

Macroeconomic Features of the Pandemic

Governor's Council of Economic Advisors
August 18, 2020

Joseph M. Santos
Professor of Economics
Ness School of Management and Economics
South Dakota State University

Marketplaces

Creative disruptions, macroeconomic shocks, sectoral shifts, and demographic trends

Policy Spaces

Growth, financial stability, fiscal, foreign-exchange, monetary, and trade policies

Marketplaces

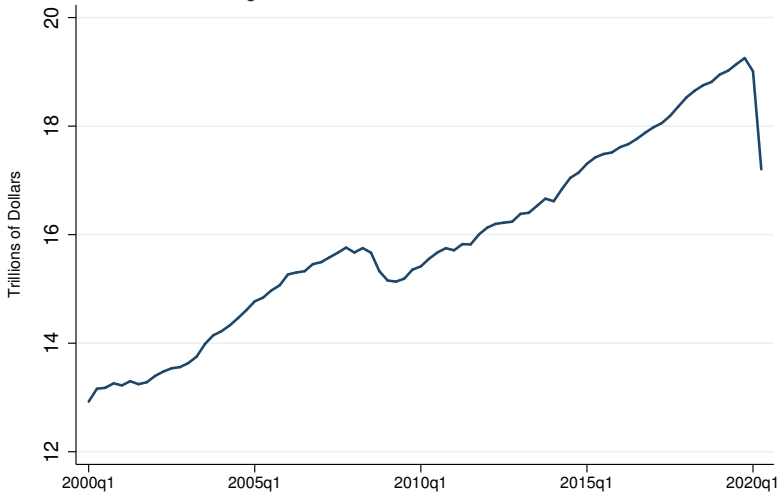
Creative disruptions, [macroeconomic shocks](#), [sectoral shifts](#), and demographic trends

Policy Spaces

Growth, financial stability, [fiscal](#), foreign-exchange, [monetary](#), and trade policies

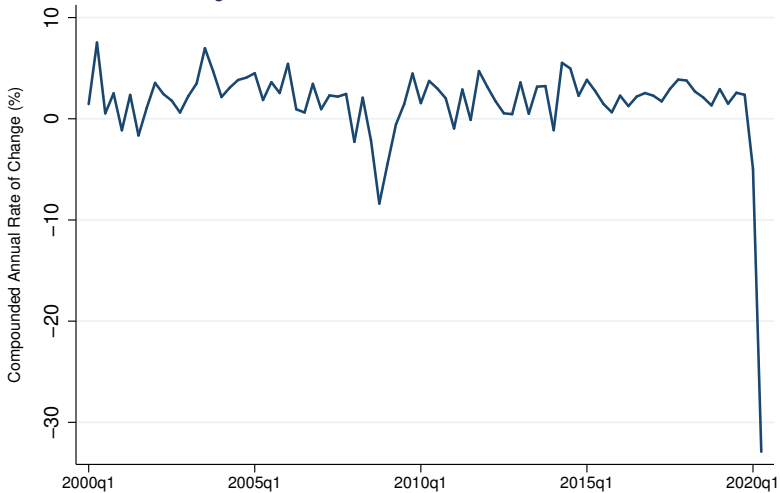
Macroeconomic Shocks

Figure 1: Gross Domestic Product, in Levels



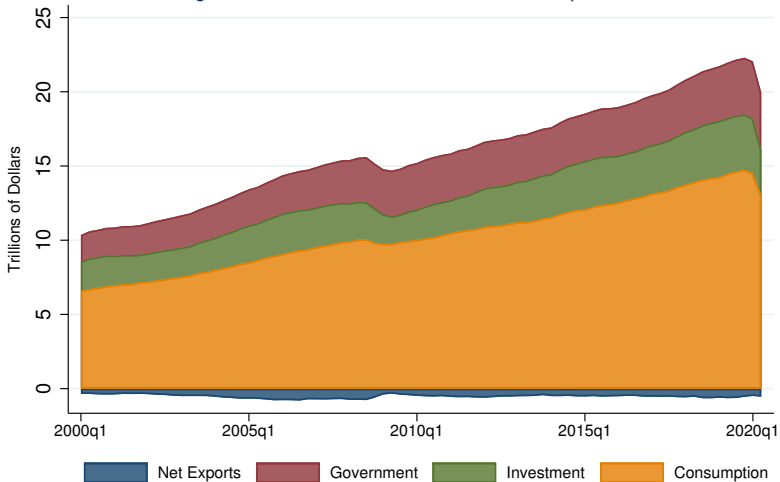
Source: Federal Reserve Bank of St. Louis (FRED).

Figure 2: Gross Domestic Product, in Growth Rates



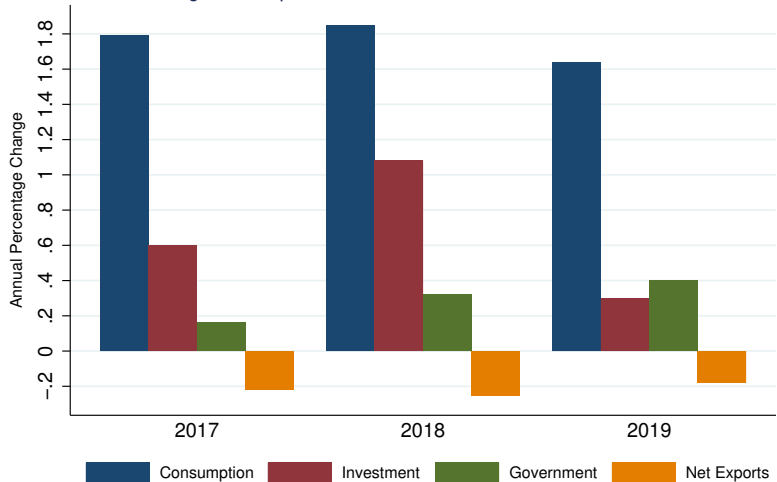
Source: Federal Reserve Bank of St. Louis (FRED).

Figure 3: U.S. Gross Domestic Product – Expenditures



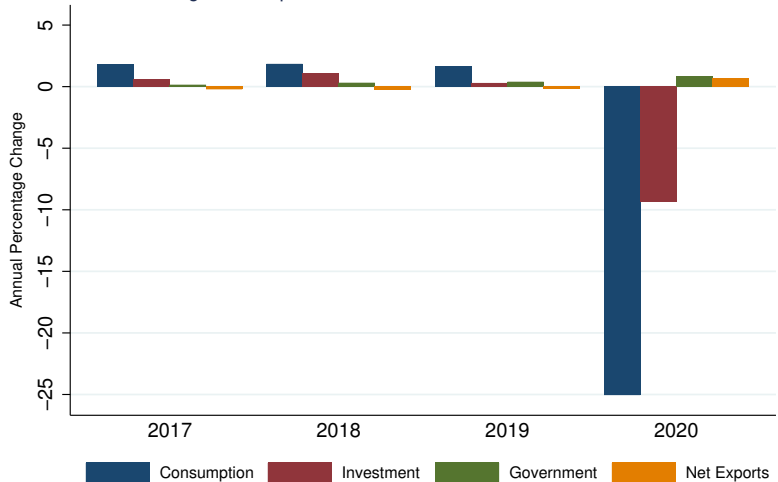
Source: Federal Reserve Bank of St. Louis (FRED).

Figure 4: Expenditure Contributions to Real GDP Growth



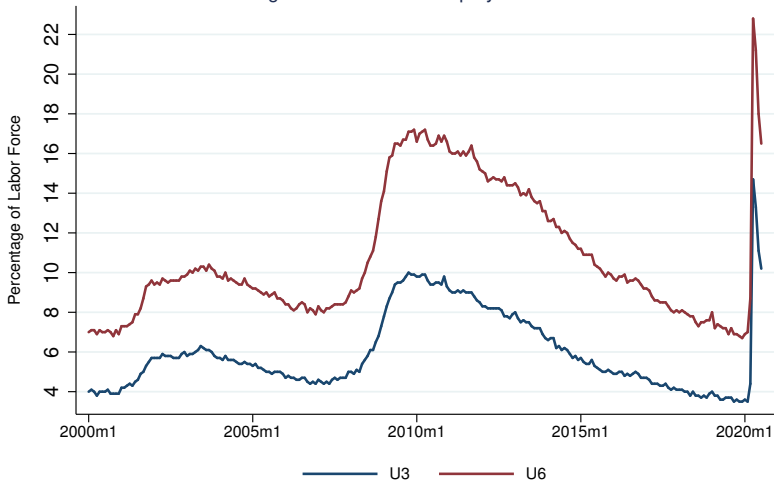
Source: Bureau of Economic Analysis.

Figure 5: Expenditure Contributions to Real GDP Growth



Source: Bureau of Economic Analysis; 2020 data reflect second quarter annualized growth.

Figure 6: Civilian Unemployment Rates



Source: Federal Reserve Bank of St. Louis (FRED).

Figure 7: Labor-Force Participation Rate



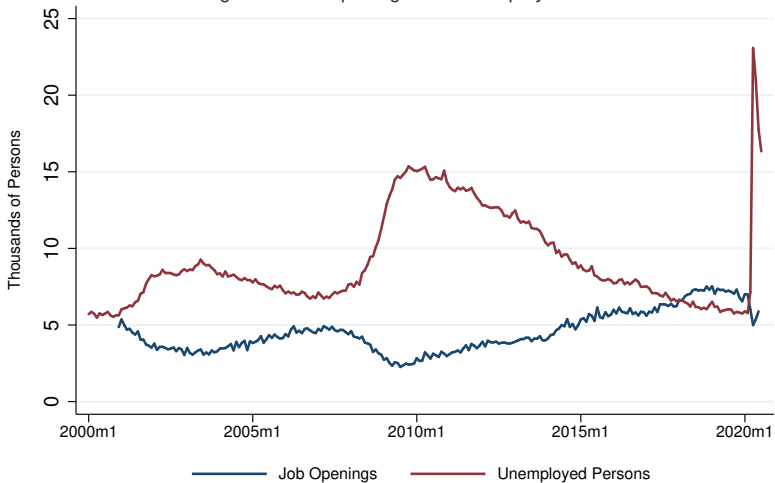
Source: Federal Reserve Bank of St. Louis (FRED).

Figure 8: Median Duration of Unemployment Spells



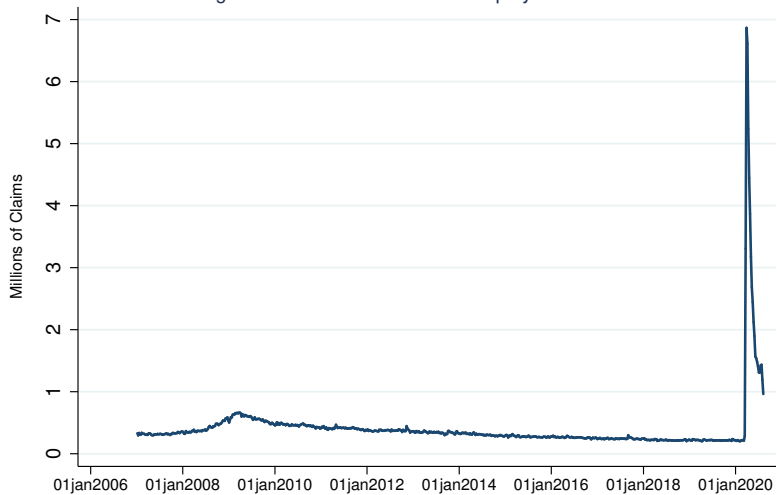
Source: Federal Reserve Bank of St. Louis (FRED).

Figure 9: Job Openings and Unemployed Persons



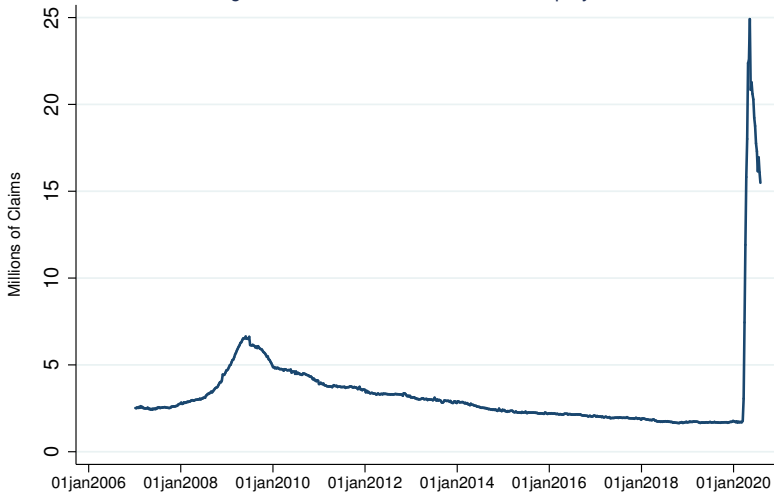
Source: Federal Reserve Bank of St. Louis (FRED).

Figure 10: Initial Claims for Unemployment Benefits



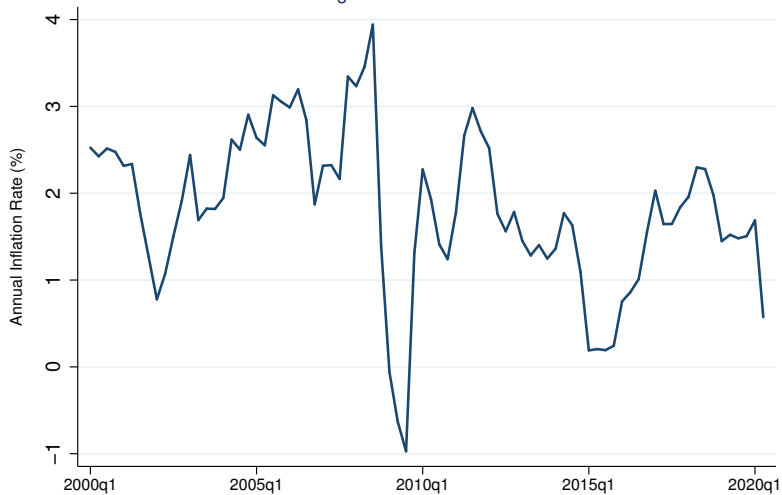
Source: Federal Reserve Bank of St. Louis (FRED).

Figure 11: Continued Claims for Unemployment



Source: Federal Reserve Bank of St. Louis (FRED).

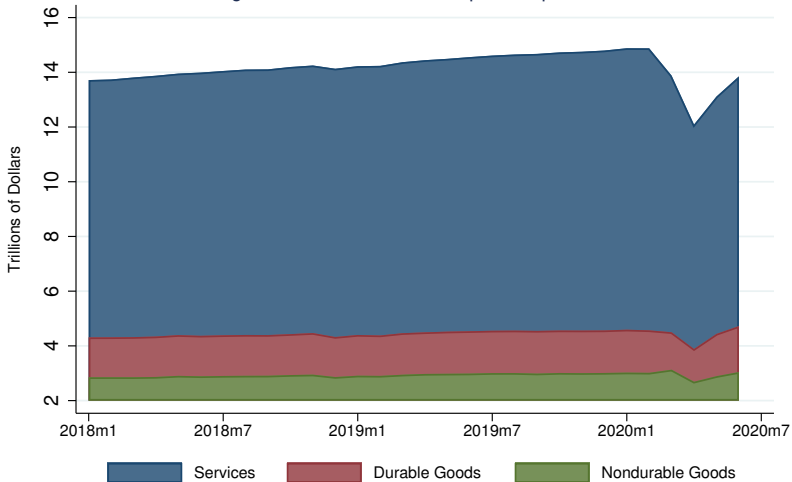
Figure 12: Inflation Rate



Source: Same-quarter-growth in personal consumption expenditures price index; Federal Reserve Bank of St. Louis (FRED).

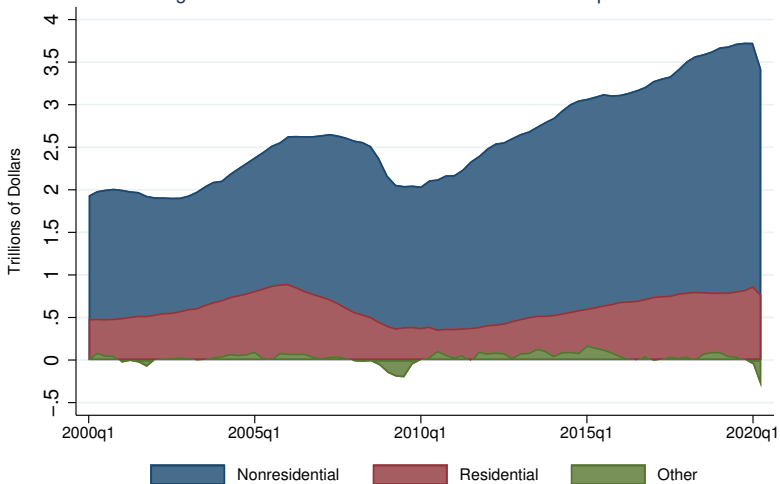
Sectoral Shifts

Figure 13: Personal Consumption Expenditures



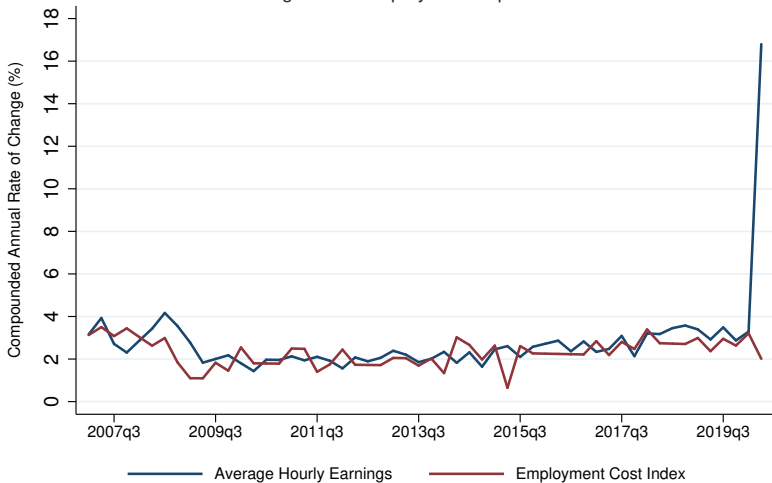
Source: Federal Reserve Bank of St. Louis (FRED).

Figure 14: Gross Private Domestic Investment Expenditures



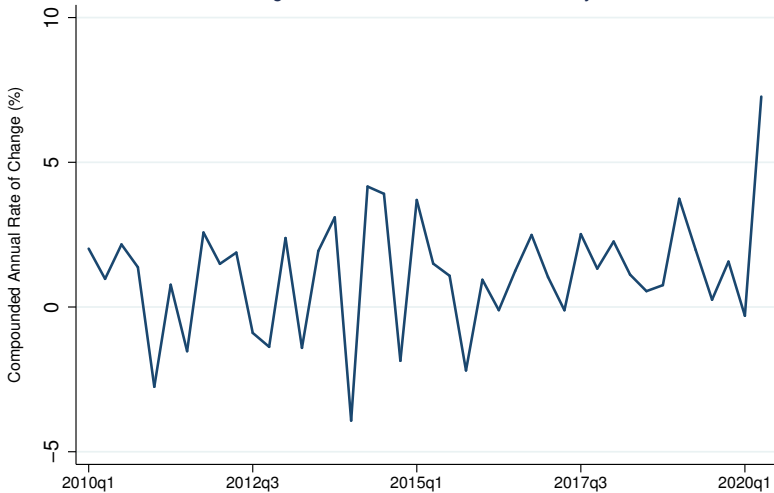
Source: Federal Reserve Bank of St. Louis (FRED).

Figure 15: Employee Compensation



Source: Federal Reserve Bank of St. Louis (FRED).

Figure 16: Nonfarm Labor Productivity



Source: Federal Reserve Bank of St. Louis (FRED).

Monetary Policy

Monetary Policy

R Star Is Born

Taylor Rule

$$ffr_{target} = f \left(inflation\ gap, output\ gap, r^* \right)$$

Where ffr_{target} is the target federal funds rate.

Taylor Rule

$$ffr_{target} = f \left(\underset{+}{inflation\ gap}, output\ gap, r^* \right)$$

Where ffr_{target} is the target federal funds rate.

Taylor Rule

$$ffr_{target} = f \left(inflation\ gap, \underset{+}{output\ gap}, r^* \right)$$

Where ffr_{target} is the target federal funds rate.

Taylor Rule

$$ffr_{target} = f \left(inflation\ gap, output\ gap, r_{+}^{*} \right)$$

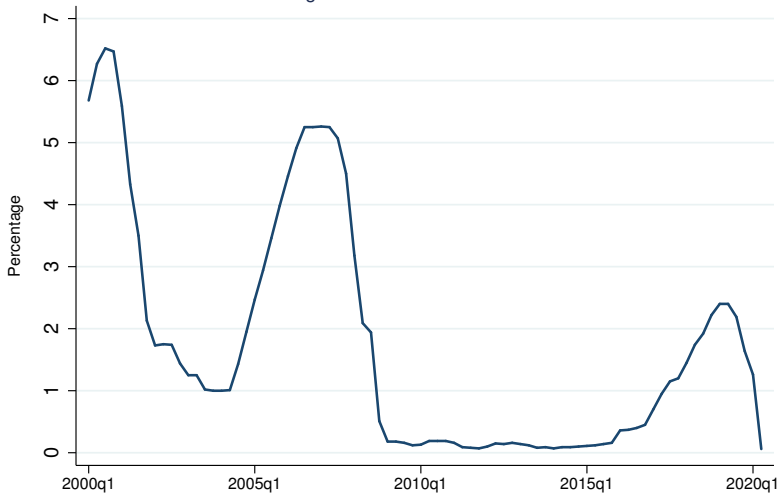
Where ffr_{target} is the target federal funds rate.

Taylor Rule

$$ffr_{target} = f \left(inflation\ gap, output\ gap, r^* \right)$$

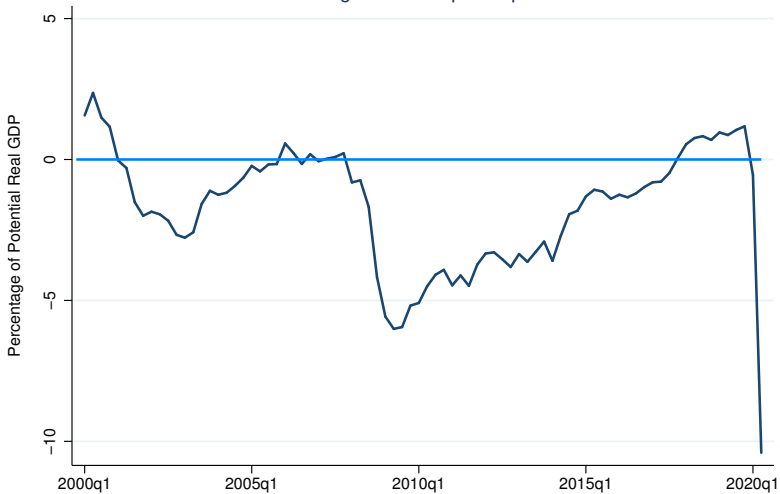
Where ffr_{target} is the target federal funds rate.

Figure 17: Federal Funds Rate



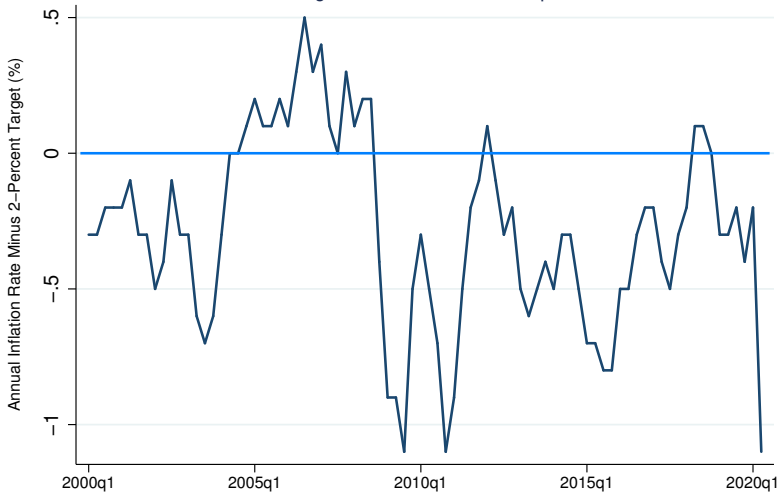
Source: Federal Reserve Bank of St. Louis (FRED).

Figure 18: Output Gap



Source: Author's calculations and Federal Reserve Bank of St. Louis (FRED).

Figure 19: U.S. Inflation Gap



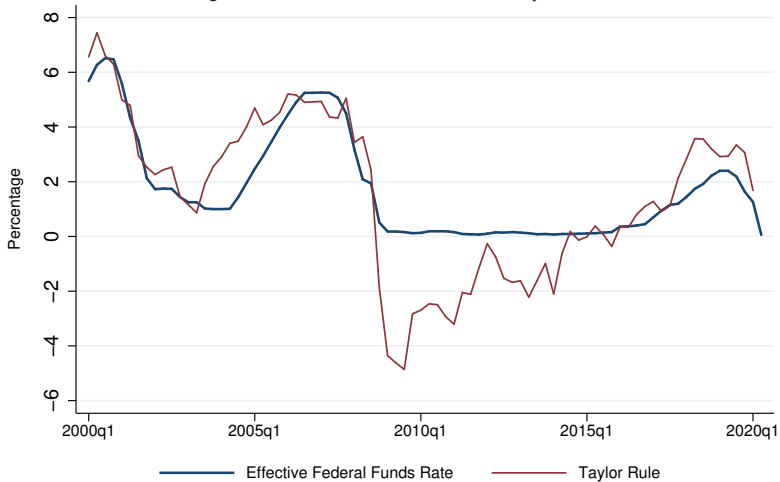
Source: Author's calculations and Federal Reserve Bank of St. Louis (FRED).

Figure 20: Natural Rate of Interest (R-Star)



Source: Holston, Laubach, and Williams (2016).

Figure 21: Federal Funds Rate and Taylor Rule Rate



Source: Author's calculations, FRED and Holston, Laubach, and Williams (2016); Taylor rule data until Q1 of 2020.

Monetary Policy

Monetary Policy

The Big Easing

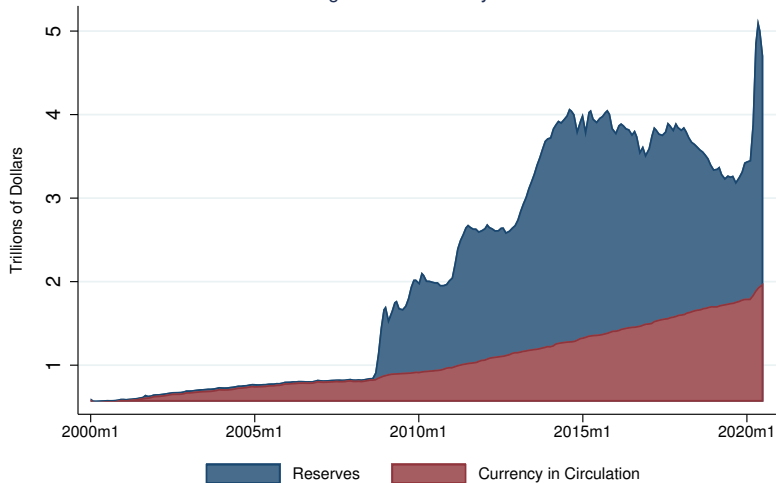
Federal Reserve System

Assets	Liabilities and Equity
<p data-bbox="432 547 614 578">Credit Easing</p>	<p data-bbox="771 547 1030 578">Quantitative Easing</p>

Federal Reserve System

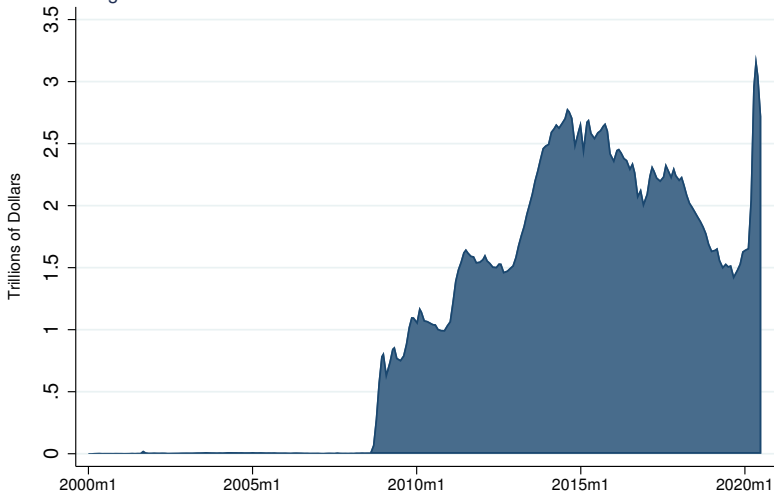
Assets	Liabilities and Equity
Credit Easing	Monetary Base Quantitative Easing

Figure 22: Monetary Base



Source: Federal Reserve Bank of St. Louis (FRED).

Figure 23: Total Reserve Balances Maintained with Federal Reserve Banks



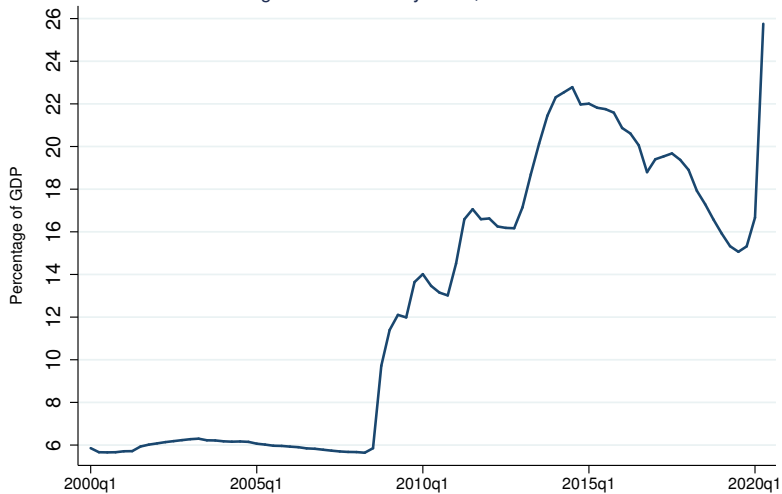
Source: Federal Reserve Bank of St. Louis (FRED).

Table 1: Unconventional Monetary Policy Tools

Policy Tool	Description
Quantitative Easing	Purchase Treasury and agency MBS
Commercial Paper Funding Facility*	Purchase eligible commercial paper
Primary Dealer Credit Facility	Lend to primary dealers
Money Market Mutual Fund Liquidity Facility*	Lend to money-market mutual funds
Primary Corporate Credit Facility*	Purchase eligible corporate bonds, primary market
Secondary Corporate Credit Facility*	Purchase eligible corporate bonds, secondary market
Term Asset-Backed Securities Loan Facility*	Lend against asset-backed securities
Main Street Loan Facilities*	Lend to small and mid-sized businesses
Municipal Liquidity Facility*	Purchase eligible short-term municipal notes
Paycheck Protection Liquidity Facility	Lend against Paycheck Protection Program-loans
Swap Lines and Repurchase Facility	Lend to foreign central banks

Asterisk denotes U.S. Treasury capitalization. Source: Wells Fargo Securities.

Figure 24: Monetary Base, Share of GDP



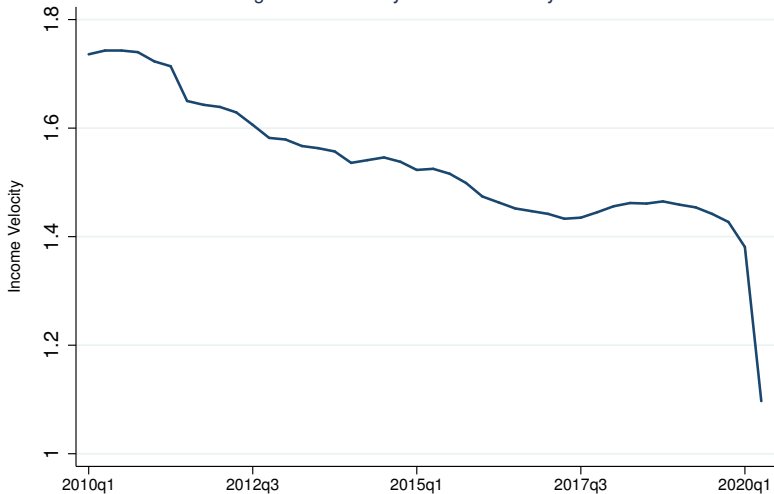
Source: Federal Reserve Bank of St. Louis (FRED).

Figure 25: Money Stock



Source: Federal Reserve Bank of St. Louis (FRED).

Figure 26: Velocity of the M2 Money Stock



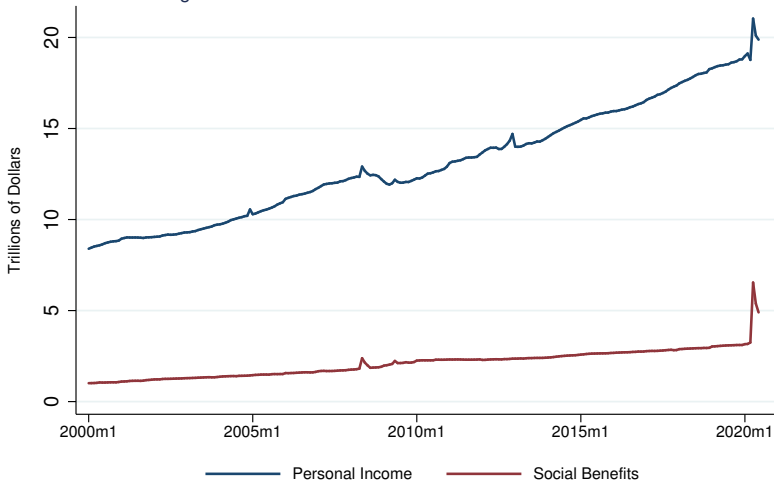
Source: Federal Reserve Bank of St. Louis (FRED).

Fiscal Policy

Fiscal Policy

Extra Credit

Figure 27: Personal Income and Social Benefits to Persons



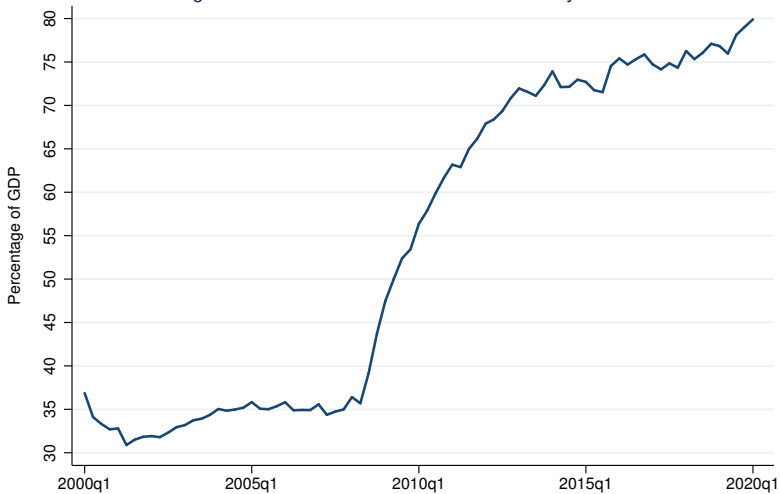
Source: Federal Reserve Bank of St. Louis (FRED).

Figure 28: Personal Saving Rate



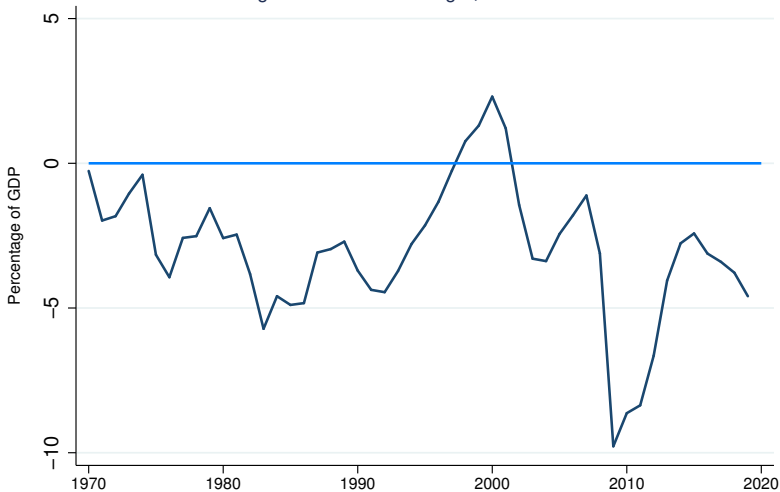
Source: Federal Reserve Bank of St. Louis (FRED).

Figure 29: Federal Government Debt Held by the Public



Source: Federal Reserve Bank of St. Louis (FRED).

Figure 30: Federal Budget, Share of GDP



Source: Federal Reserve Bank of St. Louis (FRED).

Some Debt Arithmetic

$debt \uparrow \Leftrightarrow deficit \uparrow$

$debt \uparrow \Leftrightarrow interest\ rates \uparrow$

$debt \uparrow \Leftrightarrow GDP \downarrow$

Where *debt* and *deficit* are relative to GDP.

Some Debt Arithmetic

debt ↑ ⇔ *deficit* ↑

debt ↑ ⇔ *interest rates* ↑

debt ↑ ⇔ *GDP* ↓

Where *debt* and *deficit* are relative to GDP.

Some Debt Arithmetic

debt ↑ ⇔ *deficit* ↑

debt ↑ ⇔ *interest rates* ↑

debt ↑ ⇔ *GDP* ↓

Where *debt* and *deficit* are relative to GDP.

Some Debt Arithmetic

$debt \uparrow \Leftrightarrow deficit \uparrow$

$debt \uparrow \Leftrightarrow interest\ rates \uparrow$

$debt \uparrow \Leftrightarrow GDP \downarrow$

Where *debt* and *deficit* are relative to GDP.

Table 2: Stabilizing Budget-to-GDP Ratios

Assume the federal government debt-to-GDP ratio is **0.80**.

GDP Growth	Interest Rate	Stabilizing Budget	Actual Budget
6.0%	1.0%	-4.0%	-4.59%
	3.0%	-2.4%	-4.59%
	5.0%	-0.8%	-4.59%
3.0%	3.0%	0.0%	-4.59%
	5.0%	1.6%	-4.59%
	7.0%	3.2%	-4.59%

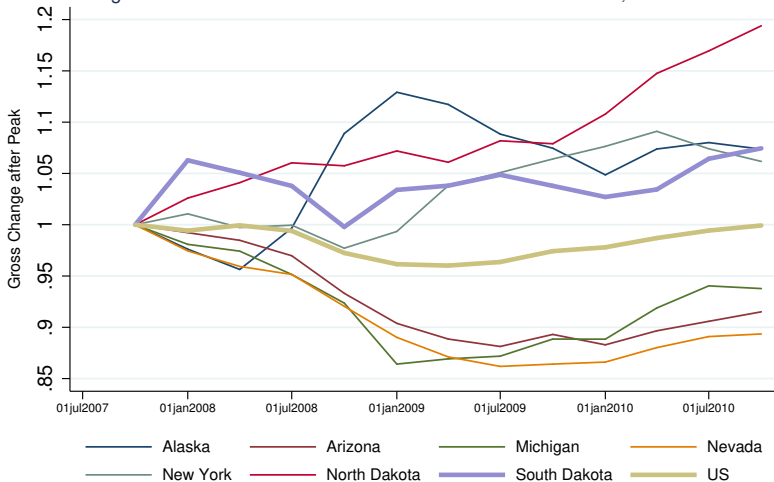
Sources: Federal Reserve Bank of St. Louis FRED and author's calculations.

Fiscal Policy

Fiscal Policy

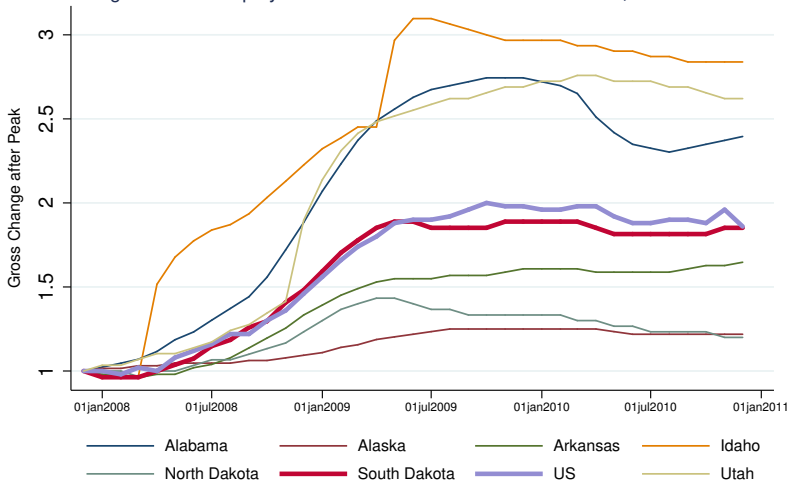
States' Plights

Figure 31: Gross State Product after December–2007 Peak, Select States



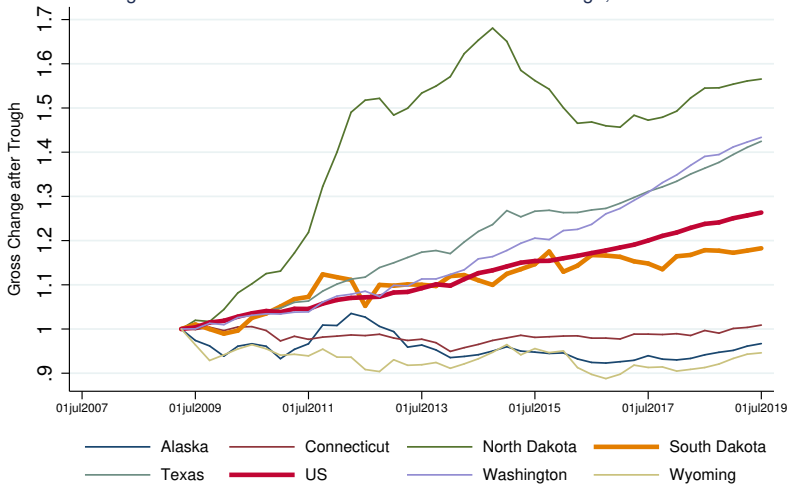
Source: Author's calculations and Federal Reserve Bank of St. Louis (FRED).

Figure 32: Unemployment Rate after December–2007 Peak, Select States



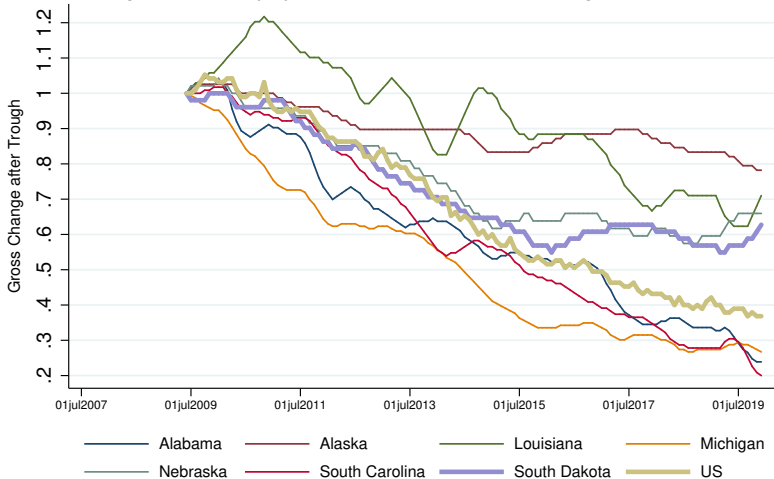
Source: Author's calculations and Federal Reserve Bank of St. Louis (FRED).

Figure 33: Gross State Product after June–2009 Trough, Select States



Source: Author's calculations and Federal Reserve Bank of St. Louis (FRED).

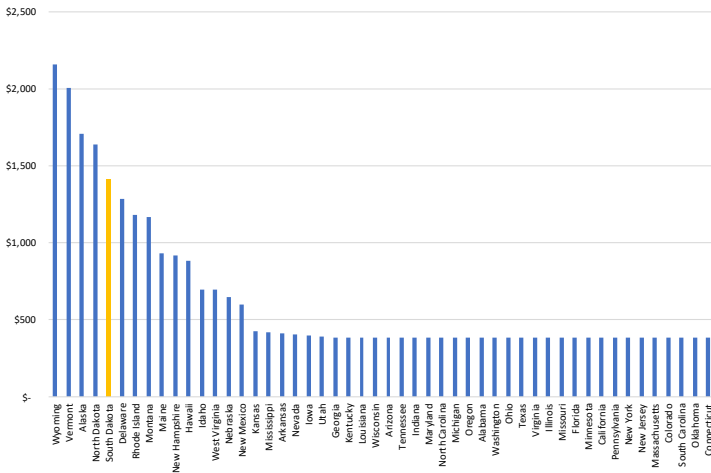
Figure 34: Unemployment Rate after June–2009 Trough, Select States



Source: Author's calculations and Federal Reserve Bank of St. Louis (FRED).

Figure 35: CARES Act State Aid per Capita

Source: U.S. Treasury and FRED; population counts based on 2019 data.)



Thank you.