COVID-19 Fiscal Measures and Inflation[1]

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[1]The views expressed herein are those of the authors and not necessarily those of the Federal Reserve Bank of San Francisco, the Federal Reserve System or the Morning Consult Economics Intelligence.

This paper

- Countries relied on fiscal support to households and businesses to mitigate the pandemic effects
- We study whether fiscal support effects on inflation varied by target-group
- We rely on sentiment data to proxy for underlying real economic activity
- We find that even early in the pandemic, fiscal support was more inflationary when directed to households
- This effect was enlarged by improving sentiment on current conditions

Literature: partial list

- **Fiscal support during COVID:** Makin and Layton, 2021; Alberola-Ila et al. (2020); Benmelech and Tzur-Ilan (2020); Hürtgen (2020)
- **Measures were generally effective:** Chudik, Mohaddes and Raissi (2021); Guerrieri et al. (2020); Fornaro and Wolf, (2020); Gourinchas et al. (2020); Gourinchas et al. (2021); Furceri et al. (2021); Faria-e-Castro (2021)
- **... and necessary:** Baldwin and di Mauro (2020)
- **Fiscal support and inflation:** Jordà and Nechio (2023)
- **Fiscal support and credit:** Karakaplan (2021); Aizenman, Jinjarak and Spiegel (2022); Kahn and Wagner (2021)

Our analysis in a nutshell: inflationary effects of fiscal support

- 10 countries: Australia, Brazil, Canada, France, Germany, Japan, Russia, Spain, the U.K., and the U.S.
- Data from Feb 2020 to Sep 2021
- Fiscal support split by main target-group: consumers vs. businesses
- Proxy for underlying real activity:
  - 2020: lockdowns standard real activity measures are not responsive
  - 2021: supply chain disruptions distort measures of real activity

  $\Rightarrow$ Rely on weekly measure of consumer sentiment on current and expected future conditions as a proxy for real activity
- Local projections at weekly frequency

Data

- **Sentiment**: from from Morning Consult Economic Intelligence - 5 questions, 3 indexes: ICS, ICC, ICE ▸ Figure ▸ Questions

- **Fiscal measures**: Oxford University "COVID-19 Government Response Tracker" (OxGRT) — announced amount as a share of GDP plus textual analysis of whether directed at consumers or firms, explicitly excluding medical-related measures ▸ Figure ▸ Method

- **Inflation, PMI**: IMF, Bloomberg, respectively ▸ Figure

- **Controls**: Severity of lockdowns and COVID-19 impact from OxGRT, monetary policy (3m bond rate, 2y-3m bond rates) from Bloomberg

Survey questions

1. Personal Finances – Current Conditions: “We are interested in how people are getting along financially these days. Would you say that you (and your family living there) are better off or worse off financially than you were a year ago?”

2. Personal Finances – 12-month Expectations: “Now looking ahead — do you think that a year from now you (and your family living there) will be better off financially, or worse off, or just about the same as now?”

3. Business Conditions – 12-month Expectations: “Now turning to business conditions in the country as a whole — do you think that during the next twelve months we’ll have good times financially, or bad times, or what?”

4. Business Conditions – 5-year Expectations: “Looking ahead, which would you say is more likely — that in the country as a whole we’ll have continuous good times during the next 5 years or so, or that we will have periods of widespread unemployment or depression, or what?”

5. Current Buying Conditions: “Thinking about the big things people buy for their homes — such as furniture, a refrigerator, stove, television, and things like that. Generally speaking, do you think now is a good or bad time for people to buy major household items?”

Sentiment indices

- For each question, the net score equals the percentage of weighted positive values minus the percentage of weighted negative values plus 100.
- Index of Consumer Sentiment (ICS) that captures consumers' views regarding current and future personal financial conditions and business conditions in the country as a whole. (average of net scores from questions 1-5)
- Index of Consumer Expectations (ICE) measures consumers' expectations of their future personal financial conditions and business conditions in the country as a whole. (average of net scores from questions 2-4)
- Index of Current Conditions (ICC) reflects consumers' views of their current personal financial conditions and of current buying conditions for large household goods. (average of net scores from questions 1 and 5)

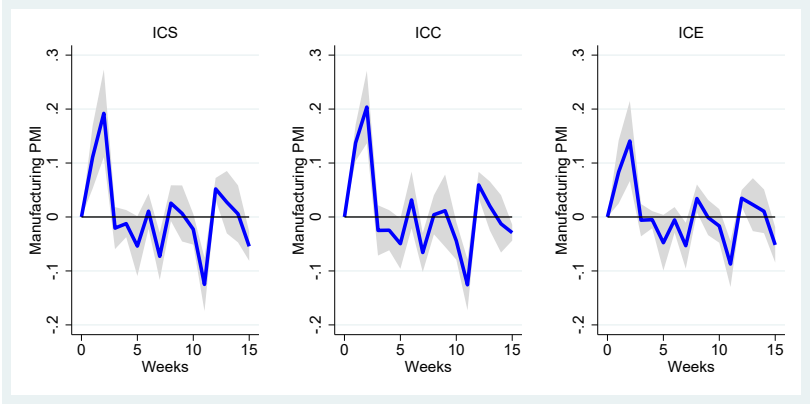
Summary statistics

Variable	Mean	Std. Dev.	Min	Max
Inflation rate (π)	2.376	2.399	-1.194	10.74
Fiscal	0.16	1.34	0	25.99
Fiscal^C	0.16	1.33	0	25.99
Fiscal^F	0.13	1.19	0	25.99
Manufacturing PMI	52.59	6.59	30.8	66.7
ΔManufacturing PMI	0.050	1.81	-16.2	13.3
ICS	82.47	15.08	46.5	128.6
ICC	85.24	10.11	58.6	115.3
ICE	80.62	20.89	37.7	137.9
ΔICS (S)	-0.023	2.17	-15.3	6
ΔICC (S)	-0.047	2.23	-15.0	7.4
ΔICE (S)	-0.0074	2.46	-15.5	7.6
Stringency index	57.46	18.04	0	87.96
COVID-related deaths per capita	0.571	0.572	0	2.346
3-month government bond rate	0.78	2.10	-0.96	10.2
2yr-3m government bond rate	0.34	0.84	-0.35	6.02

Sentiment is a leading indicator for PMI

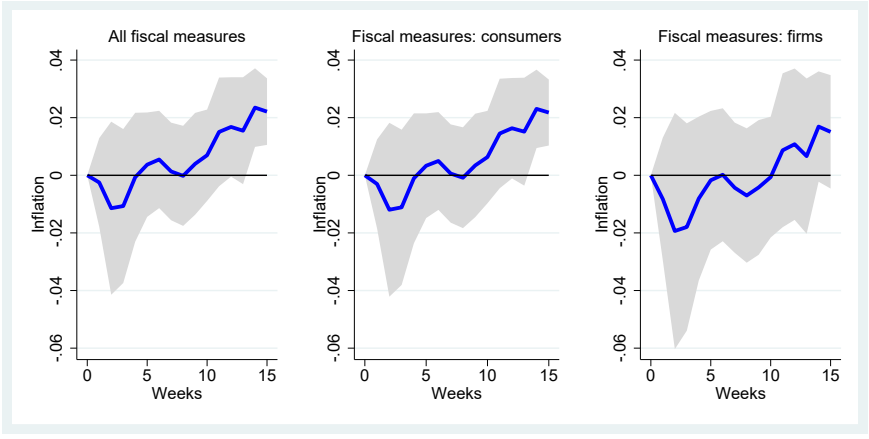
$$\text{PMI}_{it+s} = \alpha_i + \alpha_{tm} + \sum_{r=1}^{4} \beta_{PMI,r}\text{PMI}_{it-r} + \sum_{r=1}^{4} \beta_{S,r} S_{it-r} + X'_{it}\gamma + \varepsilon_{it}, \quad s \in [0, 20]$$

Time period t is a week. X includes stringency index, the number of COVID-related deaths per capita, and monetary policy. Robust standard errors are clustered on country.



Fiscal support and inflation: Not controlling for real activity

$$\pi_{it+s} = \alpha_i + \alpha_{tm} + \sum_{r=1}^{4} \beta_{\pi,r} \pi_{it-r} + \sum_{r=1}^{4} \beta_{F,r} \text{Fiscal}_{it-r} + X'_{it}\gamma + \varepsilon_{it}, \quad s \in [0, 20].$$

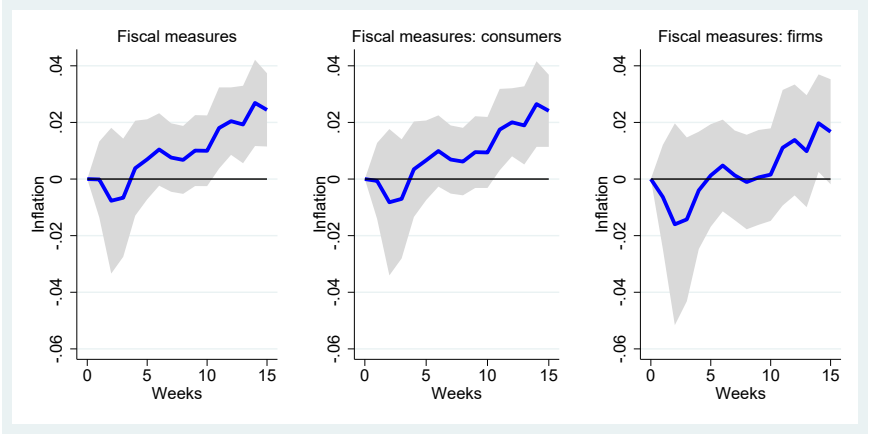


Sample regressions

LHS:	π_t	π_{t+1}	π_{t+2}	π_{t+3}	π_{t+4}	π_{t+5}
π_{t-1}	0.724***	0.639***	0.745***	0.731***	0.646***	0.588***
π_{t-2}	-0.003	0.187**	0.098*	0.002	-0.008**	0.063*
π_{t-3}	0.193**	0.094*	-0.005	-0.007	0.073**	0.131*
π_{t-4}	-0.007	-0.054	-0.002	0.079	0.056	-0.048
Fiscal_{t-1}	-0.011	-0.011	-0.001	0.004	0.005	0.001
Fiscal_{t-2}	-0.007	0.002	0.005	0.010	0.007	0.003
Fiscal_{t-3}	0.006	0.006	0.009	0.006	0.004	0.005
Fiscal_{t-4}	0.009*	0.012*	0.010	0.009	0.009	0.011
Stringency Index	-0.002	-0.003	-0.003	-0.001	-0.002	-0.002
Deaths per capita	0.314*	0.432*	0.516*	0.616*	0.742*	0.847*
3m bond rate	-0.051	-0.075	-0.102	-0.126	-0.154	-0.178
2y-3m bond rate	0.028	0.044	0.065	0.092	0.118	0.145
Observations	965	961	957	953	949	939
R^2	0.969	0.961	0.956	0.950	0.940	0.934

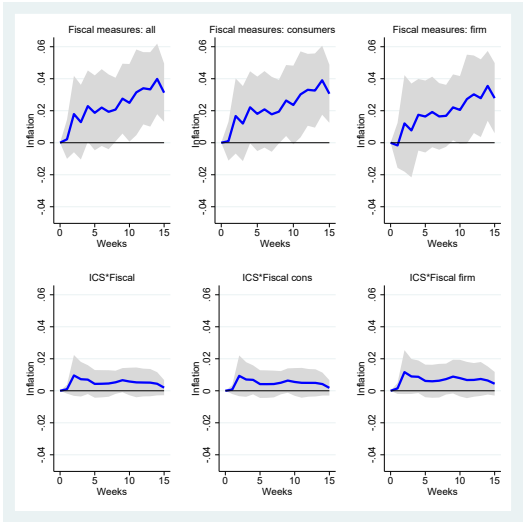
Fiscal support and inflation: Controlling for real activity using ICS

$$\pi_{it+s} = \alpha_i + \alpha_{tm} + \sum_{r=1}^{4} \beta_{\pi,r} \pi_{it-r} + \sum_{r=1}^{4} \beta_{F,r} \text{Fiscal}_{it-r} + \sum_{r=1}^{4} \beta_{S,r} S_{it-r} + X'_{it}\gamma + \varepsilon_{it}, \quad s \in [0, 20].$$



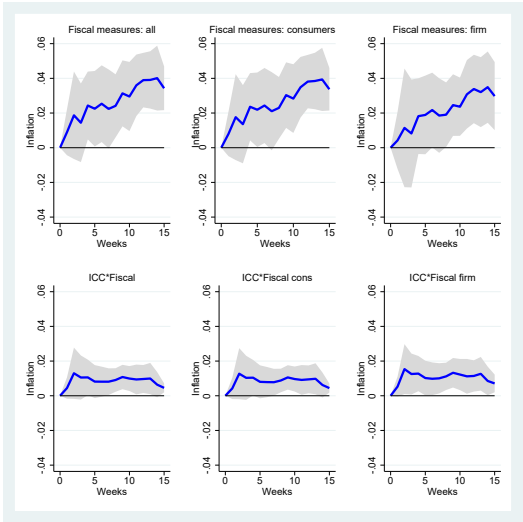
Fiscal support and inflation: Interacting with sentiment: ICS

$$\pi_{it+s}\alpha_i+\sum_{r=1}^{4}\beta_{\pi,r}\pi_{it-r}+\sum_{r=1}^{4}\beta_{F,r}\text{Fiscal}_{it-r}+\sum_{r=1}^{4}\beta_{S,r}S_{it-r}+\sum_{r=1}^{4}\beta_{FS,r}S_{it-r}\text{Fiscal}_{it-r}+X'_{it}\gamma+\varepsilon_{it},\ \ s\in[0,16].$$



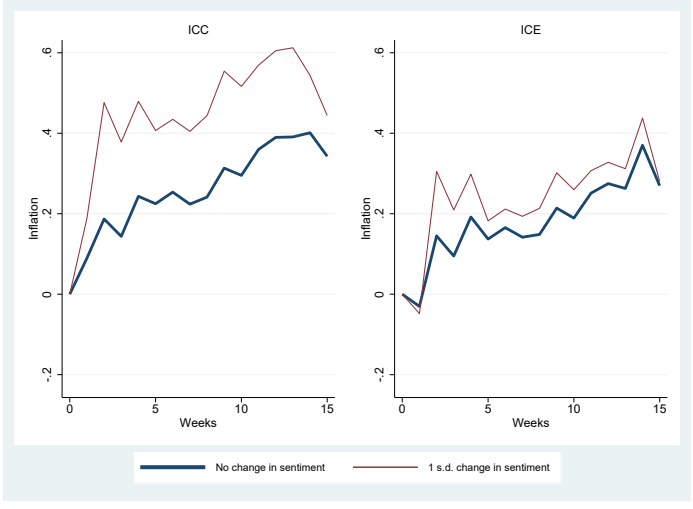
Fiscal support and inflation: Interacting with sentiment: ICC

$$\pi_{it+s}\alpha_i+\sum_{r=1}^{4}\beta_{\pi,r}\pi_{it-r}+\sum_{r=1}^{4}\beta_{F,r}\text{Fiscal}_{it-r}+\sum_{r=1}^{4}\beta_{S,r}S_{it-r}+\sum_{r=1}^{4}\beta_{FS,r}S_{it-r}\text{Fiscal}_{it-r}+X'_{it}\gamma+\varepsilon_{it},\ \ s\in[0,16].$$



Magnitudes

- Predicted effect of total fiscal support of 10 percent of GDP on inflation ▸ Fiscal



Robustness tests

- Non-overlapping fiscal support classification Results
- Controlling for sentiment and PMI at the same time
- Controlling for supply chain disruption (stockout index), smaller sample Results
- Specification changes: 8 lags, excluding stringency of lockdowns, excluding monetary policy, excluding the U.S.
- Replacing monthly fixed effects with other options
- Separating cash and non-cash support

Summary of findings

- Early stages of current inflation bout linked to pandemic fiscal stimuli
- Inflationary effect mostly driven by support to households
- Effect amplified in an environment of improving consumer sentiment
- Magnitudes of the effect are substantial even early on