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Keywords

JEL Classification

J31, J64

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Understanding Consumer Inflation Expectations during the COVID-19 Pandemic*

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Abstract

We study how individuals' formation of inflation expectations are affected by the stringent containment and economic support measures put in place during the Covid-19 pandemic. Using the New York Fed Survey of Consumer Expectations (SCE) and the Oxford Covid-19 Government Response Tracker (OxCGRT), we find that policies aimed to contain the pandemic lead to an increase in individuals' inflation expectations and inflation uncertainty. We also find some heterogeneity in the impact across different demographic groups.

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1 Introduction

Inflation expectations play a major role in many decisions by households and firms, such as consumption, wage bargaining, and price setting. Consequently, they serve as a key input for central banks in their assessments of inflation risks as de-anchored expectations might result in a persistent rise of prices. This involves the distinction between short-lived spikes and persistent deviations and is especially relevant during periods of stress (such as financial, economic, or even health crises) when policymakers need to make decisions amid unclear economic signals.

At the time of writing, the Covid-19 pandemic continues to pose a threat to a sustained economic recovery in many economies. The response of authorities, e.g. in the U.S., included instituting stringent containment and health measures as well as economic support measures. This paper aims to examine the impact of these various government measures on the formation of consumers' inflation expectations. Have these policies helped anchor inflation expectations, or have they instead contributed to a rise in inflation expectations or inflation uncertainty? Answering these questions will provide insights into how expectations are formed in a crisis.

We investigate the behaviour of U.S. inflation expectations, namely the Federal Reserve Bank of New York's Survey of Consumer Expectations (SCE), through February 2021 by using the Oxford Covid-19 Government Response Tracker (OxCGRT) as indicator of local measures. The implemented measures were not homogeneous, such that we leverage on their variation between states and across time to identify their impact on inflation expectations and inflation uncertainty. Our main contribution is that we improve upon Armantier et al. (2021) who examined how inflation beliefs in the SCE evolved over five specific phases during the first six months of the Covid-19 pandemic.

By exploiting the panel dimension of the survey, we find that the effective policies to contain the pandemic lead to an increase in both 1-year ahead inflation expectations and inflation uncertainty. For the 3-year ahead expectations the results are mixed. At the same time, confirmed cases and deaths contribute little to explaining inflation beliefs. We also examine a cross-sectional dimension of the data with particular

attention to demographic aspects such as education and high income. Our results are in line with those of Armantier et al. (2021) suggesting no substantial heterogeneities in the effect of the crisis.

The onset of the Covid-19 pandemic since spring 2020 represented a seismic shock for economies worldwide. Lockdown measures such as temporary business shutdowns first indicated a supply-side shock, whereas contagion fears, increased uncertainty (Leduc and Liu (2016)), and job losses soon led to declines in demand. This resulted in divergent effects on U.S. inflation rates: food prices rose while the energy and services inflation fell in the second quarter of 2020. Core inflation measured through PCE inflation excluding food and energy fell from 2.1 percent in February to around 1 percent in April 2020.¹

Consumer's inflation expectations, on the other hand, had risen at short- and mediumterm horizons since the onset of the crisis (Figure 1).² Moreover, there is a notable increase in individual uncertainty (Figure 2). This reflects consumers' relative inability to clearly quantify what the Covid-19 pandemic would mean for future price developments. One reason could be the confluence of both demand and supply shocks, which rendered the impact on prices to depend both on the magnitude and timing of these shocks. Another reason may be the large change in the composition of consumption baskets following lockdowns, such that consumers are not able to assess the current overall inflation rate (Gautier et al. (2020)). At the same time, one needs to consider that respondents have become more polarised with more divergent views on future inflation including deflationary expectations (Armantier et al. (2021)).

The literature on inflation expectations is extensive and our paper particularly relates to studies analysing consumer inflation expectation dynamics during the COVID-19 era such as Binder (2020), Dietrich et al. (2020), Coibion et al. (2020), and Candia

¹From about March 2021, the economy then experienced an "atypical nature of the recovery" (Lagarde (2021)) since the rapid reopening of the economy pushed prices upwards. Furthermore, many sectors revealed supply-chain bottlenecks that contributed to an increase in inflation. Consequently, the Federal Reserve has recently signalled tightening in policy rates. However, this part of the "story" is beyond the sample considered in this paper.

²Note that average consumers inflation expectations in the U.S. are typically above the Federal Reserve's target of 2% inflation. This bias is not unusual and has been observed in other economies.





Figure 1 Consumers' Inflation Expectations

Figure 2 Consumers' Inflation Uncertainty

Notes: 60-day moving average of daily median inflation expectations at the horizon of 1-year and 3-years. The daily median interquartile range of inflation expectations at horizons 1-year and 3-years. Source: Survey of Consumer Expectations, New York Fed and own calculations.

et al. (2021).³ The remainder of the paper is structured as follows: Section 2 describes the Survey of Consumer Expectations by the Federal Reserve Bank of New York and the data on state containment policies. Section 3 specifies the econometric model and discusses the results, while section 4 concludes.

2 Data

2.1 Consumer Inflation Expectations

Each month, the New York Fed Survey of Consumer Expectations⁴ is answered by about 1,300 rotating household heads. Households may participate up to twelve

³For a discussion on other measures of inflation expectations such as by firms and professional forecasters or financial markets, see Meyer et al. (2021) and Apergis and Apergis (2021). In contrast to consumer expectations, these declined notably with the onset of the pandemic.

⁴https://www.newyorkfed.org/microeconomics/sce#/

months before being substituted.⁵ For a discussion of the survey's details and representativeness, we refer to Armantier et al. (2016). Individuals are surveyed about their households' financial and job situation, their expectations on their own future earnings and spending, as well as the economy's future inflation. Our analysis focuses on the questions in which participants rate the odds of certain value ranges of future inflation, e.g., the percent chance that inflation over the next 12 months will be between 2% and 4%, see Appendix A. As a result, participants submit their density distribution of expected future prices at the 1- and 3-year horizon. This provides insights into their range of perspectives and uncertainty around a mean forecast. The SCE further surveys different demographic aspects, allowing us to explore heterogeneity within the panel.

Our analysis starts in April 2015 and includes survey submissions until February 2021.⁶ We focus on the individuals' density mean as well as the individual uncertainty calculated as the interquartile range of the individuals' density forecast. Since survey participations are distributed over the entire month, this allows us to link them to current key data of the pandemic.

2.2 Containment policies and number of Covid-19 cases and deaths

Our measures on government responses by the US state governments are obtained from the Oxford Covid-19 Government Response Tracker (OxCGRT) (Hale et al. (2021)).⁷ The OxCGRT builds upon 17 indicators that are grouped according to their objectives; i.e., containment and closure (e.g., school or workplace closing, restrictions on gathering size, etc.), economic response (e.g., income support, debt relief for households, etc.), health systems (e.g., testing policy, vaccination policy, etc.) and others.

⁵Over the reviewed sample, about half remain in the panel for the entire possible period.

⁶While the panel started in June 2013, some questions such as how participants consider their health conditions were only included later.

⁷Sub-national indices for US states are obtained from this data depository: https://github.com/ OxCGRT/USA-covid-policy. The associated analysis is documented by Hallas et al. (2020).

These indicators are combined into the various composite indices using a simple, additive unweighted method. We focus specifically on the Containment and Health (CHI) and the Economic Support Indices (ESI). The former shows the number and strength of the measures undertaken to contain the pandemic spread and protect the health of the residents. The latter captures the extent of economic support that is implemented to support livelihoods. As shown in Figure 4, there are substantial variations of the indices between the US states.

In addition to these indices, the OxCGRT database also provides information about the number of confirmed cases and deaths at the state level. Using this data, we construct 7-day moving averages of the changes in the number of cases and deaths. We include these variables as our state-level explanatory variables in our regression specifications.

Our approach in using state-level containment measure refines the approach employed by Armantier et al. (2021). In their paper, they identify possible changes during the pandemic by partitioning the post-pandemic data into five periods that are applied uniformedly across all states in the US. However, in reality, the evolution of the pandemic did vary between states. In our approach, we allow for the timing and magnitude of the pandemic to vary across states, depending on the implementation of stringency measures. Thus, we do not need to make ex-ante choices about the timing and evolution of the pandemic.

We match each individual respondent in the SCE by their reported state of residence with the state-specific indicators obtained from the OxCGRT at the given survey date. The unique aspect of our combined dataset is that both the SCE and OxCGRT are available at daily frequency, thereby allowing for a high-frequency estimation of the impact of the policy measures on reported inflation expectations.



Figure 3 Containment and Health Index

Figure 4 Economic Support Index

Notes: Maximum and minimum lines refer to the maximum and minimum of the index among the 50 US states and the District of Columbia, respectively.

3 Estimation and Results

3.1 Model

We estimate the following panel data model for the mean inflation expectations and inflation uncertainty of survey participants' density forecasts:

$$y_{it|t+k}^e = \beta_i + \delta_\tau + \gamma_1 CHI_{st} + \gamma_2 ESI_{st} + \gamma_3 GasPrice_{rt} + \gamma_4 \pi_{rt} + \gamma_5 Deaths_{st} + \gamma_6 Cases_{st} + \epsilon_{it}$$
(1)

where we replace y with $\pi_{it|t+k}^{e}$, which is the inflation expectation of the survey participant i at time t for the horizon t + k, where k = 1, 3 years, when we estimate the model for the individual density mean, and with $\sigma_{\pi_{it|t+k}}$ for the interquartile range as a proxy for inflation uncertainty. The CHI_{st} is the Containment and Health Index in state s, the ESI_{st} is the Economic Support Index, the $GasPrice_{rt}$ represents the gasoline prices⁸ and π_{rt} is the current inflation rate in the region r of the individual respondent i.⁹ The specifications also include confirmed Covid-19 cases and deaths at the state level and control for individual and tenure fixed effects, β_i and δ_{τ} respectively.

⁸See Binder (2018) for the link between inflation expectations and gasoline prices.

 $^{^{9}}$ The r is the region for gas prices and regional inflation rates, where the boundaries of regions might differ from states, s.

In addition, we investigate heterogeneities by controlling for a range of demographics similar to the Armantier et al. (2021) such as age, income, gender, education, and health status of individual respondents.

In making a causal interpretation of the impact on inflation expectations and uncertainty, our policy variables to measure the stringency of containment measures are continuous and vary by state, thereby not subject to problems associated with making ex-ante choices about the timing and evolution of the pandemic. However, there could still be remaining confounding factors. For example, the severity and timing of the imposition of the containment measures themselves could depend on the political leaning of the state governments. At the same time, these political leanings could have affected inflation beliefs independently of the containment measures (Bachmann et al. (2021)). As a robustness check, we omitted individuals that reside in the five states¹⁰ that flipped from Republican to Democrat at the 2020 US Presidential Election and re-estimated our regressions. Those results (not shown) remain broadly in line with our baseline findings.

3.2 Individual density means

Table 1 reports the results for 1-year and 3-year ahead inflation expectations. The first two columns present the results for mean expectations for 1-year ahead inflation, with column 1 showing the full sample result and column 2 the results from the sample of stayers (individuals who remain for at least 12 survey rounds) only. One of the (non-economic) policy measures, the Containment and Health Index (CHI) is statistically and economically significant out of all the major economic variables included in the model. This is the case in both the full and the stayers only samples. The sign of the coefficient suggests that stronger containment and health-related policies correspond with higher 1-year ahead inflation expectations. This may reflect individuals' expectations that these measures would lead to a faster economic and, therefore, faster inflation recovery. Although not reported due to space constraints, the tenure fixed effects also indicate that the mean inflation expectations are lower for participants who stay in the survey for a longer period, suggesting that participants

¹⁰The states are Arizona, Georgia, Michigan, Pennsylvania and Wisconsin.

learn from their past participation in the survey and may pay more attention to inflation news and data (Kim and Binder (2021)).

	Inflation expectations (1-year ahead)		Inflation expectations (3-year ahead)		
	(1) Full sample	(2) Stayers only	(3) Full sample	(4) Stayers only	
Containment and Health Index (CHI)	0.0161**	0.0177*	0.0129*	0.0125	
	(0.00670)	(0.00908)	(0.00674)	(0.00926)	
Economic Support Index (ESI)	0.00143	0.00560	-0.00271	0.00332	
	(0.00558)	(0.00711)	(0.00538)	(0.00666)	
Gas Prices (Annual Change, percent)	0.0122*	0.0228**	0.000176	-0.00469	
	(0.00732)	(0.0107)	(0.00786)	(0.0111)	
CPI (Annual Change, percent)	0.0408	-0.0916	0.183	0.285	
	(0.141)	(0.200)	(0.141)	(0.207)	
Daily change in confirmed cases	7.19e-07	-1.98e-06	-6.39e-06	-3.47e-05**	
	(9.24e-06)	(1.08e-05)	(9.25e-06)	(1.37e-05)	
Daily change in confirmed deaths	0.000372	0.000490	0.000577	0.00310***	
	(0.000595)	(0.000802)	(0.000705)	(0.00111)	
Observations	30,809	15,277	30,661	15,215	
R-squared	0.505	0.488	0.509	0.492	
Constant	Yes	Yes	Yes	Yes	
Individual fixed effects	Yes	Yes	Yes	Yes	
Survey tenure fixed effects	Yes	Yes	Yes	Yes	

 Table 1

 Impact of Covid-19 Pandemic Measures on Inflation Expectations

Notes: The indicator, gas prices (annual change, percent), measures the annual change in the weekly U.S. Regular Gasoline Prices (dollars per gallon) at the regional level (i.e. East Coast, New England, Central Atlantic, Lower Atlantic, Midwest, Gulf Coast, Rocky Mountain, West Coast) is obtained from the U.S. Energy Information Administration (EIA) website. CPI (annual change, percent), which measures the inflation rate of Census divisions, is obtained from the U.S. Bureau of Labor Statistics (BLS). Columns (1) and (3) show the results from the full sample while columns (2) and (4) show the results for the individuals who remain in the sample for at least 12 rounds. Standard errors (in parentheses) are clustered at the individual level. *p < 0.1, **p < 0.05, ***p < 0.01.

Columns 3 and 4 of the same table report results for the 3-year ahead inflation expectations. The Containment and Health Index (CHI) variable is marginally significant in the full sample and insignificant in the stayers sample, suggesting that the CHImeasure is expected to have an effect in the short-term but not in the medium run. Arguably, participants are able to distinguish between the short and medium-term, as the effects of these policies are expected to vanish by the end of the third year from the date of the survey. The results in the full sample are similar to the 1-year ahead responses we discussed above. However, for the sample with stayers only, the CHIvariable is not statistically significant. In this sample, the 7-day moving average of confirmed cases turns out to be significant with a negative coefficient. Interestingly, the Economic Support Index (ESI) is not statistically or economically significant. In Appendix B, Table 3 reports results from the specification with a number of interactions for the 1- and 3-year ahead inflation expectations. Some interesting results emerge from these regressions: In the full sample (column 1), the interactions of the Containment and Health Index (*CHI*) with college-educated participants have a negative effect on mean expectations. Participants with a household income above USD 100K also report a significantly lower expected inflation 1-year out. On the other hand, people over the age of 60 have a higher mean expected inflation. The health status also plays some role in survey participants' 1-year ahead expectations where people with "very good" health report significantly lower inflation expectations.

3.3 Individual uncertainty

Next, we run estimations on the respondents' interquartile range at the two horizons to determine what affects people's uncertainty about future inflation. The results are shown in Table 2. An increase in containment measures, *CHI*, leads to individuals becoming more uncertain about future inflation at both horizons. Hence, it can be assumed that people sense the severity of the pandemic, particularly through the implemented policy measures rather than through actual cases or deaths. The stronger the policies taken by a state, the more uncertain respondents become about the pandemic's impact on future inflation. In terms of the size of the impact, we observe a median increase in inflation uncertainty at the 1-year horizon of one-sixth around mid-April 2020, when containment measures along the states were most extensive, see Figure 3. Hence, at that time, the individual's interquartile range widens by 116 percentage points. This signals a potential de-anchoring of inflation expectations and thus reduced trust in the central banks' ability to maintain price stability, see Grishchenko et al. (2019), Apokoritis et al. (2019) and Coleman and Nautz (2021). Furthermore, Armantier et al. (2021) show that the increased inflation uncertainty in 2020 already had a significant effect on precautionary savings.

For the 1-year horizon, we do not find a different effect of containment policies in the full sample versus the sample with stayers only. Yet, people who stay in the panel for a minimum of 12 months become slightly more uncertain about prices at the 3-year horizon. Accordingly, stayers assign a wider range of possible outcomes to future

 Table 2

 Impact of Covid-19 Pandemic Measures on Inflation Uncertainty

 Inflation uncertainty (1-year ahead)

 Inflation uncertainty (1-year ahead)

 Inflation uncertainty (1-year ahead)

	Inflation uncertainty (1-year ahead)		Inflation uncertainty (3-year ahead)		
	(1) Full sample	(2) Stayers only	(3) Full sample	(4) Stayers only	
Containment and Health Index (CHI)	0.0179***	0.0185***	0.0122***	0.0172***	
	(0.00481)	(0.00619)	(0.00438)	(0.00596)	
Economic Support Index (ESI)	0.000378	0.00123	0.000372	0.000586	
	(0.00347)	(0.00379)	(0.00348)	(0.00442)	
Gas Prices (Annual Change, percent)	-0.00374	-0.00238	-0.00472	0.000732	
	(0.00518)	(0.00691)	(0.00487)	(0.00660)	
CPI (Annual Change, percent)	0.00424	0.0600	0.0172	0.0132	
	(0.101)	(0.124)	(0.0853)	(0.113)	
Daily change in confirmed cases	-1.85e-06	-1.33e-06	-1.09e-05***	-2.10e-05***	
	(3.93e-06)	(1.03e-05)	(3.29e-06)	(8.00e-06)	
Daily change in confirmed deaths	9.40e-05	-0.000147	0.000836***	0.00147***	
	(0.000297)	(0.000700)	(0.000246)	(0.000519)	
Observations	30,809	15,277	30,661	15,215	
R-squared	0.737	0.741	0.749	0.758	
Constant	Yes	Yes	Yes	Yes	
Individual fixed effects	Yes	Yes	Yes	Yes	
Survey tenure fixed effects	Yes	Yes	Yes	Yes	

Notes: The indicator, gas prices (annual change, percent), measures the annual change in the weekly U.S. Regular Gasoline Prices (dollars per gallon) at the regional level (i.e. East Coast, New England, Central Atlantic, Lower Atlantic, Midwest, Gulf Coast, Rocky Mountain, West Coast) is obtained from the U.S. Energy Information Administration (EIA) website. CPI (annual change, percent), which measures the inflation rate of Census divisions, is obtained from the U.S. Bureau of Labor Statistics (BLS). Columns (1) and (3) show the results from the full sample while columns (2) and (4) show the results for the individuals who remain in the sample for at least 12 rounds. Standard errors (in parentheses) are clustered at the individual level. *p < 0.1, **p < 0.05, ***p < 0.01.

inflation three years from now. This is of particular interest, as in general, tenure leads to smaller uncertainty about future inflation (for brevity not shown here, see also Kim and Binder (2021)). At the same time, we have seen in section 3.2 that stayers are not significantly affected by containment policies on their inflation expectations at the 3-year horizon.

The Economic Support Index, ESI reflects the policy measures aimed at mitigating the negative economic effects of the pandemic and the implemented containment measures. However, an increase in ESI does not affect inflation uncertainty. This means that such economic support policies do not create any sense of certainty, at least about future prices. Yet, as shown in Figure 4, there is not too much variation in the ESI such that we might not be able to gauge the entire effect.

As indicated above, the numbers of confirmed Covid-19 cases and deaths affect people's uncertainty about future prices to a much smaller degree. While we find no impact for the 1-year horizon, reactions are significant for inflation uncertainty three years ahead. The daily change in confirmed cases makes people less uncertain about future prices at both horizons, while we find an opposite effect for the change in confirmed deaths. For stayers, the effects are even larger, yet still small compared to the impact of the containment policies. This contrasts the results by Apergis and Apergis (2021) who analyse break-even inflation and find significant effects of confirmed cases and deaths while they control for oil prices and equity volatility.

In Table 4 in Appendix B, we examine a potential heterogeneity in consumers' reaction to the Covid-19 pandemic, as we did for the individual density means with a particular focus on containment policies.

For the general demographic aspects, in line with Ben-David et al. (2018), we confirm uncertainty decreasing effects for respondents with higher education, increased financial literacy, a higher household income, higher age, male gender, as well as some occupation categories. Specifically, full- and part-time employed people, as well as retirees and early retirees, reveal less uncertainty about future prices. When individuals first enter the survey, they are also asked about their current health. The results indicate that people who consider their health to be merely fair or poor are significantly more uncertain about future prices.

When interacting these demographic aspects with Covid-19 indicators and policies, we find significant results for individuals with high income and college education. Particularly those with a household income of above USD 100K¹¹ reveal higher inflation uncertainty at both horizons in response to containment policies. Therefore, these respondents are more uncertain about the potential medium-term effects of pandemic policies and project a wider range of outcomes. By contrast, we find a slight uncertainty decreasing effect for the 1-year horizon for individuals with some college education due to the policies. This indicates that educated individuals expect policies to dampen the effects of the pandemic. Although we expected that those individuals with health issues would respond significantly to the pandemic and the implemented measures, we found no such effect. However, the survey only asks the health question the first time respondents enter and therefore does not allow further conclusions about changes.

4 Conclusions

We build upon the recent paper by Armantier et al. (2021) by further exploring the effects of the pandemic on individuals' inflation expectations formation. We considered the impact of actual policy measures (i.e., containment policies and economic support) implemented in the different U.S. states on inflation expectations and inflation uncertainty. In this way, we contribute to a better understanding of how consumers perceive crises and crisis policies. We find that controlling for the actual cases and deaths from the pandemic in a state, the effective containment measures, which directly affect all state residents, influence their expectations. These measures lead individuals to expect higher inflation and be more uncertain about future price developments over the one-year horizon. Over the three-year horizon, our results are more mixed, with statistical and economically significant effects on inflation uncertainty but not on inflation expectations.

¹¹Households with an income of above USD 100K represent about 30 percent of the sample. On average, these individuals' tenure in the sample is lower than for households with lower income.

Although the measures are aimed at mitigating the pandemic and its negative impact on society and the economy, these actually lead to an increase in short-term inflation expectations and uncertainty. Furthermore, to the extent that higher inflation uncertainty over the medium-term can signal a de-anchoring of inflation expectations, our results show that these policy measures may have longer lasting impact on individuals' inflation expectation formation.

For future research, we highlight the importance of examining the effects of the different types of containment measures. Through that, we can ascertain which type of policy measures are particularly useful for containing the spread of the virus, in tandem with their trade-offs vis-a-vis central banks' mandate in preserving price stability.

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A Original Wording of Questions Q9 and Q9c from the New York Federal Reserve Survey of Consumer Expectations (SCE)

Q9) In your view, what would you say is the percent chance that, over the next 12 months...

•	the rate of inflation will be	12% or higher.	
•		between 8% and 12%	6.
•	•••	between 4% and 8%.	•
•		between 2% and 4%.	•
•		between 0% and 2%.	•
•	the rate of deflation will be	between 0% and 2%.	
٠		between 2% and 4%	
٠		between 4% and 8%.	•
•		between 8% and 12%	6.
•		12% or higher.	

Q9c) And in your view, what would you say is the percent chance that, over the [Month, Year - 24 months from survey date] and [Month, Year - 36 months from survey date], ...

Source: Survey of Consumer Expectations, © 2013-2020 Federal Reserve Bank of New York (FRBNY). The SCE data are available without charge at http://www.newyorkfed.org/microeconomics/sce and may be used subject to license terms posted there. FRBNY disclaims any responsibility for this analysis and interpretation of Survey of Consumer Expectations data.

B Additional Tables

Table 3Effect of Covid-19 pandemic on inflation expectations (Cross-section)

	Inflation Expectations		Inflation Expectations	
	1-year ahead		3-yea	r ahead
	Full	Stayers	Full	Stayers
	Sample	Only	Sample	Only
Containment Health Index	-0.00236	0.00746	-0.0148	0.000102
	(0.0177)	(0.0257)	(0.0164)	(0.0244)
Education: Some college	0.169	0.251	-0.105	-0.00703
	(0.300)	(0.430)	(0.310)	(0.440)
Education: College	-0.167	-0.516	-0.257	-0.521
	(0.273)	(0.383)	(0.287)	(0.400)
CHI X Education: Some college	-0.00745	-0.00760	-0.00332	-0.00803
	(0.00942)	(0.0136)	(0.00879)	(0.0131)
CHI X Education: College	-0.0183**	-0.00500	-0.0116	-0.00827
	(0.00907)	(0.0117)	(0.00821)	(0.0113)
Household income (USD50k to USD100k)	-0.244	-0.0527	-0.336	-0.0231
	(0.269)	(0.308)	(0.269)	(0.308)
Household income (Above USD100k)	-0.633**	-0.235	-0.624*	-0.184
	(0.303)	(0.337)	(0.318)	(0.369)
CHI X Household income (USD50k to USD100k)	-0.00608	-0.00273	-0.00631	-0.00324
	(0.00860)	(0.0121)	(0.00748)	(0.00965)
CHI X Household income (Above USD100k)	-0.00246	-0.00851	0.00408	0.00789
	(0.00891)	(0.0123)	(0.00862)	(0.0107)
Age: 40 to 60 years	0.487**	0.202	0.365*	0.0474
	(0.209)	(0.297)	(0.216)	(0.312)
Age: Above 60 years	1.321***	1.543***	0.876**	0.936**
	(0.337)	(0.425)	(0.356)	(0.451)
CHI X Age: 40 to 60 years	0.00429	0.0195**	0.00777	0.00562
	(0.00706)	(0.00941)	(0.00631)	(0.00907)
CHI X Age: Above 60 years	0.0110	0.0111	0.0163*	0.0159
	(0.0107)	(0.0150)	(0.00989)	(0.0124)
Sex: Male	-0.441*	-0.783**	-0.108	-0.255
	(0.243)	(0.326)	(0.243)	(0.322)
CHI X Sex: Male	0.00219	-0.00202	0.00488	-0.00363
	(0.00645)	(0.00860)	(0.00616)	(0.00779)
Marital status: Not married	-0.197	-0.0328	-0.129	-0.0207
	(0.239)	(0.294)	(0.241)	(0.288)
CHI X Marital status: Not married	-0.00130	-0.0100	0.00365	0.00328
	(0.00732)	(0.0103)	(0.00683)	(0.00809)
Financial literacy: High	-0.166	-0.350	-0.143	-0.101
	(0.274)	(0.362)	(0.279)	(0.361)
CHI X Financial literacy: High	-0.000572	0.00203	0.00312	-0.00639
	(0.00818)	(0.0111)	(0.00785)	(0.0107)
	Continued on next page			

Table 3 – continued from previous page				
	Inflation Expectations		Inflation Expectations	
	1-year ahead		3-year ahead	
	Full	Stayers	Full	Stayers
	Sample	Only	Sample	Only
Health: Very good	-0.563**	-0.557	-0.373	-0.402
	(0.270)	(0.398)	(0.276)	(0.416)
Health: Good	-0.0705	-0.360	0.0914	-0.0392
	(0.342)	(0.543)	(0.341)	(0.540)
Health: Fair or poor	-0.416	-0.468	0.0694	0.220
	(0.497)	(0.650)	(0.524)	(0.672)
CHI X Health: Very good	0.0149**	0.0124	0.0157**	0.00624
	(0.00750)	(0.0100)	(0.00747)	(0.00940)
CHI X Health: Good	0.00625	0.00842	0.00730	0.00701
	(0.00889)	(0.0121)	(0.00863)	(0.0112)
CHI X Health: Fair or poor	0.0171	0.00550	0.0136	-0.0181
	(0.0131)	(0.0154)	(0.0129)	(0.0158)
Daily change in confirmed cases	1.23e-05	-6.98e-06	-2.26e-06	-3.50e-05**
	(1.39e-05)	(9.19e-06)	(9.82e-06)	(1.67e-05)
Daily change in confirmed deaths	-0.000210	0.000731	0.000358	0.00292**
	(0.000779)	(0.000709)	(0.000734)	(0.00128)
Observations	30,455	15,106	30,324	15,054
R-squared	0.046	0.080	0.037	0.078
Individual fixed effects	No	No	No	No
State fixed effects	Yes	Yes	Yes	Yes
Survey tenure fixed effects	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes

Notes: Other controls include (not shown) regional inflation rates, regional gas prices (annual change), employment status, economic support index. Columns (1) and (3) show the results from the full sample while columns (2) and (4) show the results for the individuals who remain in the sample for at least 12 rounds. Financial literacy is "high" for respondents who answer at least four out of the five questions on financial knowledge in the survey correctly (see Armantier et al. (2021) for a similar treatment). The baseline characteristics are education at high school level, household income of below USD 50k, below 40 years old, female, married, low financial literacy, and excellent reported health. Robust standard errors in parentheses. *p < 0.1, **p < 0.05, ***p < 0.01.

	Inflation Uncertainty		Inflation Uncertainty	
	1-year ahead		3-year ahead	
	Full	Stayers	Full	Stayers
	Sample	Only	Sample	Only
Containment Health Index	-0.00767	0.00481	-0.00590	0.0140
	(0.0163)	(0.0239)	(0.0162)	(0.0235)
Education: Some college	-0.723**	-0.661	-0.561*	-0.498
	(0.303)	(0.403)	(0.300)	(0.419)
Education: College	-1.432***	-1.393***	-1.205***	-1.127***
	(0.270)	(0.345)	(0.262)	(0.361)
CHI X Education: Some college	-0.0150*	-0.00587	-0.0122	-0.00718
	(0.00898)	(0.0131)	(0.00880)	(0.0131)
CHI X Education: College	-0.0133	-0.00147	-0.0109	-0.00712
	(0.00825)	(0.0108)	(0.00800)	(0.0107)
Household income (USD50k to USD100k)	-1.459***	-1.373***	-1.560***	-1.445***
	(0.278)	(0.362)	(0.278)	(0.373)
Household income (Above USD100k)	-1.516***	-1.114***	-1.634***	-1.283***
	(0.309)	(0.375)	(0.309)	(0.392)
CHI X Household income (USD50k to USD100k)	0.0132	0.0160	0.0160*	0.0175
	(0.00833)	(0.0112)	(0.00819)	(0.0111)
CHI X Household income (Above USD100k)	0.0142*	0.0263**	0.0194**	0.0356***
	(0.00854)	(0.0120)	(0.00849)	(0.0120)
Age: 40 to 60 years	-0.335	-0.374	-0.340	-0.393
	(0.248)	(0.330)	(0.247)	(0.353)
Age: Above 60 years	-0.538	-0.440	-0.462	-0.353
	(0.331)	(0.430)	(0.326)	(0.443)
CHI X Age: 40 to 60 years	0.00475	0.00143	0.00383	-0.000614
	(0.00745)	(0.0103)	(0.00725)	(0.0103)
CHI X Age: Above 60 years	0.0132	0.00845	0.0103	0.00786
	(0.00989)	(0.0141)	(0.00965)	(0.0141)
Sex: Male	-0.918***	-0.884***	-0.649***	-0.506
	(0.226)	(0.309)	(0.223)	(0.314)
CHI X Sex: Male	-0.00693	-0.00459	-0.00651	-0.00524
	(0.00607)	(0.00808)	(0.00595)	(0.00819)
Marital status: Not married	-0.113	-0.161	-0.288	-0.182
	(0.245)	(0.308)	(0.244)	(0.320)
CHI X Marital status: Not married	0.00227	0.00278	0.00821	0.00655
	(0.00710)	(0.0114)	(0.00697)	(0.0112)
Financial literacy: High	-2.302***	-2.040***	-2.266***	-2.067***
	(0.263)	(0.346)	(0.262)	(0.357)
CHI X Financial literacy: High	0.00707	0.00669	0.00339	-0.00129
-	(0.00704)	(0.00880)	(0.00694)	(0.00890)
Health: Very good	-0.182	0.232	-0.292	0.0779
	(0.256)	(0.292)	(0.250)	(0.299)
Health: Good	0.383	0.711*	0.336	0.616
	(0.302)	(0.368)	(0.299)	(0.375)
			Continued	on next page

Table 4Effect of Covid-19 pandemic on inflation uncertainty (Cross-section)

Table 4 – continued from previous page					
	Inflation Expectations		Inflation Expectations		
	1-year ahead		3-year ahead		
	Full	Stayers	Full	Stayers	
	Sample	Only	Sample	Only	
		•			
Health: Fair or poor	1.071**	1.767***	1.126**	1.685***	
	(0.442)	(0.590)	(0.440)	(0.591)	
CHI X Health: Very good	0.00435	-0.00648	0.00405	-0.00693	
	(0.00703)	(0.00854)	(0.00698)	(0.00884)	
CHI X Health: Good	0.00288	-0.00761	0.00211	-0.00706	
	(0.00761)	(0.00965)	(0.00769)	(0.0101)	
CHI X Health: Fair or poor	0.0153	0.0161	0.0151	0.0152	
	(0.0115)	(0.0171)	(0.0116)	(0.0175)	
Daily change in confirmed cases	4.95e-06	9.23e-07	-7.75e-06	-1.75e-05	
	(7.13e-06)	(1.04e-05)	(5.48e-06)	(1.30e-05)	
Daily change in confirmed deaths	0.000110	-0.000321	0.000904**	0.00115	
	(0.000465)	(0.000700)	(0.000454)	(0.00101)	
Observations	30,455	15,106	30,324	15,054	
R-squared	0.237	0.262	0.229	0.255	
Individual fixed effects	No	No	No	No	
State FE	Yes	Yes	Yes	Yes	
Survey tenure fixed effects	Yes	Yes	Yes	Yes	
Constant	Yes	Yes	Yes	Yes	

Notes: Other controls include (not shown) regional inflation rates, regional gas prices (annual change), employment status, economic support index. Columns (1) and (3) show the results from the full sample while columns (2) and (4) show the results for the individuals who remain in the sample for at least 12 rounds. Financial literacy is "high" for respondents who answer at least four out of the five questions on financial knowledge in the survey correctly (see Armantier et al. (2021) for a similar treatment). The baseline characteristics are education at high school level, household income of below USD 50k, below 40 years old, female, married, low financial literacy, and excellent reported health. Robust standard errors in parentheses. *p < 0.1, **p < 0.05, ***p < 0.01.