COVID-19 Economic Impacts

Beware the Ides of March
A Day Romans Settled Debts

March 19, 2020

KPMG Economics

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The Federal Reserve held an emergency FOMC meeting on March 15th at which they cut interest rates by 100 basis points and announced multiple measures to assist debt capital market liquidity

“The purpose of the following pages is to study the problem of debt in Rome of the Ciceronian age. A part of this argument will be uncontroversial or at least familiar; that is, the way in which Roman politicians lived in prolonged states of indebtedness”

M.W. Frederiksen, *Caesar, Cicero and The Problem of Debt*

“There is an inverse relationship between flattening the caseload curve and the economic cost. Flattening the caseload curve is critical but it comes with an economic cost if other measures are not also taken. Even with substantial government assistance “L” shaped downturns may be unavoidable as corporate debt levels are simply too high to avoid a day of reckoning.”

C. L. Hunter

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Mapping and Analyzing the COVID-19 Outbreak

1. The Debt Connection
2. Economics of Social Distancing
3. Debt and Social Distancing Interact
4. Concluding Thoughts

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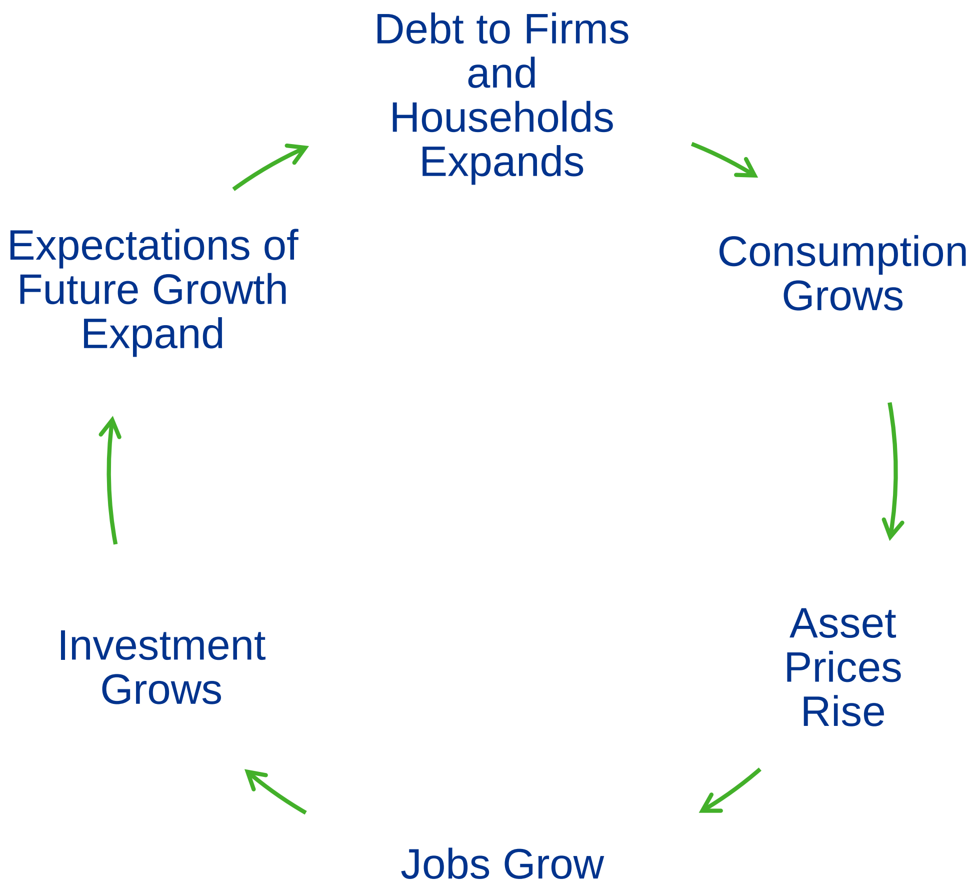
In a growing economy debt amplifies growth, at first

Debt Amplifies Growth Through All Channels of Growth



- From Roman to modern times, expanding debt is a time-honored way to grow economies.
- Economies that expand debt either too quickly or too much eventually face increased risk premia; that is higher borrowing costs.
- Higher borrowing costs slow growth and can lead to a vicious circle of unwinding debt like the world experienced in the global financial crisis.
- Adverse shocks can also slow growth which can be problematic as debt levels are no longer sustainable at a lower growth rate.

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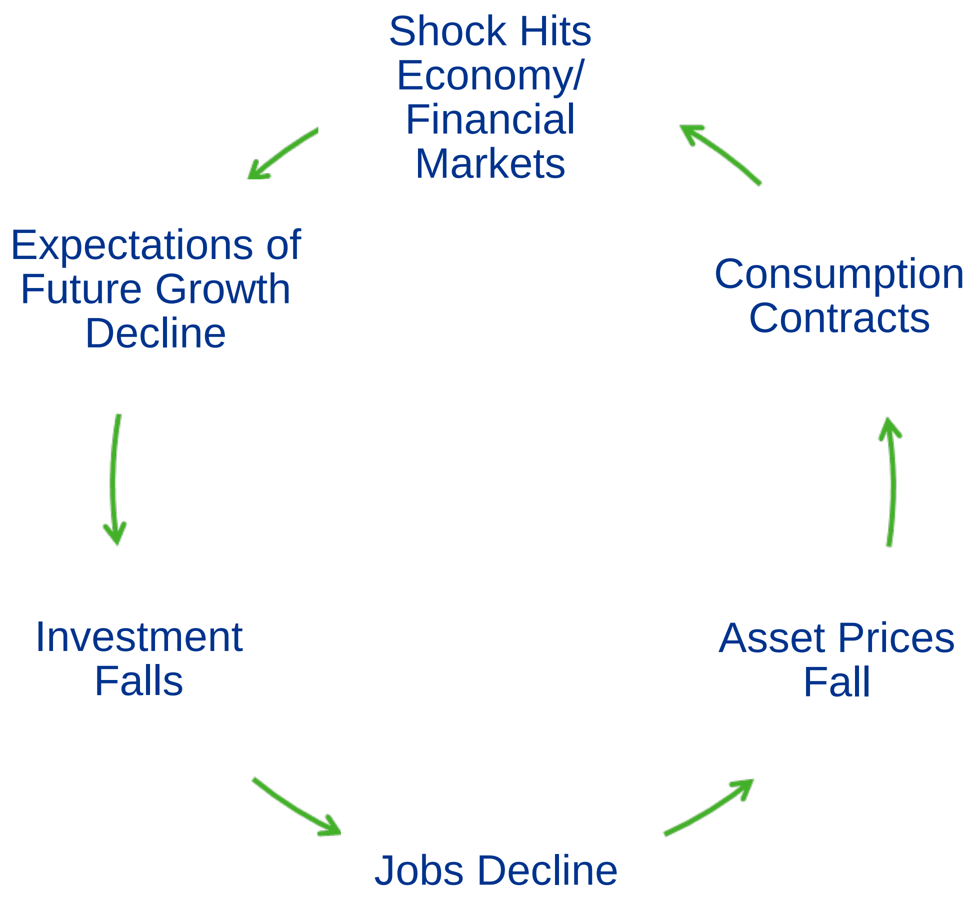
A shock turns the growth cycle into a downward debt spiral

Debt Amplifies Contraction Through All Channels of the Economy



- Sometimes debt expansions grow enough that no adverse impacts are felt.
- More often, debt grows too much and adverse consequences lead to an unwind of the debt.
- The unwind can be orderly or, as is more often the case, disorderly.
- The adverse shock of coronavirus is a combination of supply shock, demand shock and financial markets shock.
- The Federal Reserve and U.S. Government are taking measures to lead to a more orderly unwind but there is growing concern around timing.

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Risks interact with one another to produce the outcome

Covid-19 will interplay with debt levels and capital markets

The global economy in precarious place to handle shocks

Real GDP Growth Rates %				
Top 10 Countries by GDP		2017	2018	2019
1	U.S.	2.4	2.9	2.3
2	China	6.9	6.7	6.1
3	Japan	2.2	0.3	0.7
4	Germany	2.8	1.5	0.6
5	U.K.	1.9	1.3	1.4
6	France	2.4	1.7	1.3
7	India	6.5	6.7	5.3
8	Italy	1.7	0.7	0.3
9	Brazil	1.3	1.3	1.1
10	Canada	3.2	2.0	1.6

Notes: Annual growth rate y/y%
Source: KPMG Economics, Respective Countries' National Statistics Office, Haver Analytics

- The risk of a global recession in 2020 is extremely high as nations shutdown economic activity to limit the spread of COVID-19.
- COVID-19 is unique in that it is a supply shock, a demand shock, and also a market shock.
- As production is curtailed around the world, many firms will not have necessary inputs.
- A severe demand shock is also underway.
- **A hopeful "V" or "U" shaped recovery depends on the timing and magnitude of government assistance as well as the level of corporate debt, and how companies and markets cope with lower demand.**

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COVID-19 shows up in high frequency manufacturing

Mfg PMI									
Europe	**Jun-19**	**Jul-19**	**Aug-19**	**Sep-19**	**Oct-19**	**Nov-19**	**Dec-19**	**Jan-20**	**Feb-20**
France	51.9	49.7	51.1	50.1	50.7	51.7	50.4	51.1	49.8
Germany	45.0	43.2	43.5	41.7	42.1	44.1	43.7	45.3	48.0
Ireland	49.8	48.7	48.6	48.7	50.7	49.7	49.5	51.4	51.2
Italy	48.4	48.5	48.7	47.8	47.7	47.6	46.2	48.9	48.7
Spain	47.9	48.2	48.8	47.7	46.8	47.5	47.4	48.5	50.4
U.K.	48.0	48.0	47.4	48.3	49.6	48.9	47.5	50.0	51.7
Americas									
Brazil	51.0	49.9	52.5	53.4	52.2	52.9	50.2	51.0	52.3
Canada	49.2	50.2	49.1	51.0	51.2	51.4	50.4	50.6	51.8
Mexico	49.2	49.8	49.0	49.1	50.4	48.0	47.1	49.0	50.0
U.S.	50.7	50.4	50.3	51.1	51.3	52.6	52.4	51.9	50.7
Asia & Pacific									
Australia	52.0	51.6	50.9	50.3	50.0	49.9	49.2	49.6	50.2
China	49.4	49.9	50.4	51.4	51.7	51.8	51.5	51.1	40.3
Japan	49.3	49.4	49.3	48.9	48.4	48.9	48.4	48.8	47.8
Korea	47.5	47.3	49.0	48.0	48.4	49.4	50.1	49.8	48.7
India	52.1	52.5	51.4	51.4	50.6	51.2	52.7	55.3	54.5
Indonesia	50.6	49.6	49.0	49.1	47.7	48.2	49.5	49.3	51.9
Malaysia	47.8	47.6	47.4	47.9	49.3	49.5	50.0	48.8	48.5
Singapore	49.6	49.8	49.9	49.5	49.6	49.8	50.1	50.3	48.7
Vietnam	52.5	52.6	51.4	50.5	50.0	51.0	50.8	50.6	49.0

Source: KPMG Economics, IHS Markit, Haver Analytics (Feb 2020)

Note: The Purchasing Managers Index (PMI) is a monthly survey of industry that is a real-time snapshot of economic conditions. It is a diffusion index and a reading greater than 50 indicates expansion while a reading below 50 indicates contraction.

- The global impact of China's slowdown was felt around the world; a PMI reading below 50 indicates recessionary conditions.
- The virus outbreak has disrupted manufacturing supply chains and sharply curtailed energy and commodity demand.
- What was previously a manufacturing-only recession has now spread to the services sector.
- We anticipate the March PMI data for both services and manufacturing to reflect growing economic stress as social distancing causes a sharp decline in demand.

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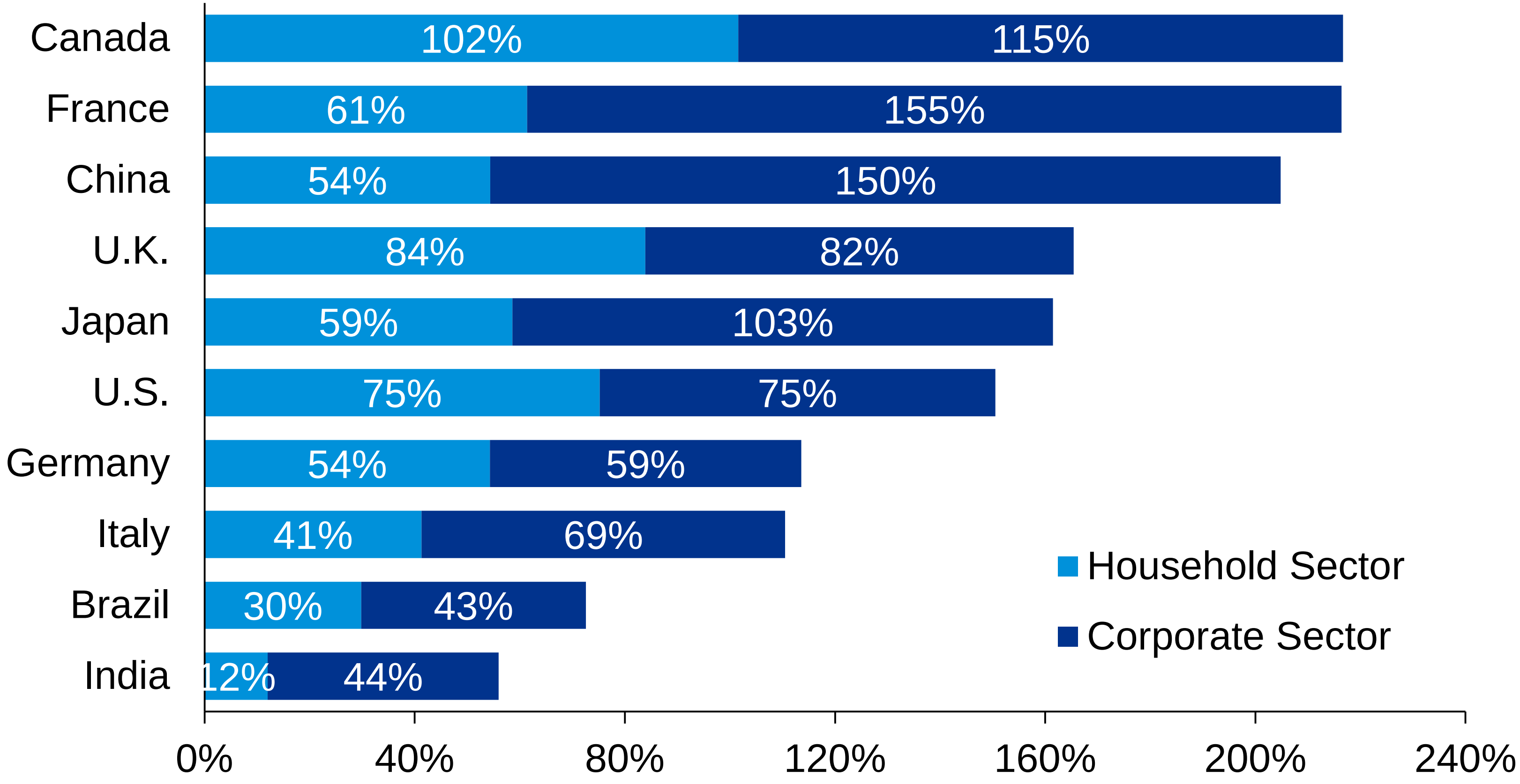
Elevated debt levels make social distancing more costly

Private Nonfinancial Sector Credit
(% of GDP)



Source: KPMG Economics, BIS, Haver Analytics (Q3 2019)
Excludes Luxembourg, Netherlands, Sweden and others with higher ratios due to smaller GDP size

- Government efforts to extend credit terms for households and businesses may not come in time to avoid significant debt defaults.
- The higher the debt levels the more costly and economically damaging social distancing is for an economy.
- U.S. debt capital markets have seen significant strain as the coronavirus spreads globally.
- Outflows from high grade, high yield and municipal bonds have been significant. Spreads for corporate bonds have widened hundreds of basis points. Additionally, Treasury market strain is also being seen in ways that did not manifest during the global financial crisis of 08.

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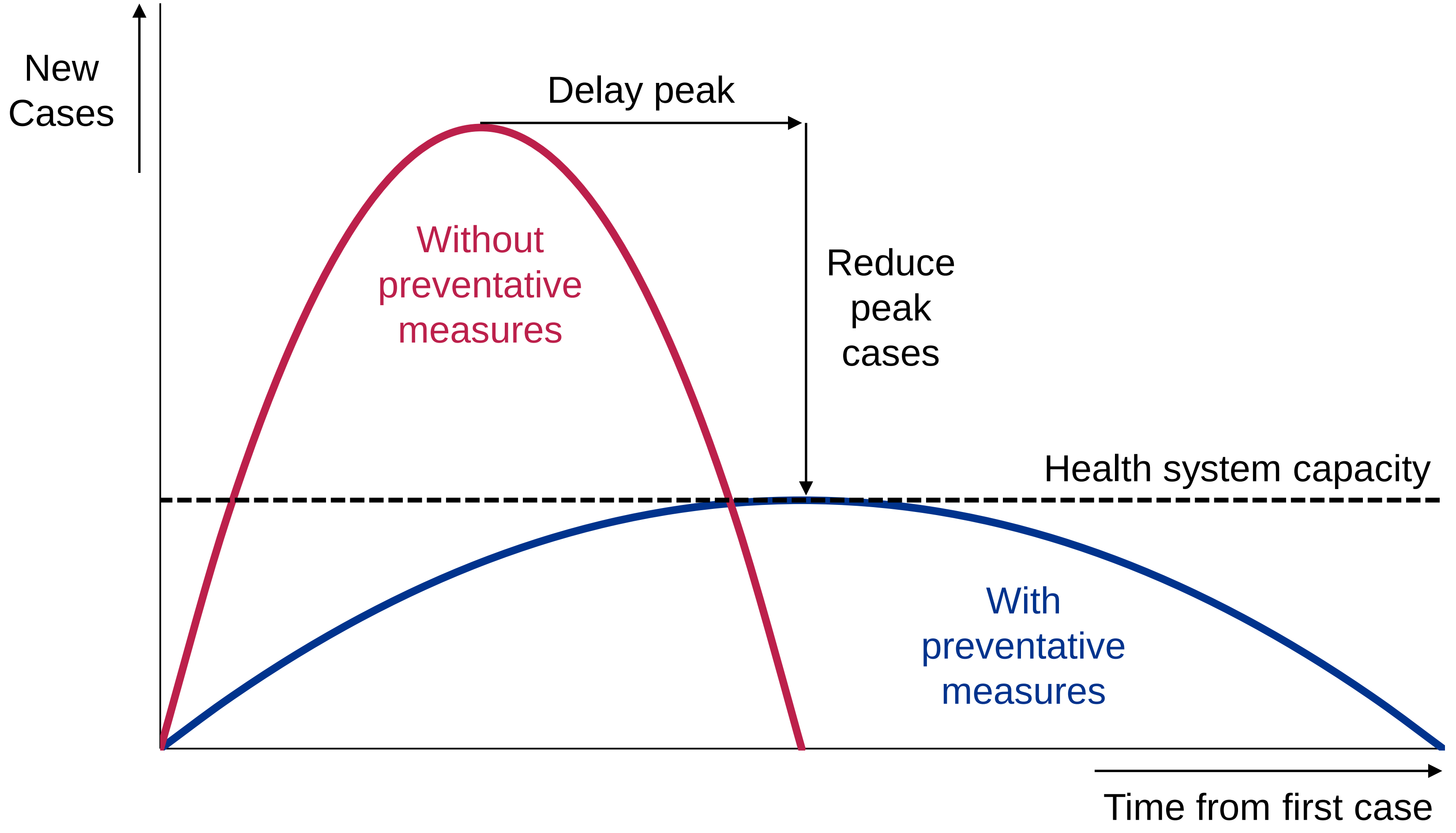
The Economics of Social Distancing

Nations must lower peak to avoid overwhelming health systems

Flattening the Pandemic Curve



- According to a paper by UC Berkley economist, Gournichas, if 50% of the world is infected, 1% of the world, 76 million people would die.[1]
- This assumption is based on the available critical care beds and a 2% case fatality rate.
- A strong policy response includes measures that both delay and reduce the peak number of new cases to prevent the health care system from being overrun.
- Ongoing research for more effective treatment and a possible vaccine do not solve the immediate problem of system capacity.

Source: KPMG Economics, Chart Adapted from CDC/The Economist, [1]Gournichas (2020)

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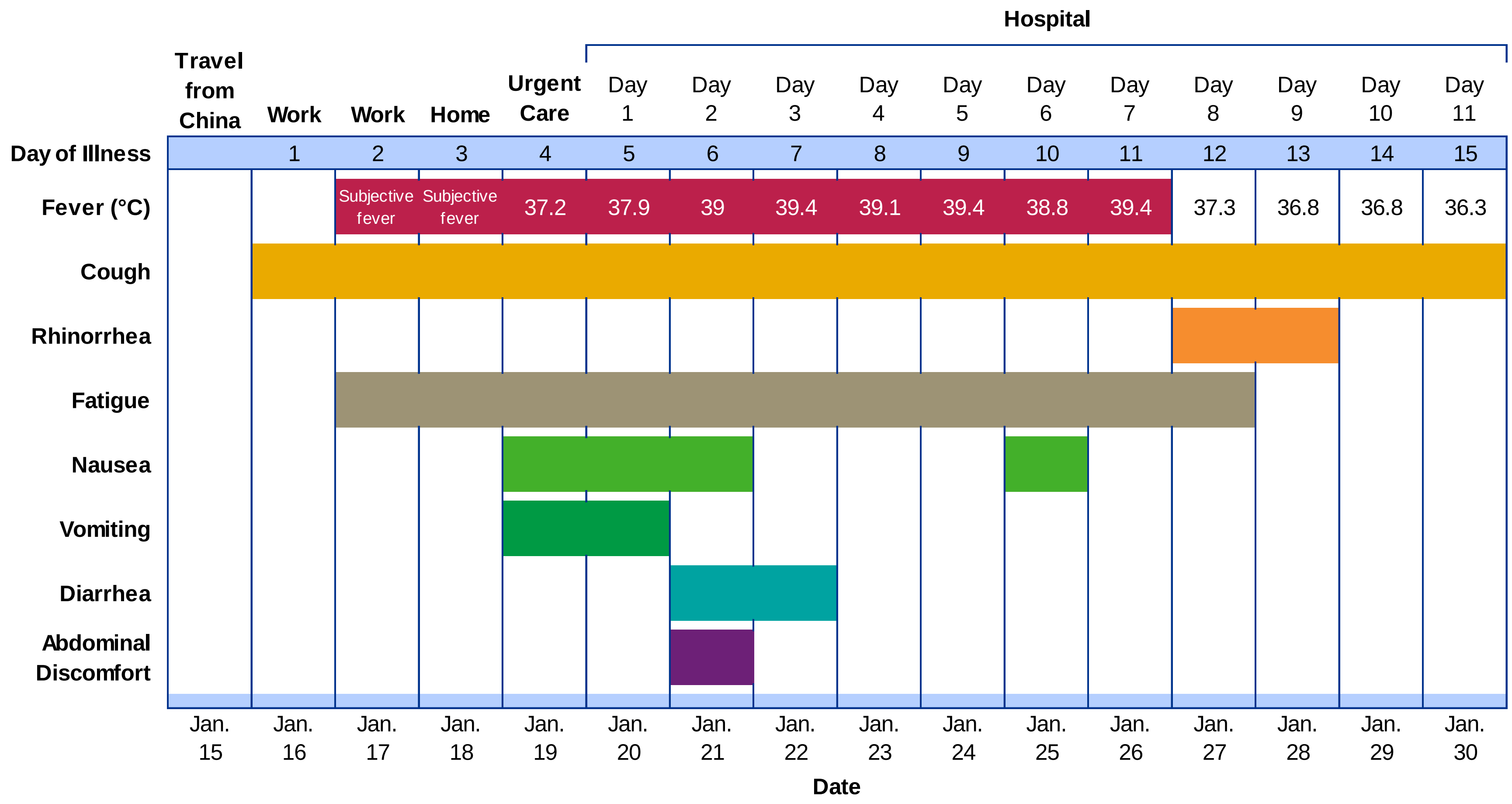
Illness can be severe and lengthy, even with treatment

Symptom Timeline of First U.S. COVID-19 Patient



- COVID-19 infection begins with a 2-14 day incubation period before symptoms arise followed by severe flu-like symptoms for ~2 weeks.
- At present, research suggests that approximately 20% of those who contract COVID-19 will need hospital treatment that is extensive.
- This puts significant strain on healthcare facilities as well as on the economy.

Source: KPMG Economics, World Health Organization

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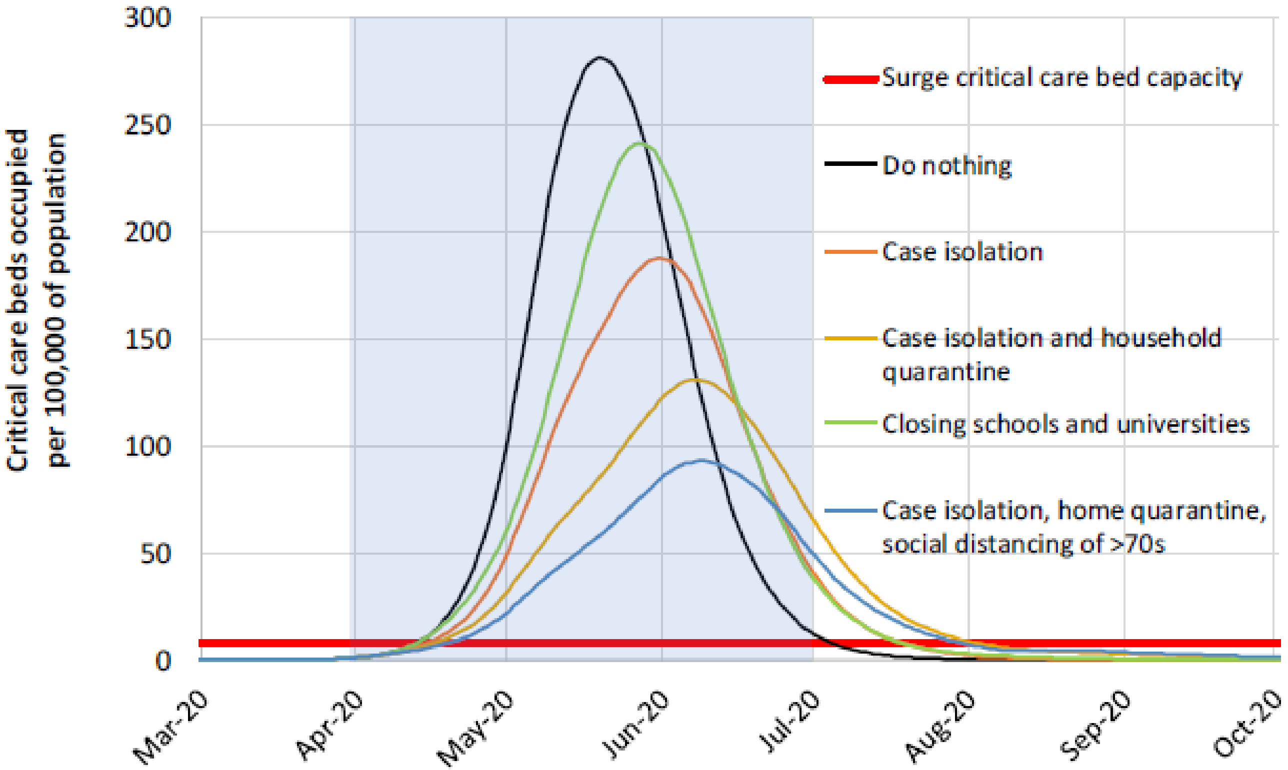
Scenario analysis for the UK shows social distancing needed

Mitigation Strategy for the U.K.



Policy	Description
Case isolation in the home	Symptomatic cases stay at home for 7 days, reducing non-household contacts by 75% for this period. Household contacts remain unchanged. Assume 70% of household comply with the policy.
Voluntary home quarantine	Following identification of a symptomatic case in the household, all household members remain at home for 14 days. Household contact rates double during this quarantine period, contacts in the community reduce by 75%. Assume 50% of household comply with the policy.
Social distancing of those over 70 years of age	Reduce contacts by 50% in workplaces, increase household contacts by 25% and reduce other contacts by 75%. Assume 75% compliance with policy.
Social distancing of entire population	All households reduce contact outside household, school or workplace by 75%. School contact rates unchanged, workplace contact rates reduced by 25%. Household contact rates assumed to increase by 25%.
Closure of schools and universities	Closure of all schools, 25% of universities remain open. Household contact rates for student families increase by 50% during closure. Contacts in the community increase by 25% during closure.

Source: KPMG Economics, Imperial College COVID-19 Response Team, Neil Ferguson (2020)

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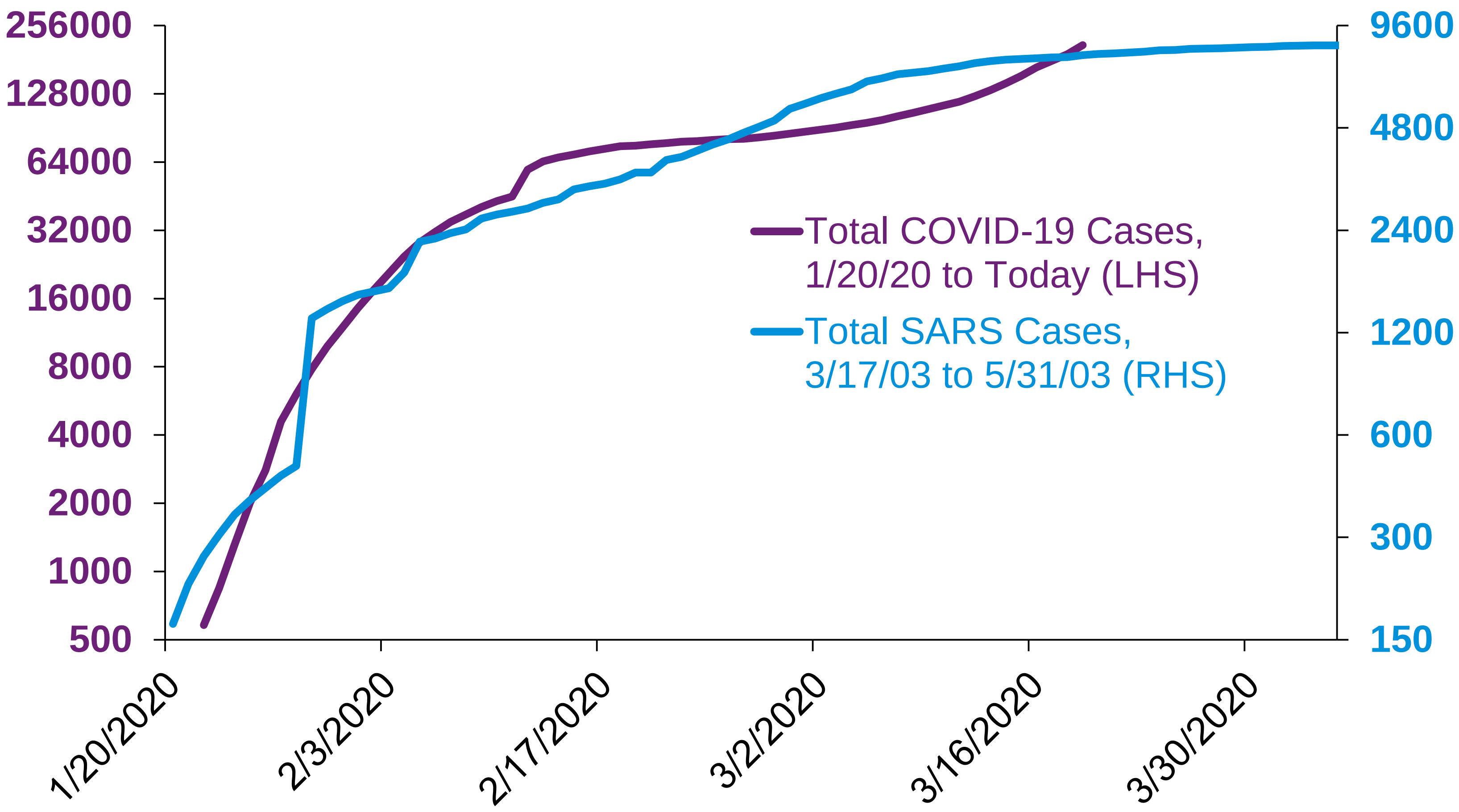
Medical professionals make comparison to SARs in 2003

Total Confirmed Cases as of March 19, 2020

Logarithmic Scale



Source: KPMG Economics, World Health Organization, COVID-19 on the left-hand side, SARS on the right-hand side

- The majority (65%) of cases are now outside of China.
- Many analysts are highlighting the similar path of the outbreak to SARS. While the absolute numbers are larger with Covid-19, the pattern of infection is similar, so far.
- To stay abreast of developments, we encourage people follow the WHO, New England Journal of Medicine, and The Lancet to name a few.
- On January 31, 2020, 94 academic journals, societies, institutes, and companies signed a commitment to making research and data on the disease freely available, at least for the duration of the outbreak.

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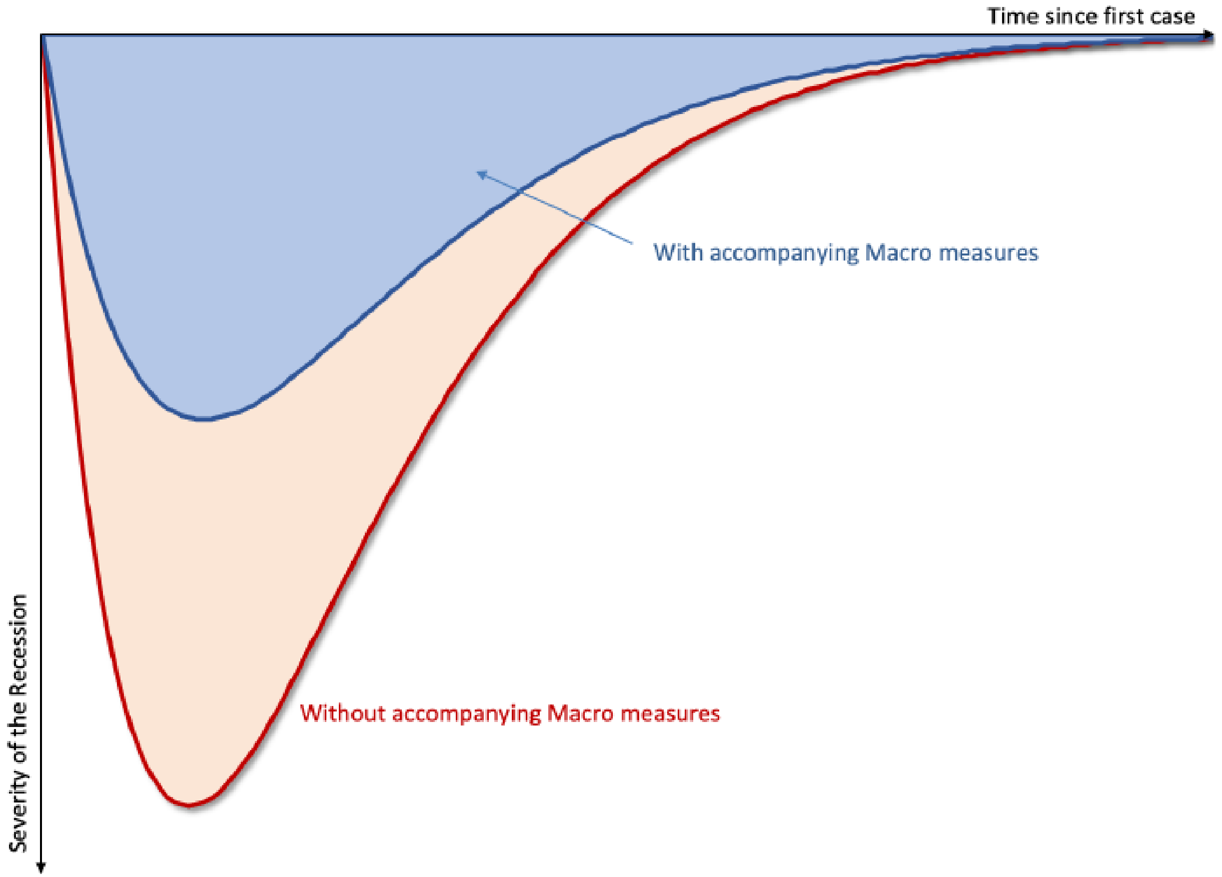
Inverse relationship between health and economic impact

Flattening the Recession Curve



Source: KPMG Economics, Gournichas (2020)

- Flattening the caseload curve is critical but it comes with an economic cost if other measures are not also taken.
- Governments are learning by doing when addressing the economic risks of closing the economy and asking citizens to engage in social distancing.
- Countries with higher levels of debt will require greater assistance by their governments to prevent "L" shaped economic downturns.
- Even with substantial government assistance, "L" shaped downturns may be unavoidable.

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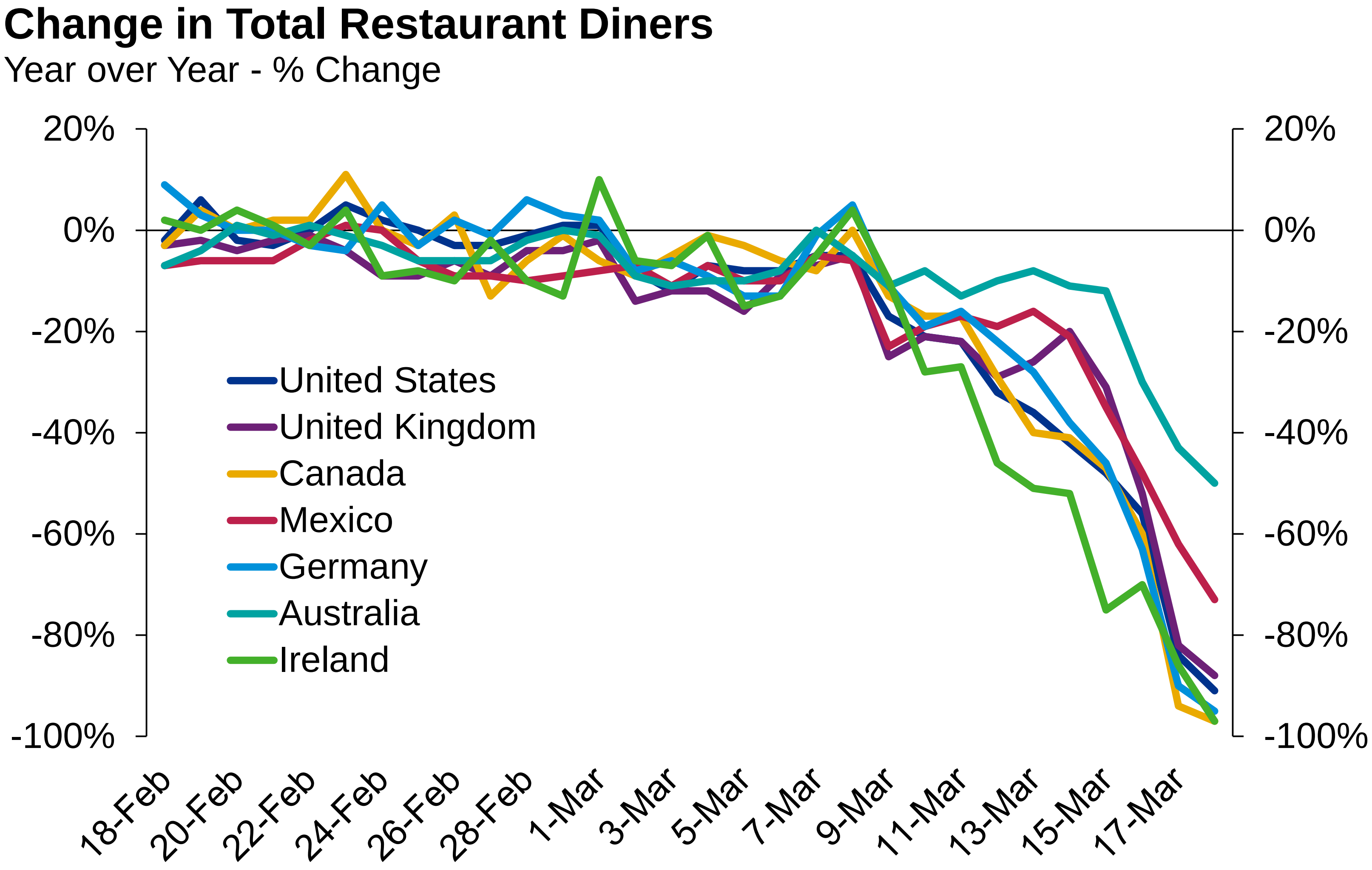
Social distancing leads to a collapse in activity



Source: KPMG Economics, OpenTable (March 18, 2020), Haver Analytics

- Global restaurant diners were down 89% year-over-year as of March 18th. Data suggests this will fall to a 100% decline and remain there for several weeks.
- Restaurants are a useful proxy for person to person retail activity.
- Many restaurants, already operating on thin margins, will be forced to lay off staff and/or close in the coming weeks.
- Weekly unemployment claims in the U.S. surged 33% wk/wk data released for the week of March 14th.

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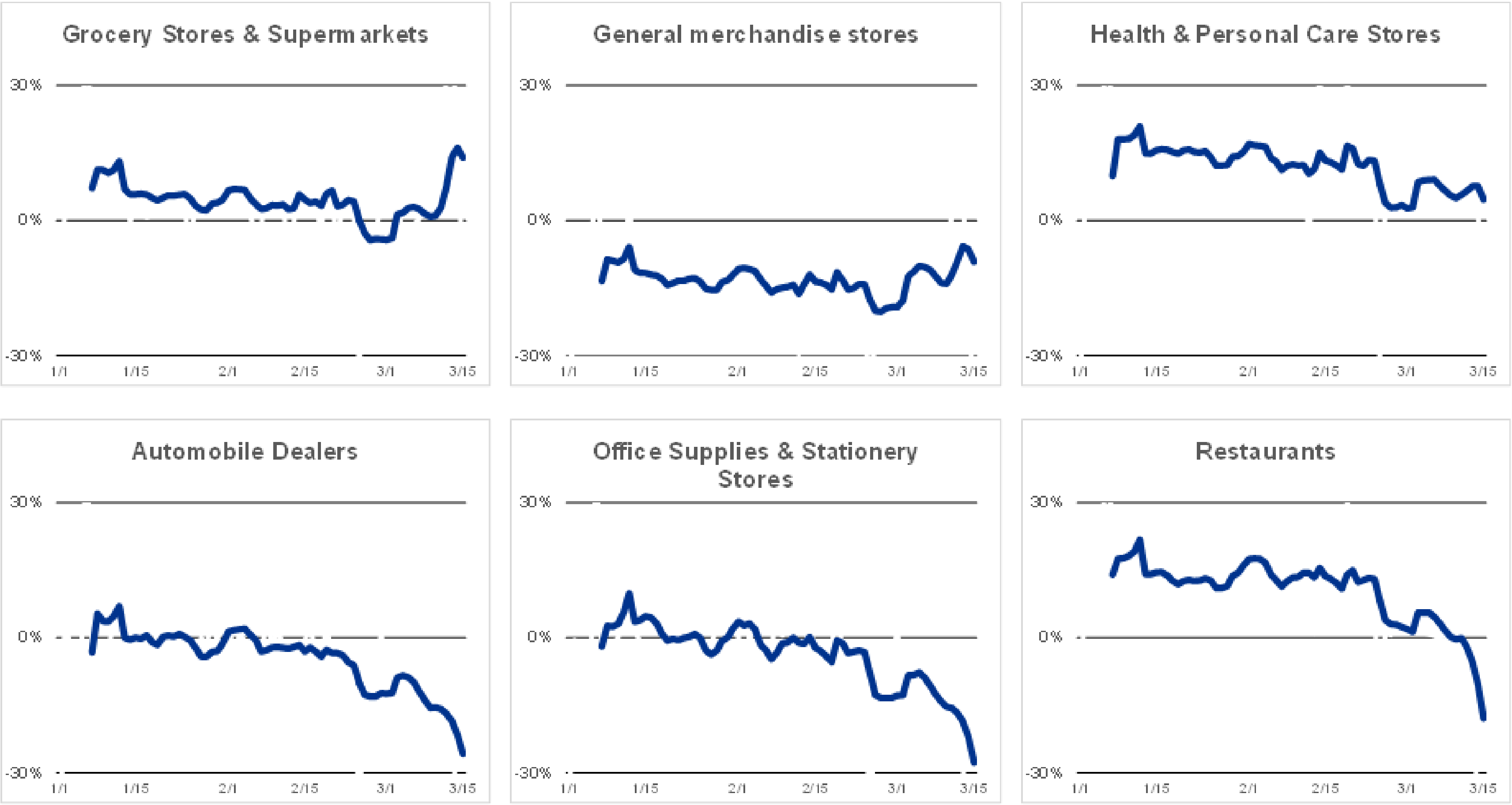
Cell phone traffic data reveal many retail outlets see decline

Visits Index (△ 2020 vs. 2019)



Source: KPMG Economics, KPMG Strategy, SafeGraph Foot Traffic

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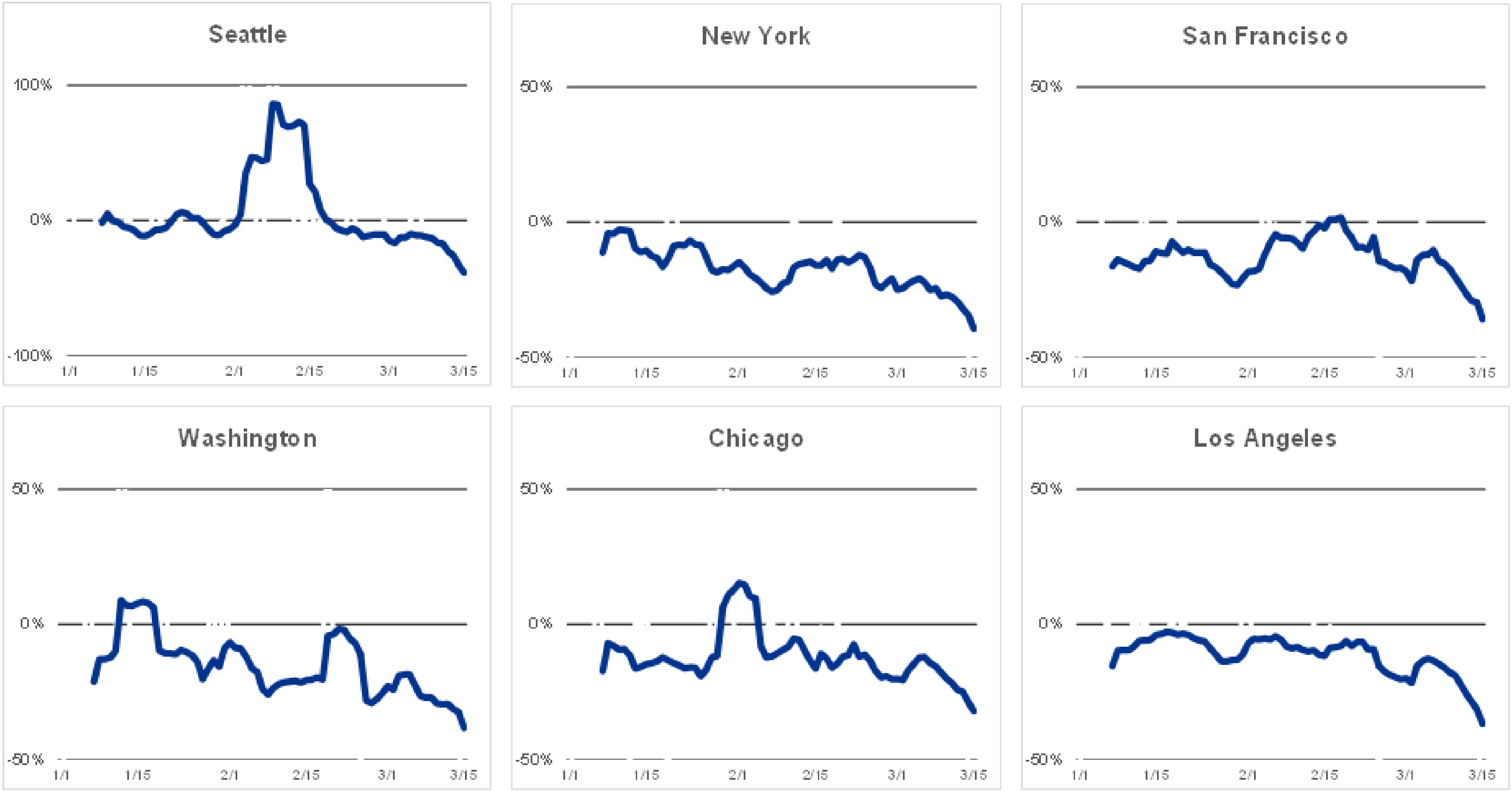
Already weak auto sales will see bigger declines in March

City-level Automobile Dealers Foot Traffic Visits Index (△ 2020 vs. 2019)



Source: KPMG Economics, KPMG Strategy, SafeGraph Foot Traffic

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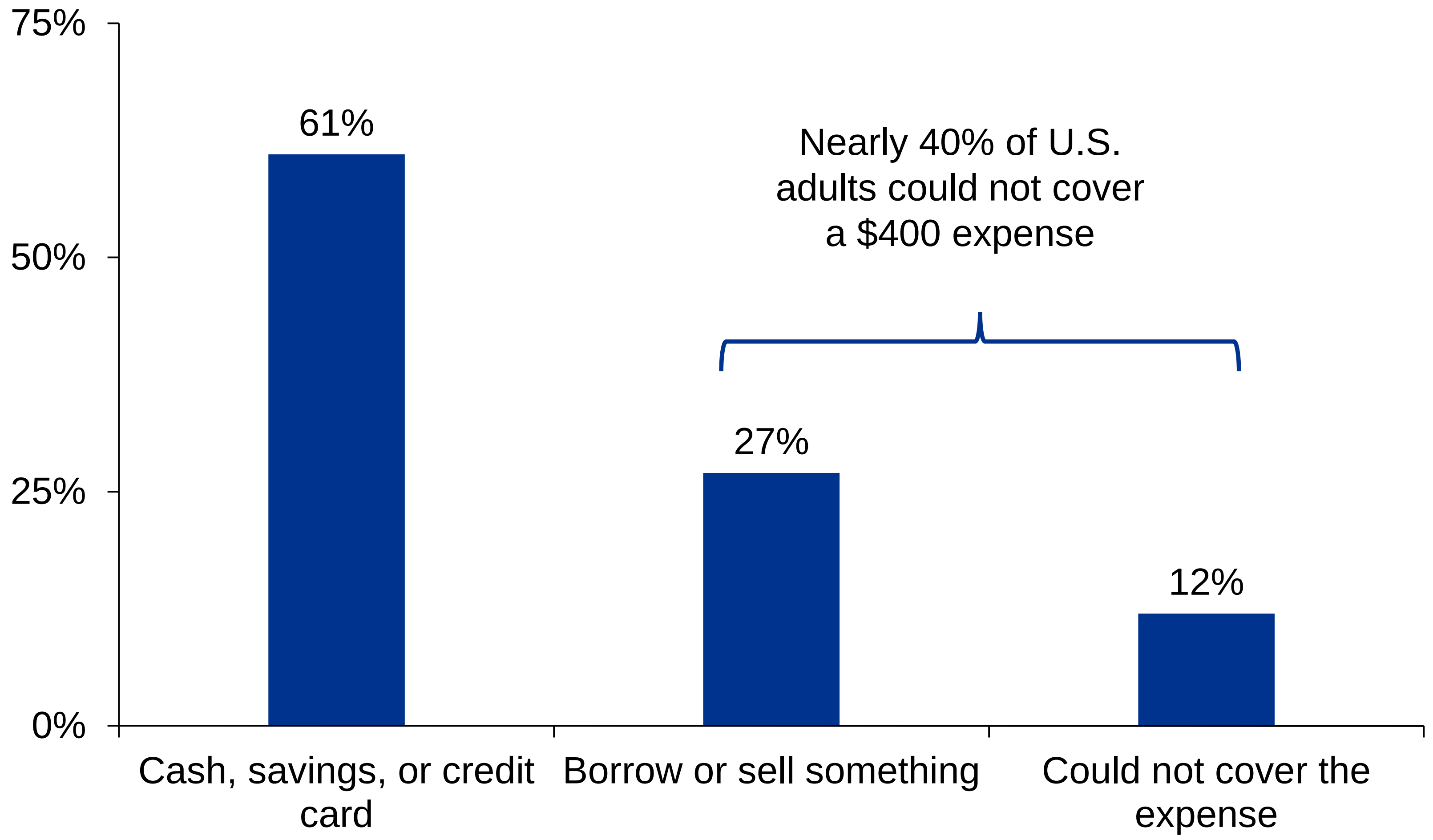
Those with fewer resources most likely to be laid off

How U.S. Adults Cover an Unexpected $400 Expense



Source: KPMG Economics, Federal Reserve Board (2019)

- 24% of U.S. workers do not have paid sick leave. This population is likely to be most vulnerable economically should the virus spread.
- Some large firms are able to change their policies in the face of the health crisis, but many are too small to offer such assistance.
- 9.4% of Americans do not have healthcare. This population be adversely impacted even with changes implemented to make testing widely available for free.
- Government assistance to those most in need is critical, but will likely be too late to avoid lost consumption for a month.

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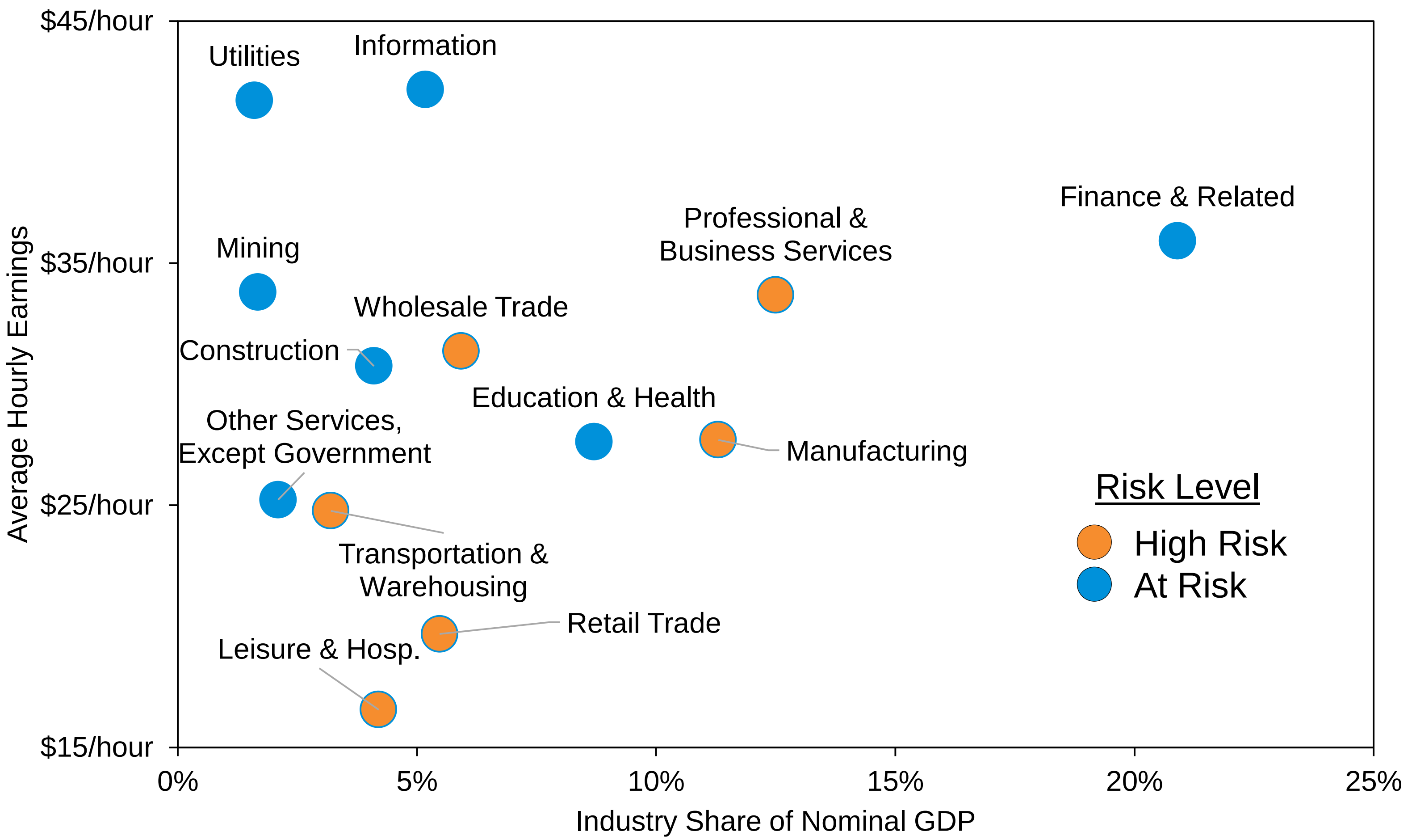
Lower wage industries have greater multipliers in downturn

Industry Earnings and Share of U.S. GDP



Note: Industries/employees most at risk are denoted with an orange circle

Source: KPMG Economics, BLS, BEA, Haver Analytics

- Lower wage workers are less likely to have savings and are the most likely to be unable to meet even non-discretionary spending needs.
- Thus the multiplier on how COVID-19 impacts the economy is greater for low wage employees, we estimate between 1.3-1.7x the size of the industry in terms of economic impact.
- Social distancing and collapsing trade will impact the sectors highlighted in orange the most but **no sector will escape unscathed**.

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Goods trade with China centered on machinery and agriculture

U.S. Trade Exposure to China (2017)

HS2

Top 5 Imports	Total ($Bil.)	Share of Imports from China	Share of Total U.S. Imports	Top 5 Exports	Total ($Bil.)	Share of Imports from China	Share of Total U.S. Exports
Machines	$240.0	50%	10.3%	Transportation	$28.1	21%	1.2%
Miscellaneous	$61.9	13%	2.6%	Machines	$25.3	19%	1.1%
Textiles	$39.3	8%	1.7%	Vegetable Products	$15.3	11%	0.7%
Metals	$24.0	5.0%	1.0%	Chemical Products	$11.7	8.8%	0.5%
Plastics and Rubbers	$20.0	4.2%	0.9%	Instruments	$11.7	8.8%	0.5%

HS4

Top 5 Imports	Total ($Bil.)	Share of Imports from China	Share of Total U.S. Imports	Top 5 Exports	Total ($Bil.)	Share of Imports from China	Share of Total U.S. Exports
Broadcasting Equipment	$67.4	14%	2.9%	Planes, Helicopters, and Spacecraft	$13.4	10%	0.6%
Computers	$46.6	10%	2.0%	Soybeans	$12.4	9%	0.5%
Office Machine Parts	$26.9	6%	1.1%	Cars	$11.5	9%	0.5%
Models and Stuffed Animals	$12.5	2.6%	0.5%	Integrated Circuits	$7.75	5.8%	0.3%
Other Furniture	$11.7	2.4%	0.5%	Crude Petroleum	$3.91	2.9%	0.2%

HS6

Top 5 Imports	Total ($Bil.)	Share of Imports from China	Share of Total U.S. Imports	Top 5 Exports	Total ($Bil.)	Share of Imports from China	Share of Total U.S. Exports
Transmit-receive Apparatus (TV, Radio, etc.)	$67.4	14%	2.9%	Fixed Wing Aircraft	$13.1	10%	0.6%
Computer Data Storage Units	$37.4	8%	1.6%	Soybeans	$12.4	9%	0.5%
Parts and Accessories of Data Processing Equip.	$26.8	6%	1.1%	Medium Sized Cars	$8.39	6%	0.4%
Toys	$12.5	2.6%	0.5%	Monolithic Integrated Circuits	$7.71	5.8%	0.3%
Color TVs and Monitors	$9.01	1.9%	0.4%	Petroleum	$3.81	2.9%	0.2%

Source: KPMG Economics, MIT Observatory of Economic Complexity

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Trade with Italy concentrated in medical, autos, chemicals

U.S. Trade Exposure to Italy (2017)

HS2

	Top 5 Imports				Top 5 Exports		
	Total ($Bil.)	Share of Imports from Italy	Share of Total U.S. Imports		Total ($Bil.)	Share of Imports from Italy	Share of Total U.S. Exports
Machines	$9.7	22%	0.4%	Chemical Products	$5.1	30%	0.3%
Transportation	$9.2	21%	0.4%	Machines	$3.1	19%	0.2%
Chemical Products	$6.8	15%	0.3%	Mineral Products	$1.7	10%	0.1%
Foodstuffs	$3.5	7.7%	0.1%	Transportation	$1.2	7.0%	0.1%
Metals	$2.1	4.7%	0.1%	Instruments	$1.1	6.4%	0.1%

HS4

	Top 5 Imports				Top 5 Exports		
	Total ($Bil.)	Share of Imports from Italy	Share of Total U.S. Imports		Total ($Bil.)	Share of Imports from Italy	Share of Total U.S. Exports
Cars	$5.0	11%	0.2%	Packaged Medicaments	$1.9	11%	0.1%
Packaged Medicaments	$3.6	8%	0.2%	Human or Animal Blood and Vaccines	$1.8	11%	0.1%
Wine	$1.8	4%	0.1%	Gas Turbines	$0.9	5%	0.1%
Passenger and Cargo Ships	$1.6	3.6%	0.1%	Crude Oil	$0.62	3.7%	0.0%
Human or Animal Blood and Vaccines	$1.2	2.6%	0.1%	Aircraft Parts	$0.62	3.7%	0.0%

HS6

	Top 5 Imports				Top 5 Exports		
	Total ($Bil.)	Share of Imports from Italy	Share of Total U.S. Imports		Total ($Bil.)	Share of Imports from Italy	Share of Total U.S. Exports
Medium Sized Cars	$3.6	8%	0.2%	Medicaments Nes, in Dosage	$1.9	11%	0.1%
Medicaments Nes, in Dosage	$2.6	6%	0.1%	Blood, Toxins, Cultures, Medical Use	$1.8	11%	0.1%
Cruise Ships and Boats	$1.6	4%	0.1%	Petroleum and Crude	$0.62	4%	0.0%
Wines	$1.4	3.1%	0.1%	Aircraft Parts	$0.57	3.4%	0.0%
Large Sized Cars	$1.32	2.9%	0.1%	Waste/Scrap, Precious Metals ex. Gold	$0.45	2.7%	0.0%

Source: KPMG Economics, MIT Observatory of Economic Complexity

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Federal Government Action: to date and near-term prospects

This month and next, Congress and the President have focused on three tranches of emergency measures in response to COVID-19. One has been enacted; the second may be enacted by week's end; the third remains conceptual.

- Coronavirus Preparedness and Response Supplemental Appropriations Act, 2020 (Public Law 116-123) – ***March 6th***
- $8.3 billion emergency relief law included **$7.8 billion** in discretionary funding.
- Mainly uses existing Department of Health and Human Services programs. Significant flow-downs to the states. (***OGA Executive Action Report available***)
- Families First Coronavirus Response Act (H.R. 6201) – ***March 18th***
- Would require health insurers to cover COVID-19 test costs, sick and family leave benefits for employers with less than 500 employees, offset with payroll tax credits.
- Economic Stimulus Package – ***details to be determined***
- Discussions of economic stimulus package that could **exceed $1 trillion**
- Sector-focused and individual-focused elements, perhaps including direct payments to Americans tiered by income
- 'Stafford Act' of 1988
- ✓ Releases tens of billions of dollars from the Federal Emergency Management Agency's (FEMA) Disaster Relief fund. The declaration also allows the government to **delay tax collections**.

Source: KPMG Economics, KPMG's Office of Government Affairs

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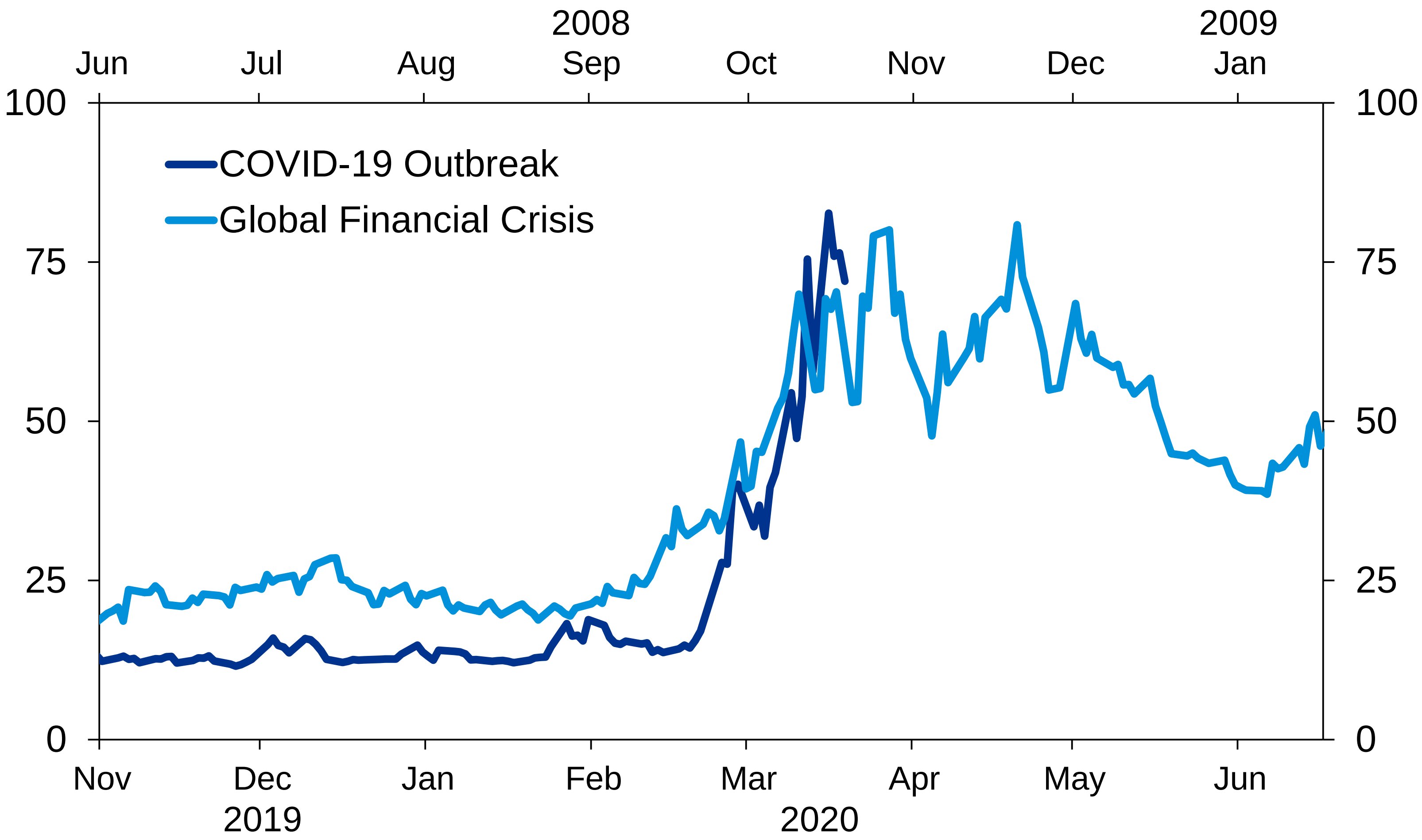
Debt and Social Distancing

The VIX index is more than a barometer of market sentiment

CBOE Volatility Index (VIX)



Source: KPMG Economics, Wall Street Journal (March 19, 2020), Haver Analytics

- A higher VIX occurs in times of stock market sell-off.
- An elevated VIX is associated with wider corporate bond spreads; the higher borrowing costs reduce corporate investment which in turn reduces GDP.
- The VIX is an important tool for economists to model the knock-on effects of market selloffs on capital spending.

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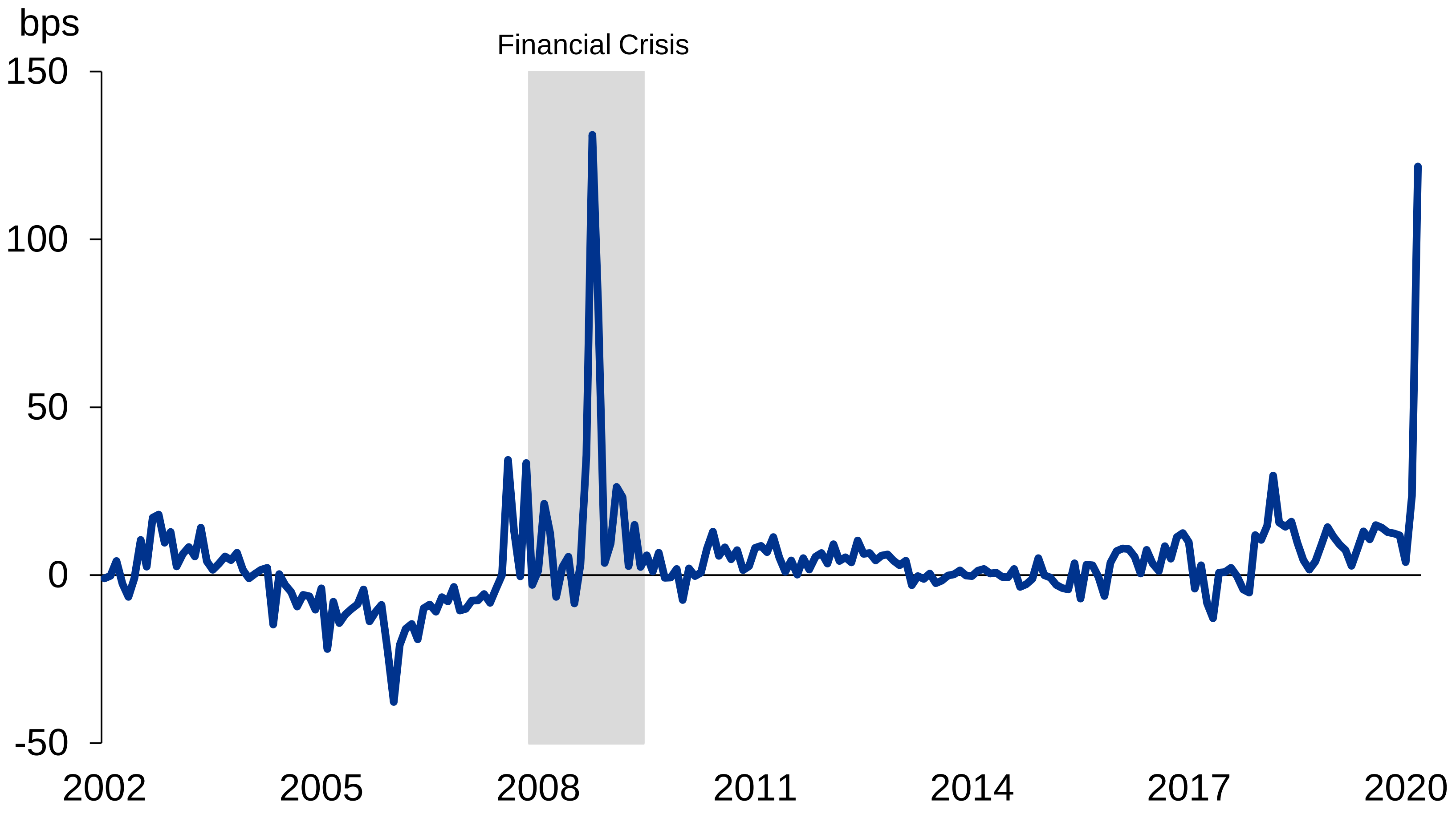
Stress appears in money markets, Fed establishes CPFF

U.S. 90-Day Nonfinancial Commercial Paper

(vs USD Swap OIS 3M spread)



Source: KPMG Economics, Bloomberg (March 17, 2020).

- A breakdown in market functioning for the commercial paper market necessitated the Fed to announce a Commercial Paper Funding Facility (CPFF) on March 17th in order to support the flow of credit to businesses which ultimately distribute paychecks to households.
- The commercial paper (CP) market finances a wide range of economic activity, supplying credit and funding for auto loans and mortgages.
- CP also supplies short-term liquidity to meet the operational needs of companies.

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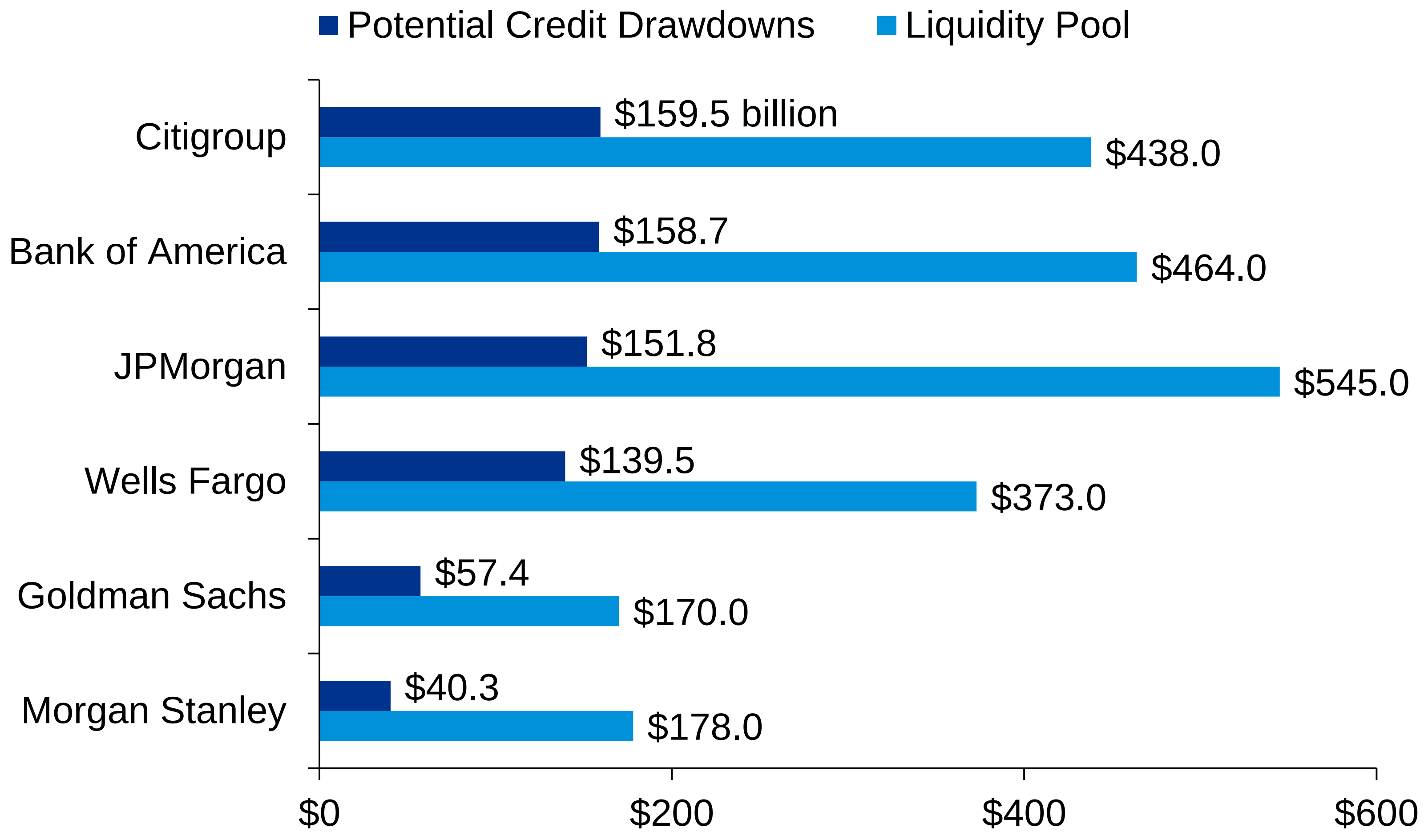
Banks estimated to have adequate capital buffers

Liquidity of Largest U.S. Banks



Source: KPMG Economics, Bloomberg Economics, Company Filings

- Capital buffers built up after the global financial crisis are necessary as firms draw down on credit lines provided by banks.
- Bloomberg estimates firms will draw down at least $700 billion in credit lines.
- Bloomberg estimates this will entail selling “liquid” assets; this will no doubt cause continued strain in the bond market, both treasuries and corporate fixed income.
- Assets assumed to be liquid are experiencing widening bid/offer spreads as liquidity dries up in some markets.
- Continued Fed liquidity support is essential to keep markets functioning.

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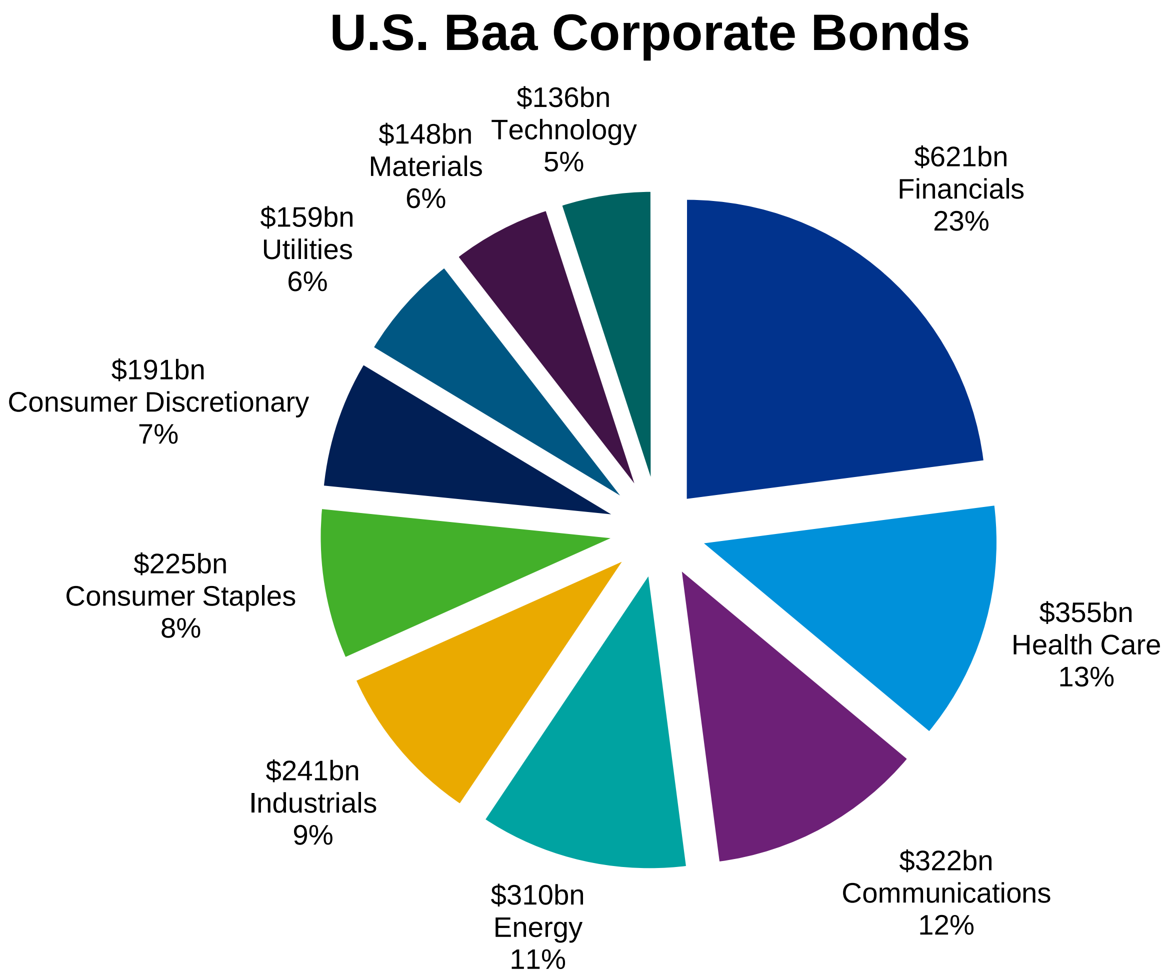
March 19th, 2020

At least 25% Baa corporate bonds at risk of downgrade



Source: KPMG Economics, Bloomberg (March 17, 2020), Total = $2.7tn

- Over 50% of investment grade corporate bonds, a full **$2.7tn, are rated Baa,** which is the lowest rung on the investment grade ratings ladder.
- The most leveraged companies will see their ability to repay hampered by a sudden decline in income.
- Rollover risk is also a significant factor, reflected in widening bond spreads.
- In particular, energy firms face substantial downgrade risk due to the fall in oil prices below $30 per barrel.
- Consumer Discretionary, Materials, Industrials and Financials all face significant challenges as well.

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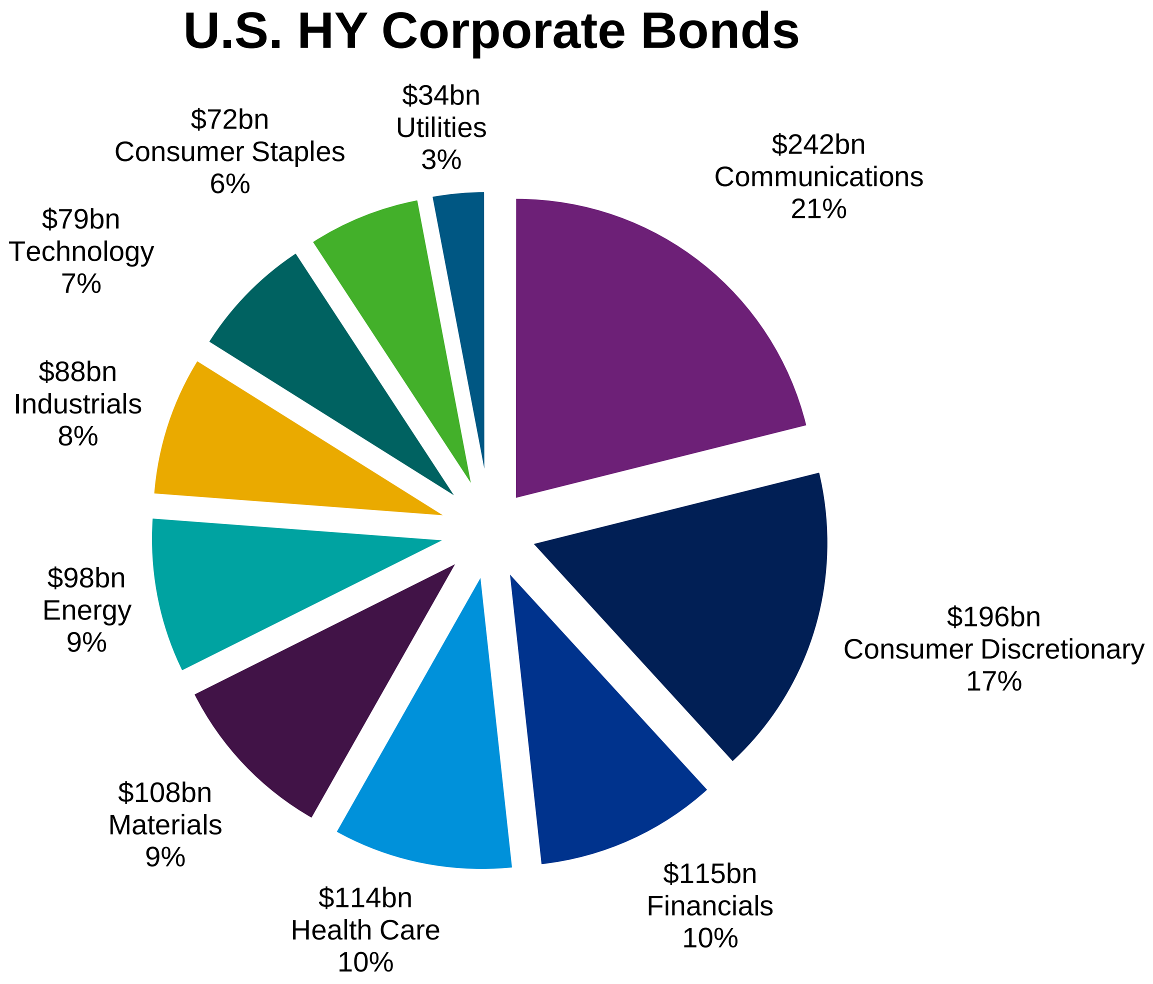
High yield corporate bonds at risk of default in a recession



Source: KPMG Economics, Bloomberg (March 18, 2020), Total = $1.2tn

- The consumer discretionary and energy sectors are at a particularly high risk of default from an oil price below $30 and a sudden fall in consumption.
- With auto assembly lines closed, industries in that supply chain are at high risk and we expect elevated defaults in industrials, materials, and high yield financials.
- Without a rapidly deployed federal assistance program to distressed companies, defaults are likely to be higher than during the global financial crisis.

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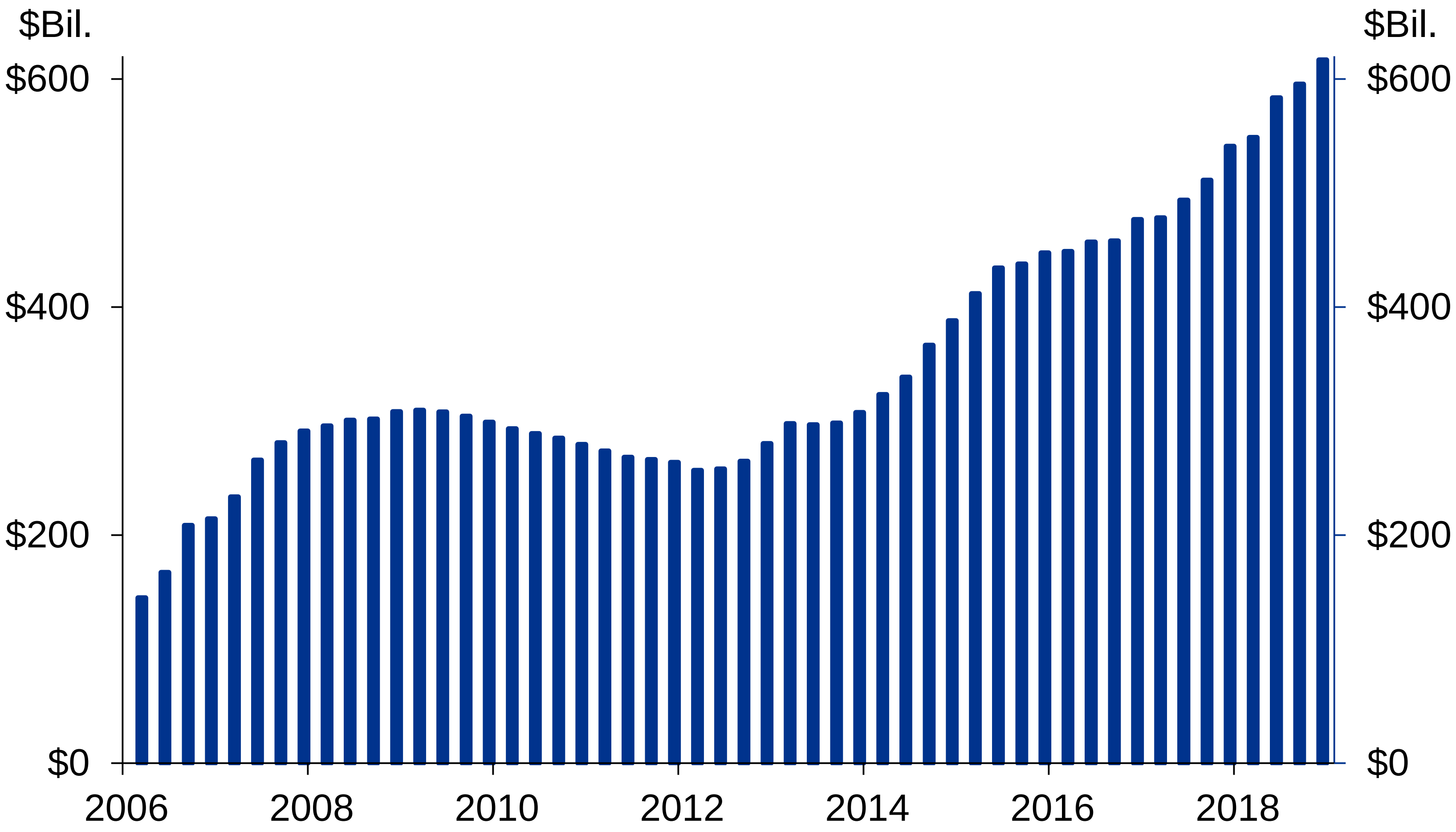
CLOs account for about ½ of leveraged loan market

U.S. CLOs Outstanding



Source: KPMG Economics, SIFMA

- The U.S. collateralized loan obligation (CLO) market reached $617bn at the end of 2018, accounting for approximately half of U.S. leveraged loans outstanding.
- Insurance companies (28%), mutual funds (16%), banks (15%), pension funds (10%) held roughly half of Cayman-issued CLOs at year-end 2018.
- A sudden drop in consumption impacts the ability of companies to repay and widened bond spreads increase the cost of rolling over debt.
- There is a strong possibility M&A and Private Equity will be adversely impacted.

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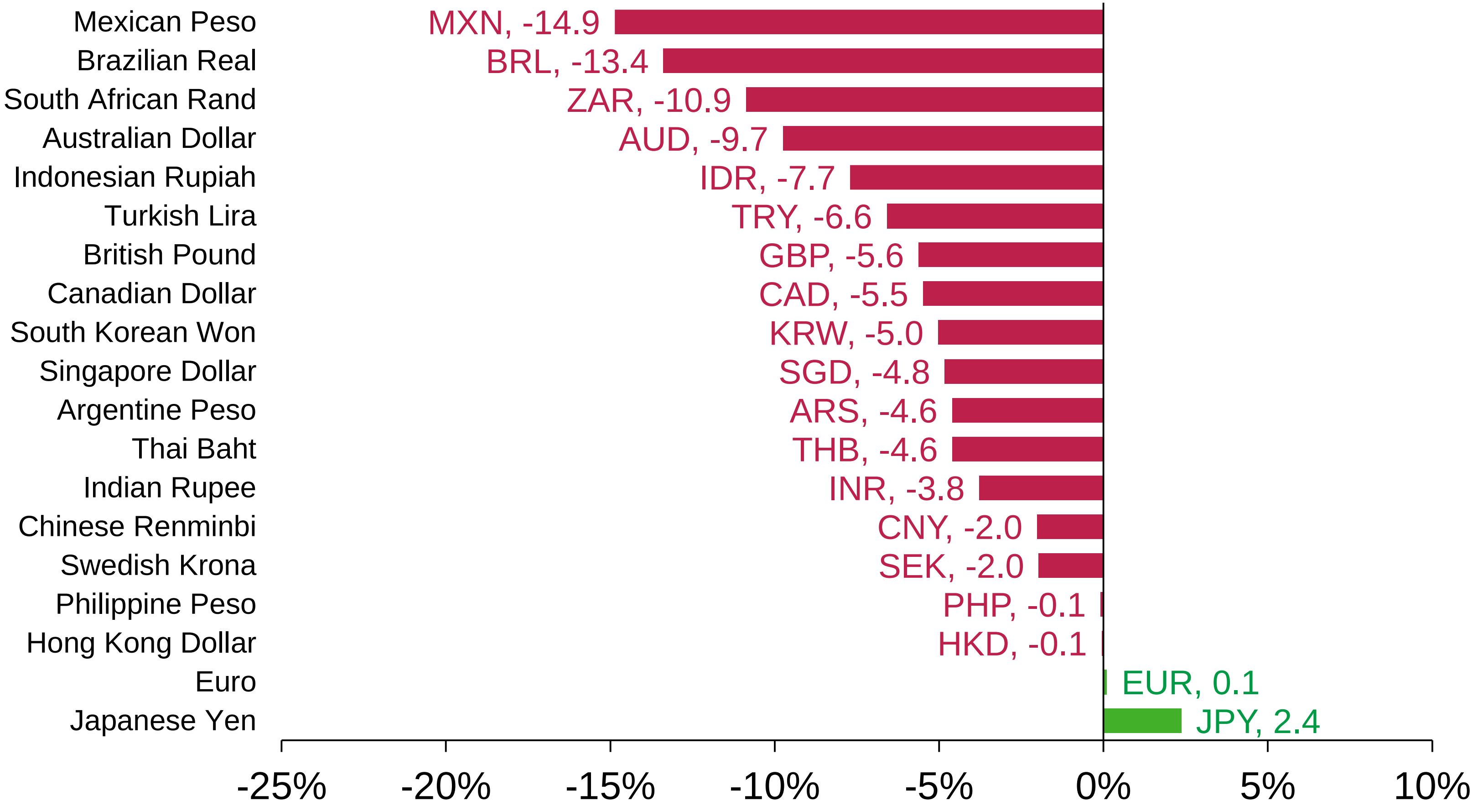
A strong dollar hurts dollar borrowers the world over

Foreign Currencies Weaker Against Dollar

% Chg. Jan 20th to Mar 17th, 2020



Source: KPMG Economics, BBG (March 17, 2020)

- A rush to safe haven assets such as the U.S. dollar, Yen and Euro has caused other currencies to weaken.
- Around $3 trillion of loans are outstanding in U.S. dollars that have been issued by non-U.S. domiciled corporations and businesses.
- Commodity exporters which engaged in dollar funding are going to be at risk of default as commodities decline.
- The Federal Reserve has opened swap lines with global central banks to ease dollar liquidity globally and to help stem the steep appreciation of the U.S. Dollar.

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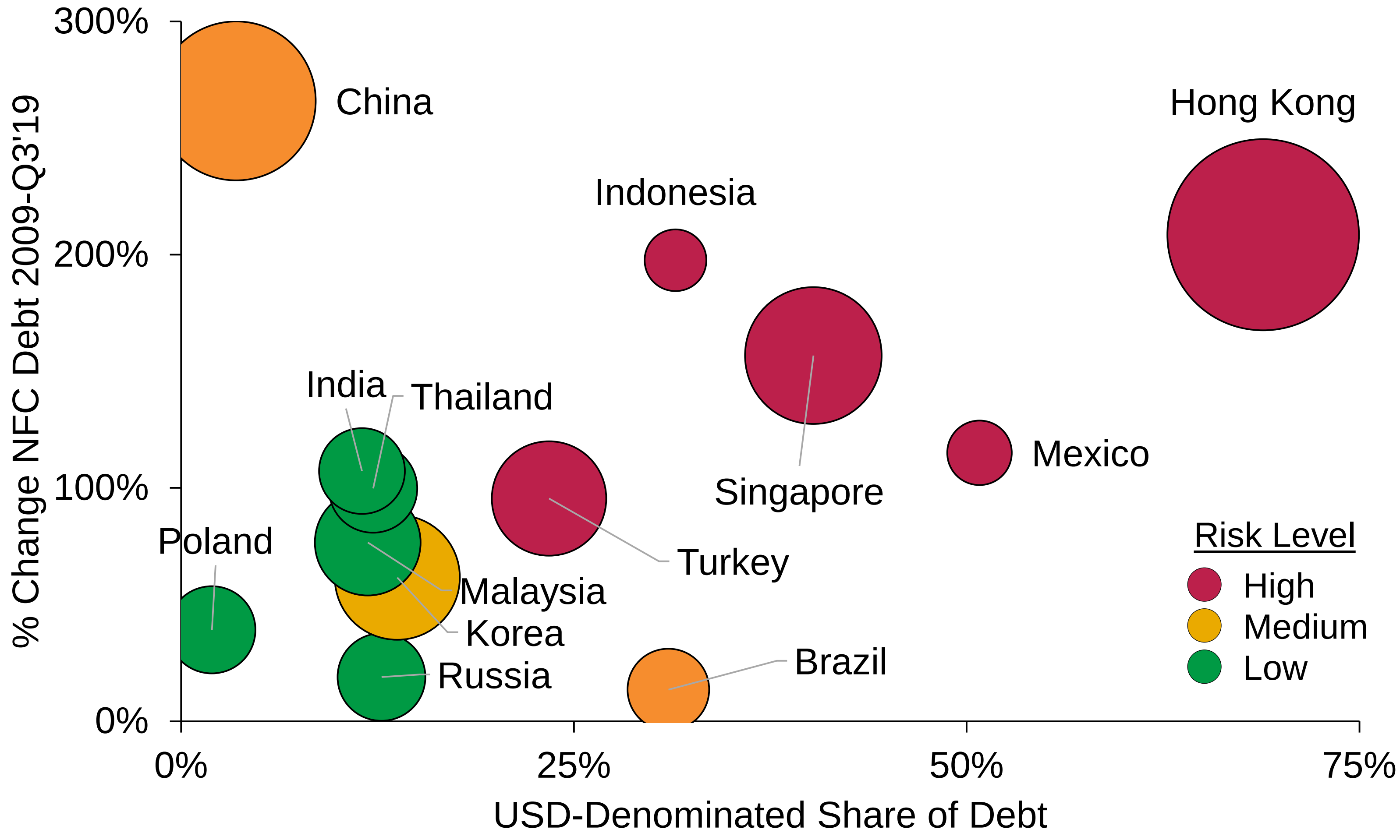
Weaker currencies raise concerns about EM debt burdens

China Debt Grows to $21 Trillion Over 10 years



Source: KPMG Economics, IIF, Haver Analytics

- Emerging market debt has more than doubled in many countries as the aftermath of the financial crisis ushered in an era of low and negative bond yields, seemingly indefinitely.
- Hong Kong, Mexico, Singapore, Turkey, Indonesia, and Brazil all borrowed substantial amounts of dollar-denominated debt in relation to their GDP; depreciations in their currencies and in many commodities will make it more difficult to meet debt obligations.

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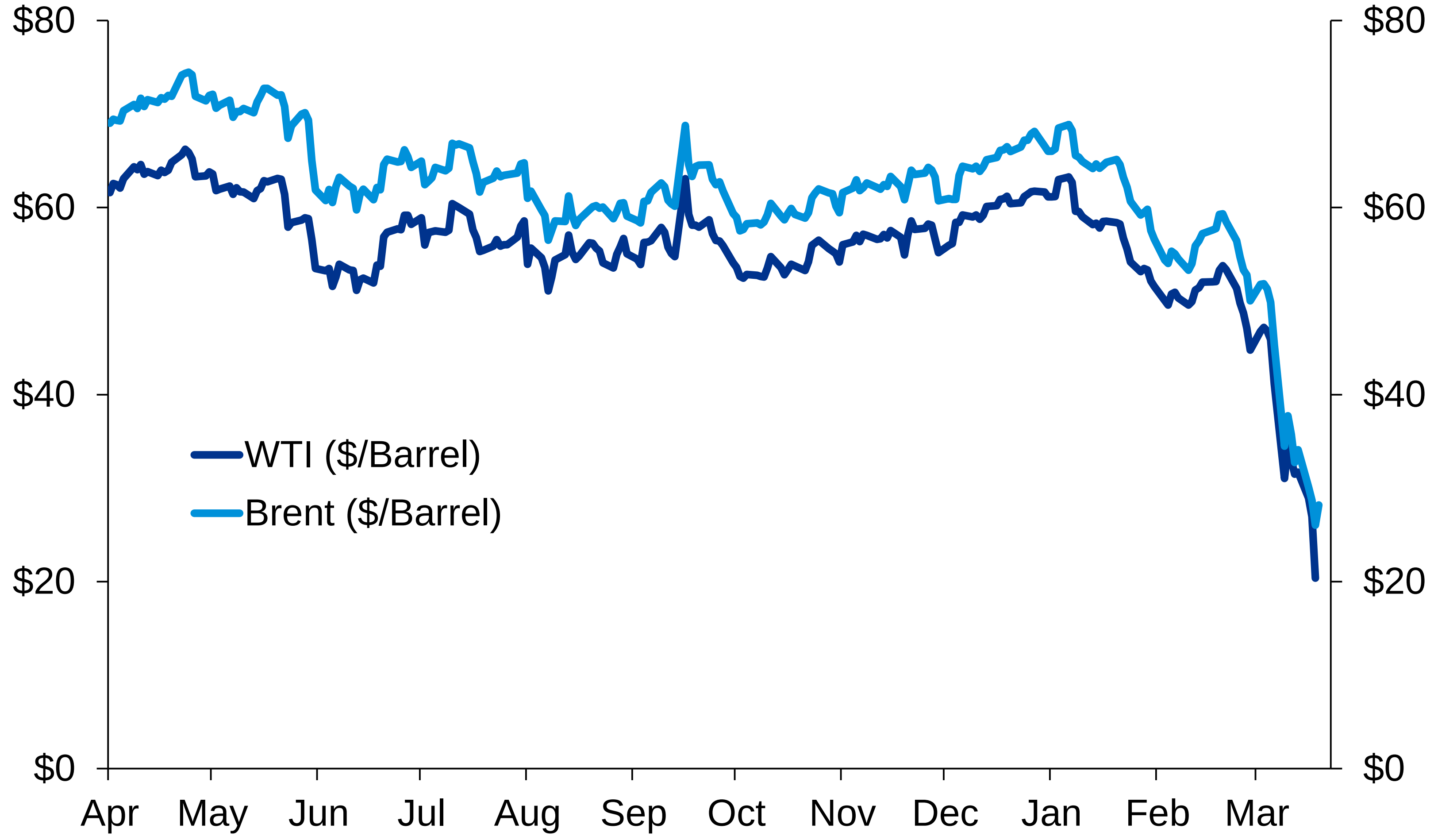
Oil prices decline, challenging the profitability of some firms

Oil Prices



Source: KPMG Economics, EIA, CME Group, Financial Times, Haver Analytics (Mar 18, 2020)

- Oil prices have fallen more than 60% from their recent peak in early January.
- Saudi Arabia slashed its crude production and is threatening record output after Russia chose not to comply with OPEC's proposed production cuts. Market share is worth more than profitability to Saudi Arabia.
- Sustained oil prices below $30/barrel will impact U.S. shale producers many of which are heavily leveraged and could face downgrades and increased default rates.

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Lofty oil price forecasts underpin many producer budgets

IMF Fiscal Breakeven Oil Prices in $/bbl					
		Projections		CDS Spread (bps)	
Country	**2018**	**2019**	**2020**	**1-Jan-20**	**17-Mar-20**
Iran	$82	$156	$195	-	-
Iraq	$45	$62	$60	387	957
Kuwait	$54	$54	$55	36	102
Russia	$51	$49	-	55	202
Saudi Arabia	$89	$86	$84	56	64
United Arab Emirates	$67	$70	$70	91	323

Note: Most recent CDS spreads for Russia and Saudi Arabia are from Mar 13 and Feb 24 respectively

Source: KPMG Economics, IMF "Regional Economic Outlook: Middle East and Central Asia", Statistical Appendix Table 6, Economic Expert Group (Russia), Bloomberg

- IMF analysis of federal budgets' assumptions and breakeven prices suggest continued downward pressure on prices will strain producer fiscal budgets.
- Issuing debt to maintain spending levels is becoming increasingly costly as wider credit default spreads indicate.
- Capital markets are pricing in the risk that many producers will face difficulties meeting fiscal obligations.
- Many face touch choices about cutting fiscal spending, risking unrest among their populations.

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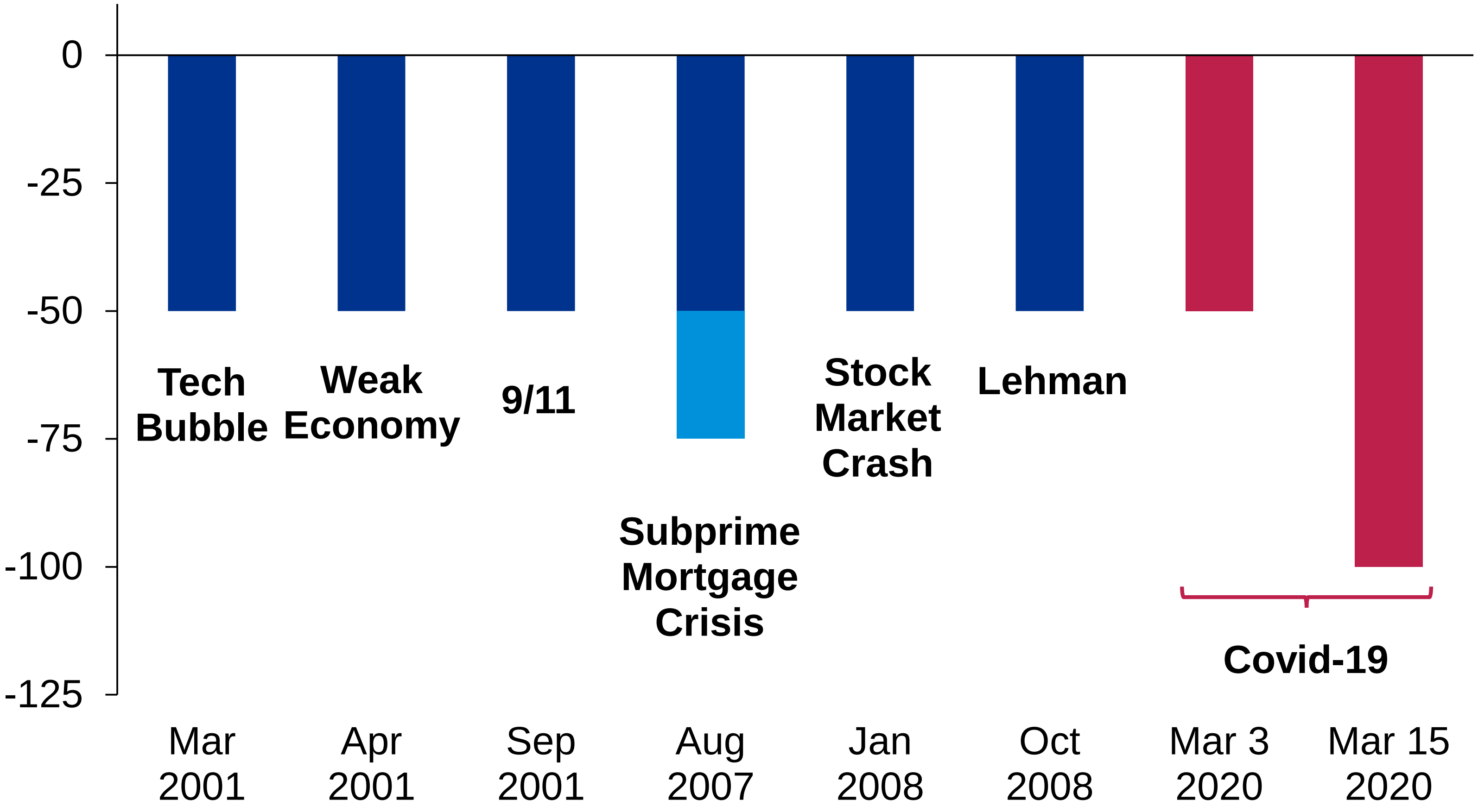
Fed delivers two emergency rate cuts to aid economy

United States: Emergency Fed Rate Cuts

Basis points (bps)



Source: KPMG Economics, Oxford Economics, Federal Reserve Board

- On March 3, the Federal Open Market Committee (FOMC) voted unanimously to cut rates by 50 bps in an emergency move to support economic activity "in the face of new risks to the economic outlook."
- On March 15, the FOMC implemented a second emergency rate cut of 100 bps, bringing interest rates down to the zero-lower-bound.
- The FOMC also announced $700 billion in quantitative easing measures, with $500 billion in U.S. Treasury securities purchases and $200 billion in mortgage-backed securities (MBS) purchases.
- **Chair Powell has repeatedly highlighted that the Fed will use all of the tools at its disposal to assist the economy and markets.**

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Government assistance evolves as the situation unfolds

U.S. Monetary & Fiscal Response		
Type	**Date**	**Action**
Federal Reserve	Mar-03-2020	Intermeeting 50 bps cut in fed funds rate, "new risks to the economic outlook"
	Mar-09-2020	Daily overnight repo operations raised from $100 bn to $150 bn
	Mar-10-2020	Two-week term repo operations raised from $20 bn to $45 bn
	Mar-12-2020	Offer minimum $175 bn in daily overnight repos and minimum $45 bn two-week term repos
		Offer three 1m term repos at $50 bn each
	Mar-12-2020	Offer $500 bn in 3m repo
		Purchase $60 bn per month across range of Tsy securities through April 13, 2020
	Mar-13-2020	Offer $500 bn in 3m repo, $500 bn in 1m repo
		Offer 3m and 1m repo operations for $500 bn on a weekly basis
		Offer minimum $175 bn in daily overnight repos, minimum $45 bn in 2wk term repo 2x a wk
	Mar-15-2020	Intermeeting 100 bps cut in fed funds rate to 0-0.25%
		Purchase $500 bn in Treasury securities, $200 bn in mortgage-backed securities
		Eliminates penalty rate on discount window borrowing, reserve requirements cut to 0%
		Coordinated action with major central banks lowering US dollar liquidity swaps by 25 bps
	Mar-16-2020	Additional overnight repo operation of $500 bn
	Mar-17-2020	Fed establishes Commercial Paper Funding Facility (CPFF) to support flow of credit to
		households and businesses
	Mar-18-2020	Fed establishes Money Market Mutual Fund Liquidity Facility (MMLF)
	Mar-20-2020	Expands MMLF to include municipal money markets
Federal Government	Mar-06-2020	President Trump signs $8.3 bn coronavirus spending bill
	Mar-13-2020	President Trump declares national emergency, $50 bn emergency funding for states
	Mar-14-2020	Proposed House bill: Free coronavirus testing, emergency paid sick days (14 days),
		Expanded unemployment insurance: $2 bn to state unemployment insurance programs,
		Expanded food security: $1 bn to food assistance programs
	Mar-17-2020	President Trump proposes $850 bn economic stimulus package with $50 bn for airlines

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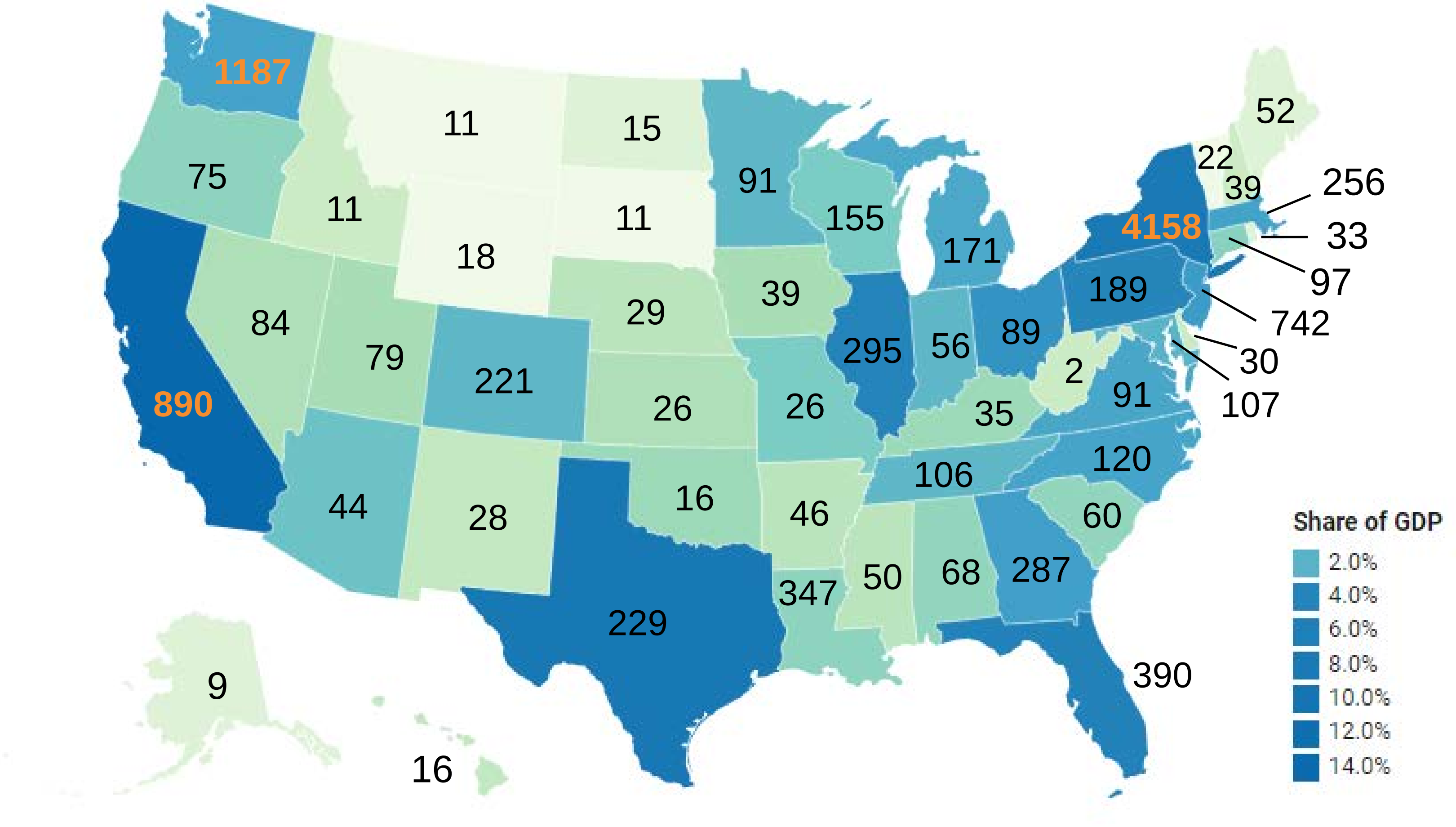
Majority of country is engaging in extreme social distancing

Confirmed Cases as of March 19, 2020



- Social distancing will cause a large drop in discretionary spending, likely 30% y/y in March, 75% y/y in April and 45% y/y in May assuming social distancing can conclude in late April or early May.
- Job losses for the most vulnerable Americans will likely also cause a decline in non-discretionary spending as well.
- Federal assistance will help, but is likely to come with a lag such that a severe drop in spending is unavoidable.

Source: KPMG Economics, Bureau of Economic Analysis, Johns Hopkins University, Haver Analytics

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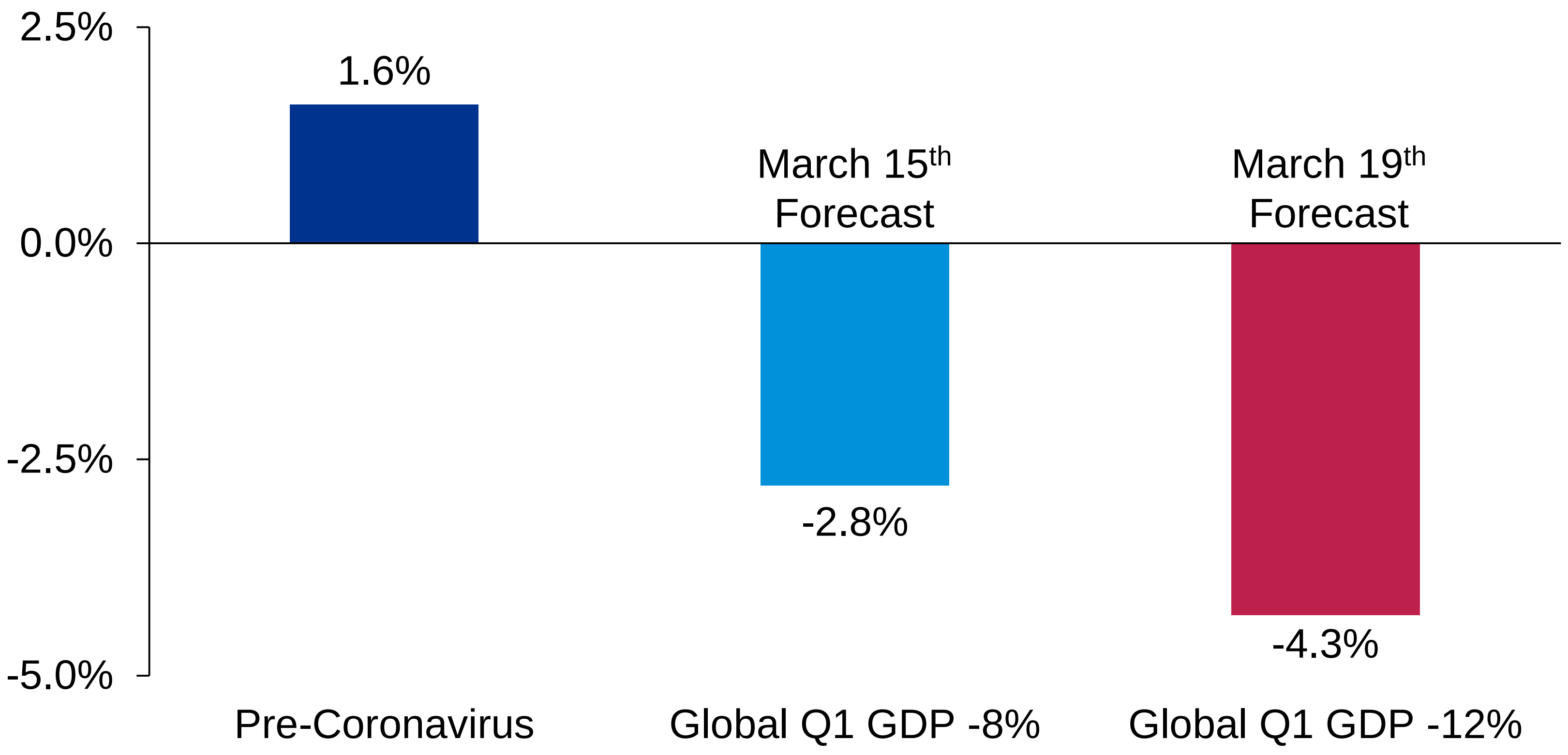
Coronavirus pandemic will cause a recession

U.S. 2020 GDP Forecast Worsen as Data Reveals Slowdown Magnitude

Annualized Real GDP Growth



Note: Forecasts are inherently time sensitive and projections are dated as of March 19, 2020.
Source: KPMG Economics, Macroeconomic Advisors by IHS Markit, Haver Analytics

- Our base case involves a fall in global GDP to -12% in Q1 of 2020.
- We also expect fiscal stimulus to be distributed in late April at the earliest – too late for many to avoid unemployment and missed payments and expenditures.
- The extent of equity market decline and bond market fallout will determine if the health crisis becomes a “U” or “L” shaped recession.
- Our forecast expects S&P earnings to fall 25%, and P/E ratios to decline to 14x.

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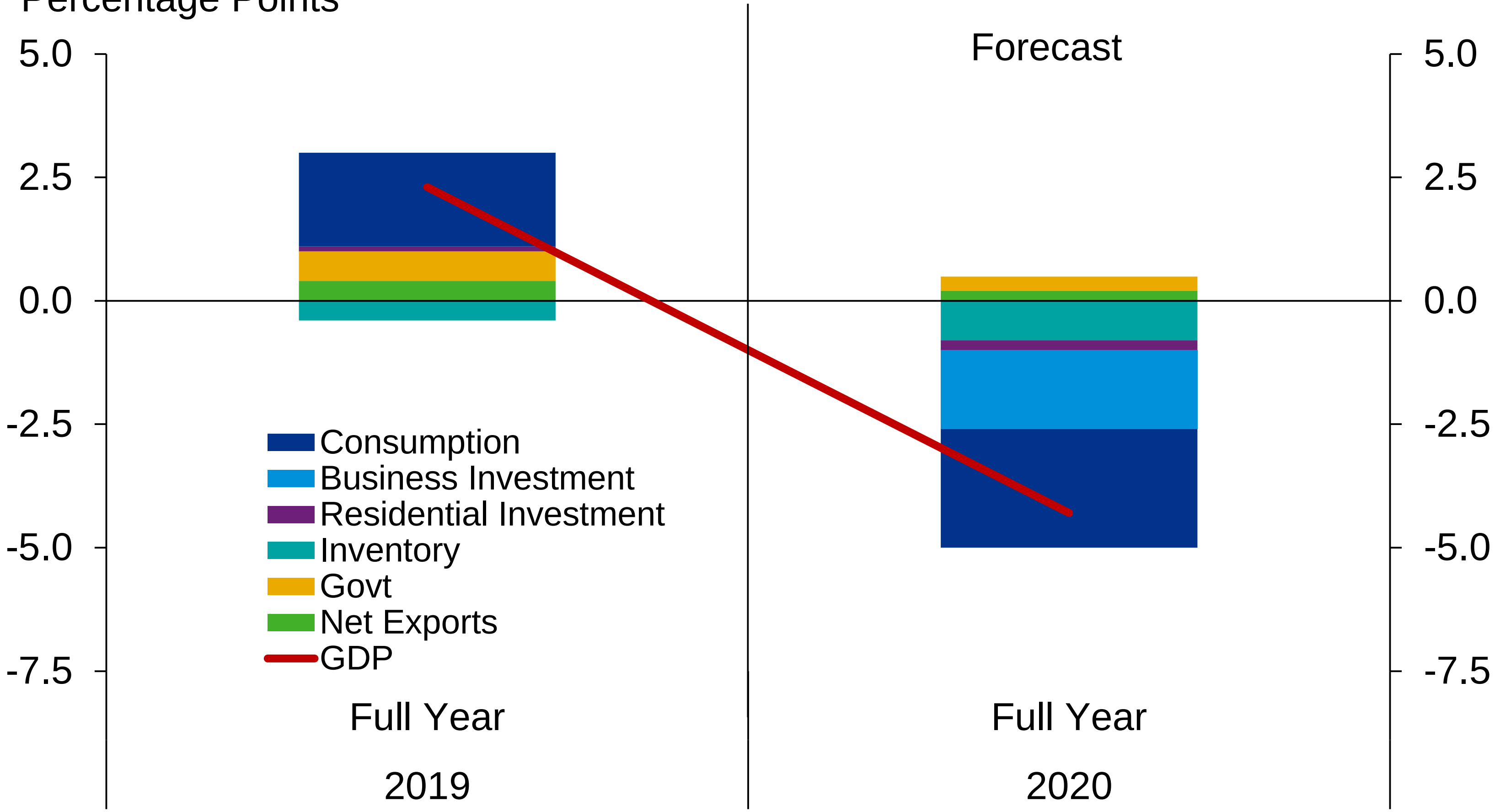
Preliminary analysis suggests -4.3% y/y growth for 2020

Contributions to US GDP Growth

Percentage Points



Note: Forecasts are inherently time sensitive and projections are dated as of March 19, 2020.

Source: KPMG Economics, BEA, Macroeconomic Advisors by IHS Markit, Haver Analytics

- The biggest impact will be due to lower consumption, weaker business investment (as firms engage in precautionary behavior due to elevated uncertainty), and lower inventory accumulation arising from a combined supply shock and weakened demand.
- We expect to see a firm fiscal response from the federal government as the COVID-19 situation deteriorates further, but at the best case this will result in a "U" shaped recession.

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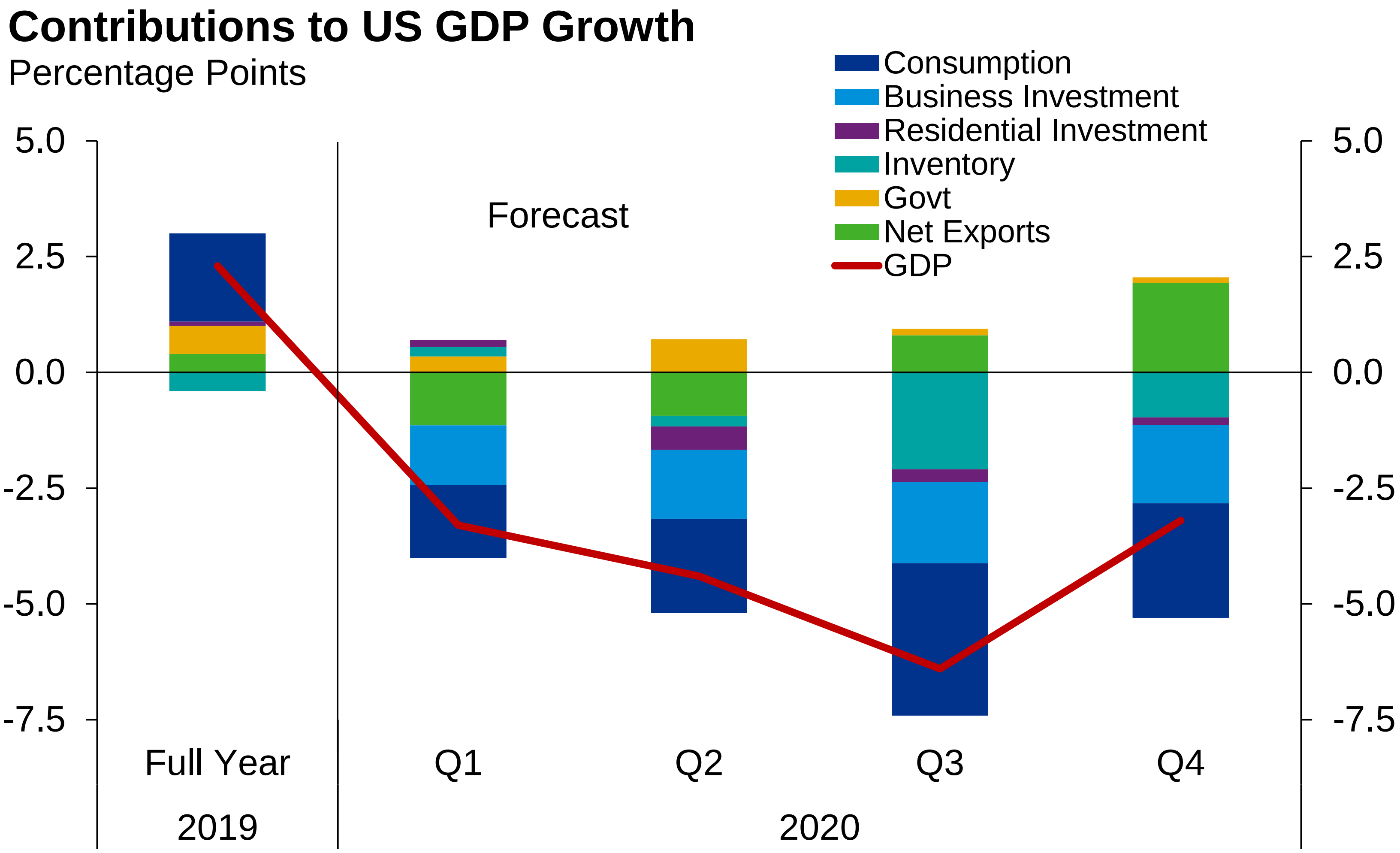
U.S. forecast is morphing from “V” to “U” or “L” shape



Note: Forecasts are inherently time sensitive and projections are dated as of March 19, 2020.
Source: KPMG Economics, BEA, Macroeconomic Advisors by IHS Markit, Haver Analytics

- Q1 GDP growth could show a significant impact from COVID-19 due to a complete shutdown of economic activity in March.
- Q2 and Q3 will reveal a large adverse impact from falling consumption, business investment and exports.
- In times of an outbreak of a new disease, research shows that consumers engage in “aversion behavior”.
- Social distancing policies being enacted by a number of states, including the cancellation of large gatherings in any venue, will sharply curtail consumption in the months ahead, reducing the odds of a quick recovery.

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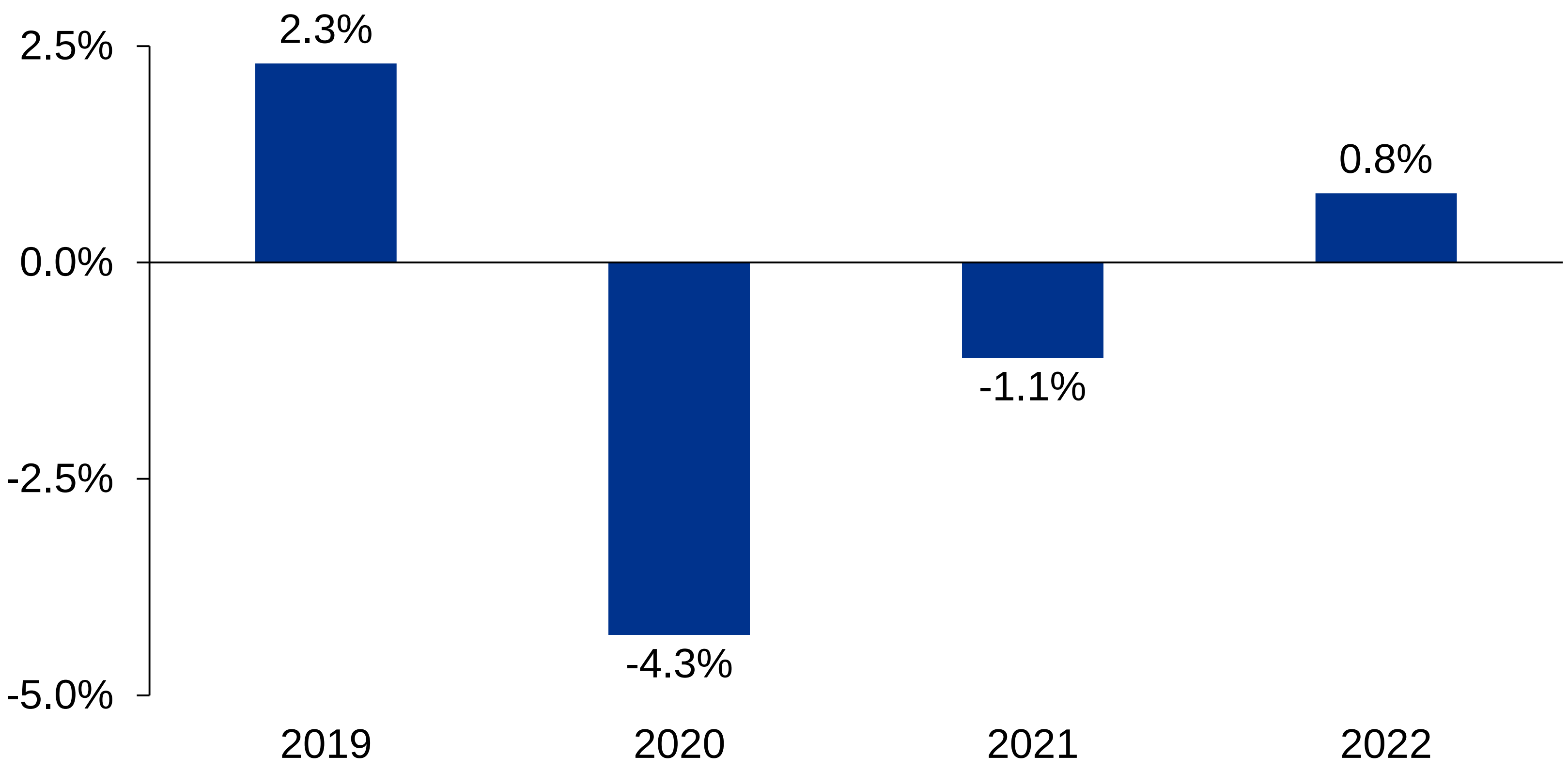
U.S. GDP likely to rebound in second half of 2021

U.S. Growth Forecast
Annualized Real GDP Growth



Note: Forecasts are inherently time sensitive and projections are dated as of March 19, 2020.
Source: KPMG Economics, BEA, Macroeconomic Advisors by IHS Markit, Haver Analytics

- COVID-19 impact will likely extend beyond this year.
- We expect U.S. GDP to recover into positive territory in second half of 2021.
- An earlier recovery is possible given the fiscal stimulus currently being considered by Congress.

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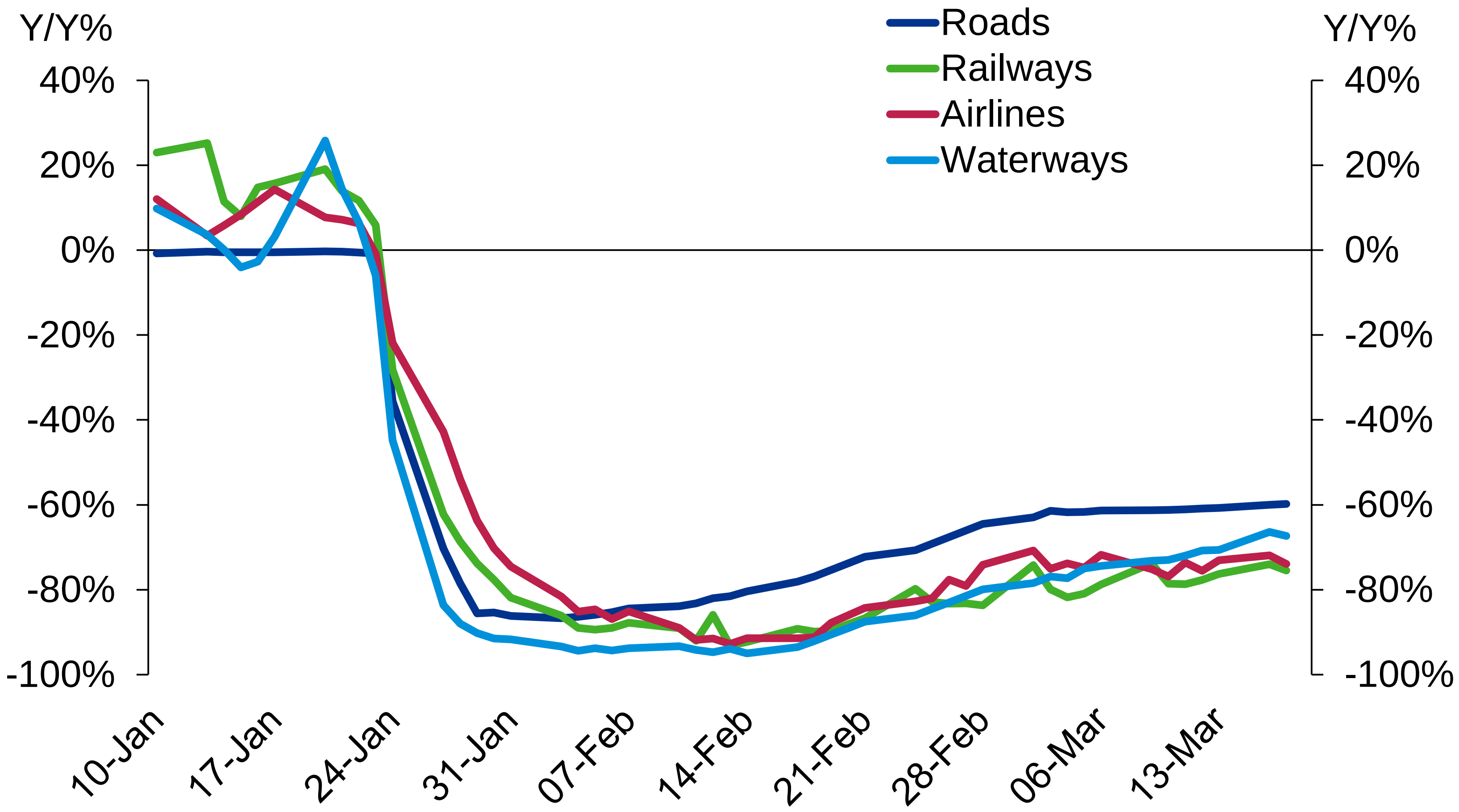
China Is the Preview Movie for Global Covid-19 Economic Impact

Chinese travel has been down 60-95% since mid-January

Daily Passenger Volumes in China No Recovery Yet

2019 to 2020



Source: KPMG Economics, Ministry of Transport, Haver Analytics (March 17, 2020)

- Travel volume is a leading barometer of China's overall economic activity.
- Following the Lunar New Year, passenger volumes in China collapsed by 87% compared to the same period a year ago and have yet to meaningfully recover.
- With China currently only seeing around 15-16 million trips per day, it will be some time until economic activity return to normal levels.
- Q1 GDP growth estimates range from -11% y/y (Bloomberg) to -40% y/y (JPMorgan Chase). We fear Q2 may also be slightly negative as well.

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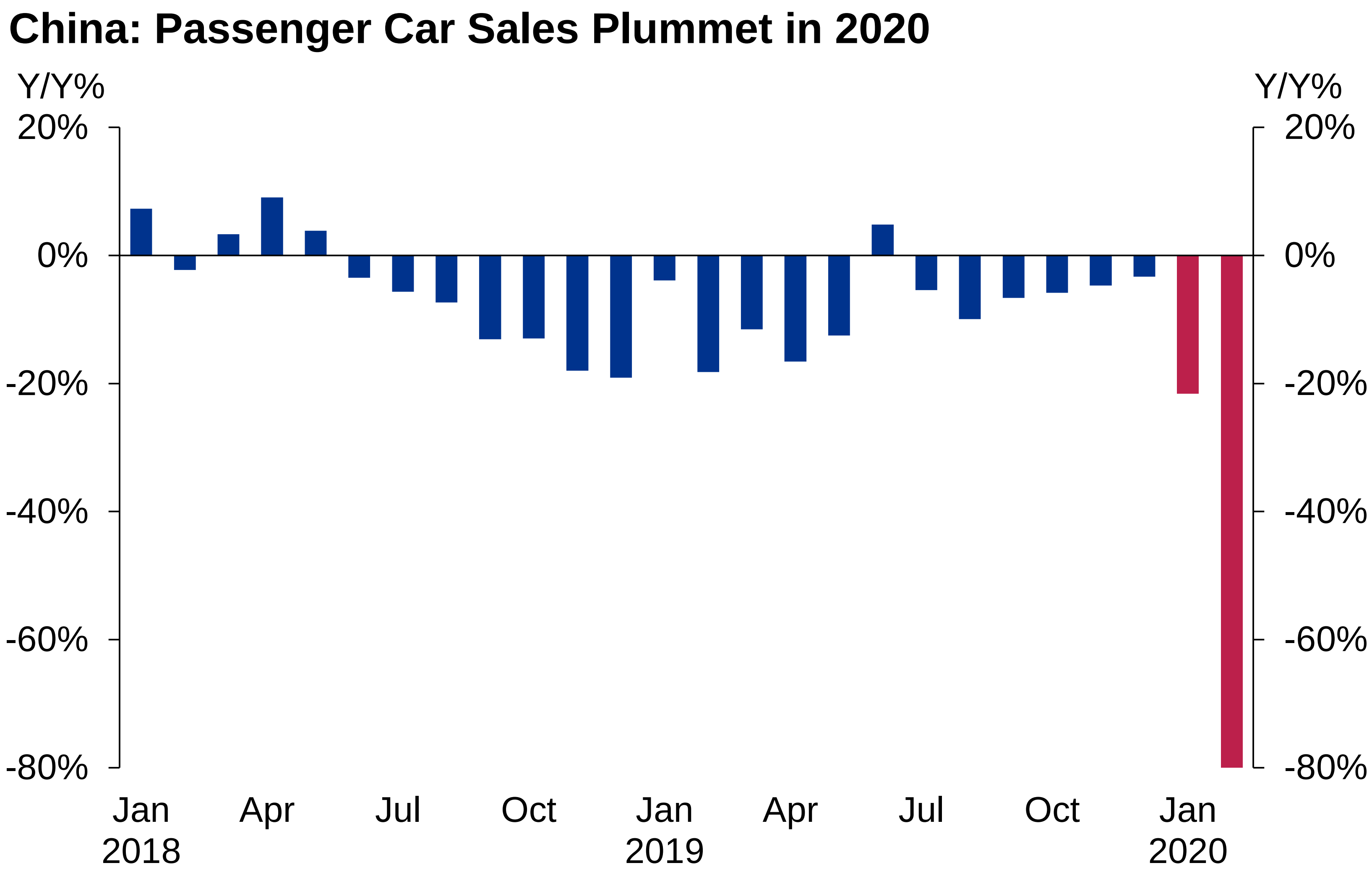
Chinese auto sales fell dramatically in January and February



Source: KPMG Economics, China Association of Automobile Manufacturers (Feb 2020), Haver Analytics

- Vehicle purchases provide a look into the health of Chinese consumers and industry.
- Prior to COVID-19, China's auto sales were negative for a full year due to weak demand.
- Sales plunged to -80% y/y in February and we expect a similar decline in March.
- As an auto manufacturing hub, Hubei province's shutdown will ripple negatively throughout the global auto industry; these effects are being felt acutely in South Korea, Japan, and Germany.

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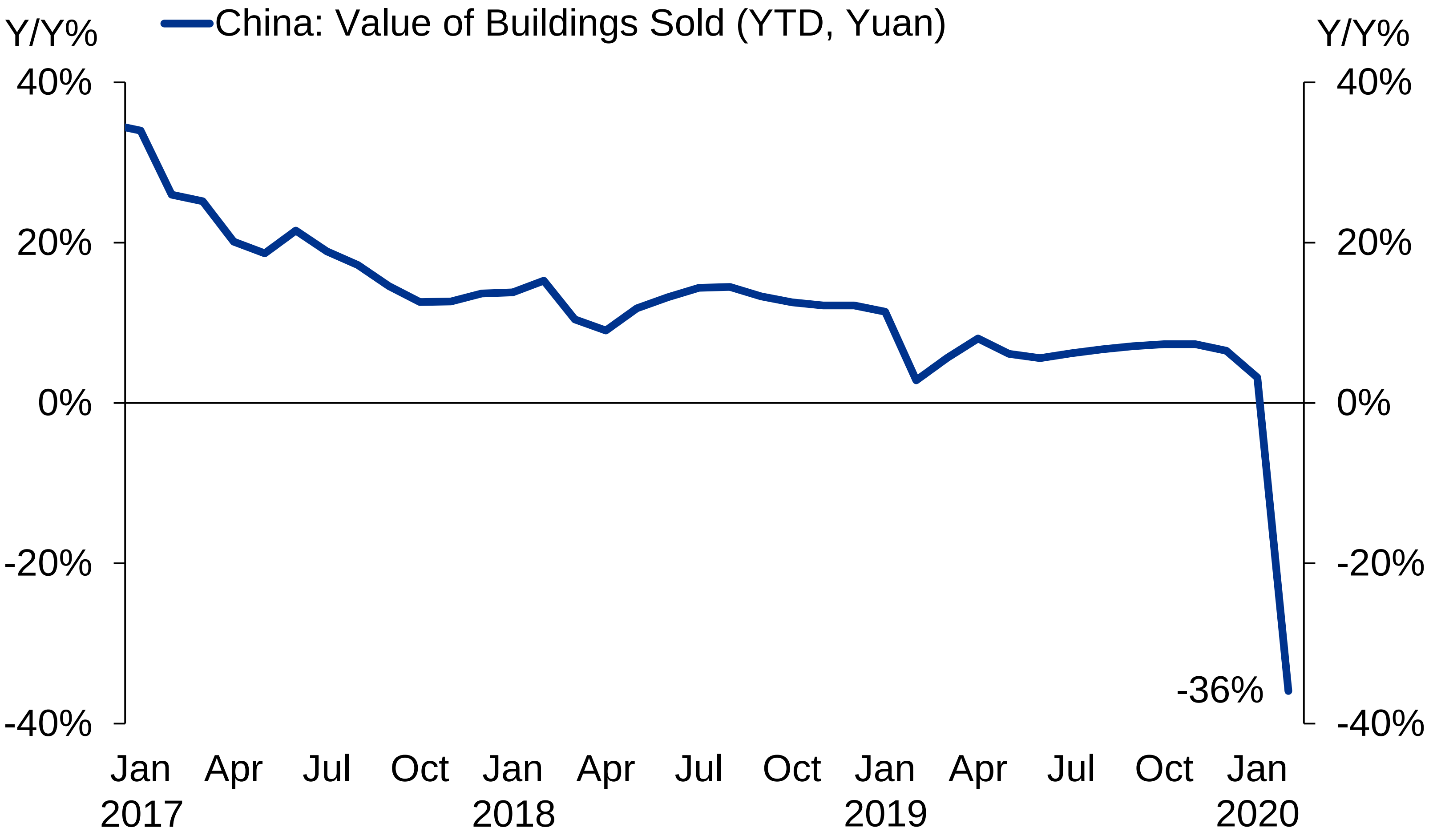
Highly leveraged property sector faces crumbling demand

China: Total Property Sales



- February property sales fell 36% YTD y/y in value and by 40% YTD y/y in terms of floor space, putting builders in a precarious situation.
- Further, property investment declined by 16% YTD y/y and infrastructure investment fell by 30.3% YTD y/y.
- Construction has also been slowed by the absence of migrant workers as many have not returned to work from their home provinces even after quarantines have been lifted.
- Falling sales and construction will put enormous pressures on builders, most of whom financed new projects with large amounts of high-interest debt.

Source: KPMG Economics, China Association of Automobile Manufacturers (Feb 2020), Haver Analytics, Rhodium Group

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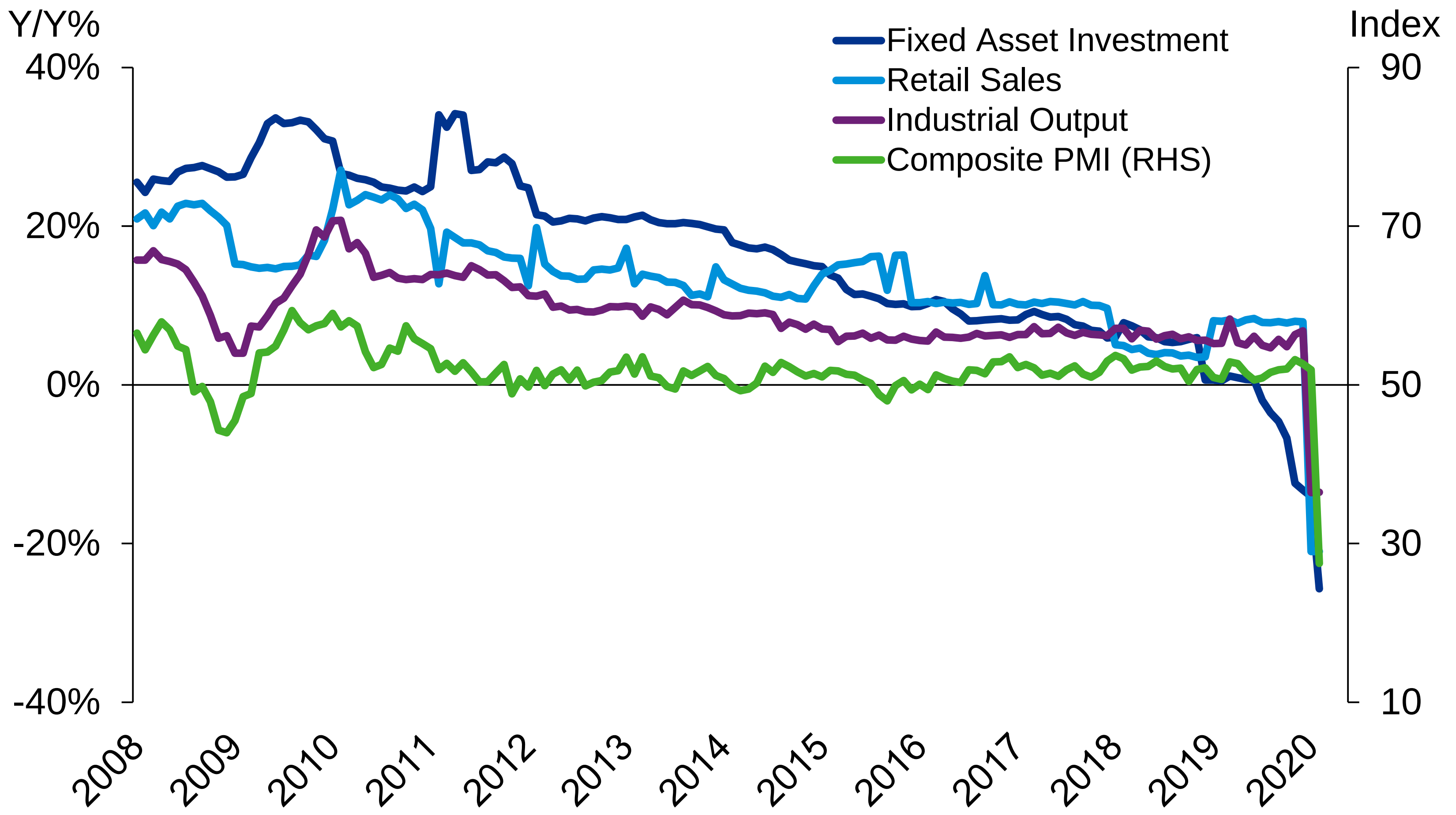
Chinese economy hobbled, slow recovery highly likely

China: Economic Indicators



- Chinese experience shows that no industries were spared from the outbreak.
- Retail sales, and industrial output all rapidly declined and fell year-over-year at the worst rates in decades.
- We estimate that first quarter real GDP in China will fall by at least 10% at a q/q annualized rate.
- This is a much deeper decline than what occurred during the global financial crisis.
- Further, although the PBOC has provided stimulus, the credit channel is weak and many SMEs face liquidity challenges.

Note: People's Bank of China (PBoC), Small- and Medium-sized Enterprise (SME)

Source: KPMG Economics, China Association of Automobile Manufacturers (Feb 2020), Haver Analytics

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Concluding Thoughts

Countries with high debt and elderly face most risk

As of March 18th, 2020

Country	Cases per Mil. Pop.	Total Cases	Total Deaths	Share of the Population Over Age 70	Private Nonfinanical Debt-to-GDP (Q3-2019)
Italy	589.8	35,713	2,978	17%	110.5%
Switzerland	352.4	3,028	28	14%	253.6%
Spain	297.6	13,910	623	15%	152.4%
Norway	288.2	1,550	6	12%	239.0%
Iran	209.4	17,361	1135	4%	-
Austria	183.8	1,646	4	14%	138.9%
Denmark	183.1	1057	4	14%	221.7%
South Korea	164.2	8,413	84	10%	195.0%
Germany	147.6	12,327	28	16%	113.7%
France	138.8	9,043	148	15%	216.3%
Sweden	127.4	1,279	10	15%	255.8%
China	56.4	80,906	3,237	6%	204.8%
United States	23.7	7,786	118	11%	150.5%
United Kingdom	11.6	2,626	71	13%	165.3%
Japan	7.0	889	29	21%	161.5%

Source: KPMG Economics, Johns Hopkins University, UN Population Statistics, BIS, Haver Analytics

- The countries with the greatest number of older people are the most at risk in terms of death rate and strain on medical resources.
  - Japan – 21% over 70
  - Italy – 17%
  - Germany – 16%
  - Sweden – 15%
  - Spain – 15%
  - U.K. – 13%
  - U.S. – 11%
  - South Korea – 10%
  - Singapore – 7%
  - China – 6.5%
  - Iran – 4%

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Global Impact

- Virus in 183 countries as of March 20th
- Countries with oldest populations most at risk for high death rates and adverse news flows
- Social distancing is necessary but comes at a great economic cost
- Government efforts to mitigate the economic cost are evolving in response to the crisis
- Longer-term impact is felt by indebted companies or those with poor cash flows, those that cannot remain open, cannot employ people or cannot make debt payments
- Coordinated and individual government action is underway to mitigate negative health and economic impacts
- Nevertheless the virus is estimated to produce “U” or “L” shaped economic outcomes

Source: KPMG Economics, www.worldometers.info, WHO, Johns Hopkins, World Bank

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