The Covid-19 crisis and consumption: survey evidence from six EU countries

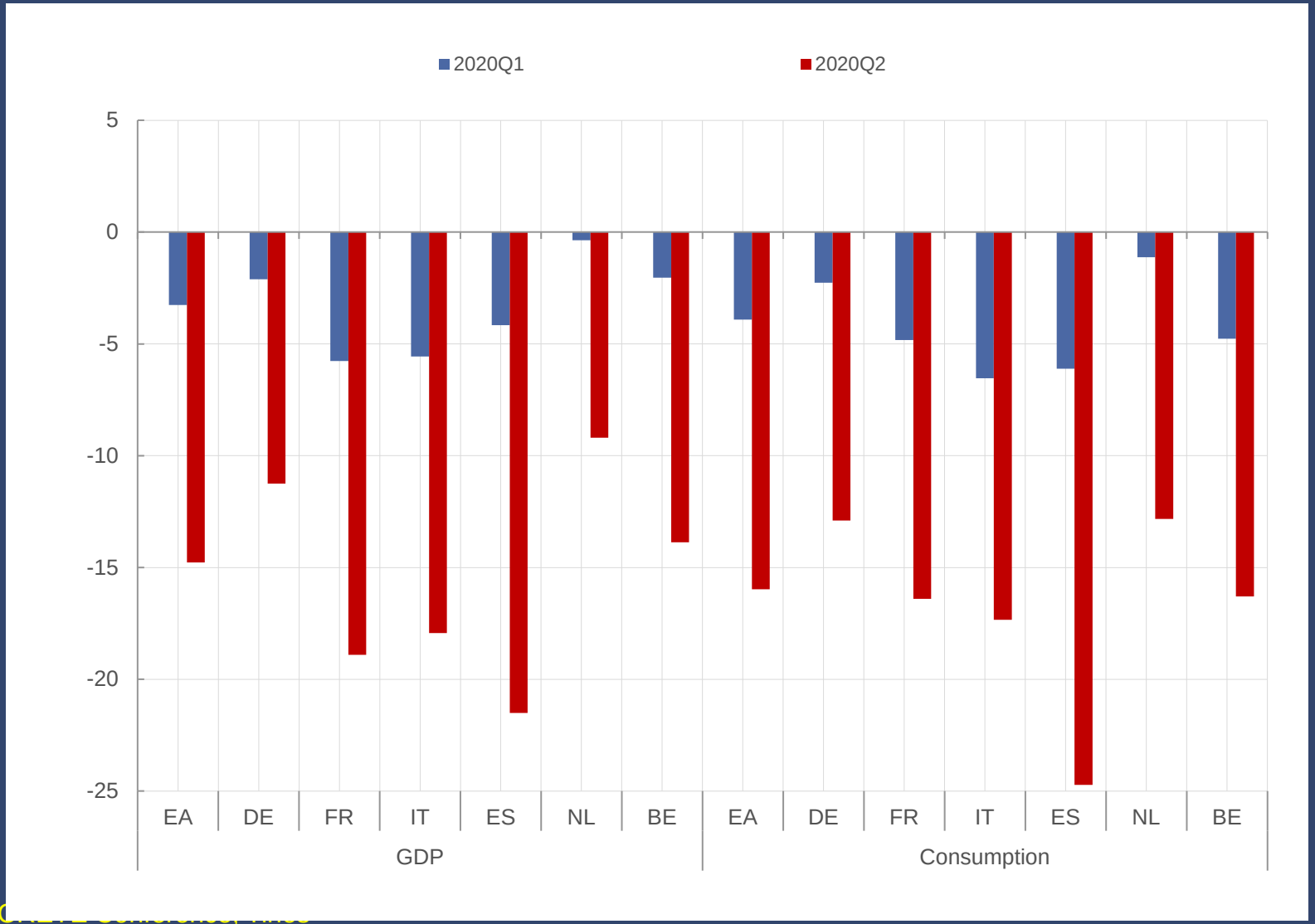
Dimitris Christelis
University of Glasgow

Dimitris Georgarakos
ECB

Tullio Jappelli
University of Naples

Geoff Kenny
ECB

% change in GDP and private consumption relative to 2019 Q1 / Q2



Starting premise

- Households are exposed to a multifaceted shock that affects them to a different degree, depending on:
  - job arrangements
  - age, household composition, education
  - access to liquidity
  - health status
  - region of residence

- We use a household-specific measure, for the first time in the literature, of the perceived severity of the financial consequences due to the Covid-19 shock, as well as f the health-related concern it induces

- Area-level measures of Covid-19 impact (e.g., deaths or infections at the zip code level) are less informative and may suffer from the ecological inference problem (what is true at a higher level of aggregation may not hold at a lower level)

Starting premise (cont.)

- Financial concern due to Covid-19 can depend on various factors including:
  - expected income (level and variance)
  - expected taxes needed to pay for current transfers
  - expected asset prices (esp. of the own home)

- Spending can be also affected by constraints such as lockdowns (either general or sector-specific), travel restrictions etc.

- We isolate two specific factors, namely the financial and health concerns

Survey questions

- Q1: What is the effect of households' concern about the financial consequences of Covid-19 on consumption?
- Q2: What is the effect of households' concern about the impact of the coronavirus (COVID-19) on household members' health
- Strong effect of financial concerns due to Covid-19 on spending on non-durables - ↑ from 0 to median concern: ↓ 8% in consumption
  - Consistent with precautionary saving
- No statistically significant effect of health concern on overall spending
- Household heterogeneity in financial-related pandemic concerns
  - Scope for targeted support measures

Related Literature

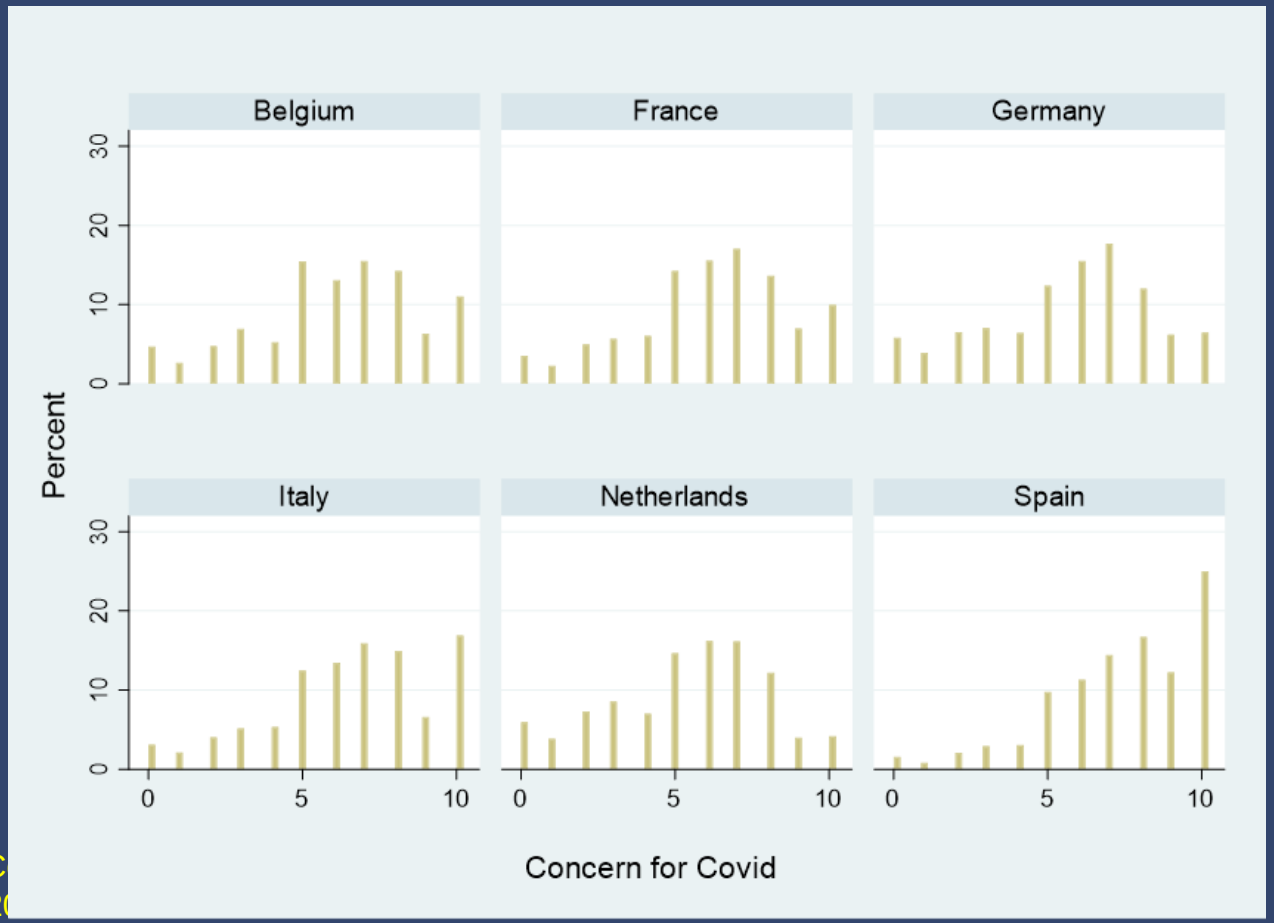
- Existing studies: mainly administrative data; one country/ US
- Focus: regional conditions/ timing of the consumption response
- For the US: Baker et al. (2020); Cox et al. (2020); Chetty et al. (2020)
- For the UK: Chronopoulos et al. (2020); Hacioglou et al. (2020); Dunn et al. (2020)
- Other countries: DK: Andersen et al. (2020); FR: Bounie et al. (2020); ES and PT: Carvalho et al. (2020a, 2020b)

Data

- Consumer Expectations Survey (CES), coordinated by the ECB
- Internet panel; DE, FR, ES, IT, BE, NL; ~ 10,000 households per wave
- We use the April – July, October 2020 waves
- Non-durable consumption; April/July/October; 10 items; follow-up checking screen and monthly running sum (median ~1,254€ per month)
- Household financial and health concerns due to Covid-19: every month since April

Household financial concerns due to Covid-19

- How concerned are you about the impact of the coronavirus (COVID-19) on the financial situation of your household?"
  - 0 - Not concerned .... 10 – Extremely concerned



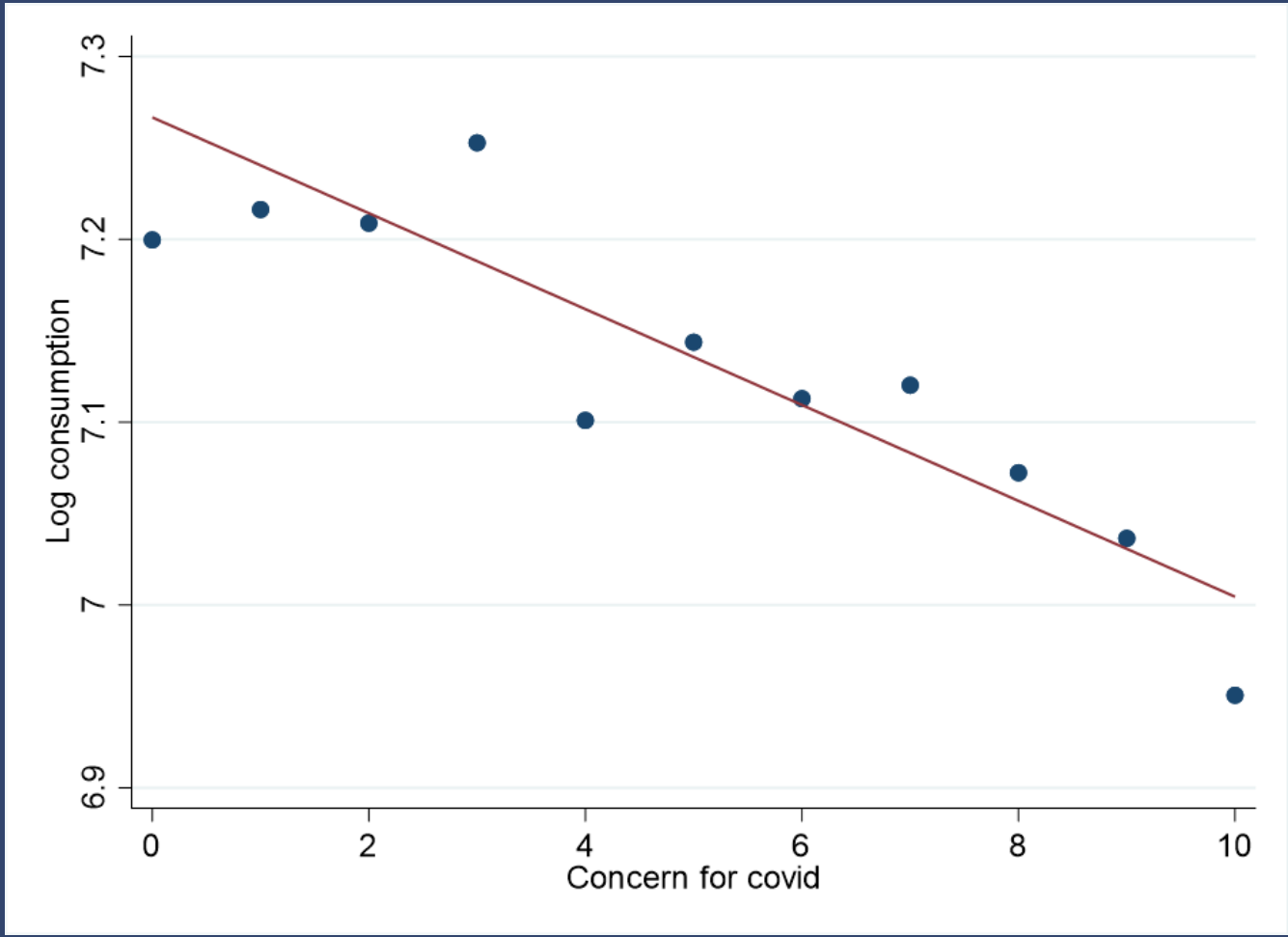
Heterogeneity in financial concerns due to Covid-19

- Age: 36-59 (+)
- Age: 60 plus (-)
- Male (-)
- Education (-)
- Employed (+)/ PT (+), Unemployed (++) vs. Retired
- Income (-)
- Access to liquidity (--)
- BE (+), FR(+), NL(+), IT(++), ES(++) vs. DE
- May(-), June(-), July(-), October(-) vs April

Heterogeneity in health concerns due to Covid-19

- Correlation with financial concerns (~ 0.51)
- Age: 36-59 (+), Age: 60 plus (+);
- Male (-)
- Education (-);
- PT, Unemployed: no significant; vs. Retired
- Income (-);
- BE (+), FR(+), NL(+), IT(+), ES(++) vs. DE
- May(-), June(-), July(-), October(-) vs April

Financial concerns due to Covid-19 and consumption



Financial concern due to Covid-19 and consumption: panel FE

Variable	Fixed effects OLS		
	Coeff.	Std. Error	p-value
Concern about the household's financial situation due to Covid-19	-0.0137	0.003	0.000
Concern about own and household member's health due to Covid-19	0.0006	0.003	0.826
Employed full-time	0.0200	0.038	0.597
Employed part-time or on extended leave	-0.0194	0.029	0.505
Unemployed	-0.0262	0.035	0.450
Has liquidity	0.1005	0.020	0.000
July 2020 wave	0.1176	0.009	0.000
October 2020 wave	0.1744	0.009	0.000
Number of observations	23,220		

Financial and health concerns due to Covid-19 and consumption items: panel FE

Variable	Financial Concern			Health Concern		
	Coeff.	Std. Error	p-value	Coeff.	Std. Error	p-value
Food at home and outside the home, clothing	-0.0230	0.0043	0.000	-0.0006	0.0047	0.901
Housing expenses, utilities, home equipment, furnishings etc.	-0.0011	0.0053	0.828	0.0132	0.0057	0.020
Health	-0.0089	0.0086	0.303	0.0366	0.0093	0.000
Transportation, recreation, travel, entertainment, education, other	-0.0309	0.0078	0.000	0.0076	0.0084	0.368

Partial identification

- Covid-19 financial concern is very likely endogenous, due to time-varying unobservables (e.g., distress due to other reasons). This problem can be addressed using partial identification methods

- Starting premise: the treatment is endogenous and there is no exogenous variation that can help identify its effect (Manski, 1990; 1994; 1997)

- Average treatment effect (outcome y, observed treatment w, generic treatment value d, controls x):

$$E[y(d_2)|x]-E[y(d_1)|x]$$

- Average potential outcome:

$$E[y(d)|x]=E[y(d)\,|\,x,w=d]P(w=d|x)+E[y(d)\,|\,x,w\neq d]P(w\neq d|x)$$

Partial identification

- A mathematical model allows one to evaluate the counterfactual $E[y(d) \mid x, w \neq d]$
  - models make many assumptions (about behaviour, parameter values, functional forms, extent of heterogeneity, exogeneity of errors, global maxima); not clear how each one affects the results

- One can also evaluate the counterfactual $E[y(d) \mid x, w \neq d]$ using a regression model
  - regression rests on exogeneity, functional form

- PI is non-parametric, rests on very few assumptions, and it is absolutely transparent how each assumption affects results.

Partial identification (cont.)

- Exogeneity implies that

$$E[y(d) \mid x, w \neq d] = E[y(d) \mid x, w = d]$$

i.e., no treatment selection, as, e.g., in RCTs. Then,

$$E[y(d) \mid x] = E[y(d) \mid x, w = d]$$

- Then, the ATE equals the difference in conditional means, i.e.,

$$E[y(d_2) \mid x] - E[y(d_1) \mid x] = E[y(d_2) \mid x, w = d_2] - E[y(d_1) \mid x, w = d_1]$$

Partial identification (cont.)

- Lack of exogeneity implies that

$$E[y(d) \mid x, w \neq d] \neq E[y(d) \mid x, w = d]$$

- PI puts bounds around

$$E[y(d) \mid x, w \neq d]$$

and thus on

$$E[y(d) \mid x]$$

and thus on

$$E[y(d_2) \mid x] - E[y(d_1) \mid x]$$

Partial Identification (cont.)

- For example,

$$1{,}200 \leq E[Y(d_1)|x] \leq 1{,}350$$
$$1{,}025 \leq E[Y(d_2)|x] \leq 1{,}100$$

$$1{,}025 - 1{,}350 = -325$$
$$\leq E[Y(d_2)|x] - E[Y(d_1|x)] \leq$$
$$1{,}100 - 1{,}200 = -100$$

- To narrow identification regions, we need lower bounds that are as large as possible, and upper bounds that are as small as possible

- PI provides bounds for the derivative of a decision rule with respect to the parameter of interest

Partial Identification (cont.)

- Without assumptions, the only credible bounds on the counterfactual terms are the minimum and maximum possible values, which typically produce uninformative identification regions

$$E[y(d) \mid x, w=d]P(w=d|x) + y_{min}P(w \neq d|x) \leq E[y(d) \mid x] \leq E[y(d) \mid x, w=d]P(w=d|x) + y_{max}P(w \neq d|x)$$

- Using assumptions, we will replace y_{min} with something larger, and y_{max} with something smaller

Assumption 1: Monotone Treatment Response (Manski, 1997)

- A greater financial concern due to Covid-19 does not increase consumption, ***on average***

- Plausible assumption – difficult to think reasons why it would not be valid

- Example: the counterfactual mean spending of those who are not concerned, had they been very concerned. Under MTR, an upper bound for this counterfactual term is the actual mean spending of those who are not concerned

- This MTR upper bound is smaller than the overall maximum, and thus identification regions become more narrower and thus more informative

Assumption 2: Bounded variation (Manski and Pepper, 2018)

- The BV assumption puts a bound on how much the counterfactual term can differ from the observed term
- Example: the counterfactual mean spending of those who are not concerned, had they been very concerned. Under BV, the lower bound for this counterfactual term can be smaller than the actual mean spending of those who are not concerned by at most a multiple k of the standard deviation of the outcome
- This lower bound is smaller than the overall minimum and thus identification regions become narrower and thus more informative
- BV does not affect the upper bound of the effect of the financial concern on consumption (i.e., by at least how much consumption drops due to the concern) but only the lower bound (i.e., but at most how much it drops)
- We show results for several values of k and let readers decide which they think is most plausible

Assumption 3: Monotone Instrumental Variable

- MIVs (Manski and Pepper, 2000) can be weakly monotonically associated with the outcome, and are thus much easier to find
- They do not identify the LATE but the ATE – nothing to do with compliers
- They serve to partition the sample space conditional on their values and search for maximum lower bounds and minimum upper bounds
- Our MIV is age (conditional on income)
- Conditional on income, older households do not spend less than the young, on average – plausible assumption due to dissaving in older age
- Negative association between spending and age in the data – not a proof

PI results for consumption: ATE of a change from the below to above median concern

Assumptions	Lower bound	Upper bound	Lower Bound Low 95% CI	Lower Bound Upper 95% CI	Upper Bound Low 95% CI	Upper Bound Upper 95% CI
Exogenous treatment selection	-0.1191		-0.1461		-0.0928	
No assumptions	-4.5988	4.3019	-4.6703	-4.5308	4.2304	4.3699
MTR	-4.5988	0.0000	-4.6703	-4.5308	0.0000	0.0000
MTR + MIV	-4.1550	-0.0098	-4.2575	-4.0489	-0.0270	-0.0009
MTR + MIV + BV20	-0.1185	-0.0098	-0.1298	-0.0987	-0.0270	-0.0009
MTR + MIV + BV25	-0.1494	-0.0098	-0.1631	-0.1287	-0.0270	-0.0009
MTR + MIV + BV30	-0.1798	-0.0098	-0.1941	-0.1581	-0.0270	-0.0009
Number of observations	23,370					

Conclusions

- Negative and significant effect of concern for the financial consequences of Covid-19 on non-durable consumption
- FE: from zero to median concern, about 8% decline in consumption in panel FE
- PI: at least 1% and at most 12% drop going from below to above the median
- Models should try to incorporate the heterogeneity that gives rise to financial concerns: job status, age, expectations about income, asset prices and future taxes
- Maybe put less emphasis on health concerns as drivers of economic behavior