, which is a more comprehensive debt database, Germany's total debt (private, all instruments, plus government) was 211.5% of GDP in 2017, vs. the U.S. (307%); Canada (356.3%); the U.K. (316.9%); Japan (440.1%); France (335.7%); Italy (302.2%); Singapore's (277.7%); and, Korea (295.4%). These figures are in gross terms and don't take into account assets, which are very large in the case if Singapore, and substantial in the case of Canada's public sector. These figures also don't include the full public sector, and in the case of Singapore, the private sector includes only loans and securities, and not all instruments, as in other countries.
Thrift makes sense for Germany, given its sizable contingent liabilities – that is, financial responsibilities that could ultimately revert to the German government -- such as losses in partner European countries, health care and pension commitments, and any future cleanup of the country's unprofitable banks. Likewise, Germany -- with a highly open economy -- is vulnerable to negative external shocks such as from Brexit or a rise in protectionism.
When you look at debt for the wider economy – government plus households and firms – Germany looks favorable. Economy-wide debt totaled 156 percent of GDP in Germany, versus 233 percent for the U.S. in 2017 – and, no higher than 150 percent in Singapore, 247 percent in Canada, and an estimated 253 percent in China. These economy-wide debt figures are derived from net government debt plus gross debt of households and non-financial corporations.
Net government debt in 2017 was 78 percent of GDP for U.S., net of the U.S. Social Security and Medicare Trust Funds and other assets, 28 percent Canada (which has large pension fund assets at both the federal and provincial levels), Germany's 45 percent, and China's estimated 54 percent of GDP in net debt. China's government also holds large equity positions in state-owned enterprises which are not netted out in its net debt figure. U.S. gross GGD of 107% or 105.6% in 2017 doesn't net out the trust funds, such as $2.9 T in the SS trust fund. When that is netted out you get 101%. When other items are netted out, you get 82% per the IMF WEO, a difference of 19% of GDP. Fed flow of funds total economy wide debt of ~$49 T is 252%. Using net gen. govt debt, the total is 233%. In Singapore, government assets exceed government debt by 72-208% of GDP. Gross debt comparisons are as follows – Singapore 111% of GDP, Canada 90%, Germany 64%, and China 68% (see IMF WEO April 2018, and IMF Article IV reports 2018, especially China which uses an "augmented debt" calculation). Singapore does not regularly publish the balances of its Government Investment Corporation and Temasek holdings. These sovereign assets plus the CPF are estimated in a range of $590 bln to over $1 trillion. When these are subtracted from gross debt of 111% of GDP, Singapore has net general government debt of *negative* 72% - *negative* 208% of GDP! Singapore's economy-wide debt net of government assets could be as low as 14% of GDP. This comparison of gross government debt is inaccurate as it overstates the government debt problem for some countries – especially for Singapore. Singapore runs budget surpluses year after year, so does not need to borrow, but issues debt in order to fully fund pensions and other items (social security) for Singaporean retirees and families. Also Singapore's budgetary surpluses year after year have resulted in large holdings of assets in government-owned Sovereign Wealth Funds (SWFs), which invest in overseas assets. As a result, Singapore's government debt net of assets is negative, indicating that government financial assets exceed debt by a large amount. The Singapore government's debt issuance is done as well to provide a benchmark in the financial markets for corporate bond issuance. Singapore does not regularly publish the balances of its Government Investment Corporation and Temasek holdings. These sovereign assets plus the CPF are estimated in a range of $590 bln to over $1 trillion. When these are subtracted from gross debt of 111% of GDP, Singapore has net general government debt of *negative* 72% - 208% of GDP! Some analysts estimate an additional 20-30 percent of GDP in debt in China due to the so-called "shadow banking sector". As for other large economies, Japan has very high gross and net government debt (238% and 156% respectively), the UK (87%, 78%), France (97%, 87%), Italy (130%, 118%), and Brazil (88%, 56%).
See IMF Global Debt Database for non-financial corporate debt to GDP levels 2016 – U.S. ~122% and Germany ~94%. See Fitch etc
Both Germany and the U.S. invest about 21 percent of GDP each year in future growth, but Germans fund this through a national savings ratio of over 28 percent of GDP – the balance going toward its financial cushion. The U.S. borrows its shortfall from abroad.

See OECD at https://data.oecd.org/hha/household-savings.htm for household savings (income less consumption of households) to disposable income (household income after taxes). The national savings ratio is the savings of all economic sectors in a country – the government, households and corporations – relative to GDP, the sum total of all transactions in an economy in a year. Government debt, revenues and deficits include the federal, state and local governments. Savings less investment is the current account balance, which if negative as in the case of the U.S.—that is, a current account deficit - it represents the amount the U.S. must borrow from abroad to fund investment. If positive, as in Germany – that is, a current account surplus -- it is the amount Germany lends to other countries so they can fund their current account deficits.
Germany has benefited from the euro, launched in 1999. The country's export competitiveness has relied to an extent on the competitive value of the euro, held down by the inclusion of weaker economies in the currency area. Strong demand for German exports has underpinned the generation of huge trade (and current account) surpluses and the country's status as a creditor nation. This has come at a cost, because Germany – representing nearly a third of the economy of the Euro Area – has had to play a critical role in maintaining its cohesion. Thus far, German leadership – in conjunction with its European partners and the IMF – has deftly navigated these shoals through country bailouts. These bailouts have had tough conditions attached that have contributed to persistent high unemployment rates in some countries – a potential source of future stress for the Euro Area. 19 countries in Europe adopted the euro as their single currency in 1999, giving up control over monetary policy (i.e. money creation) to the European Central Bank) and unable to devalue their currency in order to jumpstart exports and growth. The European sovereign debt crisis – centered on Greece – that began in 2010 – ran the risk of a major country sovereign default (Greece in fact did default on sovereign debt), broad failure of a country's banking system, and exit from the Euro Area which would have been disruptive for all the economies of the Euro Area, of Europe, and ultimately of the global economy. See IMF Article IV Staff Report on Germany, 2018. Germany's participation in the European Central Bank's "capital key" puts the country on the hook for 18.4% of the bank's liabilities. Furthermore, through a cross-border settlement system, known as Target2, Germany's central bank has claims of over $1 trillion on other Euro Area countries – such as Italy and Spain, equivalent to over 25% of German GDP. Likewise it has nearly 30% of the paid-in capital of the European Stability Mechanism, which had just under €300 billion outstanding lent out to countries such as Greece and Spain, during the 2010-16 period. See Handelsblatt, June 8, 2018 at https://www.handelsblatt.com/today/finance/target2-when-is-a-trillion-euro-not-a-trillion-euro/23582376.html?ticket=ST-425790-ap5AXm6uQg6ecnSOMArw-ap1; and, ABN Amro, May 2017, Eurozone Watch: Target2 balances a ticking time bomb? at https://insights.abnamro.nl/en/2017/05/eurozone-watch-target2-balances-a-ticking-time-bomb/; and, http://www.europarl.europa.eu/RegData/etudes/BRIE/2014/497755/IPOL-ECON_NT(2014)497755_EN.pdf; and, https://www.esm.europa.eu/; and, https://www.ecb.europa.eu/pub/pdf/other/ecb.targetar2017.en.pdf
IMF estimates that Germany's REER was 10-20% undervalued in 2018. See IMF Article IV Staff Report on Germany, 2018, p. 11. U.S. demand for imports due to low savings and fiscal stimulus is also a driver of German surpluses and positive NIIP. Much needs to be done to reduce the risk of destabilization of the euro, including: allocating more resources to common European funds that can support sovereign bond markets and banks in a crisis, as well as for ongoing investment and job creation in depressed regions; deepening E.U. institutions – to further banking, capital markets, fiscal and political union; allowing greater policy diversity on migration and other issues; and, renewed efforts by member governments to meet fiscal benchmarks, clean up weak banks, and enhance productivity. Greater political coordination between north and south and east and west in Europe is likewise required to counter the forces of division, such as the Hanseatic League, the Visegrad Group, See Economists, The World in 2019, Economist Jan. 5-11, 2019 pp 8-9, and Dec. 15-21, p. 53 Charlemagne, and, June 2018 "In Bad Oder, Germany's Troubled Relations With the Visegrad States…"
Aging more than most – CIA Factbook – In 2015, Germany's old agency dependency ratio was 32.1%, vs. 23.8% in Canada, 22.1% in the U.S., and 42.7% in Japan, measuring the number of old people 65 and over, as a percentage of the working age population, 15-64.
[109] Because so many foreigners want to hold dollars – including foreign central banks -- strong demand for U.S. government securities persists. The USD is used to store wealth by central banks, SWFs, and financial institutions, and to denominate and settle international transactions in trade and finance. Add data on FX holdings and trading by currency – BIS report FX trading turnover triennial report, 2016. IMF COFER on central bank reserves currency composition. As a measure of this ongoing demand for USD, of all foreign exchange trading in 2016 88% of it had

the USD on one side of these transaction, the next largest figure being the euro on 31% of one side of transactions, followed by the Japanese yen on 22% of FX transactions.

[110] Oatley, p. 216 on premature British convertibility and huge FX outflows in the late 1940s. Lairson and Skidmore and Kindleberger on German crisis in 1930. See C.S.S. Newton, "The Sterling Crisis of 1947 and the British Response to the Marshall Plan," The Economic History Review, August 1984, at https://www.jstor.org/stable/2597288?seq=1#page_scan_tab_contents.

[111] The unilateral re-imposition of U.S. sanctions on Iran by the Trump administration in 2018 has put at risk European transactions with Iran through SWIFT, the U.S. dollar-dominated international payments system. As a result, the Europeans – led by Germany – have launched an alternative non-dollar payments system to facilitate transactions with Iran. Such blows to U.S. dollar dominance could accelerate, though presently the dollar looks attractive relative to any alternative, including the euro. See DW, August 22, 2018 at https://www.dw.com/en/germany-urges-swift-end-to-us-payments-dominance/a-45242528, and Aljazeera, June 10, 2019 at https://www.aljazeera.com/news/2019/06/system-circumvent-sanctions-iran-ready-german-fm-190610070011253.html.

[112] See World Bank WITS (trade statistics) at https://wits.worldbank.org/countrysnapshot/en/DEU, and National Industrial Strategy 2030, German Ministry of Economic Affairs and Energy, 2019.

[113] Surveys of German manufacturing have indicated a worsening contraction in 2019, causing businesses to cut staff. The OECD forecasted German GDP growth of 0.7 percent in 2019 – marked down nearly a full percentage point in March 2019 – and of only just above 1 percent in 2020. This compares unfavorably with a 10-year average growth rate exceeding 2 percent. See OECD report, March 6 2019, p. 3. See IHI Markit press release, March 22 2019 at https://www.markiteconomics.com/Survey/PressRelease.mvc/5b44eec864a24ca29ecd317e65e22ac8: "The IHS Markit Flash Germany Manufacturing PMI registered 44.7 in March, down from 47.6 in February and its lowest reading in over six-and-half years. The index has now fallen in 14 of the past 15 months, down from a record high of 63.3 at the end of 2017, with each of the index's sub-components imparting a negative influence since the previous survey… The downturn in demand for German goods continued to be largely driven by a slump in new export orders, which fell for the seventh month in a row and at the quickest rate since August 2012. Anecdotal evidence highlighted delayed decision-making among clients due to uncertainty, as well as weaker demand in the automotive sector." Growth forecasts for Germany have been revised down sharply as a result. Growth could be even lower if U.S. tariffs on automobiles are imposed -- autos and parts make up a comparatively large 15 percent of German exports. See https://www.forbes.com/sites/charleswallace1/2019/02/17/car-industry-fears-trump-tariffs-on-vehicle-imports/#4a48666e6102. See Economist Feb. 9, p. 61.
Germany's low unemployment rate is vulnerable to globalization's retreat, given that exports are a higher share of GDP compared to other advanced economies -- and manufacturing employment a higher share of the workforce. See Economist Feb. 9, Fitch Data Comparator, Dec. 2018. Regarding Germany's unemployment rate – the unemployment rate reported by the German authorities is the Registered Unemployment Rate, as opposed to the ILO definition. The Registered rate tends to be higher by a ratio of ~1.4. For example, the registered rate was 5.5% in 2017, and the ILO rate was 3.8%. For the U.S. the ILO rate and the rate reported by the U.S. BLS are the same – both 3.9% in 2018. The U.S. rate is based on a household survey. Germany's registered rate is based on those workers registering for unemployment benefits. The discrepancy in the German case is that Germany's registered rate likely picks up a lot of part-time workers, working less than 15 hours per week, but considered "without work". See German Institute for Employment Research, June 2017 report at http://doku.iab.de/forschungsbericht/2017/fb0617.pdf; and, ILO data at https://www.ilo.org/ilostat/faces/oracle/webcenter/portalapp/pagehierarchy/Page21.jspx;ILOSTATCOOKIE=XHimLZPRtYBKsZ4HjTNlgoQtPQButhFVAlap5ZivK7GeKGfj5595!1567639201?_afrLoop=369332208009755&_afrWindowMode=0&_afrWindowId=null#!%40%40%3F_afrWindowId%3Dnull%26_afrLoop%3D369332208009755%26_afrWindowMode%3D0%26_adf.ctrl-state%3Doinygn2zg_4; and, US BLS unemployment time series at https://data.bls.gov/timeseries/lns14000000; and, a time series on German registered unemployment prepared by U.S. St. Louis Fed (FRED) at https://fred.stlouisfed.org/series/LMUNRRTTDEQ156S.

[114] Germany's conservative fiscal policy provides a "policy cushion" against recession or crisis as well. Germany has room to relax fiscal policy, given low government debt and a budget surplus. By contrast, the U.S. is currently running a large deficit, so that if recession hits – and it will -- there will be little room to stimulate growth.

The great 20th century economist John Maynard Keynes warned of "the paradox of thrift" – the notion that when economic actors increase savings during bad times – which they tend to do -- they spend less, which can prevent the economy from digging itself out of recession. See John Maynard Keynes, The General Theory of Employment, Interest and Money, 1936, as discussed. in https://research.stlouisfed.org/publications/page1-econ/2012/05/01/wait-is-saving-good-or-bad-the-paradox-of-thrift/.

[115] There is fiscal space for greater public investment in infrastructure and technology, as well as spending on skills acquisition and child care. Public investment lags other countries due to capacity constraints in municipalities as well as onerous procedures and disagreements across multiple levels of government. For example, federal funds for digitalization in schools got held up because state governments rejected federal conditions, until mediation resolved the dispute. Federal government intervention has helped municipalities – responsible for the largest share of public investment -- by providing consulting services and financial relief. Municipalities report a significant backlog of investment in traffic infrastructure and schools due to staffing constraints and high levels of debt. Public investment in human capital – which includes education spending and active labor market programs – is estimated by the IMF to be below levels in other advanced E.U. countries – though there are signs improvement including additional federal government funding. The overall quality of Germany's infrastructure – while still high – has been declining, according to WEF executive surveys.

See IMF Article IV Staff Report on Germany, July 2018, p. 14-16, and Annex VIII, p. 82 figure 4, and pp. 78-84: "Key Findings - Germany's general government investment has declined since reunification, drive by construction spending by municipal governments. At around 2–2¼ percent of GDP, Germany's general government investment is among the lowest in advanced economies. - Various modalities for governments to support investment in public goods complicate cross country comparison of government investment. Accounting for investment grants and PPPs, Germany's general government investment remains below peers'. However, the government provides sizable loan guarantees, some of which may be used for investment in public goods. - Germanys' total—private and public—investment in non-dwelling assets is below peers', especially in buildings and structures. The net capital stock of infrastructure—e.g., land transports, utilities—and education has been eroding since the early 2000s. In addition, the perceived quality of infrastructure is deteriorating while municipalities' perceived investment backlog for education and infrastructure is accumulating, suggesting a scope for increasing investment in these areas."

See also WEF, Global Competitiveness report, 2018. For updated lifelong learning chart for the E.U., which shows improvement in Germany since the IMF 2018 report, go to https://ec.europa.eu/eurostat/statistics-explained/index.php/Adult_learning_statistics. Business investment (excluding real estate) in Germany has fallen over two percentage points of GDP in the last two decades – while the portion that German firms invest overseas has remained steady. See IMF Article IV Staff Report on Germany, pp 5-8

See Bloomberg: "Deficit Conquered, Germany is Finally Boosting Public Spending", Jana Randow, Bloomberg, March 1 2019.

Private investment – which has fallen in recent years due to lackluster business confidence -- could be stimulated through tax breaks. Germany's corporate income tax rate -- at nearly 30 percent, versus under 26 percent in the U.S. since the Trump tax cut – is now positioned on the high side. See OECD at https://stats.oecd.org/index.aspx?DataSetCode=Table_II1

With the German economy nearly in recession during the second half of 2018, policy makers have begun contemplating tax cuts. See DW articles, Nov 2018 – Feb. 2019.

[116] Germany ranked only 31st in the world on ICT adoption, behind the U.S.'s 27th. Germany does particularly poorly on the number of users of high-speed fiber connections. See WEF GCI, 2018; Germany is ranked 66th in the world on high-speed fiber connections to homes and businesses, behind China's#7 rank, Korea's #1, Japan's #3, Singapore's #4, the U.S.'s 40th, and Canada's 41st. On overall ICT adoption (mobile cellular, broadband, etc) Germany was ranked 31st, vs. China's 26th, the U.S.'s 27th, Canada's 34th, Korea's #1 and Japan's #3 positions.

See World Bank Ease of Doing Business Oct 2018; and IMF Article IV Staff Report on Germany, 2018, pp. 19-21, 28 and 37. Germany's Doing Business ranking in the World Bank ranking – representing the ease for companies to start and operate businesses, getting the necessary government approvals and access to credit and energy – was 24th of 190 countries, less favorable than Canada's 22nd, the U.S.'s 8th, 2nd for Singapore, but better than Japan's 39th and China's 46th. Germany fell short in key components such as ease of starting a business (114th), registering property (78th), and protecting minority shareholders (72nd). See World Bank's Doing Business survey, Oct. 2018. Protection in Germany's network industries – e.g. railways and postal services -- and professional services – e.g.

accountancy, law, architecture and engineering – are extensive and limit entrants. The latter include exclusive rights, compulsory membership in chambers, and regulation of prices and fees.

[117] See The Guardian, Sept. 18 2015, at https://www.theguardian.com/world/2015/sep/18/angela-merkel-sick-man-of-europe-germany-economy-chancellor.

[118] Gerhard Schroeder's Social Democrats were in a coalition government with the environmentalist Green Party from 1998-2005. After losing the 2005 election to the center-right, led by Angela Merkel, Schroeder has since his election defeat in 2005 become a board member of Russian energy firm Rosneft and also of Nordstream, effectively lobbying on behalf of the Russian energy sector.

[119] Agenda 2010 also included pension reform designed to reduce the government's pension liability, while also reducing the "labor wedge" – the difference between what a company pays and what workers receive, consisting of labor taxes that hurt corporate competitiveness.

[120] The turnaround in Germany's unemployment rate occurred as a result of the Hartz reforms, but also was driven by earlier wage restraint agreed to by unions in exchange for greater job security, German firms' development of an overseas supply chain focused on eastern Europe recently opened after the end of the Cold War, and a boom in demand overseas, notably in emerging markets that had a strong demand for German manufactures and capital goods. See DW, "German Issues in Nutshell: Hartz IV," June 6, 2017 at https://www.dw.com/en/german-issues-in-a-nutshell-hartz-iv/a-39061709; Christian Odendahl, "The Hartz Myth: A closer look at Germany's labour market reforms", Centre for European Reform, July 2017; and, Alexandra Spitz-Oener, Harvard Business Review Case Study, "The Real Reason the German Labor Market is Booming," March 13, 2017 See Christian Odendahl, "Germany After the Hartz Reforms," Foreign Affairs, Sept. 11 2017 at https://www.foreignaffairs.com/articles/germany/2017-09-11/germany-after-hartz-reforms. See Hartz Committee membership at https://www.edp-service.de/Hartz/hartz_start.htm.
The problem of low-wage works caught in insecure jobs, lower life-time earnings, and persistent poverty – notably among the elderly compelled to endure a longer working life, could be alleviated with a more robust life-long training effort. Participation in life-long training – education and training for 25-64 year olds -- which is low by international comparison. See IMF Article IV Staff Report on Germany, July 2018, p. 16.

[121] Dissatisfaction with the negative effects of Hartz persists on the left in Germany.
See Bloomberg, Feb. 26, 2019, "Macron Risk Outcry…" at https://www.bloomberg.com/news/articles/2019-02-26/macron-risks-outcry-by-plowing-ahead-with-french-welfare-reform. The reforms introduce flexibility to hiring and firing, reform apprenticeships, and limit amounts and availability of generous unemployment benefits.

[122] Math scores rose from below 500 in 2003-06, to an average of 511 in 2009-15. Overall, Germany ranked an average of 13th in math, science and reading that year, versus a U.S. ranking of 31st. Despite this improvement, Germany has more work to do in order to reach the top ranks of countries in education outcomes. Germany has a lower level of university enrollment than peers, partially offset by its robust system of vocational training and apprenticeships. See 2015 OECD PISA scores. See OECD Education at a Glance, 2015. U.S. rank in math in 2003 was a very low 28 of 38 countries, vs. Germany's 19. Canada average 519 in the 2009-15 period, and 531 in 2003-06. German spending on primary education is low – 0.6% of GDP, vs. U.S.'s 1.6%, and Canada's 2.1%. German education outcomes don't perform well in terms of equity. In the 2015 PISA study, 15.8 percent of the variation in science test scores for German students was explained by socioeconomic status, vs. an average of 12.9 percent for OECD countries, and 11 percent in the U.S. The IMF recommends increased focus on improving migrants' education outcomes through greater integration; and also increasing compulsory education time in primary education. See IMF Article IV Staff Report on Germany, July 2019, pp. 15-17: "The new government's plans to provide full day primary education to all students by 2025 through enhanced collaboration between the Federal government and the Länder is a welcome and important step." See also: Holly Young, The Guardian, Nov. 25, 2015 at https://www.theguardian.com/teacher-network/2015/nov/25/what-can-we-learn-from-the-great-german-school-turnaround; and, Florian Waldow, "What PISA did and did not do: Germany after the PISA-shock", European Educational Research Journal, 2009, at https://journals.sagepub.com/doi/pdf/10.2304/eerj.2009.8.3.476 .

[123] See https://www.plattform-i40.de/I40/Navigation/EN/Industrie40/WhatIsIndustrie40/what-is-industrie40.html: "The platform is steered and led by the federal minister for economic affairs and energy, Peter Altmaier, the federal minister of education and research, Anja Karliczek, and high-ranking representatives from industry, science and the trade unions. Experts from business, science, associations and the trade unions develop operational solutions together with representatives from various federal ministries in thematic working groups.

The groups look at future-related issues in the areas of standardisation and norms, security of networked systems, legal frameworks, research, working arrangements and business models. The steering committee, which includes business representatives, develops a strategy for the technical implementation of the working groups' findings. Through international cooperation, the Platform Industrie 4.0 contributes its findings to global discourse and promotes standardization as well as the cross-border exchange for digitization in production."
On China, see "Why Does Everyone Hate Made in China 2025," CFR blog, March 28, 2018, Lorand Laskai.
See Hannover Messe at https://www.hannovermesse.de/home.
The German government has been active in promoting technological innovation, producing a periodic report on the state of the digital economy and coordinating federal funding of R&D and skills acquisition. See https://www.gtai.de/GTAI/Content/EN/Invest/_SharedDocs/Downloads/GTAI/Fact-sheets/Business-services-ict/fact-sheet-digital-en.pdf?v=3.

[124] See Peter Almaier, National Industrial Strategy 2030, Ministry of Economic Affairs and Energy, February 2019, pp. 7, 10-11. While Germany excels in basic research in AI, it lags in commercial applications.

[125] See https://www.plattform-i40.de/I40/Navigation/EN/Industrie40/WhatIsIndustrie40/what-is-industrie40.html, p. 11: "If the digital platform for autonomous driving with Artificial Intelligence were to come from the USA and the battery from Asia for the cars of the future, Germany and Europe would have lost over 50 per cent of value added in this area. The associated impact would extend far beyond the automotive industry itself. This problem therefore concerns not only the companies in the sector but all economic and state stakeholders equally."

[126] These German companies that dot the landscape are called the "Mittelstand". – See https://www.hightech-strategie.de/de/The-new-High-Tech-Strategy-390.php; and, "Industry 4.0, Smart Manufacturing for the Future" at http://www.gtai.de/GTAI/Content/EN/Invest/_SharedDocs/Downloads/GTAI/Brochures/Industries/industrie4.0-smart-manufacturing-for-the-future-en.pdf. See https://www.hightech-strategie.de/de/The-new-High-Tech-Strategy-390.php; http://www.gtai.de/GTAI/Content/EN/Invest/_SharedDocs/Downloads/GTAI/Brochures/Industries/industrie4.0-smart-manufacturing-for-the-future-en.pdf; See National Industrial Strategy 2030, Germany Ministry of Economic Affairs, Feb. 2019 at https://www.bmwi.de/Redaktion/DE/Downloads/M-O/national-industrial-strategy-2030.pdf?__blob=publicationFile&v=4.

[127] Specifically, it maintains that China is shifting from being a large consumer of German goods to a competitor that could come to dominate whole industries -- heavily supporting its companies with state funds and mandating domestic content in production. To counter this threat, the German government argues for increasing public investment, tax incentives and subsidies for domestic industries, as well as adjusting European anti-trust rules to allow protection of national and European champions. At the European level, Germany proposes convening a Council of Industrial Ministers for E.U.-wide planning.

[128] In order to confront new challenges, a degree of soul-searching is under way about what role the country should play in a world in which its traditional ally – the U.S. – once the leader of a global security alliance and the rules-based multilateral system – is abdicating in favor of a unilateralism.

[129] And expand the labor force. Major parties in Germany: CDU-CSU etc. German government seeks to include some long-term planning as part of the budgetary process, allocating funds for these initiatives over a 4-year time horizon.

[130] Measures implemented include: tax incentives and funding for R&D – especially for small and medium enterprises; increased funding for high-speed internet and digitalization – including for schools; full-day primary education; afterschool programs; all-day child care; life-long training; and, targeted benefits to reduce child and old-age poverty. SME digitalization support includes the government's Central Innovation Program. See IMF Article IV Staff Report on Germany, July 2018; "Another German Budget Without Debt", Steffen Stierle, Nov. 27, 2018, Euractiv; and, "Deficit Conquered, Germany is Finally Boosting Public Spending", Jana Randow, Bloomberg, March 1 2019. Given unfavorable demographic trends, additional measures to expand the labor force are needed, including lowering taxes on labor and other disincentives to work – notably, affecting women and second wage earners in households; and, a higher retirement age and training for older workers. Germany's old age dependency ratio is higher than in the U.S. and other peers, and is rising. The IMF forecasts that Germany's labor force will begin shrinking in 2020. Ultimately, higher levels of immigration are required to grow the labor force.
Germany's generous welfare state is funded in part by taxes on labor. Furthermore, health care benefits are generous, so that the tax and benefit implications for spouses can act as a disincentive to work. See IMF Art. IV

Staff Report on Germany, 2018, p 18. Also, see p. 27. Germany's fertility rate was 1.5 births per woman, vs. 1.8 in the U.S. and 1.6 in Canada, but higher than Singapore's 1.2. See World Bank at https://data.worldbank.org/indicator/SP.DYN.TFRT.IN?locations=DE. Immigration is lower in Germany, with net migration at half U.S. levels – 1.5 migrants per 1000 of population in 2017, vs. U.S.'s 3.9 and Canada's 5.7. See CIA Factbook. GDP growth average 2% p.a. in Germany in the 5 years to 2018 (last year a forecast), vs. U.S. 2.4%, and 1.8% in the 30y to 2018, vs. U.S. 2.5%. See IMF WEO Oct. 2018. 5y population growth in Germany was 0.2%, despite a bulge in population growth in 2015 and 2016 of 0.9% and 0.8% respectively, reflecting the government's policy of accepting large numbers of Syrian war refugees, and policy reversed since due political and electoral pressures. See IMF Article IV Staff Report on Germany, 2018, p. 39; and Fitch Sovereign Data Comparator, Dec. 2018. Germany's low 5y average population growth to 2018 compares with the U.S.'s 0.7% p.a., Canada's 1%, Singapore's 1.5%, and China's 0.5%. Germany's per capita GDP growth was 1.7% per year in the 5y to 2018 (last year a forecast), same as the U.S., both comparing favorably with other advanced economies – Canada's 1%, Singapore's 1.5% (which was also Fitch's AAA median), but well below China's 6.4%. The old age dependency ratio represents the proportion of elderly (65+) to working age people (15-64). According to the CIA Factbook, Germany's ratio was 32.1 vs. the U.S. 22.1 and Canada's 23.8 in 2015.

[131] It based its foreign policy on two principles -- Atlanticism – protection provided by its superpower ally -- the United States; and European unity – a bond with its former archenemy -- France -- that formed the backbone of the economic (and political) unification of Western Europe, the convening of a European Parliament and the creation of European bureaucracy in Brussels, and the adoption of a single currency. The external environment facing Germany in the post-war period facilitated this transformation. The Cold War and the Soviet threat, the recovery of capitalist economies, globalization and European integration helped transform Germany into an economic powerhouse, reinforcing support for the cautious policies pursued since the war. Good leadership – notably, the center-right, coalition politics of Konrad Adenauer -- also reinforced the correctness of this path. Trauma of first half of 20th century led to a political transformation per the International Relations theory of Constructivism. See "Norms, identity and national security in Germany and Japan", in Peter Katzenstein (red.) *The culture of national security: norms and identity in world politics;* Berger - 1996 - New York: Columbia University Press.

[132] Rules central to a "single-member plurality" system make it difficult for smaller parties to gain seats.

[133] Nazi participation in coalition governments ushered in democracy's demise.

[134] Coalition governments including the AfD are possible in state governments in east German states such as Saxony and Saxony-Anhalt – see https://www.economist.com/europe/2019/07/18/germanys-far-right-strong-in-the-east-weak-in-the-west. Afd secured 13% of the vote in September 2017 national elections, and polls around 25% in some eastern States (e.g. Saxony). It currently has 91 of 709 seats in the Bundestag, the federal parliament. See https://www.bundestag.de/en/parliament/plenary/distributionofseats. Given the challenge from the right on Merkel's immigration policy from the CDU's own sister party -- the Bavarian CSU -- is it possible that the CSU -- or even the whole CDU-CSU faction -- could govern one day with the far-right AfD? This would be similar to the Austrian case, where the right-wing People's Party has formed a coalition with the far-right Freedom Party. Germany's practice of assiduously reducing income inequality and offering the benefits of prosperity broadly throughout society could limit the appeal of extremists. Regional considerations must be taken into account in fashioning policy, especially given the appeal of extremism in the former communist east of the country.
In E.U. parliamentary elections in late May 2019, the establishment center-right and center-left parties across Europe lost seats, though populist, extremist parties were also held at bay. This allowed the Greens, which can be considered center-left, to reap gains. Is this just a breather from further gains for populist extremists in Europe? See https://www.bbc.com/news/world-europe-48491609

[135] By one measure of GDP (at market exchange rates), the U.S. is the largest economy and China the second largest; by another (at "purchasing power parity" or PPP), the U.S. is the second largest economy and China is the largest. At market exchange rates, U.S. GDP was $19.4 trillion in 2017 vs. China's $12 trillion. At PPP, China's 2017 GDP -- according to the IMF WEO in April 2018 -- was estimated at $23.2 trillion, making it a larger economy than the U.S. at $19.4 trillion (which is the baseline, so its GDP is not adjusted for purchasing power – all other countries' are). These calculations are impacted by exchange rates -- with a weakening of the U.S. dollar, U.S. per capita Gross Domestic Product (GDP, or output, calculated as the sum of all goods and services sold in the country in a year) would compare less favorably to other countries' GDP. Adjustment for "purchasing power parity"

corrects for under- and over-valued exchange rates, but also price differences across countries – a haircut in China may not be priced as it is in the U.S. PPP estimates attempt to adjust exchange rates and prices so that internal and external purchasing power of currencies are equal. This adjustment by economists introduces potential human error. This text therefore tends to rely more on GDP at market exchange rates. That said, the PPP calculation suggests that the Chinese economy may in fact be larger than the U.S. economy in terms of the sheer volume of goods and services it produces. That is probably an accurate statement.

[136] See Glenn Leibowitz, Inc., Dec. 21, 2017, article on Apple and China, at https://www.inc.com/glenn-leibowitz/apple-ceo-tim-cook-this-is-number-1-reason-we-make-iphones-in-china-its-not-what-you-think.html. Quote from Apple CEO Tim Cook at the Fortune Global Forum, Guangzhou, China, December 2017, as reported by Glenn Leibowitz, journalist and McKinsey staffer.

[137] See Chris Buckley, NYT, Oct. 5 2016, "Xi Jinping May Delay Picking China's Next Leader, Stoking Speculation," at https://www.nytimes.com/2016/10/05/world/asia/china-president-xi-jinping-successor.html.

[138] See The End of Reform in China, Foreign Affairs, Authoritarian Adaptation Hits a Wall, May/June 2015.

[139] China's GDP on a PPP basis was nearly 25% larger than the US's in 2018 -- $25.3 trillion vs. the U.S.'s $20.5 trillion. At market exchange rates – without adjustment to the exchange rate and to relative price – China's economy was significantly smaller than the U.S. economy at $13.4 trillion in 2018. The adjustments for PPP attempt to measure activity, as opposed to pricing. So if a haircut costs $25-50 in the U.S., but at the current exchange rate 25-50 cents in China (this is a stylized example not meant to precisely reflect reality), then the PPP adjustment equates the value of the two – assuming quality is the same. When that exercise is done – which introduces the potential for human error in the calculation – then China's economy is larger than the U.S.'s, indicating that there is more economic activity going on in China than the U.S. – which is probably an accurate statement. That said, this paper focuses on GDP in USD at market exchange rates across countries – due to the timeliness of GDP data at market exchange rates, and the diminished risk of human error in making complex calculations.

Exports of good and services were $2.4 in 2017. And population was 1.4 billion in 2018. See IMF WEO April 2019, and discuss PPP.

Many economists believe that China's GDP growth has been overstated. Michael Pettis has argued that GDP has been fueled by credit, and bad debts are understated because they are just rescheduled instead of written off. If these bad debts were written off, GDP growth would have been less than half, he argues. For example, non-performing loans in the banks totaled an estimated 1.8% of total loans in 2018 according to Fitch. If that figure were considerably higher, say 5-20% of loans, provisioning against bad loans would lower GDP. Other economists use different measures – such as evening light intensity recorded by satellites which is correlated with GDP – suggest that GDP growth could be less than half of what is recorded. See Johns Hopkins University economists Barbera and Hu at https://cfe.econ.jhu.edu/chinas-slowdown-meets-eye/. A study comparing GDP implied by actual VAT taxes of industrial firms vs. official GDP indicates that GDP could be at least $1.5 trillion lower. See Brookings study from March 7, 2019 at https://www.brookings.edu/wp-content/uploads/2019/03/BPEA-2019-Forensic-Analysis-China.pdf.

[140] Many economists believe that the size of China's economy is overstated – though even with substantial downward adjustments to GDP, the growth story remains impressive and irrefutable.

[141] This is not a purely Chinese problem. Even market economies – in an environment of prolonged low interest rates, deep tax cuts, and climate change denial – expand by way of wasteful spending – in excessive residential property development and the production of gasoline-powered cars, for example. Yet market economies are self-correcting – in theory.

[142] See IMF Article IV Staff Report on China, July 2018, p. 4

[143] For example, The WTO ruled that the U.S. State of Washington subsidized commercial aircraft producer Boeing in violation of international trade rules. France has been alleged to actively practice industrial espionage. Oatley, International Political Economy, pp. 104-7. Bloomberg News, "WTO Issues Mixed Decision in EU-Boeing Subsidy Dispute", Bryce Baschuk, March 28, 2019. WTO, "United States -- Measures Affecting Trade in Large Civil Aircraft (Second Complaint)", March 28, 2019. See Robert Gates in Politico on industrial espionage at https://www.politico.com/story/2014/05/france-intellectual-property-theft-107020

[144] See Article IV. Autor Dorn. Harry Wu and David Liang, China's Productivity Performance Revisited from the Perspective of ICTs, Dec. 9, 2017. See The Economist, Sept 23, 2017, "The Global Economy, How China is battling

ever more intensely in world markets"; and, CSIS, John Andrew Lewis, August 2, 2017, "China and Technology: Tortoise and Hare Again"

[145] See IMF Blog: https://www.imf.org/external/pubs/ft/fandd/2019/06/christine-lagarde-future-of-bretton-woods-straight.htm

[146] The Communist Party of China's (CCP) legitimacy also rests on the revolution in the 20th century, which defeated the its nationalist rivals in 1948, after helping defeat Japanese colonialism, and asserted Chinese sovereignty against over a century of deep Western encroachment, including in the mid-19th century, when it was forced by British colonialism to accept opium imports and widespread drug addiction. See Ian Morris, *Why the West Rules – for Now, The Patterns of History, and What They Reveal about the Future*, 2010 Picador, pp. 3-18.
See Freedom in the World 2019, Freedom House, China report" "China's authoritarian regime has become increasingly repressive in recent years. The ruling Chinese Communist Party (CCP) is tightening its control over the state bureaucracy, the media, online speech, religious groups, universities, businesses, and civil society associations, and it has undermined its own already modest rule-of-law reforms. The CCP leader and state president, Xi Jinping, has consolidated personal power to a degree not seen in China for decades, but his actions have also triggered rising discontent among elites within and outside the party. The country's budding human rights movements continue to seek avenues for protecting basic rights despite a multiyear crackdown." Millions of Muslim Uighers are reportedly held in political reeducation camps in western China. Tibetans are likewise mistreated and denied rights. An elaborate domestic security apparatus squelches opposition, and rights advocates and others are jailed and tortured.

[147] The Economist, "Special Report: The Pearl River Delta", "Innovation, Welcome to Silicon Delta". April 8, 2017.

[148] See *The Economist,* April 8-14, 2017, Print Edition, "Special Report – The Pearl River Delta", pp. 3-12, especially, "Innovation – Welcome to Silicon Delta, Copycats are out, innovators are in", pp. 9-10 (about activity in the dynamic city of Shenzhen); and, "The loyal family, Xi Jinping wants officials to declare allegiance to himself", pp. 37-38. For e-car market background, see Jing Yang Fitch Ratings, August 10, 2017, "Why China is Poised to Become an E-car Juggernaut.
The contradiction between political monopoly and the free-wheeling innovation going on in the Pearl River Delta is striking. Political monopoly and economic diversity cannot coexist forever. A fight becomes increasingly likely, unless political leaders loosen up their grip, as the British did during the Industrial Revolution, with political access expanded to the merchant classes.

[149] Economist Feb. 17, 2018, Schumpeter, p. 61, "Chinese tech v American tech"; and, IMF Article IV Staff Report on China, July 2018, p. 18

[150] See The Fourth Industrial Revolution, Klaus Schwab, World Economic Forum. Economist articles etc. For world car inventory, see https://subscribers.wardsintelligence.com/analysis/world-vehicle-population-rose-46-2016

[151] See Brad Setser, CFR, "Why China's Incomplete Macroeconomic Adjustment Makes China 2025 a Bigger Risk", March 14, 2019: "Huawei is significant for a lot of reasons. Its origins are complex, but it clearly did not start as a state-owned goliath. It had to prove itself domestically and abroad before it emerged as China's national champion in telecommunications equipment manufacturing. But Huawei also has clearly benefited from "Buy China" preferences among the state-owned telecommunications firms and enormous amounts of export financing (for its customers, not directly for Huawei itself). And it now believes it has a technological advantage in addition to a cost advantage in the infrastructure equipment needed for 5G." And, The Economist, Dec. 13, 2018.

[152] Lairson and Skidmore.

[153] Nevertheless, China pursues an industrial policy of "picking winners", whereby the government chooses which industries and companies to favor – which has been rightly criticized for leading to inefficiency and corruption. Pouring public money into loss-making ventures and crony capitalism can result. The nexus between government and business becomes so close that well-connected firms have access to government funding and can secure favorable regulations. This undermines the rule of law and is not in a country's best interest. This is why caution is warranted in getting government involved in strategic planning. A good rule is: when there is an important public good -- with a high return to society over the long term, and markets fail to provide it adequately because of uncertain profits in the short term – then there is a role for government. Alarm – in fact, outright hysterics of American libertarians -- over any government role in the economy should be avoided. See The Economist, Aug. 5,

2010 at https://www.economist.com/node/16741043. See The Economist's Crony capitalism index, May 7, 2016, at https://www.economist.com/graphic-detail/2016/05/05/comparing-crony-capitalism-around-the-world.
[154] See The Economist, March 7, 2019, "Unicorns in winter…"
[155] See Nicholas Lardy: https://www.rba.gov.au/publications/confs/2016/pdf/rba-conference-volume-2016-lardy.pdf, pp. 39-40; and, IMF Article IV Staff Report on China, pp. 11-12, 19. Lardy estimates in 2016 that state firms only produced 25% of industrial and 20% of manufacturing output in 2011, the rest produced by private firms. And, in 2013, private and foreign affiliate firms produced 86% of China's exports, vs. only 11% for state firms. It depends on how you categorize state and private firms. The Economist reported on Dec. 15, 2018 in "Free Exchange, The Lives of the Parties," that private Chinese firms were responsible for 52% of industrial output. In the IMF Article IV Staff Report on China, July 2018, on p. 19, a chart shows that the SOE share of investment in China began moving up again in 2014, after declining from just under 50% in 2006 to a low near one-third, and by 2017 it reached the high 30s.
[156] See, for example, Standard & Poor's, Sept. 21, 2018, "People's Republic of China Rating Affirmed at A+…" On debt see IMF GDD, 2019, and IMF Article IV Staff Report on China, July 2018.
[157] Chinese face barriers to internal migration in search of better jobs, including the "hukou" system – household residency registration – which limits the ability of migrant workers to obtain social services and access to schools in cities where they lack a residency permit. See Article IV, p. 21. Income inequality in China is substantial as well – with a GINI index of 47 and a low labor share of GDP of 61%, according to the IMF. See Article IV, p. 49.
[158] Depending on whether you measure GDP by market exchange rates or PPP. Based on market exchange rates, carbon intensity of China's GDP was 1.24 kilograms of emissions for every USD of output in 2014 (vs. 0.3 for the US and Canada, 0.2 for Singapore and Germany, and 0.5 for the world. Based on PPP, China's carbon intensity was 0.6 kg per PPP $ of GDP, vs. 0.3 for the U.S., Canada and the world, 0.2 for Germany, and 0.1 for Singapore. See World Bank, reflecting Oak Ridge.
[159] China's GDP in 2016 expressed in U.S. dollars was $11.2 trillion at current prices, vs. the U.S.'s $18.6 trillion; however, when adjusted for "purchasing power parity" (PPP) (that is, for an exchange rate that equates internal and external purchasing power, and price adjustments that equate the price of goods across countries, with large adjustments often made for "non-tradable" goods), China's GDP in 2016 was $21.3 trillion, exceeding the size of the U.S. economy. These data were provided in the IMF's WEO in October 2017, with the PPP calculation being done by the OECD. This is a fair number to look at to consider relative economic size, although given that it involves calculations and deep adjustments made by economists, the potential for human error is introduced, warranting a first-cut comparison of GDP across countries to be done at market exchange rates and actual prices. See WEF GCI, 2018. China's ICT adoption was ranked 26th in the world, just ahead of the U.S.'s 27th, Germany's 31st and Canada's 34th, but behind Korea's #1 and Japan's #3 positions. Notably, however, in the key area of high speed connectivity, China is doing well Huawei 5G. China is ranked #7 on fiber optic subscriptions, vs. Korea's #1, Japans's #3, Singapore's #4, and well ahead of the U.S.'s 40th, Canada's 41st, and Germany's 66th positions.
[160] World Bank Doing Business report, and WEF Competitiveness reports, latter 2016-17 Report, p. 146, and 2017-18 report. Article IV report.
[161] The PISA exercise in China only covered four regions in 2015, although these regions represented over 230 million people, which -- though less than one-fifth of China's population -- is still well in excess of the population of almost every other country in the PISA sample. In addition, China's special administrative regions of Hong Kong and Macao rank 2nd and 4th in PISA tests -- ahead of Canada.OECD U.S. PISA Report 2015, p. 12. China's' four cities tested in the PISA exercise are Beijing, Shanghai, Jaingsu, and Guangdong). In addition, Taiwan – a country with which China hopes one day to re-unify and a major investor in Mainland China – ranks 6th, just ahead of Canada. See China PISA note 2015.
[162] See Economist, Nov. 17, 2018, "Seizing the laurels, Tsinghua University may soon top the world league in science research". See Qingnan Xie and Richard B. Freeman, NBER, "Bigger Than You Thought: China's Contribution to Scientific Journals," WP 24829, July 2018, p. 2. College-educated Americans represent a larger proportion of the population than in most other large countries in the world -- including in China, Germany, France and Canada. This is because of the greatly expanded access to higher education that began after World War II. However, this advantage is narrowing. The U.S. lead in college-educated young people (aged 25-34) is fast closing, with financing pressures for students intensifying. See NSF p. 2-88: "Educational attainment, measured as the proportion of a population that has reached a specific level of education, is often used as a proxy for human capital and the skill levels associated with that particular education level (OECD 2016). Higher education in the United States expanded greatly after

World War II. As a result, the U.S. population led the world in educational attainment for several decades. Because of this, the United States offered clear advantages for firms whose work would benefit from the availability of a highly educated workforce. In the 1990s, however, many countries in Europe and Asia began to expand their higher education systems. Some of them have now surpassed the United States in the attainment of bachelor's or higher-level degrees among their younger cohorts. The generational shift in attainment so visible in many systems is not visible in the United States. Over time, the expansion of higher education elsewhere has substantially diminished the U.S. educational advantage. Although the United States continues to be among the top countries with the highest percentage of the population ages 25–64 with a bachelor's degree or higher, many countries have surpassed the United States in the percentage of the younger population (ages 25–34) with a bachelor's degree or higher."

Tuition pressure is rising -- reliance on own-source funds has increased, making it tougher to obtain advanced degrees in the U.S. See IBID pp. 2-27 to 2-46.

[163] China has had its successes. For example, investment in high-speed rail has linked the country's cities and reduced travel times – and will likely result in lower carbon emissions than otherwise would obtain with air or road travel. See The Future of Rail, 2019, International Energy Agency, at https://webstore.iea.org/download/direct/2434?filename=the_future_of_rail.pdf. Including little success promoting domestic semiconductor production. See "Biting the Bullet, China Sets Its Sights on Sunrise Industries," Economist, Sept. 23, 2017.

[164]See https://www.csis.org/analysis/made-china-2025; and, The Economist, March 3, 2018, "Briefing – China and the West, Not the partner you were looking for", pp. 18-20.

[165] See NSF p. 4-4 to 4-6; and, IMF WEO Oct. 2017. In real terms. The NSF is the U.S. agency established in 1950 to promote science. See NSF's Science and Engineering Indicators 2018, Chapter 4; notably p. 40 on the growth comparisons. Asia's total share was 40 percent of total R&D. Chinese R&D expanded a rapid 16 percent per year since 2000. China's R&D intensity -- that is, R&D to GDP -- is strong, at 3.6 percent of GDP (at market exchange rates), versus approximately 2.7 percent of GDP in the U.S. Germany, Japan and Korea likewise spend a lot on R&D relative to the size of their economies. The NSF report argues that U.S. R&D intensity exceeds China's 2.1% of GDP, but that is a purchasing power parity (PPP) calculation, which massively adjusts China's GDP to $19.7 trillion from $11.2 trillion (at market exchange rates) in 2015, due to exchange rate valuation issues and price differences. At market exchange rates, China's R&D intensity, at 3.6% of GDP, exceeds the U.S. Similarly, the R&D intensity in the third and fourth largest economies, Japan and Germany, moves considerably higher than the U.S. rate when calculated at market exchange rates, rather than at PPP.

"Worldwide R&D performance totaled an estimated $1.918 trillion in 2015, up from $1.415 trillion in 2010 and $722 billion in 2000. Fifteen countries or economies performed $20 billion or more of R&D in 2015, accounting for 85% of the global total. The top rankings at present continue to be dominated by the United States and China.

• The United States remained the largest R&D-performing country in 2015, with gross domestic expenditures on R&D of $497 billion, a 26% share of the global total, and an R&D-to-GDP ratio of 2.7%. China was a decisive second, with R&D expenditures of $409 billion, a 21% global share, and an R&D-to-GDP ratio of 2.1%.

• Japan ($170 billion, 9% global share, ratio of 3.3%) and Germany ($115 billion, 6% global share, ratio of 2.9%) were the comparatively distant third and fourth largest R&D-performing countries. The other 11 countries or economies in the top 15 were South Korea, France, India, the United Kingdom, Brazil, Russia, Taiwan, Italy, Canada, Australia, and Spain—with the annual national R&D expenditure totals ranging from about $61 billion (France) down to $20 billion (Spain).

The R&D performed domestically by U.S. businesses occurs mainly in five business sectors: chemicals manufacturing (particularly the pharmaceuticals industry); computer and electronic products manufacturing; transportation equipment manufacturing (particularly the automobile and aerospace industries); information (particularly the software publishing industry); and professional, scientific, and technical services (particularly the computer systems design and scientific R&D services industries)."

IBID p. 4-4 to 4-6. GDP is at market exchange rates, NOT PPP. In 2015, Japan spent $170 billion, Germany $115 billion, with France and Canada also figuring in the top 15 R&D spenders globally.

[166] See Qingnan Xie and Richard B. Freeman, NBER, "Bigger Than You Thought: China's Contribution to Scientific Journals," WP 24829, July 2018, p. 2.

[167] In 2015, the government launched its "Double First Class Plan" to make payments to academics for getting papers published – with bonuses well in excess of standard salaries. See Economist, Nov. 17, 2018.

[168] See National Science Foundation, "Science and Engineering Indicators 2018" at https://www.nsf.gov/statistics/2018/nsb20181/, p. O-30 (National Science Board) – report to the U.S. Congress and the President. "The National Science Foundation (NSF) is an independent federal agency created by Congress in 1950 'to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense...'" (https://www.nsf.gov/). "Developing and commercializing new and emerging technology is inherently risky, and financial support can provide insurance against some of this uncertainty. Venture capital investment is an indicator of support for emerging technologies that have the potential for successful commercialization and was globally about $131 billion in 2016. The United States attracts slightly more than half of this venture capital funding, although its share has been declining as other countries, particularly China, ramp up their S&T [science & technology] capabilities for developing new technologies."
See also The Economist, March 7, 2019, "Unicorns in winter…"

[169] CB Insights in McKinsey

[170] Which comprises on-line banking, insurance, wealth management, and payments In 2018, the frenzy of new VC deals in Chinese tech slowed, as the stock market sagged, and Chinese firms even began trimming staff. See The Economist, Sept. 23, 2017, "The next wave, China's audacious and inventive new entrepreneurs"; and, IMF Article IV Staff Report on China, July 2018, p. 18; and, See also The Economist, March 7, 2019, "Unicorns in winter…"

[171] See https://www.cnn.com/2018/09/30/tech/quantum-computing-china/index.htmll; and, https://www.bloomberg.com/news/articles/2019-01-06/china-s-moon-landing-may-fuel-humanity-s-drive-to-other-galaxies. See also *The Economist,* April 8-14, 2017, Print Edition, "Special Report – The Pearl River Delta", pp. 3-12, especially, "Innovation – Welcome to Silicon Delta, Copycats are out, innovators are in"

[172] See Harry Wu & David T. Liang, Dec. 9, 2017, of Japan's RIETI (Research Institute of Economy, Trade and Industry), "China's Productivity Performance Revisited from the Perspective of ICTs"; and, The Economist, Dec. Dec. 15, 2018, "Free Exchange, The Lives of the Parties". Wu and Liang of the Japanese research institute RIETI. See IMF WEO April 2019. China's investment to GDP hit a high of 48 percent in 2011.

[173] Population growth – estimated at 0.4 percent in 2018 -- has fallen below the U.S. rate and may begin declining – limiting labor force growth. More worrying is that recent evidence suggests that China's one-child policy – imposed for years to contain expansion of enormous population and relaxed in 2015 – is leading to a demographic challenge.
See CIA Factbook, 2018 for population growth estimate. For TFP growth issue, see Harry Wu & David T. Liang, Dec. 9, 2017, of Japan's RIETI (Research Institute of Economy, Trade and Industry), "China's Productivity Performance Revisited from the Perspective of ICTs"; and, The Economist, Dec. Dec. 15, 2018, "Free Exchange, The Lives of the Parties".
See The Economist, "China's two-child policy is having unintended consequences", July 26, 2018.

[174] Germany's rise -- beginning in the mid-19th century -- relative to Great Britain, did not occur without war and millions dead. Peace between authoritarian and democratic states can be elusive, as suggested in "democratic peace theory". Democratic peace theory. See Immanuel Kant, *Perpetual Peace*; and, Michael W. Doyle, "Kant, Liberal Legacies and Foreign Affairs", *Philosophy and Public Affairs* (1983), and *Ways of War and Peace: Realism, Liberalism, and Socialism* (W.W. Norton).
See Paul Kennedy, *The Rise and Fall of the Great Powers*. Barbara W. Tuchman, *The Guns of August*. Stephen Van Evera, *Causes of War*. E.H. Carr, *The Twenty Years' Crisis*

[175] These institutions were not available in the 19th century when Great Britain hoped to coopt Germany, the rising power of the day.

[176] Multilateral efforts to curtail excessive subsidies of steel and other industrial products worldwide should proceed. TPP sought to further the cause of adhering to rules regarding state subsidies. International pressure on China over its excess production of industrial products has yielded some results -- with cuts to steel and coal production implemented there since 2015 -- though the Chinese authorities should do much more in this regard. See IMF Article IV Staff Report on China, August 2017, p. 17

[177] See https://www.theguardian.com/world/2019/jul/19/jair-bolsonaro-brazil-amazon-rainforest-deforestation

[178] See National Science Foundation, "Science and Engineering Indicators 2018" at https://www.nsf.gov/statistics/2018/nsb20181/, p. O-30 (National Science Board) – report to the U.S. Congress and the President.

[179] See Fitch, S&P and Moody's reports, and IMF Article IV Staff Reports.

[180] The CFE would fold existing councils and advisory groups under its umbrella, such as the president's American Workforce Policy Advisory Board, the National Economic Council, and the infrastructure advisory council, etc. These councils can be either formally disbanded by executive order or informally folded into the CFE – with their efforts channeled toward implementing the nation's strategic plan, in order to avoiding overlapping authorities. National Council for the American Worker, established by Executive Order by Trump.
[181] See NBER paper, June 2018, on ARPA model at https://urldefense.proofpoint.com/v2/url?u=http-3A__papers.nber.org_tmp_61816-2Dw24674.pdf&d=DwIBAg&c=slrrB7dE8n7gBJbeO0g-IQ&r=kpd4vxPJx2HiXuhGIuTwFg&m=PZxPdza6UKo-KiMPn54HaVr8ennoJPNxv9I1fKhPgEQ&s=AuoowR-HZthnkuCOx8XhO8HnLM6RPiaK4-DKWgp3O_g&e=. After the Soviet Union launched the Sputnik satellite in 1957, DoD formed the Defense Advanced Research Projects Agency (DARPA) to finance technological research. This approach has been extended to other agencies (called the ARPA model). Besides DoD, the ARPAs are in Energy, the intelligence agencies, and Homeland Security.
[182] See note on strategy expert, Richard Rumelt's discussion of the Jobs' insights as a paradigm of effective strategic planning, in McKinsey on Steve Jobs. McKinsey Classics, February 2019: "What is Strategy?" On Steve Jobs: "At the turn of the present century, many people knew a lot about MP3s, streaming audio, and similar looming changes in the music industry. Others were authorities on computer hardware and software and still others on the web. But the minds of these people were trapped within their own fields of expertise. The crucial role of Steve Jobs was to combine three distinct pools of knowledge and resources quickly and skillfully."
See Klaus Schwab, The Fourth Industrial Revolution. He identified the following megatrends, all driven by digitization and IT – autonomous vehicles, 3D printing for medical and industrial products, advanced robotics and AI, new materials (including super-strong nanomaterials , the internet of things (IoT), blockchains, digital on-demand platforms, genetic sequencing and synthetic biology.
[183] See American Political Science Association's (APSA) Task Force Report (2013), "Negotiating Agreement in Politics". See The Hill, 2013, Gangs article.
[184] See McKinsey on Steve Jobs. McKinsey Global Institute article what is strategy – Steve Jobs – made connections among trends: At the turn of the present century, many people knew a lot about MP3s, streaming audio, and similar looming changes in the music industry. Others were authorities on computer hardware and software and still others on the web. But the minds of these people were trapped within their own fields of expertise. The crucial role of Steve Jobs was to combine three distinct pools of knowledge and resources quickly and skillfully.
See Klaus Schwab, The Fourth Industrial Revolution, 2016 World Economic Forum, esp. pp. 14-25
[185] Economic policy under George H.W. Bush, Bill Clinton, and Barack Obama (the latter after the post-GFC financial rescue was complete) moved in the direction of greater thrift. The Reagan, George W. Bush and Donald Trump tax cut episodes were irresponsible and ideologically driven.
[186] Economy-wide debt in Germany is just below 2x GDP. Canada's challenge is to reduce private debt – which the authorities proactively pursue through macroprudential measures – including tighter mortgage underwriting standards and bank stress tests. The Federal Reserve in the its June 7, 2019 Flow of Funds report (Z.1) reports debt in 1Q19 of $52.6 trillion, broken down by $15.7 trillion in household debt, $15.6 trillion in business debt, and $21.3 trillion in government debt at all levels. See https://www.federalreserve.gov/releases/z1/Current/. Federal Reserve Statistical Release, Financial Accounts of the United States, Table B-1, Distribution of U.S. net wealth, p. 8; and D-3 (Debt), p.7
Those figures in 4Q18 were as follows: $51.9T, $15.6T, $15.3dT, and $20.9T, respectively. The Fed utilizes a narrow definition of business debt, totaling approximately 76% of GDP (1Q19), whereas the IMF in its Global Debt Database, drawing on OECD figures, finds that when you include a broad definition of corporate debt liabilities – including not only loans and securities, but also other liabilities, according to the following broad definition: "special drawing rights (AF12), currency and deposits (AF2), debt securities (AF3), loans (AF4), insurance, pension, and standardised guarantees (AF6), and other accounts payable (AF8)," the figure for non-financial corporate debt, all instruments was 122% of GDP in 2017. See https://stats.oecd.org/index.aspx?queryid=34814. For IMF GDD see https://www.imf.org/external/datamapper/datasets/GDD. Both Canada and Germany had higher private debt, all instruments, of a similar magnitude (40-50% of GDP) as the U.S., when all debt instruments were included. The economy-wide debt estimate used in this article – U.S. ~282% of GDP, Canada ~294% of GDP, and Germany ~192% of GDP, utilizes the higher business debt figure, but also nets out government assets, per the IMF's WEO estimate of the net debt and gross debt. See https://www.imf.org/external/pubs/ft/weo/2019/01/weodata/index.aspx. Germany has lower debt levels across the board, but in the Canada and U.S. comparison we find that U.S. private

debt levels are considerably lower than in Canada, whereas U.S. government debt levels (especially at the federal level) are considerably higher. The IMF has said that the Canadian authorities have acted appropriately by tightening macroprudential measures to slow house price appreciation and rising mortgage debt (from the May 21 2019, IMF Staff Concluding Statement from the Article IV Mission): "Several rounds of macroprudential measures, provincial and municipal tax measures, and tighter monetary policy have contributed to a reduction in housing-related financial stability risks.) Furthermore, Canada's general government sector (federal, state and local governments) holds sizable financial assets compared to the U.S. (~62% of GDP vs. ~15% of GDP), reflecting Canada's prudent funding of pension liabilities. When unfunded pension liabilities are added to gross general government debt levels, U.S. general government debt totals 125% of GDP, vs. Canada's 105%. See IMF Article IV Staff reports, July 2018. GGD, or Gross General Government Debt is defined of the total debt of a country's government sector, including the federal, state and local governments. The larger portion of this debt stock is with the federal government in the U.S. case, but with the provincial governments in the case of Canada. Note as well that Canada's net debt – net of assets especially its pension fund investments—is forecast to total 27% in 2019, vs. U.S. net debt of 78%, and even starker comparison. See IMF WEO Oct. 2018.

The U.S. is a wealthy country – with substantial assets in real estate, U.S. corporations, intellectual property, etc. The Federal Reserve estimates that the U.S. has a "net wealth" of about $98 trillion -- calculated as the value of all American assets, less what it owes the rest of the world. This net wealth is equal to over 4 1/2 times the size of the U.S. economy (GDP). That is impressive. That means that, in theory, after the U.S. pays off its obligations to the rest of the world, it has assets worth over four times one year's income. Of course, there is quite a lot debt in the U.S. economy left after paying off foreigners, but that represents U.S. residents owing money to other U.S. residents. One caveat is that the estimate of the value of U.S. assets is based to a large extent on current market values. Markets fluctuate. Of U.S. net wealth, ~$70 trillion is in household real estate and the stock market, the value of which can fluctuate with market conditions. However, the stock of debt does not fluctuate with the market – the debt you owe is the debt you owe. So, the $52 trillion in debt (plus annual interest) has to be paid no matter what. Some observers believe that U.S. real estate and stocks (equities) are overvalued and are due for a sizable "correction" -- that is, a sharp market sell-off. In fact, in 2008, during the Global Financial Crisis (GFC), the value of U.S. assets subject to market fluctuation (real estate and stock market prices) fell to less than the amount of debt in the U.S. economy. Another factor complicating matters is that U.S. owners of assets are not always the same entities as U.S. borrowers, so "paying down" debts to foreigners out of assets is not a simple matter. Substantial borrowing from foreigners increases risk because foreign lenders tend to be more fickle than domestic lenders -- ready to exit a country at the first sign of trouble. Domestic lenders tend to have a "home bias" and are natural lenders to domestic borrowers. They are less likely to pull the plug when the going gets tough. The point is that the U.S. economy is leveraged. And, the situation is deteriorating -- given large and rising government deficits adding to the stock of debt each year – driven by Trump's tax cuts and spending hikes -- versus budget surpluses in Singapore and Germany, and a small deficit in Canada. Also, U.S. households save less of income than in many other countries -- a situation forecast to deteriorate in the coming years. Other countries are not forecast to experience a deterioration in household savings. Economy-wide debt rose sharply in the U.S. during the GFC, after rising sharply heading into that crisis. The dynamics of these two debt increases were different. In the three years leading into the crisis -- from 2004 to 2007 – U.S. debt rose nearly 20 percentage points of GDP driven by rapid increases in the debt of households and corporations. Since that time, the debt of households has come down sharply as a percentage of GDP and corporate debt has remained relatively stable. However, government debt rose nearly 40 percent of GDP due to the bailout of the private sector during the crisis years and the inability to substantially cut deficits after that. Low taxes in the U.S. -- by contributing to deficits -- also keep government debt high. The coverage of America's economy-wide debt stock with market-sensitive assets fluctuated from over 140 percent in 2006 before the GFC to under just above 90 percent in 2008. In 2008, the market value of assets did not cover the national debt. Today, coverage of the national debt is ~130 percent – still below the pre-GFC level. This debt coverage ratio only includes asset that are heavily market sensitive and relatively liquid such as household real estate and stock market values, not intellectual property and buildings and structures owned by government and firms.

It is challenging – though not impossible – to affect the savings behavior of the private sector, but the U.S. government can directly (and immediately) raise national savings by raising taxes and cutting spending. And, the federal government should do both, where the problems lies.

The U.S. should run government surpluses like Germany and Singapore, or at least lower deficits like Canada. Trump's policies -- $1.6 trillion in tax cuts, combined with substantial spending increases – may well push government debt to ~120 percent of GDP in ten years – high relative to peer countries and not far from the stratospheric levels implied by the polices of Bernie Sanders and his heirs. The plans of Sanders / Warren and others could result in debt of ~140% of GDP in 10 years. See The Economist, April 29-May 5 2017 print edition, "Donald Trump's tax plan, Under audit", P. 10; The Economist, "The budget, Zero sums," May 27 2017, p. 26. And see reference to Center for Budget and Policy Priorities. See Moody's on Warren's child care proposals at https://www.economy.com/mark-zandi/documents/2019-02-18-Child-Care-Act.pdf; See analysis of Warren's net worth tax proposal at http://gabriel-zucman.eu/files/saez-zucman-wealthtax-warren.pdf
See Tax Policy Center, May 2016. Sanders' centerpiece is the expansion of government-provided health care, an enhanced "Medicare for All", a single payer -- with an estimated cost of $14 - $30 trillion over ten years. See Bernie Sanders, *Guide to Political Revolution*, August 2017. See Tax Policy Center paper (Urban-Brookings), May 9, 2016, "An Analysis of Senator Bernie Sanders's Tax and Transfer Proposals". See Gerald Friedman, UMass-Amherst, January 28, 2016. See Romer and Romer, February 25, 2016, "Senator Sanders's Proposed Policies and Economic Growth". Author's calculations. Sanders and Friedman estimate $14 trillion. Tax Policy Center $32 trillion (including acute and long-term care). While Trump's policies could increase general government debt (federal, state and local debt) to 120-140% of GDP in ten years (from over 100% today), Sanders' policies could spike debt up to ~140% of GDP. Canada vs. US on GGD plus unfunded pension liabilities. See Article IV Reports, July 2018, on these countries, including for the U.S. on p. 36.
Under Sanders, government debt would likely rise even higher than under Trump -- to, say, 140 percent of GDP. While health care is important to worker productivity, a lower-cost public-private solution -- such as President Obama's Affordable Care Act – would be preferable. See, for example, Steven Brill, The Washington Post, "Nine ways to really fix Obamacare," June 30, 2017, at https://www.washingtonpost.com/opinions/nine-ways-to-really-fix-obamacare/2017/06/30/dc5a8fc4-5cfc-11e7-a9f6-7c3296387341_story.html?utm_term=.d7df835a8fca. From that article: "The failure of the Republicans to agree, so far, on an alternative to Obamacare should not be surprising — because Obamacare was, in fact, the long-standing Republican alternative to the more radical health-care reforms, such as a single-payer system, that Democrats have proposed since the Truman era. What President Barack Obama and his party pushed through Congress in 2010 was more conservative — and more pro-private sector — than what Richard M. Nixon proposed in the 1970s, or what Republican Gov. Mitt Romney implemented in Massachusetts in 2006. Put simply, Obama dared Republicans to take yes for an answer. In a polarized America, they still said no." Measures Steve Brill suggests include: to have more insurance rate differentials between young and old participants, subsidies for older people, allowing Medicare to negotiate down drug and medical device prices, reinstating excise tax on medical devices, anti-trust to prevent merged hospitals from raising prices, bundled payments and tort reform.
Perhaps one day the U.S. could contemplate Medicare for All if it could be designed to provide broad coverage and high-quality health care. However, such a course would be costly, so Medicare for All must wait until America's finances improve significantly. See Obama speech, September 2018, at https://www.huffingtonpost.com/entry/barack-obama-medicare-for-all-good-new-ideas_us_5b92b971e4b0162f472cd52c. Define Medicare and what Medicare for All is.
Sanders' plan would raise taxes across all income groups, especially on the wealthy; but, this still would not cover the costs of his spending initiatives that include -- in addition to Medicare for All – long-term care, tuition-free college, infrastructure and environmental initiatives, and expanded family and social security benefits.
The IMF reports the personal savings rate in the U.S. at 3.4% in 2017 of disposable income (income after taxes) forecasts to decline in the coming years, vs. 9.9% in Germany. According to OECD calculations, the U.S. household savings ratio was 5% of disposable income in 2016, vs. 3.8% in Canada in 2017, and a very high 37.1% in China. The U.S. household savings ratio – which reached a low of around 2.7% in 2005 before the GFC rose sharply after the crisis – has households repaired their balance sheets – reaching 7.9% in 2012. The IMF forecasts a return to previous lows of 2.5-2.7% in 2018-20 in the U.S.
China is running very large government budget deficits according to the IMF's "augmented deficit" calculation: in excess of 10 percent of GDP per year. That said, Chinese households save an enormous amount of income – the OECD estimates that China's households saved 37.1% of disposable income in 2015. Economists argue that the perception of households of a poor social safety net in China – to provide for unemployment, retirement, education, health care – drives high households savings.

See IMF Article IV reports 2018 for these countries. Note China's government debt and deficit figures reflect the IMF's calculation of "augmented" debt and The IMF and other multilaterals are attempting to broaden out the measure of private debt to include other lending besides loans and bonds. When this is done, economy-wide debt increases some 40-50 percent of GDP in the U.S., Canada and Germany. Data for Singapore and China is not available to make this estimate, but we could assume the same order of magnitude. In China, the data are particularly murky.deficits – including local government financing vehicles, spending financed by land sales, and off-budget spending. See IMF Art. IV report for China, July 2018, p. 47.

Fed for U.S. IMF Article IV for other countries. Fitch data comparator June 2018 GGD plus private credit. The latter does not always correspond to other measures. For example, gross debt in the U.S. economy at year-end 2017 was 252% of GDP according to the Fed Flow of Funds, but the Fitch figures – GGD plus private credit totals 285%. Likewise, the IMF Art IV report 2018 for Singapore states that household debt was 72%, non-financial corporate debt was 150%, and GGD was 111%, totaling 333%. Fitch says that private credit in Singapore at year-end 2017 was 139% of GDP. Part of the issue is the source – private credit to GDP comes as per Fitch comes from the IMF IFS vs. the Fed's Flow of Funds report. According to Fitch's figures, U.S. economy-wide debt totaled 285% (GG debt plus private credit). U.S. deficit spending coming out of the financial crisis, but also to the low level of taxes in the United States – a political choice. The debt of federal, state and local governments together – what economists call the "general government" -- totaled 101 percent of GDP at end-2017. This compares to Singapore's 111 percent, Canada's 90 percent, Germany's 63 percent, and China's 68 percent. Fed for U.S. IMF Article IV for other countries. Fitch data comparator June 2018 GGD plus private credit. The latter does not always correspond to other measures. For example, gross debt in the U.S. economy at year-end 2017 was 252% of GDP according to the Fed Flow of Funds, but the Fitch figures – GGD plus private credit totals 285%. Likewise, the IMF Art IV report 2018 for Singapore states that household debt was 72%, non-financial corporate debt was 150%, and GGD was 111%, totaling 333%. Fitch says that private credit in Singapore at year-end 2017 was 139% of GDP. Part of the issue is the source – private credit to GDP comes as per Fitch comes from the IMF IFS vs. the Fed's Flow of Funds report. According to Fitch's figures, U.S. economy-wide debt totaled 285% (GG debt plus private credit). U.S. deficit spending coming out of the financial crisis, but also to the low level of taxes in the United States – a political choice. The debt of federal, state and local governments together – what economists call the "general government" -- totaled 101 percent of GDP at end-2017. This compares to Singapore's 111 percent, Canada's 90 percent, Germany's 63 percent, and China's 68 percent. From IMF WEO April 2018, except U.S. from Fitch Sovereign Comparator, June 2018 (excludes debt held by government trust funds), and China from the IMF Art IV July 2018, p. 47 which is the "augmented" debt which includes local government financing vehicles and other items, which the Chinese government deems off-budget. See SWF rankings for estimates of sovereign liquid assets. China has large holdings of state-owned enterprises – banks and industrial enterprises. Some of these are indebted and some in fact zombie firms. But many are quite profitable and could be sold by the Chinese state. These are not liquid so are not deducted from government debt to get net debt. These could be valued at over 50% of GDP. Among large advanced economies, only Japan (153%), Italy (120%), France (88%), and Spain (86%) exceeded the U.S. See IMF WEO April 2018.

Data on debt is becoming more comprehensive. The IMF, the OECD and the BIS are attempting to include in private debt all debt instruments, in addition to the major items of loans and debt securities (bonds) – called "total private debt, all instruments" vs. "total private debt, loans and debt securities". However, the more comprehenseive information is only available for a subset of countries. For example, relevant for this book, the broader definition is not yet available for Singapore and China. The discussion above utilizes the narrower definition – whether from the IMF Global Debt Database (May 2018), the IMF WEO (April 2018), from national sources such as the Federal Reserve Flow of Funds (June 2018), or from the IMF International Financial Statistics (IFS) -- by way of the Fitch Sovereign Data Comparator (June 2018). The differences can be marked. For example, gross economy-wide debt totaled 252% from the Fed Flow of Funds at end-2017, 285% from the Fitch Comparator, utilizing "private credit" from the IMF IFS, 310% from IMF GDD using "total private debt, all instruments" vs. 258% using "total private debt, loans and debt securities" (2016). Similar sized-divergences occur in the IMF GDD data for Canada and Germany – a difference of 52% of GDP for the U.S., 54% for Canada, and 42% for Germany. These are not de minimis and suggest, as the IMF has, that the global debt problem (debt has risen sharply globally in recent years, not least because of accommodative monetary policies and low interest rates for a long time after the GFC. See IMF WP/18/1 "Global Debt Database: Methodology and Sources", Mbaye, Badia, Chae, May 2018. From p 11: "In line with the System of National Accounts 2008, the GDD defines debt as the gross outstanding stock of all liabilities that are debt instruments. Based on this definition, debt statistics should ideally include loans, debt securities, special drawing rights; currency and deposits; other account payables; and insurance, pension, and standardized guarantee schemes. In practice, however, only a handful of countries provide exhaustive coverage of sovereign and private debt instruments dating back to the 1950s. This is especially true for private debt, where the data consistent with the above definition are either nonexistent (particularly in most emerging market economies and low-income developing countries) or start in the early 1990s (as is the case in most advanced economies). Thus, we also compile an alternative measure of private debt that focuses on the core debt instruments, i.e., loans and debt securities. This narrower definition of private debt mirrors that of the BIS' database and helps expand the GDD's coverage considerably. For public debt, the above broader definition was maintained and, to the extent possible, we flag those cases where the instrument coverage falls short (Annex I)."

Research has found that companies that reduce debt during good times are more resilient when the inevitable financial crisis strikes. Countries must do the same. Researchers on corporate strategy at McKinsey have found that firms that have weathered downturns well – what they call the "resilients" – have done so by reducing debt and cutting costs during the good times. See "Bubbles pop, downturns stop," McKinsey Quarterly, May 2019, by Martin Hirt, Kevin Laczkowski, and Mihir Mysor at https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/bubbles-pop-downturns-stop?cid=other-eml-alt-mcq-mck&hlkid=2005edbd36974cb5a121dd61c569db1e&hctky=10318357&hdpid=5f2e28f4-c76a-42e7-9955-3d7e98c56ab0.

[187] See CBO, "Options for Reducing the Deficit: 2019-2028", December 2018, incl. p. 10. The IMF estimated that what was required to substantially lower the debt burden was closer to 4% off GDP in cuts in the federal deficit. See US IMF Article IV Staff Report, July 2018, pp. 17, 36. Fitch Ratings reported in Dec. 2018 that the median gross general government debt to GDP ratio for AAA countries forecasted for end-2019, was 41%, vs. a forecast for the U.S. of 101%, and 41% for Singapore, 81% for Canada, and 58% for Germany.

[188] For every 1 percent increase in the corporate tax rate, revenues increase $100 billion (or 0.5 percent of GDP) over ten years. See OECD, https://stats.oecd.org/Index.aspx?DataSetCode=TABLE_II1. The median overall corporate tax rate in 35 OECD countries is 24.2%, but higher in a number of large OECD countries such as Germany (30.2%), Japan (30%), France (34.4%), and Canada (26.7%), though substantially lower in the U.K. (19%). The U.S. overall rate, including Federal, state and local corporate taxes, will be around 27% with the Trump's tax cuts. That said, the non-partisan Center for Budget and Policy Priorities (CBPP) has calculated that due to tax breaks and loopholes, U.S. companies pay only 24% of income from new investment in taxes. Such tax breaks and loopholes create inefficiencies and, arguably, corruption, as the largest and loudest companies with lobbying efforts are more likely to obtain these tax benefits. See https://www.cbpp.org/research/federal-tax/actual-us-corporate-tax-rates-are-in-line-with-comparable-countries: "After accounting for tax breaks and loopholes, U.S. corporate rates are well below the 35 percent top statutory rate and are in line with corporate rates in similar countries. The Treasury Office of Tax Analysis estimates: The average corporate tax rate on profits from new investments made in the U.S. is 24 percent; the average corporate rate on profits from new investments made by companies in other "Group of Seven" (G-7) industrialized, democratic countries, weighted by the size of their economies, is 21 percent. This measure of tax rates is useful when considering how corporate taxes affect companies' decisions about where to make new investments. The share of worldwide profits that U.S. multinational corporations pay in U.S. and foreign income taxes is about 28 percent; the average for companies headquartered in other G-7 countries, weighted by the size of their economies, is 29 percent. This measure of tax rates that a multinational might face on its income from all countries is useful for considering how corporate taxes might affect where multinationals choose to reside for tax purposes." See the Non-partisan Congressional Budget Office (CBO) analysis at https://www.cbo.gov/budget-options/2016/52271 on the impact of raising the corporate tax rate on revenues.

[189] The tax cuts plus closing loopholes and imposing other taxes such as a carbon tax could have raised the U.S. federal tax intake in net terms, which is recommended by the IMF. See the IMF's Article IV Staff Report on the U.S. for 2017 at http://www.imf.org/en/Publications/CR/Issues/2017/07/27/United-States-2017-Article-IV-Consultation-Press-Release-Staff-Report-45142). Also, see OECD corporate tax rates, Fitch Sovereign Data Comparator for tax intake. Excerpt of author's email note from Nov. 2017, "Kill this tax bill": "The Republican plan to cut ~$1.6 trillion in taxes over 10 years is irresponsible. The vote in the Senate is due this week, so action to ensure that this vote fails is required. In a country with low national savings and rising government debt (and rising

debts owed to foreigners), the primary lever the government has to correct this is cutting the budget deficit. The U.S. is living beyond its means, and cutting taxes right now is just not prudent. The CBO report released yesterday forecasts a loss of $1.6 trillion in revenues over 10 years from the Senate bill, with lower spending of $219 billion, the latter largely due to the repeal of health care's individual mandate. This results in a net $1.4 trillion increase in government debt and deficits, and a consequent likely similar-sized decrease in national savings, over 10 years. This legislation is irresponsible because what the U.S. government should be doing right now is actually the opposite: gradually increasing tax revenues - in order to reduce debt, raise national savings, and fund productivity-enhancing spending such as training and education, basic research, and adjustment assistance (including affordable health care). True, tax reform is needed, including lowering the high U.S. corporate tax rate and closing corporate tax loopholes. But let's distinguish between tax *intake* and tax *rates*. Republicans would have you believe, in their advertising and public statements, that the U.S. has the highest taxes in the world. This is not true. In fact, the U.S. has the lowest tax intake of any major economy at 31% of GDP. The U.S. corporate tax rate is among the highest in the world at 35% and should be lowered. It should be lowered to improve the competitiveness of U.S. business, especially small and medium U.S. corporations who don't benefit as much from corporate tax loopholes. The cut in the U.S. corporate tax rate probably does not need to go as low as 20% as the Republicans propose, but to 25-30%, which would alleviate the current competitive disadvantage. But, don't believe me, look at the IMF's advice to the U.S. (see quote below, and if interested read the latest IMF Article IV report on the U.S. (link above). A U.S. government debt burden that continues moving higher will mean higher sovereign credit risk, which will mean a higher cost of capital for private investors. As a result, these tax cuts would mean slower economic growth for the U.S. over the longer term, contrary to Republican claims. With higher debt and risk, America could, over time, lose its status as a safe haven for global investment, which has enabled the U.S. dollar to be the world's reserve currency and the U.S. economy to have a first call on global savings.This first call on global savings by the U.S. has helped fund everything from business investment, equity and real estate market gains, government deficits, and household consumption. Rising debt, including, importantly, higher foreign claims on U.S. residents, could lead to an acceleration of the decline of the U.S. as the world's premier economy, much as Great Britain's preeminence evaporated in the years after World War I. Republicans in the past (1980s and early 2000s) have tried this massive tax cuts for growth strategy before, and it has not worked. It is a fantasy that lower tax rates lead to such higher economic growth that tax revenues surge. Taxes are already low. Cutting taxes will serve only to raise government deficits and debt. See the Kansas case described below where tax cuts were reversed this year due to gaping deficits. Lowering taxes can have a greater growth impact in high-tax economies, such as France, where the tax intake is considerably higher (53% of GDP vs. the U.S.'s 31%). It is wrong-headed and driven by a Republican belief since Ronald Reagan that tax cuts win elections. The U.S. living beyond its means is reflected in a very high Net International Investment Position (NIIP), a metric that subtracts foreign claims on the U.S. from U.S. claims on foreigners. The U.S. NIIP is a whopping negative 43% of GDP (- $7.9 trillion!), versus a positive >50% of GDP in Germany and ~15% in China. The best way for the USG to drive down the negative NIIP position is to cut the budget deficit, by raising taxes and controlling spending. In fact, all top economists surveyed by the University of Chicago said they believed government debt to GDP would be a higher as a result of Republican tax cuts, while over half said they didn't believe the tax plan would boost growth (with only 2% saying it would boost growth, the rest being "uncertain"). IMF quote on the U.S. (2017): "Fiscal policy should aim for a gradual and sustained reduction in the general government deficit—brought about by both higher revenues and lower spending—to put public debt on a downward path...There is a need to simplify the system—with lower tax rates and fewer exemptions—and redesign it to create incentives for people to enter the labor force, decrease income polarization, and support low- and middle-income households. An increase in revenue can be sought from a broad-based federal consumption tax, a carbon tax, and a higher federal gas tax."

[190] Alexandria Ocasio-Cortez (AOC) has proposed an income tax of 70 percent on the top income tax bracket. Bernie Sanders plans to tax estates over $1 billion at 77 percent. Elizabeth Warren wants to assess a tax of 2

percent on net worth above $50 million. See https://www.cnbc.com/2019/02/12/bill-gates-supports-wealth-tax-like-aoc-but-income-is-a-misfocus.html. On Warren's net worth tax see analysis of revenues earned -- ~$210 billion pre year – at http://gabriel-zucman.eu/files/saez-zucman-wealthtax-warren.pdf. The problem with the tax measures that target the wealthy – while possibly effective at reducing inequality which is a good goal – is that they don't tend to raise much in revenue. Serious revenue is raised by imposing higher taxes on the middle class. The Economist report (Feb. 14 2019 article in "millennial socialism"), for example, that AOC's proposal is estimated to raise ~$12 bln or 0.3% of the total tax intake;

[191] Such as education, health care, adjustment assistance, infrastructure spending, funding of basic R&D, and job training programs, including lifelong learning incentives. For general government revenues to GDP, see Fitch Ratings, Sovereign Data Comparator, Dec. 2018.

[192] See IMF Article IV Staff Report on the United States, July 2018, p. 21. Excessive government intervention in the economy – including high taxes – deters investment, innovation and growth.

[193] Germany's tax intake is 45% and France's 54%, for example.

Cliffs should be avoided for such programs as Medicaid, child health insurance, nutrition and housing assistance Expansion of child care has been addressed by presidential candidate Elizabeth Warren – who would increase the number of children covered under child care programs to 12 million from around 6-7 mln, by funding government child care centers, offering a sliding scale of coverage – free for families with income below $50k. The cost has been estimated at $70 billion per year -- quite expensive -- so that significant adjustments (including means-testing) would be required to keep costs down.

[195] Reducing inequality is conducive to economic growth and competitiveness, as well as to political consensus. See IMF Article IV Staff Reports on the U.S., July 2018 and 2017, p. 21, and Concluding Statement on the IMF Article IV Consultation, June 6, 2019, at https://www.imf.org/en/News/Articles/2019/06/06/mcs060619-united-states-staff-concluding-statement-of-the-2019-article-iv-mission. See also Steven Brill, The Washington Post, "Nine ways to really fix Obamacare," June 30, 2017, at https://www.washingtonpost.com/opinions/nine-ways-to-really-fix-obamacare/2017/06/30/dc5a8fc4-5cfc-11e7-a9f6-7c3296387341_story.html?utm_term=.d7df835a8fca. From that article: "The failure of the Republicans to agree, so far, on an alternative to Obamacare should not be surprising — because Obamacare was, in fact, the long-standing Republican alternative to the more radical health-care reforms, such as a single-payer system, that Democrats have proposed since the Truman era. What President Barack Obama and his party pushed through Congress in 2010 was more conservative — and more pro-private sector — than what Richard M. Nixon proposed in the 1970s, or what Republican Gov. Mitt Romney implemented in Massachusetts in 2006. Put simply, Obama dared Republicans to take yes for an answer. In a polarized America, they still said no." Measures Steve Brill suggests include: to have more insurance rate differentials between young and old participants, subsidies for older people, allowing Medicare to negotiate down drug and medical device prices, reinstating excise tax on medical devices, anti-trust to prevent merged hospitals from raising prices, bundled payments and tort reform.

Perhaps one day the U.S. could contemplate Medicare for All if it could be designed to provide broad coverage and high-quality health care. However, such a course would be costly, so Medicare for All must wait until America's finances improve significantly. See Obama speech, September 2018, at https://www.huffingtonpost.com/entry/barack-obama-medicare-for-all-good-new-ideas_us_5b92b971e4b0162f472cd52c. Define Medicare and what Medicare for All is.

See CBO report on options to cut the budget deficit – Dec 2018. Cut entitlement spending, discretionary spending, or raise revenues. SS outlays > receipts in 2018. $2.8 trillion trust fund. Run out in 2034. Do bipartisan deal like in 1983. CBPP state based on trust fund reports that SS will be able to pay full statutory benefits through 2034 before the trust fund is depleted and then some % of that based on SS payroll taxes afterwards, and Medicare will be able to do that through 2026 and then 91% afterwards through payroll taxes declining each year as a %: Following the bipartisan Social Security solvency deal in 1983, Social Security ran a surplus every year until 2018. See CBPP report. U.S. government makes entitlement payments through annual contributions and is expected to deplete its Social Security and Medicare trust funds during the period 2026-34 unless taxes are increased. By contrast, the U.S. government makes entitlement payments – Social Security, Medicare, Medicaid and other payments -- out of taxes. Over the years, the U.S. generated surpluses in the trust funds equivalent to about 15 percent of GDP, expected to be depleted during the period 2026-34 unless taxes are increased. Infra, student loan forgiveness. The government should also raise the federal minimum wage to avoid a reduction of wages for those getting the EITC.

See Moody's report on Warren child care proposal at https://www.economy.com/mark-zandi/documents/2019-02-18-Child-Care-Act.pdf

[196] Maybe one day the U.S. could afford Medicare for All, but it would have to be fully funded. Delaney plan is interesting bc he has govt provide basic services, with private plans available for additional services – not unlike how it works in Singapore with tiered facilities, paid for out of HC savings accounts. **Fixing Obamacare** -- rather than repealing it or replacing it with an expensive single payer -- would be the optimal solution today. But support for extreme solutions is gaining, while little is heard any more about shoring up and improving the ACA. Steve Brill article on how to fix. HC – public and private option – competition – Seth Moulton. Opioid crisis – See Economist article Feb. 23 – ideology prevents enactment of sound policies – e.g. clean needle program, etc. Opioid crisis and race – now it's a crisis of white people in rural areas – even though there have been urban drug problems including affecting African-Americans heavily for decades – now it's the nation's attention. Heroin and crack were crises for African-Americans; opioids esp. stemming from prescription opioids is hitting white America. gaining popularity but is it? Recent poll – Kaiser Foundation poll (see NPR Feb 8 The Takeaway with Amy Walter, interview with Molly Ann Brody of Kaiser) found that 51% of Democrats wanted Congress to fix the ACA, while 38% wanted Medicare for All. Many don't understand what Medicare for All and how much change there will be. When you start asking them whether they are willing to give up what they have with such a change, like employer-sponsored insurance, then support starts to crumble. Can move toward universal health care a la Obama, without busting public finances a la AOC and Sanders – a public option, expand Medicaid, expand Medicare, fix ACA, but no Medicare for All, cut drug costs – staring to lose popularity. Fix ACA. While health care is important to worker productivity, a lower-cost public-private solution -- such as President Obama's Affordable Care Act – is preferable. This is an excellent example of the noxious effect of polarization. Fixing Obamacare -- rather than repealing it or replacing it with an expensive single payer -- would be the optimal solution. But support for extreme solutions gains, while little is heard any more about shoring up and improving the ACA.

IMF Concluding Statement Article IV Consultation, June 6, 2019 on opioid crisis.

[197] Corporate debt has been rising and real estate and stock prices are higher worldwide, so worries about another credit bubble and a painful market correction have emerged. IMF Blog April 16, 2019: "Fortunately, IMF economists have developed a new tool to help policymakers predict the odds, or the magnitude, of a large decline in house prices. Their study, which is described in detail in Chapter Two of the April 2019 *Global Financial Stability Report*, identifies five factors that are associated with greater risk of a housing bust. These include rapid economic growth (in advanced economies), overvaluation of home prices, credit booms, and tighter financial conditions, which may include higher interest rates.

What steps can policymakers take to limit the downside risks to house prices and their consequences for the real economy? So-called macroprudential measures seem to be effective. Examples include regulations that limit the amount of a home loan relative to the property price, or the size of the monthly mortgage payment relative to income. With the right policies, it will be possible to improve the resilience of the housing market."

For EITC, see http://www.ncsl.org/research/labor-and-employment/earned-income-tax-credits-for-working-families.aspx.

Extreme ideas that argue against thrift, such as Modern Monetary Theory (MMT) – a foolish notion that calls for virtually unlimited money creation to finance ever-wider government deficits because inflation is no longer considered a problem, should be discarded. MMT seeks to eliminate the government's budgetary constraint, which would only hasten the decline of the U.S. economy. Such magical thinking smacks of the trap that Carmen Reinhart and Kenneth Rogoff warned about in their pathbreaking study of financial crises across eight centuries, *This Time is Different*. See pp. 15-20. See MMT incl. Marco Annunziata, Mohammed El-Erian. The point made here does not dismiss the "paradox of thrift" argument famously made by John Maynard Keynes, that in bad times, private actors save more, which reduces aggregate demand and aggravates the downturn associated with a financial crisis. See John Maynard Keynes, The General Theory of Employment, Interest and Money, excerpts from chapter 24, http://www.marxists.org/reference/subject/economics/keynes/general-theory/. In fact, Keynes point argues for government intervention – deficit spending and lower interest rates – to stimulate aggregate demand when recession / depression hits. Thrift provides the resources for such a "rainy day". The study showed that high debt has nearly always been the cause of financial ruin, the curse of nations -- in spite of the fact that nearly every time before the onset of a financial crisis, participants in the credit frenzy – like today's MMT partisans – have argued that "this time is different" – because -- among other reasons -- political stability is here to stay, technology has made financial markets more efficient, technocrats have mastered economic policy, risk has been diversified, and globalization solves all ills. Thrift is a necessary.

[198] Care should be taken in putting in place such rules to avoid the fate of the 1980s Gramm-Rudman-Hollings automatic spending caps -- which were ruled unconstitutional because they usurped Congress's power of the purse.

[199] The Democrats and Republicans should be able to reach a consensus on how to rationalize taxes and spending. By contrast, it makes no sense to cut fiscal deficits through sequestration -- across-the-board discretionary spending cuts harmful to the economy -- amid periodic near-sovereign defaults that undermine the country's creditworthiness, and government shutdowns due to political brinksmanship over the debt ceiling – and more fundamentally, over rigid economic ideologies. See Zachary A. Goldfarb, Washington Post, Aug. 6 2011, S&P Downgrades US Credit Rating for First Time, at https://www.washingtonpost.com/business/economy/sandp-considering-first-downgrade-of-us-credit-rating/2011/08/05/gIQAqKeIxI_story.html?utm_term=.8c6ee2d9712e, and Damian Palletta and Matt Philipps, Walls Street Journal, August 6, 2011, at mhttps://www.wsj.com/articles/SB10001424053111903366504576490841235575386. S&P downgraded the U.S. sovereign rating to AA+ from AAA to reflect the debt ceiling standoff in 2011, where it remains today. See The Economist, April 29-May 5 2017 print edition, "Donald Trump's tax plan, Under audit", P. 10; The Economist, "The budget, Zero sums," May 27 2017, p. 26. And see reference to Center for Budget and Policy Priorities. Also p. 25 health care article in Economist.

[200] See National Science Foundation, "Science and Engineering Indicators 2018" at https://www.nsf.gov/statistics/2018/nsb20181/, p. O-3 (National Science Board) – report to the U.S. Congress and the President. From Foreword, p. F-3: "Science and Engineering Indicators (Indicators) is a congressionally mandated report that provides high-quality quantitative information on the U.S. and international science and engineering enterprise. Indicators is factual and policy neutral. It does not offer policy options, and it does not make policy recommendations. The report employs a variety of presentation styles—such as narrative text, data tables and figures—to make the data accessible to readers with different information needs and different information-processing preferences." And, also from p. O-3: This overview highlights information from Science and Engineering Indicators that offers insights into the global landscape and presents broadly comparable data to examine indicators across regions, countries, and economies, comparing S&E training, research outputs, the creation and use of intellectual property, and the output of knowledge-intensive industries. It is not intended to be comprehensive: numerous important topics that are addressed in individual chapters are not covered in the overview: K–12 mathematics and science education, demographic profiles of those participating in S&E education and occupations, and public attitudes and understanding of S&T. Major findings on particular topics can be found in the "Highlights" sections that appear at the beginning of Chapters 1–8." "In knowledge-intensive economies, S&E [science and engineering] research, its commercial utilization, and other intellectual work are of growing importance. Increasingly, economies rely on a skilled workforce and sustained investment in R&D to produce knowledge streams, new technologies, and discoveries. The resulting knowledge and discoveries lead to new or improved products and processes, as well as output growth in many industries, notably manufacturing industries that produce spacecraft, pharmaceuticals, and computers or in the sizable financial, business, education, and health services sectors."

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[201] For the U.S. federal Department of Education's National Assessment of Educational Progress (NAEP), which has focused on 4th and 8th graders, see https://nces.ed.gov/nationsreportcard/about/: "The National Assessment of Educational Progress (NAEP) is the largest nationally representative and continuing assessment of what America's students know and can do in various subject areas. Assessments are conducted periodically in mathematics, reading, science, writing, the arts, civics, economics, geography, U.S. history, and in Technology and Engineering Literacy (TEL). In 2017, NAEP began administering digitally based assessments (DBA) for mathematics, reading, and writing, with additional subjects to be added in 2018 and 2019." For NAEP alignment with international assessments, see https://nces.ed.gov/nationsreportcard/about/international.aspx. Math

performance was relatively flat over the period 2005-15, versus more marked improvement during the previous 10-year period in NAEP tests. In 2015 See National Science Foundation, "Science and Engineering Indicators 2018" at https://www.nsf.gov/statistics/2018/nsb20181/, p. 1-13. P. 4 on discussion of performance gaps between white and black and Hispanic students. Both math and science assessments found that less than half of students in these two cohorts were proficient in these subjects.
The U.S. performed worse than the average of 35 OECD countries participating in the international PISA exams of high school students in 2015 -- the latest assessment date. Another international test -- the Trends in International Mathematics & Science Study (TIMSS) – which assesses a younger cohort – also showed the U.S. achieving scores well short of top performers. The U.S. scored 470 in math, versus the OECD's 490. Number 1-ranked Singapore scored 564, four provinces in China 531, Canada 516, and Germany 506. Hong Kong 548, Japan 532. Note statistical differences in the PISA scores. See the Organisation for Economic Cooperation and Development (OECD). Program for International Student Assessment (PISA). Add links to TIMSS and NAEP. The NAEP exercise showed 8th graders proficient in math at slightly over a third from 2009 to 2017. See https://www.nationsreportcard.gov/math_2017/nation/achievement?grade=8.
Regarding the Red state / Blue state balance -- Massachusetts (a Blue state) achieved a math score of 500 in the PISA tests, and North Carolina (a Red state) a score of 471. The U.S. has compared more favorably with other countries in science and reading, but still falls well below top-ranked countries. The U.S. shortfall was more pronounced in math than in science in both the TIMSS and PISA exercises. Gaps between Red and Blue states also show up as well in the TIMSS assessment. The PISA assessment tests 15 year-olds across 72 countries (OECD plus others). Note groupings of countries where there is no statistical difference, in addition to straight score ranking. Explain statistically significant ranges. China's assessment includes only provinces – Beijing, Shanghai, Jiangsu, and Guangzhou. Hong Kong and Macao are included separately. As is Taiwan. China's 4 provinces scored 531 in math. The NAEP assessment also shows a large number of "Red States" below the national average in math: see https://www.nationsreportcard.gov/math_2017/states/scores?grade=8.
In the U.S. News and World Report ranking of U.S. states along 8 parameters of quality of life – health care, education, economy, infrastructure, opportunity, fiscal stability, crime & corrections, and the natural environment, Blue states outperformed Red states on Education. On overall education, which assesses pre-K to 12th grade and higher education equally, of 20 states that were Blue (for Clinton) in 2016, 6 were in the top ten states; of the 30 states that were Red (for Trump) only 4 were in the top 10 states. The balance was worse when pre-K to 12th is isolated – consistent with the PISA and NAEP results – 7 of top 10 were Blue states, 3 were Red states. All 5 of the top 5 states for pre-K to 12th were Blue States in the following order – Massachusetts, New Jersey, New Hampshire (which is sometimes Blue, sometimes Red), Vermont and Connecticut. In the entire pool 75% of Blue states were in the top 25 states on overall education; whereas over 83% of Red states were in the bottom half. See https://www.usnews.com/news/best-states/rankings/education
The Organisation for Economic Cooperation and Development (OECD). Program for International Student Assessment (PISA) tests 15 year-olds across 72 countries (OECD plus others). Note groupings of countries where there is no statistical difference, in addition to straight score ranking. Explain statistically significant ranges. China's assessment includes only 4 big cities; Hong Kong, Taiwan and Macao are included separately. OECD 2015 PISA results for the U.S. at http://www.oecd.org/pisa/pisa-2015-United-States.pdf , on p. 18: "In science and reading, there was no statistically significant difference between performance in the United States and the average performance across the OECD, while in mathematics, the United States performed below the OECD average."… the mean performance in the United States in science and reading has been stable since the last assessment in which they were the major domains: from 489 to 496 score points in science from 2006 to 2015, and from 500 to 497 points in reading from 2009 to 2015. however, mathematics performance in the United States fell significantly, from 481 to 470 points between 2012 (a year in which its performance was also below the OECD average) and 2015." See Massachusetts Department of Education note of Dec. 6, 2016, at http://www.doe.mass.edu/news/news.aspx?id=24050, for Massachusetts vs. North Carolina PISA scores: 527 vs. 500 for reading (higher is better) respectively; 500 vs. 471 for math; and, 529 vs. 502 for science. Per 2015 OECD PISA report: scores fall in a range that is statistically equivalent, for example, from p. 18-19 of the 2015 report: "…the mean performance of the United States in science (496 score points) is statistically equivalent to that of countries with a performance ranging between 490 and 502 points; 12 other OECD countries perform at this level, including, for example, Austria, Belgium, Denmark, France, Poland and Sweden. Massachusetts' math score deteriorated from the previous assessment (514 in 2012) – as did the overall U.S. score (480 in 1012). The United

States performs significantly below the four high-performing countries/economies discussed in this report: Canada (528), Estonia (534), Germany (509) and Hong Kong (China), a non-OECD member (523)."

See Trends in International Mathematics and Science Study (TIMSS). See https://nces.ed.gov/timss/. For example, Florida (a "swing" state, but leaning Red) scored 493 in math for 8th graders in TIMSS, whereas the U.S. overall scored 518. In science, Florida's 8th graders scored an average of 508, whereas the U.S. scored 530.

Nevertheless, American students tend to perform better in TIMSS than in PISA in both math and science. PISA purports to test real world application of knowledge, while TIMSS tests knowledge of the school curriculum. American students showed improvement over time in the TIMSS tests, versus being flat to down in PISA.

See Tom Loveless, "The 2017 Brown Center Report on American Education: How Well Are American Students Learning?" March 2017, Brookings Institution, at https://www.brookings.edu/wp-content/uploads/2017/03/2017-brown-center-report-on-american-education.pdf, pp. 7-11. TIMSS's U.S. math ranking was somewhat better than the PISA results, due to testing approach and sample selection. "The Trends in International Mathematics and Science Study (TIMSS) provides reliable and timely data on the mathematics and science achievement of U.S. students compared to that of students in other countries. TIMSS data have been collected from students at grades 4 and 8 since 1995 every 4 years, generally.

See pp. 9-16 for a "What is PISA" discussion. Add description of the scoring and who is in OECD 30, 35, etc. and the other countries contained therein and China's 4 cities. Discuss statistical significance.

On reading, the U.S. scored 497, vs. an OECD average of 493, and top-ranked Singapore's 535. On science, the U.S. scored 496, vs. an OECD average of 493, and top-ranked Singapore's 556. Massachusetts' math score was worse than the following countries (on a statistically significant basis) - Singapore, Hong Kong, Taiwan, Japan, Korea, Switzerland, Estonia, Canada and the Netherlands – and equal or superior to other countries in the PISA exercise.

See Press Release, Dec. 6, 2106, Massachusetts Commonwealth government.

And compared to Canadian provinces, Massachusetts scored worse than only Alberta, British Columbia and Quebec on science in 2015.

See Press Release, Dec. 6, 2106, Massachusetts Commonwealth government. North Carolina, by contrast, scored 502 in science, besting Manitoba and Saskatchewan in Canada as well as the overall U.S. average. See US OECD PISA 2015 report, p. 19. Explain statistically significant ranges.

The U.S. scored 496 in science in 2015, versus the OECD average of 493, and 556 for top-ranked Singapore, 528 for Canada and 509 for Germany. Massachusetts scored 529 in science. Massachusetts' science score was worse than only a few countries (on a statistically significant basis) – including Singapore, Japan, Estonia, Taiwan and Finland. In Massachusetts, 14 percent of students scored in the top two levels in science (levels 5 & 6), versus Singapore where 24 percent of students did. On reading, the U.S. scored 497 in 2015, slightly above the OECD average of 492, but below 535 for top-ranked Singapore, 527 for Canada, and 509 for Germany. Massachusetts was effectively tied for second place on reading in 2015. With a score of 527 – Massachusetts tied with Canada and Hong Kong – and together they were in second place behind Singapore. Statistically, Massachusetts' reading score was no different from top-ranked Singapore. North Carolina by contrast scored 500 in reading. Although the U.S. ranking was lower than 20th in all three subject categories in PISA 2015, the U.S. was ranked 12th in a new category – "collaborative problem solving" – which assesses students in their capacity to solve problems together. Other sources for education outcomes largely confirm the OECD data.

In addition, TIMSS Advanced measures advanced mathematics and physics achievement in the final year of secondary school across countries." TIMSS country coverage is smaller than the OECD PISA coverage. TIMSS covers 55 countries at the 4th grade level, 44 countries at the 8th grade level, and only 9 countries at the 12th grade level. This is largely why the PISA tests were used in this book's scoring model. "TIMSS Advanced data [12th grade] have been collected internationally three times, in 1995, 2008 and 2015. The United States participated in TIMSS Advanced in 1995 and 2015. TIMSS is sponsored by the International Association for the Evaluation of Educational Achievement (IEA) and managed in the United States by the National Center for Education Statistics (NCES), part of the U.S. Department of Education…"

The choice of which tests to use for comparison is not without controversy. See Tom Loveless, "The 2017 Brown Center Report on American Education: How Well Are American Students Learning?" March 2017, Brookings Institution, at https://www.brookings.edu/wp-content/uploads/2017/03/2017-brown-center-report-on-american-education.pdf.

Some countries consistently perform at the similar levels on both the PISA and TIMSS tests – including the top-ranked East Asian countries. For example, in 2015, Singapore topped all rankings in both PISA and TIMSS tests

(except in TIMSS Advanced which it did not participate). Canada also performed at similar levels cross the two testing methodologies. That said, PISA claims to test real-world application of learning, while TIMSS focuses more on curricula. PISA 2015 report, p. 3: "The assessment does not just ascertain whether students can reproduce knowledge; it also examines how well students can extrapolate from what they have learned and can apply that knowledge in unfamiliar settings, both in and outside of school." By contrast, from the TIMSS 2015 report, p. 1: "TIMSS is designed to align broadly with mathematics and science curricula in the participating education systems and, therefore, to reflect students' school-based learning."
Some have argued that PISA results do not reflect student preparation with a skill set. According to http://www.tc.columbia.edu/articles/2016/december/tcs-henry-levin-on-us-news-website/
See National Science Foundation, "Science and Engineering Indicators 2018" at https://www.nsf.gov/statistics/2018/nsb20181/, pp. 1-5: "In the international arena, the Trends in International Mathematics and Science Study (TIMSS) and the Program for International Student Assessment (PISA) 2015 data show that the U.S. average mathematics assessment scores were well below the average scores of the top-performing education systems.

• On the TIMSS mathematics assessment, average scores for the top five performers—Singapore, Hong Kong, South Korea, Taiwan, and Japan—were at least 54 points higher than the United States at grade 4 (593–618 versus 539) and at least 68 points higher than the United States at grade 8 (586–621 versus 518). On the TIMSS science assessment, the U.S. 546 at grade 4 and 530 at grade 8. TIMSS scales results so that the mean is 500, indicating that the U.S., while not a stellar performer, is consistently above the mean in the TIMSS test, in contrast to the OECD PISA performance.
• The United States' average score of 470 on the PISA mathematics literacy assessment for 15-year-olds was at least 62 points below the average scores (532–564) of the top five performers—Singapore, Hong Kong, Macau, Taiwan, and Japan. TIMSS data show that U.S. fourth and eighth graders have raised their scores over the 20 years since administration of the first TIMSS mathematics assessment in 1995.
• Between 1995 and 2015, the average mathematics score increased by 21 points for fourth graders and by 26 points for eighth graders."

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[202] Just as the Council of Provincial Education Ministers in Canada and the Education Ministers Conference in Germany do.

[203] That was the executive branch. The judicial branch got involved earlier, notably in the landmark ruling mandating school desegregation, Brown vs. the Board of Education of Topeka in 1954, argued before the Supreme Court by NAACP chief counsel, Thurgood Marshall. See https://www.naacpldf.org/case-issue/landmark-brown-v-board-education/.

[204] See https://www2.ed.gov/about/overview/budget/history/index.html. See PISA US Country Note, 2015, p. 52

[205] Remedies at problem schools could be harsh, including firing principals and staff, lengthening the school year, converting to a charter school or closing.

[206] Conservatives objected to the heavy hand of the federal government they argued was contained in NCLB. States' rights have been a staple of Republican Party education policy -- pushing authorities down to the localities, instead of having a national education plan.

[207] Common Core was an example of an organic solution that fit U.S. political realities. With NGA leadership, states were encouraged to adopt the standards. Common Core has been adopted by 41 of 50 states since 2010. OECD PISA Report, 2012. P. 1 of the OECD PISA Report, Country Note on the U.S. The report also stated regarding future math performance, "The analysis suggests that a successful implementation of the Common Core Standards would yield significant performance gains also in PISA." P. 3. Add citation for 2012 and 2015 PISA reports. Add this point: There is room for progressive education – i.e., utilizing alternative methods to teach in order to bring meaning, enjoyment and concrete understanding to learning – and for the mitigation of unnecessary stress on young people – while still maintaining rigorous national education standards. Tailoring programs to national needs does not need to imply a material relaxation of standards. See Common Core at http://www.corestandards.org/about-the-standards/: "The Common Core is a set of high-quality academic standards in mathematics and English language arts/literacy (ELA). These learning goals outline what a student should know and be able to do at the end of each grade. The standards were created to ensure that all students graduate from high school with the skills and knowledge necessary to succeed in college, career, and life, regardless of where they live. Forty-one states, the District of Columbia, four territories, and the Department of Defense Education Activity (DoDEA) have voluntarily adopted and are moving

forward with the Common Core." [207] Reference 2012 US OECD PISA report. Common Core as of 2008 was sponsored by the National Governors Association and the Council of Chief State School Officers (CCSSO). See "Benchmarking for Success: Ensuring U.S. Students Receive a World-class Education," 2008, of the NGA, CCSSO and Achieve, Inc., a bipartisan, non-profit organization to raise educational standards.
In addition, 30 states across the country are in the process of adopting what have been called "proficiency-based learning" models – focusing on students acquiring specific skills and competencies, rather than simply clocking set hours of learning time. See The Hechinger Report, Weekly Newsletter, April 23, 2019, including "Vermont's 'all over the map' effort to switch schools to proficiency-based learning"

[208] Plus the District of Columbia and four territories. Common Core as of 2008 was sponsored by the National Governors Association and the Council of Chief State School Officers (CCSSO). See "Benchmarking for Success: Ensuring U.S. Students Receive a World-class Education," 2008, of the NGA, CCSSO and Achieve, Inc., a bipartisan, non-profit organization to raise educational standards.

[209] NCLB failures included rigid federal remedies that required frequent waivers.

[210] Most of the states opting out of, repealing, or revising Common Core were Red states.

[211] See https://www.edweek.org/ew/articles/2017/11/13/even-when-states-revise-standards-the-core.html. See http://www.corestandards.org/standards-in-your-state/. By 2013, 7 states, Oklahoma, Texas, Virginia, Alaska, Nebraska, Indiana, and South Carolina have not adopted the Common Core Curriculum at the state level. Minnesota opted out of the math standards. With opposition to the standards growing, not least due to ascendancy of the Republican Party in government which leads opposition to the standards, three states that initially adopted the standards – Indiana, Oklahoma and South Carolina have opted out, and legislation to prohibit implementation introduced in other states. 8 states by Jan. 2017 had repealed or withdrew: See https://www.districtadministration.com/article/common-core-no-more-new-york-and-21-other-states-revise-or-rename-k12-standards. A report by Achieve found that most states that revised standards kept the "core of the core", albeit in some cases watered down, especially in math. See http://scholasticadministrator.typepad.com/thisweekineducation/2015/11/financial-woes-plague-common-core-rollout-wsj.html#.WoI9pKinE2w. See Wikipedia and https://www.usnews.com/news/articles/2014/08/20/common-core-support-waning-most-now-oppose-standards-national-surveys-show.

[212] Upgrading teacher performance was also stymied with ESSA, as teacher evaluations were no longer necessarily based on student performance. See The Economist, Dec. 23, 2017, "Public Education, America's school funding is more progressive than many assume"

[213] See article on Secretary of Education Betsy DeVos at https://www.politico.com/story/2018/02/07/betsy-devos-school-choice-education-397633. See DoE Budget History; The Atlantic, March 11, 2019, Adam Harris; Edweek, March 11, 2019 and October 1, 2018, Andrew Ujifusa.

[214] Booker also sought private giving -- such as the large donation Facebook's Mark Zuckerberg made to Newark schools. Energetic, innovative and centrist leadership -- like Booker's -- is needed on education.

[215] Experimentation with test frequency and curriculum development – and ample funding of education innovation -- are warranted.
See Natalie Wexler, The Atlantic, August 2019, "Elementary Education Has Gone Terribly Wrong", at https://www.theatlantic.com/magazine/archive/2019/08/the-radical-case-for-teaching-kids-stuff/592765/.

[216] Entitlements represent nearly 15 percent of GDP. See Congressional Budget Office at https://www.cbo.gov/publication/52408. See Dept of Education at https://www2.ed.gov/about/overview/budget/history/index.html. See The Economist, Jan. 25, 2018, "Budget, busted, America's budget process swallows time but achieves too little". Roughly 2/3 of federal spending is represented by entitlements – such as social security, Medicare and Medicaid, while defense spending is about 15% of the total budget and one-third of the budget remaining after entitlements, called "discretionary" spending. The Dept of Education budget is about 2-3% of the total budget and 5.5-6% of discretionary spending. Furthermore, defense spending's share is likely to move sharply higher in the Trump administration. See New York Times, February 12, 2018, Politics, White House Proposes $4.4 Trillion Budget That Adds $7 Trillion to Deficits, by Julie Hirschfeld Davis at https://www.nytimes.com/2018/02/12/us/politics/white-house-budget-congress.html?hp&action=click&pgtype=Homepage&clickSource=story-heading&module=first-column-region&region=top-news&WT.nav=top-news; and, Politico, Feb. 12. 2018, Trump scales back request for stiff budget cuts, by Sarah Ferris and Jennifer Scholtes, at https://www.politico.com/story/2018/02/11/trump-budget-

cuts-domestic-programs-403636. The Department of Education's budget is split roughly evenly between primary and secondary education on the one hand and higher education on the other. The biggest line items in the budget have traditionally been for grants and loans for college tuition -- though the Trump budget proposes scaling back needs-based college programs. The budget for primary and secondary education is dominated by ESEA aid to lower-income school districts (16 percent of the budget) and funding for special education (14 percent). There are also funds for teacher quality (just 2.7 percent of the budget) and "21st century learning centers" – which are after-school programs in reading and math for disadvantaged students (1.3 percent). The latter program would be cut in the Trump budget.
Other important programs remain underfunded. "Math and Science Partnerships" -- designed to upgrade teachers' math and science skills -- have been funded with ~$150 million per year (0.2 percent of the budget), despite budgetary requests that were much higher during the Obama years. The "Teacher Incentive Program" -- which supplements low teacher pay with bonuses to the best teachers and principals -- receives funding of only $200-250 million per year (about 0.3 percent of the budget).

[217] See 2017 Brookings report on Pell Grants at https://www.brookings.edu/wp-content/uploads/2017/10/pell-grants-report1.pdf, and Forbes article on Pell Grants from Feb. 2, 2018 at https://www.forbes.com/sites/prestoncooper2/2018/02/02/pell-grants-are-now-a-middle-class-benefit/#13d702974a1f.

[218] Four East Asian nations and Sweden are in the top five on ICT adoption. See WEF, 2018.

[219] Such additional funds for Red states might even result in greater political support among conservatives for a robust DoEd.

[220] From OECD Education at a Glance, 2018: http://www.oecd.org/education/education-at-a-glance-2018-data-and-methodology.htm. US teacher salaries (with 15 years experience) relative to workers with comparable education in 2017 was 0.76, vs 1.18 in Canada, and 1.11 in Germany, 1.03 for the OECD average, and 0.96 for the EU22 average.
Statutory salaries of teachers with 15 years of experience and most prevalent qualification, relative to earnings for full-time, full-year workers with tertiary education (ISCED 5 to 8), Upper secondary, general programmes.
See also p. 50 2015 PISA report: "One of the primary ways to recruit stronger teachers is to raise teacher salaries. higher teacher salaries (relative to those of similarly educated workers) are associated with higher teacher skills in numeracy and literacy (Hanushek, Piopiunik and Wiederhold, 2014). Canada, Germany and Hong Kong (China) ensure relatively high salaries for teachers. the ratio of salaries for lower secondary teachers (with typical training) after 15 years of experience to per capita GDP is 1.63 in Hong Kong (China), 1.53 in Germany and 1.50 in Canada, while the ratio is 1.16 in the United States." And, see NSF, "Science and Engineering Indicators 2018" at https://www.nsf.gov/statistics/2018/nsb20181/, p. 1-83: "Teachers' salaries are associated with the attractiveness of teaching as a profession. The relative earnings in teaching and nonteaching professions correlate with career choices, and there is less attrition among teachers with higher salaries (Feng 2014; Gilpin 2012; James et al. 2011; OECD 2005). The United States ranks low among developed countries with respect to the ratio of teachers' salaries to the salaries of other tertiary educated workers. For primary school teachers, the U.S. ranking is 20th of 23 countries. For lower and upper secondary school teachers, the United States is 21st of 23 countries."

[221] See The Economist, Jan. 30, 2018, "Education in America, What's the Matter with Oklahoma". Some states have moved to a 4-day school week to save funds and to allow underpaid teachers to work second jobs. Also see Kansas case at https://www.washingtonpost.com/news/wonk/wp/2017/06/07/kansas-republicans-raise-taxes-rebuking-their-gop-governors-real-live-experiment-in-conservative-policy/?utm_term=.8631720eac26. See West Virginia case at https://www.cnn.com/2018/03/03/us/west-virginia-teachers-strike/index.html. Denver and LA teacher protests. Kansas Brownback. Arkansas education system – 4 day work week etc. Economist article Mar 2 2019.

[222] And, 2nd and 5th in the TIMSS tests of 8th graders in Science and Math respectively. See TIMSS, Results From TIMSS 2015, pp. 6 and 15

[223] And an OECD average of 86 percent. In the U.S., local efforts -- such as New York City's universal pre-K program under Mayor Bill de Blasio -- have expanded access; however, only a national initiative could increase pre-K coverage to levels obtained in top performers. Mayor Bill deBlasio's massive effort to enroll students in universal pre-K in New York City, where previously pre-K enrollment rates were reported at about 50%, enrolled an additional 68,000 4 year olds in public school by Sept 2017. See The New Yorker, Rebecca Mead, Sept. 7, 2017. Find OECD PISA quote on role of universal pre-K in future education outcomes.

[224] See OECD Education at a Glance, 2018. Spending on early childhood education in 2015 (< 3 years old) was 0.41% of GDP in the U.S., vs. 0.6% for the OECD average, 1.4% in Sweden, 0.85% in Israel, 0.58% in Germany, 0.57% in Korea, while quite low at 0.23% in Japan.

See OECD PISA Country Note, Japan, 2015, including p. 8 on resource allocation.

See OECD PISA Notes for Japan, 2012 and 2015. In spite of Japan's strong education outcomes, the country is ranked only one spot better than the U.S. in the Country Risk rankings, pulled down by a poor sovereign rating -- A+/A/A1 vs. the U.S.'s AA+/AAA/Aaa and Germany's, Canada's and Singapore's AAA/AAA/Aaa -- and given Japan's off-the-charts sovereign debt burden of 231% of GDP (though much lower net of assets and public sector cross-holdings, though still about as high as indebted Italy with its BBB-range ratings), and poor business climate with a World Bank Ease of Doing Business percentile ranking of 79.4 (39/190 countries), vs. Germany's 87.4 and the U.S.'s very strong 95.8 – given Japan's heavy bureaucratic obstacles and challenges starting and running a business.

[225] IMF Article IV Staff Report on the U.S., July 2018, p. 18

[226] See "The US Labor Market in 2050, Supply, Demand and Policies to Improve Outcomes", Harry J. Holzer, May 31 2019, Georgetown University, at https://www.brookings.edu/wp-content/uploads/2019/05/201905_Holzer-The-US-Labor-Market-in-2050-Supply-Demand-and-Public-Policy.pdf

[227] See The Diplomat, Singapore, Oct. 12, 2017 -- large numbers of Singaporeans have taken advantage of this program. See also the Aspen Institute, "Lifelong Learning and Training Accounts", May 2018 at https://assets.aspeninstitute.org/content/uploads/2018/05/Lifelong-Learning-and-Training-Accounts-Issue-Brief.pdf?_ga=2.74750482.1894486856.1560823428-1664743796.1560823428. Reference Moulton proposal as well as Trump's council on the American worker and the 14 job training programs. (?)

[228] S&E degrees have represented about one-third of bachelor's degrees awarded in the U.S. in the 15 years to 2015. By contrast, in 2014 about half of bachelor's degrees awarded in China and Japan were for S&E. Of the estimated total number of bachelor's degrees awarded in the world in 2014, 7.5 million, about 25% were awarded in India, 22% in China, and 10% in the United States. Reference NSF – breakdown of S&E degrees incl. social science degrees. NSF 2018, pp. 2-5 to 2-8.

[229] Or Europe. IBID p. 2-55. Most of the growth in S&E degrees in the U.S. has been in the social sciences and life sciences, though engineering degree awards have risen in the last ten years as well.

[230] Reflected in OECD figures showing growth in the number of researchers in China and Korea outpacing similar growth in the U.S. and Europe. See NSF Science & Engineering Indicators, p. 3-79; p. 3-147, p. 3-130 to 3-131

[231] NSF Science & Engineering Report. GDP grew on average 2.2 percent both in the 10-year period 1998-2008 and in the 5-year period 2010-15, though R&D expenditure expanded 3.6 percent per year during the first period and only 2.3 percent in the second period.

[232] $356 billion, or nearly three-quarters of R&D was performed by private business. Academic institutions performed 13%. See NSF p. 4-105: "R&D: Research and experimental development comprise creative and systematic work undertaken in order to increase the stock of knowledge—including knowledge of humankind, culture, and society—and its use to devise new applications of available knowledge. Basic research: Experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view. Applied research: Original investigation undertaken in order to acquire new knowledge; directed primarily, however, toward a specific, practical aim or objective. Experimental development: Systematic work, drawing on knowledge gained from research and practical experience and producing additional knowledge, which is directed to producing new products or processes or to improving existing products or processes (OECD 2015)." Private business performed 58% of applied research and financed just over half, while the federal government financed 36%. The federal government also financed 16% of product development, usually with defense industries or federal labs, while business financed 82% of product development, and performed 88% of it.

[233] Most of it academic institutions. NSF, p. 4-6. "Federal obligations for the total of R&D and R&D plant were $129 billion in FY 2008, $145 billion in FY 2009, and $147 billion in FY 2010. But the years thereafter have been marked by several large declines—in FYs 2011 and 2013, with only modest offsetting increases in FYs 2012, 2014, and 2015. Federal R&D funding had dropped to $131 billion in FY 2015—a decline of 18% from the FY 2010 level, when adjusted for inflation.

Fifteen federal departments and 12 other agencies engage in and/or fund R&D in the United States. Eight of these departments or agencies reported R&D obligations in FY 2015 in excess of $1 billion: U.S. Department of Agriculture, Department of Commerce, Department of Defense (DOD), Department of Energy, Department of

Health and Human Services (HHS), Department of Homeland Security, National Science Foundation, and National Aeronautics and Space Administration. These together accounted for 97% of all federal obligations for R&D that year.
DOD has historically accounted for half or more of annual federal R&D funding. Health-related R&D accounts for the majority of federal nondefense R&D funding. DOD and HHS have borne the brunt of the federal R&D funding decline since FY 2010, with the other nondefense categories being much less affected."
[234] See BEA GDP 1Q19, and Morgan Stanley commentary, Ellen Zentner, Apr. 26, 2019. Growth of 7.5% in 2018 – with an average quarterly rate (sa annual rate) of 10.2% that year, and 7.2% in 1Q19 at sa annual rate.
[235] Higher R&D expenditure by the U.S. government would promote productivity increases, higher GDP growth, product innovation, and a greener future.
See NSF p. 4-4 to 4-6; and, IMF WEO Oct. 2017. The NSF report argues that U.S. R&D intensity exceeds China's 2.1% of GDP, but that is a purchasing power parity (PPP) calculation, which massively adjusts China's GDP to $19.7 trillion from $11.2 trillion (at market exchange rates), due to exchange rate valuation issues and price differences. As such, this introduces potential human error in the calculation. At market exchange rates, China's R&D intensity, at 3.6% of GDP, exceeds the U.S. Similarly, the R&D intensity in the third and fourth largest economies, Japan and Germany, moves considerably higher than the U.S. rate when calculated at market exchange rates, rather than at PPP.
"Worldwide R&D performance totaled an estimated $1.918 trillion in 2015, up from $1.415 trillion in 2010 and $722 billion in 2000. Fifteen countries or economies performed $20 billion or more of R&D in 2015, accounting for 85% of the global total. The top rankings at present continue to be dominated by the United States and China.
• The United States remained the largest R&D-performing country in 2015, with gross domestic expenditures on R&D of $497 billion, a 26% share of the global total, and an R&D-to-GDP ratio of 2.7%. China was a decisive second, with R&D expenditures of $409 billion, a 21% global share, and an R&D-to-GDP ratio of 2.1%.
• Japan ($170 billion, 9% global share, ratio of 3.3%) and Germany ($115 billion, 6% global share, ratio of 2.9%) were the comparatively distant third and fourth largest R&D-performing countries. The other 11 countries or economies in the top 15 were South Korea, France, India, the United Kingdom, Brazil, Russia, Taiwan, Italy, Canada, Australia, and Spain—with the annual national R&D expenditure totals ranging from about $61 billion (France) down to $20 billion (Spain).
The R&D performed domestically by U.S. businesses occurs mainly in five business sectors: chemicals manufacturing (particularly the pharmaceuticals industry); computer and electronic products manufacturing; transportation equipment manufacturing (particularly the automobile and aerospace industries); information (particularly the software publishing industry); and professional, scientific, and technical services (particularly the computer systems design and scientific R&D services industries)."
AI underfunded. Trump in Feb. 2019 issued executive order to federal agencies to focus on AI. SpaceX – innovation of landing rockets on landing pads. McKinsey article on 10 lessons from digitalization. From McKinsey, discussion of new frontier technologies: "new frontier technologies including general ledger technologies like blockchain, automation, and a large set of smart, artificial-intelligence (AI)- based technologies. Europe was a pioneer here with the first autonomous car, a German Mercedes; 35 percent of deep learning models were developed in Europe.28 However, Europe's leadership in this sphere appears to have been short-lived. China is already attracting 50 percent of global investment in AI startups according to CB insights, ahead of the United States. Europe's diffusion of AI lags behind that of the United States in domains such as advanced neuronal algorithms, and voice and video recognition tools; the only type of AI technology where Europe does not lag behind the United States is smart robotics." Drones – inspect pipelines, wind turbines, power lines. Robots on factory floor, AI programming and management. Singapore Techmetrics – AI in services – e.g. hospitality and HC. Marco. The work that scientists do – quantum mechanics (NOVA episode); earth's magnetic field (Ira Plato, Science Friday, 2/8). Quantum computing. Chinese innovation. Let government take the lead in education policy.
[236] There is a legitimate debate among economists and policymakers about whether support to industry can enhance competitiveness. The so-called "infant industry" argument – a creation of Alexander Hamilton in 1791 as a justification to protect American manufacturing from a more competitive Britain – drove tariffs higher in both America and Germany, allowing these countries to industrialize by the late 19th century. Similar strategies have been deployed by later industrializers, such as Japan and China. Oatley, Ch. 5: infant industry argument. While British-brokered "free trade" involved a lot of countries in the 19th century, the U.S. kept tariffs high until after World War II. See Lairson & Skidmore, pp. 46-49, 60-63, 71-83. Alexander Hamilton, Report on Manufactures (to the U.S. Congress), 1791.

See Oatley, pp. 111-37, for a discussion of the disaster of Import Substitution Industrialization in developing countries in the 20th century.

[237] See The Economist, Jan. 24, 2019, "Globalisation has faltered"; and McKinsey, p. 17. The U.S.-China trade war has begun to negatively impact corporate profits, though financial markets remain in denial about this. What should firms do about vulnerabilities in their value chains? Apple has an elaborate global value chain – including production that is largely overseas, and R&D, design and distribution largely in the U.S. If Apple's vendors had to shift production out of China, this could trigger heavy losses. Ultimately a higher cost of capital will be applied to firms exposed to globalization. A vicious cycle of lower investment in tradables, lower corporate profits, lower overall investment and consumption could ensue. An ominous trend in major players today – notably, in the U.S. and China – is to reverse the rationalization of production around the world by capturing more production on-shore. This is what has pushed Germany to roll out its National Industrial Strategy 2030, arguing that Europe needs a "closed value-added chain" too. See Economist, Dec. 2018, Slowbalization.

To date, global value chains remain robust, especially in the most cutting-edge sectors -- such as telecom equipment, as compared to more "commoditized" manufactures such as office machinery and computers. See Pinelopi Koujianou Goldberg, Chief Economist, World Bank Group, "The Future of Trade", Finance & Development, June 2019. While domestic value-added is on the rise (reflecting on-shoring) and trade is slowing, global value chains still remain robust. This is reflected in the fact that the volume of parts and components trade has not declined, especially in the most cutting-edge sectors such as telecoms.

[238] Through 2011, which included the period after China joined the WTO IMF study. These productivity gains were due to: 1) competition from Chinese imports – which caused import-competing firms to increase efficiency, and domestic firms to access low-cost inputs; and, 2) exporters' better access to the Chinese market.

See "Trading With China: Productivity Gains, Job Losses," Working Paper, WP/17/122, JaeBin Ahn & Romain Duvall, May 2017. 1.9% of the 12.3% increase in Total Factor Productivity (productivity increase due to innovation, rather than to adding more capital or labor) in the median country-sector (18 countries, 18 economic sectors), was due to trade with China. See pp. 1-5.

[239] See Autor, Dorn & Hanson, "The China Shock: Learning from Labor Market Adjustments to Large Changes in Trade," NBER Working Paper 21906, January 2016, pp. 1-9, 36-39. Autor, Dorn et al. point out that while the U.S. and Europe had effectively given China Most Favored Nation (MFN) status since the 1980s, which applied protection against Chinese goods only up to what was given to the "most favored nation", that is the best possible deal, the formalization of this status with entry into the WTO in the 2000s gave China improved access to imported inputs and opened up the floodgates for investment in China as uncertainty about the new trade relations was reduced. And, See The Economist, September 23 2017, Does China play fair? p. 11.

[240] IBID, p. 4

[241] IMF study: "Trading With China: Productivity Gains, Job Losses," Working Paper, WP/17/122, JaeBin Ahn & Romain Duvall, May 2017, see Abstract.

[242] See McKinsey Global Institute, January 2019, "Globalization in Transition: the Future of Trade and Value Chains". Services trade is understated due to the uncounted services-content of trade in goods, transfer of intangibles (IP, R&D and brands) across the global value chain, and free digital services available worldwide.

[243] BEA, International Transactions report, March 2019 at https://www.bea.gov/newsreleases/international/transactions/.
https://bea.gov/scb/pdf/2007/04%20April/0407_ita_text.pdf . See US ITC, Recent Trends in U.S. Services Trade, Annual Report 2017. And, Oatley p. 206.

[244] Negotiating market access in services can be more complicated than traditional negotiations over tariffs on goods. The harmonization of regulations, IP protections, and data protocols (e.g. regarding privacy) is challenging. See Pinelopi Koujianou Goldberg, Chief Economist, World Bank Group, "The Future of Trade", Finance & Development, June 2019.

[245] RCEP, AIIB, Belt and Road, etc.

[246] President Trump is not the only person standing in the way of America going all-in on globalization. Senator Bernie Sanders and his heirs on the left likewise oppose trade liberalization and globalization. Their broadside against American corporations – if implemented – could impair the country's ability to compete. Sanders, Warren and others have called for the breakup of America's internet companies – in addition to banks. This is even as foreigners -- such as Germany's Economy Minister -- speak admiringly of U.S. tech companies, calling for a strategy to create European versions. The American left takes a narrow view in its blanket opposition to U.S. firms. They shouldn't trash their country's

champions. These companies should be fairly taxed, yes, by closing loopholes. Standard anti-trust investigations are fair game too, making sure they don't restrict competition and consumer choice with monopolistic behavior. But, while "breakup" of big tech is a popular applause line among progressives, it is bad policy. Likewise, Alexandria Ocasio-Cortez's (AOC) opposition to Amazon investing in her Queens congressional district may have made her a national hero among progressives, but it is sure to make her district poorer.

Sanders trade references. Justice Democrats, Democratic Socialists, Ocasio-Cortez etc. Sanders -- like Trump -- opposes most trade deals. Sanders -- not Trump -- led the initial assault on President Obama's signature trade initiative -- the Trans-Pacific Partnership (TPP). This was a regional deal with 11 other Pacific nations (excluding China), which economists forecast would have raised growth in U.S. GDP and exports, while favoring American labor by offering more gains to labor than to capital. All signatories to this deal stood to benefit, with the U.S. seen as likely to register gains in services (including financial, technology, and logistics services), communications (including data-driven industries), agriculture, and advanced manufactures (including electrical equipment), while increasing imports of other manufactures (e.g. autos, textiles, apparel) and energy. U.S. priorities -- including intellectual property protection -- were addressed in TPP.

Even more important -- this agreement would have put pressure on China to adhere to international rules, if it wanted to join the trade group in the future to avoid the trade diversion it would suffer due to the agreement.[246] This could have resulted in a leveling of the playing field with the world's second largest economy, notably in areas where China has been accused of cheating – intellectual property, government procurement, subsidies, and anti-trust. It could have reasserted American leadership in Asia of a group of countries pursuing a rules-based economic system. Instead, China is offering its own regional trade deal that excludes the U.S. and asserting leadership of Asia as the U.S. has stepped back from the region under Trump.

In spite of these potential gains, Bernie Sanders said: "Let's be clear: the TPP is much more than a 'free trade' agreement. It is part of a global race to the bottom to boost the profits of large corporations and Wall Street by outsourcing jobs; undercutting worker rights; dismantling labor, environmental, health, food safety and financial laws; and allowing corporations to challenge our laws in international tribunals rather than our own court system."

Sanders has attacked international trade across the board. He claims that U.S. trade deals, "have forced American workers to compete against desperate and low-wage labor around the world. The result has been massive job losses in the United States and the shutting down of tens of thousands of factories. These corporately backed trade agreements have significantly contributed to the race to the bottom, the collapse of the American middle class and increased wealth and income inequality."

Bernie Sanders and his heirs just can't quit their negative animus toward corporations -- as responsible for the unbridled exploitation of people all over the world, rather than as a source of jobs, technology, competitiveness and prosperity. Reality – as is usually the case -- is somewhere in between, but certainly not the bogeyman Sanders and his allies conjure up. President Trump – for his part -- recognizing a winning issue when he sees one, even if it originates on the left -- withdrew the U.S. from TPP by executive order in his first full day of work on January 23, 2017, hailing his action as a "great thing for the American worker…" A year later, the other 11 Pacific nations -- including Canada and Singapore -- signed a modified version of TPP, covering just 14 percent of global GDP, instead of the 40 percent it would have covered with the U.S. TPP could have served as a the core of a global deal on trade liberalization, which would have served to jumpstart global economic growth.

Other successful politicians on the left of the Democratic Party – Bernie Sanders' heirs -- such as Alexandria Ocasio-Cortez who won an important primary election in New York City for the U.S. Congress in June 2018 and has helped energize the left – largely echo his populism. Ocasio-Cortez is a member of the Democratic Socialists of America, which advocates socialism – that is, public ownership of the means of production -- articulating a similar class warfare message to Sanders that seeks to "weaken the power of corporations". On the heels of her victory, she joined Sanders in the summer of 2018 to campaign for "hard-left" Democratic primary candidates around the country. There is a good deal of energy bubbling up as you move further out on the American left – powered by both the resistance to Trump and the Sanders insurgency against Hillary Clinton in 2016. The notion that Mrs. Clinton's defeat against Trump represented the failure of the strategy of Democrats tacking to the center is a powerful recruitment tool. Launched in 2017, the Justice Democrats – a collection of Democratic candidates who pledge to adhere to Sanders' priorities and to not accept financing from corporations -- are part of this phenomenon. In the runup to her Democratic primary victory, Ocasio-Cortez was quoted as saying, "My opponent is the institutional Democratic Party." The Young Turks Network – a populist left news organization – is given credit for giving air time to her campaign, while mainstream media such as CNN barely noticed and were caught flat-footed. There are strong linkages among these groups on the far left, including leaders in common. These are the heirs to Bernie Sanders and many follow his brand of populism. There is no doubt some nuance among "progressives" – for example, Democratic nominee for Governor of Florida, Andrew Gillum, was endorsed by Sanders but has taken some independent decisions.

Good government demands that the City and State attract Amazon with tax breaks, but that their plan ultimately would yields more commerce -- and therefore more tax revenues -- over time. Disruption caused to residents of the neighborhood can be addressed with policy – income support to those residents whose rents rise while incomes don't; training provided by the company or the City for residents so they can find tech or other jobs related to the new economy. This is simply good government of the type that Singapore practices -- a city highly unlikely to turn away a major tech company such as Amazon. This grandstanding was extremely short-sighted by AOC and the American left.

See Politico article on left and right trashing big tech, April 24, 2019, at https://www.politico.com/story/2019/04/24/partisan-enemies-find-a-common-cause-whacking-tech-companies-1333886

[247] Eurasia, TPP, 2015; PIIE

[248] McKinsey Global Institute report January 2019, and TTP and TTIP web sites.

[249] NAFTA can likewise be chalked up as a success story for U.S. services. While the deficit in goods trade widened with NAFTA – largely due to America's enormous appetite for Mexican and Canadian oil – the services surplus also widened sharply. In fact, excluding oil, the overall balance of trade with NAFTA partners has been in balance. Furthermore, the rationalization of the North American value chain is apparent in statistics showing two-way trade in petroleum (crude and refined products), and automobiles and auto parts. This locational rationalization has allowed North American firms to compete against multinationals in Europe and Asia.Trade among the three NAFTA partners tripled from 1993 to 2014, totaling about $1 trillion. The U.S. goods trade deficit with Canada and Mexico rose to $88 billion in 2014, from $9 billion in 1993, while the services surplus rose to $45 billion from $11 billion. However, the number 1 import of the U.S. from NAFTA partners is crude oil. When crude is excluded, the U.S. ran a goods trade surplus with Canada and Mexico from 2011-13 and balance in 2014. So, besides America's ongoing "giant sucking sound" of crude oil imports -- needed to power American cars and other activities, and overall excessive carbon footprint -- America's trade balance is comfortably in surplus with NAFTA partners, when the services surplus is included. See Congressional Research Service, "The North American Free Trade Agreement (NAFTA)", M. Angeles Villarreal, Ian F. Fergusson, pp. 1-25 (April 16, 2015).

[250] From the standpoint of maximizing output and raising America's living standards.The U.S. should constantly move toward the frontier of production of higher value-added goods and services. The way to do this is through education, training and R&D spending – in order to become a low-cost producer of sophisticated goods and services. See David Ricardo on "comparative advantage" and the gains from trade in (1817): *The Principles of Political Economy and Taxation*, Chapter 7, On Foreign Trade. Ricardo, a descendent of Portuguese Jews who came to London by way of Amsterdam, made a fortune speculating during the Battle of Waterloo during the Napoleonic wars. See Economist article, Schumpeter, Jan. 27, 2011. Ricardo became an economic philosopher, arguing famously that countries gained from trade by specializing in the production of products they produce best, that is, in which they have a comparative advantage, or the lowest "opportunity cost". Opportunity cost is what you give up in production of one good when you specialize in the production of another good. Even if one country has an absolute advantage in all goods, a country can specialize in producing what they are "least-bad" at and trade. Both countries will be better off. All countries gain from trade, though inside a country there are usually winners and losers. In Ricardo's simplified case with England and Portugal producing wine and cloth – English wine producers went out of business, as did Portuguese cloth producers, much as U.S. textile producers were hurt by trade with China, whereas tech services providers and others have benefitted from trade with China. Economists since have tested this theory and it holds. Heckscher-Ohlin built on the theory of comparative advantage in the early 20th century with their theory that a country has a comparative advantage in the good that utilizes intensively the country's abundant factor -- capital or labor. Wealthy countries are abundant in capital; populous countries are abundant in labor. Stolper-Samuelson in the 1940s posited that trade leads to "factor price equalization" – i.e. wages and returns to capital (e.g. interest rates) tend to equalize across countries due to trade. Downward pressure on low-skilled wages in the U.S. as a result of trade with China is a reflection of the Stolper-Samuelson dynamic. Hence, lower-skilled labor, especially in import-competing sectors, were hurt by trade with China. Even Autor, Dorn and Hanson don't categorically dismiss the "gains from trade" argument in their analysis of the impact on the U.S. of trade with China. See Autor, Dorn & Hanson, "The China Shock: Learning from Labor Market

Adjustments to Large Changes in Trade," NBER Working Paper 21906, January 2016. Their important paper argues that China's challenge has decimated communities, labor markets, and workers in import-competing sectors, and these workers are not rebounding over many years, not finding other employment very easily, their lifetime incomes have fallen. Moreover, these economists are skeptical as to when and where the gains from trade are occurring in other sectors. The public policy response should be to use a portion of the gains from trade to fund adjustment assistance and training of workers negatively affected in import-competing sectors. An IMF study identifies a portion of the gains from trade from trading with China in: "Trading with China: Productivity Gains, Job Losses," Working Paper, WP/17/122, JaeBin Ahn & Romain Duvall, May 2017. These economists find that 1.9% of the 12.3% increase in Total Factor Productivity (the productivity increase due to innovation, rather than to adding more capital or labor) in the median country-sector (18 countries, 18 economic sectors), was due to trade with China. See pp. 1-5. This increase in productivity, plus the efficiency gains and higher consumption gained from specializing and trading, constitute the gains from trade. These gains are real, but a portion of them should be redistributed to citizens and communities negatively impacted by trade, focusing on skills acquisition in order to offer higher-valued goods and services, for which workers can be expected to be paid more.

[251] Value-added per worker defined as the contribution to GDP of each sector per worker and after costs are deducted. See Singapore government data: https://data.gov.sg/dataset/value-added-per-worker-at-current-market-prices-by-industry-ssic-2010-annual?resource_id=0feb6e56-b0f1-43a8-83b9-a710d06109cf. Services value-added per worker began exceeding manufacturing in 2006 which has persisted, though when it is disaggregated only Finance & Insurance value-added per worker exceeded Manufacturing in 2016.

Manufacturing's value-added as a percentage of GDP for major countries in the country risk study and the U.S. Countries are ranked from highest to lowest per capita GDP (the U.S. being the highest, Indonesia the lowest). Wealth is not correlated with the importance of manufacturing to the economy. Still, if manufacturing is stressed as a matter of public policy, then advanced, high value-added products should be the focus. Sources: World Bank at https://data.worldbank.org/indicator/NV.IND.MANF.ZS; and, IMF WEO Oct. 2017

[252] Such as health care, customized software, equipment maintenance, e-commerce and fintech, social media, business processes, and logistics – See McKinsey, esp. pp 14-17. Digitalization, cross border data flows, the Internet of Things (IoT), automation, AI, and ultra-fast 5G wireless networks – today's innovations -- may mean slower growth in goods trade, but faster growth in services trade. Trade in goods is regionalizing. Automation -- loss of more jobs in advanced economies. Huge investment in intangible assets. True regionalization –EM consumption up, domestic value added up, firms locating value chain closer to demand; but Automation reducing Labor cost advantage, less key to trade. Value chains more knowledge and skills intensive. New manu – automation, AI, IoT.

[253] See "The WTO", Backgrounder by James McBride, September 12, 2016, at https://www.cfr.org/backgrounder/world-trade-organization-wto. "Perhaps the WTO's most successful attribute has been its trade dispute mechanism, a forum that has been used extensively over the past two decades, helping to avoid unilateral responses to disputes and potential trade wars. Since 1995, members have filed more than five hundred disputes with the WTO. Most of these are settled by consultations or mutual agreement before advancing to litigation. Upon joining, all members agree to a Dispute Settlement Mechanism (DSM) in which WTO-appointed trade experts can render a binding judgment. When one member files a complaint against another, the countries must first attempt to resolve the issue through consultation, and only if that fails is a panel chosen by the WTO's Dispute Settlement Body to hear the case. A panel ruling's recommendations, if not overturned on appeal, must be implemented by the offending country. If a country fails to respond, the plaintiff can then take targeted retaliatory measures such as blocking imports or raising tariffs. The United States is the most active participant in the system, having filed 110 complaints and served as defendant in 126 cases. Since 2009, the Obama administration has filed twenty disputes, eleven of them against China, which quickly became a target for disputes after it joined the WTO in 2001. China has drawn thirty-six complaints, more than any other developing country. The United States, in particular, has used the WTO process to challenge Chinese government support for domestic industries, restrictions on imports, and other state-led trade policies. Eleven of the eighteen total U.S. complaints against China have been settled."

[254] The "current account balance" of the balance of payments is a broad measure of trade. See Bureau of Economic Analysis, U.S. Dept of Commerce, at https://www.bea.gov/international/concepts_methods.htm. The current

account includes export and imports of goods and services, income receipts and payments (profits, interest payments, payments to labor, transfers such as workers' remittances into and out of the country).
Articles on drivers of CA deficits – Gagnon, IMF, Eichengreen, etc.
If the government boosts aggregate demand – through deficits or a loose monetary policy -- beyond what the country can produce, then imports rise. Current account deficits expanded sharply in America as a result of the Reagan and George W. Bush tax cuts in the 1980s and early 2000s, fueling a build-up in external debt. Tax cuts put more money in people's pockets; but, unless people save more as a result – which they did not – this drives current account deficits. The current account deficit – which includes goods, services and income -- was $488 billion in 2018, or 2.4 percent of GDP, down from $806 billion or 5.8 percent of GDP in 2006, but up from less than $350 billion (2.1 percent) five years ago. The decline from 2006 reflected a higher services surplus of $269 billion (up from $76 billion in 2006), as well as an income balance (net returns on investment overseas) that reverted to surplus. The 2018 result was more favorable than 2006 in spite of the highest ever goods deficit of nearly $900 billion in 2018. Goods imports would be even higher today, but petroleum imports have been contained over the last decade due to hydraulic fracturing in the U.S.
See BEA at https://www.bea.gov/international/detailed_trade_data.htm. On fracking, see Forbes at https://www.forbes.com/sites/rrapier/2017/06/02/fracking-saves-consumers-180-billion-annually-on-gasoline/#415c240012dd.
The Trump tax cuts were a principal driver of the widening current account deficit in 2018.
By contrast, robust growth in American services exports have acted to keep a lid on current account deficits. Some economists suggest that conventional trade statistics exaggerate U.S. current account deficits. Given the development of global value chains, a significant portion of production that is ultimately imported to the U.S. comes from companies headquartered in the U.S. – so is supportive of economic activity and jobs domestically. This is particularly the case with regard to NAFTA countries. Likewise, the high value-added of U.S. firms in global value chains may not be fully reflected in U.S. export figures. In NAFTA, the production of automobiles and other manufactures is integrated across the U.S., Canada and Mexico – with parts and finished automobiles moving across borders within corporate production chains. See Villarreal & Fergusson, CRS, NAFTA Renegotiation and Modernization, Feb. 27, 2018, pp. 9-10, including a discussion of the underestimation of U.S. value-added in trade contained in traditional trade statistics, and OECD calculations that seek to adjust such statistics: "Conventional measures of international trade do not always reflect the flows of goods and services within global production chains. For example, some auto trade experts claim that auto parts and components may cross the borders of NAFTA countries as many as eight times before being installed in a final assembly plant in a NAFTA country. Traditional trade statistics include the value of the parts every time they cross the border and count the value multiple times. The Organization for Economic Co-operation and Development (OECD) and the World Trade Organization (WTO) developed a Trade in Value Added (TiVA) database, which presents indicators that provide insight into domestic and foreign value added content of gross exports by an exporting industry. These statistics provide a more detailed picture of the location where value is added during the various stages of production. U.S. trade with Canada and Mexico is diverse and complex since a final good sold in the market could have a combination of value added from all three countries, or from other trading partners. The most recent TiVA data available (2011) for trade in goods and services indicate that the conventional measurement puts the total U.S. trade deficit (including goods and services) with NAFTA countries at $135 billion, while the TiVA methodology puts the deficit at $79.8 billion. Regarding global supply chains, see, for example, the case of Apple in China. See https://www.npr.org/2018/08/01/634492250/whats-at-stake-for-apple-in-china; and Glenn Leibowitz, Inc., article on Apple in China, Dec. 21, 2017 at https://www.inc.com/glenn-leibowitz/apple-ceo-tim-cook-this-is-number-1-reason-we-make-iphones-in-china-its-not-what-you-think.html.
Thus, the U.S. is responsible for -- and exercises a good deal of control over -- more of global trade than trade figures suggest. And, the disruption to global value chains and trade resulting from Trump's trade wars is ultimately bad for American jobs. See Thomas D. Lairson and David Skidmore, *International Political Economy, The Struggle for Power and Wealth*, Third Edition, 2003 Thomson Wadsworth, p. 73 and IMF, IFS, Trade of Goods, May 2017 (IMF on line)
[255] Under Section 232 of the 1962 Trade Expansion Act. He announced in May 2019 that auto tariffs would be delayed for six months while the U.S. negotiates with Japan and the E.U. See https://www.npr.org/2019/05/17/724271067/trump-delays-auto-tariffs-for-6-months; and, Institute for International Finance (IIF), July 17, 2017, "US Policy Update, Trade Policy and Section 232": What Commerce Will

Consider, Section 232 authorizes the Secretary of Commerce to conduct investigations to determine the effects of imports of any article on the national security of the United States. Section 232 investigations include consideration of: • domestic production needed for projected national defense requirements; • domestic industry's capacity to meet those requirements; • related human and material resources; • the importation of goods in terms of their quantities and use; • the close relation of national economic welfare to U.S. national security; • loss of skills or investment, substantial unemployment and decrease in government revenue; and • the impact of foreign competition on specific domestic industries and the impact of displacement of any domestic products by excessive imports. If the Department determines that importation of the article in question threatens to impair the national security and if the President concurs, he can take action to "adjust the imports of an article and its derivatives."
The countries Trump has targeted are allies and parties to security treaties with the U.S., such as NATO, where they have agreed to defend the U.S. if attacked.
[256] See Clark Packard, Foreign Policy, May 4, 2019, https://foreignpolicy.com/2019/05/04/congress-should-take-back-its-authority-over-tariffs-trump/.
The U.S. Constitution stipulates the separation of powers among the branches of government, and this applies to trade. Congress is granted authority over taxation (including tariffs) and commerce, and the President authority over foreign affairs, including trade agreements. Congress must approve joining trade agreements, but the president can unilaterally withdraw from them. Congress has ceded its authority over trade to the executive branch through legislation passed in the 20th century. The Department of Commerce usually must issue a "finding" to Congress, explaining a trade action. The reasoning behind Congress ceding authority to the president was that presidents since World War II have tended to be more supportive of free trade than Congress. So, in the interest of trade liberalization, Congressional majorities ceded trade authority to the president. In order to claw back oversight, the Congress would have to pass legislation, and assuming the president vetoes it, must garner a two-thirds majority in both houses to override the veto. This looks challenging at best in today's Congress. The courts – such as the U.S. Court of International Trade – can rule on whether the president oversteps his authority on trade matters. A bipartisan group in Congress has put forward legislation – that may be veto-proof – to require congressional approval before tariffs based on the national security justification can be levied, and transfer authority to the DoD (from Commerce) to undertake a national security investigation. Hope that the courts would disallow the president invoking the nation security justification for tariffs faded when the U.S. Court of International Trade in March 2019 sided with Trump in a case brought by steel importers. The case has been appealed to the Supreme Court, which is unlikely to rule against the president on issues of national security.
See New Democrat Network at https://www.ndn.org/blog/2019/02/ndn-supports-bicameral-tariff-bill: "NDN is pleased to endorse and support the Bicameral Congressional Trade Authority Act of 2019, introduced on January 31st, 2019 in the House and Senate. The legislation provides critical Congressional and Department of Defense oversight on the President's Section 232 ability to use national security as a justification to unilaterally impose tariffs on our close trading partners. The bill will require that such a justification emerge from our defense community at the Department of Defense (rather than the Department of Commerce) and that any use of national security-based tariffs is approved by Congress before implementation. The legislation was introduced by Senators Toomey (R-PA) and Warner (D-VA) in the Senate, and Reps. Kind (D-WI), Panetta (D-CA) and Gallagher (R-WI) and LaHood (R-IL) in the House. This legislation is consistent with NDN's calls for Congress to challenge what we believe to have been the President's repeated, illegitimate use of Section 232 authority to impose tariffs on our close allies."
Constitution gives Congress power over tariffs (taxation, commerce), President power over international agreements – foreign affairs – can w/d from agreements, has powers in a national emergency. Legislation – Congress can delegate power to president with certain conditions – there are no general authorities to modify tariffs delegated to the President. Congress has delegated powers over tariffs and duties to the President. 2/3 override required. President can impose duties w/o a finding. Court challenges. Congress delegates power to lower tariffs with conditions, and expedited legislative approval of trade agreements – "fast track". In delegating power to president, Congress requires the president make a "threshold finding". President can take action with time restrictions. See IIF 7/17/17 article. Anti-dumping duties. Court challenges – US Court of International Trade – did president overstep delegated authority? 1917 Trading with the Enemy Act. 1962 Trade Expansion Act – section 232 national security threat. 6 month notification then terminate trade agreement. 1974 Trade Act – trade promotion authority (TPA) – fast track. Section 301 USTR broad authority to recognize "unreasonable,

discriminatory trade practices". NAFTA – president can proclaim anti-dumping duties to maintain reciprocity – eg. Canadian lumber. 2015 if country has unfair trade practices, president can proclaim additional duties. Not to raise duties greater than 2015 rate? NAFTA modification by law? Congress. Presidential proclamation – existing statutory authority – tariffs, rules of origin, under certain circumstances. US ITC – International Trade Commission – ITA – in Dept. of Commerce, injury – dumping, subsidies. Final anti-dumping ruling. Congress – joint procedural disapproval with, say, TPA. Withdraw from agreements – NAFTA, WTO, TPP. New trade agreements require Congressional approval. Withdraw from agreements does not require Congressional approval. President can w/d from agreements. Congress – to change delegated powers – Congress needs 2/3 votes to override presidential veto. Hard to do. Courts – Constitution gives President powers over foreign affairs.

[257] See https://www.cnn.com/2019/03/11/politics/us-germany-huawei-letter/index.html; and, https://www.theguardian.com/technology/2019/apr/30/alleged-huawei-router-backdoor-is-standard-networking-tool-says-firm. An alternative includes Republican Karl Rove's plan to have a politically-connected American company get into the 5G business – but this brings up corruption and conflict-of-interest issues. How to approach these key tech/security issues. An approach is not to ban Huawei, but to develop processes like the UK that test hardware for spying. See Feb 2 2019 Economist. Action against ZTE and Huawei. Eli says that hasn't worked. China science articles in Economist -- Jan 2019. See Eli's articles. Huawei 5G – ZTE – Chinese market power and vulnerability. Multilateral cooperation. Security issues. Australia, Japan, Taiwan and others excluding Huawei from supplying 5G kit; UK's approach of having Huawei open lab in UK to test systems. Germany, France follow suit. How to approach these key tech/security issues. CSIS article on China from IPE class. Eli's email on GB's checking of Huawei. March 11, 2019, CNN article, that USG warning Germany not to utilize Huawei. Erikson and Nokia – see Economist article Mar 23 2019. Karl Rove and Rivada 5G plan. See Greg Gallent's emails.

[258] The dependency ratio is defined as the proportion of the population (young and old) that is not working, but rather dependent on those who work.

[259] This is why the Doha Round of trade negotiations -- begun in 2001 -- failed.

[260] For example, a Trade Facilitation Agreement, which streamlined customs practices was agreed to in 2013. The Information Technology Agreement, signed in 1996, was expanded in 2016 – with 53 members cutting tariffs and then applying these cuts to all WTO members. See Pinelopi Koujianou Goldberg, Chief Economist, World Bank Group, "The Future of Trade", Finance & Development, June 2019.

[261] See IMF Art IV 2019 conclusion – trade policy recommendations: "For the global economy to function well, it needs to be able to rely on a more open, more stable, and more transparent, rules-based international trade system. Rising import tariffs and other steps taken by the administration are undermining the global trading system, increasing restrictions on trade in goods and services, and catalyzing a cycle of retaliatory trade responses. Rather than expanding tariff and non-tariff barriers, the U.S. and its trading partners should work constructively to better address distortions in the trading system that are partly rooted in the system's inability to adapt to long-term changes in the international environment. It is especially important that the trade tensions between the U.S. and China—which represent a threat to the global outlook and create important negative spillovers to other countries—are quickly resolved through a comprehensive agreement that strengthens the international system (not through a managed trade deal that targets a compression in the bilateral U.S.-China trade deficit). As highlighted in the April 2019 World Economic Outlook, tariff measures are likely to be ineffective at containing bilateral trade deficits and will be damaging to the U.S. and to global macroeconomic outturns. Instead, the external imbalance will need to be addressed through fiscal adjustment and supply side reforms that improve productivity and competitiveness. The U.S. would gain by working with international partners to strengthen the rules-based, multilateral trading system. This should include advancing trade negotiations in areas such as e-commerce and services and ensuring the continued enforceability of existing WTO commitments through a well-functioning WTO dispute settlement system. In this regard, the U.S., Mexico and Canada Agreement could, if approved, alleviate uncertainty and provide some modernization in the areas of services, e-commerce, and data transparency. Finally, greater attention needs to be paid to the welfare of those workers dislocated by the ongoing reshaping of the U.S. economy by technology and trade. This will require intensifying policy efforts such as through greater public investments in training and education, temporary income support, and job search assistance."

[262] Versus 2005. See Rhodium Group, "Final U.S. Emissions Estimates for 2018", May 30, 2019; and, NYTimes, June 1, 2018, "Trump Will Withdraw U.S. from Paris Climate Agreement", Michael D. Shear. Cuts of See https://obamawhitehouse.archives.gov/the-press-office/2015/12/01/press-conference-president-obama. President Barack Obama, Press Conference, December 1, 2015, Paris, France, OECD.

[263] CAA of 1970. Trump's replacement for CPP was called Affordable Clean Energy (ACE). The Supreme Court had ruled in 2007 that the CAA required the EPA to limit greenhouse gases in order to protect public health. So, Trump's EPA must show that ACE complies with the CAA – outlining how it will achieve the necessary emissions cuts. While Obama's CPP pointed to carbon pricing, carbon capture technology, and switching to cleaner fuels as methods of reducing emissions, Trump's ACE relies exclusively on increasing the efficiency of burning fossil fuel. Studies indicate that ACE may not reduce emissions at all, because could in the end result in burning more fossil fuel. CPP notes and citation. With 24 states challenging this in court, the Supreme Court in 2016 issued a stay on these emissions limits, pending the lower court rulings.The EPA subsequently issued an "endangerment finding", establishing that current and projected levels of greenhouse gases threaten public health. Legal challenges to the ACE are expected. Cite study on ACE effect on emissions.

[264] The difference arises from the Trump team's exclusion of health problems caused by the release of the smallest toxic particles that can also cause breathing problems. Methane has 86 times the global warming effect as CO2. See McKinsey Sustainability Blog, June 5, 2019.

[265] The Trump team also plans to halt the tightening of automobile fuel efficiency standards after 2021; and, its Department of the Interior has rolled back Obama-era land protections, opening up public land -- including coastal waters -- to oil drilling. Interior seeks to do the same in the Arctic National Wildlife Refuge. The Trump administration has also begun chipping away at legislation that protects endangered species. And to revoke waivers for states with standards tighter than the EPA's, including California and 13 other states.
Trump's assault on climate science has included heavy budget cuts to the EPA's Office of Science and Technology and dropping scientists from EPA advisory boards. From $762 million to $489 million. The EPA's research budget of $516 million is low in Fiscal Year 2015. Trump's budget aims to eliminate all climate-related programs NYT article on Trump budget, Feb 12 2018. UPDATE. Add reference to dropping scientists from advisory boards.
Most damaging was Trump's announcement in 2017 that the U.S. would pull out of the 195-nation Paris climate accord, abdicating U.S. leadership on this issue and encouraging other countries to flout emissions reductions. Full withdrawal could take several years – past the 2020 elections.
See https://www.cnbc.com/2016/11/09/four-obama-climate-change-efforts-probably-will-get-scrapped-now.html; See Vox at https://www.vox.com/2018/12/28/18159509/mats-mercury-epa-toxic-coal-power-plant; https://www.vox.com/2018/8/21/17763916/epa-clean-power-plan-affordable-clean-energy; https://www.vox.com/2019/6/19/18684054/climate-change-clean-power-plan-repeal-affordable-emissions; https://iopscience.iop.org/article/10.1088/1748-9326/aafe25/pdf; Umair Irfan, Aug. 16, 2018, "The EPA refuted its own bizarre justification for rolling back fuel efficiency standards"; Aug. 21, 2018, "EPA analysis of its own new climate proposal: thousands of people will die". On MATS, the Trump EPA excluded certain "co-benefits". See https://www.vox.com/2018/12/28/18159509/mats-mercury-epa-toxic-coal-power-plant: "While the EPA's latest proposal doesn't repeal MATS outright, it starts to undermine its legal foundations. The EPA's reasoning is that the current regulation as it stands is too costly and does not meet the "appropriate and necessary" standard. The EPA said complying with MATS can cost power producers upward of $9.6 billion per year, but the benefits can only be quantified up to $6 million. This is a vastly lower tally than what the Obama administration calculated when it issued the rule. They estimated **$80 billion** in benefits because they included the health side benefits of limiting toxic chemical pollution in addition to reducing the toxic chemicals themselves. This includes things like reducing emissions of particulate matter smaller than 2.5 microns in diameter (**PM2.5**), which can trigger breathing problems. 'EPA is not saying that it can't consider PM2.5 co-benefits when it makes regulatory decisions,' said Jeff Holmstead, a former deputy administrator at the EPA under President George W. Bush, in an emailed statement. 'They're just saying that, in this case, where virtually all the benefits are 'co-benefits' of reducing a pollutant that is supposed to be regulated under other Clean Air Act programs, we can't use these co-benefits to justify a regulation that is only supposed to be about hazardous air pollutants.' By changing the cost-benefit analysis of MATS, the EPA is making it easier to challenge its implementation. 'If finalized, it will leave the mercury reduction requirements vulnerable to rollback or further legal attack, and it puts at risk years of progress to reduce exposure to a known neurotoxin that accumulates in the environment,' said Janet McCabe, who served as the acting assistant administrator for the Office of Air and Radiation at the EPA under Obama, in an emailed statement. 'The proposal also sets a very troubling precedent for how the EPA evaluates the impact of policy on public health.'"; Jan. 8, 2019, "The government isn't letting the shutdown get in the way of Arctic drilling"; See EPA, "Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Section 202(a) of the Clean Air Act"; and, https://www.epa.gov/mats/basic-information-about-mercury-and-air-toxics-standards.

The Trump administration has chipped away at the Endangered Species Act and Migratory Birds Treaty Act that protects birds.

[266] See https://www.whitehouse.gov/presidential-actions/presidential-executive-order-promoting-energy-independence-economic-growth/.

See also IMF WP/19/89 "Global Fossil Fuel Subsidies Remain Large…", pp. 8-9: "There are different approaches to valuing CO2 emissions in the economics literature. One involves estimating the 'social cost of carbon' (SCC)—the discounted value of worldwide damages from the future global climate change associated with an additional ton of current emissions—and some recent assessments suggest an SCC of around $35 per ton for 2015 emissions (in U.S. $2015), though estimates are contentious.16 Another approach is to estimate global emissions prices consistent with cost effectively meeting temperature stabilization goals; for example, a recent review suggests a global CO2 emissions price of $4080 per ton (in $2015) by 2020 would be consistent with the Paris goal of limiting mean projected warming to 2oC (Stern and Stiglitz, 2017). A third approach is to assess carbon prices consistent with countries' mitigation pledges, and a recent assessment17 puts this at around $35 per ton in 2030 (in 2015$) for G20 countries combined, though considerably higher for many advanced countries. Based on this summary, the estimates discussed below assume, common across all countries, an illustrative value of $40 per ton for 2015 emissions, rising at 3 percent a year in real terms (U.S. IAWG 2016)."

[267] See IMF WP/19/89, May 2019: "Global Fossil Fuel Subsidies Remain Large: An Update Based on Country-Level Estimates", Abstract: "This paper updates estimates of fossil fuel subsidies, defined as fuel consumption times the gap between existing and efficient prices (i.e., prices warranted by supply costs, environmental costs, and revenue considerations), for 191 countries."

See also CEQ document, 6/21/19, on GHG emissions. See Brookings, Feb. 28, 2017, SCC testimony at https://www.brookings.edu/testimonies/the-social-costs-of-carbon/. See Economist, Nov. 16, 2017 article at https://www.economist.com/united-states/2017/11/16/the-epa-is-rewriting-the-most-important-number-in-climate-economics; and VOX, David Roberts, April 26, 2016. See IMF WP/19/89, May 2019 on fossil fuel subsidies.

[268] See NYT, Michael Shear; and, Justin Gillis and Nadja Popovich, June 1, 2017; and, Union of Concern Scientists 2015 estimates: https://www.ucsusa.org/global-warming/science-and-impacts/science/each-countrys-share-of-co2.html: Top 20 CO2 emitters in 2015 in order: China, U.S., India, Russia, Japan, Germany, South Korea, Iran, Canada, Saudi Arabia, Brazil, Mexico, Indonesia, South Africa, U.K., Australia, Italy, Turkey, France and Poland.

[269] Broader greenhouse gas emission – of which CO2 is the largest component -- have also risen. CO2 emissions -- over 80 percent of GHG emissions in the U.S. -- rose 2.7% in 2018. CO2 emissions are responsible for over 80 percent of U.S. greenhouse gases (which also includes methane). Greenhouse gases (GHG) , according the UN Climate Change Convention, called United Nations Framework Convention on Climate Change (UNFCCC), and the U.S. White House Council on Environmental Quality (CEQ), include carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF6) and nitrogen trifluoride (NF3). See 2009 UN GHG fact sheet, and CEQ's June 21, 2019 document: http://www.kattenlaw.com/files/648561_att_-_draft_guidance.pdf. Methane has 86 times the global warming effect as CO2. See McKinsey Sustainability Blog, June 5, 2019.

[270] Automobile fuel efficiency gains –combined with a muted increase in passenger miles -- have limited the growth in CO2 emissions from cars – another win for government policy.

[271] US Paris accord commitments include cuts of 26-28 percent by 2025 from 2005See Rhodium Group studies, US Climate Service, January 8 and May 30, 2019. See McKinsey Sustainability Blog, April 2019: "In fact, renewables accounted for about 21 percent of all electric-generating capacity in the U.S. last month. The EU is even further ahead, with approximately 30 percent renewable electricity in 2017… The EU is committed to cutting greenhouse gas emissions by 40 percent compared to 1990 levels by 2030, and in California, New Jersey, and New York, utilities are required to have 50 percent electricity from renewables by 2030."

[272] See 4th National Climate Assessment at file:///C:/Users/rogel/Documents/Country%20docs/US.Climate%20Report.Vol%20II.Nov%202018.NCA4_2018_FullReport.pdf; especially pp. 24-32 and 72-144. Every ten years, a Strategic Plan is produced every guide research across thirteen agencies of the federal government on "global change", reporting to the Committee on the Environment, Natural Resources and Sustainability of the NTSC.

[273] See MIT Technology Review, 2019, at https://www.technologyreview.com/s/613342/get-ready-for-tens-of-millions-of-climate-refugees/; and UNHCR at https://www.unhcr.org/en-us/climate-change-and-disasters.html.

[274] Environmental justice does have a point in its effort to protect disadvantaged communities heavily impacted by climate change and a low carbon plan, but excluding industry from the solution is not the answer.
On carbon capture and storage (CCS) technology, see discussion at http://www.ccsassociation.org/what-is-ccs/: "The CCS chain consists of three parts; capturing the carbon dioxide, transporting the carbon dioxide, and securely storing the carbon dioxide emissions, underground in depleted oil and gas fields or deep saline aquifer formations. First, capture technologies allow the separation of carbon dioxide from gases produced in electricity generation and industrial processes by one of three methods: pre-combustion capture, post-combustion capture and oxyfuel combustion. Carbon dioxide is then transported by pipeline or by ship for safe storage. Millions of tonnes of carbon dioxide are already transported annually for commercial purposes by road tanker, ship and pipelines. The U.S. has four decades of experience of transporting carbon dioxide by pipeline for enhanced oil recovery projects. The carbon dioxide is then stored in carefully selected geological rock formation that are typically located several kilometres below the earth's surface."
See negative emissions technologies (NET) and reliable sequestration, 2019 book by the National Research Council (National Academies of Sciences, Engineering and Medicine) at file:///C:/Users/rogel/Downloads/25259%20(1).pdf, e.g. p. xi. NET include biological processes to increase carbon stocks below ground, biomass technologies, chemical processes, and enhancements of geologic processes that capture CO2 and bind it with rocks). From the report: "Most climate mitigation technologies are intended to decrease the rate at which we take additional carbon from fossil fuel reservoirs and ecosystems and add it to the atmosphere as CO2. These include renewable electricity, increased energy efficiency, and carbon capture and storage of emissions from fossil power plants. On hybrid power plants, from the GE Brief, May 2, 2019: "For instance, the world's first hybrid power plant in Los Angeles uses natural-gas-burning turbines called peakers to pick up the slack when Mother Nature stops fueling the renewables." This report focuses on the reverse: technologies that take CO2 out of the atmosphere and put it back into geologic reservoirs and terrestrial ecosystems. These negative emissions technologies, or NETs, have received much less attention by researchers than traditional mitigation technologies. The Committee on Developing a Research Agenda for Carbon Dioxide Removal and Reliable Sequestration was created to recommend a detailed research and development plan for NETs that: (1) use biological processes to increase carbon stocks in soils, forests, and wetlands, (2) produce energy from biomass, while capturing and storing the resulting CO2 emissions, (3) use chemical processes to capture CO2 directly from the air and then sequester it in geologic reservoirs, and (4) enhance geologic processes that capture CO2 from the atmosphere and permanently bind it with rocks. These NETs are at vastly different stages of readiness. Some are close to being ready for large-scale deployment, while others require basic scientific research." Sources Green New Deal, Inslee and Beto plans, Brookings, McKinsey Sustainability blog, GE Brief, etc. Price of renewables dropping. Decarbonize the electricity grid – see McKinsey. Klobuchar plan makes sense (NPR Feb 2019) – first, rejoin Paris Climate Accord, get back to Obama's gas mileage standards, powerplant actions (closings?), etc. Sustainability. McKinsey Sustainability blog. April 22 2019 blog. Rail report of IEA. High Rail Scenario, 10 mb/d less in oil. Economist article on oil majors – need role for govt – Feb 8 2019. See https://www.nap.edu/catalog/24778/an-assessment-of-arpa-e: "In 2005, the National Research Council report *Rising Above the Gathering Storm* recommended a new way for the federal government to spur technological breakthroughs in the energy sector. It recommended the creation of a new agency, the Advanced Research Projects Agency-Energy, or ARPA-E, as an adaptation of the Defense Advanced Research Projects Agency (DARPA) model—widely considered a successful experiment that has funded out-of-the-box, transformative research and engineering that made possible the Internet, GPS, and stealth aircraft. This new agency was envisioned as a means of tackling the nation's energy challenges in a way that could translate basic research into technological breakthroughs while also addressing economic, environmental, and security issues. See McKinsey Sustainability Blog, March 29, 2019 on hydrogen powered fuel cell cars; and April 2019: "The role of storage is already being recognized by policymakers. California, Massachusetts, New Jersey, and New York all have storage targets and/or roadmaps to storage goals." On plastics see McKinsey / Denmark plastics report at

https://www.mckinsey.com/featured-insights/europe/the-new-plastics-economy-a-danish-research-innovation-and-business-opportunity ; and, Tel Aviv University at https://phys.org/news/2018-12-sustainable-plastics-horizon.html: "A new Tel Aviv University study describes a process to make bioplastic polymers that don't require land or fresh water—resources that are scarce in much of the world. The polymer is derived from microorganisms that feed on seaweed. It is biodegradable, produces zero toxic waste and recycles into organic waste."
See GE Brief, March 19, April 23, May 2, June 27, 2019. Such as GE Digital Energy Innovation Lab as a potential partner, and GE Research as an actual partner for ARPA-E: From April 23 GE Brief: "The Energy Department's R&D arm, ARPA-E, recently awarded $5.8 million to GE Research to develop a superfast medium-voltage direct current circuit breaker, a key component of any DC grid that prevents disruptions from rippling through the system. GE engineers are using charged gas, or plasma, to build a compact breaker that can be adapted to the current infrastructure with as little disruption as possible. Says GE's Timothy Sommerer: "Nobody wants to run bulldozers through cities to put in new cables and towers and other infrastructure. With a DC grid, you could reuse existing space for AC lines and just upgrade them."
There are forecasts of a nearly 70 percent cost decline in lithium-ion batteries by 2030.
Methane has 86 times the global warming effect as CO2. See McKinsey Sustainability Blog, June 5, 2019.

[275] See Ian Parry, IMF Finance & Development, June 2019, "What is Carbon Taxation?" at https://www.imf.org/en/News/Podcasts/All-Podcasts/2019/06/28/ian-parry-on-carbon-taxes?utm_medium=email&utm_source=govdelivery

[276] The U.S. government should go back to the Obama-era practice of assessing federal programs based on the SCC. See Ian Parry, IMF Finance & Development, June 2019, "What is Carbon Taxation?" at https://www.imf.org/en/News/Podcasts/All-Podcasts/2019/06/28/ian-parry-on-carbon-taxes?utm_medium=email&utm_source=govdelivery; Economist, November 16, 2017; Jesse D. Jenkins and Valerie J. Karplus, UNU Winder WP 2016/44; U.S. government Interagency Working Group on Social Cost of Greenhouse Gases, August 2016, Technical Support Document, esp. p. 4; and, IMF WP/19/89 "Global Fossil Fuel Subsidies Remain Large…", pp. 8-9: "There are different approaches to valuing CO2 emissions in the economics literature. One involves estimating the 'social cost of carbon' (SCC)—the discounted value of worldwide damages from the future global climate change associated with an additional ton of current emissions—and some recent assessments suggest an SCC of around $35 per ton for 2015 emissions (in U.S. $2015), though estimates are contentious.16 Another approach is to estimate global emissions prices consistent with cost effectively meeting temperature stabilization goals; for example, a recent review suggests a global CO2 emissions price of $4080 per ton (in $2015) by 2020 would be consistent with the Paris goal of limiting mean projected warming to 2oC (Stern and Stiglitz, 2017). A third approach is to assess carbon prices consistent with countries' mitigation pledges, and a recent assessment17 puts this at around $35 per ton in 2030 (in 2015$) for G20 countries combined, though considerably higher for many advanced countries. Based on this summary, the estimates discussed below assume, common across all countries, an illustrative value of $40 per ton for 2015 emissions, rising at 3 percent a year in real terms (U.S. IAWG 2016)."

[277] See Encyclopedia Britannica at https://www.britannica.com/topic/populism. Populism involves a deterioration toward "mob rule", through government mismanagement and even lawlessness, a process the ancient philosophers worried about. Polybius, an historian of Rome writing in the 2nd century B.C., warned in *The Histories* that democracies in which the rule of law and respect for the constitution are undermined cycle into mob rule. Modern political scientists likewise warn of "democratic backsliding," that is, when democratically-elected rulers consistently use power to make democracy unfair and ultimately weaken institutions such as elections and the protection of civil liberties, including freedom of the press. Attacking the "mainstream media" is a tactic both Trump and Sanders have used. Political polarization – when political parties find less and less in common and begin to see their opponents as illegitimate -- aggravates democratic backsliding. Compromise is critical to the smooth functioning of democracy. It is true that the popular will is ignored at the leader's own peril. Even authoritarians, dictators, leaders who operate above the law, when they ignore popular sentiment, can be overthrown. Democratically-elected governments can likewise be thrown out at the next election. However, when majority rule infringes on the basic rights of the people or of minorities and undermines the long-run interests of society through, for example, a mismanagement of the economy, it becomes populism. Populists may attempt to

favor certain industries in the country as well, usually the businesses of supporters, favored sectors, regions and groups which support the leader. Populism provides a nice jolt to the economy, a shot in the arm…and they reward supporters, their "base", handsomely. Populism can involve the undermining of political institutions, such as political parties, the press, different levels and branches of government, and institutions of "civil society" such as interest groups and religious institutions. This occurs as the populist leader seeks a direct connection with the common people, sidestepping, delegitimizing, and even harassing existing institutions called "elite" by the populist. The populist attempts to avoid any intermediation of his or her direct contact with the "people". Trump's policy proposals and approach to governing have been consistent with populism. *The Economist* magazine argues that populism never works. With time, countries pursuing it exhaust its usefulness. Imbalances are created – high government debt and inflation – and eventually have to be reversed. Countries that have gone all in for populism in recent years, such as Argentina and Venezuela, have not performed well, exhibiting low GDP growth and high inflation rates. See Jan-Werner Müller, What is Populism, 2016 University of Pennsylvania Press, Philadelphia PA. See Steven Levitsky and Lucan A. Way, *Competitive Authoritarianism, Hybrid Regimes After the Cold War*, 2010 Cambridge University Press, pp. 5-32.
See Michael Mandelbaum, *The Road to Global Prosperity*, 2014 Simon and Schuster, p. 129. The "Trump jolt" to the economy and to financial markets has been powered by short-term drivers.[277] Trump's economic policy has been broadly criticized. Ben Bernanke – a Republican economist, former Chairman of the Federal Reserve, and before that Chairman of President George W. Bush's Council of Economic Advisers -- warned in June 2018 about the negative effects of Trump's economic policies: "What you are getting is a stimulus at the very wrong moment. The economy is already at full employment." He added -- with some humor -- that the Trump stimulus "is going to hit the economy in a big way this year and next year, and then in 2020, Wile E. Coyote is going to go off the cliff," referring to the cartoon coyote in the Road Runner TV series -- popular during Bernanke's childhood – who would often fall haplessly over a cliff, or blow himself up with dynamite, in his vain effort to make a meal out of the road runner.[277] That is Bernanke's metaphor for the U.S. economy after two years of Trump's populism. Politicians on the left, for their part, add a twist to populism: class warfare. "Donald Trump," said Sanders on the campaign trail in 2016, "tapped into the anger of a declining middle class that is sick and tired of establishment economics, establishment politics and the establishment media." [277] "Almost all of the new income generated in recent years has gone to the top one percent," he routinely claimed, referring to the one percent of Americans in the highest income bracket, adding ominously, that Americans must be "prepared to take on the one percent." Populist positions on the left include call for a breakup of the banks and big tech. AOC's assault on Amazon investing in New York City is consistent with her membership in the Democratic Socialists of America, which seek to "weaken the power of corporations".[277] On Obama's signature trade deal, presidential candidate Sanders said: "TPP is much more than a 'free trade' agreement. It is part of a global race to the bottom to boost the profits of large corporations and Wall Street by outsourcing jobs; undercutting worker rights; dismantling labor, environmental, health, food safety and financial laws; and allowing corporations to challenge our laws in international tribunals rather than our own court system."

[278] Government spending that drives deep deficits, accompanied by monetary accommodation, may be required on rare occasions to avert depression, such as the during the Great Depression in the 1930s or the onset of the Global Financial Crisis (GFC) in 2008-09. Populists, by contrast, often roll out such policies at or near full employment. Populists may also seek to lift financial markets by currying favor with business elites.

[279] See https://www.brennancenter.org/analysis/his-own-words-presidents-attacks-courts; and, https://www.vox.com/2019/5/17/18629175/trump-treason-fbi-russia; and, https://thehill.com/hilltv/rising/409951-ex-trump-speech-writer-says-attacks-on-hispanic-judge-in-2016-were-embarassing; and, https://www.vox.com/2019/4/5/18297113/trump-authoritarian-comments-immigration-judges-media; and, https://www.rollcall.com/news/whitehouse/trump-pushes-treason-message-even-as-mulvaney-seeks-border-deal-with-dems. See https://www.politico.com/story/2018/08/02/trump-media-enemy-people-ivanka-white-house-760581. Weimar Germany. See John Dilulio Jr., Brookings, Feb. 13, 2017 at https://www.brookings.edu/blog/fixgov/2017/02/13/ten-questions-and-answers-about-americas-big-government/. See John Kelly, Slate, Oct. 26, 2016, "What's With All Trump's Talk about 'Draining the Swamp'?" at http://www.slate.com/blogs/lexicon_valley/2016/10/26/why_do_trump_and_his_supports_keep_talking_about_draining_the_swamp.html. See Paula Dwyer, Chicago Tribune, February 4, 2016, at http://www.chicagotribune.com/news/opinion/commentary/ct-elizabeth-warren-bernie-sanders-system-rigged-

20160204-story.html. Catch phrases noted above like “drain the swamp”, “deep state”, and “rigged system” have made headlines. “Armies of regulators descending like locusts,” is another disturbing phrase from the 2016 campaign trail. See Stuart Shapiro, The Hill, “Government bureaucrats are people, too”, 11/12/15 at http://thehill.com/blogs/pundits-blog/labor/259907-government-bureaucrats-are-people-too.

[280] Catch phrases noted above like “drain the swamp”, “deep state”, and “rigged system” have made headlines. “Armies of regulators descending like locusts,” is another disturbing phrase from the 2016 campaign trail. See Stuart Shapiro, The Hill, “Government bureaucrats are people, too”, 11/12/15 at http://thehill.com/blogs/pundits-blog/labor/259907-government-bureaucrats-are-people-too.

[281] True, markets can keep private actors honest – the “bottom line” is a powerful master. But, democracy likewise can keep governments honest -- when it includes independent watchdogs such as the press, the courts, ethics agencies, and law enforcement. Congressional committees when independent and bipartisan can serve this purpose. Furthermore, corruption often takes place at the nexus of the public and private sectors. For example, see Wells Fargo case in The Street, March 2, 2018, at https://www.thestreet.com/amp/story/14508322/1/wells-fargo-directors-retire-after-federal-reserve-slams-governance.html. The College admissions scandal of 2019 is another example

[282] Distrust of government emanates from the colonial struggle, states’ rights battles, the Civil War, and as a consequence of the culture wars and since the 1960s-70s. Gallup Poll June 2019 showed 75% disapprove of how Congress is doing – worse than Trump. 20% of Americans approve of Congress, vs. ~43% for Trump. See https://www.cnn.com/2019/06/01/politics/poll-of-the-week-congress-approval-rating/index.html; and Gallup poll itself:

[283] The U.S. intelligence agencies should be deployed in staunching foreign cyber attacks, engaging appropriate U.S. cybersecurity firms. See Craig Timberg and Tony Romm, WAPO, July 25, 2019, at https://www.google.com/amp/s/beta.washingtonpost.com/technology/2019/07/25/its-not-just-russians-anymore-iranians-others-turn-up-disinformation-efforts-ahead-vote/%3foutputType=amp; and, Maggie Miller, July 17, 2019, The Hill at https://thehill.com/homenews/house/453514-house-panel-advances-bill-to-protect-elections-from-foreign-interference; and, NBC News, June 18, 2019 at https://www.nbcnews.com/politics/congress/schumer-slams-mcconnell-blocking-election-security-legislation-n1018836; and, Craig Timberg, CNN appearance, July 25, 2019.

[284] Germany’s 1920s-30s “stab in the back”; China’s “century of humiliation” are two examples.

[285] See http://www.cnn.com/2017/01/20/politics/trump-inaugural-address/. Add citations of left’s blame quotations.

Again, this is not self-hate, but self-improvement. It is the patriotic thing to do. Finding common ground across the nation -- not only around policy, but also on values -- should become a goal of American politics.

[286] Egg hatched, from the Broadway show, 1776. American exceptionalism is embodied in the “shining city upon a hill” – an image drawn from the Bible that American leaders from John Winthrop, a colonial governor of Massachusetts, to Ronald Reagan have alluded to. A country offering an example to the world – moral leadership -- equipping the arsenal of democracy, issuing a clarion call for freedom, national self-determination and global cooperation. Winthrop / Reagan – WAPO, HuffPost Put the quotes in. Put in points about decolonization, self-determination, the independence of sovereign nations -- both strong and weak, and for global cooperation. Add citations for American exceptionalism. See Quora at https://www.quora.com/Whats-shining-city-on-a-hill-mean; and Ruth Marcus at WAPO, Feb. 20, 2018, who compares “American carnage” in Trump’s inaugural to Reagan’s “shining city upon a hill” in his Farewell Address, at https://www.washingtonpost.com/opinions/weve-left-the-shining-city-upon-a-hill-for-an-era-of-american-carnage/2018/02/20/73a1aaf8-1642-11e8-92c9-376b4fe57ff7_story.html?noredirect=on&utm_term=.66ff23409f6a.

Even the creed of national self-determination and democracy was exported to the rest of the world by a U.S. president – Woodrow Wilson – who segregated the federal bureaucracy by race and was well-known to be a white supremacist. American exceptionalism has justified an economic model that has contributed to environmental degradation -- including climate change. World Bank, 2014, Carbon intensity. Carbon intensity of GDP. US among top large advanced nations in carbon intensity – C02 emissions per dollar of GDP (PPP basis). See https://data.worldbank.org/indicator/EN.ATM.CO2E.PP.GD. Through the invention and mass production of the automobile, the U.S. has become the top carbon emitter, running close to China.

[287] Manifested over the last hundred-plus years in movements such as Civil Rights, #MeToo, and L.G.B.T.Q. Pride.On the June 2019 Pride celebrations: See https://www.theguardian.com/world/2019/jun/30/new-york-pride-parade-lgbtq-rights

[288] As well as the failure later of what was called "'import-substitution industrialization" in developing nations.

[289] Define ISI. Socialism is defined as government ownership of the means of production. See articles on "millennial socialism" in the Feb. 14, 2019 Economist. A factor motivating millennials today is intergenerational conflict, a legitimate concern that should not be dismissed. They are burdened with high student debt, unaffordable home prices, limited participation in the booming stock market, sluggish economic growth, ineffective education, deteriorating politics, and an aging population that will soon burden them with their health care and retirement needs. The share of income controlled by capital keeps going up, and the share of labor goes down – which hurts most millennials. The appeal of Trump's nativism – keep the migrants out, stop other countries from cheating us – appeals to a portion of this cohort. The revolutionary fixes of the left – the Green New Deal, Medicare for All, guaranteed basic income, free everything, tax the rich – appeal to another portion. Through a program of Savings / Education / Exchange – driven by strategic planning and fostering consensus – populism can be kept at bay and "millennial moderates" could become a growing share of that age cohort.

[290] Extreme ideas that argue against thrift, such as Modern Monetary Theory (MMT) – a foolish notion that calls for virtually unlimited money creation to finance ever-wider government deficits because inflation is no longer considered a problem, should be discarded. MMT seeks to eliminate the government's budgetary constraint, which would only hasten the decline of the U.S. economy. Such magical thinking smacks of the trap that Carmen Reinhart and Kenneth Rogoff warned about in their pathbreaking study of financial crises across eight centuries, *This Time is Different*. See pp. 15-20. See MMT incl. Marco Annunziata, Mohammed El-Erian.

[291] Some observers (e.g. Dani Rodrik, an economist at Harvard's Kennedy School) have argued that populism really consists of a set of policies that help the common person against the ravages of globalization. A "good kind of populism", Rodrik argues, such as embodied in Franklin Roosevelt's New Deal, could fend off the "bad kind of populism". However, policies that promote long-term economic performance, thereby serving the common person in the long run, are not always popular. They consist of initiatives that foster education and innovation, open markets and engagement with the world, and savings and low debt. They don't always juice the economy in the short run. Yes, a sound policy approach includes adjustment assistance and a social safety net, as embodied in the New Deal, which can ease the pain of economic change. Perhaps Dani Rodrik's "good kind of populism" does promote country success, but if his program abandons short-term stimulants and palliatives in favor of long-run cures, it ceases to be populism. See Dani Rodrik, The New York Times, Feb. 21, 2018, Op-ed, "What Does a True Populism Look Like? It Looks Like the New Deal".
Measures that increase fairness – such as affordable health care, targeted income support and student loan forgiveness, and efforts to give workers a greater stake in firms – make sense.

[292] This is the essence of the German model today – the social market economy.

[293] See American Political Science Association's (APSA) Task Force Report (2013), "Negotiating Agreement in Politics".
See Robert Mickey, Steven Levitsky, Lucan Way, "Is America Still Safe for Democracy? Why the United States is in Danger of Backsliding", Foreign Affairs, May-June 2017, at https://www.foreignaffairs.com/articles/united-states/2017-04-17/america-still-safe-democracy. The word "paradoxically" is used because, the authors argued, with greater justice came increased polarization and dysfunction. See Steven Levitsky and Lucan A. Way, Competitive Authoritarianism, Hybrid Regimes After the Cold War, 2010 Cambridge University Press.

[294] Gridlock results and the policies that pass are suboptimal. Budget sequestration, continuing resolutions, government shutdowns, near debt-defaults, party-line votes, "budget reconciliation" deployed to pass partisan laws, sharp swings in policy following changes in government are reflections of this dynamic. See American Political Science Association's (APSA) Task Force Report (2013), "Negotiating Agreement in Politics"; and, Politico, Oct. 2015 on budget reconciliation. Budget reconciliation allowed for a majority, rather than a supermajority in the Senate (3/5 vote or 60 Senators), begun in 1974 to facilitate reconciliation of budget bills between the House and Senate. This mechanism has been used outside the intended annual budgetary process to secure party line majority votes on partisan legislation, in order to avoid the difficult bipartisan negotiations usually required for a 3/5 vote in the Senate – such as the 2001 George W. Bush tax cuts, and the 2010 Obama ACA vote. Republicans attempted to repeal the ACA in 2017 using this mechanism but were frustrated by a no vote by Senator McCain, who called for a return to "regular order" in such votes.

Budget sequestration consists of blanket cuts to discretionary spending in the event no deal is reached in Congress.
[295] https://www.imf.org/en/Publications/WP/Issues/2019/06/03/Stranded-How-Rising-Inequality-Suppressed-US-Migration-and-Hurt-Those-Left-Behind-46824. See IMF WP Alichi et al Nov. 2017 – income inequality polarization, middle class slipping – 50% due to routinization, 50% due to international trade competition. See Wolff NBER – wealth inequality up – median net worth hasn't recovered from GFC nearly as much as average. Top brackets wealth gains > lower 40%. In part due to higher RE proportion in middle class, which hasn't recovered as much as stocks. Also due to high leverage of middle class (mortgages). See https://www.nber.org/papers/w24085. Income mobility is down. See NBER at https://www.nber.org/papers/w22910.pdf.
"Red" states vote Republican, while "Blue" states vote Democrat (this has to do with the color coding on the election maps shown by the major news outlets, especially CNN). Blue states tend to be on the coast and Red states in the south or center of the country and tend to more rural. See Institute of International Finance (IIF) Global Macro Views (GMV) Nov. 13, 21 and 28 2017. The IIF is a research and advocacy institute employing staff economists, with membership centered on financial institutions. The IIF produced an interesting series of articles in 2017, analyzing employment and broader economic trends in Red and Blue states in the U.S. See Mickey, Levitsky and Way, Foreign Affairs, May-June 2017.
[296] Such as technology companies, social media, exporters of services, and life sciences firms.
[297] "Red" states vote Republican, while "Blue" states vote Democrat (this has to do with the color coding on the election maps shown by the major news outlets, especially CNN). Blue states tend to be on the coast and Red states in the south or center of the country and tend to more rural. Institute of International Finance (IIF) Global Macro Views (GMV) Nov. 13, 21 and 28 2017. The IIF is a research and advocacy institute employing staff economists, with membership centered on financial institutions. The IIF produced an interesting series of articles in 2017, analyzing employment and broader economic trends in Red and Blue states in the U.S. Red state labor force participation has been a full percent below the national average, which remains stuck at below 63% vs. higher levels achieved around 66% before the GFC.
[298] Rankings of states on quality of life show Blue states outperforming Red States. In the *US News and World Report*'s ranking of U.S. states along 8 parameters of quality of life – health care, education, economy, infrastructure, opportunity, fiscal stability, crime & corrections, and the natural environment, 8 of the top 10 ranked countries were Blue states (voted for Clinton in 2016), while only two Utah and Nebraska were Red states (voted Trump). Of the 20 states that voted for Clinton, 70% were ranked in the top of states, whereas 63% of 30 states that voted for Trump were in the bottom half the U.S. News and WP 2019 rankings. On the economy and opportunity, 6 of the top 10 were Blue States too.
The IMF found that one reason labor mobility is declining in the U.S. is because higher real estate prices in Blue states make it harder for workers in Red states to move "uphill" to better jobs. See IMF WP 19/122 at https://www.imf.org/en/Publications/WP/Issues/2019/06/03/Stranded-How-Rising-Inequality-Suppressed-US-Migration-and-Hurt-Those-Left-Behind-46824
[299] Institute of International Finance (IIF) Global Macro Views (GMV) Nov. 13, 21 and 28 2017. The IIF is a research and advocacy institute employing staff economists, with membership centered on financial institutions. The IIF produced an interesting series of articles in 2017, analyzing employment and broader economic trends in Red and Blue states in the U.S.
[300] The Supreme Court ruled in 2019 that it has no authority to limit gerrymandering. See American Political Science Association's (APSA) Task Force Report (2013), "Negotiating Agreement in Politics"; and, Politico, Oct. 15, 2017, Jeff Davis, on budget reconciliation; and, NPR, June 27, 2019, at https://www.npr.org/2019/06/27/731847977/supreme-court-rules-partisan-gerrymandering-is-beyond-the-reach-of-federal-court. See the Atlantic, March 2016, How to Reduce Polarization; and University of Chicago (ideas to reduce polarization).
[301] In open primaries, often the top two finishers, independent of which party they are from, compete in the general election. See Atlantic article, Mar 2016, How to Reduce Polarization.
In Canada, political parties – and party leaders – play a role in choosing candidates -- which appears to yield greater centrism.
[302] Versus 1990. See APSA article, pp. 12 & 31.
[303] Partisans have a louder voice than in the past, attacking moderates who deviate from party orthodoxy. Viewers self-select the slant of their news –watching Fox, CNN or MSNBC exclusively. See top conservative news sites list at

https://toptere.com/website-rankings/news-media/top-conservative-websites/. See top liberal news sites list at https://toptere.com/website-rankings/news-media/top-liberal-websites/.
[304] APSA.
[305] Greater control of the legislative agenda by party leaders, rather than committee chairs, has resulted in legislation more closely aligned to party ideology. Committees tend to be more more technocratic and issue-centered.
[306] What political scientists call "veto players".
[307] The proper role of government; protection from or engagement with the wider world; national identity, race, religion, sexual orientation, and immigration; the environment and climate change; abortion; and the right to bear arms or go to school without the threat of gun violence are questions that get the national dander up.
See Robert Mickey, Steven Levitsky, Lucan Way, "Is America Still Safe for Democracy? Why the United States is in Danger of Backsliding", Foreign Affairs, May-June 2017, at https://www.foreignaffairs.com/articles/united-states/2017-04-17/america-still-safe-democracy; and, Steven Levitsky and Lucan A. Way, *Competitive Authoritarianism, Hybrid Regimes After the Cold War*, 2010 Cambridge University Press.
Gerrymandering is carving up election districts in pursuit of partisan results.
[308] Income levels of African-Americans relative to the rest of the country have not improved in the last 40 years. Discriminatory practices – such as in mortgage lending – persist. See BLS data – weekly earnings 1979-2019, African Americans relative to Whites, stagnant at just under 80%. At least this has not deteriorated, amid an overall deterioration of income inequality. See Pew research, July 12, 2018 at https://www.pewresearch.org/fact-tank/2018/07/12/key-findings-on-the-rise-in-income-inequality-within-americas-racial-and-ethnic-groups/. See https://www.npr.org/2018/11/24/670513608/how-some-algorithm-lending-programs-discriminate-against-minorities; https://www.wunc.org/post/blacks-and-latinos-denied-mortgages-rates-double-whites; and, https://www.pbs.org/newshour/show/struggle-for-black-and-latino-mortgage-applicants-suggests-modern-day-redlining.
[309] Nancy Pelosi, June 13, 2019, CFR, interview with Fareed Zakaria per Fareed Zakaria GPS, Sunday, June 16, 2019.
[310] This in no way is an argument against diversity. Greater inclusion is the only possible way forward. But, care to build the center and find common ground among diverse groups would limit the potential for diversity to result in polarization.
[311] Permanent bodies such as the CBO, or ad-hoc bipartisan commissions, such as the Greenspan Social Security and the immigration reform commissions of the 1980s. See APSA
[312] See APSA, including vii-viii, pp. 60-65.
[313] Note the successes and proposals of the Problem Solvers Caucus in the House – 44 moderate Republicans and Democrats and their backers No Labels, co-chaired by Lieberman – 23/28 Members of Congress running in 2018 who are members of the Problem Solvers Caucus were funded by $15 million in No Labels funding and won reelection. Problem Solvers wins? (WAPO article). Problem Solvers effort needs a kick in the pants. Infrastructure plan 2019.
[314] Politics in advanced countries around the world may be getting more fluid. The dividing line might be better described as "drawbridge up" or "drawbridge down", referring to pro or anti-globalization forces. Divisions might not fit neatly in the traditional right-left categories – but polarization remains ominous nonetheless.
[315] See Evangelia Sembou, "HEGEL'S IDEA OF A 'STRUGGLE FOR RECOGNITION': THE 'PHENOMENOLOGY OF SPIRIT'", History of Political Thought, Vol. 24, No. 2 (Summer 2003), pp. 262-281; and, Kant; Existentialism of Jean-Paul Sartre, Camus, L'Homme Revolte; Frantz Fanon, Black Skin, White Masks (1952) and The Wretched of the Earth (1961).
But, let's be clear: there can be no such exercise of mutual recognition with people who espouse hate – like the Nazi and White Supremacist views expressed at the Unite the Right rally in Charlottesville in 2017. Reconciliation with these people cannot occur unless (and until) such people truly renounce these views – which requires at a minimum anti-bias and diversity training. By an organization skilled at doing this sort of training such as the NAACP or the ADL.
To that end, the hero journalists who work tirelessly – sometimes at personal peril – in investigative journalism that reports facts to the public must be supported – and protected. Support for organization such as the Committee to Protect Journalists is important to America's future success. See See https://cpj.org/about/.
America's national spirit – what the French call élan – must be rekindled. Élan can be a powerful ingredient for country success. Unity, consensus, common values, a national calling, favorable demographics, youthful vigor – these attributes can underpin a cohesive and inspired nation. Sometimes a powerful élan is channeled in a

negative direction. This was the case with fascism and communism. By contrast, national energy can be depleted as a result of poor leadership, political and social divisions, and economic failure. This is how a country loses its mojo. Today, populism and polarization are sapping the positive élan around the world, or worse, channeling it into its negative cousin.