Uncertainty and Reallocation in the Wake of COVID-19

Steven J. Davis

51st Annual Money, Macro and Finance Conference Webinar

2 September 2020
Uncertainty and Market Volatility
In the Wake of COVID-19

1. Historically elevated uncertainty
2. Very rapid uncertainty rise
3. Huge flow of market-moving information – e.g., more big daily stock market jumps in March 2020 than any month since 1900.
4. No previous pandemic, including the Spanish Flu, had remotely similar effects on stock market volatility
5. When do firms expect COVID uncertainty to resolve? (Hint: Chasing rainbows.)
**Realized U.S. Stock Market Volatility, January 1900 to April 2020**

**Notes:** The sample period runs from 1/2/1900 to 4/30/2020. From December 1925 onwards, returns are computed using Yahoo Finance’s ‘adjusted close’ series for the S&P 500 (^GSPC). Before that, returns are from the Global Financial Data extension of the Dow Jones Index. In both panels, we calculate realized volatility as the sum of squared returns over the past 10 trading days.
High frequency measures of uncertainty during 2020

Notes: Decision Maker Panel Survey conducted by the Bank of England, Nottingham University and Stanford University and Bloom et al. (2019) and www.decisionmakerpanel.com. Values linearly interpolated when the DMP survey was not in the field. Values of the Likert Uncertainty measure were extrapolated using information about firms’ sales expectations and uncertainty for the first five weeks. VIX-24M, Likert Uncertainty, and Sales Subjective Uncertainty’s axes are hidden.
## The Unprecedented Stock Market Impact of the Coronavirus

|                              | Number of Daily U.S. Stock Market Jumps Greater than $|2.5\%|$ | Number Attributed to Economic Fallout of Pandemics | Number Attributed to Policy Responses to Pandemics |
|------------------------------|-------------------------------------------------------|--------------------------------------------------|--------------------------------------------------|
| 2 January 1900 to 21 February 2020 | 1,116                                                  | 0                                                | 0                                                |
| 24 February 2020 to 30 April 2020  | 27                                                    | 13.4                                             | 10.4                                             |

Note: Tabulated from results in Baker, Bloom, Davis and Sammon (2020), who consider all daily jumps in the U.S. stock market greater than 2.5%, up or down, since 1900. They classify the reason for each jump into 16 categories based on human readings of next-day (or same-evening) accounts in the *Wall Street Journal* (and *New York Times* in 2020). Fractional counts arise when newspapers differ in their jump attribution or human readers differ in their classification of the attribution. Number Attributed to Economic Fallout of Pandemics includes jumps on 3/12 and 3/16 that a subset of coders classified as Macroeconomic Outlook. It’s clear from reading these articles that the journalist regarded the deterioration in the Macroeconomic Outlook as due to the spread of the coronavirus.
Figure 2. Newspaper-Based Equity Market Volatility Tracker and the 30-Day VIX, January 1985 to April 2020

Notes: The Equity Market Volatility Tracker reflects the frequency of articles about stock market volatility in leading U.S. newspapers, as quantified by Baker, Bloom, Davis and Kost (2019). The 30-Day VIX is constructed as the monthly average of daily closing VIX values collected from Yahoo Finance. Bottom panel displays daily data for each series.
Figure 3. Infectious Disease EMV Index, Weekly and Monthly Data from 1985 to April 2020

Notes: The Infectious Disease EMV Tracker is computed as the overall EMV tracker value multiplied by the share of EMV Articles that contain one or more of the following terms: epidemic, pandemic, virus, flu, disease, coronavirus, mers, sars, ebola., H5N1, H1N1.
The COVID Uncertainty Resolution Horizon Has Receded

When do you think it is most likely that the coronavirus-related uncertainty facing your firm will be largely resolved?

High Dispersion in Firm-Level Stock Returns in the Wake of COVID-19

1. The pandemic fallout and policy responses also triggered high dispersion in firm-level equity returns. See next two slides, which draw on Barrero, Bloom and Davis (2020) and Davis, Hansen and Seminario (2020).

Cross-Sectional Dispersion of Monthly Equity Returns among U.S.-listed firms, Using Closing Prices on Last Trading Day of Month

Figure 4: The Dispersion of Monthly Firm-Level Stock Returns, January 1984 to June 2020

A. Interquartile Range of Equity Returns in the Value-Weighted Return Distribution

24 February To 21 March
IQR is 15 standard deviations greater than average IQR in 2019

Figure 1: Value-Weighted Mean and Cross-Sectional IQR of U.S. Equity Returns, Daily for 2019 and for Large Daily Jumps in 2020

Reproduced from Davis, Hansen and Seminario (2020)
COVID-19 Is Also a Reallocation Shock

• For every 10 layoffs between March 1 and mid-May, American firms hired 3 to 4 new workers. (Think Amazon, Wal-Mart, CVS Healthcare, Lowe’s home improvement chain, Domino’s Pizza,...)

• Back in May, we projected that one-third or more of COVID-induced layoffs from March to May would be permanent in the sense that job losers would not return to their old jobs.

• Since the pandemic struck, firm-level forecasts (at a one-year horizon) imply much higher rates of expected job and sales reallocation than before the pandemic.

• Full work days performed at home are expected to triple after the pandemic as compared to before the pandemic. About one-fifth of office worker days will shift from business premises to home.

• Some good news: Jobs are much more plentiful than the unemployment numbers suggest.
Many Pandemic-Induced Job Losses Are Permanent

• Employers see 23% of layoffs from March 1 to mid-May as permanent (Atlanta Fed/Chicago Booth/Stanford Survey of Business Uncertainty).

• 23% of job losers saw their layoffs as permanent in late April/early May (Washington Post/IPSOS Poll)

• 23% of claimants for unemployment benefits in California during March-May 2020 saw their layoffs as permanent at the time of filing (California Policy Lab).

• Many “temporary” layoffs don’t lead to recalls. Based on past conversion rates from temporary layoffs to recalls, BBD (2020a) project that one-third or more of the March-May layoffs will be permanent.

• CA Policy Lab data show a falling share of “temporary” layoffs from 90% in mid March to 60% in early August.
How Many Permanent Layoffs, Ultimately?

Historically, many “temporary” layoffs don’t lead to actual recalls. That suggests the 23% permanent-layoff share of recent job losses in the SBU, WP/Ipsos poll, and California claimants is too optimistic about the realized recall rate.

To project the realized permanent-layoff share, we apply evidence from two studies:

• Katz and Meyer (1990): 72% of UI recipients who expected recall were actually recalled. 13% of ex ante “permanent” layoffs were also recalled.

• Moscarini (based on Fujita and Moscarini, 2017) obtains actual recall rates of 87.5% and 6.6%.

Using realized recall rates in these studies (as a function of perceived layoff status), we project a realized permanent-layoff share of 32% to 42% for COVID-induced job losses.
So, what’s actually happened to the number of permanent job losses?

CPS Count of Unemployed on Permanent Layoff

Up 4.7 million from December 2007 to July 2009

Up 1.1 million from February to July 2020

Not so bad?
Monthly Flows from Employment to Out of the Labor Force (Inactivity) in the United States

1. An extra 6.1 million persons transitioned from employment to OLF (inactivity) in April and May 2020.
2. The monthly flow of reentrants to the unemployment pool also rose sharply, from about 1.5 million in April to 2.4 million per month in June and July.
3. CPS interviewer guidance since March 2020 has likely led to underestimation of permanent layoffs. See Appendix A in Barrero et al. (2020).
Since early June, new claims for unemployment benefits are running at about 1 to 1.5 million per week. That’s roughly 4-6 times the pre-pandemic pace. (U.S. Department of Labor)

The fraction of new claimants who say they expect to be recalled to their previous job has fallen from about 90% in late March to about 60% in late July. (California Policy Lab)

Bottom Line: 10+ million American workers have experienced a permanent job loss since March. Permanent job losses continue at a much higher rate than before the pandemic.
Notes: Source Barrero, Bloom and Davis (2020). The expected excess reallocation rate for sales revenue measures the rate at which sales revenue will move from one firm to another over the next four quarters, after accounting for aggregate sales revenue growth. This is computed as the activity-weighted average of the absolute (gross) value of individual firms’ expected sales revenue growth, less the absolute value of the activity-weighted average sales revenue growth. The underlying data are from the Survey of Business Uncertainty conducted by the Federal Reserve Bank of Atlanta, Stanford University, and the University of Chicago Booth School of Business https://www.frbatlanta.org/sbu.
Jobs Are Much More Plentiful Than The Unemployment Numbers Suggest

Job Vacancy Rate, January 2001 to June 2020

(1) June 2020
Vacancy Rate = 3.7%
Unemp. Rate = 11.1%

(2) May 2017
Vacancy Rate = 3.7%
Unemp. Rate = 4.4%

(3) October 2009
Vacancy Rate = 1.6%
Unemployment Rate = 10.0%
Workers Think So, Too

In the Conference Board’s June Consumer Confidence Survey, only 24 percent of respondents said jobs are hard to get.

• That’s much less than in 2008-09, even though unemployment is higher now.

• In fact, the survey results say that finding a job now is about as hard as in 2015, when the unemployment rate averaged 5.3%.

This slide based on Levenson (2020).
Weekly Count of High-Propensity Business Applications in 2020 and % Change Relative to Same Week in 2019

Since early July, U.S. business formation exceeds pre-pandemic pace and is 60-100% above its pace a year earlier.
Why Behavioral Shifts Will Stick

Massive, pandemic-induced shifts in consumer spending, working arrangements, and business practices will partly stick:

1. Millions of households tried online shopping and delivery services in recent months. Many will continue to value the convenience and (perceived) safety.

2. After turning to virtual meetings out of necessity, many businesses find they offer an easier, cheaper alternative to travel and in-person meetings. In aggregate, businesses expect to cut travel expenditures by 29% after the pandemic relative to pre-pandemic spending (Altig et al., 2020).

3. 50+% of employees worked from home in May 2020 (Brynjolfsson et al, 2020, and BBD, 2020a) → much learning by doing by individuals and organizations.

4. WFH productivity exceeded expectations of most workers (BBD, 2020b).

5. Spurred by the pandemic, individuals and businesses undertook investments in equipment, infrastructure and platforms that raise employee effectiveness when working remotely or engaging customers virtually (BBD, 2020b).

6. Also spurred by the pandemic, leading technology companies plan to intensify efforts to develop new products that improve remote interactivity.

7. COVID has knocked down regulations that had inhibited a shift from in-person to virtual interactions, especially in the delivery of healthcare services.
DIGITAL TRANSFORMATION IS YEARS AWAY. I DON'T SEE OUR COMPANY HAVING TO CHANGE ANY TIME SOON.
Survey Evidence on the Post-Pandemic Shift to Working from Home

Disaggregated results say one-fifth of all office worker days will shift from business premises to home. Since WFH propensity rises sharply with wages, the implied shift in worker spending away from business districts is even greater. From BBD (2020a).

<table>
<thead>
<tr>
<th>What percentage of your full-time employees...</th>
<th>Rarely or never (%)</th>
<th>1 full day per week (%)</th>
<th>2 to 4 full days per week (%)</th>
<th>5 full days per week (%)</th>
<th>Paid working days at home as a percent of all working days (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>...Worked from home in 2019?</td>
<td>90.3</td>
<td>3.4</td>
<td>2.9</td>
<td>3.4</td>
<td>5.5</td>
</tr>
<tr>
<td>...Will work from home after the coronavirus pandemic?</td>
<td>73.0</td>
<td>6.9</td>
<td>9.9</td>
<td>10.3</td>
<td>16.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BLS’ American Time Use Survey (2017-2018)</th>
<th>Rarely or never (%)</th>
<th>1 full day per week (%)</th>
<th>2 to 4 full days per week (%)</th>
<th>5 full days per week (%)</th>
<th>Paid working days at home as a percent of all working days (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-Time Workers</td>
<td>89.8</td>
<td>3.8</td>
<td>3.8</td>
<td>2.6</td>
<td>5.2</td>
</tr>
</tbody>
</table>
Based on a survey of 2,500 U.S. residents, 20 to 64, who earned more than $20,000 in 2019. Fielded from 21-29 May by QuestionPro on behalf of Stanford University. We reweight the sample to match the CPS by earnings class/industry/state.

Brynjolfsson et al. find similar results in independent work.

Implies 62% of labor services supplied at home, 67% when weighting by earnings.
COVID-19 compelled workers to invest time and money in learning how to WFH

Notes: Responses to the questions: “How many hours have you invested in learning how to work from home effectively (e.g., learning how to use videoconferencing software) and creating a suitable space to work?” and “How much money have you and your employer invested in equipment or infrastructure to help you work from home more efficiently – computers, internet connection, furniture, etc.?” with the latter expressed as a fraction of monthly income. Home more efficiently.

Data are from a survey of 2,500 US residents aged 20 to 64, earning more than $20,000 per year in 2019 carried out between June 30 and July 9 by QuestionPro on behalf of Stanford University. Sample reweighted to match current CPS by income, industry, and state. Employers covered about one-third of the monetary outlays that workers incurred to work from home more efficiently.
Working from home used to carry stigma, but this has changed during COVID

Change in WFH Perceptions Among People You Know

<table>
<thead>
<tr>
<th>Perception</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved among almost all</td>
<td>21.0</td>
</tr>
<tr>
<td>Improved among most</td>
<td>29.1</td>
</tr>
<tr>
<td>Improved among some</td>
<td>18.0</td>
</tr>
<tr>
<td>No change</td>
<td>26.9</td>
</tr>
<tr>
<td>Worsened among some</td>
<td>3.0</td>
</tr>
<tr>
<td>Worsened among most</td>
<td>1.8</td>
</tr>
<tr>
<td>Worsened among almost all</td>
<td>0.3</td>
</tr>
</tbody>
</table>

**Notes:** Responses to the question “Before COVID-19, ‘working from home’ was sometimes seen as ‘shirking from home.’ Since the COVID pandemic began, how have perceptions about working from home (WFH) changed among people you know?”

Data are from a survey of 2,500 US residents aged 20 to 64, earning more than $20,000 per year in 2019 carried out between June 30 and July 9 by QuestionPro on behalf of Stanford University. Sample reweighted to match current CPS by income, industry, and state.
Workers have learned how efficient they are at home relative to business premises

Notes: Responses to the question “How does your efficiency working from home during the COVID-19 pandemic compare to your effectiveness working on business premises before the pandemic?”

Data are from a survey of 2,500 US residents aged 20 to 64, earning more than $20,000 per year in 2019 carried out between June 30 and July 9 by QuestionPro on behalf of Stanford University. Sample reweighted to match current CPS by income, industry, and state.
The experience has turned out better than expected – true across the board

**Notes:** Responses to the question “Compared to your expectations before COVID (in 2019), how has working from home turned out for you?”

Data are from a survey of 2,500 US residents aged 20 to 64, earning more than $20,000 per year in 2019 carried out between June 30 and July 9 by QuestionPro on behalf of Stanford University. Sample reweighted to match current CPS by income, industry, and state.
Now we know what makes WFH work poorly (bad internet connection, young kids at home)

Efficiency WFH by internet quality

<table>
<thead>
<tr>
<th>Internet Quality</th>
<th>How efficient are you WHF relative to on premises (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perfect, can work 100% time</td>
<td>-1.1</td>
</tr>
<tr>
<td>Good, can work 90% time</td>
<td>-5.2</td>
</tr>
<tr>
<td>Moderate, work 70% to 80%</td>
<td>-5.2</td>
</tr>
<tr>
<td>Poor, work &lt;70% time</td>
<td>-12.2</td>
</tr>
</tbody>
</table>

Efficiency WFH by whether living with children

<table>
<thead>
<tr>
<th>Whether Living with Children</th>
<th>How efficient are your WHF relative to on premises (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>-2.7</td>
</tr>
<tr>
<td>Yes, youngest in pre-/primary</td>
<td>-2.5</td>
</tr>
<tr>
<td>Yes, youngest in ES</td>
<td>-6.2</td>
</tr>
<tr>
<td>Yes, youngest in MS</td>
<td>-4.1</td>
</tr>
<tr>
<td>Yes, youngest in HS</td>
<td>-12.3</td>
</tr>
</tbody>
</table>

Notes: The graphs show the mean response to the question “How does your efficiency working from home during the COVID-19 pandemic compare to your effectiveness working on business premises before the pandemic?”, by internet quality (left) and whether respondents live with children.

Data are from a survey of 2,500 US residents aged 20 to 64, earning more than $20,000 per year in 2019 carried out between June 30 and July 9 by QuestionPro on behalf of Stanford University. Sample reweighted to match current CPS by income, industry, and state.
There is value in the *choice to* work from home or on business premises.

![Graph showing efficiency comparison between working from home (WFH) and business premises.](image)

**Notes:** The black bar computes the mean efficiency WFH during COVID based on responses to the question: “How does your efficiency working from home during the COVID-19 pandemic compare to your effectiveness working on business premises before the pandemic?” The red bar shows the mean efficiency if respondents choose to work where they are most productive, setting the minimum efficiency (relative to business premises) be 0.

Data are from a survey of 2,500 US residents aged 20 to 64, earning more than $20,000 per year in 2019 carried out between June 30 and July 9 by QuestionPro on behalf of Stanford University. Sample reweighted to match current CPS by income, industry, and state.
Employees that can WFH also on average want ≈50% of days WFH

Source: Response to the questions: “In 2021+ (after COVID) how often would you like to have paid work days at home?”

Data from a survey of 2,500 US residents aged 20 to 64, earning more than $20,000 per year in 2019 carried out between May 21-25, by QuestionPro on behalf of Stanford University. Sample reweighted to match current working from home rations in the 2017/2018 American Time Use Survey.
But WFH much higher for more educated higher-earners

Occupations: WFH far higher for managers and professionals

Industries: WFH higher in professional service industries

<table>
<thead>
<tr>
<th>Industry</th>
<th>Percentage of employees paid WFH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional &amp; business services</td>
<td>43.3</td>
</tr>
<tr>
<td>Financial activities</td>
<td>39.5</td>
</tr>
<tr>
<td>Information</td>
<td>39.4</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>21.5</td>
</tr>
<tr>
<td>Public administration</td>
<td>18.1</td>
</tr>
<tr>
<td>Other services</td>
<td>17.1</td>
</tr>
<tr>
<td>Education and health services</td>
<td>14.8</td>
</tr>
<tr>
<td>Wholesale and retail trade</td>
<td>11.6</td>
</tr>
<tr>
<td>Construction</td>
<td>10.5</td>
</tr>
<tr>
<td>Transportation and utilities</td>
<td>9.4</td>
</tr>
<tr>
<td>Agriculture, forestry &amp; fishing</td>
<td>8.3</td>
</tr>
<tr>
<td>Leisure and hospitality</td>
<td>5.4</td>
</tr>
</tbody>
</table>

References


Altig, David, Jose Maria Barrero, Nicholas Bloom, Steven J. Davis, Brent Meyer, Emil Mihaylov and Nick Parker, 2020b. “Businesses Anticipate Slashing Postpandemic Travel Budgets,” Macroblog, 4 August.


