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

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

[Graph showing the percentage change in GDP and private consumption for various countries from 2020 Q1 to 2020 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 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
<table>
<thead>
<tr>
<th>Variable</th>
<th>Coeff.</th>
<th>Std. Error</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concern about the household's financial situation due to Covid-19</td>
<td>-0.0137</td>
<td>0.003</td>
<td>0.000</td>
</tr>
<tr>
<td>Concern about own and household member's health due to Covid-19</td>
<td>0.0006</td>
<td>0.003</td>
<td>0.826</td>
</tr>
<tr>
<td>Employed full-time</td>
<td>0.0200</td>
<td>0.038</td>
<td>0.597</td>
</tr>
<tr>
<td>Employed part-time or on extended leave</td>
<td>-0.0194</td>
<td>0.029</td>
<td>0.505</td>
</tr>
<tr>
<td>Unemployed</td>
<td>-0.0262</td>
<td>0.035</td>
<td>0.450</td>
</tr>
<tr>
<td>Has liquidity</td>
<td>0.1005</td>
<td>0.020</td>
<td>0.000</td>
</tr>
<tr>
<td>July 2020 wave</td>
<td>0.1176</td>
<td>0.009</td>
<td>0.000</td>
</tr>
<tr>
<td>October 2020 wave</td>
<td>0.1744</td>
<td>0.009</td>
<td>0.000</td>
</tr>
<tr>
<td>Number of observations</td>
<td>23,220</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Financial and health concerns due to Covid-19 and consumption items: panel FE

<table>
<thead>
<tr>
<th>Variable</th>
<th>Financial Concern</th>
<th>Health Concern</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coeff.</td>
<td>Std. Error</td>
</tr>
<tr>
<td>Food at home and outside the home, clothing</td>
<td>-0.0230</td>
<td>0.0043</td>
</tr>
<tr>
<td>Housing expenses, utilities, home equipment, furnishings etc.</td>
<td>-0.0011</td>
<td>0.0053</td>
</tr>
<tr>
<td>Health</td>
<td>-0.0089</td>
<td>0.0086</td>
</tr>
<tr>
<td>Transportation, recreation, travel, entertainment, education, other</td>
<td>-0.0309</td>
<td>0.0078</td>
</tr>
</tbody>
</table>
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

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

• 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

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