

Discussion of “The Devil is in the Tail: Macroeconomic Tail Risk Expectations of Firms”

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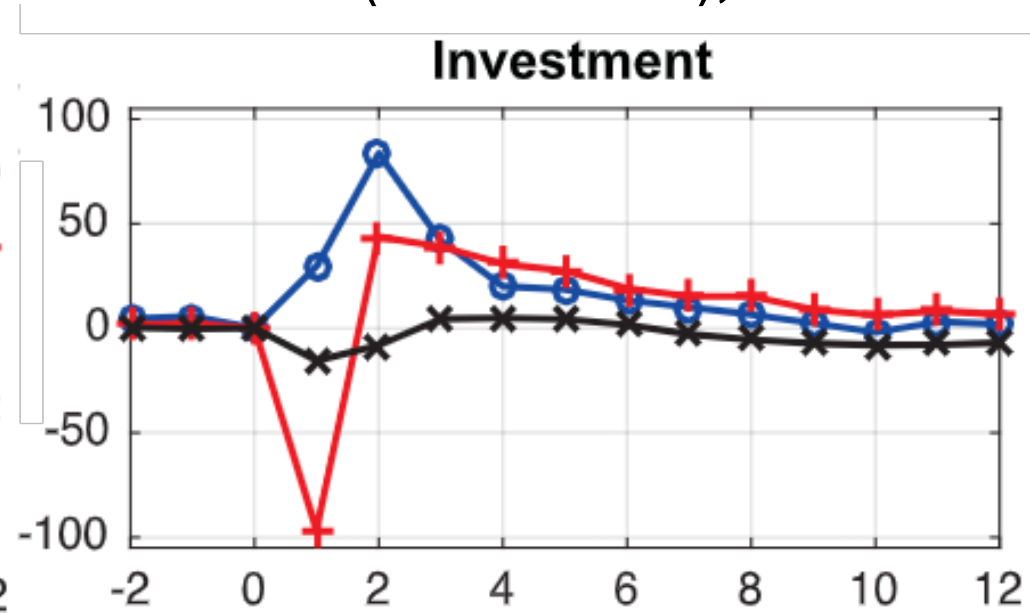
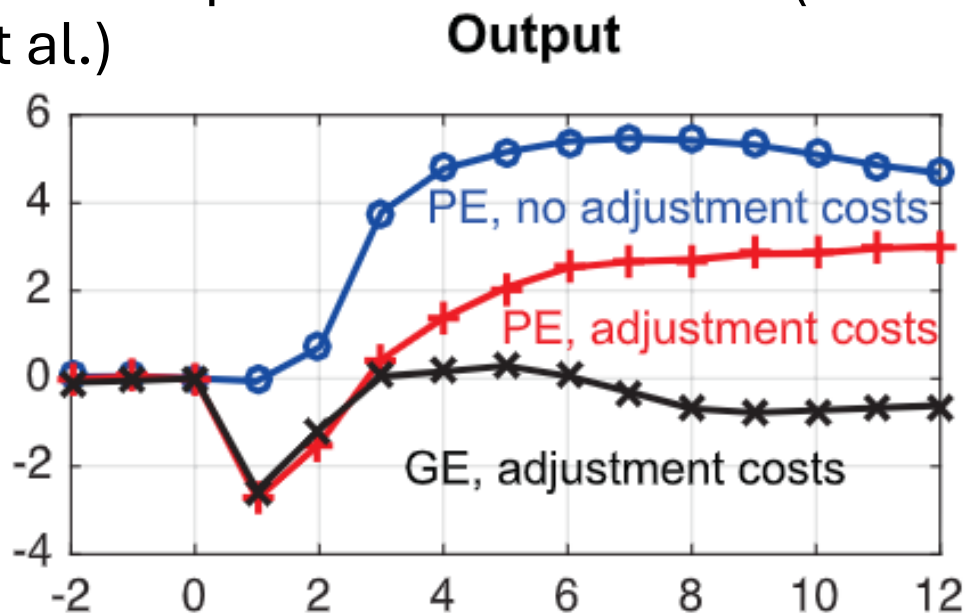
Overview

- Large literature on effects of uncertainty on the economy
 - Firms: various mechanisms for uncertainty reducing investment
 - Non-convex adjustment costs (fixed costs, irreversibility)
 - Concave decision rules
 - Financial frictions (bankruptcy costs act as a tax on capital)
 - Robustness concerns (this paper)
 - Households: precautionary behavior reduces demand
 - Some work driven by *dispersion*
 - Think of a shock $\sigma_t \varepsilon_{t+1}$. σ_t^2 is uncertainty, $(\sigma_t \varepsilon_{t+1})^2$ is realized volatility
 - Ilut, Kehrig, and Schneider (JPE 2018) concave decision rules in employment
 - Baqaee and Farhi (QJE 2019), Dew-Becker (ECMA 2023) complementarity in networks

	Δ Unemployment	
$\sigma_{\varepsilon,t-1}$	0.22	-0.00
	[0.06,0.38]	[-0.24,0.24]
RD_{t-1}^{ret}		0.23
		[-0.03,0.49]

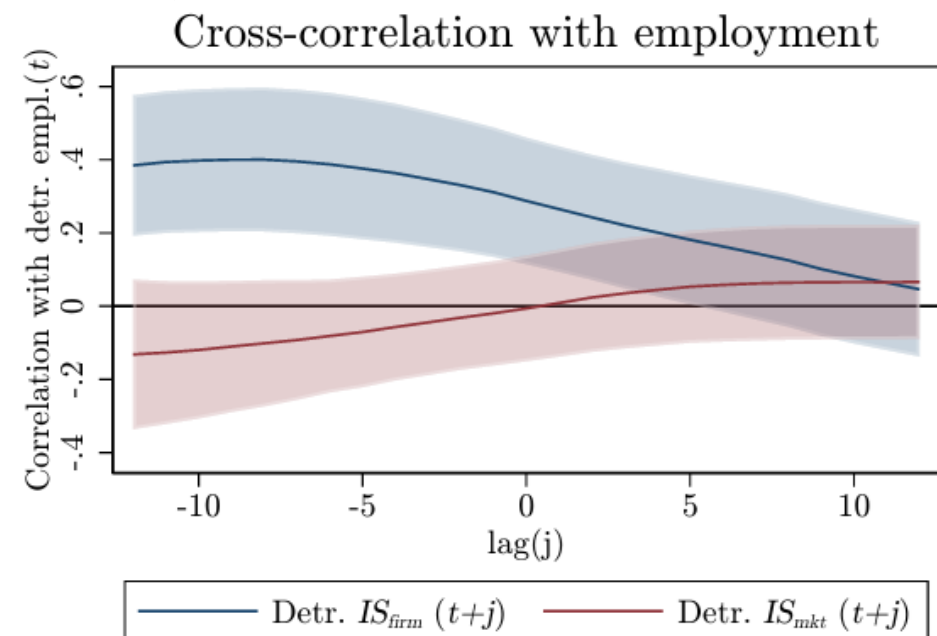
Overview

- Note: in many cases, uncertainty is *expansionary*
 - Investment: Oi-Hartmann-Abel effect
 - Volatility in complementary input prices (e.g. wages, materials) raises expected MPK
 - Quantitatively important in Bloom et al. (ECMA 2018)
 - Networks: when inputs are substitutes, use the cheapest one for production
 - Consumption: A force reducing expected MPK reduces interest rates, making consumption more attractive (Khan and Thomas (ECMA 2008), Bloom et al.)



Overview

- We also don't know the right measure of uncertainty
 - Why do we look at the variance? Makes sense in a Taylor series, but less appropriate with nonconvexities
 - Even harder with ambiguity – what are people/firms ambiguous over?
 - What is the right definition of tail risk? Third moment? Quantiles?
 - Aggregate or idiosyncratic?
- Summary: open question what uncertainty does, and even the right way to measure it



This paper

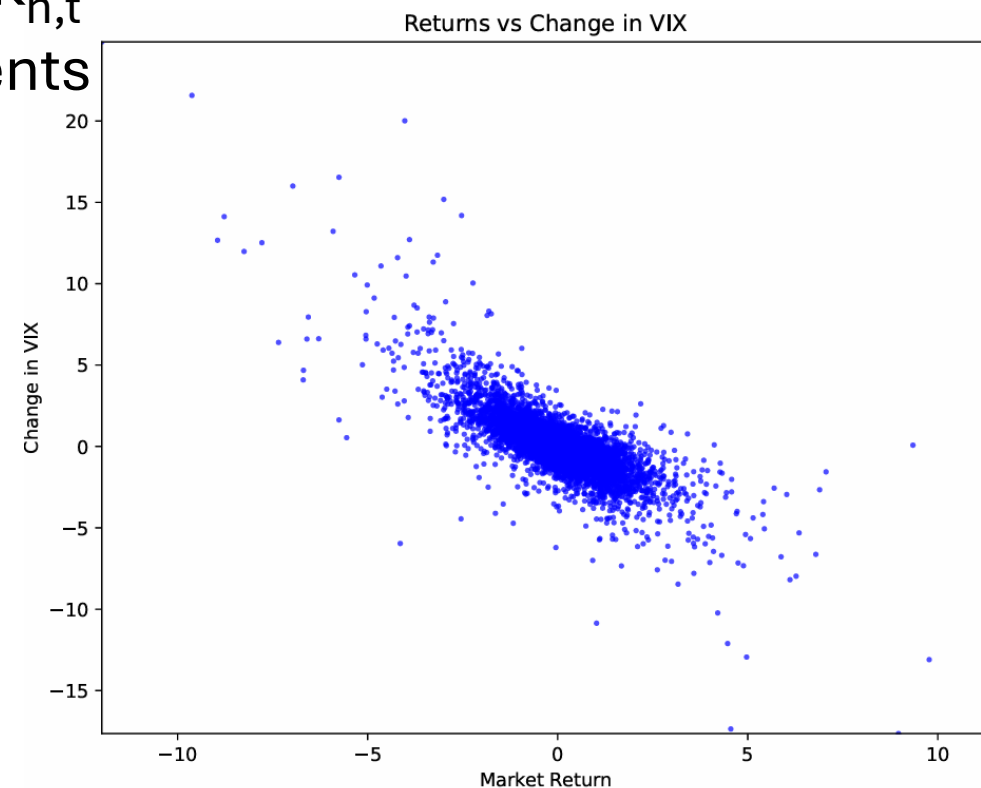
1. Measures manager beliefs about tail event probabilities
2. Shows higher tail probabilities associated with lower investment plans
 - Even after controlling for “expectations” and “uncertainty”
 - Directly helps answer the questions above!
3. Develops a model with ambiguity aversion to match the data

How to think about variation in beliefs?

- One perspective: just measure the subjective distribution, regress outcomes on its features
 - But how much independent variation is there?
 - Dist. is a continuous function, but does it have infinite degrees of freedom?
- Alternative view: beliefs arise from a learning process. Puts constraints on joint behavior of moments of beliefs

Dew-Becker, Giglio, and Molavi (2025)

- Suppose there is a latent state x_t following some arbitrary dynamic process
- Agents observe a continuous Gaussian signal process dy_t with precision σ^{-2}
- Denote the n 'th conditional *cumulant* by $k_{n,t}$
 - First three cumulants equal first three moments
- Then: $dk_{n,t}/dy_t = k_{n+1,t}\sigma^{-2}$



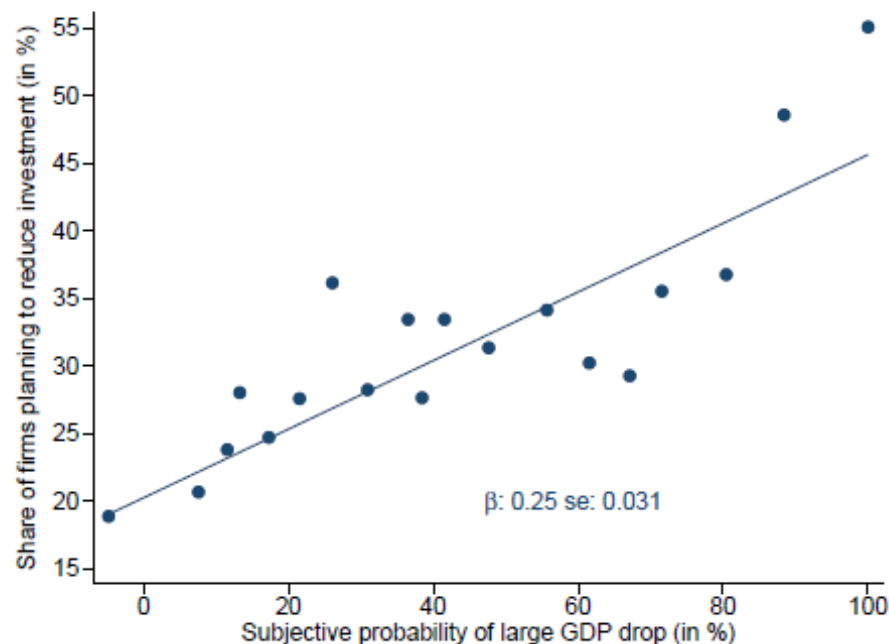
Dew-Becker, Giglio, and Molavi (2025)

- $dk_{n,t}/dy_t = k_{n+1,t}\sigma^{-2}$
 - Sensitivity of mean to news proportional to variance
 - Sensitivity of variance proportional to third moment
 - ...
- Can have very rich dynamics for all moments of beliefs, but all beliefs conditionally perfectly correlated
 - Note that the moments are not *unconditionally* perfectly correlated
- Does this matter? Depends on the goal
 - For unconditional relationships, no
 - But conditionally – e.g. for IRFs – yes. It means there are no independent shocks to individual moments
 - Any third-moment shock is a shock to all moments simultaneously

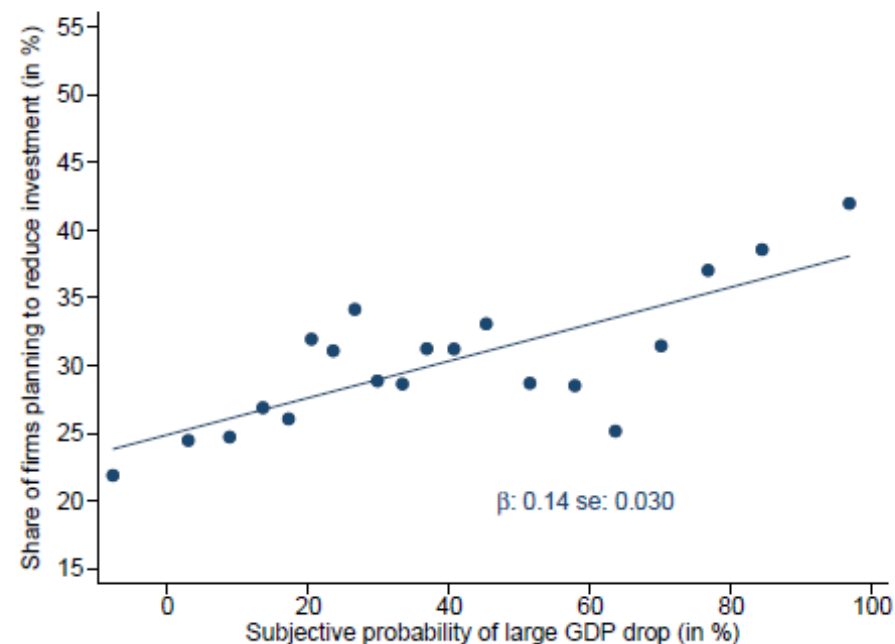
The paper's results

- #1: higher subjective probability of tail event (>5% GDP drop) => higher probability of reducing investment
 - Even after conditioning on expectations and uncertainty

(a) Raw relation in the cross-section
(no controls)



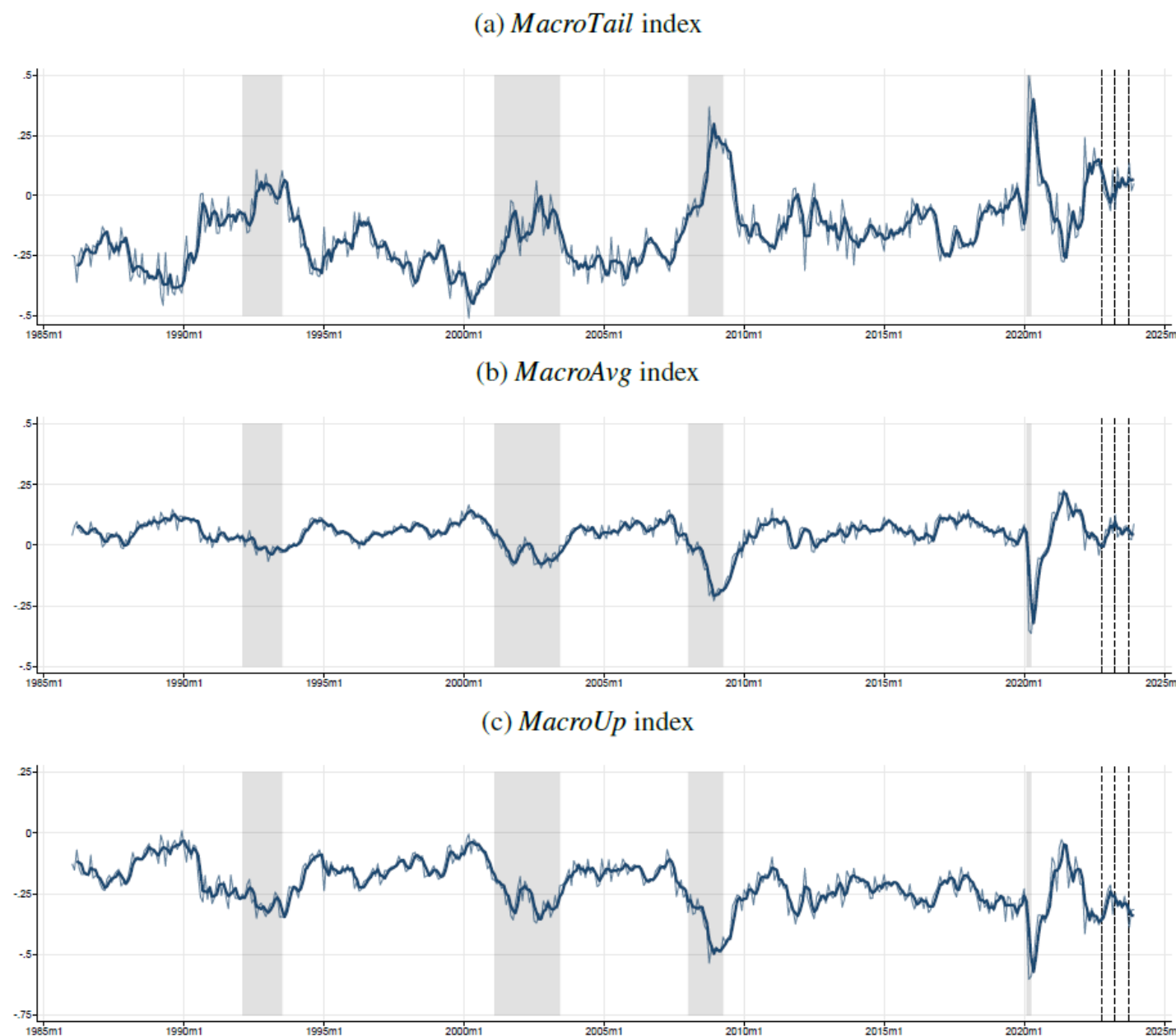
(b) Conditioned on business expectations and uncertainty



The paper's results

- #3a: Measure tail risk by asking GPT what it thinks of the news
 - Note that these are very strongly correlated (72–85%)
 - Would help to see residuals from a regression of *MacroTail* on *MacroAvg* – what is the independent variation?

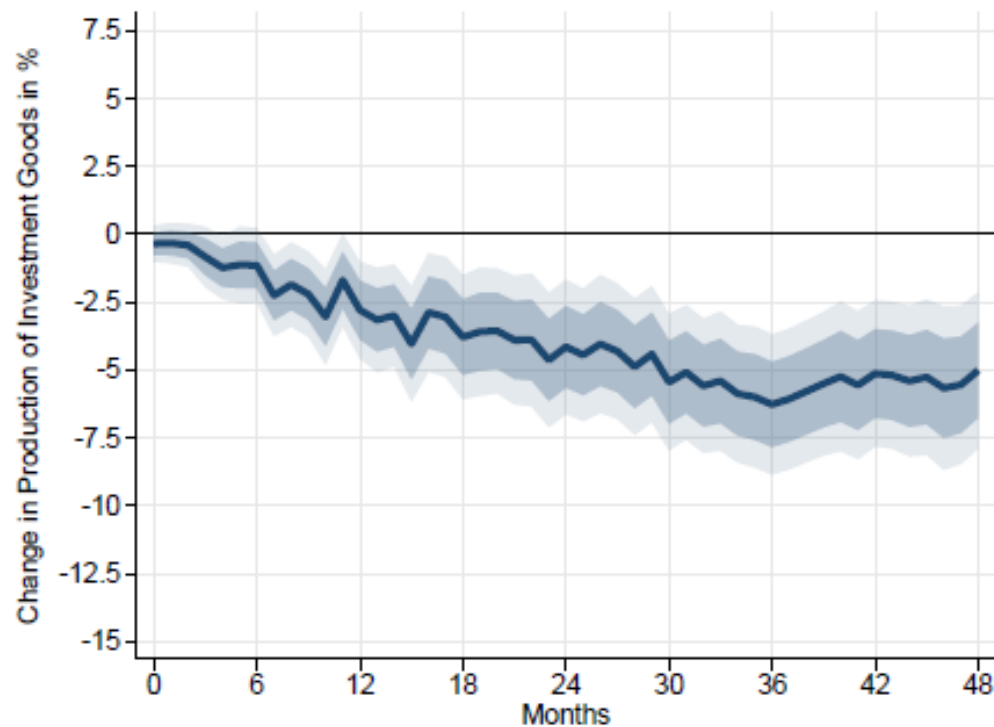
Figure 9: Macroeconomic beliefs over time based on newspaper data



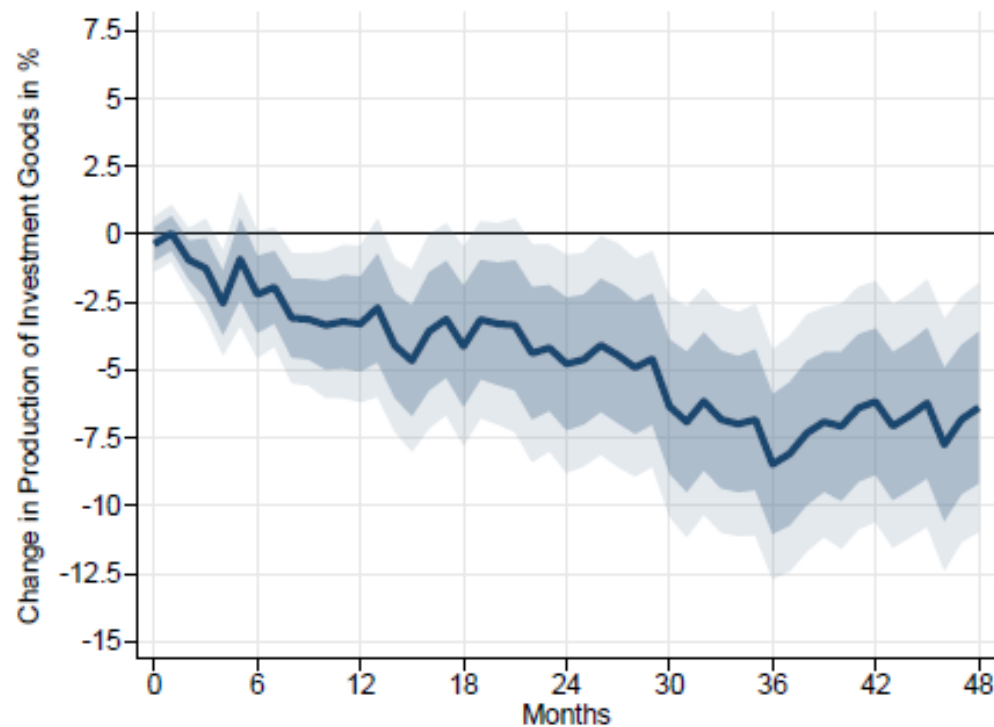
The paper's results

- #3b: high tail risk predicts decline in the production of investment goods

(a) Ctrl for avg. macro forecasts
(*MacroAvg*)



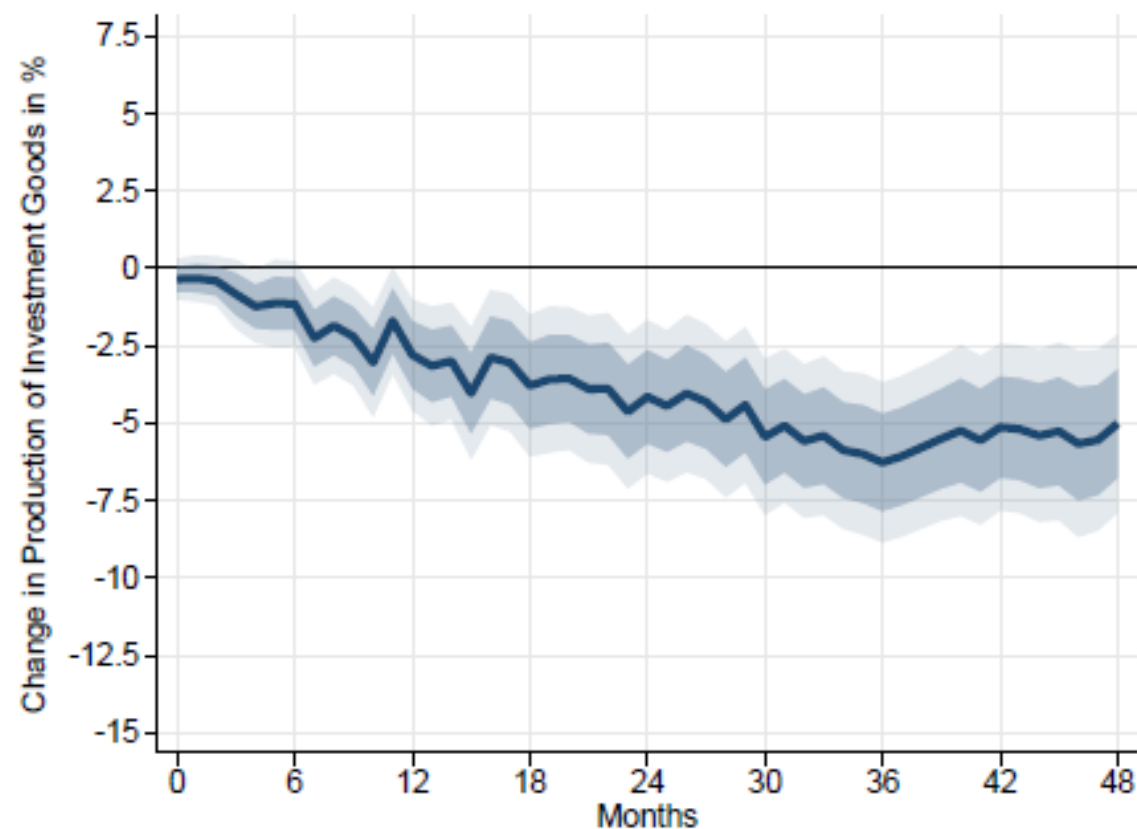
(b) Ctrl for avg. macro forecasts and macro upside risk expectations (*MacroAvg* and *MacroUp*)



The paper's results

- This is a *very* large effect
- Comments:
 - “Production of investment goods” is not investment
 - This is not an identified VAR, and there are few controls – don’t think of this as a response to a shock
 - This says: when news historically looked more extreme for the tail than the average, investment subsequently fell

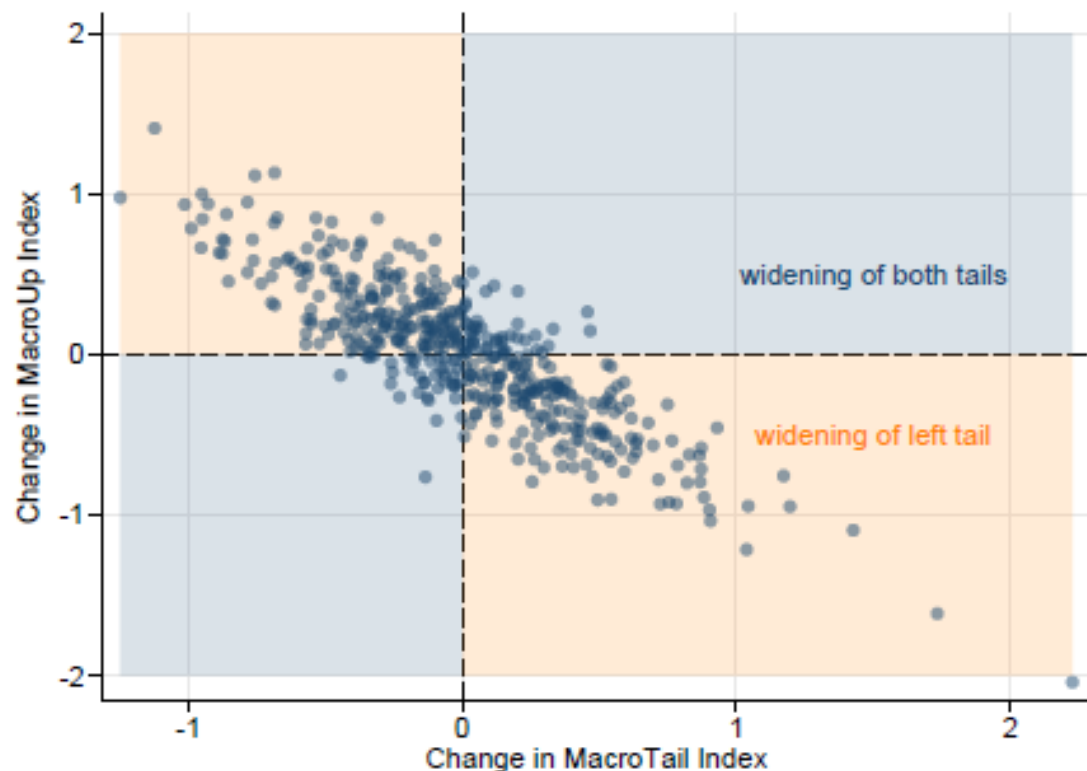
(a) Ctrl for avg. macro forecasts
(*MacroAvg*)



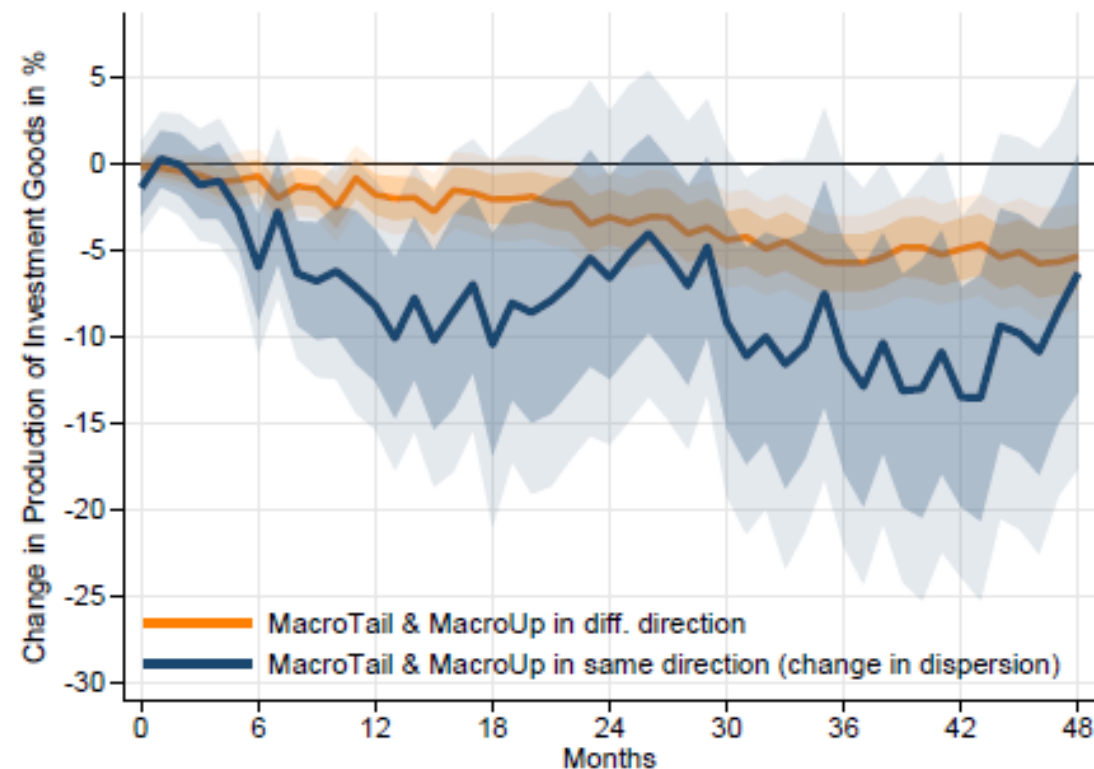
The paper's results

- Note the paper addresses the correlation issue:

(a) Relation of changes in the tails:
 $\Delta MacroTail$ and $\Delta MacroUp$

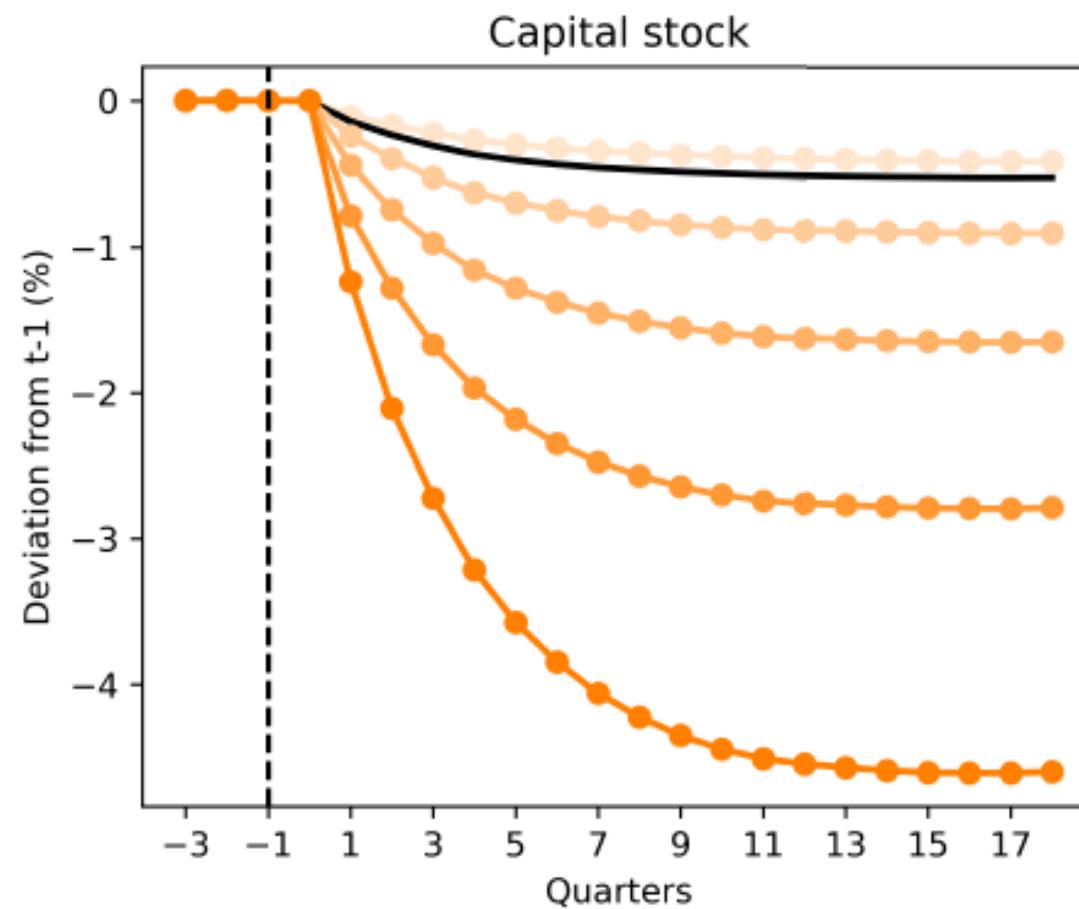
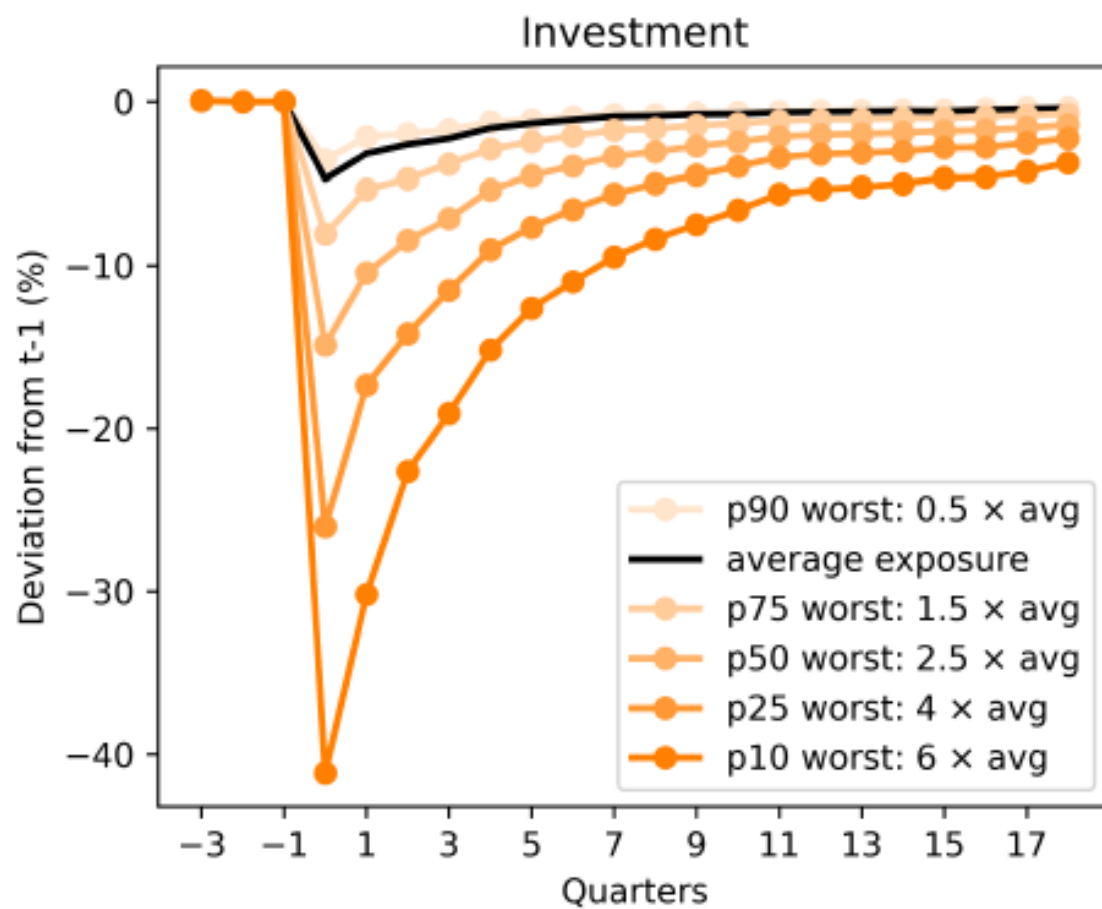


(b) Split effect of *MacroTail*
by co-movement with *MacroUp*



The paper's results

- #4: model of (physical) investment under ambiguity



Are people ambiguity averse?

- Far from 100% of people appear to be ambiguity averse
- Evidence from three papers:

Panel A: Ambiguity Attitudes (proportion of respondents for each question)

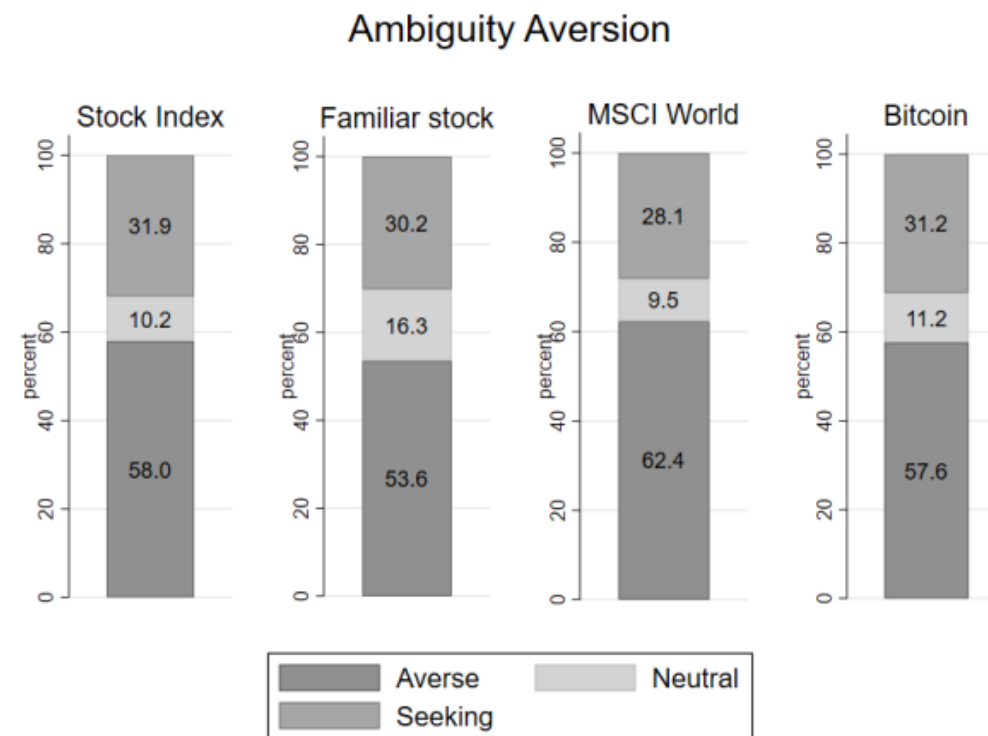
Ambiguity Question:	10%	50%	90%
Ambiguity Averse	0.19	0.51	0.56
Ambiguity Neutral	0.23	0.12	0.16
Ambiguity Seeking	0.58	0.37	0.29

A-neutral prob. p	0.10	0.50	0.90
Ambiguity Averse	33.5%	68.3	53.2
Ambiguity Seeking	49.4%	22.1	35.3
Ambiguity Neutral	17.1%	9.6	11.6

- When I do this with MBAs informally, I usually get about 1/3 each ambiguity averse, neutral, and seeking

Figure 3: Ambiguity Attitudes toward Financial Sources (Averse, Neutral and Seeking)

This Figure shows the percent of investors who are ambiguity averse (b -index > 0 , significant at 5%), ambiguity neutral (cannot reject b -index = 0), and ambiguity seeking (b -index < 0 , significant at 5%) for the local stock market index (b_{aex}), a familiar company stock (b_{stock}), the MSCI World stock index (b_{msci}), and Bitcoin ($b_{bitcoin}$). The sample consists of $n = 295$ investors.



Summary

- This paper covers a huge amount of ground:
 - Runs a survey, estimates tail risk perceptions, correlates them with investment expectations, asks about hypotheticals, uses GPT to measure risk, develops an ambiguity aversion model, analyzes policy
- All of this is important, and these questions are unsettled, both theoretically and empirically – there is lots of room for the paper’s contributions!
- I’m interested in *where beliefs come from* and what that implies
 - The variation isn’t exogenous and independent
 - How do we think about the dependence among moments?