Managing Household Expectations with Unconventional Policies

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Motivation

- During liquidity trap increased use of unconventional policies
- Policy assumes households understand economic incentives fully
  - Forward guidance
    Eggertsson & Woodford (2003)
  - Unconventional fiscal policies
    D’Acunto, Hoang, & Weber (2018)
  - Conventional fiscal policies
    Farhi & Werning (2017)
- **BUT** policies often less effective: e.g., *forward guidance puzzle*
  Del Negro, Giannoni, & Patterson (2015)
- Recent theory literature: heterogeneous agents & uninsurable shocks
  McKay, Nakamura, & Steinsson (2016); Kaplan, Moll, & Violante (2018); Hagedorn et al (2018)
Simple Policies vs Complex Policies

- Pre-announced VAT increases (left) stimulate inflation expectations and spending
- ECB fwd guidance announcements (right) do not move expectations and choice
- Both policies theoretically operate through identical channel: Euler equation
Research Question

- Do policies that theoretically work through Euler equation work?

- Higher inflation expectations → higher consumption?

- Higher inflation expectations lower real interest rates with binding ZLB

- Fiscal multipliers increase with higher inflation when ZLB binds

- But: precautionary savings channel, preference assumptions, inflation tax on liquid asset, income effects, etc.

  Inflation expectations ⇔ consumption (open) empirical question
This Paper

- Inflation expectations ⇔ willingness to purchase durables

- Identification: Difference-in-Differences
  Novel German household data between Jan 2000 to Feb 2016
  Unexpected rise in VAT and forward guidance announcements of ECB
  Match German & foreign households in DiD design

- Main finding
  HH inflation expectations ↑ → durables purchases ↑ before VAT hike
  Homogeneous effect across whole population
  No effect for forward guidance
Data Sources

- European harmonized survey on consumption climate
- 2,000 representative German households every months
- Questions about aggregate and personal economic expectations
- Sample period: January 2000 to February 2016
- Rich demographics (age, income, marital status, city size, kids, job)
- Macro aggregates (unemployment, uncertainty, Dax, interest rates)
Survey Questions 1

Question 8

Given the current economic situation, do you think it’s a good time to buy larger items such as furniture, electronic items, etc.?

Answer choices: “it’s neither good nor bad time,” “it’s bad time,” or “it’s a good time.”
Survey Questions II

Question 3

*How will consumer prices evolve during the next twelve months compared to the previous twelve months?*

Answer choices: “prices will increase more,” “prices will increase by the same,” “prices will increase less,” “prices will stay the same,” or “prices will decrease.”

Create a dummy that equals 1 when households answer “prices will increase more.”
Increase in CPI inflation in 2007 driven by durable goods inflation subject to VAT increase

Lagged inflation expectations and standardized durable inflation highly correlated
Readiness to Spend and Real Durable Consumption

- Positive correlation between purchasing propensity and actual purchases
- Most positive observation in last quarter before VAT increase
- Large negative observation in quarter of increase
Baseline Specification: Multinomial Logit

- Assume survey answer is random variable $y$
- Define the response probabilities as $P(y = t|X)$
- Assume the distribution of the response probabilities is

$$P(y = t|X) = \frac{e^{X\beta_t}}{1 + \sum_{z=1,2} e^{X\beta_z}},$$

- Estimate $\beta_t$ via maximum likelihood
- Marginal effect: derivative of $P(y = t|x)$ with respect to $x$
- Empirically: define “it’s neither good nor bad time” as baseline
Baseline Specification

Marginal Effects: \[
\frac{\partial P(y = t|x)}{\partial x} = P(y = t|x) \left[ \beta_{tx} - \sum_{z=0,1,2} P(y = z|x) \beta_{zx} \right]
\]

<table>
<thead>
<tr>
<th>Good time to buy</th>
</tr>
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<tbody>
<tr>
<td>Inflation Increase</td>
</tr>
<tr>
<td>6.24***</td>
</tr>
<tr>
<td>(1.62)</td>
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<tr>
<td>Past Inflation</td>
</tr>
<tr>
<td>-3.42***</td>
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<td>(0.28)</td>
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Households which expect inflation to increase

- **7%** more likely to answer “good time to purchase durables”

N. obs 326,011 321,496
Empirical Results

Demographics, Expectations, and Macro Aggregates

- HH characteristics shape purchasing propensities (age, income, ...)
  - Characteristics might be systematically related to inflation expectations

- Economic outlook can affect cross-sectional relationship
  - Optimistic households might expect high growth and low inflation

- Household might be bullish or bearish about the economy
  - w/ Philips curve in mind: answer high growth and high inflation
Control for **Demographics**, Outlook, and Macro–aggregates

Marginal Effects: 

\[
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<td><strong>Inflation increase</strong></td>
<td>7.55***</td>
<td>8.88***</td>
<td>8.75***</td>
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<td></td>
<td>(1.56)</td>
<td>(1.60)</td>
<td>(1.16)</td>
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Demographics | X         | X         | X         |
Individual expectations | X         | X         |           |
Macro Aggregates |                      |           | X         |
Nobs           | 244,497   | 219,799   | 219,799   |

8% more likely to answer “good time to purchase”
Control for **Demographics, Outlook, and Macro–aggregates**

Marginal Effects:

\[
\frac{\partial P(y = t|x)}{\partial x} = P(y = t|x) \left[ \beta_{tx} - \sum_{z=0,1,2} P(y = z|x) \beta_{zx} \right]
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<td>Individual expectations</td>
<td>X</td>
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<td>Macro Aggregates</td>
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<td>X</td>
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<tr>
<td>Pseudo R²</td>
<td>0.0292</td>
<td>0.0654</td>
<td>0.0762</td>
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- **Demographics** X X X
- **Individual expectations** X X
- **Macro Aggregates** X

**Nobs** 244,497 219,799 219,799

- **9%** more likely to answer “good time to purchase”
Household Heterogeneity

Effect of inflation expectations on willingness to spend higher for

- More educated households
- High income households
- Urban households
- Unconstrained households
VAT Experiment of 2007 I

- Pre-election 2005: promise not to increase VAT
- Nov 2005: new government announces increase in VAT by 3%
- Jan 2007: entry into force of VAT increase
- VAT increase legislated to consolidate budget
- Not related to prospective economic conditions
- Exogenous tax change acc to Romer and Romer nomenclature
VAT Experiment of 2007 II

- Inflation expectations build up during 2006

- Germany part of Euro zone and no independent monetary policy

- Nominal rate did not increase to offset inflation expectations

- Experiment resembles unconventional fiscal policy described in Correia, Fahri, Nicolini, Teles (2013)

- Feldstein (2002) proposition for Japan: Pre-announced VAT increases

- Stimulate inflation expectations & private spending
Forward Guidance Announcements by ECB I

- First announcement by former ECB President Draghi on 7/4/2013:

> “The Governing Council has taken the unprecedented step of giving forward guidance in a rather more specific way than it ever has done in the past. In my statement, I said “The Governing Council expects the key ...” - i.e. all interest rates - “... ECB interest rates to remain at present or lower levels for an extended period of time.” It is the first time that the Governing Council has said something like this.”

- “Firmly reiterate(d)” on 1/9/2014 which serves as second event date

- NK model: promises to keep rates at 0 until end of liquidity trap

- Inflationary in future $\rightarrow$ hence agents update expectations today
Empirical Results

Forward Guidance Announcements by ECB II

- Lack of credible? Professional forecasters revised expectations
  Andrade & Ferroni (2018)

- Lack of credibility more plausible for sophisticated agents: test in XS

- Forward guidance through financial markets?

- Households react to lower long-term rates and take out more loans?
  - Many households do not adjust propensity to take out loans to $\Delta r$
    D’Acunto, Hoang Paloviita, Weber (2020)
  - No delayed effect on durable purchases in data

- Odyssean vs Delphic Forward Guidance? Odyssean in our sample
  Andrade & Ferroni (2018)
Empirical Results

Difference-in-Differences Matching Estimator

- All Germans treated by VAT and Forward Guidance announcements
- Micro data for France, UK, Sweden from EU harmonized survey
- Match German & foreign households with nearest-neighbor algorithm
- Matching categories: gender, age, education, income, social status
- Estimate Average Treatment Effect of VAT shock:

\[
(\bar{Dur}_\text{German,post} - \bar{Dur}_\text{German,pre}) - (\bar{Dur}_\text{foreign,post} - \bar{Dur}_\text{foreign,pre})
\]
Parallel-Trends Identifying Assumption I

- Control group behaves similarly to Germans before VAT shock
- Behavior of control group after shock how Germans behaved absent of it
Parallel Trends Identifying Assumption II

- **Unconventional Fiscal Policy**
  - Germany
  - European Countries

- **Forward Guidance**
  - Germany
  - European Countries

Parallel trends in inflation expectations *before* the announcement.
Parallel-Trends Identifying Assumption III

Parallel trends in durable propensity before the announcement
Further Identifying Assumptions

- Balanced households’ characteristics after matching
- Treated and control households distributed across full distribution
- Positive effect of inflation expectations on consumption expenditure at micro level for all countries
Further Identifying Assumptions

- Balanced households’ characteristics after matching (√)

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Further Identifying Assumptions

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Empirical Results

Average Treatment Effect of VAT shock

\[(\bar{\text{Dur}}_{\text{German}, \text{post}} - \bar{\text{Dur}}_{\text{German}, \text{pre}}) - (\bar{\text{Dur}}_{\text{foreign}, \text{post}} - \bar{\text{Dur}}_{\text{foreign}, \text{pre}})\]

- German and foreign households behave similarly before shock
- Immediate increase of purchasing behavior of Germans after shock
- Effect builds up during 2006
- Reversion to normal after actual VAT increase
Empirical Results

Average Treatment Effect of Forward Guidance

\[
\left( \bar{Dur}_{\text{German, post}} - \bar{Dur}_{\text{German, pre}} \right) - \left( \bar{Dur}_{\text{foreign, post}} - \bar{Dur}_{\text{foreign, pre}} \right)
\]

- German and foreign households behave similarly before shock
- No impact reaction to either announcement
- No delayed reaction questions indirect effect through financial markets
Heterogeneity of VAT Shock: Sophistication & Demos

- Homogeneous effect across demographics and proxies for sophistication
Heterogeneity of VAT Shock: Financial Constraints

- Muted reaction for more constrained households
Heterogeneity of Fwd Guidance: Sophistication & Demos

- No immediate or delayed reactions across demographic splits
- Non-response for highly sophisticated questions lack of credibility as explanation
Heterogeneity of Fwd Guidance: Financial Constraints

- No heterogeneous response by fin constraints for forward guidance announcements
Empirical Results

Income Effects?

\[
(\overline{\text{Dur}}_{\text{German, post}} - \overline{\text{Dur}}_{\text{German, pre}}) - (\overline{\text{Dur}}_{\text{foreign, post}} - \overline{\text{Dur}}_{\text{foreign, pre}})
\]

- Perceptions of current income do not move around VAT announcements
- Income expectations don’t move either
- Questions relevance of indirect effects in HANK models for unconventional fiscal policy
Taking Stock

- Unconventional fiscal policy is salient, easy to understand
- Reaction across cuts of the data by income, education, age, etc
- But: low reaction to “complex” policies: e.g., *forward guidance puzzle*
- Do cognitive abilities limit the effectiveness of economic policies?

D’Acunto, Hoang, Paloviita, Weber (2020):

*Human Frictions to the Transmission of Economic Policies*

*IQ, Expectations, and Choice*
Conclusion

- Households expecting higher inflation want to purchase more durables
- Discretionary fiscal policy in recessions: series of pre-announced VAT increases and a simultaneous reduction in income tax rates
- Transmission of fwd guidance through household expectations muted
- Scope for increased economic literacy, policy transparency, & salience