Webinar: COVID-19 and global financial markets

FEATURING
MARKUS BRUNNERMEIER, PRINCETON BCF
TORSTEN SLOK, DEUTSCHE BANK SECURITIES

Thursday, March 19, 2020
12:00 PM ET
Limited Space Available
Registration Required
Intro

- What’s happening to
  - People
  - Health contagion
  - Gaining time
  - Real economy

Scenario: \( V \) vs. \( L \)
Intro

- What’s happening to
  - People
    - Health contagion
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  - Real economy
    - Supply chains
    - Hoarding
Intro

- What’s happening to
  - People
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  - Financial markets
    - Financial runs

contagion
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    - Financial runs contagion

- Q: What’s the difference btw. economic hoarding vs. financial run?
  - Hoarding food vs. hoarding money collapse of system
Intro

- What’s happening to
  - People
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  - Real economy
    - Supply chains
    - Hoarding
  - Financial markets
    - Financial runs contagion

Q: What’s the difference btw. economic hoarding vs. financial run?

- Hoarding food vs. hoarding money → collapse of system
- A: Central bank can print money (at no cost), but not food
Shocks and Amplification

- **Nature of the initial economic shock**
  - Temporary vs. permanent (V, U, L-shaped)
  - Supply vs. demand (1970s)
  - Aggregate vs. idiosyncratic (finance)
  - ...

- **Nature of amplification/feedback effects/spirals/non-linearities**
  - Risk-on to risk-off
  - Flight-to-safety (safe asset = good friend indeed)

- Multiple equilibria
Financial Markets

- Stock market
Financial Markets

- Stock market
- Credit/Funding Markets – Who funds gov./businesses/HH?
  - Via capital markets & shadow banks
    - Gov. / Corporate bonds (long-run)
    - Repo market = collateralized lending
    - Money market funds
  - Commercial paper (short-run)
Financial Markets

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- Foreign Exchange (FX) Market
  - Currencies
  - International capital flows - Flight-to-safety (risk-off)
Questions

- Do financial markets overact ... or simply react/correct?
- Does it matter? Why (not)?
- Should central bank care? About
  - Stock market?
  - Credit/funding markets?
  - Market making (US Treasury)?
- Should government restore funding by by-passing financial sector?
  - Loan: COVID-19 Liquidity Life Line Proposal (Europe)
    - Exploit that tax authorities can enforce payment as an add-on to taxes
  - Gift: $1000-Check/Helicopter money (US/Hong Kong)
COVID-19 and Global Financial Markets

March 2020

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DISCLOSURES AND ANALYST CERTIFICATIONS ARE LOCATED IN APPENDIX 1. MCI (P) 066/04/2019.
Outline

1. Before the virus
2. The virus
3. Financial market reaction to the virus
4. Fed and ECB reaction
5. Fiscal policy reaction
6. Macroeconomic implications
Before the virus
US: Since 1776 we have never before had a decade without a recession

Source: NBER, Wikipedia, DB Global Research
The virus
The second derivative is key for markets
The second derivative matters for markets

Cumulative deaths in Coronavirus [COVID-19] Cases

- China
- China ex Hubei
- France
- Germany
- South Korea
- Italy
- Japan
- Spain
- US
- Germany
- Iran
- UK

Source: Johns Hopkins University, DB Global Research

Last Updated: 3/18/2020
Financial market reaction to the virus
US financial stress somewhat above 2011 levels

Financial stress in the United States

OFR Financial Stress Index (0=Average Stress Level) (ls)
Bloomberg United States Financial Conditions Index (Inverted axis, rs)

Latest obs: March 19, 2020

Source: OFR, Bloomberg Finance LP, Haver Analytics, DB Global Research
Global stock markets have lost $25tn over the past month

Bloomberg world exchange market capitalization

Source: Bloomberg Finance LP, DB Global Research
15 days: Fastest 20% correction in the S&P500 on record

Number of days it took for S&P500 to enter bear market

Note: A bear market is when the index falls 20% from an all-time high in the last 52 weeks

Source: S&P, Bloomberg Finance LP, DB Global Research
Rates and equity vol at 2008/2009 levels

Index

10yr treasury note VIX (ls)  VIX (rs)

Source: CBOE, WSJ, Haver Analytics, DB Global Research
The number of circuit breakers

Number of times S&P 500 fell 7% and hit a circuit breaker

Source: Bloomberg Finance LP, DB Global Research
Signs of stress in funding markets

Source: Bloomberg Finance LP, DB Global Research
Commercial paper markets

Source: Bloomberg Finance LP, DB Global Research
Yields on Investment grade and High yield corporate bonds

Source: Bloomberg Finance LP, DB Global Research
IG and HY spread

Bloomberg Barclays OAS for United States

Source: Bloomberg Finance LP, DB Global Research
IG and HY CDS

Markit CDX North America 5y Indices

Source: Markit, Bloomberg Finance LP, DB Global Research
Significant differentiation in credit markets at the moment

Performance of various ICE Bofa 7-10 bond indices

Source: ICE BofA, Bloomberg Finance LP, DB Global Research
Number of distressed issuers traded

Note: Distressed bonds are bonds trading at more than 1000 basis points over the benchmark Treasury.

Source: BEA, Bloomberg Finance LP, DB Global Research
50% of the IG index is BBB

Share of market value in Bloomberg Barclays USD IG

Source: Bloomberg Finance LP, DB Global Research

Deutsche Bank Research  Torsten Slok, torsten.slok@db.com  +1 212 250-2155  March 2020
US credit markets have grown from $2trn in 2008 to $7trn today. All driven by much more BBB and single-A paper outstanding.
Holdings of corporate and foreign bonds as % of corporate and foreign bond outstanding

- Foreigners
- Mutual funds
- Life insurance
- Banks
- Households

Share of credit held by foreigners moving up again

Source: FRB, Haver Analytics, DB Global Research
Hedging costs coming down for European and Japanese investors who want to buy US fixed income

1yr hedge cost for USD in annual yield (rolling 6m FX forwards)

Source: Steven Zeng, Bloomberg Finance LP, DB Global Research
US leveraged loans: Recent acceleration in downgrades

US Leveraged loans: ratio of downgrades to upgrades

Source: S&P LCD/LSTA, Deutsche Bank Credit: Securitization CLO Research, DB Global Research
Industry distribution of downgrades of leveraged loans

2019 Leveraged loan downgrades, by industry
Top 15 sectors

Source: S&P LCD, DB Global Research
Low primary dealer inventory of corporate bonds relative to the stock of IG and HY outstanding

Source: FRB-NY, FRB, Haver Analytics, DB Global Research

Primary dealer positions by corporate bonds

- Total stock of US corporate bonds outstanding (ls)
- Primary dealer inventory of corporate bonds (rs)

Source: FRB-NY, FRB, Haver Analytics, DB Global Research
How vulnerable are markets to a redemption shock?
Funds with estimated liquidity shortfalls account for half of all high-yield fund assets

Asset Share of Funds with HQLA Shortfalls
(Percent of sector’s assets)

<table>
<thead>
<tr>
<th>%</th>
<th>Jun. 30, 2017</th>
<th>Mar. 31, 2019</th>
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<tbody>
<tr>
<td>Fixed-income funds</td>
<td>10%</td>
<td>15%</td>
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<tr>
<td>High-yield funds</td>
<td>45%</td>
<td>50%</td>
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Source: IMF GFSR October 2019, DB Global Research

Note: Total AUM of funds analyzed: $10.5trn. The exercise assumes that redemption shocks are equivalent to the worst percentile of funds’ monthly asset outflows during 2000–19. If these shocks cannot be absorbed, funds suffer liquidity shortfalls.
Correlation breakdown: S&P500 vs 10s

S&P 500 vs US 10y yields in 2020

Source: S&P, FRB, Haver Analytics, DB Global Research
Correlation between gold and 10s

Gold price and 10 year treasury yield

Gold price (ls)  10y treasury yield (inverted,rs)

Source: FRB, WSJ, Haver Analytics, DB Global Research
Correlation breakdown: Gold and JPY

United States: Gold vs USDJPY

Source: WSJ, FRB, Haver Analytics, DB Global Research
Correlation breakdown: Gold and CHF

Source: WSJ, FRB, Haver Analytics, DB Global Research
Fed and ECB reaction
10-year rates: Spread between Treasuries and Bunds narrowing

10 year yield differential: United States minus Germany

Source: US Treasury, Bbk, Haver Analytics, DB Global Research
Dollar index

Bloomberg Dollar Spot Index

Source: Bloomberg Finance LP, DB Global Research
Cumulative rate cuts in OECD countries

Cumulative interest rate cuts in OECD member countries

Source: Central Banks, Haver Analytics, DB Global Research
Fiscal policy reaction
Google searches for “file for unemployment”

Source: Google trends, DB Global Research
Small and medium-sized companies play a very important role in the US economy

Global employment in S&P500 companies is only 17% of US nonfarm payrolls*

* Data as of February 2020

Source: Bloomberg Finance LP, BLS, Haver Analytics, DB Global Markets Research
Economic policy uncertainty at highest level since the financial crisis

Source: PolicyUncertainty.com, Haver Analytics, DB Global Research
US: Coronavirus likely to have bigger impact on low-income groups

Percent of private industry workers with access to paid sick leave, vacation, and holidays, by wage category, 2019

- Paid sick leave
- Paid vacation
- Paid holidays

There are 5.8mn gig workers in the US economy

Source: BLS, DB Global Research

Employment of contingent workers by year

- Total Contingent workers employed (ls)
- Percentage of Contingent workers in total employment (rs)

Source: BLS, DB Global Research
Many gig workers don’t have health insurance

Employed contingent and noncontingent workers by health insurance coverage and eligibility, 2017

- Contingent workers
- Noncontingent workers

Source: BLS, DB Global Research
## Fiscal packages announced

<table>
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<tr>
<th>IMF</th>
<th>US</th>
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<tr>
<td><strong>Fiscal packages announced</strong></td>
<td><strong>A $750 to $800 billion package has been mentioned</strong></td>
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<td>The IMF said it “stands ready” to use its $1 trillion lending capacity to help countries.</td>
<td><strong>Deferring tax payments</strong> for individuals and businesses affected by the virus, this would add US$200 billion to the economy, and the Small Businesses Administration will provide emergency capital to certain firms.</td>
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<td><strong>For low-income countries</strong>: Rapid-disbursing emergency financing of up to $10 billion (50 % of quota of eligible members) that can be accessed without a full-fledged IMF program.</td>
<td><strong>A US$7.8 billion emergency spending bill</strong> to fund response to the outbreak, was signed on March 6.</td>
</tr>
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<td>Other members can access emergency financing through the Rapid Financing Instrument. This facility could provide about $40 billion for emerging markets that could potentially approach IMF for financial support.</td>
<td><strong>Lawmakers are set to vote on a package of measures including paid sick leave</strong> for hourly workers staying at home.</td>
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<td>Also have the Catastrophe Containment and Relief Trust – the CCRT – which provides eligible countries with up-front grants for relief on IMF debt service falling due.</td>
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<td>Government is ready to spend as much as 25 billion euros (US$28.3 billion) on virus-related stimulus; provisions could include aid for workers facing temporary layoffs and compensation for affected firms.</td>
<td>A 12 billion-pound (US$15.3 billion) virus package was announced as part of a 30 billion-pound budget, including 5 billion pounds for a National Health Service emergency response fund, statutory sick pay for those self-quarantined, and aid for businesses.</td>
</tr>
<tr>
<td>Finance Minister Roberto Gualtieri said the Cabinet is likely to approve a first package worth about 12 billion euros bn.</td>
<td>Under discussion: Help for workers facing temporary layoffs, boosting a guarantee fund for loans to small- &amp; medium-sized firms, compensation for firms whose turn over fell more than 25% &amp; some form of moratorium for business &amp; personal mortgage repayments.</td>
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Source: IMF, Bloomberg, various media sources, DB Global Research
# Fiscal packages announced

<table>
<thead>
<tr>
<th>Japan</th>
<th>South Korea</th>
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<td>• Abe’s administration rolled out a <strong>second</strong> package to tackle virus effects, bringing the <strong>total allocation since last month to 2.03 trillion yen</strong> (US$19.6 billion)</td>
<td>• 11.7 trillion won (US$9.7 billion) was allocated in a special budget to aid <strong>medical response, businesses and households</strong>; Yonhap News reports officials are discussing expanding the amount.</td>
</tr>
<tr>
<td>• The latest measures include <strong>1.1 trillion yen in loan support and 430.8 billion yen in aid for medical professionals and those affected by school closures.</strong> That adds to 500 billion yen allocated last month in <strong>low-cost loans</strong> to companies affected by the virus.</td>
<td>• <strong>Tax breaks, rent subsidies</strong> announced Feb 28.</td>
</tr>
<tr>
<td>• Some ruling-party members are calling for an extra budget of 30 trillion yen in coming months.</td>
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<th>Australia</th>
<th>New Zealand</th>
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<td>• <strong>Fiscal stimulus worth A$17.6 billion</strong> (US$11.4 billion) includes A$1.3 billion to safeguard jobs of 120,000 apprentices.</td>
<td>• Government has announced a <strong>spending package equivalent to 4% of GDP.</strong></td>
</tr>
<tr>
<td>• <strong>One-time cash payments</strong> to welfare recipients and lower-income households; wage subsidies for small- and medium-sized firms.</td>
<td>• It includes <strong>covering wages for people</strong> who are required to self-isolate but cannot work from home, or those caring for relatives who are sick with the virus, even if they are not sick or do not test positive for Covid-19.</td>
</tr>
<tr>
<td>• A$1 billion fund set up to help <strong>tourism operators</strong> and some <strong>China-exposed exporters.</strong></td>
<td>• The NZ$12.1bn stimulus includes wage subsidies, bolstering the healthcare sector's response to the virus, more money for low-income families and those on social welfare, and changes to business tax.</td>
</tr>
</tbody>
</table>

Source: IMF, Bloomberg, various media sources, DB Global Research
Macroeconomic implications
Stock market declines point to a significant drop in nonfarm payrolls over the coming three months.

The 1918-1919 recession lasted 7 months

Number of months U.S. economy in recession
(staritng year of recession shown)

Source: NBER, Wikipedia, DB Global Research
Mortality rate in areas impacted by major pandemics

<table>
<thead>
<tr>
<th>Estimated number of deaths in major pandemics</th>
<th>Per 10,000 persons</th>
</tr>
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<tr>
<td>Flu pandemic (1918)</td>
<td>555</td>
</tr>
<tr>
<td>Fifth cholera pandemic (1881)</td>
<td>9.7</td>
</tr>
<tr>
<td>Asian flu pandemic (1957)</td>
<td>5.1</td>
</tr>
<tr>
<td>Hong Kong flu pandemic (1968)</td>
<td>2.8</td>
</tr>
<tr>
<td>Swine flu pandemic (2009)</td>
<td>0.8</td>
</tr>
</tbody>
</table>

Source: Patel, V., D. Chisholm., T. Dua, R. Laxminarayan, and M. E. Medina-Mora, editors. 2015, NCBH, DB Global Research
Global growth outlook

World (G4)* GDP growth

US GDP growth

EA GDP growth

Germany GDP growth

Source: DB Global Research

Deutsche Bank Research Torsten Slok, torsten.slok@db.com +1 212 250-2155 March 2020
Global growth outlook

China GDP growth

Japan GDP growth

Source: DB Global Research
Torsten Slok, Ph.D.

• Chief Economist, Managing Director
• Deutsche Bank Securities, Inc.

- Torsten Slok joined Deutsche Bank Securities in the fall of 2005.
- Mr. Slok’s Economics team has been top-ranked by Institutional Investor in fixed income and equities since 2010, including #1 in 2019. Slok currently serves as a member of the Economic Club of New York.

- Prior to joining the firm, Mr. Slok worked at the OECD in Paris in the Money and Finance Division and the Structural Policy Analysis Division. Before joining the OECD he worked for four years at the IMF in the Division responsible for writing the World Economic Outlook and the Division responsible for China, Hong Kong, and Mongolia.

- Mr. Slok studied at University of Copenhagen and Princeton University. He has published numerous journal articles and reviews on economics and policy analysis, including in Journal of International Economics, Journal of International Money and Finance, and The Econometric Journal.
Appendix 1
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Macroeconomic fluctuations often account for most of the risks associated with exposures to instruments that promise to pay fixed or variable interest rates. For an investor who is long fixed-rate instruments (thus receiving these cash flows), increases in interest rates naturally lift the discount factors applied to the expected cash flows and thus cause a loss. The longer the maturity of a certain cash flow and the higher the move in the discount factor, the higher will be the loss. Upside surprises in inflation, fiscal funding needs, and FX depreciation rates are among the most common adverse macroeconomic shocks to receivers. But counterparty exposure, issuer creditworthiness, client segmentation, regulation (including changes in assets holding limits for different types of investors), changes in tax policies, currency convertibility (which may constrain currency conversion, repatriation of profits and/or liquidation of positions), and settlement issues related to local clearing houses are also important risk factors. The sensitivity of fixed-income instruments to macroeconomic shocks may be mitigated by indexing the contracted cash flows to inflation, to FX depreciation, or to specified interest rates – these are common in emerging markets. The index fixings may – by construction – lag or mis-measure the actual move in the underlying variables they are intended to track. The choice of the proper fixing (or metric) is particularly important in swaps markets, where floating coupon rates (i.e., coupons indexed to a typically short-dated interest rate reference index) are exchanged for fixed coupons. Funding in a currency that differs from the currency in which coupons are denominated carries FX risk. Options on swaps (swaptions) the risks typical to options in addition to the risks related to rates movements.

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