How Do Households Respond to Inflation? An Investigation of Transmission Mechanisms

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Motivation

- In recent recessions, policymakers have considered using inflation expectations as a policy tool:

  With nominal short-term interest rates at ... their effective lower bound. ... [C]entral banks have sought additional ways to stimulate their economies, including adopting policies that are directly aimed at influencing expectations of ... inflation. -Janet Yellen

- Empirical evidence on the relationship between inflation expectations and consumption is mixed, and there is no systematic work on how people think about this relationship

- Understanding this relationship is important in the current high-inflation landscape. How would higher, unanchored inflation expectations affect current consumption decisions?

Our Contribution

- Conduct a novel survey to assess the relationship between inflation expectations and current consumption and investigate heterogeneity
- Disentangle the different mechanisms that guide households' consumption behavior in response to changes in inflation expectations and highlight heterogeneity (e.g., across demographics, durables vs nondurables, long-term vs short-term treatments)

  Mechanism Examples:
  - Intertemporal substitution from the consumption Euler equation (increase consumption)
  - Fixed budget plans (no change to consumption)
  - Sticky wages (decrease consumption)

Preliminary Results

- Most households do not change their current consumption plans despite changes to future expected inflation
- Leading mechanisms include fixed budget plans, and that future inflation does not affect current decision making
- For the minority who would decrease their spending, many say this is because their wages won't keep up and the real value of their savings will deteriorate
- For the very small minority who would increase their spending, stockpiling and intertemporal substitution are main channels
- *Much more to come...*

Literature

- Survey-based research on consumption response to changes in inflation expectations: results are mixed and highlight heterogeneity
    - Bachmann et al. (2015), Duca-Radu et al. (2021), Coibion et al. (2021), D'Acunto et al. (2019)
- Inflation narratives: consumers dislike inflation and disagree about the causes of it
    - Shiller (1996), Kamdar (2019), Andre et al. (2021)
- Subjective models of the macroeconomy: beliefs about inflation and unemployment are widely dispersed following hypothetical economic shocks
    - Andre et al. (2022)

General Survey Design

Pre-Treatment Module

- Inflation expectations for 3 months, 1 year, and 10 year horizons
- 'Priors': household income growth, fed funds, financial situation predictability, spending on durable or nondurables

Treatment Module

- Treatment - increase 1-year or 10-year inflation expectations by 3pp

Post-Treatment Module

- 'Posteriors': household income growth, fed funds, financial situation predictability, change in economic outlook, spending on durable or nondurables
- Mechanism solicitation for the reasons behind their consumption responses (3 approaches): open-text box, yes/no, and numerical

Cognitive Ability and Demographics Module

4 Total Treatments

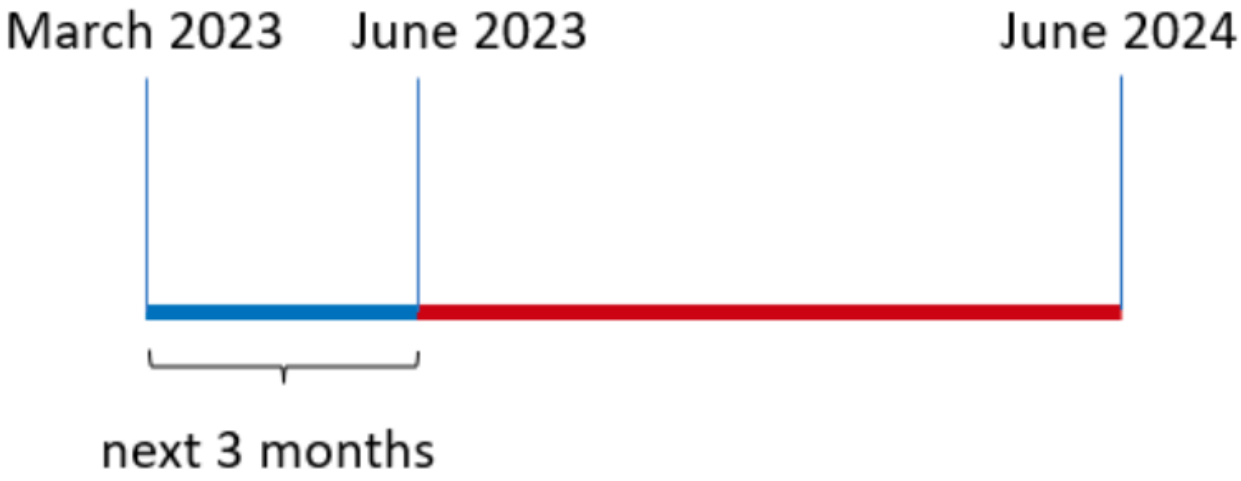
SD: Short Term (1 Year), Durables Increase inflation expectations for the *1-year period* after the next 3 months by 3 percentage points, and assess the effects on *durable* goods consumption

SN: Short Term (1 Year), Nondurables Increase inflation expectations for the *1-year period* after the next 3 months by 3 percentage points, and assess the effects on *nondurable goods and services* consumption

LD: Long Term (10 Years), Durables Increase average annual inflation expectations for the *10-year* period after the next 3 months by 3 percentage points, and assess the effects on durable goods consumption

LN: Long Term (10 Years), Nondurables Increase average annual inflation expectations for the *10-year* period after the next 3 months by 3 percentage points, and assess the effects on *nondurable goods and services* consumption

Short-Run Treatments Example: Timing



- We use timelines throughout our survey for clarity
- Blue font to refers to the next 3 months and red font indicates the 1-year period (or 10-year period), starting 3 months from now
- We elicit consumption over the next 3 months
- The shock, priors, and posteriors are elicited over the 1- or 10-year horizon

'Prior' Consumption Plans

Recall: by ***household*** we mean everyone who usually lives in your primary residence (including yourself), excluding those as non-relatives (e.g., roommates and renters).

Nondurable goods and services include for instance food, tobacco, alcohol, gasoline, clothing, haircuts, transportation, and other small services and nondurable goods that do not last in time.

The purchases of nondurable goods and services could vary from month to month. While answering the next two questions, please think about your household's **average monthly** spending.

Now **looking ahead**, what do you think your household's average monthly spending on nondurable goods and services will be over the next 3 months from March 2023 to June 2023?

Please enter a number in dollars ($) greater than or equal to 0.

Monthly spending on nondurable goods and services (in $)

Short-Term Treatment Wording I

Now, imagine that you have received some information about future prices from a reliable source that you trust. In response to this new information, you update your expectations on prices as follows:

*(1) Over the next 3 months from March 2023 to June 2023, you expect the percentage change in prices to be 2% (this is the **same** as your initial expectation).*

*(2) Over the 12-month period from June 2023 to June 2024, you expect the percentage change in prices to be 8% (this is **3% higher** than your initial expectation).*

*(3) Over the 10-year period from June 2023 to June 2033, you expect the percentage change in prices per year on average to be 3% (this is the **same** as your initial expectation).*

Short-Term Treatment Wording II

The table below summarizes your initial expectations and updated expectations on future prices.

Expectations on changes in future prices	Over the next 3 months March 2023 to June 2023	Over the 12-month period June 2023 - June 2024	Over the 10-year period June 2023 - June 2033
Initial	*2%*	5%	3% per year
Updated	***2%***	***8%***	**3% per year**

Note: expected inflation over the next 3 months was fixed to the household's prior to avoid mechanical increases in spending

Posterior Consumption Plans

We ask a series of questions to solicit the household's change in consumption plans in the next three months:

- In response to the change in your expectations, would you change the amount or type of spending you plan to do over the next three months?
- If so, would you plan to change the dollar amount?
- If so, would you increase or decrease your consumption?

Examples of Mechanisms I

Decrease:

- **Saver's Wealth Effect:** "As prices will rise even more after the next 3 months, my existing savings over this period won't be worth as much. So, I will buy less durable goods over the next 3 months."
- **Uncertainty:** "As prices will rise even more after the next 3 months, my household will face higher financial uncertainty over this period. So, I will buy less durable goods over the next 3 months."

No Change:

- **Liquidity Constraints:** "I don't have money and cannot borrow to increase my spending over the next 3 months."
- **Fixed Budget:** "I have a fixed budget plan and stick with it."

Examples of Mechanisms II

Increase:

- **Intertemporal Substitution**: "As prices will rise even more after the next 3 months, the return on savings won't be worth as much after the next 3 months, thus saving over the next 3 months becomes less attractive. So, I will buy more durable goods over the next 3 months."
- **Stockpiling**: "As prices will rise even more after the next 3 months, I will buy more durable goods over the next 3 months before prices go up even more."

Survey

- Conducted using Dynata in late February through March 2023
- Online consumer survey, age 18 and over
- Representative sample across age, gender, race, and census region
- Median completion time of 19 minutes
- Approximately 570 responses for each of the treatments
- Respondents could not take more than one of our surveys
- Analyses that follow includes everyone that finished the survey

Representative Sample

	(1) SD	(2) SN	(3) LD	(4) LN	(5) U.S. Pop.
Age	58.51	59.20	56.64	56.98	52.16
White	0.78	0.90	0.87	0.88	0.78
Female	0.45	0.52	0.52	0.50	0.55
Has at Least a 4-Year College Degree	0.50	0.54	0.52	0.52	0.44
Married	0.62	0.64	0.61	0.65	0.43
Household Income less than 50k	0.32	0.37	0.42	0.37	0.40
Household Income 50k to 100k	0.39	0.33	0.32	0.30	0.36
Household Income 100k+	0.27	0.29	0.26	0.33	0.25
Northeast	0.18	0.24	0.22	0.21	0.15
Midwest	0.18	0.21	0.22	0.25	0.25
South	0.43	0.39	0.40	0.38	0.37
West	0.20	0.15	0.16	0.16	0.23
N	560	569	568	585	

Results: How Do Individuals Adjust Consumption?

Takeaway: Regardless of treatment, the majority of people say their spending over the next 3 months will be unchanged if their future inflation expectations rise

Percent of Households with Each Consumption Response By Treatment

	(1) SD	(2) SN	(3) LD	(4) LN
No Change	73	62	63	64
Same Spending Different Bundle	7	10	11	14
Increase	5	6	6	5
Decrease	15	21	20	17
N	560	569	568	585

Results: How Do Individuals Adjust Consumption?

Takeaway: In the short durable treatment, households are significantly more likely to not change their consumption relative to other treatments

Percent of Households with Each Consumption Response By Treatment

	(1) SD	(2) SN	(3) LD	(4) LN
No Change	73	62	63	64
Same Spending Different Bundle	7	10	11	14
Increase	5	6	6	5
Decrease	15	21	20	17
N	560	569	568	585

Mechanisms: Open-Text Box

We have not yet analyzed the open-text answers. However, some responses are thoughtful and can easily be mapped into a mechanism:

- "Am on a fixed income so my spending has to pretty much stay the same."
- "Having a budget and sticking to that budget"
- "If prices will go up it makes more sense to buy long-lasting items sooner than later."
- "To cut back on my spending in order to save up for future preference and plan ahead in case of economic situation"
- "Since the price of goods is increasing at a higher rate than I anticipated & my income will not keep pace with that increase in must decrease what I am spending."

Results: Mechanisms - No Change

Takeaway: Of the majority of households that decide not to change their consumption whatsoever, most say they have a fixed budget plan or future inflation does not affect their current spending plans

Households that Select Each Mechanism
As a Percent of 'No Change' Households

	(1) SD	(2) SN	(3) LD	(4) LN
Fixed Budget	60	63	71	61
No Effect	65	69	69	65
Liquidity Constraint	39	38	49	37
Real Income Unchanged	10	13	15	12
N	407	355	357	377

Results: Mechanisms - Decrease

Takeaway: Of the households that decrease their consumption plans, they most often say it is because of the wealth effect and wages that won't keep up

Households that Select Each Mechanism
As a Percent of 'Decrease' Households

	(1) SD	(2) SN	(3) LD	(4) LN
Savers Wealth Effect	86	93	90	94
Rigid Wages	62	72	56	62
Variable Debt	31	31	32	34
Inflation Hedge	60	52	54	53
Uncertainty	27	37	38	39
Debtors Wealth Effect (reverse)	10	17	12	11
N	84	120	111	98

Results: Mechanisms - Increase

Takeaway: Of the minority of households that increase spending, they most often say it is due to intertemporal substitution or stockpiling

Households that Select Each Mechanism
As a Percent of 'Increase' Households

	(1) SD	(2) SN	(3) LD	(4) LN
Intertemporal Substitution	63	33	56	52
Stockpiling	63	50	58	55
Debtors Wealth Effect	27	11	25	21
Flexible Wages	7	3	22	14
Nominal Illusion	30	11	8	17
Uncertainty (reverse)	7	0	8	7
Variable Debt (reverse)	3	0	0	3
N	30	36	36	29

Results: Mechanisms - Increase

Takeaway: Those who increase their consumption, are more likely in the durable treatments to be driven by stockpiling and intertemporal substitution

Households that Select Each Mechanism
As a Percent of 'Increase' Households

	(1) SD	(2) SN	(3) LD	(4) LN
Intertemporal Substitution	63	33	56	52
Stockpiling	63	50	58	55
Debtors Wealth Effect	27	11	25	21
Flexible Wages	7	3	22	14
Nominal Illusion	30	11	8	17
Uncertainty (reverse)	7	0	8	7
Variable Debt (reverse)	3	0	0	3
N	30	36	36	29

Results: Intensive Margin

Takeaway: Conditional on adjusting consumption (increase or decrease), the duration of the shock does not significantly impact the size of consumption adjustments

Consumption Change by Subset

	(1) D, Increase	(2) N, Increase	(3) D, Decrease	(4) N, Decrease
Long Treatment	-203.0	-249.6	-55.12	-15.26
	(163.2)	(321.3)	(51.26)	(66.13)
N	66	65	196	218

Next Steps

- Qualifications
- Analyze open-text boxes and assess if they are consistent with the mechanisms people select
- We have quantitative measures of how much each mechanism informs an individuals' thought process
- Investigate heterogeneity (cognitive ability, age, savings, etc):
  - What predicts the sign and magnitude of the consumption change?
  - What predicts the mechanisms that people select?

Conclusion

- The majority of households do not change their consumption in response to a change in inflation expectations
- Households are more likely to decrease their consumption than they are to increase their consumption in anticipation of future inflation (in contrast to the consumption Euler equation)
- Households are more likely to intertemporally substitute or stockpile durables than nondurables
- The duration of the shock does not affect the magnitude of the consumption response