

Macroeconomics: Fiscal and Monetary Policy Response to COVID-19

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COVID-19 Crisis and the Federal Reserve's Policy Response

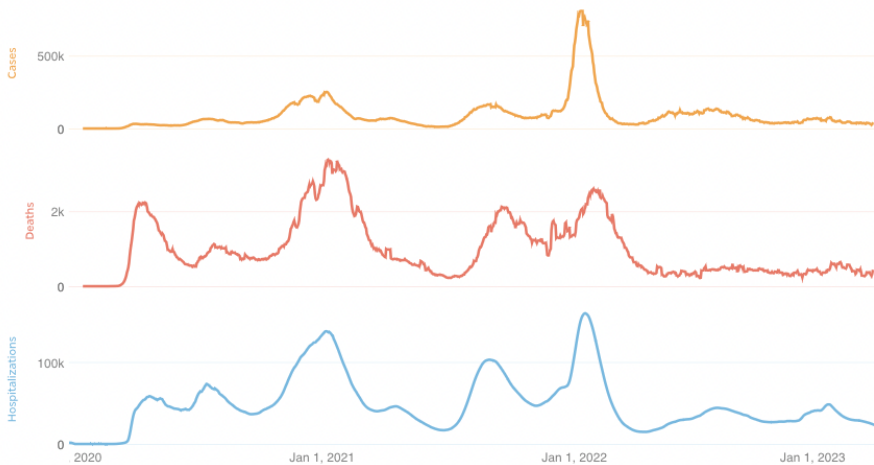
In the United States, both the fiscal and monetary policy responses to the COVID crisis were unprecedented in their scale, scope, and speed. In this paper, we have argued that the Federal Reserve acted decisively and with dispatch to deploy all the tools in its conventional kit and to design, develop, and launch within weeks a series of innovative facilities to support the flow of credit to households and business. These measures, taken together and in tandem with a historic fiscal policy response, provided crucial support to the economy in 2020 and are continuing to contribute to what is expected to be a robust economic recovery in 2021.

Clarida, Richard H., Burcu Duygan-Bump, and Chiara Scotti (2021). "The COVID-19 Crisis and the Federal Reserve's Policy Response," Finance and Economics Discussion Series 2021-035. Washington: Board of Governors of the Federal Reserve System

Outline

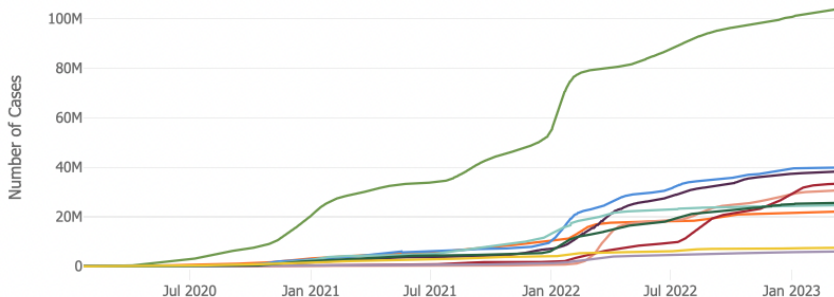
- ① Background
- ② U.S. Economy
- ③ Policy Analysis
- ④ BIS Annual Reports

COVID-19 in the US: Timeline



<https://coronavirus.jhu.edu/region/united-states>

COVID-19: Cumulative Cases

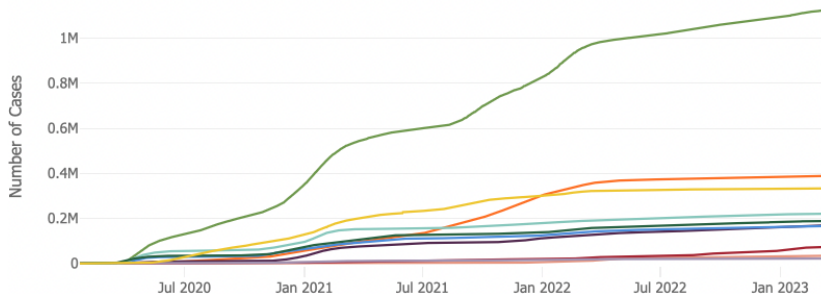


Click any country below to hide/show from the graph:

- | | | | |
|---------|---------|--------------|----------------|
| US | Russia | Korea, South | Japan |
| Germany | Austria | France | United Kingdom |
| Italy | Mexico | | |

<https://coronavirus.jhu.edu/data/cumulative-cases>

COVID-19: Cumulative Deaths



Click any country below to hide/show from the graph:

- | | | | |
|---------|---------|--------------|----------------|
| US | Russia | Korea, South | Japan |
| Germany | Austria | France | United Kingdom |
| Italy | Mexico | | |

<https://coronavirus.jhu.edu/data/cumulative-cases>

COVID-19 in the US: Numbers

WORLD COUNTRIES

UNITED STATES

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OVERVIEW

All Time

Past Day

Past Week

Past Month

Confirmed Cases

103,802,702

Deaths

1,123,836



VACCINE TRACKER

[Learn more about vaccines >](#)

Doses Administered

672,076,105

People receiving at least 1 dose

269,554,116

% of Population receiving at least 1 dose

81.82%

<https://coronavirus.jhu.edu/region/united-states>

Note: JHU has stopped collecting data as of March 10, 2023.

Fiscal and Monetary Policy Basics

Think-pair-share: discuss with your peers and write down summary answers. Then, please share in the chat box.

- ① What is fiscal policy? Which government branches are responsible?
- ② What are the goals and tools (measures) of fiscal policy in the U.S.?
- ③ What is monetary policy? Which government agency is responsible?
- ④ What are the goals and tools of monetary policy in the U.S.?

Fiscal Policy

The word "fiscal" relates to public treasury or revenues. Fiscal policy is a broad term used to refer to the taxation and spending policies of the federal government.

Policymakers use the federal budget process to establish spending priorities and identify revenue to pay for those activities.

Monetary Policy

Central bank actions involving the use of interest rate or money/credit tools to achieve such goals as maximum employment and stable prices.

Conventional Tools: 1) Open Market Operation; 2) Discount Window; 3) Reserve requirements. Nonconventional Tools: Quantitative Easing.

Fiscal Policy Types, Objectives, and Tools

EXPANSIONARY
FISCAL POLICY

VS


CONTRACTIONARY
FISCAL POLICY

Government
spending

Taxes

Government
spending

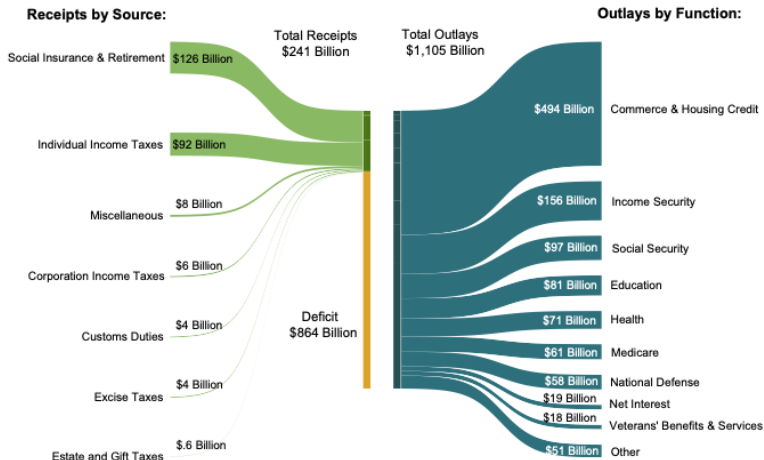
Taxes

 the balance

<https://www.thebalancemoney.com/what-is-fiscal-policy-types-objectives-and-tools-3305844>

Fiscal Policy: Receipts and Outlays

Figure 1. Receipts, Outlays, and Surplus/Deficit for June 2020



Source: Monthly Treasury Statement (2020)

Fiscal Policy Response: \$5.2T

Trump Administration

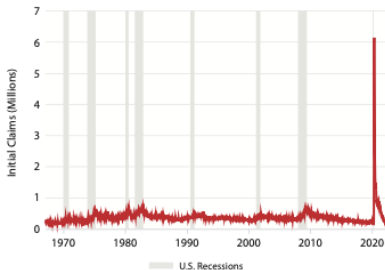
- March 6, 2020. Coronavirus Preparedness and Response Supplemental Appropriations Act (CPRSAA) \$8.3 billion
- March 18, 2020. Families First Coronavirus Response Act (Families First, or FFCRA) \$192 billion
- March 27, 2020. Coronavirus Aid, Relief, and Economic Security Act (CARES) \$2.3 trillion
- April 24, 2020. Paycheck Protection Program and Health Care Enhancement Act (PPPHCEA) \$483 billion
- December 27, 2020. Coronavirus Response and Relief Supplemental Appropriations Act (Response and Relief, or CRRSAA) \$868 billion

Biden Administration

- March 11, 2021. American Rescue Plan Act (ARPA) \$1.9 trillion.

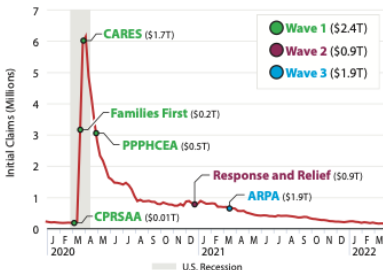
Federal Fiscal Response 2020-2021

Figure 1: U.S. Initial Unemployment Insurance Claims, 1970-2022



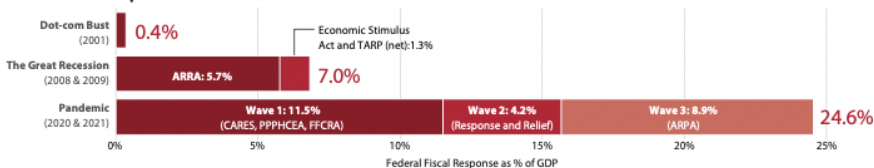
Source: U.S. Employment and Training Administration

Figure 2: U.S. Initial Unemployment Insurance Claims and Major Fiscal Response Bills, 2020-2022



Source: U.S. Employment and Training Administration

Federal Fiscal Response to Recent Recessions as % of U.S. GDP

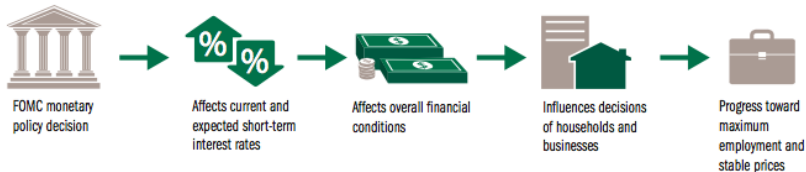


Source: Congressional Budget Office and U.S. Bureau of Economic Analysis

Monetary Policy: Dual Mandate

Figure 3.1. The Fed's statutory mandate: maximum employment and stable prices

The Federal Reserve conducts monetary policy in pursuit of the goals set for it by Congress. The mandated goals are considered essential to a well-functioning economy for households and businesses.



The Federal Reserve conducts monetary policy by using a variety of tools to manage financial conditions that encourage progress toward its dual mandate objectives: maximum employment and stable prices.

Source: The Fed Explained - What the Central Bank Does. CH3. 2021

March 15, 2020 FOMC Meeting



<https://www.federalreserve.gov/monetarypolicy/fomcpresconf20200315.htm>

What are the specific measures taken by the Fed in the early stage of COVID?

Monetary Policy Response

- Federal funds rate were lowered by 150bps in March to 0-0.25bps.
- Purchase of Treasury and agency securities.
- Expanded overnight and term repos.
- Lowered cost of discount window lending.
- Reduced existing cost of swap lines with major central banks and extended the maturity of FX operations; broadened U.S. dollar swap lines to more central banks; offered temporary repo facility for foreign and international monetary authorities.
- Emergency lending facilities to support the flow of credit, in some cases backed by the Treasury using funds appropriated under the CARES Act.

Source: Milstein and Wessel (2021) What did the Fed do in response to the COVID-19 crisis?

<https://www.brookings.edu/research/fed-response-to-covid19/>

<https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19#U>

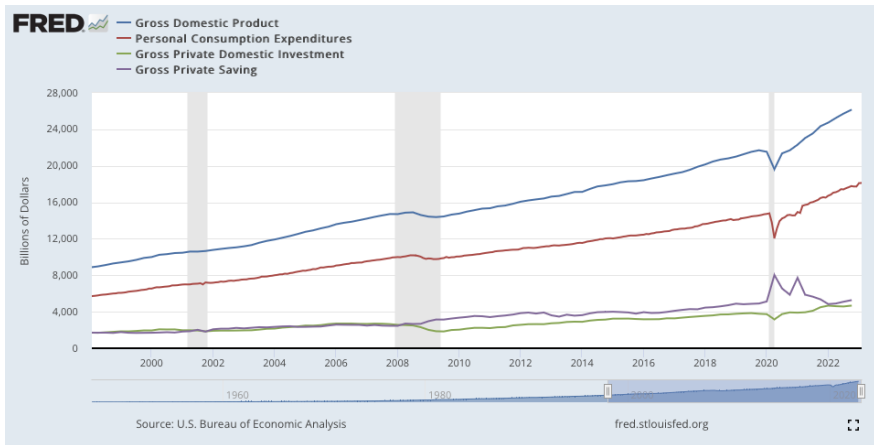
COVID-19 News and Media

- March 15, 2020 FOMC meeting (w)
- Global News (202004)
The impact COVID-19 is having on the global economy | 4:55 [w]
- Harvard Business Review (202005)
Understanding the Economic Shock of the COVID-19 Crisis | 4:17 [w]
- Brookings Policy Books (202204) Recession Remedies: Lessons Learned from the U.S. Economic Policy Response to COVID-19 | 7:45 [w]
- The Economist
202007 COVID-19: what will happen to the global economy? | 10:05 [w]
202008 America's stimulus package: is it working? | 11:49 [w]
202010 COVID-19: how to fix the economy | 10:53 [w]

Outline

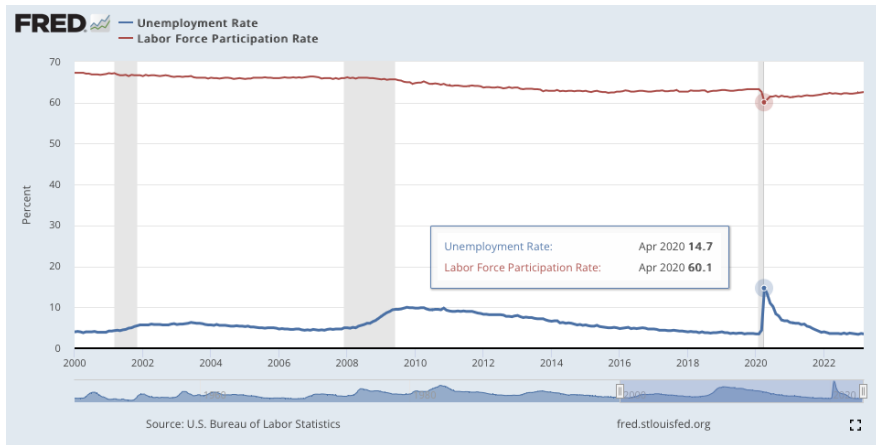
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National Income and Savings



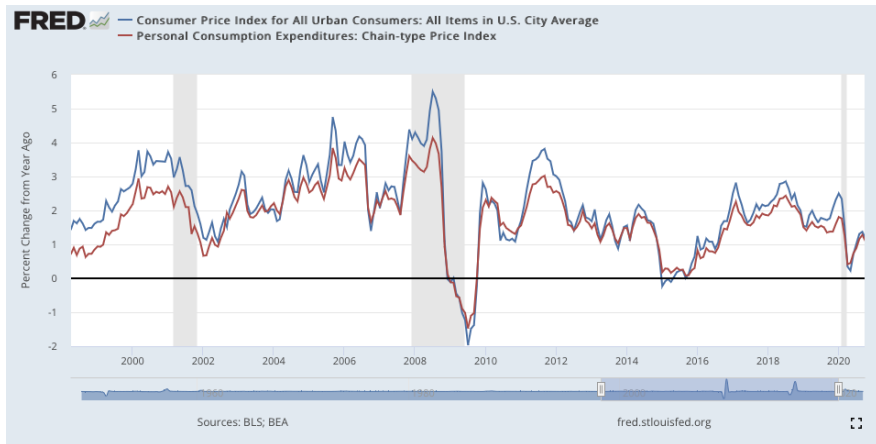
<https://fred.stlouisfed.org/series/GDP>

Labor Market Conditions



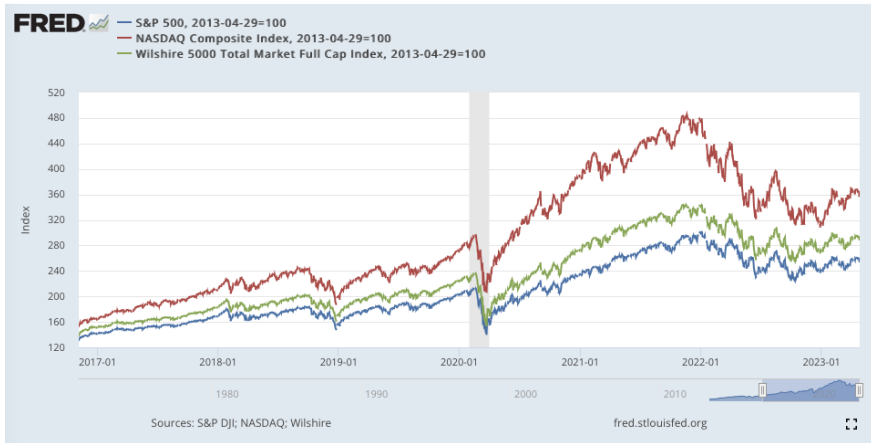
<https://fred.stlouisfed.org/series/UNRATE>

Inflation Rate Measures



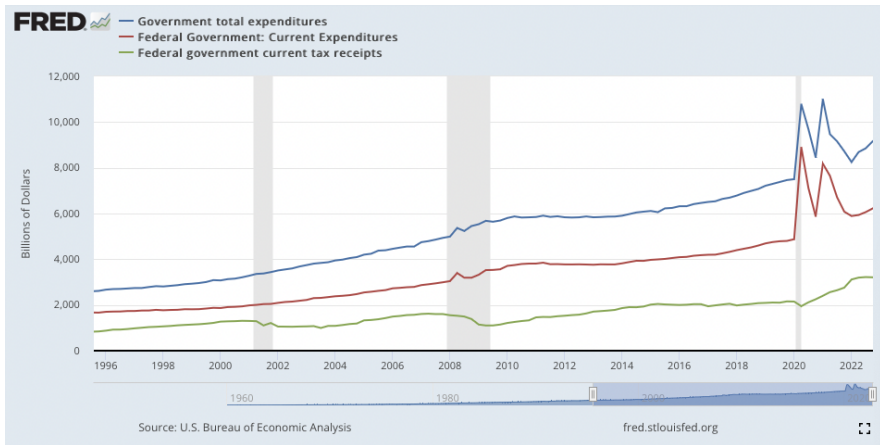
<https://fred.stlouisfed.org/series/CPIAUCSL>

Stock Market Indexes



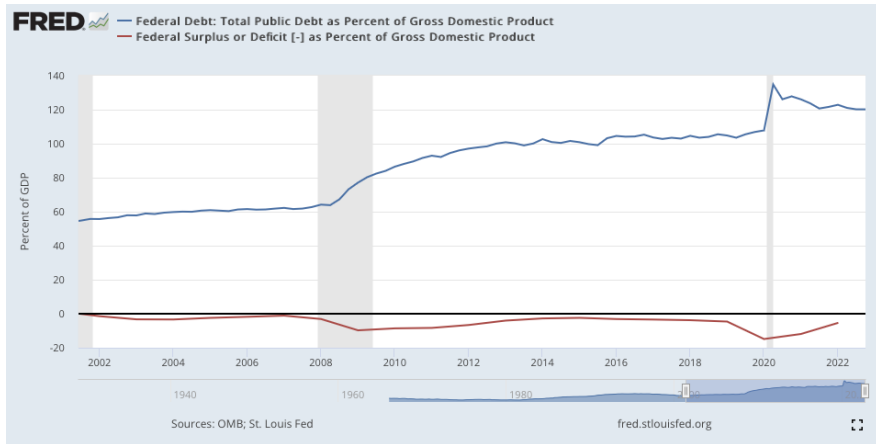
<https://fred.stlouisfed.org/series/SP500>

Federal Expenditures and Tax Receipts



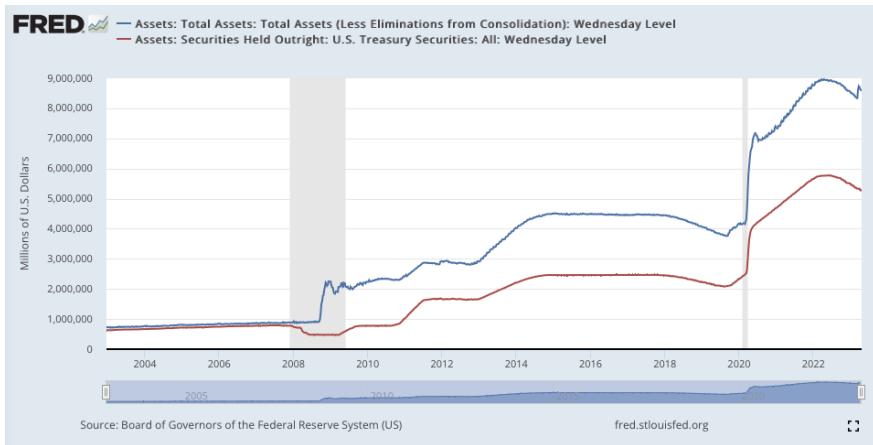
<https://fred.stlouisfed.org/series/W068RCQ027SBEA>

Federal Debt and Budget Deficit



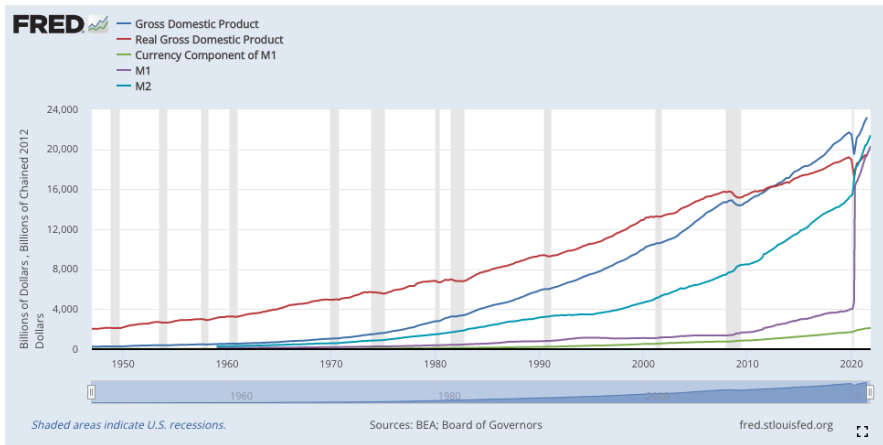
<https://fred.stlouisfed.org/series/GFDEGDQ188S>

Federal Reserve Assets Balance



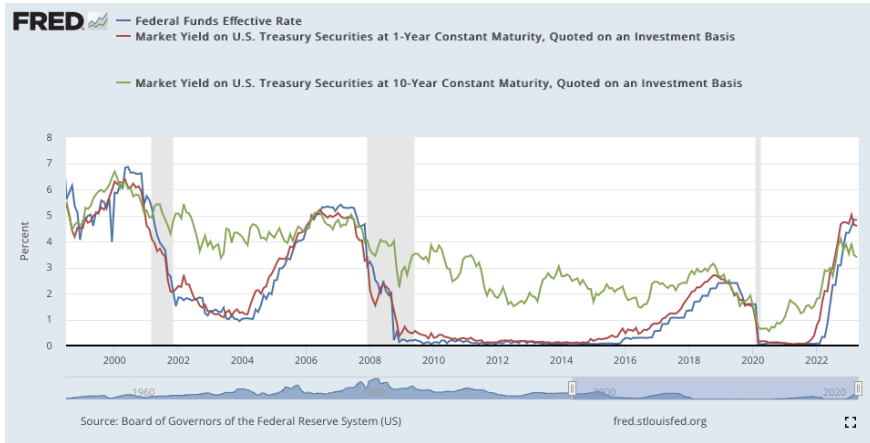
<https://fred.stlouisfed.org/series/WALCL>

Money Stocks and GDP



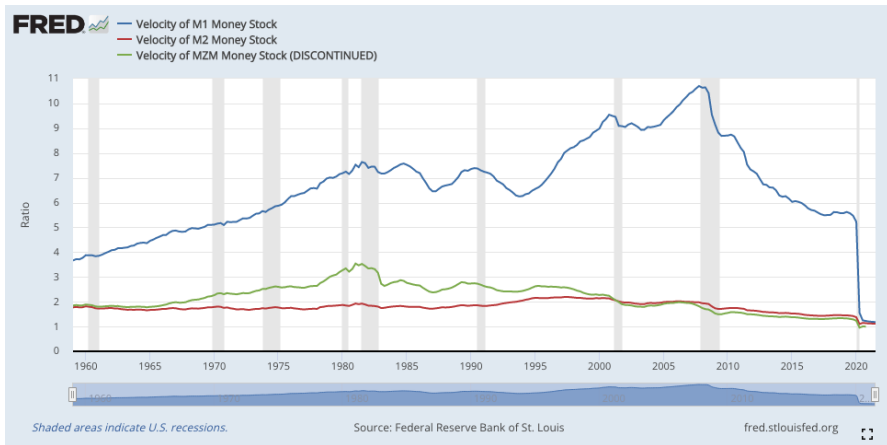
<https://fred.stlouisfed.org/series/WM1NS>

Federal Funds Rate and Treasury Yields



<https://fred.stlouisfed.org/series/DFF>

Money Stocks Velocity



Outline

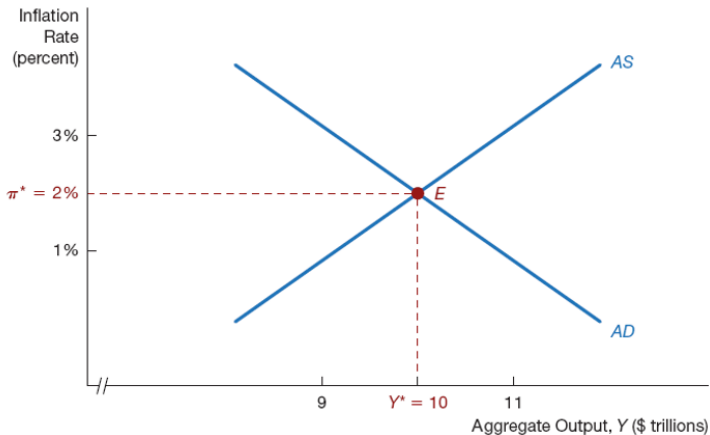
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AD-AS Theory: Function and Assumption

- All societies experience short-run economic fluctuations around long-run trends. These fluctuations are irregular and largely unpredictable. When recessions occur, real GDP and other measures of income, spending, and production fall, while unemployment rises.
- To analyze the economy's short-run fluctuations, Economists develop the model of aggregate demand and aggregate supply (AD-AS). Students will learn about some of the sources for shifts in the AD curve and the AS curve and how these shifts can cause recessions. This section also introduces actions policymakers might undertake to offset recessions.
- Classical economic theory is based on the assumption that nominal variables such as the money supply and the price level do not influence real variables such as output and employment. Most economists believe that this assumption is accurate in the long run but not in the short run.
- According to the AD-AS model, the output of goods and services and the overall level of prices adjust to balance AD and AS.

Source: N. G. Mankiw (2021) CH33, Principles of Economics, 9e, Cengage.

AD-AS Model



Source: Mishkin (2022)

Aggregate Demand Theory: $AD=C+I+G+NX$

Aggregate-demand curve shows the quantity of goods and services that households, firms, and the government want to buy at each price level. According to Keynes' theory, aggregate demand in the economy is composed of consumption, investment, government purchases, and net exports. The aggregate-demand curve slopes downward for three reasons.

- ① The first is the wealth effect: A lower price level raises the real value of households' money holdings, which stimulates consumer spending.
- ② The second is the interest-rate effect: A lower price level reduces the quantity of money households demand; as households try to convert money into interest-bearing assets, interest rates fall, which stimulates investment spending.
- ③ The third is the exchange-rate effect: As a lower price level reduces interest rates, the dollar depreciates in the market for foreign-currency exchange, which stimulates net exports.

Source: N. G. Mankiw (2021) CH33, Principles of Economics, 9e, Cengage.

Short-Run Aggregate Supply Theories

Three theories have been proposed to explain the upward slope of the short-run AS curve, implying that output deviates from its natural level when the actual price level deviates from the price level that people expected.

- ① Sticky-wage theory, an unexpected fall in the price level temporarily raises real wages, which induces firms to reduce employment and production.
- ② Sticky-price theory, an unexpected fall in the price level leaves some firms with prices that are temporarily too high, which reduces their sales and causes them to cut back production.
- ③ Misperceptions theory, an unexpected fall in the price level leads suppliers to mistakenly believe that their relative prices have fallen, which induces them to reduce production.

The effects of the change in the price level will be temporary. Eventually people will adjust their price level expectations and output will return to its natural level; thus, the aggregate-supply curve will be vertical in the long run.

Source: N. G. Mankiw (2021) CH33, Principles of Economics, 9e, Cengage.

Short-Run Aggregate Supply Curve: Movements

Why the Short-Run Aggregate-Supply Curve Might Shift?

- ① Events that shift the long-run aggregate-supply curve will shift the short-run aggregate-supply curve as well.
- ② Expectations of the price level will affect the position of the short-run aggregate-supply curve even though it has no effect on the long-run aggregate-supply curve.
- ③ An increase in the expected price level decreases the quantity of goods and services supplied and shifts the short-run aggregate-supply curve to the left. A decrease in the expected price level increases the quantity of goods and services supplied and shifts the short-run aggregate-supply curve to the right.

Source: N. G. Mankiw (2021) CH33, Principles of Economics, 9e, Cengage.

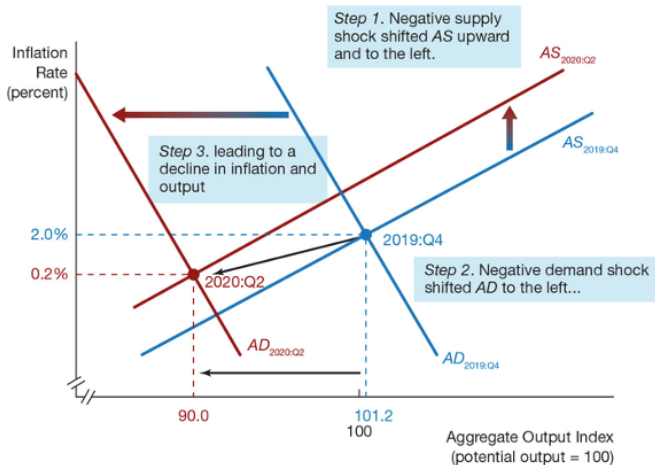
AD-AS Analysis: 2019Q4 : 2020Q2

Indicators	2019 Q4	2020 Q2
GDP Growth	2.57	-8.53
Unemployment (%)	3.6	11
CPI Inflation	2.31	0.72
PPI Inflation	2.01	-2.14
PCE Inflation	1.60	0.74

<https://stlouisfed.shinyapps.io/macro-snapshot>

- How does Covid-19 affect AD and AS?
- What happen to the AS aggregate supply?
- What happen to the AD aggregate demand?
- What happen to the macroeconomic equilibrium?

AD-AS Analysis: The COVID-19 Recession



Source: Mishkin (2022)

AD-AS Analysis: 2020Q2 : 2021Q2

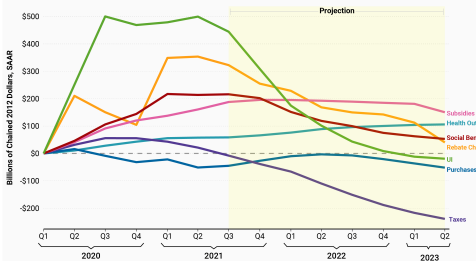
Indicators	2020 Q2	2021 Q2
Gov Expenditure (%)	87.23	-14.01
M2 Growth	21.87	13.2
GDP Growth	-8.53	12.46
Unemployment (%)	11	5.9
CPI Inflation	0.72	5.28
PPI Inflation	-2.14	9.21
PCE Inflation	0.74	4.25

<https://stlouisfed.shinyapps.io/macro-snapshot>

- How does fiscal and monetary policy affect AD and AS?
- What happen to the macroeconomic equilibrium?

How pandemic-era fiscal policy affects the level of GDP? _(w)

Effects of the Components of Fiscal Policy on the Level of GDP

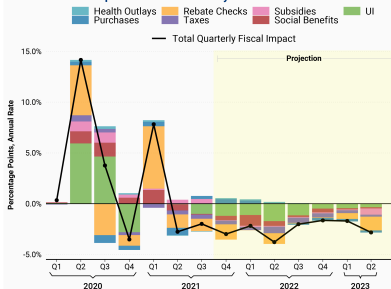


Note: Government purchases, taxes, and transfers are shown net of what they would have been had they increased at the rate of potential GDP growth from 2020 Q1 on.

Source: Hutchins Center calculations using data from the Congressional Budget Office and the Bureau of Economic Analysis.

H Hutchins Center
on Fiscal & Monetary Policy
at BROOKINGS

Effects of the Components of Fiscal Policy on GDP Growth



Source: Hutchins Center calculations using data from the Congressional Budget Office and the Bureau of Economic Analysis.

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at BROOKINGS

The chart shows the headline fiscal impact measure on GDP, broken down into the different components of fiscal policy. The largest boost to GDP growth in the early stages of the pandemic came from the large increases in spending on unemployment insurance and rebate checks. As the impetus from these programs lessens over time, these categories of spending become a negative for GDP growth. Source: Brookings (2021)

Quantity Equation: $MV=PY$

The Quantity Theory of Money (QTM) is an economic theory relating the price of the goods and services to the quantity of money in circulation for them. It provides a monetary perspective of economic transactions.

- ① M – money quantity: How many dollars in the economy are available to exchange for the goods and services?
- ② V – transaction velocity: How many transactions occur in each period? Payment technology can affect transaction frequency.
- ③ P – the price of the goods and services in exchange.
- ④ Y – the quantity of the goods and services in exchange.

QTM applies to any single transaction as well as all economic transactions. Throughout our study of Macroeconomics, this equation helps us connect the dots of all chapters.

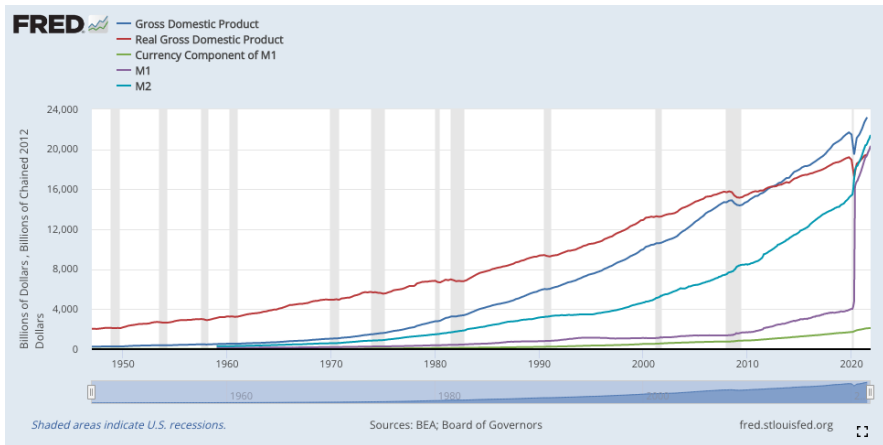
Quantity Theory $MV=PY$: 2019-2021

Indicators	2019-06	2020-06	2021-06
Fed Assets	3.85T	7.01T	8.07T
M2 Growth	4.8	22.8	13.2
EFFR	2.4	0.08	0.10
CPI Inflation	1.65	0.72	5.28
PPI Inflation	0.59	-2.14	9.21
PCE Inflation	1.49	0.74	1.28
RGDP Growth	2.14	-8.35	12.46
Unemployment	3.6	11	5.9

<https://stlouisfed.shinyapps.io/macro-snapshot>

- What happen to the money stock in the US economy?
- What happen to the price level over the period?
- What happen to the economic growth?

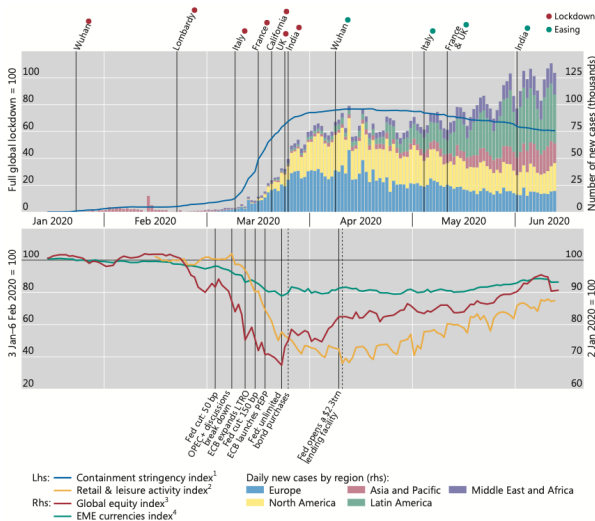
QTM: Output and Money



Outline

- ① Background
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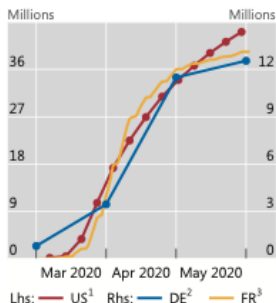
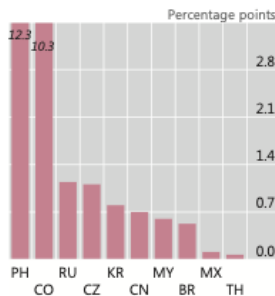
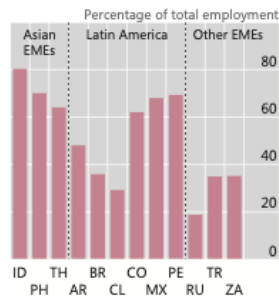
COVID-19 Timeline



Source: BIS Annual Economic Report (2020)

Unemployment Soars

Surge in jobless, short-time workers

Unemployment rate in EMEs, changes from end-2019⁴Widespread informal employment⁵

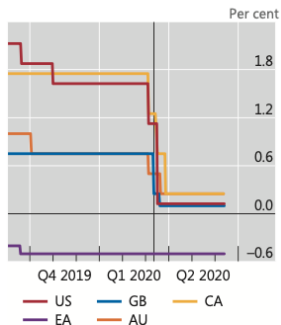
¹ Weekly initial jobless claims, cumulative since early March. ² Cumulative number of "Kurzarbeit" notifications, in terms of number of employees, since February 2020. ³ Cumulative number of "chômage partiel" applications, in terms of number of employees. ⁴ Data up to May 2020 or latest available, depending on country. ⁵ Data correspond to latest available data. According to ILO definition. For BR and MX, informal employment refers to workers not contributing to social security systems.

Sources: Inter-American Development Bank, Information System on Labor Markets and Social Security (SIMS); International Labour Organization; Datastream; national data; BIS calculations.

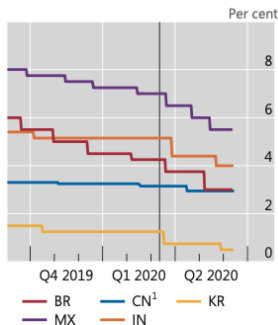
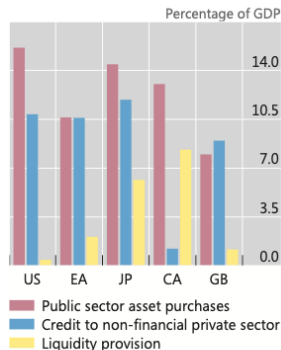
Source: BIS Annual Economic Report (2020)

Swift and Forceful Monetary Response

Policy rates: AEs



Policy rates: EMEs

Monetary policy responses²

The vertical lines in the left-hand and centre panels indicate 11 March 2020 (coronavirus outbreak declared a pandemic by the World Health Organization).

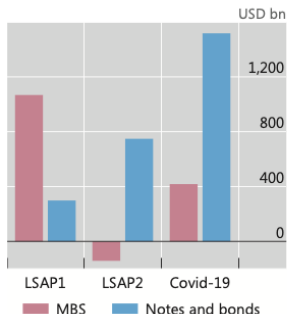
¹ Medium-term lending facility, one-year rate. ² Projected maximum support during March–December 2020, based on official announcements. See Cavallino and De Fiore (2020).

Sources: P Cavallino and F De Fiore, "Central banks' response to Covid-19 in advanced economies", *BIS Bulletin*, no 21, June 2020; Datastream; national data; BIS calculations.

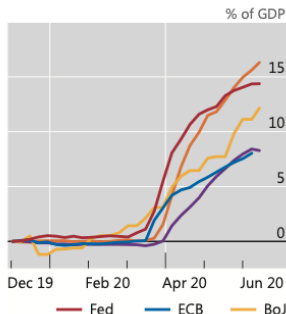
Source: BIS Annual Economic Report (2020)

Swift and Forceful Monetary Response

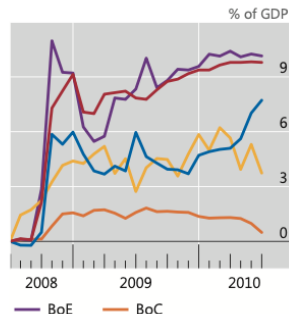
Federal Reserve asset purchases¹



Balance sheet growth: Covid-19²



Balance sheet growth: GFC²



¹ Difference in weekly holdings between the start and the end of the selected periods: LSAP1 = November 2008–March 2010; LSAP2 = November 2010–June 2011; Covid-19 = January 2020–latest available data. MBS = mortgage-backed securities. ² Cumulative changes in total balance sheet size since December 2019 (centre panel, weekly) and since June 2008 (right-hand panel, monthly). As a percentage of four-quarter moving sum of quarterly GDP; for April 2020 onwards, sum of Q2 2019–Q1 2020 GDP.

Sources: Bank of Canada; Bank of England; Board of Governors of the Federal Reserve System; Datastream; national data; BIS calculations.

Source: BIS Annual Economic Report (2020)

Global US dollar Funding Squeeze

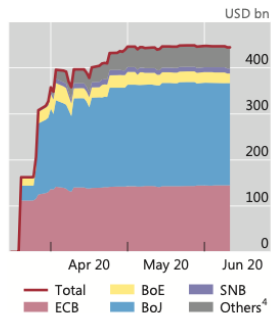
USD-denominated liabilities outside the US, by counterparty sector



Three-month FX swap basis against the US dollar³



Fed swap line outstanding amounts



The vertical line in the centre panel indicates 15 March 2020 (the announcement of the enhancement of swap lines between the Federal Reserve and five central banks).

¹ Non-US banks' US dollar-denominated liabilities excluding those booked by offices located in the United States. Excludes inter-office positions but includes liabilities to other (unaffiliated) banks. Positions reported by banks located in China and Russia start to be included as of Q4 2015. ² Sum across US dollar-denominated international debt securities, cross-border bank loans and local bank loans to non-banks located outside the US; this residency-based classification may include US non-banks outside the US. For details, see BIS, *BIS global liquidity indicators: methodology*, April 2019, Section 3.1. ³ Defined as the spread between three-month US dollar Libor and three-month FX swap-implied US dollar rates. ⁴ Please refer to the table in Box II.B for a list of central banks with swap lines at the Fed.

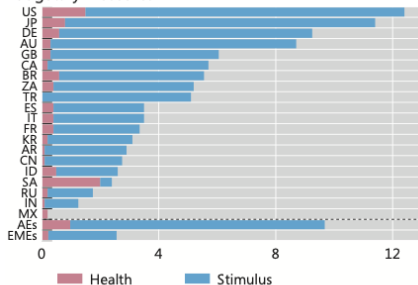
Source: BIS Annual Economic Report (2020)

Large-Scale Fiscal Packages

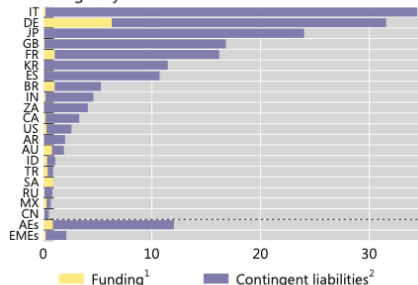
As a percentage of GDP

Graph I.16

Budgetary measures



Non-budgetary measures



Estimates focus on government discretionary measures that supplement existing automatic stabilisers, which differ across countries in their breadth and scope. AEs = AU, CA, DE, ES, FR, GB, IT, JP and US; EMEs = AR, BR, CN, ID, IN, KR, MX, RU, SA, TR and ZA. For regions, weighted averages based on GDP and PPP exchange rates.

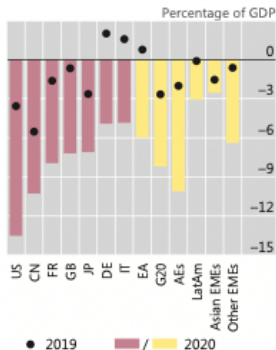
¹ Equity injections, asset purchases, loans and debt assumptions, including through extra-budgetary funds. ² Guarantees on loans and other contingent liabilities such as loans channelled through public financial agencies.

Sources: IMF, *Fiscal Monitor*, April 2020 and update June 2020; IMF, *World Economic Outlook*; BIS calculations.

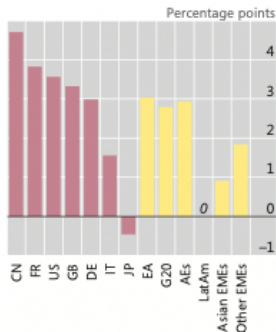
Source: BIS Annual Economic Report (2020)

Fiscal Deficits and Debt

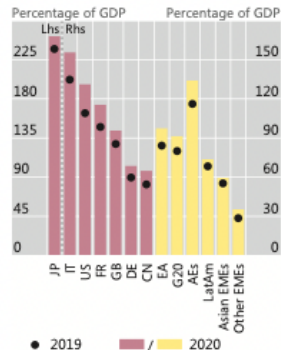
Massive widening fiscal deficits¹ expected for 2020



Primary deficits for 2021 projected to remain significantly above pre-Covid-19 shock average level²



Public debts likely to undergo steepest increase since GFC



For regions, weighted averages based on GDP and PPP exchange rates. AEs = AU, CA, DE, ES, FR, GB, IT, JP and US; LatAm = AR, BR, CL, CO, MX and PE; Asian EMEs = HK, ID, IN, KR, MY, PH and TH; Other EMEs = CZ, HU, PL, RU, SA, TR and ZA.

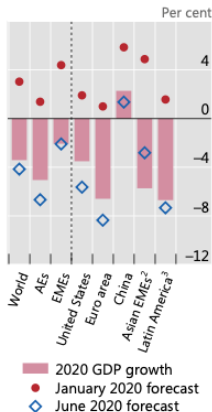
¹ Primary deficits. ² Difference between 2021 estimate and the average of 2016–19.

Sources: IMF, *World Economic Outlook*, April 2020; BIS calculations.

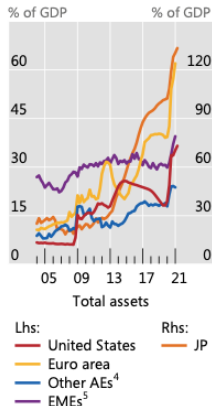
Source: BIS Annual Economic Report (2020)

Macroeconomic Policy Support Limited the Fallout

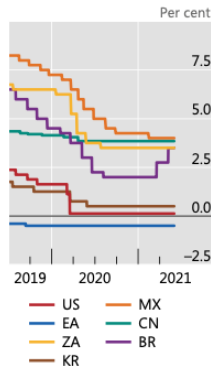
A large downturn, but not as severe as feared¹



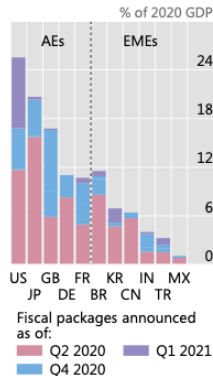
Central bank balance sheets expanded further



Policy rates steady in AEs, but rose in some EMEs



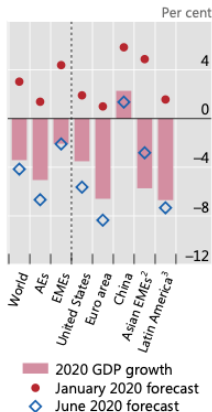
Large fiscal stimulus, particularly in AEs



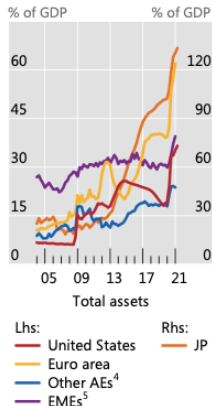
Source: BIS Annual Economic Report (2021)

Household Income and Firms' access to Credit

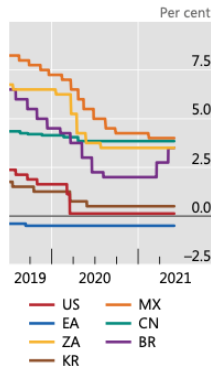
A large downturn, but not as severe as feared¹



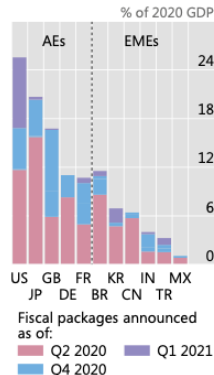
Central bank balance sheets expanded further



Policy rates steady in AEs, but rose in some EMEs



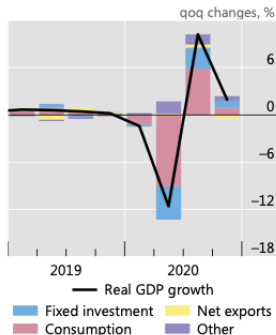
Large fiscal stimulus, particularly in AEs



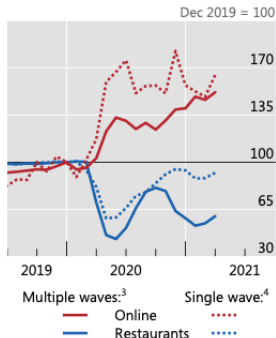
Source: BIS Annual Economic Report (2021)

Global Consumption and Trade Recovery

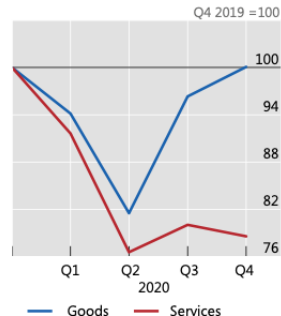
Global consumption bounced back¹



Services consumption returned when constraints eased, but online shopping persisted²



Global goods trade recovered quickly as services trade lagged



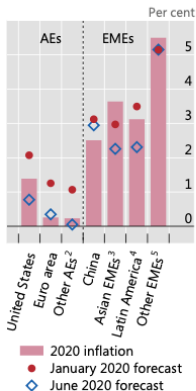
¹ Weighted average based on GDP and PPP exchange rates of 46 countries representing 71% of world GDP. ² Data up to March 2021. ³ Countries with multiple waves: CA, DE, ES, FR, GB, NL, SE and US. ⁴ Countries with a single wave: AU, NZ and SG.

Sources: OECD; Consensus Economics; national data; BIS calculations.

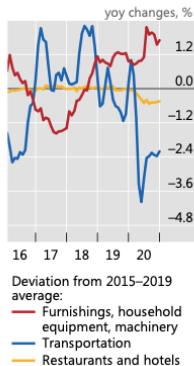
Source: BIS Annual Economic Report (2021)

Inflation Picked Up as Cost Pressures Mounted

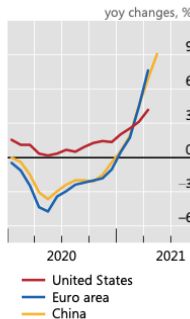
In 2020 inflation stayed low in AEs, but rose in some EMEs¹



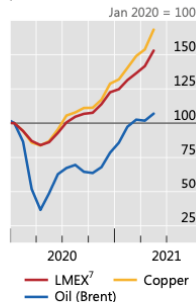
Prices grew more slowly in pandemic-affected sectors than in others⁶



Producer prices increased as the period progressed



After declining early in the pandemic, commodity prices soared



¹ Country groups calculated as weighted averages based on GDP and PPP exchange rates. ² AU, CA, CH, JP and SE. ³ HK, ID, IN, KR, MY, TH and SG. ⁴ BR, CO, CL, MX and PE. ⁵ PL, RU, SA, TR and ZA. ⁶ Simple average across 36 countries. ⁷ London Metal Exchange index, consisting of the prices of the six primary metals: copper, aluminium, lead, tin, zinc and nickel.

Source: BIS Annual Economic Report (2021)

Fiscal Policy Response to the Pandemic

This paper provides estimates of the size and determinants of the fiscal policy response to the COVID-19 pandemic across thirty advanced economies. In contrast to the fiscal response to financial crises, I find no evidence that fiscal space was an important determinant of the aggressiveness of pandemic fiscal packages. Focusing in on the US fiscal policy response, I discuss the policy implications of the unique features of a pandemic recession. I argue that the social insurance and public health components of the \$5.2 trillion US package, such as expanded unemployment insurance and government funding of vaccine development and distribution, were highly appropriate, whereas broad-based stimulus measures, such as the onetime payments to households, were not. Finally, I consider some of the longer-run consequences of the US fiscal policy actions. The aggressive fiscal expansion, along with extensive private saving during the pandemic, is likely to generate rapid growth over the next few years. The rise in the debt-to-GDP ratio, caused by both the policy response and the pandemic recession itself, could limit future fiscal action if anti-debt sentiment reemerges.

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