I Z A Institute
of Labor Economics
Initiated by Deutsche Post Foundation

DISCUSSION PAPER SERIES

IZA DP No. 13224

The Cost of the COVID-19 Crisis: Lockdowns, Macroeconomic Expectations, and Consumer Spending

Olivier Coibion
Yuriy Gorodnichenko
Michael Weber

MAY 2020

I Z A Institute
of Labor Economics

Initiated by Deutsche Post Foundation

DISCUSSION PAPER SERIES

IZA DP No. 13224

The Cost of the COVID-19 Crisis: Lockdowns, Macroeconomic Expectations, and Consumer Spending

Olivier Coibion
UT Austin and NBER

Yuriy Gorodnichenko
UC Berkeley, NBER and IZA

Michael Weber
University of Chicago, Booth School of Business and NBER

MAY 2020

ISSN: 2365-9793

IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

The Cost of the COVID-19 Crisis: Lockdowns, Macroeconomic Expectations, and Consumer Spending*

We study how the differential timing of local lockdowns due to COVID-19 causally affects households' spending and macroeconomic expectations at the local level using several waves of a customized survey with more than 10,000 respondents. About 50% of survey participants report income and wealth losses due to the corona virus, with the average losses being $5,293 and $33,482 respectively. Aggregate consumer spending dropped by 31 log percentage points with the largest drops in travel and clothing. We find that households living in counties that went into lockdown earlier expect the unemployment rate over the next twelve months to be 13 percentage points higher and continue to expect higher unemployment at horizons of three to five years. They also expect lower future inflation, report higher uncertainty, expect lower mortgage rates for up to 10 years, and have moved out of foreign stocks into liquid forms of savings. The imposition of lockdowns can account for much of the decline in employment in recent months as well as declines in consumer spending. While lockdowns have pronounced effects on local economic conditions and households' expectations, they have little impact on approval ratings of Congress, the Fed, or the Treasury but lead to declines in the approval of the President.

JEL Classification: E31, C83, D84, J26

Keywords: subjective expectations, consumer spending, labor market, employment, COVID-19, surveys

Corresponding author:
Yuriy Gorodnichenko
530 Evans Hall #3880
Department of Economics
University of California, Berkeley
Berkeley, CA 94720-3880
USA

E-mail: ygorodni@econ.berkeley.edu

* We thank the National Science Foundation for financial support in conducting the surveys. We also thank Shannon Hazlett and Victoria Stevens at Nielsen for their assistance with the collection of the PanelViews Survey. Results in this article are calculated based on data from The Nielsen Company (US), LLC and marketing databases provided by the Kilts Center for Marketing Data Center at The University of Chicago Booth School of Business. Information on availability and access to the data is available at http://research.chicagobooth.edu/nielsen. We thank Peter McCrory for sharing data on the timing of lockdowns.

Business cycles are rarely a matter of life and death in advanced economies, but the COVID19 crisis is a grim reminder that economics is a dismal science and that, quite literally, policymakers face a painful tradeoff between saving lives and saving the economy. Apart from a myriad of excruciating ethical choices, making a policy decision is particularly difficult in the current environment because policymakers and the public have only limited information on the scale of the economic calamity as well as the economic cost of lockdowns.

To provide these crucial inputs for policy, we fielded several waves of a customized survey on all households participating in the Kilts Nielsen Consumer Panel (KNCP) to elicit beliefs, employment status, spending, and portfolio allocations both before and during the COVID19 crisis. In short, we paint a very bleak state and outlook for the U.S. economy. We also use differential timing of imposing lockdowns at the local level to quantify the effect of lockdowns on households' economic outlook and their spending responses. We find that the cost of lockdowns is very large.

We first report aggregate statistics across survey waves to study how the arrival COVID19 affected spending patterns and expectations on average between the pre-crisis wave in January 2020 and April 2020. Consistent with earlier work (Coibion, Gorodnichenko and Weber, 2020, Bick and Blandin, 2020), we find a massive decline in the employment rate: the rate fell by 5 percentage points which is larger than the cumulative drop in the employment-to-population ratio during and after the Great Recession. Overall spending drops by $1,000 per month between January and April which corresponds to a 31% drop in spending with heterogeneous responses across granular categories. Specifically, we find one of the largest drops in debt payments including mortgages, student, and auto loans. This result highlights the possibility of a wave of defaults in the next few months, indicating a slower economic recovery and possibly explaining the increase in loan provisions by major US banks in recent weeks. Households also spend substantially less on discretionary expenses such as transportation, travel, recreation, entertainment, clothing, and housing-related expenses. Medical expenses, utilities, education-related expenses, and food expenses also decrease but to a lesser extent. We also document large decreases in planned spending on durables during the crisis. On average, survey participants are 5 percentage points less likely to purchase durables during the crisis wave relative to the pre-crisis wave which translates into an average drop in spending on durables of almost $1,000.

In line with these negative outcomes at the individual level, households' macroeconomic expectations have become far more pessimistic. Average perceptions of the current unemployment rate increased by 11 percentage points with similar magnitudes for expectations of unemployment in one year. Unemployment expectations over the next three to five years also increased by an average of 1.2 percentage points, indicating that households expect the downturn to have persistently negative effects on the labor market. Consistent with this view, inflation expectations over the next twelve months on average dropped by 0.5 percentage points but uncertainty increased by 0.3 percentage points. Current mortgage rate perceptions as well as expectations for the end of 2020 and 2021 dropped on average by about 0.4

percentage points with even larger drops in average expectations over the next five to ten years. These changes from before to during the COVID19 pandemic document dramatic shifts in spending, income and wealth losses, and expectations and allow us to benchmark our cross-sectional findings to these aggregate statistics. The increased uncertainty at the household level as well the large drop in planned spending indicate the potential role for some form of liquidity insurance to curb the desire for precautionary spending and stimulate demand once local lockdowns are lifted (D'Acunto et al. 2020).

To assess the economic damage that households attribute to the virus, we elicit information on the perceived financial situation of the survey participants and possible losses due to the corona virus, both in income and wealth. We measure households' concerns about their financial situation on a ten-point Likert scale with higher levels indicating being more concerned. The average (median) response is 7 (8) indicating that many households are highly concerned about their personal financial situation. We also find large declines both in their income and wealth. Forty-two percent of employed respondents report having lost earnings due to the virus with the average loss being more than $5,000. More than 50% of households with significant financial wealth report having lost wealth due to the virus and the average wealth lost is at $33,000. Given the important role of wealth effects for consumption, the drop in wealth puts further downward pressure on future consumption (Lettau and Ludvigson, 2004).

What are the economic costs of lockdowns? To answer this question, we compare economic outcomes for households in counties with lockdowns to households in counties without lockdowns. We instrument lockdowns with a dummy variable that equals one if the county has any confirmed COVID cases. Our identification exploits the heterogeneous timing of when the first COVID cases were identified in different counties. As we argue below, most lockdowns occur when only a handful of COVID cases are reported in a location, which is largely random. By themselves, these few cases are unlikely to change economic behavior of households (we provide external evidence to support this identifying assumption). We also control for share of confirmed cases at the county level which proxies for direct health effects on the economy. While our analysis is not a randomized controlled trial, we have taken a number of steps to interpret the effect of lockdowns on beliefs and choices causally.

In our first set of tests, we study the labor market response to local lockdowns. Individuals living in counties currently under lockdown are 2.8 percentage points less likely to be employed, have a 1.9 percentage points lower labor-force participation, and are 2.4 percentage points more likely to be unemployed. This degree of variation introduced by lockdowns is large. For example, these results imply that lockdowns account for close to sixty percent of the decline in the employment to population ratio. Furthermore, since we can only estimate the short-run effects of lockdowns on labor markets, these numbers are likely to be a lower bound on the total effects of lockdowns on labor markets, as continued lockdowns are likely to lead to business failures and further job loss.

To analyze the degree to which disruptions in labor markets translate into changes in aggregate demand, we study the spending patterns of survey participants using survey answers on dollar spending in narrowly defined categories during the months from January to April. We find that households under lockdown spend on average 31 log percentage points less than other households, indicating a large drop in aggregate demand due to mobility restrictions and the effect of the pandemic on income and economic expectations. However, the magnitudes of the decline vary dramatically across spending categories. To better understand the effect of the pandemic on future aggregate demand conditions, we analyze spending plans of households. We first document that lockdowns are not a significant determinant of current financial constraints and durable purchases in the months pre-crisis, thereby ruling out possible concerns that any result we document might be driven by financial constraints or past purchases because purchases of many durable goods are lumpy. At the extensive margin, survey participants under lockdown are 3.5 percentage points less likely to purchases larger ticket items in the next 12 months. At the intensive margin, these survey participants plan to spend almost 26 log percentage points less. Taken together, these results indicate a persistent drop in future aggregate demand, possibly due to a mix of lower expected income, heightened uncertainty, and supply restrictions. To the extent that part of the drop in planned spending reflects precautionary savings, our results indicate that tax rebates or other forms of direct transfers to households might be less effective than during normal recessions (Johnson et al. 2006, Parker et al. 2013).

Higher uncertainty should not only result in lower spending due to precautionary motives but might also result in portfolio reallocations out of risky assets and into safe assets. Conditional on having savings totaling more than one-month of income, participants under lockdown have a 1.7 percentage point higher portfolio share in checking accounts and a 0.7 percentage point lower share in foreign stocks, consistent with a flight to safety. We do not find a significant reaction for the share of savings held in US equity, possibly because US equity markets already had partially bounced back by the time we fielded the survey in early April of 2020.

We then move on to study the effect of lockdowns on subjective expectations, which can shed light on the speed and shape of the recovery. First, survey participants that are under lockdown expect 0.5 percentage points lower inflation over the next 12 months, which might in part explain the depressed spending response of households. Consistent with the idea that the impact of the pandemic on inflation is not clear, we find that the individual-level uncertainty about future expected inflation increases by more than 0.6 percentage points. Second, we analyze the effect on the expected unemployment rate at different horizons. The pandemic increases current unemployment estimates by staggering 13.8 percentage points, expectations for the unemployment rate in one year increase by 13 percentage points, and long-run expectations over the next three to five years are on average still 2.4 percentage points higher. These results indicate, at least through the lens of household expectations, that a V-shaped recovery might be unlikely. Moreover, given the length of heightened unemployment according to household expectations, these results could warrant an extension of unemployment insurance benefits to ensure no sharp drop in demand once claims expire. Third, we look at the effect on mortgage rate expectations, which are a central transmission mechanism for monetary policy to household consumption. The COVID-19 pandemic results in current mortgage rate perceptions that are 0.7 percentage points lower, with similar effects for a forecast horizon until the end of 2020, 2021 but even larger effects at the long run over the next five to ten years. Hence, the pandemic results in a level shift of the term structure of mortgage rates. The negative effect on expectations in the long run suggests that the lower bound on nominal interest rates might be a binding constraint for monetary policy makers for the foreseeable future.

Finally, to assess the political consequences of lockdowns, we ask respondents to rate several government bodies on a 0 (poor) to 10 (excellent) scale. We find that being under lockdown results in a 6.2 point lower rating for the President but a 3.1 point higher rating for the U.S. Center for Disease Control. Taken together, our findings help us understand the drivers of heterogeneous consumer expectations and spending patterns which is crucial to design policy interventions in an effective way.

Jointly, these findings provide new real-time evidence on the economic consequences of the COVID-19 pandemic. Our repeated surveys are able to provide unprecedented detail on how the COVID crisis has affected labor markets, household spending decisions and expectations, and even portfolio reallocations in recent months. Strikingly, we find that much of the declines in employment and spending can be attributed to lockdowns rather than to the share of the population infected by the coronavirus. While we cannot speak to the welfare effects of these policies in the absence of knowing to what extent they are successful in slowing the spread of the disease, our results do indicate a direct and large role for the preventative lockdown measures in accounting for the size of the resulting downturn.

I Related Literature

We relate to the fast-growing literature studying the economic consequences of the COVID19 pandemic. Binder (2020) shows that 30% - 40% of Americans are very concerned about the corona crisis, postponed travel and delayed purchases of larger ticket items as early as March 2020 but became more optimistic about the unemployment situation and revised downward their inflation expectations once being told about the cut in the federal funds target rate on March 3rd. Fetzer et al. (2020) show the arrival of the corona virus in a country leads to a large increase in internet searches around the world. In a survey experiment on a US population, they find survey participants vastly overestimate the mortality rate and the contagiousness of the virus. Hanspal et al. (2020) study the income and wealth loss in a survey and the impact on expectations about the economic recovery. Barrios and Hochberg (2020) and Allcott et al. (2020) use internet searches, survey data, and travel data from smartphones to document that political partisanship determines the perception of risk associated with COVID19 and non-essential travel activity. Bursztyn et al. (2020) study the effect of media consumption on the perception of the corona virus. Dingel and Neiman (2020) use data from responses to two Occupational Information Network surveys and estimate that about 37% of jobs can be performed from home, whereas Mongey (2020) documents that employees that are less likely to be able to work from home are mainly non-white and without a college degree. Using initial unemployment insurance claims, Baek et al. (2020) study the effect of lockdowns on employment at the state-level. Andersen et al. (2020), Chen et al. (2020), and Baker et al. (2020) study the consumption response to the COVID19 pandemic. On the quantitative side, a growing literature jointly models the dynamics of the pandemic and the economy to quantify the economic costs and benefits of different policies (see Atkeson (2020), Barro et al. (2020), Eichenbaum et al. (2020), Farboodi et al. (2020), Jones et al. (2020), Kaplan et al. (2020), Krueger et al. (2020), Guerrieri et al. (2020), Alvarez et al. (2020), and Dietrich et al. (2020)). Finally, our Nielsen survey builds on previous work using the Nielsen panelists to study the formation and updating of economic expectations (Coibion et al. (2019, 2020) and D'Acunto et al (2020a, b)). Coibion et al. (2020) also use Nielsen surveys to study the effect of the pandemic on labor markets and find large drops in labor-force participation due to a wave of early retirements.

II Data and Survey Design

This section describes the survey design we use to elicit expectations, plans, and past spending decisions. We first detail the Nielsen Homescan panel on which we run the survey and then provide more information on the structure of the survey.

A. Nielsen Panel

Since June 2018, we have been fielding customized surveys inviting participation by all household members in the KNCP on a quarterly frequency. The KNCP represents a panel of approximately 60,000 households that report to AC Nielsen (i) their static demographic characteristics, such as household size, income, ZIP code of residence, and marital status, and (ii) the dynamic characteristics of their purchases, that is, which products they purchase, at which outlets, and at which prices. Panelists update their demographic information at an annual frequency to reflect changes in household composition or marital status.

Nielsen attempts to balance the panel on nine dimensions: household size, income, age of household head, education of female household head, education of male household head, presence of children, race/ethnicity, and occupation of the household head. Panelists are recruited online, but the panel is balanced using Nielsen's traditional mailing methodology. Nielsen checks the sample characteristics on a weekly basis and performs adjustments when necessary.

Nielsen provides households with various incentives to guarantee the accuracy and completeness of the information households report. They organize monthly prize drawings, provide points for each instance of data submission, and engage in ongoing communication with households. Panelists can use points to purchase gifts from a Nielsen-specific award catalog. Nielsen structures the incentives to not bias the shopping behavior of their panelists. The KNCP has a retention rate of more than 80% at the annual frequency. Nielsen validates the reported consumer spending with the scanner data of retailers on a quarterly frequency to ensure high data quality. The KNCP filters households that do not report a minimum amount of spending over the previous 12 months. Information on consumer spending is available only with a pronounced lag however, so we are not yet able to combine information from our survey responses with underlying spending decisions on the part of households.

B. Survey

Nielsen runs surveys on a monthly frequency on a subset of panelists in the KNCP, the online panel, but also offers customized solutions for longer surveys. Retailers and fast-moving consumer-goods producers purchase this information and other services from Nielsen for product design and target-group marketing. At no point of the survey did Nielsen tell their panelists that the survey they fielded was part of academic research which minimizes the concerns of survey demand effects.

In January and April of 2020, we fielded the two waves of the survey that we exploit in the current paper. Our survey design builds on the Michigan Survey of Consumers, the New York Fed Survey of Consumer Expectations, the Panel on Household Finances at the Deutsche Bundesbank as well as D'Acunto et al. (2020). The January wave was fielded to 63,732 households. 18,344 individuals responded for a response rate of 26.80% and an average response time of 16 minutes 47 seconds. The response rate compares favorably to the average response rates of surveys on Qualtrics that estimates a response rate between 5% to 10%. The April wave had 13,771 unique respondents and a sample of 50,870. Nielsen provides weights to ensure representativeness of the households participating in the survey. We report descriptive statistics for participating households in Appendix Table 1. The average household income is $68,000 and the average household size 2.6. On average, survey participants are 50 years old and 73% of survey participants are white These statistics are similar to other studies using the Nielsen panel, such as Coibion at al. (2019).

The online appendix contains the detailed questions we use in the current paper. We collect information on spending (per month) in the last three months in detailed categories such as debt payments including mortgages, auto loans, and student loans, housing expenses, utilities, food, clothing, gas, medical expenses, transportation costs, travel and entertainment, education and child care, furniture and other small durables, as well as a catch-all category including charitable giving. We also ask participants about purchases of larger durables such as cars or houses over the last 6 months as well as plans to buy these items over the next 12 months. We then elicit financial constraints, and financial portfolios conditional on any savings larger than one month of income.

Subsequently, we elicit inflation expectations. We follow the design in the New York Fed Survey of Consumer Expectations (SCE) and ask specifically about inflation, because asking about prices might induce individuals to think about specific items whose prices they recall rather than about overall inflation (see Crump et al. (2015) for a paper describing and using the SCE data). We elicit a full probability distribution of expectations by asking participants to assign probabilities to different possible levels of the inflation rate. In addition, we also ask about the perception of the current unemployment rate and the expected unemployment rate in twelve months, and the next three to five years and the current rate on a fixed-rate 30-year mortgage as well as the expected rate at the end of 2020, 2021, and in the next five to ten years. Mortgages with a 30-year fixation period represent the most popular mortgage product in the U.S., accounting for more than 70% of mortgages originated over the period 2013-2016.[1]

To measure labor market conditions, we first ask respondents on whether they have a paid job and if they say no, whether they are actively looking for a job. If they answer no, we classify them as out of the labor force. In case survey participants have a paid job, we ask them whether they have lost any earnings due to the virus and if so, ask them to provide an estimate. Similarly, if respondents have savings of more than one month of income, we also ask them whether they have lost any wealth and if so, how much.

Regarding the corona virus, we ask participants if they have heard any news about it and if so, how concerned they are about their financial situation with a qualitative scale from 0 to 10. Moreover, we ask them whether they are currently under lockdown (we also observe their zipcodes), and ask to evaluate how different government bodies are handling the crisis. Finally, we ask households to estimate expected duration of lockdowns and time before conditions return to normal.

III The COVID19 Crisis in the Survey Data

A major contribution of our study to the growing literature on the effects of COVID19 on expectations and spending is the panel dimension of our survey. Hence, we can study in detail how spending, perceptions, and expectations changed over time pre and during the pandemic and also benchmark our cross-sectional estimates to the movements in these aggregates over time.

A. Pre-crisis vs. Crisis Statistics

Tables 1 and 2 provide average statistics of all the variables we analyze in the paper for the pre-crisis wave in January, the crisis wave in April, as well as the difference. Panel A of Table 1 first documents the labor market statistics. Consistent with Coibion, Gorodnichenko and Weber (2020), we find a dramatic (5 percentage point) drop in employment which is larger than the cumulative decrease in the employment-to-

[1] According to data from the National Mortgage Database program, jointly managed by the Federal Housing Finance Agency (FHFA) and the Consumer Financial Protection Bureau (CFPB).

population ratio during and after the Great Recession. The unemployment rate only increased by 2 percentage points because more than 4 percent of our survey population dropped out of the labor force which is even larger than the cumulative drop in labor-force participation between 2008 and 2016 of 3 percentage points.[2]

Panel B of Table 1 studies differences in liquidity and financial constraints across survey waves. Surprisingly, the fraction of survey participants that is able to cover an unexpected expense equal to one month of income slightly increases.[3] In a similar spirit, the fraction of households reporting significant financial wealth (more than one month of income) increases slightly.[4] Given the collapse of employment and financial markets, one may have expected that households should have less liquidity and access to credit. However, there is an offsetting factor. Because consumer spending declines dramatically, household could have greater (precautionary) savings and hence, on balance, there is little change in liquidity and access to credit.[5]

Panel C focuses on portfolio reallocations for the subsample of survey participants that have savings larger than one months of income. In the aggregate, we find small decreases in portfolio shares for cash, foreign assets, and gold but increases in US bonds and stocks. Overall, the portfolio reallocations are, however, small consistent with many savers not trading frequently (Giglio et al., 2019).

Finally, Panels D to G report average statistics for inflation expectations and uncertainty, unemployment and mortgage rates, both current, over the near future, as well as in the longer run. Inflation expectations on average dropped by 0.5 percentage points but uncertainty increased by 0.3 percentage points. Average perceptions of current unemployment rates increased by 11 percentage points with similar magnitudes for expectations in one year. Unemployment expectations over the next three to five years also increased by an average of 1.2 percentage points. These results are qualitatively similar (i.e., a large, short-run increase in unemployment with unemployment rates elevated by one percentage point in 3-5 years) when we drop observations for unemployment rates larger than 40% but economic magnitudes of the average differences across waves are about half the size. Current mortgage rate perceptions as well as expectations for the end of 2020 and 2021 also dropped on average by about 0.4 percentage points with even larger drops in average expectations over the next five to ten years. The change in average

[2] Unemployment is defined as the ratio of those respondents that currently do not have a paid job but are looking for one. We define labor-force participation as the fraction of the overall survey population that is either employed or looking for work.

[3] The survey question is "Suppose that you had to make an unexpected payment equal to one month of your after-tax income, would you have sufficient financial resources (access to credit, savings, loans from relatives or friends, etc.) to pay for the entire amount?"

[4] The survey question is "Does your household have total financial investments (excluding housing) worth more than one month of combined household income?"

[5] Another possibility is that income declined so much that more households can find credit to cover this correspondingly reduced amount of spending.

expectations show some dramatic differences across waves pre and during the crisis and allow us to benchmark our cross-sectional estimates below to movements in the aggregate.

We now move on to study the change in average monthly spending in the three months before the two survey waves. One concern with survey data is that participants might only partially recall their past expenditure. To benchmark our survey data, we first compare the reported average monthly spending in the January wave to the monthly spending in the 2018 Consumer Expenditure Survey (CEX). To do so, we take the annual data from the CEX, divide it by 12 to get monthly averages, and match the survey categories to the categories in the CEX. Some differences are expected for at least two reasons. First, no one-to-one mapping exists between categories in the different datasets. Second, consumer spending is seasonal and the CEX survey is a monthly average over a year, while the Nielsen survey covers a specific part of a year. Despite these inconsistencies, consumer spending in the Nielsen survey is reasonably close to consumer spending in the CEX (Appendix Table 2). Overall monthly spending in our survey is \$3,999 which is smaller than the average monthly spending in the CEX of \$5,102 which is expected because the CEX also includes additional categories which we did not elicit in the survey as well as larger durables such as car purchases and larger appliances. Excluding these categories moves the two averages closer to each other. As for debt payments which include student loans we see larger expenditures in the January wave than in the CEX which does not have a separate category for student loans. Housing related expenses including rent and maintenance among other expenses compare closely with monthly expenses of \$616 in our survey and \$535 in the CEX. Similarly, for utilities which also includes phone and internet, and food which includes groceries, dine out, and beverages, both surveys report spending of \$429 and \$532 (KNPC) and \$455 and \$709 (CEX), respectively. As for clothing and footwear, we find averages of \$126 in the KNCP and \$220 in the CEX. For expenditures on gasoline, the category which matches closest across surveys, we indeed find almost identical averages, \$174 versus \$176. Overall, we conclude that the survey-elicited expenses line up reasonably closely to averages we can find in the CEX and suggest our subsequent analysis provides meaningful insights. Another advantage of our survey design relative to repeated cross-sections is the fact that we can do comparisons across survey waves in the same sample population which allows us to difference out systematic misreporting (i.e., some survey respondents systematically over- or underreporting certain categories).

Table 2 reports the overall monthly dollar spending as well as the split down by categories. Note that households can report zero spending for a given category in a wave and average spending in columns (1) and (2) includes households with zero spending. To make descriptive statistics more comparable to the results we report below, we also compute the growth rate of $\log(1 + Spending)$, that is, $\overline{\log(1 + Spending)}_{April} - \overline{\log(1 + Spending)}_{January}$. We do this particular transformation of the data to handle the skewness of consumer spending and to take into account variation in the extensive margin, that is, some households stop spending on some categories. We see that overall spending over the last three months drops by $1,000 per month between January and April. The decline in the averages corresponds to a drop of 31 log percentage points in spending. Across categories, we see the largest average drops for travel, clothing, debt payments, and housing with decreases of 150, 110, 92, and 88 log percentage points, respectively.[6] To better understand the nature of these declines, we also report extensive and intensive margins of each spending category in columns (4)-(6) and (7)-(9) respectively. The extensive margin measures whether a survey participants has spent any money in a given category, whereas the intensive margin reports average dollar spending conditional on any spending. We observe large declines in the extensive margin not only for travel (the share of household reporting spending on this category declines by 31 percentage points) and clothing (22 percentage points) but also for debt payments and housing (which includes rent), by 12 and 15 percentage points, respectively. Hence, households mainly curb their discretionary spending and adjust their non-discretionary spending by less, which is consistent with D'Acunto et al. (2019). Furthermore, we observe that even for those that have positive debt payments, the size of the payment declines by approximately 15 log percentage points, while for housing (rent) the change in the intensive margin is zero (i.e., conditional on paying rent, households pay the full rent). These results suggest that constrained households stop servicing their debt and housing payments. Results for the intensive margins of other categories suggest that households downsize their purchases conditional of buying goods/services in a category. Given the importance of mortgage defaults for the severity of the Great Recession, these results suggest a sluggish recovery and substantial defaults in the coming months absent adequate policy interventions (Mian et al., 2013).

Table 2 also reports spending on durables over the previous six months, both at the extensive margin, any durable purchase, and the intensive margin, the realized dollar spending. The survey question specifies durables as a house (apartment), a car, or a large appliance. We see a slight increase in the frequency of spending on durables over the last six months in our April survey wave but no difference in the intensive margin. Because the reference period is the previous six months and the speed at which the COVID crisis has been unfolding, we are less likely to capture material variation between the pre-crisis and crisis periods.

The last row of Table 2 focuses on planned durable purchases (intensive and extensive margins) over the next twelve months. Here, we find large decreases in planned spending on durables during our crisis wave. On average, survey participants are 5 percentage points less likely to purchase durables during the crisis wave relative to the pre-crisis wave but conditional on a purchase the average amount is higher, which indicates possibly strong selection effects. When we measure the decline using $\log(1 + Spending)$ which combines both margins, the planned purchases of durable goods decline by 30 log percentage points.

[6]These figures correspond to 77.8, 66.7, 60.1, and 58.5 percentage point declines.

In short, we observe a massive decline in consumer spending and consumers anticipate reduced spending in the coming months, which is consistent with other data. For example, Baker et al. (2020) observe subsets of spending through a FinTech app and find decreases of restaurant spending of one third with overall average daily spending decreasing by two thirds between January and March but sharp increases in groceries early in the pandemic due to stockpiling with a decline during the end of March. Chen et al. (2020) use data from the largest bankcard acquiring and professional service supplier in China and find spending on goods and services decrease by 33%, whereas spending on entertainment and travel plummeted by about 60%. Anderson et al. (2020) uses transaction-level customer data from the largest bank in Denmark and documented that overall spending dropped by 25% with the largest decreases for food away from home and travel with more than 60% and almost 80%, respectively. Hence, our survey-based estimates are consistent with transaction-based analysis for several countries. Our analysis, though, has the potential advantage that we can observe overall spending and not only subsets of spending via credit cards or QR codes. From a historical perspective, these drops are large. De Nardi et al. (2012) use real personal consumption expenditure data and argue that overall consumption grew 15 percentage points less over the subsequent five years from 2007Q4 onwards compared to historical averages with even larger declines in services consumption.

B. Direct COVID19 Impacts

Table 3 reports several descriptive statistics for variables measuring welfare of survey participants in the context of the COVID crisis. First, we find that respondents have high levels of concerns about their household's financial situation. On a scale from 0 (not concerned) to 10 (extremely concerned), the mean response is 7.2 and the median response is 8. A third of respondents chose the maximum score of 10. Second, we find that even employed households report a considerable loss of labor earnings. Approximately 40 percent of the employed reported lost earnings because of COVID concerns. Conditional on losing earnings, the median loss is $1,500 but the mean loss is much higher at more than $5,000. Third, 54 percent of respondents with materially important financial wealth (worth more than one-month of household income) report losses in financial wealth because of COVID concerns. Because the distribution of wealth is highly skewed, the mean loss (approximately $33,500) is much greater than the median loss ($9,000). These statistics suggest that the COVID crisis has a significant impact on income and wealth of households. These numbers are similar to Hanspal et al (2020) who report average income losses of about $3,000 and wealth losses of about $50,000.

We also ask respondents to report the expected duration of lockdowns in their locations and the expected time before conditions return to normal in their locations. On average, lockdowns are expected to last 83 days and normalcy is expected to return in approximately six months. However, there is significant variation in these estimates: the standard deviation is 48 days for the lockdown duration and 140 days for the return time.

C. Lockdowns and COVID19 Infections

Figure 1 graphically illustrates the geographic spread of lockdowns at the county level according to our survey. The darker the color, the higher the fraction of the survey participants reporting being under lockdown. White represents counties without any data. We see substantial variation in the lockdown status with intensive lockdowns in the West, North East, and northern Midwest, which is consistent with the data reported in Baek et al. (2020).

To provide a sense for time variation in the distribution of lockdowns and COVID cases, Figure 2 shows the evolution of the fraction of counties with a lockdown as well as the fraction of counties with reported COVID cases above various thresholds. We take the timing of lockdowns at the county level from Baek et al. (2020) and the time series of confirmed COVID infections from Barrios and Hochberg (2020). We observe a significant spread of COVID cases before counties start to introduce lockdowns. Indeed, the fraction of counties with at least one confirmed COVID case leads the fraction of counties with a lockdown. For example, on March 22, 2020, more than 30 percent of counties had at least one confirmed COVID case, but only 10 percent of counties had a lockdown. Note that the fraction of counties with 10+ cases or with 100+ cases grows at a slower rate and as we increase the threshold for the number of confirmed cases, the fraction of counties with cases above a higher threshold generally lags the fraction of counties with lockdowns.

Given that lockdowns deterred social mobility substantially (Barrios and Hochberg, 2020), we now study how the COVID-induced lockdowns causally determine employment, consumer spending and expectations and whether lockdowns can account for aggregate economic conditions.

IV Econometric Framework for Measuring the Lockdown Effects

To estimate the effect of lockdown on economic activity, we need to address two related identification concerns. First, COVID infections may have a direct effect on the local economy. For example, workers may fail to show up at work because they fell sick with the virus or may have to take care of sick family members. Second, lockdowns are not applied randomly by policymakers and it could be that the same factors that lead policymakers to implement lockdowns also induce behavioral changes on the part of the population. For example, people concerned about the virus may self-quarantine thus depressing the economy before a shelter-at-home order is announced. Because of this behavioral response, a lockdown may appear to have a larger effect on the economy than its actual direct effect. In short, estimates of lockdown effects may be confounded by omitted variables.[7]

To tackle these concerns, we estimate the following econometric specification:

$$Y_{ijt} = \kappa_i + \psi \times Lockdown_{ijt} + \eta \times ShareCOVID_{jt} + error \tag{1}$$

$$Lockdown_{ijt} = \alpha_i + \beta \times \mathbb{I}\{COVID_{j,t-s} > 0\} + \gamma \times ShareCOVID_{jt} + error \tag{2}$$

where i, j index persons and counties and t and s index time. t are the January and April survey waves, $t - s$ shows the time of exposure to COVID s periods before wave t to determine variation in lockdowns in county j. Y is an outcome variable. κ_i is a person fixed effect. $Lockdown$ is a dummy variable equal to one if person i in county j reports being in lockdown at time t. $\mathbb{I}\{COVID_{js} > 0\}$ is a dummy variable equal to one if county j reported a positive number of COVID infections at time s. There is no lockdown or confirmed COVID case for any county in the January wave. $ShareCOVID_{jt}$ is the share of the population with confirmed COVID infection in county j at time t, the share is measured in percent (i.e., from 0 to 100). $ShareCOVID$ proxies for the first concern that COVID infections can have a direct effect on the economy by influencing health of workers and consumers, thus addressing the first identification concern. Data on local COVID infections are from Barrios and Hochberg (2020). Because variation in policy is at the county level, we cluster standard errors at the county level.

Equation (2) is the first-stage regression for $Lockdown$. Our identifying assumption is that local public health authorities are likely to impose a lockdown as soon as a single case of a COVID infection in a location is confirmed. The timing of this first case is largely random and can reflect idiosyncratic travel of local individuals, the ability or willingness of local authorities to do COVID tests, etc. Because the number of confirmed cases initially is very low (which we can achieve by choosing an appropriate date s), it is unlikely to generate a large public concern about contracting the virus or to have a direct health effect on the local population. Instead, the endogenous response of the local population to COVID concerns is more likely to reflect the prevalence of the disease locally, which would be captured by the $ShareCOVID$ variable. Note that with this identifying assumption, we effectively measure the effect of lockdowns by comparing late and early adopters of lockdown policies and therefore we may miss general equilibrium effects.

While we cannot statistically validate this identifying assumption, we can assess its quality indirectly by examining external data. First, we examine the distribution of COVID cases at the time when

[7] The effect of first confirmed COVID infections on the decision to introduce a lockdown can be heterogeneous across locations. For example, locations with a higher density of population could be more vulnerable to a fast dissemination of the virus and thus may implement lockdowns earlier than locations with lower densities. The public media also suggest that locations with a large share of Trump supporters appear to have a lower propensity to introduce lockdowns in response to COVID. We find some support for these hypotheses in the data (Appendix Table 3), but introducing heterogeneity in the propensity to adopt lockdowns has no material effect on our second-stage estimates and thus we consider a simple specification for the first stage.

a lockdown is implemented. Figure 3 shows that approximately 75 percent of counties have less than 10 confirmed COVID cases at the time when a lockdown is implemented. Furthermore, going from zero cases to one case is associated with a 15 percent higher probability of a lockdown. Thus, it takes only a handful of cases—which is hardly enough to have a discernable direct health effect on the local economy—before a county is under a lockdown.

Second, we use event analysis to investigate how lockdowns and first reported COVID cases influence dynamics for proxies of economic activity. In particular, we estimate the following specification:

$$\begin{aligned} Mobility_{j\tau} = \alpha_j + \phi_\tau + \textstyle\sum_{\varsigma=-8}^{14} \beta_\varsigma \times Lockdown_{j,\tau+\varsigma} \\ + \textstyle\sum_{\varsigma=-8}^{14} \psi_\varsigma \times \mathbb{I}\{First\ COVID\ at\ \tau\}_{j,\tau+\varsigma} + error. \end{aligned} \quad (3)$$

j indexes counties, τ, ς index time in days, $Mobility$ is the daily Google's Community Mobility Report (retail mobility),[8] $Lockdown_{j,\tau}$ is a dummy variable if county j has a lockdown at day τ (these data are from Baek et al. 2020), and $\mathbb{I}\{First\ COVID\ at\ \tau\}_{j\tau+\varsigma}$ is a dummy variable equal to one if county j reports its first confirmed COVID infection on day τ and zero otherwise. α_j and ϕ_τ are county and time fixed effects.

Estimated $\{\beta_\varsigma\}_{\varsigma=-8}^{14}$ and $\{\psi_\varsigma\}_{\varsigma=-8}^{14}$ provide event analysis of lockdowns and first confirmed infections. Our identification assumption predicts that the behavioral response to first infections should be small relative to the lockdown response. We report the estimates for $\{\beta_\varsigma\}_{\varsigma=-8}^{14}$ and $\{\psi_\varsigma\}_{\varsigma=-8}^{14}$ in Figure 4. We find weak (if any) pre-trends in the data for lockdowns (consistent with Baek et al. 2020) or first COVID cases. Each event reduces mobility but mobility declines by an order of magnitude more to a lockdown than to a first COVID case. Given consumer spending and/or employment are highly correlated with mobility (Baker et al., 2020), economic activity is unlikely to be materially affected by reports of a first confirmed COVID case. We conclude that our identifying assumption is plausible.

Table 4 reports estimates for the first stage regression (equation (2)) for various choices of s, the date that we use to determine whether a county has confirmed COVID cases. We see that the dummy variable for confirmed COVID cases is a strong predictor of lockdowns at the local level across different time periods. The t-statistic on $\mathbb{I}\{COVID_{js} > 0\}$ is well above 10 thus suggesting a strong first stage, that is, the instrument is relevant. Note that the coefficient on $ShareCOVID_{jt}$ is statistically significant only when we use s equal to March 22, 2020 or later, while the survey is fielded in the first week of April (i.e., the lockdown dummy in the "crisis" wave refers to April 2-23, 2020). This suggests that the intensity of infections has predictive power roughly one week before a lockdown is implemented. To ensure that our

[8] These data are described in https://www.google.com/covid19/mobility/. In short, Google uses anonymized sets of data from users who have turned on their location History setting. We use the retail mobility index which covers grocery markets, food warehouses, farmers markets, specialty food shops, drug stores, and pharmacies because of high coverage.

results are not driven by direct health effects, we set s so that $t - s$ referes to March 15, i.e., two weeks before the survey.

V Perceptions, Expectations, and Choices during Lockdowns

We now causally study the effect of lockdowns on outcomes Y_{it} such as spending, employment, expectations, and perceptions via instrumental variable regressions.[9] These results can be an important input into policy discussions about adequate measures of fiscal and monetary policy to stabilize local economies but are also important to measure the economic costs of lockdowns that are key determinants for discussions about re-opening the economy.

A. Employment status

We first analyze the effect of lockdowns on labor-market statistics. Colum (1) of Table 5 shows individuals in counties under lockdown are 2.8 percentage points less likely to be employed relative to other survey participants. Compared to the overall drop in employment we document, we find that 60% of the overall decline is driven by survey participants in early lockdown counties. Column (2) studies the effect on labor-force participation and column (3) on unemployment. Lockdowns have a sizeable effect on both variables. Individuals under lockdown have a 1.9 percentage point lower labor-force participation and a 2.4 percentage point higher unemployment rate. The difference in the unemployment rate between individuals in counties under lockdowns and other counties corresponds to a third of the overall rise in unemployment during the Great Recession, whereas the difference in the labor-force participation corresponds to almost 80% of the decline between 2008 and 2016. Moreover, the rise in unemployment corresponds to even more than 100% of the overall average rise we document in Panel A of Table 1 suggesting redistributive effects across counties. In short, lockdowns appear to have immediate and large consequences of employment and can account for much of the deterioration in the labor market that has occurred in the U.S. in 2020.

B. Consumer spending

Does this dramatic change in labor market conditions due to COVID19 induced lockdowns translate into changes in spending patterns? Table 6 reports the second-stage results for $\log(1 + spending)$ for overall spending and for granular subcategories in the previous three months. We see that lockdowns are associated with a drop in overall spending equal to 31 log percent which is even slightly larger than the overall drop we document in Panel A of Table 2. Recreation, travel, and entertainment expenses, clothing and footwear, housing expenses including rent and maintenance, transportation, and debt payments including mortgages,

[9] We report OLS estimates in Appendix Table 4 through Appendix Table 8. In general, we find that OLS estimates are smaller than IV estimates but the qualitative results are similar.

auto, and student loans see the largest declines in spending with 184, 128, 110, 92, and 71 log percentage points, respectively. Gasoline also has a large decrease in dollar spending which could partially be driven by the large decrease in oil prices. Instead, for utilities, food, or education and childcare, we only observe modest drops consistent with findings in Andersen et al. (2020), and intermediate drops for small durables such as furniture and medical expenses. These heterogeneous responses in spending across categories to local lockdowns are consistent with supply restrictions, individuals no longer being able to travel and non-essential businesses being closed but also in part reflect differences between discretionary and non-discretionary spending (D'Acunto et al. 2020c). Moreover, these results suggest different sectors in the economy might be differentially exposed to drops in consumer spending. This has important implications for the design and implementation of government programs such as loans programs as well as for the overall speed and the differential speed of the recovery across sectors of the economy and geographic partitions. Our results can therefore inform the current debate on federal help for local economies and states.

We move on to study the effect of lockdowns on durable purchases that are the most cyclical component of consumption. Durable purchases are lumpy and occur infrequently and financial constraints might be an important impediment for these purchases. Hence, we first study whether survey respondents differ systematically in their financial constraints and past purchases of durables by lockdown status. We find no systematic difference exists in the degree to which individuals are able to cover an unexpected expense equal to one month of income (see Panel B of Table 7). Similarly, no difference exists in the degree to which survey respondents purchased durable goods in the last six months (Panel B of Table 6). Panel C of Table 6, instead, indicates large drops in plans to spend on durables both at the extensive margin and the intensive margin. Survey participants under lockdown are more than 3.5 percentage points less likely to purchase durable goods in the next 12 months and plan to spend almost 26 log percentage points less. This drop in planned spending is almost 100% of the aggregate drop in planned spending in Table 2 across the survey waves in January and April 2020.

C. *Liquidity and portfolio allocations*

During times of crisis and uncertainty, a flight to safety and quality often occurs, reflected in a surge in treasuries and the US dollar. To study whether similar phenomena also happen at the individual portfolio level, we now examine the sample of individuals that have savings larger than one month of income in Panel A of Table 7. Consistent with the macro trends, we find that survey participants in lockdown counties have a portfolio share in liquid savings that is 1.7 percentage points higher than other participants even though not statistically significant. The increase in portfolio shares in checking accounts is of the opposite sign to the average in Panel C of Table 1 suggesting that survey participants in late lockdown counties actually decreased their portfolio share by more. Moreover, we find a decrease in the share of foreign assets by 0.7 percentage points. Gold is often portrayed as a store of value and safety but only few households in our sample have any savings in gold and no difference exists in portfolio shares across survey participants by lockdown status. Panel B shows that no systematic variation exists in liquidity, that is, the ability to cover an unexpected payment equal to one-month of income. This result is important because it indicates that differentially binding financial constraints are an unlikely driving force for our spending results. We also find no difference in financial wealth, that is, savings larger than one month of income, by lockdown status. This null result is plausible because it is unlikely that the checking account balance, or the value of stock and bond portfolios should be differentially affected by local lockdown conditions.

D. Macroeconomic expectations

To what extent do local lockdowns spill over to subjective expectations? After all, most economic decisions are forward looking and therefore directly depend on individuals' expectations. Moreover, the effectiveness of fiscal and monetary policy measures crucially depend on the expectations of households (Bernanke, 2010) and Binder (2020) finds systematic revisions of GDP growth and inflation expectations due to news about COVID. Ex-ante, it is unclear whether the COVID crisis will result in higher or lower inflation. On the one hand, supply-chain disruptions could increase marginal costs and result in higher future inflation. On the other hand, depressed demand as currently reflected in low oil prices could instead put downward pressure on inflation. To shed more light on this matter, we first study the effect on inflation expectations and report results in Table 8. During the binding lower bound on nominal interest rates, inflation expectations translate one-to-one into changes in real interest rates (Euler equation) which can directly impact current and future consumption choices (Coibion et al. 2019, D'Acunto et al. 2016). We see in Panel A that survey participants under lockdown have on average 0.5 percentage point lower inflation expectations over the next twelve months. Lower inflation expectations imply higher perceived real interest rates which suggests additional downward pressure on household consumption. Household consumption, however, responds not just to the level of real interest rates but also to the dispersion in inflation expectations due to precautionary savings. We use the distribution question for inflation expectations and create a measure of uncertainty in expected inflation at the individual level as the standard deviation in one-year ahead expected inflation. Indeed, local lockdowns increase the uncertainty for future inflation by more than half a percentage point which might translate into increasing precautionary savings demand. These cross-sectional estimates for inflation expectations and uncertainty are large and correspond to about 100% of the difference across survey waves in Panel D of Table 1.

The remaining Panels of Table 8 study the perceptions of current unemployment and mortgage rates as well as the expectations for the next 12 months, or the end of 2020 and 2021 and the longer horizon (three to five years for unemployment and five to ten years for mortgage rates, respectively).

Unemployment rates are a key indicator for the state of the economy and mortgage rates are the key transmission mechanism of monetary policy for many households and also directly shape the economic recovery given the importance of housing for business cycles (Mian et al., 2017). The perceived unemployment rate spikes up by more than 13 percentage points in lockdown counties and the expected unemployment rate stays at elevated levels for the next 12 months and only slowly decreases to an increase of 2 percentage points over the longer horizon (Panel B). These increases in cross-sectional estimates are even larger than the aggregate increases in expectations that we document in Panel E of Table 1. Results are similar in terms of persistence albeit slightly smaller in magnitude once we exclude extreme observations with perceptions and expectations larger than 40% (Panel C). These expectations suggest a rather sluggish and slow recovery, resembling a U shape in terms of recent policy discussions. As for mortgage rates, we see survey participants perceive a decrease of about two-thirds of a percentage point which persists until the longer horizon (Panel D). These expectations correspond to a level shift in the term structure of mortgage rates and are also consistent with a depressed economy for an extended period of time. Again, we find that the decrease in mortgage rates across counties is larger than the aggregate decreases across survey waves (Panel G of Table 1).

E. Political outcomes

Finally, we study whether local lockdowns affect the qualitative rating of several government institutions in Table 9 which we measure on a ten-point Likert scale with higher values reflecting higher approval ratings. We only elicited approval ratings in the April wave of the survey which is why our two-stage least squares estimation now exploits purely cross-sectional variation:

$$Y_i = \psi \times lockdown_i + \eta \times ShareCOVID_j + StateFE + error \tag{4}$$

$$lockdown_i = \beta \times \mathbb{I}\{COVID_{js} > 0\} + \gamma \times ShareCOVID_j + StateFE + +error, \tag{5}$$

where we use the same notation as in equations (1) and (2) and both equations include state fixed effects.

U.S. officials increasingly refer to the pandemic as a war situation[10] and typically, incumbents tend to observe a surge in support during war times with possibly important implications for the upcoming presidential elections. At the same time, the ‘current war’ also reflects a major economic hardship for many individuals and we might expect support to decrease for the president during poor economic times. We see in Table 9 that survey respondents in lockdown counties have a 6 point lower approval rating of the President than other survey respondents on a ten-point scale. No heterogeneity exists for other government institutions (the Congress in row (2), the U.S. Treasury in row (3), the Federal Reserve in row (4)). The approval for the U.S. Center for Disease Control in row (5), though, is 3 points higher for survey participants in lockdown.

[10] For example, Treasury Secretary Steven Mnuchin has noted, “This is a war, and we need to win this war and we need to spend what it takes to win the war.”

VI Conclusion

The arrival of the COVID19 pandemic resulted in major economic downturns around the world with large drops in employment, equity markets, and personal income. To slow the spread of the pandemic, many governments imposed restrictions in movements to slow the spread of the virus. We field large-scale customized surveys on a representative US panel of households to document the extent of economic damage and to study the impact of local lockdowns on realized and planned spending, income and wealth losses, macroeconomic expectations and approval ratings of political institutions. We observe a dramatic decline in employment and consumer spending as well as a bleak outlook for the next few years. Our estimates suggest that this economic catastrophe can be largely accounted by lockdowns. Furthermore, because we can only measure the immediate effect of lockdowns on labor markets and consumer spending, we likely underestimate the economic costs of these policies as more firms would gradually go out of business and more workers would be let go under continued lockdowns.

It is beyond the scope of this paper to establish whether this economic cost is sufficiently small to justify lockdown policies that likely save many thousands of lives. However, our analysis should inform policymakers about at least one part of the tradeoff they face because these costs are relevant in thinking about how long to maintain lockdown policies, especially since the costs are likely increasing with duration. The significant costs that we identify suggest that policymakers should be wary of focusing only on the benefits of lockdown policies and not carefully weighing them against their costs. Our analysis should also provide input for policies aimed to mitigate the consequences of the COVID recession. For example, we document that many households effectively default on their debt payments and rents which can start a wave of bankruptcies and evictions and thus delay the recovery. Low expectations for inflation and mortgage interest rates will likely limit the power of monetary policy. While households expect normalcy to return within six months, the ferocity and speed of this storm is such that the damage may be rather persistent. To avoid adverse hysteresis-like scenarios, policymakers may have to consider less conventional measures such as extended periods of fiscal stimulus, debt forgiveness, taking stakes in businesses (including financial institutions), and more aggressive quantitative easing.

References

Andersen, Asger Lau, Emil Toft Hansen, Niels Johannesen, and Adam Sheridan, 2020. “Consumer Reponses to the COVID19 Crisis: Evidence from Bank Account Transaction Data,” Working Paper.

Allcott, Hunt, Levi Boxell, Jacob Conway, Matthew Gentzkow, Michael Thaler, and David Yang, 2020. “Polarization and Public Health: Partisan Differences in Social Distancing during the Coronavirus Pandemic,” Working Paper.

Alvarez, Fernando, David Argente, and Francesco Lippi (2020) "A Simple Planning Problem for COVID-19 Lockdown," University of Chicago, Becker Friedman Institute for Economic Working Paper No. 2020-34.

Atkeson, Andrew (2020) "What Will Be the Economic Impact of COVID-19 in the US? Rough Estimates of Disease Scenarios," NBER Working Paper w26867.

Baker, Scott, R.A. Farrokhnia, Steffen Meyer, Michaela Pagel, and Constantine Yannelis, 2020. "How Does Household Spending Respond to an Epidemic? Consumption During the 2020 COVID-19 Pandemic," Working Paper.

Barrios, John and Yael Hochberg, 2020. "Risk Perception Through the Lens of Politics in the Time of the COVID-19 Pandemic," Working Paper.

Barro, Robert J., José F. Ursúa, and Joanna Wang (2020) "The Coronavirus and the Great Influenza Pandemic: Lessons from the 'Spanish Flu' for the Coronavirus's Potential Effects on Mortality and Economic Activity" NBER Working Paper w26866.

Bick, Alexander, and Adam Blandin, 2020. "Real Time Labor Market Estimates During the 2020 Coronavirus Outbreak," manuscript.

Binder, Carola, 2020. "Coronavirus Fears and Macroeconomic Expectations" Working Paper.

Chen Haiqiang, Wenlan Qian, and Qiang Wen, 2020. "The Impact of the COVID-19 Pandemic on Consumption: Learning from High Frequency Transaction Data," Working Paper.

Bernanke, Ben (2010). Monetary policy objectives and tools in a low-inflation environment. In *Speech at a conference on Revisiting Monetary Policy in a Low-Inflation Environment,* Federal Reserve Bank of Boston, October, Volume 15.

Bursztyn, Leonardo, Aakaash Rao, and Christopher Roth, 2020. "Misinformation During a Pandemic," Working Paper.

Coibion, Olivier, Dimitris Georgarakos, Yuriy Gorodnichenko and Michael Weber, 2020a. "Forward Guidance and Household Expectations," NBER Working Paper w26778.

Coibion, Olivier, Dimitris Georgarakos, Yuriy Gorodnichenko and Maarten van Rooij, 2019. "How Does Consumption Respond to News about Inflation? Field Evidence from a Randomized Control Trial," NBER Working Paper w26106.

Coibion, Olivier, Yuriy Gorodnichenko and Michael Weber, 2019. "Monetary Policy Communications and their Effects on Household Inflation Expectations," NBER Working Paper w25482.

Coibion, Olivier, Yuriy Gorodnichenko and Michael Weber, 2020. "Labor Markets During the COVID-19 Crisis: A Preliminary View," NBER Working Paper w27017.

Crump, Richard, Stefano Eusepi, Andrea Tambalotti, and Giorgio Toppa, 2015. "Subjective Intertemporal Substitution," Federal Reserve Bank of New York Staff Reports N 734.

D'Acunto, Francesco, Daniel Hoang, and Michael Weber, 2016. "The Effect of Unconventional Fiscal Policy on Consumption Expenditure," NBER Working Paper 22563.

D'Acunto, Francesco, Ulrike Malmendier, Juan Ospina, and Michael Weber, 2020a. "Exposure to Daily Price Changes and Inflation Expectations," NBER Working Paper w26237.

D'Acunto, Francesco, Ulrike Malmendier, and Michael Weber, 2020b. "Gender Roles and the Gender Expectations Gap," NBER Working Paper w26837.

D'Acunto, Francesco, Thomas Rauter, Christoph Scheuch and Michael Weber, 2020c. "Perceived Precautionary Savings Motives: Evidence from FinTech," NBER Working Paper 26817.

D'Acunto, Francesco, Alberto Rossi, and Michael Weber, 2019. "Crowdsourcing financial information to change spending behavior," Working Paper.

De Nardi, Mariacristina, Eric French, and David Benson (2012) "Consumption and the Great Recession," *Federal Reserve Bank of Chicago Economic Perspectives*.

Dietrich, Alexander M., Keith Kuester, Gernot J. Müller, and Raphael S. Schoenle (2020) "News and Uncertainty about COVID-19: Survey Evidence and Short-Run Economic Impact," Working Paper.

Eichenbaum, Martin S., Sergio Rebelo, and Mathias Trabandt (2020) "The Macroeconomics of Epidemics" NBER Working Paper w26882.

Farboodi, Maryam, Gregor Jarosch, and Robert Shimer, 2020. "Internal and External Effects of Social Distancing in a Pandemic," Working Paper.

Fetzer, Thiemo, Lukas Hensel, Johannes Hermle, and Christopher Roth, 2020. "Perceptions of Contagiousness and Mortality of COVID-19 Shape Economic Sentiment," Working Paper.

Giglio, Stefano, Matteo Maggiori, Johannes Stroebel, and Stephen Utkus, 2019. "Five Facts about Beliefs and Portfolios" NBER Working Paper w25744.

Guerrieri, Veronica, Guido Lorenzoni, Ludwig Straub, and Ivan Werning, 2020. "Macroeconomic Implications of COVID-19: Can Negative Supply Shocks Cause Demand Shortages?" NBER Working Paper w26918.

Hanspal, Tobin, Annika Weber, and Johannes Wohlfart, 2020. "Income and Wealth Shocks and Expectations during the COVID-19 Pandemic" Working Paper.

Jones, Callum, Thomas Philippon, and Venky Venkateswaran, 2020. "Optimal Mitigation Policies in a Pandemic: Social Distancing and Working from Home" Working Paper.

Kaplan, Greg, Ben Moll, and Gianluca Violante, 2020. "Pandemics According to HANK" Working Paper.

Krueger, Dirk, Harald Uhlig, and Taojun Xie, 2020. "Macroeconomic Dynamics and Reallocation in an Epidemic" Working Paper.

Johnson, David S., Jonathan A. Parker, and Nicholas S. Souleles, 2006. "Household expenditure and the income tax rebates of 2001," *American Economic Review* 96(5): 1589-1610.

Lettau, Martin and Sydney Ludvigson, 2004. "Understanding trend and cycle in asset values: Reevaluating the wealth effect on consumption" *American Economic Review* 94(1): 276-299.

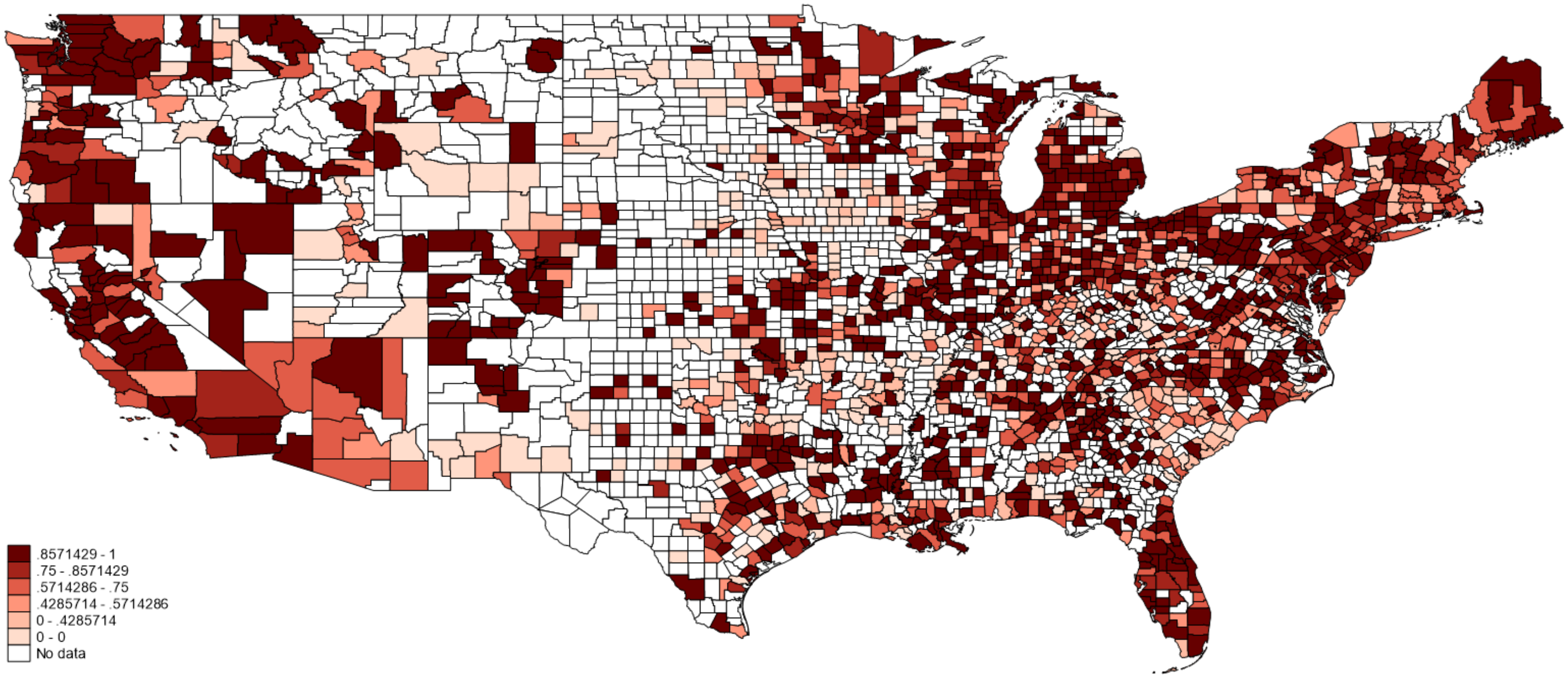
Mongey, Simon and Alex Weinberg, 2020. “Characteristics of Workers in Low Work-From-Home and High Personal-Proximity Occupations,” Becker Friedman Institute for Economic White Paper.

Mian, Atif, Amir Sufi, and Kamelesh Rao, 2013. "Household Balance Sheets, Consumption, and the Economic Slump," *Quarterly Journal of Economics* 128(4): 1687-1726.

Mian, Atif, Amir Sufi, and Emil Verner, 2017. "Household Debt and Business Cycles Worldwide," *Quarterly Journal of Economics* 132(4): 1755-1817.

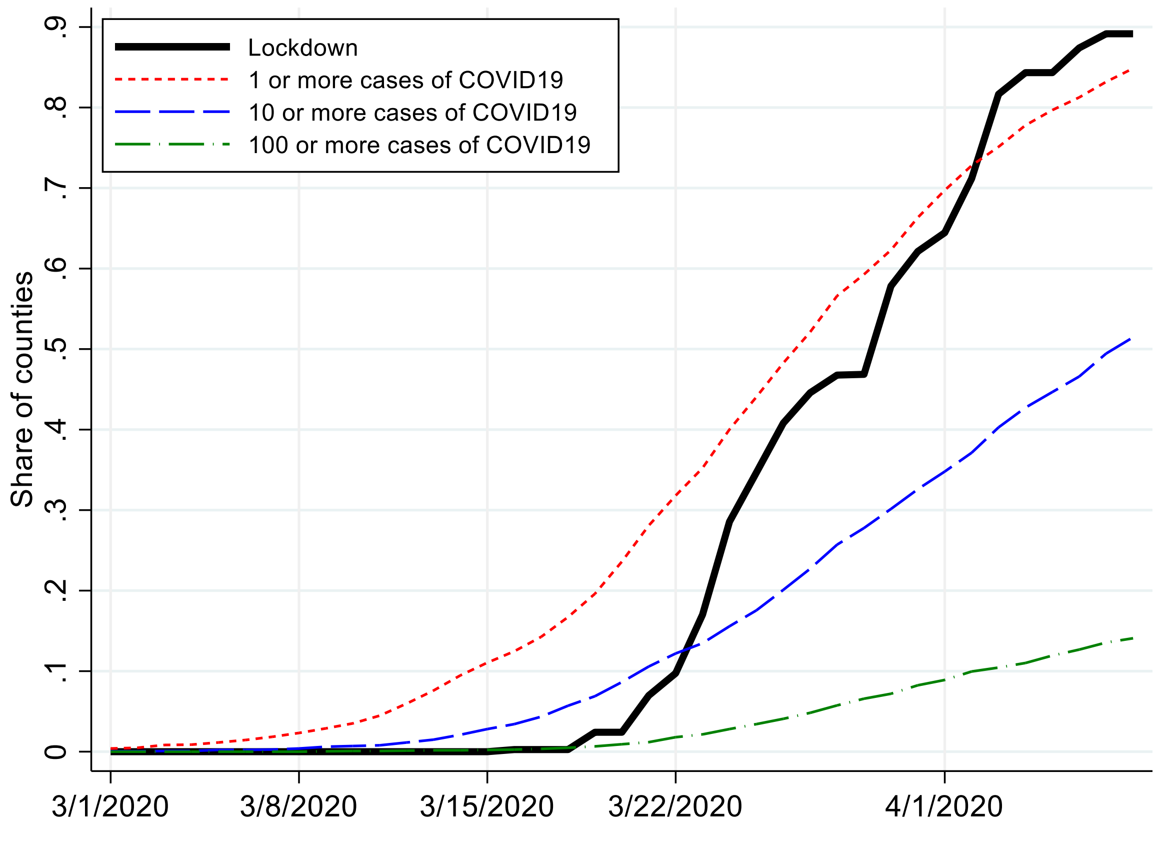
Parker, Jonathan A., Nicholas S. Souleles, David S. Johnson, and Robert McCelland, 2013. " Consumer spending and the economic stimulus payments of 2008," *American Economic Review* 103(6): 2530-2553.

Figure 1. Share of population reporting a lockdown.



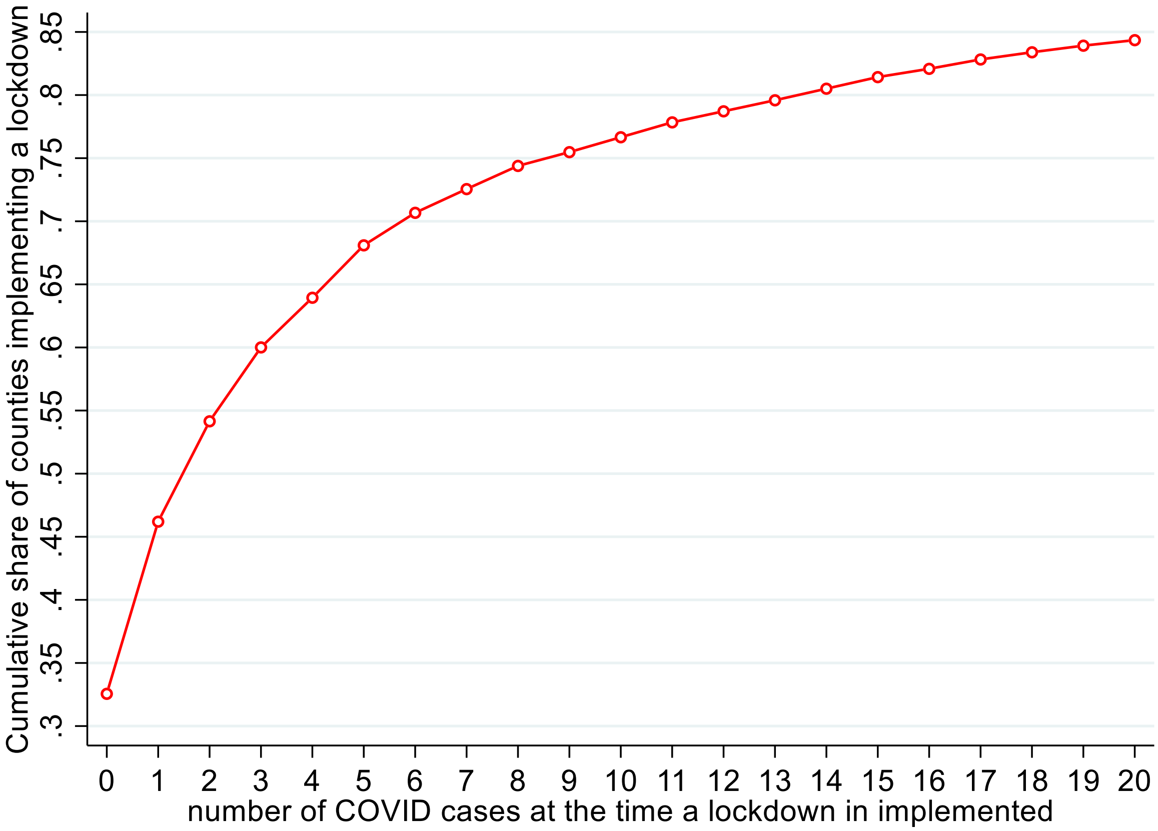
Notes: The figure shows the distribution of lockdowns as reported by respondents in the Kilts Nielsen Consumer Panel. Hawaii is a part of the sample but is not shown in the figure.

Figure 2. Evolution of COVID19 cases and lockdowns over time.



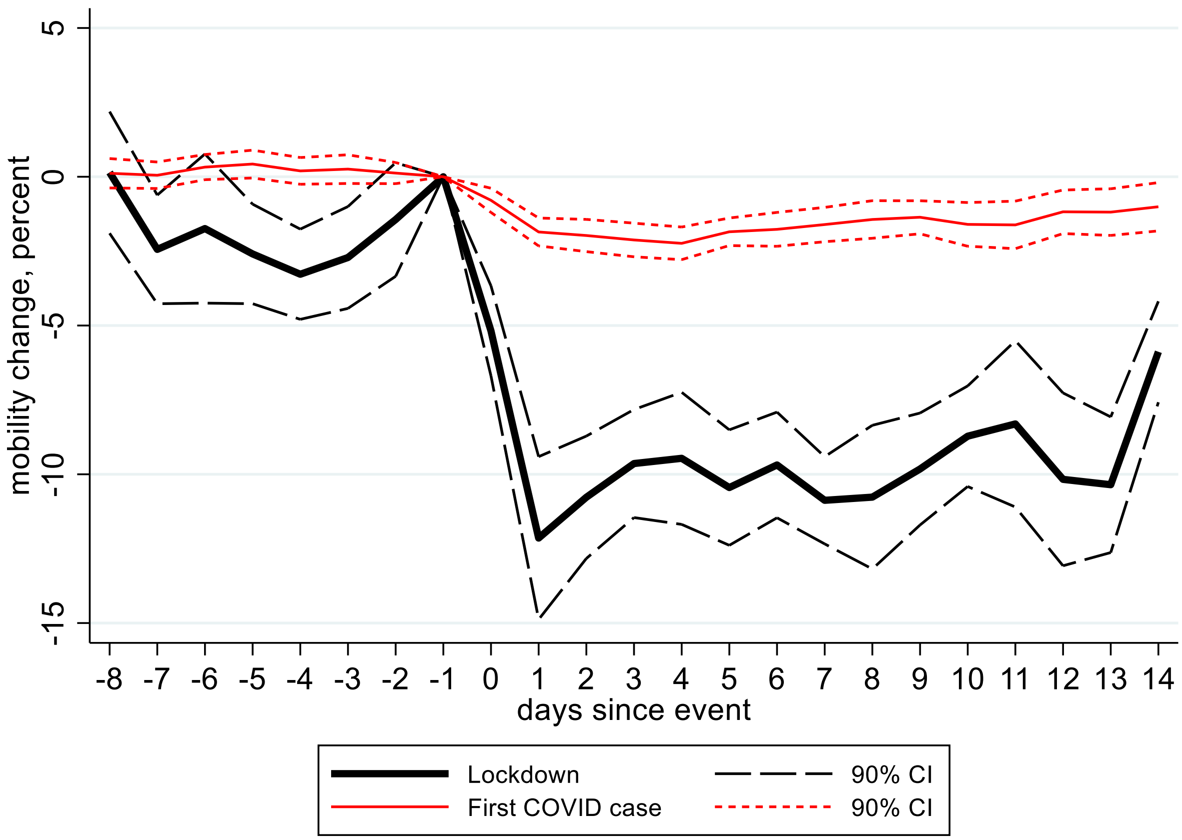
Notes: The figure shows time series for the fraction of counties adopting lockdown policies and the fraction of counties with confirmed COVID cases above a certain threshold.

Figure 3. CDF of the number of confirmed COVID cases at the time a lockdown is implemented.



Notes: The figure show the distribution of COVID cases at the time when a county implements a lockdown.

Figure 4. Retail mobility response to lockdown and the first COVID case.



Notes: the figure shows event analysis for lockdowns and first confirmed COVID infections. The estimates are based on specification (3). Standard errors are clustered by county and day. The outcome variable (vertical axis) is Google's retail mobility index which covers grocery markets, food warehouses, farmers markets, specialty food shops, drug stores, and pharmacies because of high coverage. The estimation sample is February 29, 2020 to April 3, 2020.

Table 1. Descriptive statistics by wave.

	Pre-crisis	Crisis	Difference
	mean/(st.dev)	mean/(st.dev)	mean/[s.e.]
	(1)	(2)	(3)
Panel A. Employment statistics			
Employment	0.577	0.527	-0.050***
	(0.494)	(0.499)	[0.006]
Labor force participation	0.631	0.590	-0.041***
	(0.483)	(0.492)	[0.006]
Unemployment rate	0.086	0.106	0.020***
	(0.280)	(0.308)	[0.005]
Panel B. Liquidity and access to credit			
Ability to make an unexpected payment of one-month income	0.639	0.652	0.013**
	(0.480)	(0.476)	[0.006]
Share of households with significant financial wealth	0.504	0.517	0.013**
	(0.500)	(0.500)	[0.006]
Panel C. Share of financial wealth in:			
Checking account	44.152	43.619	-0.533
	(34.811)	(34.528)	[0.601]
Cash	14.342	13.591	-0.751**
	(21.532)	(20.514)	[0.367]
US Bonds	5.127	5.769	0.641***
	(11.578)	(12.466)	[0.205]
US Stocks	21.391	22.517	1.126***
	(27.193)	(27.524)	[0.472]
Foreign stocks and bonds	3.124	2.677	-0.446***
	(8.014)	(6.900)	[0.133]
Gold and precious metals	1.233	1.088	-0.145*
	(4.896)	(4.717)	[0.084]
Bitcoin and other cryptocurrencies	0.429	0.415	-0.014
	(3.615)	(3.426)	[0.062]
Other	10.203	10.323	0.120
	(23.082)	(23.366)	[0.401]
Panel D. 12-month-ahead inflation, distributional question			
Implied Mean	2.231	1.708	-0.524***
	(4.457)	(5.868)	[0.061]
Uncertainty (standard deviation)	4.107	4.385	0.278***
	(3.546)	(3.607)	[0.044]
Panel E. Unemployment rate, point prediction			
Current	10.466	21.783	11.317***
	(13.388)	(21.861)	[0.205]
One-year-ahead	10.704	20.747	10.043***
	(12.979)	(19.397)	[0.189]
In the next 3-5 years	11.827	13.049	1.222***
	(14.475)	(14.839)	[0.181]
Panel F. Unemployment rate, point prediction, response restricted to be less than 40%			
Current	7.856	12.055	4.199***
	(7.716)	(9.547)	[0.112]
One-year-ahead	8.152	12.863	4.712***
	(7.644)	(8.949)	[0.108]
In the next 3-5 years	8.436	9.371	0.936***
	(7.572)	(7.927)	[0.099]
Panel G. Mortgage rate, point prediction			
Current	6.553	6.164	-0.389***
	(7.372)	(7.735)	[0.093]
End of 2020	7.311	6.836	-0.475***
	(8.441)	(8.965)	[0.107]
End of 2021	7.759	7.362	-0.397***
	(8.690)	(9.012)	[0.109]
In the next 5-10 years	8.644	8.039	-0.606***
	(9.443)	(9.273)	[0.116]

Notes: Column (1) reports moments for the pre-crisis wave. Column (2) reports moments for the crisis wave. Column (3) reports the difference between crisis and pre-crisis averages. Standard errors for the difference are in square parentheses. Standard deviations are reported in parentheses in columns (1) and (2). ***, **, * indicate statistical significance at 1, 5 and 10 percent.

Table 2. Pre-crisis vs. Crisis Consumer Spending

	Spending			Extensive margin			Intensive margin		
	Pre-crisis	Crisis	Diff.	Pre-crisis	Crisis	Diff.	Pre-crisis	Crisis	Diff.
	Mean (st.dev)	Mean (st.dev)	Mean [s.e.]	Mean (st.dev)	Mean (st.dev)	Mean [s.e.]	Mean (st.dev)	Mean (st.dev)	Mean [s.e.]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Consumer non-durable spending									
Total spending	3999	3033	-0.310***						
	(3485)	(2805)	[0.013]						
Debt payments	1288	905	-0.917***	0.703	0.584	-0.119***	1832	1549	-0.148***
	(1836)	(1446)	[0.042]	(0.457)	(0.493)	[0.006]	(1948)	(1607)	[0.020]
Housing (rent, maintenance, home insurance)	616	524	-0.881***	0.810	0.661	-0.149***	791	826	0.000
	(906)	(853)	[0.034]	(0.392)	(0.473)	[0.005]	(1132)	(1137)	[0.020]
Utilities	429	361	-0.474***	0.956	0.891	-0.064***	467	417	-0.103***
	(403)	(362)	[0.020]	(0.206)	(0.311)	[0.003]	(550)	(463)	[0.011]
Food	532	454	-0.266***	0.984	0.963	-0.021***	561	486	-0.140***
	(511)	(452)	[0.016]	(0.127)	(0.189)	[0.002]	(664)	(579)	[0.011]
Clothing, footwear, persona care	126	81	-1.106***	0.850	0.627	-0.223***	166	138	-0.168***
	(168)	(132)	[0.025]	(0.357)	(0.484)	[0.005]	(373)	(248)	[0.016]
Gasoline	174	125	-0.538***	0.919	0.859	-0.060***	207	154	-0.286***
	(186)	(151)	[0.021]	(0.273)	(0.348)	[0.004]	(361)	(269)	[0.012]
Other transport (public transport, car	58	36	-0.788***	0.465	0.293	-0.172***	154	151	-0.241***
maintenance)	(128)	(107)	[0.027]	(0.499)	(0.455)	[0.006]	(413)	(414)	[0.028]
Medical	220	175	-0.544***	0.745	0.644	-0.101***	329	288	-0.082***
	(402)	(349)	[0.031]	(0.436)	(0.479)	[0.006]	(697)	(556)	[0.021]
Travel, recreation, and entertainment	162	94	-1.500***	0.641	0.328	-0.312***	300	342	-0.020
	(336)	(280)	[0.031]	(0.480)	(0.470)	[0.006]	(726)	(798)	[0.027]
Education and child care	79	53	-0.290***	0.174	0.121	-0.053***	609	566	-0.145**
	(280)	(235)	[0.025]	(0.379)	(0.326)	[0.004]	(1209)	(1071)	[0.068]
Furniture, jewelry, small appliances and other	50	39	-0.471***	0.325	0.215	-0.110***	218	251	0.001
small durable goods	(146)	(136)	[0.026]	(0.468)	(0.411)	[0.006]	(688)	(640)	[0.036]
Other spending	159	84	-1.004***	0.519	0.323	-0.196***	364	280	-0.140***
	(353)	(249)	[0.032]	(0.500)	(0.468)	[0.006]	(821)	(516)	[0.029]
Purchases of durables in the previous 6 months	4,426	4,830	-0.004	0.907	0.925	0.018***	10,416	10,917	0.236***
	(21,477)	(22,689)	[0.043]	(0.291)	(0.264)	[0.007]	(44,474)	(46,830)	[0.059]
Plans to buy durables goods in the next 12 months	9,949	9,002	-0.304***	0.236	0.189	-0.048***	46,939	52,024	0.226***
	(44,362)	(42,244)	[0.046]	(0.425)	(0.391)	[0.005]	(86,891)	(89,879)	[0.069]

Notes: Columns (1), (4), and (7) report moments for the pre-crisis wave. Columns (2), (5) and (8) report moments for the crisis wave. Columns (3), (6) and (9) report the difference between crisis and pre-crisis averages. Standard errors for the difference are in square parentheses. Standard deviations are reported in parentheses in columns. In column (3), the difference is computed for averages of $\log(1 + Spending)$. In column (6), the difference is computed as a simple difference in the shares between the crisis and pre-crisis waves. In column (9), the difference is computed for averages of $\log(Spending)$. ***, **, * indicate statistical significance at 1, 5 and 10 percent.

Table 3. COVID19-related economic concerns and losses.

	Mean	St.dev.	Percentiles				
			10	25	50	75	90
Concerned about your household's financial situation (10=extremely concerned, 0 = no concerned at all)	7.18	2.96	2	5	8	10	10
Lost earnings							
Extensive (yes=1)	0.42						
Intensive	$5,293	$8,358	$200	$500	$1,500	$5,000	$20,000
Lost financial wealth							
Extensive (yes=1)	0.54						
Intensive	$33,482	$54,920	$300	$1,250	$9,000	$40,000	$100,000
Time before conditions return to normal in your location, days	186.3	140.5	61.0	91.5	152.5	227.5	366.0
The duration of lockdown in your location, days	83.0	47.7	30.5	45.5	66.0	101.5	181.5

Notes: the survey question for the first variable is "How concerned are you about the effects that the coronavirus might have on the financial situation of your household? Please choose from 0 (Not at all concerned) to 10 (Extremely concerned)". The survey question for lost earnings is "Have you lost earnings due to coronavirus concerns?" and conditional on responding "yes" the follow up question is "Could you provide an estimate of lost income? (Please round to the nearest dollar)". This question is only asked for people who are employed in the April wave of the survey. The survey question for lost financial wealth is "Have you lost any financial wealth due to coronavirus concerns?" and conditional on responding "yes" the follow-up question is "Could you provide an estimate of lost wealth? (Please round to the nearest dollar)". This question is asked only for people who reported having financial wealth (excluding housing wealth) greater than his/her household's one-month income. *The duration of lockdown in your location* is only asked for respondents who reported to be a lockdown. The survey question is "How long do you think the lockdown in your location will last?". Time before condition return to normal in your location is asked for all respondents. The survey question is "How long do you think it will be before conditions return to normal in your location?".

Table 4. First stage by the time of COVID19 exposure.

Dependent variable: $Lockdown$ reported by person i in county j at time t	Date $t-s$ in $\mathbb{I}\{COVID_{j,t-s}>0\}$ in the April 2020 wave				
	March 1	March 8	March 15	March 22	April 1
	(1)	(2)	(3)	(4)	(5)
$\mathbb{I}\{COVID_{j,t-s}>0\}$	0.746***	0.766***	0.793***	0.777***	0.769***
	(0.057)	(0.043)	(0.018)	(0.014)	(0.013)
$ShareCOVID_{jt}$	0.957	0.545	0.156	0.083*	0.076**
	(0.863)	(0.510)	(0.121)	(0.043)	(0.035)
Constant	0.301***	0.234***	0.114***	0.040***	0.012**
	(0.023)	(0.010)	(0.005)	(0.006)	(0.006)
Number of households	6,064	6,064	6,064	6,064	6,064
R^2	0.307	0.427	0.636	0.753	0.795

Notes: The table reports estimated coefficients for equation (2). Standard errors clustered by county are reported in parentheses. ***, **, * indicate statistical significance at 1, 5 and 10 percent.

Table 5. Employment status.

	Dependent variable: Dummy variables for employment status		
	Employment	Labor force participation	Unemployment
	(1)	(2)	(3)
$Lockdown_{ijt}$	-0.028***	-0.019**	0.024**
	(0.008)	(0.009)	(0.009)
$ShareCOVID_{jt}$	-0.016	-0.018	0.002
	(0.015)	(0.015)	(0.018)
Number of households	6,064	6,064	2,927
R-squared	0.012	0.006	0.012
1st stage F-stat	1,968	1,968	1,281

Notes: The table reports estimated coefficients for equation (1) with employment status variables as the regressands. Standard errors clustered by county are reported in parentheses. ***, **, * indicate statistical significance at 1, 5 and 10 percent.

Table 6. Consumer spending.

Dependent variable:	$Lockdown_{ijt}$ Coef./(s.e.)	$ShareCOVID_{jt}$ Coef./(s.e.)	Number of households	R^2	1st stage F-stat
	(1)	(2)	(3)	(4)	(5)
Panel A. log(1+Spending)					
Total spending	-0.313***	0.002	6,064	0.050	1,968
	(0.036)	(0.072)			
Debt payments	-0.708***	0.399	6,064	0.037	1,968
	(0.103)	(0.243)			
Housing (rent, maintenance, home insurance)	-1.091***	0.168	6,064	0.069	1,968
	(0.130)	(0.267)			
Utilities	-0.447***	0.205	6,064	0.030	1,968
	(0.081)	(0.131)			
Food	-0.228***	-0.047	6,064	0.015	1,968
	(0.054)	(0.067)			
Clothing, footwear, persona care	-1.275***	-0.202	6,064	0.126	1,968
	(0.091)	(0.298)			
Gasoline	-0.541***	0.221***	6,064	0.049	1,968
	(0.058)	(0.071)			
Other transport (public transport, car maintenance)	-0.916***	0.225	6,064	0.072	1,968
	(0.097)	(0.182)			
Medical	-0.626***	-0.186	6,064	0.028	1,968
	(0.103)	(0.266)			
Travel, recreation, and entertainment	-1.846***	-0.143	6,064	0.165	1,968
	(0.108)	(0.176)			
Education and child care	-0.183***	0.085	6,064	0.011	1,968
	(0.061)	(0.142)			
Furniture, jewelry, small appliances and other small durable goods	-0.632***	-0.012	6,064	0.035	1,968
	(0.101)	(0.309)			
Other spending	-1.210***	-0.291	6,064	0.094	1,968
	(0.102)	(0.613)			
Panel B. Purchases of durable goods					
Extensive margin	-0.008	0.010	6,064	0.001	793
	(0.016)	(0.032)			
Intensive margin, $\log(1+Spending)$	-0.069	-0.203	6,064	-0.000	1,968
	(0.116)	(0.206)			
Panel C. Plans to buy durable goods					
Extensive margin	-0.035**	-0.029	6,064	0.008	1,968
	(0.015)	(0.035)			
Intensive margin, $\log(1+Spending)$	-0.259**	0.025	6,064	0.006	1,968
	(0.128)	(0.290)			

Notes: The table reports estimated coefficients for equation (1) with consumer spending (actual and planned) variables as the regressands. Standard errors clustered by county are reported in parentheses. ***, **, * indicate statistical significance at 1, 5 and 10 percent.

Table 7. Liquidity and portfolio allocation.

Dependent variable:	$Lockdown_{ijt}$ Coef./(s.e.)	$ShareCOVID_{jt}$ Coef./(s.e.)	Number of households	R^2	1st stage F-stat
	(1)	(2)	(3)	(4)	(5)
Panel A. Share of financial wealth in					
Checking account	1.713	-0.044	2,995	0.003	1,439
	(1.723)	(1.961)			
Cash	-0.506	0.599	2,995	0.000	1,439
	(1.057)	(1.478)			
US Bonds	0.654	0.395	2,995	-0.002	1,439
	(0.661)	(1.477)			
US Stocks	-0.016	-0.898	2,995	0.000	1,439
	(1.285)	(2.770)			
Foreign stocks and bonds	-0.651**	-1.936***	2,995	0.010	1,439
	(0.318)	(0.395)			
Gold and precious metals	-0.033	-0.036	2,995	0.000	1,439
	(0.271)	(0.248)			
Bitcoin and other cryptocurrencies	-0.104	0.090	2,995	-0.004	1,439
	(0.074)	(0.095)			
Other	-1.056	1.831	2,995	-0.001	1,439
	(1.427)	(4.234)			
Panel B. Liquidity					
Ability to make an unexpected payment of one-month income	-0.013	0.014	5,398	0.002	1,895
	(0.013)	(0.042)			
Significant financial wealth	-0.018	0.016	6,064	-0.001	1,968
	(0.013)	(0.018)			

Notes: The table reports estimated coefficients for equation (1) with liquidity, access to credit, and portfolio allocations as the regressands. Standard errors clustered by county are reported in parentheses. Shares in Panel A are measured in percent from 0 to 100. Share are elicited only for household who report significant financial wealth. *Significant financial wealth* is equal to one if a respondent reports that his/her household has financial wealth (excluding housing) that is greater than combined monthly household income. ***, **, * indicate statistical significance at 1, 5 and 10 percent.

Table 8. Macroeconomic expectations.

Dependent variable: Macroeconomic expectations	$Lockdown_{ijt}$ Coef./(s.e.)	$ShareCOVID_{jt}$ Coef./(s.e.)	Number of households	R^2	1st stage F-stat
	(1)	(2)	(3)	(4)	(5)
Panel A. 12-month-ahead inflation, distributional question					
Implied Mean	-0.545**	-0.738	5,602	0.006	2,108
	(0.238)	(0.678)			
Uncertainty (standard deviation)	0.586***	0.261	5,602	0.017	2,108
	(0.123)	(0.299)			
Panel B. Unemployment rate, point prediction					
Current	13.751***	-0.162	5,973	0.205	1,887
	(0.848)	(1.194)			
One-year-ahead	12.952***	0.425	5,998	0.218	1,906
	(0.638)	(2.360)			
In the next 3-5 years	2.394***	-0.439	6,025	0.016	1,922
	(0.453)	(0.971)			
Panel C. Unemployment rate, point prediction, response restricted to be less than 40%					
Current	7.067***	0.243	4,885	0.208	1,682
	(0.453)	(0.954)			
One-year-ahead	8.194***	0.043	5,085	0.246	1,635
	(0.396)	(1.118)			
In the next 3-5 years	1.789***	0.211	5,516	0.028	1,767
	(0.259)	(0.655)			
Panel D. Mortgage rate, point prediction					
Current	-0.686***	0.190	6,045	0.005	1,966
	(0.240)	(0.458)			
End of 2020	-0.730***	0.148	6,046	0.007	1,956
	(0.270)	(0.399)			
End of 2021	-0.607**	0.164	6,048	0.006	1,980
	(0.297)	(0.564)			
In the next 5-10 years	-0.745**	0.666	6,045	0.007	1,970
	(0.322)	(0.551)			

Notes: The table reports estimated coefficients for equation (1) with macroeconomic expectations as the regressands. Standard errors clustered by county are reported in parentheses. ***, **, * indicate statistical significance at 1, 5 and 10 percent.

Table 9. Approval of policies.

Dependent variable: Approval of policies (10 = extremely helpful, 0 = not helpful at all)	$Lockdown_{ijt}$ Coef./(s.e.)	$ShareCOVID_{jt}$ Coef./(s.e.)	Number of respondents	R^2	1st stage F-stat
	(1)	(2)	(3)	(4)	(5)
President	-6.247***	-0.113	9,247	-0.414	16
	(2.425)	(0.225)			
Congress	1.067	0.109	9,247	-0.016	16
	(1.503)	(0.125)			
US Treasury	0.710	0.003	9,247	-0.002	16
	(1.901)	(0.170)			
Federal Reserve	2.402	-0.078	9,247	-0.072	16
	(1.958)	(0.175)			
U.S. Center for Disease Control	3.134*	-0.226	9,247	-0.138	16
	(1.851)	(0.173)			

Notes: The table reports estimated coefficients for equation (4) with political approval variables as the regressands. The first stage is given by equation (5). State fixed effects are included but not reported. Standard errors clustered by county are reported in parentheses. Political approval data are collected only in the April 2020 wave. ***, **, * indicate statistical significance at 1, 5 and 10 percent.

Appendix 1: Survey Questions

1. Which of the following goods and services have you spent money on over the last three months? (Select all that apply)
   - Debt payments (mortgages, auto loans, student loans, etc.)
   - Housing (including rent, maintenance and home owner/renter insurance, housekeeping and cleaning service, but not including mortgage payments)
   - Utilities (including water, sewer, electricity, gas, heating oil, phone, cable, internet)
   - Food (including groceries, dining out, take-out food, and beverages)
   - Clothing, footwear, and personal care
   - Gasoline
   - Other regular transportation costs (including public transportation fares and car maintenance)
   - Medical care (including health insurance, out-of-pocket medical bills and prescription drugs)
   - Travel, recreation, and entertainment
   - Education and child care
   - Furniture, jewelry, small appliances and other small durable goods
   - Other (including gifts, child support or alimony, charitable giving, and other miscellaneous)

2. Over the last three months on average, how much did your household spend (per month) on goods and services in total and for each of the individual components listed below?
   Please enter a number between 1 and 10,000 for each category. The sum of the expenditures for the individual categories should add up to the total amount.

   Total monthly spending
   Debt payments (mortgages, auto loans, student loans, etc.) $___________
   Housing (including rent, maintenance and home owner/renter insurance, housekeeping and cleaning service, but not including mortgage payments) $___________
   Utilities (including water, sewer, electricity, gas, heating oil, phone, cable, internet)
   $___________
   Food (including groceries, dining out, take-out food, and beverages) $___________
   Clothing, footwear, and personal care $___________
   Gasoline $___________
   Other regular transportation costs (including public transportation fares and car maintenance)
   $___________
   Medical care (including health insurance, out-of-pocket medical bills and prescription drugs)
   $___________
   Travel, recreation, and entertainment $___________
   Education and child care $___________
   Furniture, jewelry, small appliances and other small durable goods $___________
   Other (including gifts, child support or alimony, charitable giving, and other miscellaneous)
   $___________

$ Total __________ [TOTAL ANSWERS FROM ABOVE]

3. Suppose that you had to make an unexpected payment equal to one month of your after-tax income, would you have sufficient financial resources (access to credit, savings, loans from relatives or friends, etc.) to pay for the entire amount?
   - Yes
   - No
   - Don't know/prefer not to answer

4. Does your household have total financial investments (excluding housing) worth more than one month of combined household income?

- Yes
- No

ASK IF: Q4=YES

5. What percent of your financial wealth (excluding housing) do you invest in the following categories? Put "0" if you do not invest in a given category.

	Wealth Investment Allotment
Checking and Savings Account, Certificate of deposits	__________percent
Cash	__________percent
US Bonds	__________percent
US Stocks	__________percent
Foreign Stocks and Bonds	__________percent
Gold and precious metals	__________percent
Bitcoin and other cryptocurrencies	__________percent
Other	__________percent
% Total [TOTAL ANSWERS FROM ABOVE – MUST SUM TO 100%]	__________

6. Over the last 6 months, did you buy a new home, car, or other major big-ticket item (fridge, TV, furniture, etc.)?

- Yes
- No

ASK IF: Q6=YES

7. Which of the following did you purchase in the last 6 months? Please select all that apply.

- A house/apartment
- A car or other vehicle
- A large home appliance or electronics
- None of the above

ASK IF: Q7=YES

8. How much did you spend on the following?
- A house/apartment __________
- A car or other vehicle __________
- A large home appliance or electronics __________

9. Do you currently plan to buy a new home, car, or other major big-ticket item (fridge, TV, furniture, etc.) in the next 12 months?
- Yes
- No

ASK IF: Q9=YES

10. Which of the following do you plan to purchase in the next 12 months? Please select all that apply.
- A house/apartment
- A car or other vehicle
- A large home appliance or electronics
- None of the above

ASK IF: Q10=YES

11. How much do you plan to spend on the following?
- A house/apartment __________
- A car or other vehicle __________
- A large home appliance or electronics __________

We would like to ask you some questions about the overall economy and in particular about the rate of inflation/deflation (Note: inflation is the percentage rise in overall prices in the economy, most commonly measured by the Consumer Price Index and deflation corresponds to when prices are falling).

12. In THIS question, you will be asked about the probability (PERCENT CHANCE) of something happening. The percent chance must be a number between 0 and 100 and the sum of your answers must add up to 100.

    What do you think is the percent chance that, over the next 12 months…

Percentage

Chance

- the rate of inflation will be 12% or more ______
- the rate of inflation will be between 8% and 12% ______
- the rate of inflation will be between 4% and 8% ______
- the rate of inflation will be between 2% and 4% ______

- the rate of inflation will be between 0% and 2% _______
- the rate of deflation (opposite of inflation) will be between 0% and 2% _______
- the rate of deflation (opposite of inflation) will be between 2% and 4% _______
- the rate of deflation (opposite of inflation) will be between 4% and 8% _______
- the rate of deflation (opposite of inflation) will be between 8% and 12% _______
- the rate of deflation (opposite of inflation) will be 12% or more _______
- % Total _______

13. Do you have a paid job?
- Yes
- No

ASK IF: Q13=NO
14. Are you actively looking for a job? (Select one)
- Yes
- No

ASK IF: Q14=NO
15. Here are a number of possible reasons why people who are not working choose not to look for work. Please select all that apply to you.
- Homemaker
- Raising children
- Student
- Retiree
- Disabled, health issues
- Couldn't find a job
- On break
- No financial need
- Other

16. How much higher or lower do you think your household's total after-tax (i.e., 'take home') income will be over the next twelve months compared to the last twelve months? Please provide an answer in percentage terms.
- My after-tax income will rise by ___________% [RANGE: 0-300, ONE DECIMAL]
- My after-tax income will stay the same
- My after-tax income will fall by ___________% [RANGE: 0-300, ONE DECIMAL]

17. What is your best guess about what the current unemployment rate in the US is, what it will be in 12 months and over the next 3-5 years?
- Current unemployment rate: ___________% [RANGE: 0-100, ONE DECIMAL]

- Unemployment rate in 12 months: __________% [RANGE: 0-100, ONE DECIMAL]
- Over the next 3-5 years? __________% [RANGE: 0-100, ONE DECIMAL]

18. What do you think is the current interest rate on a fixed-rate 30-year mortgage for someone with excellent credit and what do you think it will be in the future?
- Current rate? __________% per year [RANGE: 0-100, ONE DECIMAL]
- At the end of 2020? __________% per year [RANGE: 0-100, ONE DECIMAL]
- At the end of 2021? __________% per year [RANGE: 0-100, ONE DECIMAL]
- In the next 5-10 years? __________% per year [RANGE: 0-100, ONE DECIMAL]

19. Have you seen or heard anything in the news about COVID-19 or the Coronavirus?
- Yes
- No
- Don’t know

20. How concerned are you about the effects that the coronavirus might have on the financial situation of your household? Slider from 0 (Not at all concerned) to 10 (Extremely concerned)

ASK IF: 9=YES

21. Have you lost earnings due to coronavirus concerns?
- Yes
- No

ASK IF: 21=YES

22. Could you provide an estimate of lost income? (Please round to the nearest dollar)

$______________

ASK IF: Q4=YES

23. Have you lost any financial wealth due to coronavirus concerns?
- Yes
- No

ASK IF: Q23=YES

24. Could you provide an estimate of lost wealth? (Please round to the nearest dollar)

$______________

25. Are you currently under lockdown in your location?
- Yes
- No

ASK IF Q26=YES

26. How long do you think the lockdown in your location will last?
    Months: ____________
    Days: ________________

27. How long do you think it will be before conditions return to normal in your location?
    Months: ____________
    Days: ________________

28. How would you rate the following government bodies in handling the current situation? Please assign a score ranging from 1 (Poor job) to 10 (Excellent job)
- President ___score [Don’t know box]
- Congress ___score [Don’t know box]
- US Treasury ___score [Don’t know box]
- US Federal Reserve ___score [Don’t know box]
- US Center for Disease Control (CDC) ___score [Don’t know box]

29. Generally speaking, do you think that now is a good time or a bad time **to buy**…

A house or apartment A car or other vehicle Large appliances, furniture, electronics (incl. gadgets)	() Very good () Good () Neither good nor bad () Bad () Very bad

Appendix Table 1. Descriptive statistics for households in the Nielsen Survey, January 2020 wave.

	Mean	Standard deviation
	(1)	(2)
Household income, annual, $	68,370	37,667
Household size	2.58	1.32
Age of the respondent	50.1	15.0
Share of white respondents	0.73	0.44

Appendix Table 2. Consumer spending in the Nielsen Survey and the Survey of Consumer Expenditures.

Spending category	Nielsen Survey (KNCP)	Survey of Consumer Expenditures
	(1)	(2)
Total spending	3,999	5,102
Debt payments	1,288	250
Housing (rent, maintenance, home insurance)	616	535
Utilities	429	455
Food	532	709
Clothing, footwear, persona care	126	220
Gasoline	174	176
Other transport (public transport, car maintenance)	58	142
Medical	220	414
Travel, recreation, and entertainment	162	269
Education and child care	79	117
Furniture, jewelry, small appliances and other small durable goods	50	64
Other spending	159	1715

Notes: Columns (1) reports monthly spending in the January wave of the Nielsen survey. Column (2) reports monthly spending (annual divided by 12) from the 2018 Survey of Consumer Expenditures.

Appendix Table 3. First stage by the time of COVID-19 exposure with heterogeneous responses to COVID infections.

Dependent variable: $Lockdown$ reported by person i in county j at time t	Date $t-s$ in $\mathbb{I}\{COVID_{j,t-s} > 0\}$ in the April 2020 wave				
	March 1	March 8	March 15	March 22	April 1
	(1)	(2)	(3)	(4)	(5)
$\mathbb{I}\{COVID_{j,t-s} > 0\}$	-0.674	0.600***	0.964***	1.072***	1.088***
	(1.082)	(0.220)	(0.096)	(0.079)	(0.073)
$\mathbb{I}\{COVID_{j,t-s} > 0\} \times \log(PopDensity_j)$	-0.190	-0.036	0.012	0.025**	0.028***
	(0.146)	(0.033)	(0.014)	(0.011)	(0.010)
$\mathbb{I}\{COVID_{j,t-s} > 0\} \times TrumpShare_j$	-0.043	-0.328	-0.165	-0.180*	-0.150*
	(1.222)	(0.310)	(0.121)	(0.094)	(0.088)
$ShareCOVID_{jt}$	1.139	0.575	0.116	0.002	-0.019
	(0.732)	(0.523)	(0.121)	(0.035)	(0.031)
Constant	0.301***	0.234***	0.114***	0.040***	0.012**
	(0.023)	(0.010)	(0.005)	(0.006)	(0.006)
Number of households	6,064	6,064	6,064	6,064	6,064
R^2	0.312	0.427	0.637	0.755	0.799

Notes: The table reports estimated coefficients for equation (2) with $\mathbb{I}\{COVID_{j,t-s} > 0\}$ interacted with the share of Trump votes in the 2016 Presidential elections and log population density. Standard errors clustered by county are reported in parentheses. ***, **, * indicate statistical significance at 1, 5 and 10 percent.

Appendix Table 4. Employment Status, OLS regression.

	Dependent variable: Dummy variables for employment status		
	Employment	Labor force participation	Unemployment
	(1)	(2)	(3)
$Lockdown_{ijt}$	-0.027***	-0.018***	0.023***
	(0.007)	(0.006)	(0.008)
$ShareCOVID_{jt}$	-0.018	-0.019	0.003
	(0.014)	(0.013)	(0.018)
Number of households	6,064	6,064	2,927
R-squared	0.012	0.006	0.012

Notes: This table reports OLS estimates of the specification estimated in Table 5.

Appendix Table 5. Consumer spending, OLS regression.

Dependent variable:	$Lockdown_{ijt}$ Coef./(s.e.)	$ShareCOVID_{jt}$ Coef./(s.e.)	Number of households	R^2
	(1)	(2)	(3)	(4)
Panel A. log(1+Spending)				
Total spending	-0.243***	-0.085	6,064	0.054
	(0.027)	(0.119)		
Debt payments	-0.584***	0.246	6,064	0.038
	(0.070)	(0.309)		
Housing (rent, maintenance, home insurance)	-0.925***	-0.037	6,064	0.071
	(0.090)	(0.334)		
Utilities	-0.354***	0.091	6,064	0.032
	(0.056)	(0.192)		
Food	-0.175***	-0.114	6,064	0.016
	(0.038)	(0.087)		
Clothing, footwear, persona care	-1.004***	-0.535	6,064	0.134
	(0.070)	(0.519)		
Gasoline	-0.384***	0.027	6,064	0.058
	(0.040)	(0.143)		
Other transport (public transport, car maintenance)	-0.770***	0.044	6,064	0.074
	(0.066)	(0.249)		
Medical	-0.446***	-0.407	6,064	0.033
	(0.062)	(0.281)		
Travel, recreation, and entertainment	-1.390***	-0.702*	6,064	0.181
	(0.073)	(0.416)		
Education and child care	-0.177***	0.077	6,064	0.011
	(0.044)	(0.136)		
Furniture, jewelry, small appliances and other small durable goods	-0.509***	-0.164	6,064	0.037
	(0.065)	(0.396)		
Other spending	-0.981***	-0.572	6,064	0.099
	(0.076)	(0.776)		
Panel B. Purchases of durable goods				
Extensive margin	-0.007	0.005	6,064	0.001
	(0.011)	(0.031)		
Intensive margin, $\log(1+Spending)$	0.019	-0.310	6,064	0.000
	(0.091)	(0.224)		
Panel C. Plans to buy durable goods				
Extensive margin	-0.039***	-0.024	6,064	0.009
	(0.011)	(0.035)		
Intensive margin, $\log(1+Spending)$	-0.283***	0.053	6,064	0.006
	(0.088)	(0.284)		

Notes: This table reports OLS estimates of the specification estimated in Table 6.

Appendix Table 6. Liquidity and portfolio allocation, OLS regression.

Dependent variable:	$Lockdown_{ijt}$ Coef./(s.e.)	$ShareCOVID_{jt}$ Coef./(s.e.)	Number of households	R^2
	(1)	(2)	(3)	(4)
Panel A. Share of financial wealth in				
Checking account	1.738	-0.071	2,995	0.003
	(1.236)	(1.787)		
Cash	-0.258	0.323	2,995	0.000
	(0.743)	(1.520)		
US Bonds	-0.081	1.215	2,995	0.000
	(0.455)	(1.569)		
US Stocks	-0.793	-0.032	2,995	0.001
	(0.879)	(2.248)		
Foreign stocks and bonds	-0.442*	-2.170***	2,995	0.011
	(0.251)	(0.525)		
Gold and precious metals	-0.049	-0.018	2,995	0.000
	(0.193)	(0.219)		
Bitcoin and other cryptocurrencies	0.035	-0.066	2,995	0.000
	(0.048)	(0.089)		
Other	-0.149	0.819	2,995	0.000
	(0.954)	(3.440)		
Panel B. Liquidity				
Ability to make an unexpected payment of one-month income	-0.014	0.016	5,398	0.002
	(0.010)	(0.041)		
Significant financial wealth	-0.005	-0.001	6,064	0.000
	(0.010)	(0.014)		

Notes: This table reports OLS estimates of the specification estimated in Table 7.

Appendix Table 7. Macroeconomic expectations, OLS regression.

Dependent variable: Macroeconomic expectations	$Lockdown_{ijt}$ Coef./(s.e.)	$ShareCOVID_{jt}$ Coef./(s.e.)	Number of households	R^2
	(1)	(2)	(3)	(4)
Panel A. 12-month-ahead inflation, distributional question				
Implied Mean	-0.509***	-0.781	5,602	0.006
	(0.176)	(0.672)		
Uncertainty (standard deviation)	0.450***	0.420	5,602	0.018
	(0.090)	(0.259)		
Panel B. Unemployment rate, point prediction				
Current	11.810***	2.197	5,973	0.211
	(0.581)	(2.430)		
One-year-ahead	10.431***	3.507	5,998	0.229
	(0.486)	(4.175)		
In the next 3-5 years	1.937***	0.122	6,025	0.017
	(0.327)	(0.874)		
Panel C. Unemployment rate, point prediction, response restricted to be less than 40%				
Current	5.833***	1.689***	4,885	0.216
	(0.322)	(0.621)		
One-year-ahead	6.192***	2.422	5,085	0.271
	(0.290)	(2.644)		
In the next 3-5 years	1.338***	0.739	5,516	0.031
	(0.184)	(0.790)		
Panel D. Mortgage rate, point prediction				
Current	-0.539***	0.011	6,045	0.005
	(0.175)	(0.539)		
End of 2020	-0.714***	0.128	6,046	0.007
	(0.212)	(0.374)		
End of 2021	-0.684***	0.258	6,048	0.006
	(0.215)	(0.482)		
In the next 5-10 years	-0.757***	0.682	6,045	0.007
	(0.234)	(0.528)		

Notes: This table reports OLS estimates of the specification estimated in Table 8.

Appendix Table 8. Approval of policies, OLS regression.

Dependent variable: Approval of policies (10 = extremely helpful, 0 = not helpful at all)	$Lockdown_{ijt}$ Coef./(s.e.)	$ShareCOVID_{jt}$ Coef./(s.e.)	Number of respondents	R^2
	(1)	(2)	(3)	(4)
President	-0.365***	-0.525***	9,247	0.003
	(0.131)	(0.185)		
Congress	0.143	0.174**	9,247	0.001
	(0.097)	(0.079)		
US Treasury	0.236**	0.036	9,247	0.001
	(0.118)	(0.123)		
Federal Reserve	0.045	0.087	9,247	0.000
	(0.119)	(0.106)		
Center for Disease Control	0.207**	-0.021	9,247	0.001
	(0.104)	(0.125)		

Notes: This table reports OLS estimates of the specification estimated in Table 9.