

LECTURE 24  
MACROECONOMICS OF THE COVID-19 PANDEMIC  
April 23, 2020

- I. OVERVIEW
- II. SHORT-RUN MACROECONOMIC IMPACT
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Economics 2  
Spring 2020

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## LECTURE 24

# Macroeconomics of the Covid-19 Pandemic



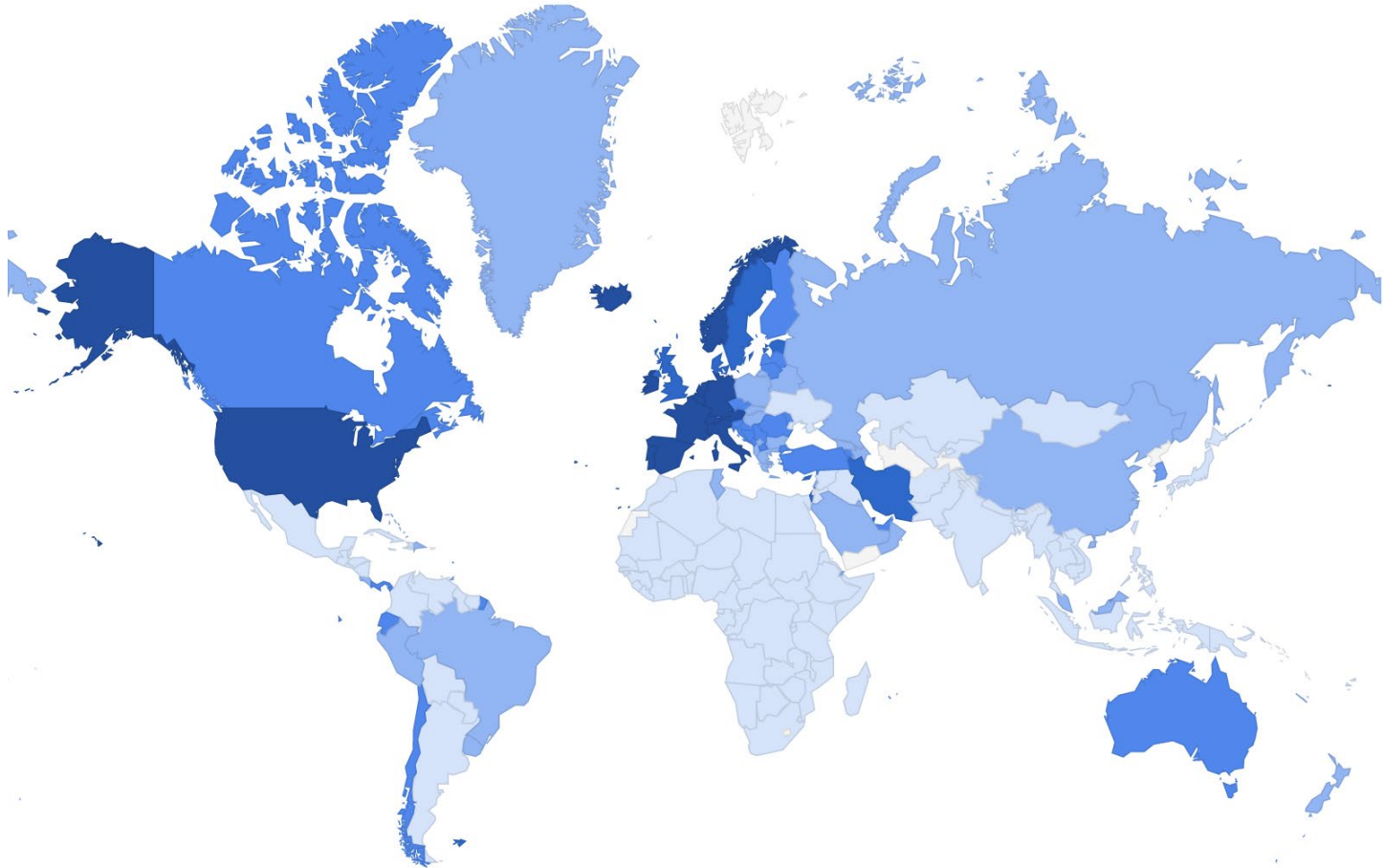
April 23, 2020

# Announcements

- We have handed out Problem Set 6.
  - It is due at 2 p.m. PDT on Thursday, April 30.
- Early this week, we emailed people who we felt were at risk of not passing the course.

# I. OVERVIEW

# The Covid-19 Pandemic



Source: Wikipedia.

# Topics

- The current situation.
- Some longer-run worries.
- The fiscal policy response.
- The monetary policy response.
- Possible impacts over the very long run.

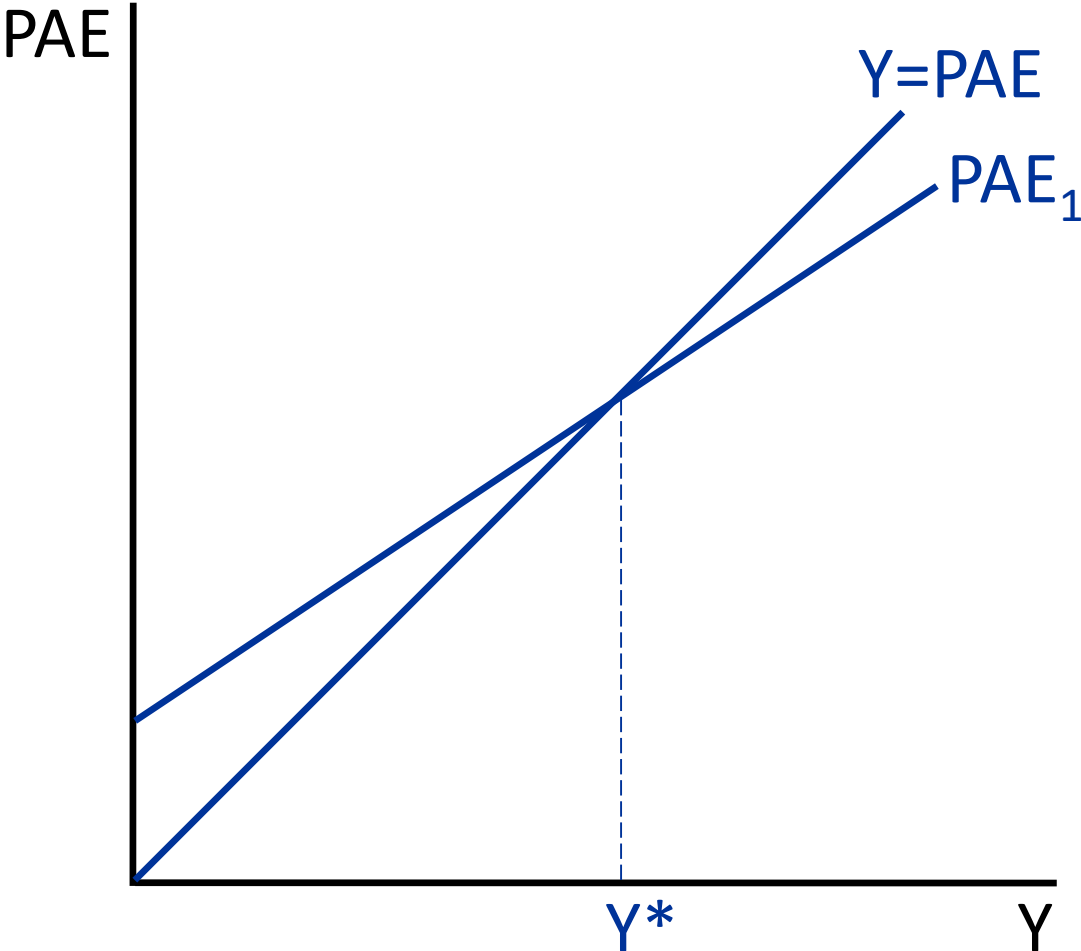
# Readings

- “How are Small Businesses Adjusting to Covid-19? Early Evidence from a Survey”
- “The Impact of Covid-19 on Gender Equality”

## II. SHORT-RUN MACROECONOMIC IMPACT



# The Keynesian Cross

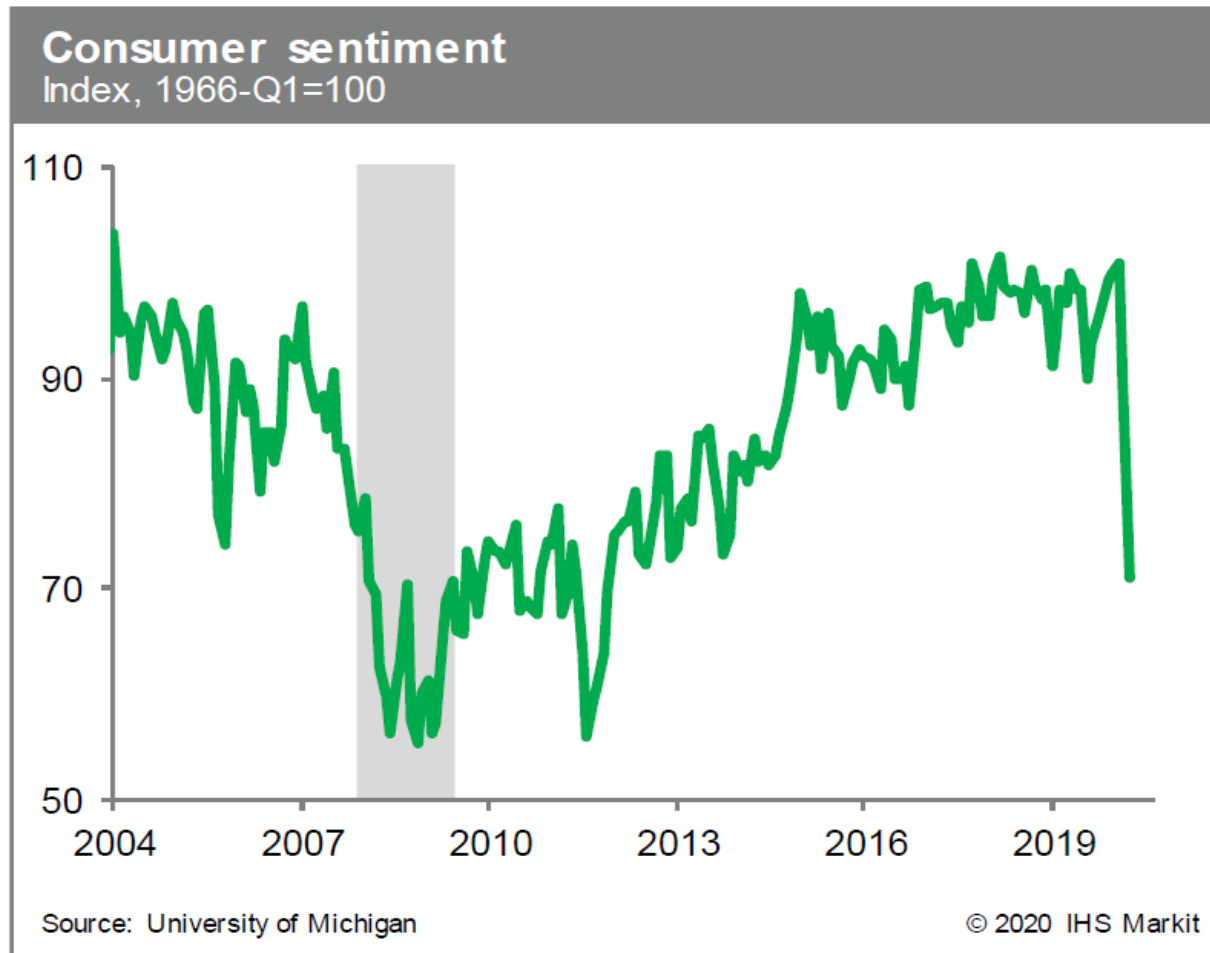


We began the pandemic with output roughly at  $Y^*$ .

# Pandemic Has Surely Reduced PAE

- Fear and health concerns have led people to reduce consumption.
- The drop in stock prices has reduced wealth and lowered autonomous consumption.
- Uncertainty and fear have reduced firms' desire to invest.

# Consumer Confidence



Source: University of Michigan and IHS Markit.

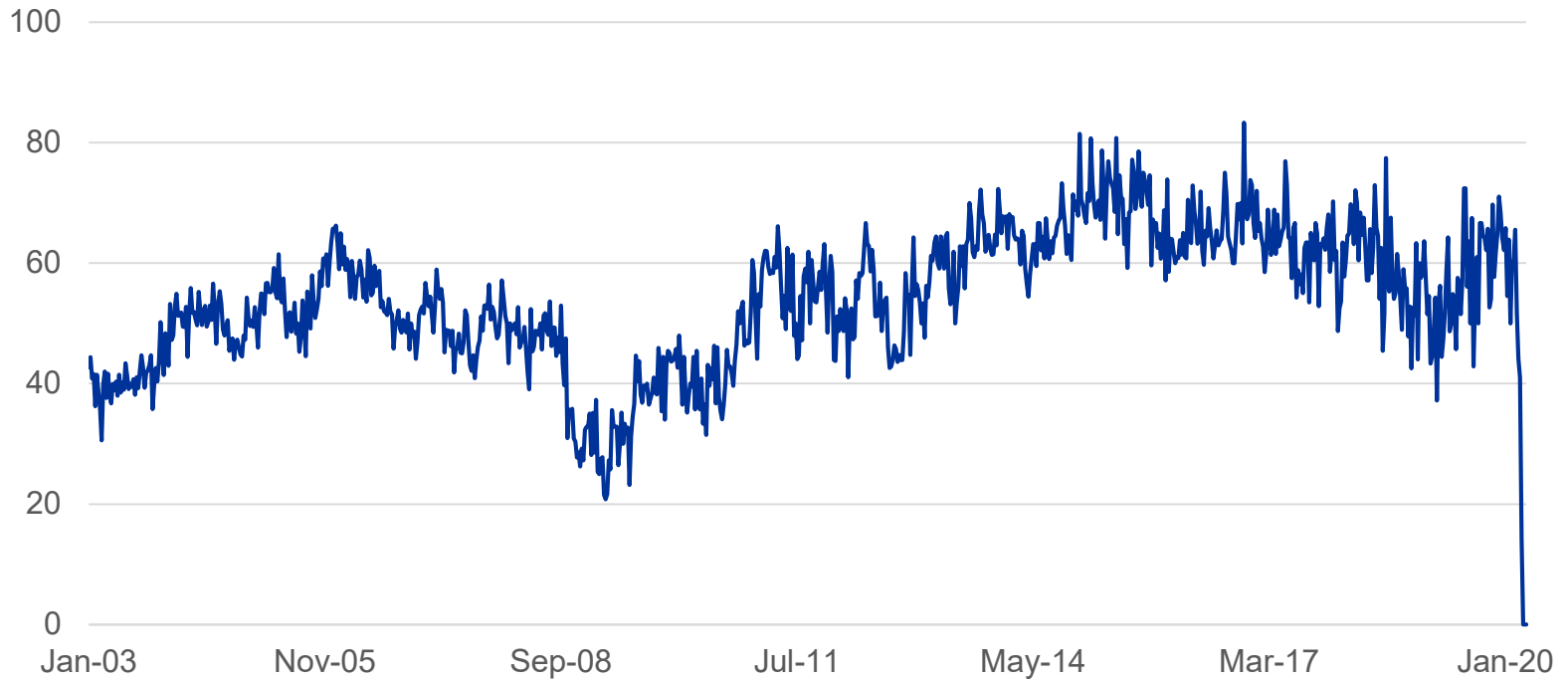
# S&P 500 Stock Price Index



Source: Macrotrends.

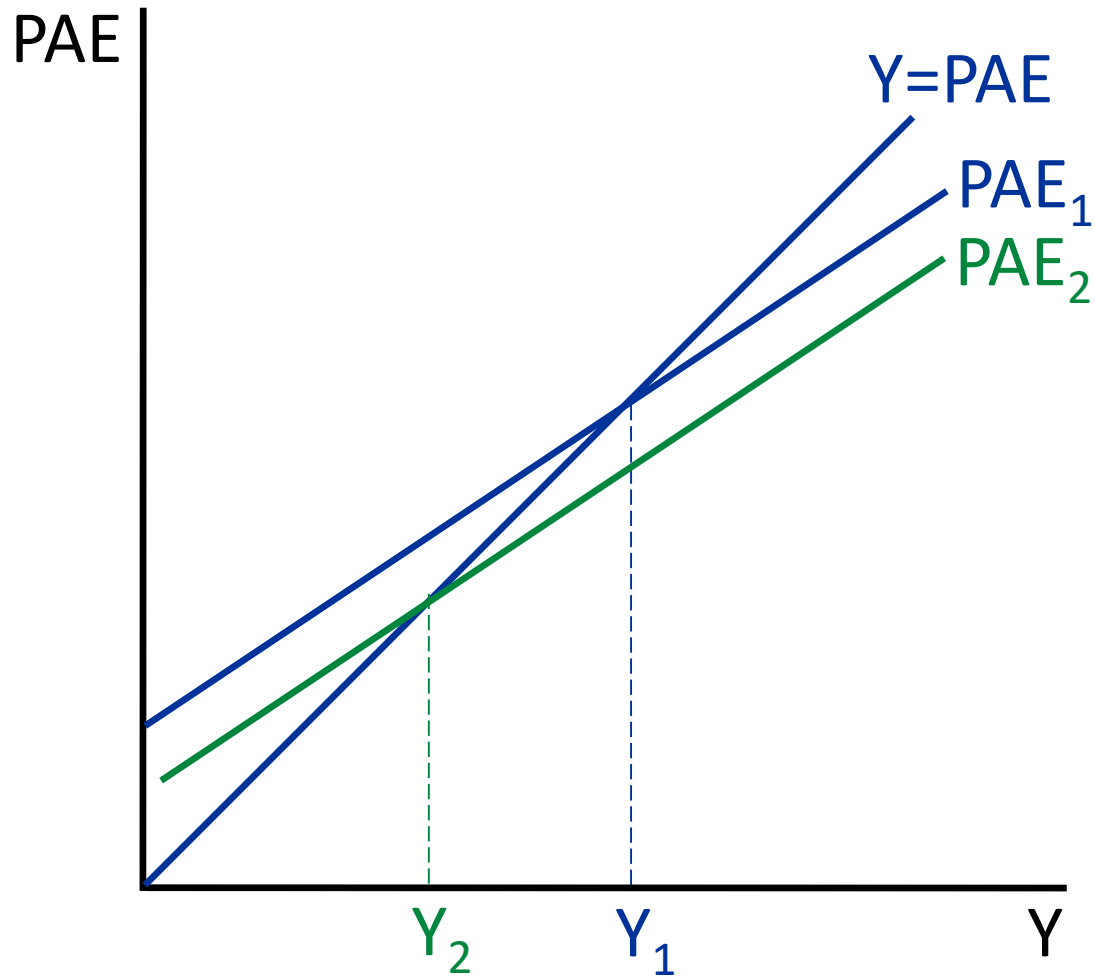
# Business Investment Collapses

% of Respondents Increasing Equipment and Software Investment



Source: Moody Analytics

# Covid-19 and the Keynesian Cross



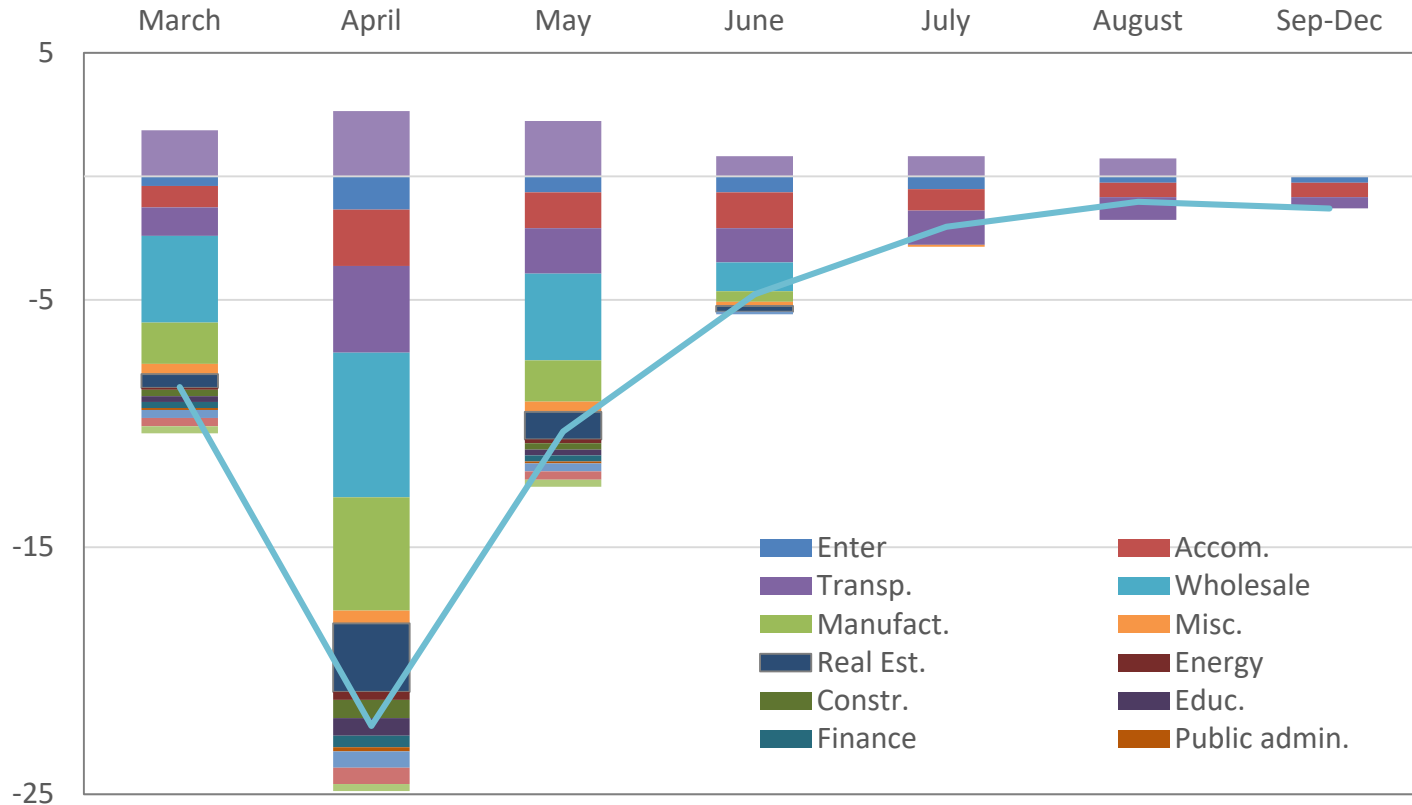
Downward shift in PAE will reduce output.

# Stay-at-Home Orders Have Limited Production

- Many businesses have not been allowed to operate for health reasons.
- Particularly true in hospitality, retail, services.
- We can think of this as preventing the economy from reaching its short-run equilibrium (if the intersection of PAE and 45-degree line is above  $Y^S$ ).
- Firms aren't able to respond to unintended declines in inventory investment.

# Business Lockdowns Hit Hard

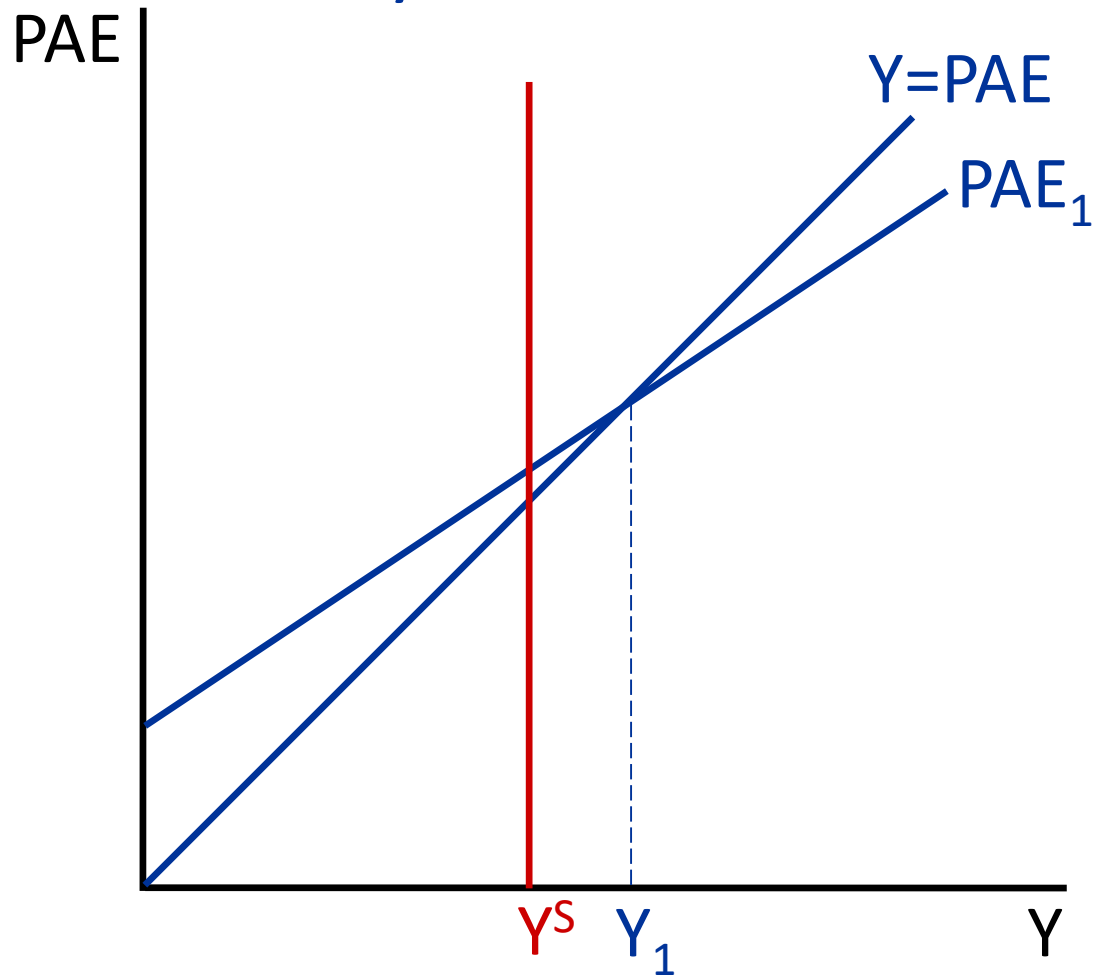
Deviation from Typical GDP, Annual ppts, by Industry 2020



Source: Moody's Analytics

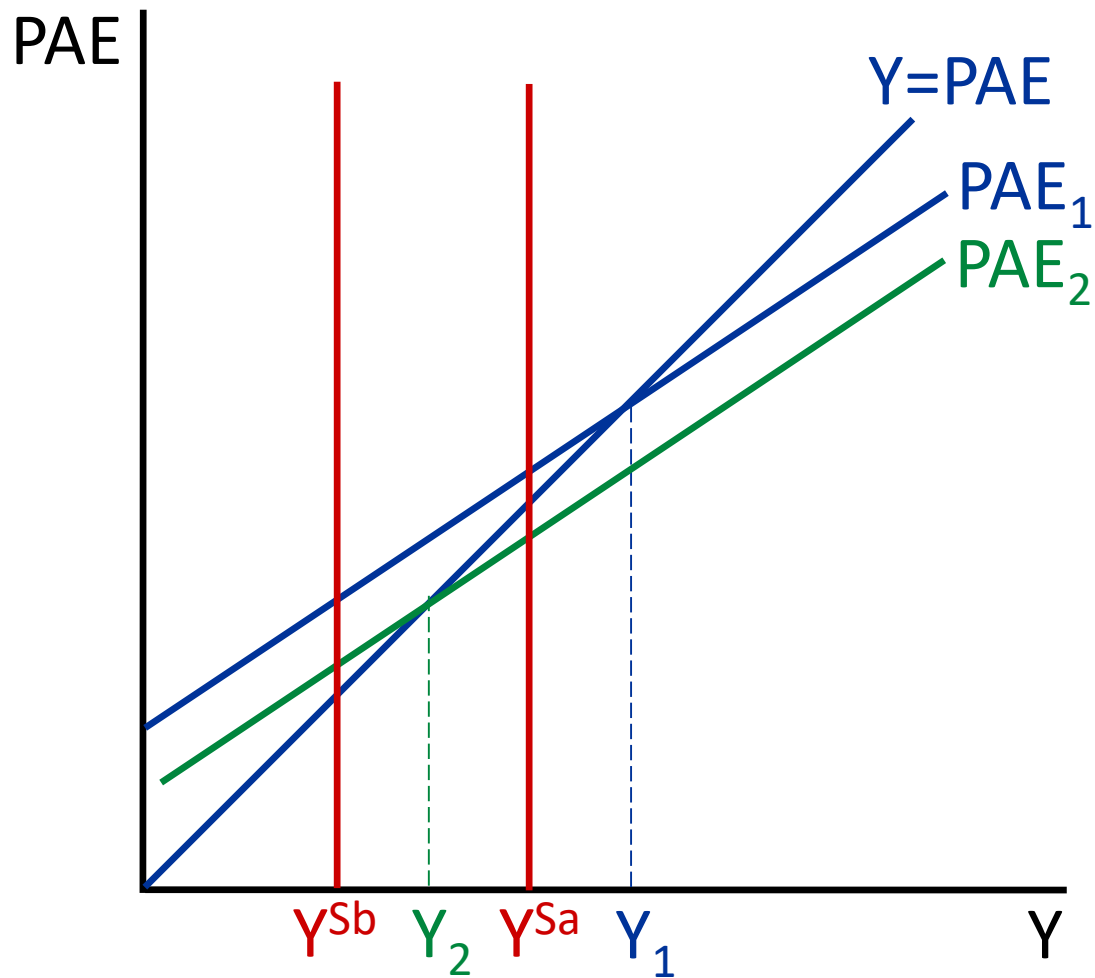


# Incorporating Supply Restrictions in the Keynesian Cross



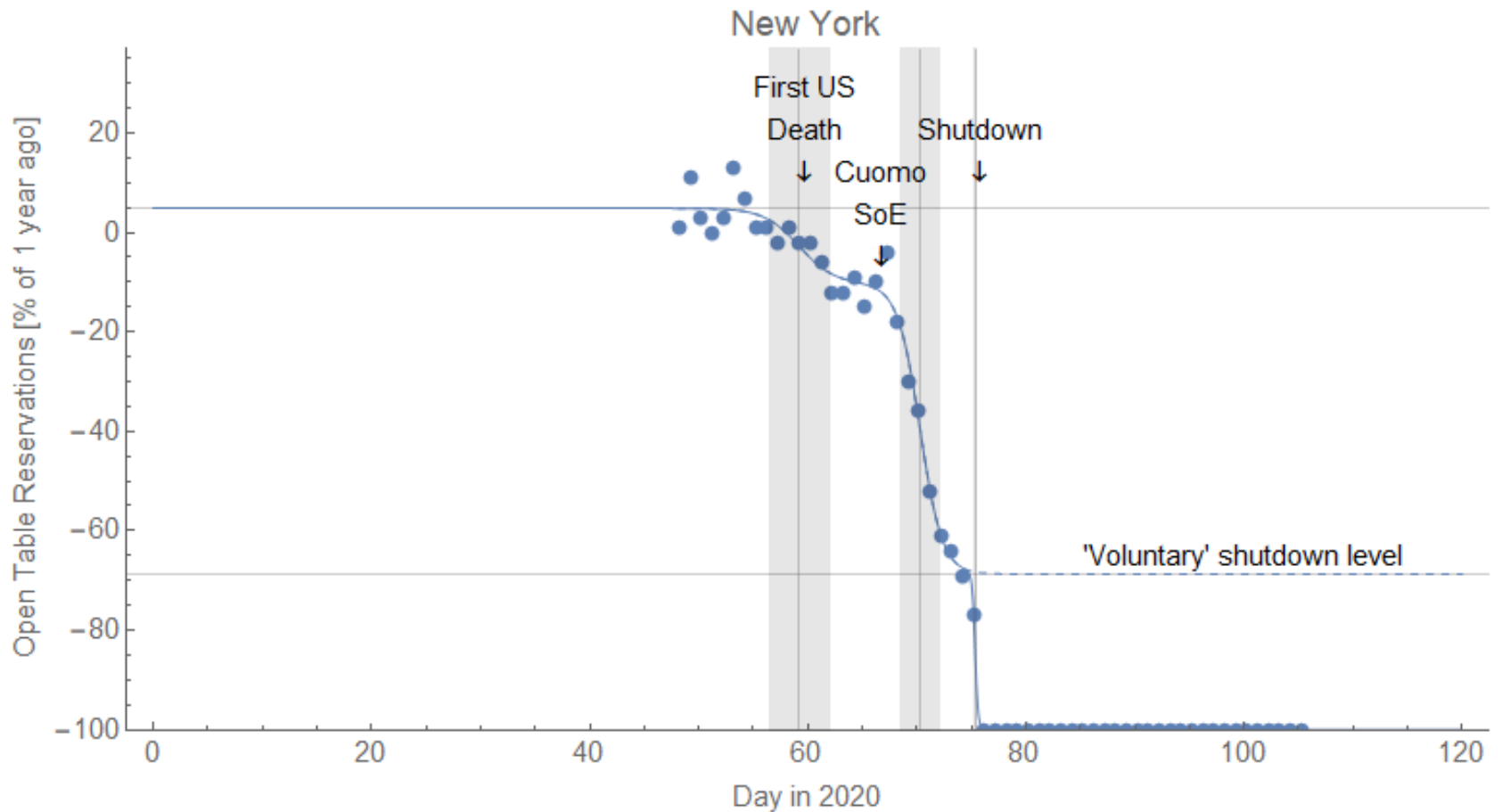
The stay-at-home orders are reducing output by government decree ( $Y^S$  is the amount of production allowed).

# Are the Supply Restrictions Binding?



Is  $Y^S$  below or above the new short-run equilibrium level of  $Y$  ( $Y_2$ )?

# OpenTable Reservations in NYC



Source: Jason Smith, Twitter.

# Issues Affecting Small Businesses

Table 4: BREAKDOWN OF ISSUES AFFECTING BUSINESSES

Business status	N total	N answering	Supply Chain	Employee Health	Demand/Orders
Currently open	2,752	2,198	30.29	49.82	66.16
Temp. closed	2,117	1,783	35.58	59.83	83.31
Perm. closed	100	85	37.87	60.85	86.13
Total	4,969	4,066	34.58	56.83	78.53

Source: Bartik et al., “How Are Small Businesses Adjusting To Covid-19?”

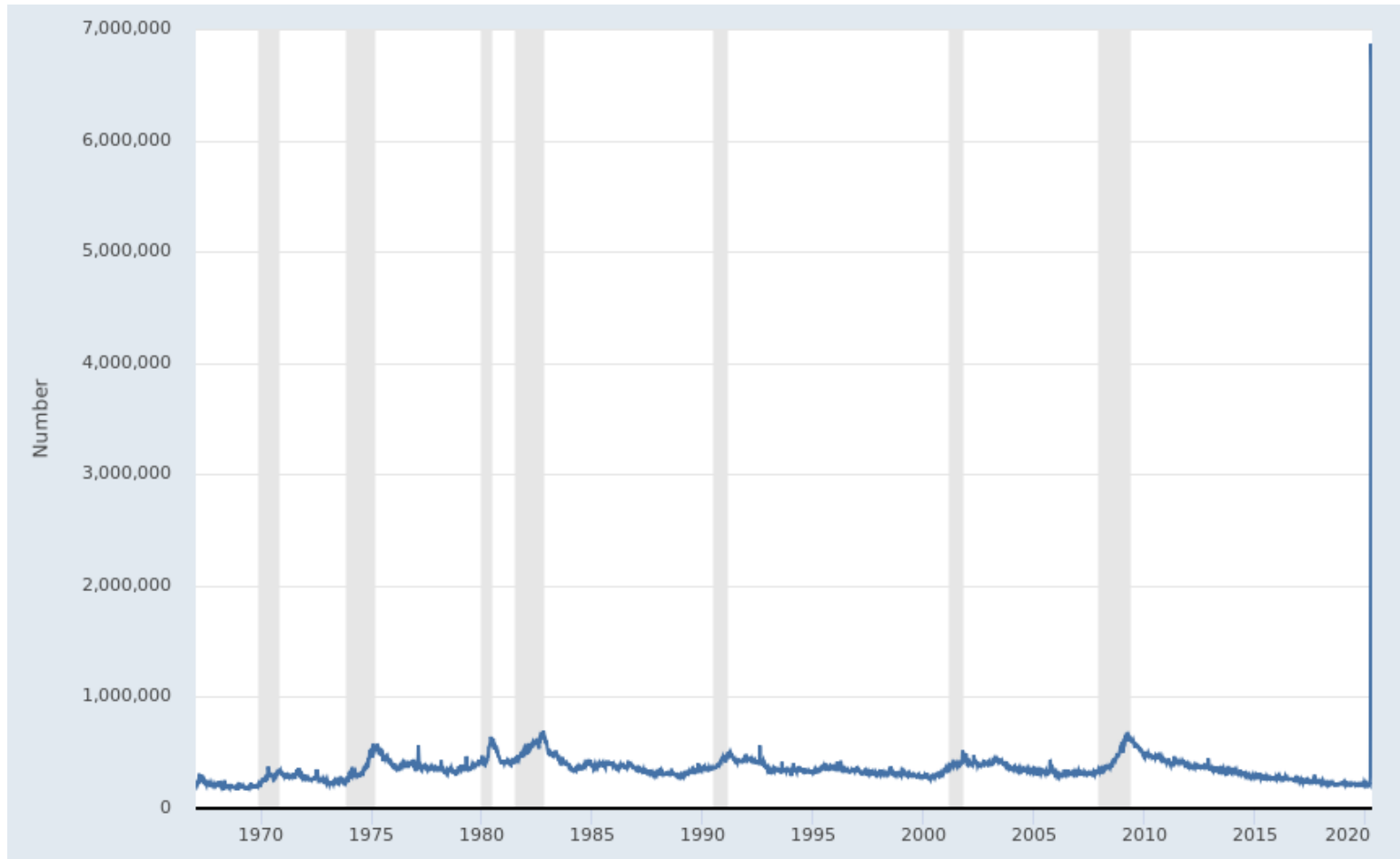
# Effects of the Supply Restrictions

- Surely having some effect.
- But, scattered evidence suggests that fall in PAE may be the major source of the fall in output.
- Supply restrictions may have affected the composition of what is produced.

# Short-Run Outcomes

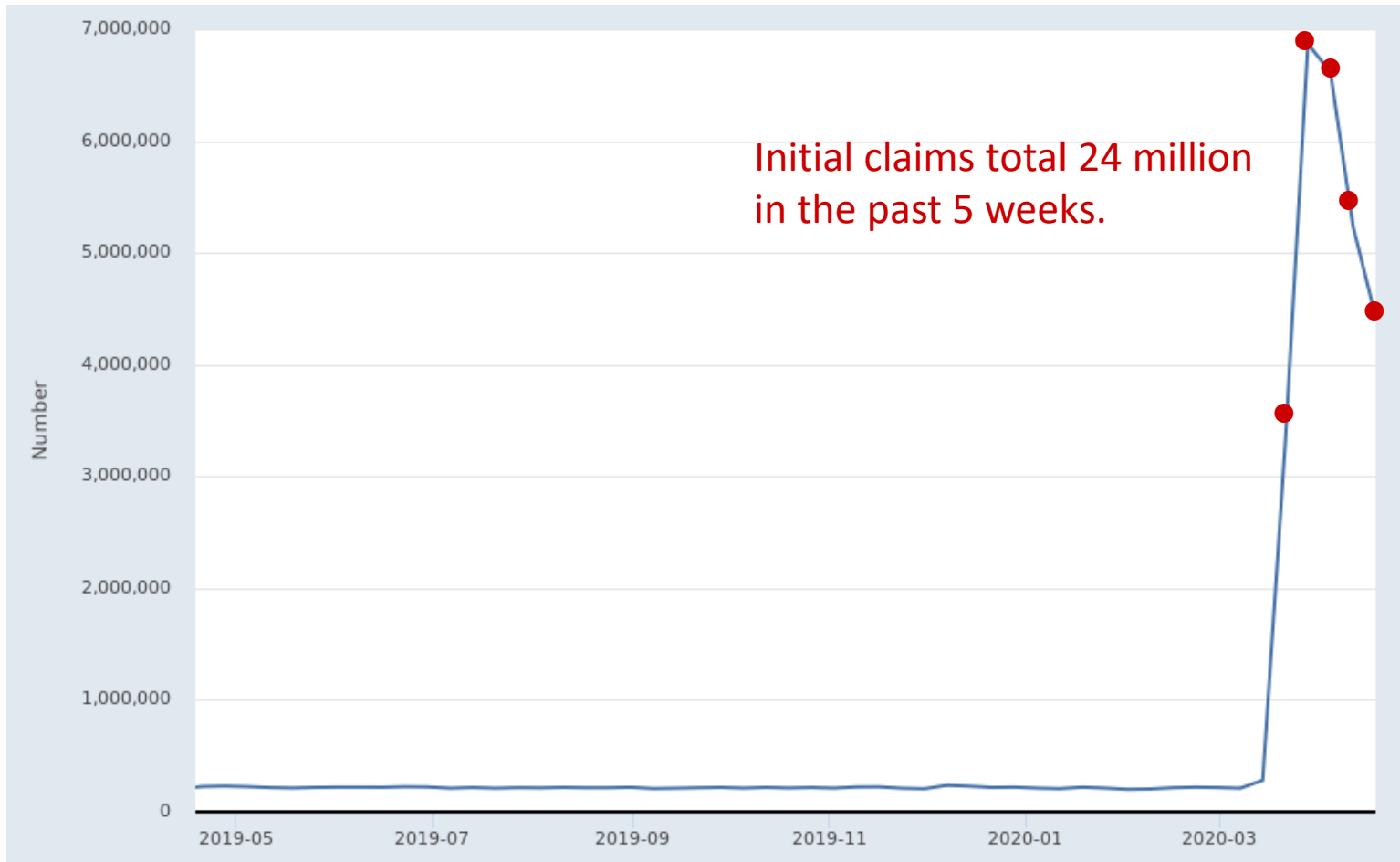
- Unemployment is skyrocketing.
- Small businesses are closing and laying off workers.
- GDP is projected to plummet.
- Unlike previous recessions, women may be more affected than men.

# Initial Claims for Unemployment Insurance



Source: Federal Reserve Bank of St. Louis, FRED.

# Initial Claims for Unemployment Insurance



Source: Federal Reserve Bank of St. Louis, FRED.



# Small Business Closures by Industry

Table 3: SUMMARY MEASURES BY INDUSTRY

	Currently Closed		Exp Closed December		Weeks COVID Will Last		Current v Jan Employment	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
All Retailers, except Grocery	.522	.5	.441	.497	14.1	9.59	.5	.42
Arts and entertainment	.713	.453	.423	.495	17.3	11.12	.4	.46
Banking/finance	.192	.395	.25	.434	16	10.88	.79	.35
Construction and related	.324	.468	.383	.487	14.3	10.23	.66	.4
Health care and related	.445	.498	.29	.454	15	10.4	.69	.37
Other	.397	.489	.349	.477	16.6	11.16	.7	.41
Personal Services	.86	.348	.387	.488	11.7	8.24	.35	.4
Professional Services	.218	.413	.292	.456	15.7	10.55	.79	.41
Real Estate	.381	.487	.302	.461	15.6	11.31	.68	.42
Restaurants and related	.543	.5	.536	.5	13.3	9.03	.25	.37
Tourism/Lodging	.615	.488	.442	.498	16	9.83	.3	.34
Total	.446	.497	.366	.482	15.38	10.57	.6	.45
N	4969	.	4069	.	4170	.	4362	.

Source: Bartik et al., “How Are Small Businesses Adjusting To Covid-19?”



IHS Markit™

Current Quarter GDP Tracking Sheet

**April 21, 2020**

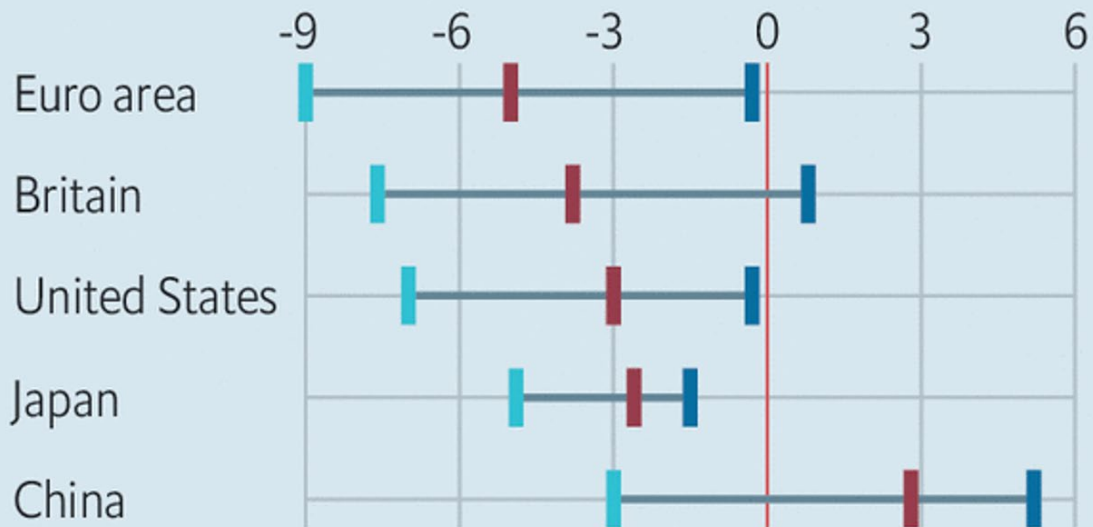
**Q1-2020 GDP Tracking -3.0%; Q2-2020 GDP Tracking -27.4%**

## Doom and gloom

Economists' forecasts\* for GDP, 2020

% change on a year earlier

■ Low   ■ Median   ■ High



Sources: *The Economist*; 18 investment banks and economics consultancies

\*Made in March 2020

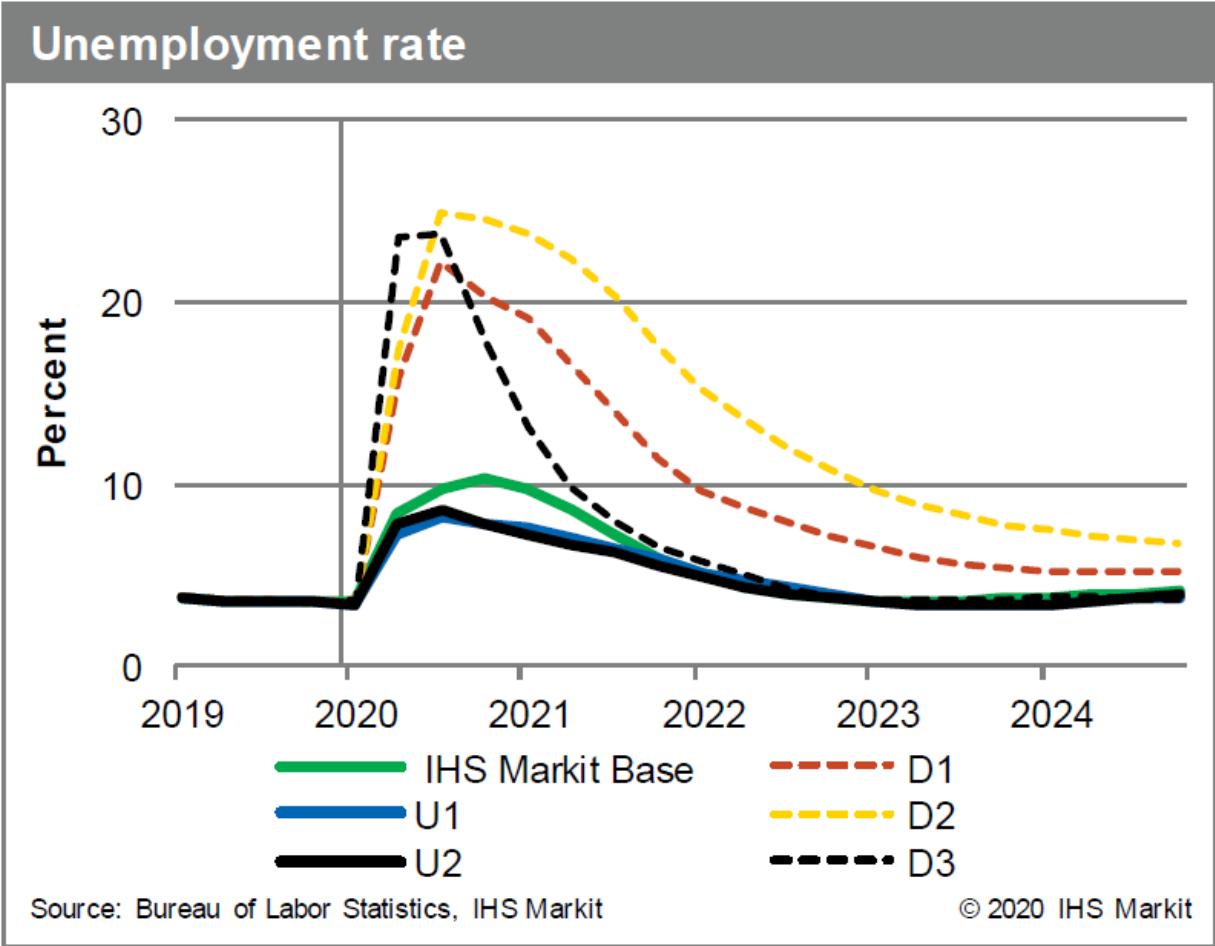
Table 2: Labor Force Across “Critical” and “Telecommutable” Occupations.

Occupation	Able to TC	Effective Annual TC	Employed Men	Employed Women	Critical Occupation
Transportation and Material Moving	3%	1	10%	2%	✓
Food Preparation and Serving	4%	2	4%	6%	
Building and Grounds Cleaning and Maintenance	4%	4	4%	3%	
Production	4%	4	8%	3%	
Healthcare Support	8%	13	1%	4%	✓
Construction	10%	4	8%	0%	
Farming, Fishing, and Forestry	11%	1	1%	0%	✓
Installation, Maintenance, and Repair	11%	10	6%	0%	✓
Extraction	13%	1	0%	0%	
Personal Care and Service	13%	21	2%	6%	
Protective Service	14%	4	3%	1%	✓
Healthcare Practitioners and Technicians	16%	17	3%	10%	✓
Technicians	18%	3	0%	0%	
Office and Administrative Support	26%	24	7%	19%	
Sales and Related	33%	35	10%	10%	
Education, Training, and Library	37%	36	3%	10%	
Community and Social Services	46%	46	1%	2%	
Life, physical, and social science	54%	24	1%	1%	
Arts, Design, Entertainment, Sports, and Media	57%	45	2%	2%	
Management,business, science, and arts	63%	44	13%	9%	
Legal	64%	35	1%	1%	
Business operations specialists	66%	60	2%	3%	
Architecture and engineering	67%	36	3%	1%	
Financial specialists	68%	37	2%	3%	
Computer and Mathematical	78%	66	4%	2%	

Source: Alon, et al., “The Impact of Covid-19 on Gender Equality.”

### III. LONGER-RUN WORRIES

# Range of Forecasts for the Unemployment Rate



Source: IHS Markit

## Near-term effects may linger.

- Could happen two ways.
- If lockdown is the constraint on output, failure to control the virus could require leaving the lockdown in place for an extended period.
- If PAE is the constraint, even if lockdown is lifted, output may not recover.

# CDC/FEMA Preconditions for Reopening

- Incidence of infection is “genuinely low.”
- A “well functioning” monitoring system capable of “promptly detecting any increase in incidence” of infection.
- A public health system that is “reacting robustly” to all cases of covid-19 and has surge capacity to react to an increase in cases.
- A health system that has enough inpatient beds and staffing to rapidly scale up and deal with a surge in cases.



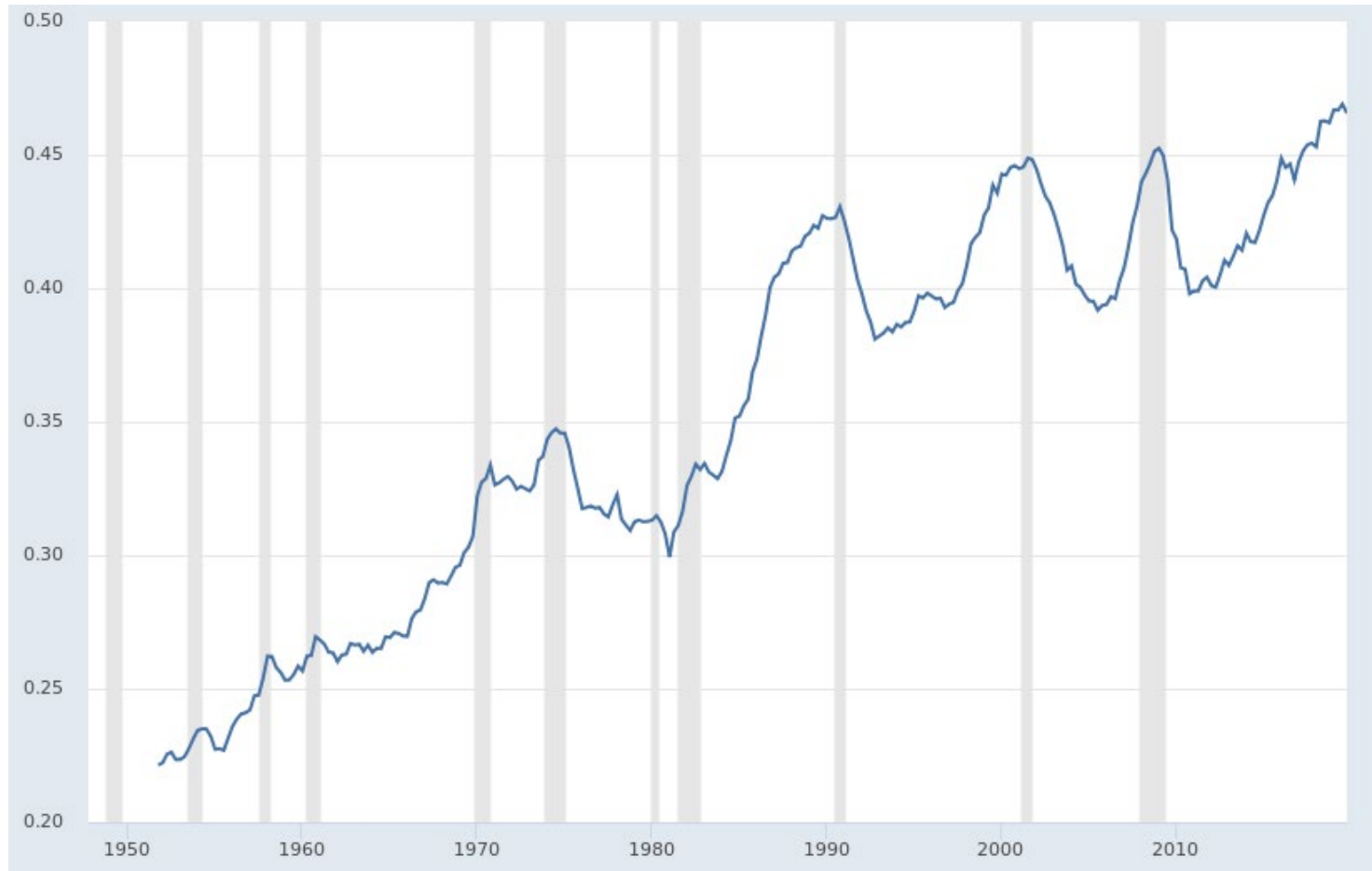
## PAE effects could get worse.

- People could react more strongly to a second wave of the virus.
- Financial system could suffer a meltdown.
- A financial crisis could reduce lending and confidence, which would lower C and I.

## **CDC director warns second wave of coronavirus is likely to be even more devastating**

The nation's top public health official warned that a second wave of the novel coronavirus would probably coincide with the start of flu season and could overwhelm the health system.

# Corporate Debt (Share of GDP)



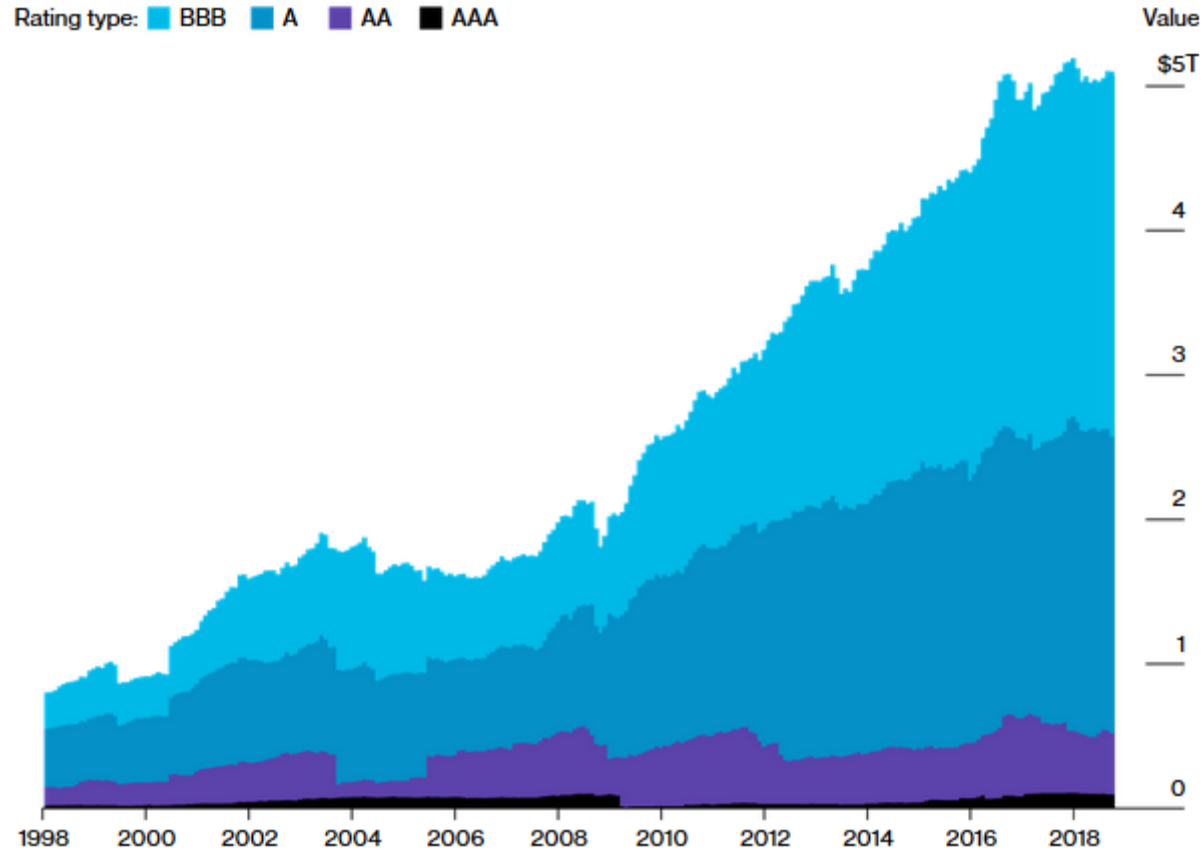
Source: Federal Reserve Bank of St. Louis, FRED.

# Quality of Outstanding Corporate Debt

## The Big Downgrade

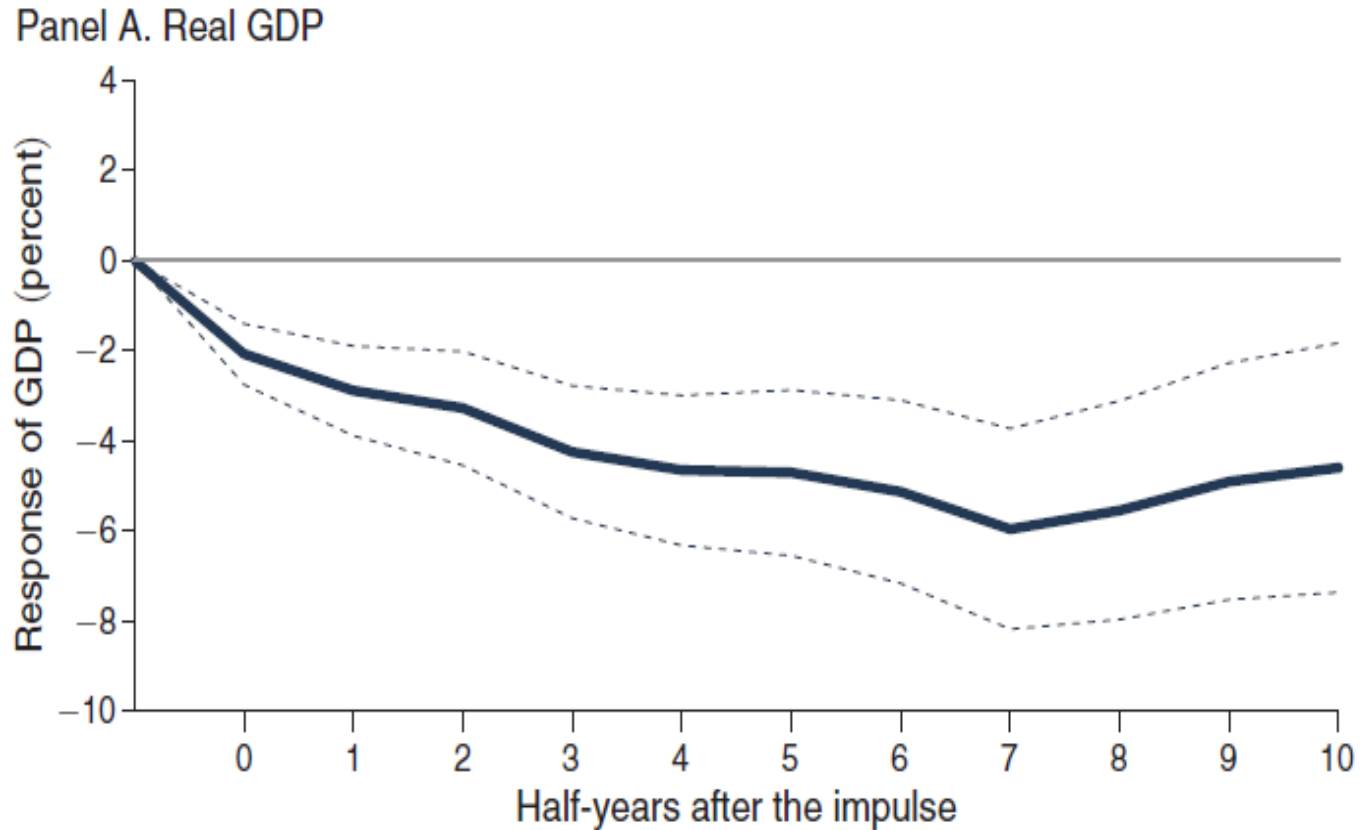
More than half of the U.S. investment-grade index now sits in the lowest ratings tier

Rating type: ■ BBB ■ A ■ AA ■ AAA



Source: Bloomberg Barclays indices

# The Average Aftermath of a Financial Crisis



Source: Romer and Romer, "New Evidence on the Aftermath of Financial Crises."

## The pandemic could do long-run damage.

- The short-run problems lead to a reduction in  $Y^*$ .

- Recall:

$$\frac{Y^*}{POP} = f\left(\frac{K^*}{N^*}, T\right) \cdot \frac{N^*}{POP}$$

- The pandemic and the recession could lower  $Y^*/Pop$  through all three components.

## Possible Effects on $K^*/N^*$

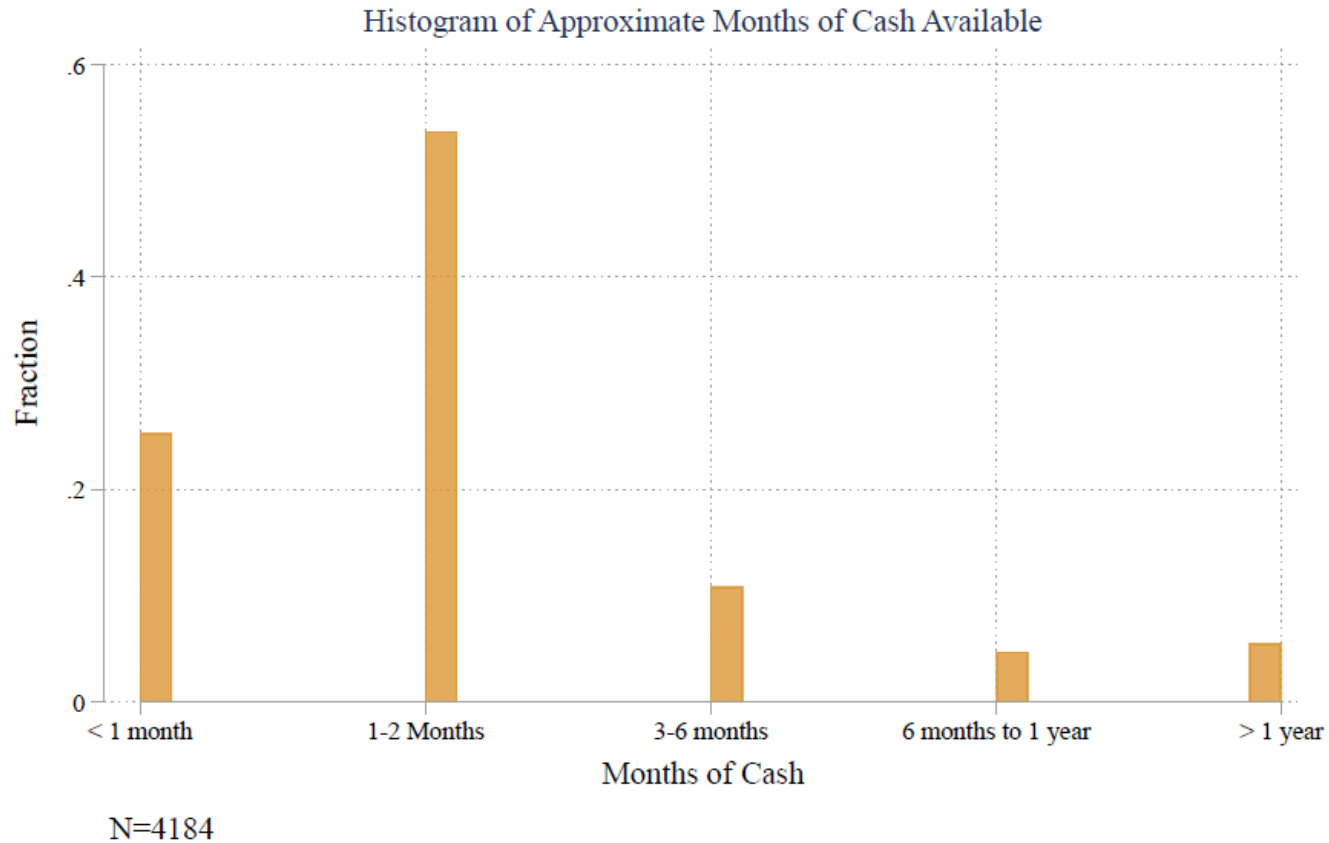
- Prolonged period of very low investment could result in lower  $K^*/N^*$  (when one takes into account depreciation).
- Closing of schools is reducing human capital accumulation.

## Possible Effects on T

- Business failures destroy knowledge and accumulated learning by doing.
- Prolonged unemployment destroys worker-firm matches that were good for productivity.
- Prolonged health concerns force changes in how we conduct business and organize production.



# Small Business Months of Cash on Hand



Source: Bartik et al., "How Are Small Businesses Adjusting To Covid-19?"

# Business Survival and Duration of Crisis

Table 5: REPORTED LIKELIHOOD OF REMAINING OPEN BY INDUSTRY AND HYPOTHETICAL CRISIS DURATION

Industry	N	1 Month	4 Months	6 Months
All Retailers, except Grocery	598	0.69	0.35	0.33
Arts and entertainment	314	0.65	0.45	0.35
Banking/finance	177	0.78	0.63	0.59
Construction	448	0.72	0.43	0.45
Health care	449	0.79	0.47	0.35
Other	1,462	0.76	0.48	0.38
Personal Services	214	0.57	0.40	0.22
Professional Services	271	0.79	0.63	0.54
Real Estate	147	0.74	0.56	0.56
Restaurant/Bar/Catering	173	0.72	0.30	0.15
Tourism/Lodging	174	0.66	0.48	0.27
Total	4,427	0.72	0.47	0.38

Source: Bartik et al., “How Are Small Businesses Adjusting To Covid-19?”

## Possible Effects on $N^*/POP$

- Prolonged unemployment and health concerns could lead workers to exit the labor force.

## IV. FISCAL POLICY

## Fiscal Policy—Main Actions to Date (especially the CARES Act)

- Direct support for medical spending and for other emergency measures: roughly \$350 billion (?).
- Direct and indirect payments to workers (Unemployment Insurance, Paycheck Protection Program, stimulus payments): roughly \$1 trillion.
- Other business tax reductions: roughly \$250 billion.

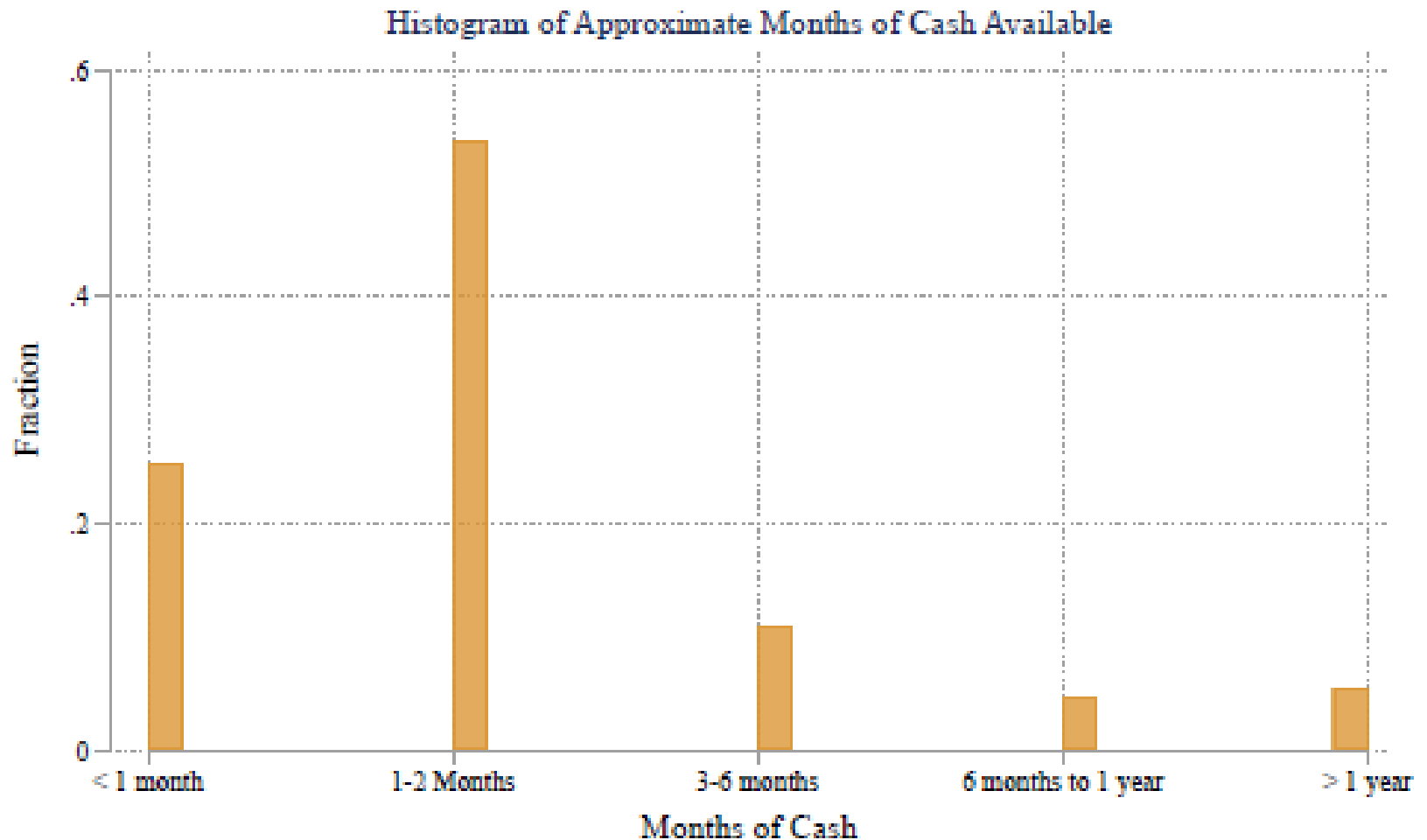
# Direct Support for Medical Spending and for Other Emergency Measures

- Directly raises PAE.
- Health care services in a pandemic surely have large positive externalities.
- The same is true of other actions to improve public health (avoiding large gatherings, staying at home, wearing masks in stores, and so on).

# Direct and Indirect Payments to Workers— Goals

- Target to the workers most harmed (both on PAE and distributional grounds).
- Distribute funds quickly.
- Preserve existing employer-employee relationships.
- Minimize perverse incentives.

# The Financial Fragility of Small Businesses



Source: Bartik et al., “How Are Small Businesses Adjusting To Covid-19?”



# Payments to Workers: Unemployment Insurance

- Expanded coverage; increase generosity; extend time period; waive waiting periods.
- Roughly \$260 billion.
- Strengths and weaknesses?

# Payments to Workers: Paycheck Protection Program

- Payments to small businesses to be used (mainly) for payroll for firms for which “Current economic uncertainty makes the loan request necessary to support ongoing operations of the Applicant. ”
- Roughly \$350 billion (with more coming soon).
- Strengths and weaknesses?

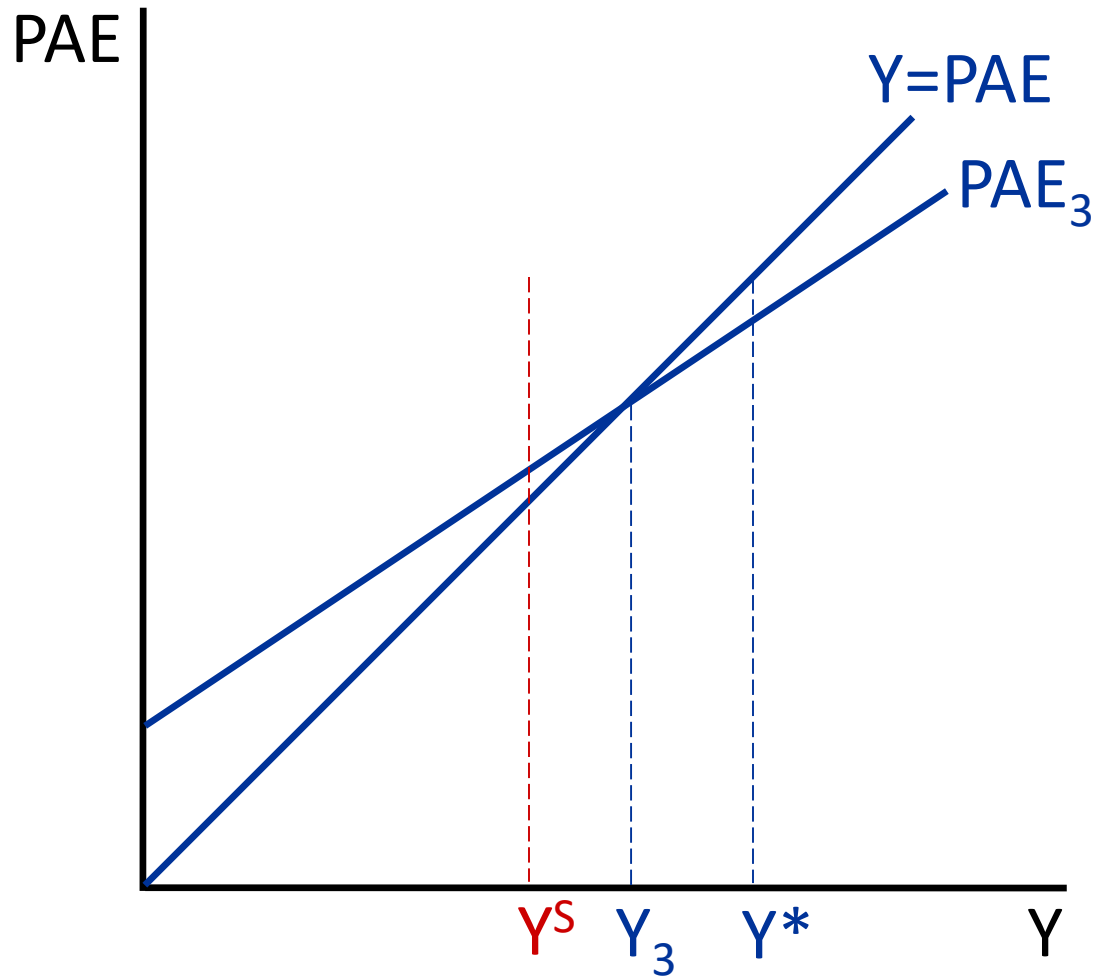
# Payments to Workers: Stimulus Payments

- \$1200 for per each adult and \$500 per child, for households with incomes up to roughly \$100,000 for individuals and \$200,000 for married couples.
- Roughly \$300 billion.
- Strengths and weaknesses?

# Policy Goals for the Recovery Period

- Help restore PAE.
- Make up for lost investment in physical and human capital investment.
- Help restore valuable previous employer-employee relationships.

# Will There Be Enough Demand When the Supply Restrictions Are Lifted?



After the supply restrictions are lifted, there may not be enough demand to get output back up to  $Y^*$ .

# Possible Fiscal Policies During the Recovery Period

- Continued stimulus.
- Especially: Investment-oriented fiscal stimulus (for example, infrastructure, R&D, tax credits for private investment, support for education).

## V. MONETARY POLICY

# Monetary Policy—Main Actions to Date

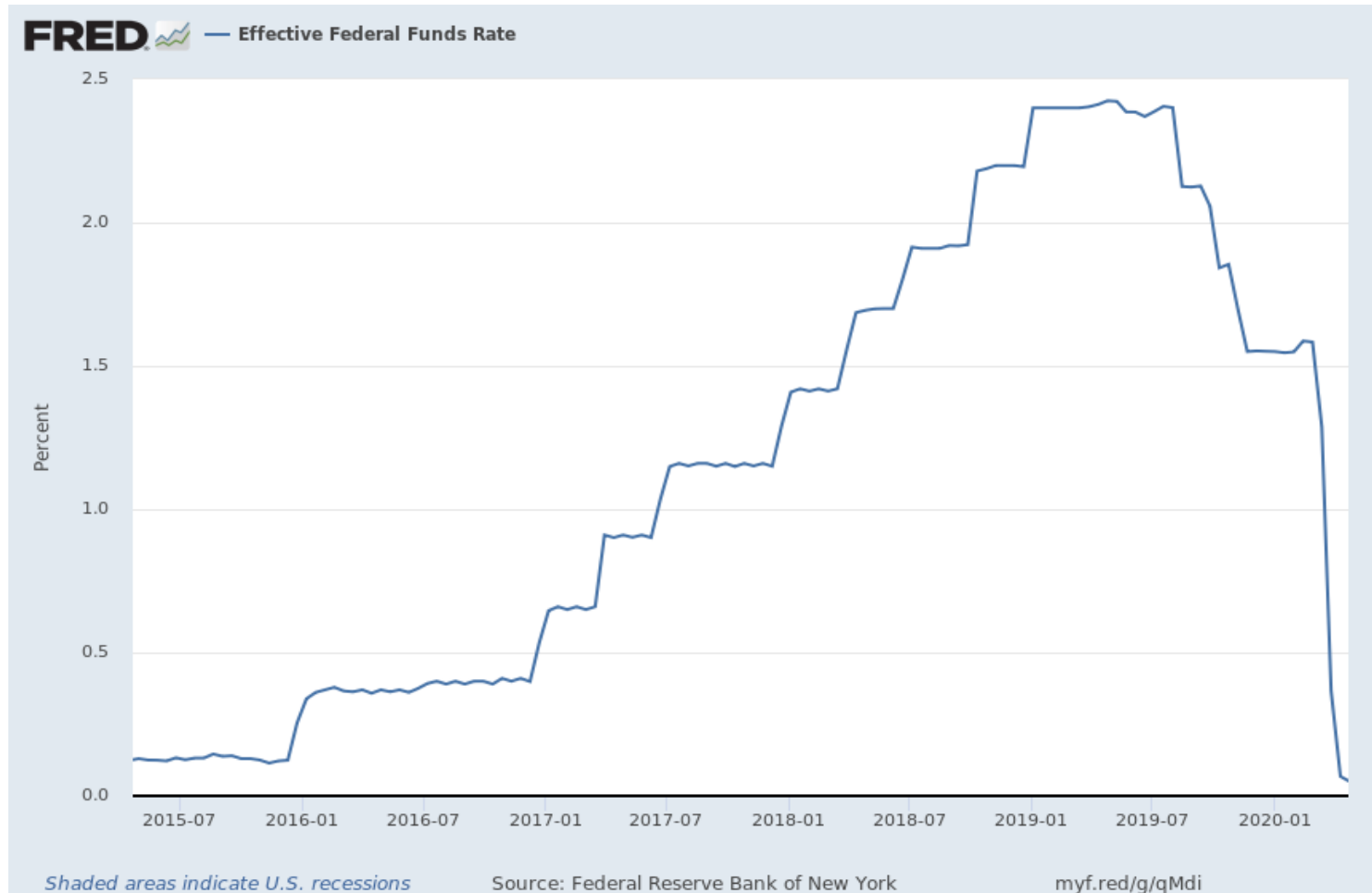
- Cut the short-term nominal interest rate to roughly zero.
- Unconventional monetary policy.
- Actions to support lending to particular markets.
- Actions to prevent disruptions in financial markets.



# Monetary Policy—Goals

- Maintain PAE.
- Prevent bankruptcies of businesses that are fundamentally sound.
- Leave the economy and financial system in a position where PAE can recover once the lockdown is over.

# Cutting the Short-Term Nominal Rate



Source: FRED.

# Unconventional Monetary Policy

- Quantitative easing: “the [Federal Reserve] will increase its holdings of Treasury securities by at least \$500 billion and its holdings of agency mortgage-backed securities by at least \$200 billion.”
- Forward guidance: “We have also committed to keeping rates [near zero] until we are confident that the economy has weathered the storm and is on track to achieve our maximum-employment and price-stability goals.”

# Actions to Support Lending to Particular Markets

- Example: Paycheck Protection Program Liquidity Facility.
- “will support the effectiveness of the PPP by extending credit to financial institutions that make PPP loans, using such loans as collateral.”

# Actions to Actions to Prevent Disruptions in Financial Markets

- Example: Secondary Market Corporate Credit Facility.
- “will support market liquidity for corporate debt by purchasing individual corporate bonds of Eligible Issuers and exchange-traded funds (ETFs) in the secondary market.”

# Policy Goals for the Recovery Period

- Help restore PAE.
- Make up for lost investment in physical and human capital investment.
- Help restore valuable previous employer-employee relationships.

# Possible Monetary Policy Actions During the Recovery Period

- Continue some or all of the policies from the lockdown period.
- Stronger steps to raise expected inflation (recall that  $r = i - \pi^e$ , and  $i$  cannot go much below zero).

# The Recent Behavior of Expected Inflation



Source: Federal Reserve Bank of Cleveland.



# Will the Highly Expansionary Monetary Policy Lead to High Inflation?

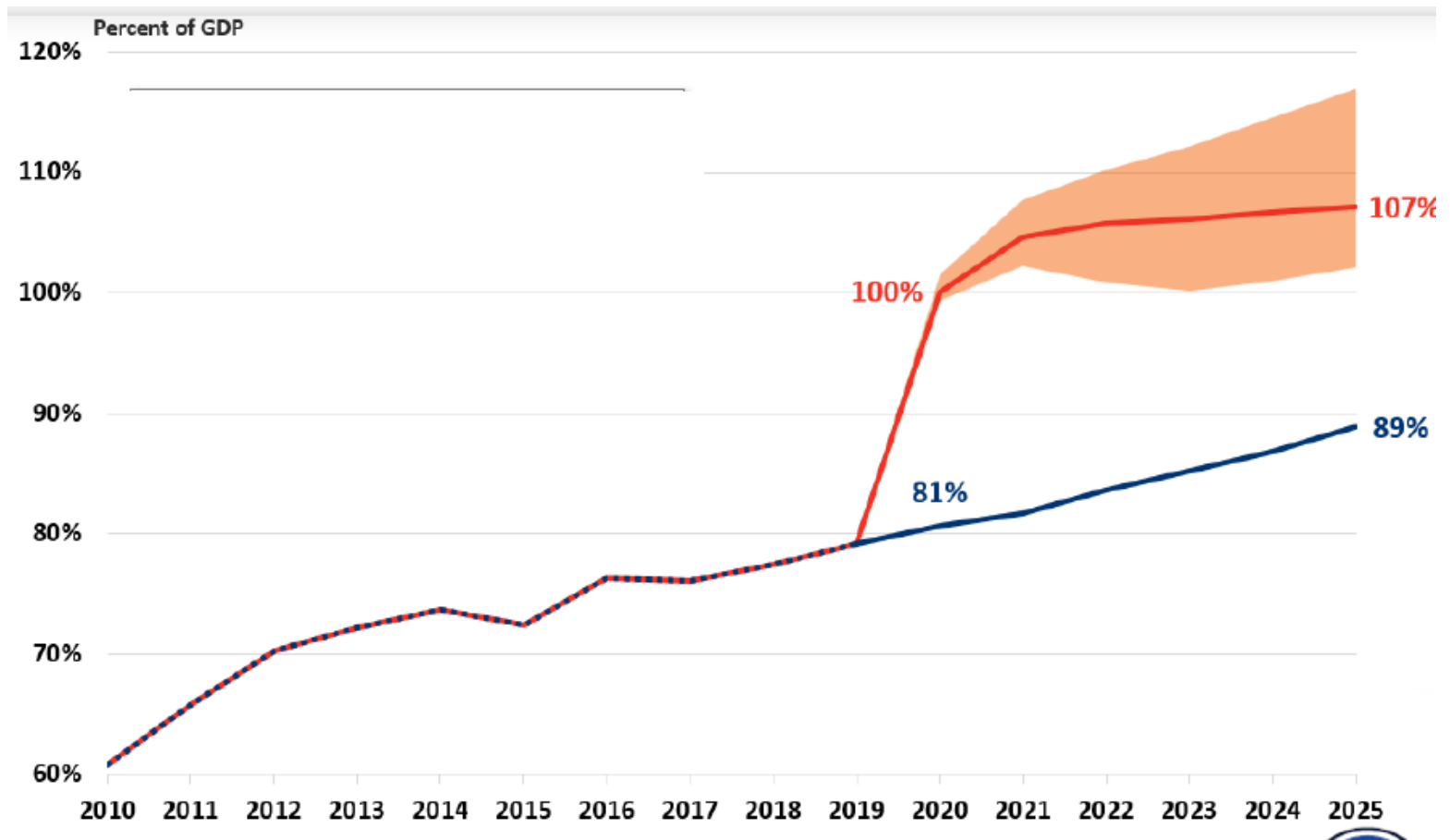
- There's not a *direct* connection between monetary policy and inflation.
- Rather, the link is indirect:
  - When the Fed lowers  $r$ , the PAE line shifts up.
  - If that causes  $Y$  to exceed  $Y^*$ , then, after a while, inflation starts to rise.
- So, unless the Fed pursues expansionary policy to the point where  $Y$  is well above  $Y^*$  for a sustained period, we're very unlikely to get high inflation.
- And currently, people don't expect that.

## VI. POSSIBLE CONSEQUENCES OVER THE VERY LONG-TERM

## Two Possible Adverse Long-Run Effects

- Reductions in  $K^*/N^*$ ,  $N^*/POP$ , and  $T$ .
- Negative effects of the high government debt resulting from the crisis and the policy response.

# The Impact of the Crisis on the Projected Ratio of Federal Government Debt to Annual GDP



Source: Committee for a Responsible Federal Budget.

## Two Possible Positive Long-Run Effects

- Improvement in T (for example, more flexible work arrangements, improved forms of online learning).
- Greater gender equality.

# The Crisis May Cause Many Husbands to Have Primary Responsibility for Childcare

Table 9: Distribution of Couples by Family Group

<b>With Children</b>	Wife Non-Tele	Wife Tele	Wife Crit	Wife Non-Emp
Husb Non-Tele	17%	5%	5%	11%
Husb Tele	9%	7%	3%	8%
Husb Critical	8%	2%	4%	6%
Husb Non-Emp	4%	1%	1%	7%
<i>Total</i>	38%	16%	13%	33%

Source: Alon et al., "The Impact of Covid-19 on Gender Equality."

## Evidence Cited by Alon et al. That Gender Norms Are Changeable

- Long-run effects of greater female labor force participation in World War II.
- “boys who grow up in a family where the mother is working are later on more likely to be married to women who also work.”
- “the introduction of just two weeks of paternity leave for fathers in Spain had persistent effects on the division of labor within couples.”