When is Growth at Risk?

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Spring 2020 Brookings Panel on Economic Activity

Zoom, 19 March 2020

Background

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► **Empirical implication**: **financial variables** may be helpful for predicting moments other than the mean and **signal risks for growth**

The Economic Impact of COVID-19

Predictive distributions of GDP growth using financial and real information

Predictive Distributions for 2020 Q1
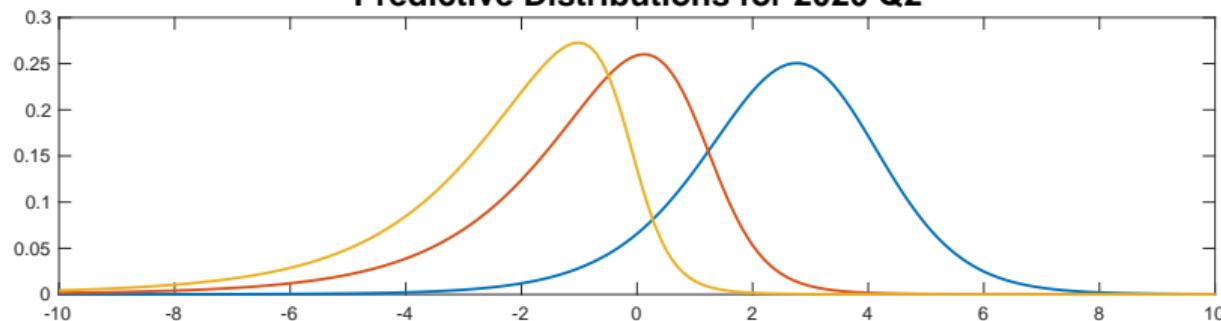
Legend:
- 2/29/2020
- 3/9/2020
- 3/16/2020

Predictive Distributions for 2020 Q2

Research Questions

This paper investigates **two questions**:

1. Are data **sufficiently informative** to predict and estimate the dynamics of **variance, skewness, fat tails** of the conditional GDP growth distribution?

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This paper investigates **two questions**:

1. Are data **sufficiently informative** to predict and estimate the dynamics of **variance, skewness, fat tails** of the conditional GDP growth distribution?
2. Do financial variables contain **advance information** for higher moments of the predictive distribution of GDP growth?

Contributions:

- ▶ Disentangle **financial specific information** from information that is **contemporaneous and common** to macro and financial variables
- ▶ We asses **uncertainty** in different forms:
  - ▶ Out-of-sample at one and four quarters
  - ▶ In sample uncertainty in estimation of moments
  - ▶ Data uncertainty – real time and calendar

Step 1: Detecting Financial-Specific Information

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$\Rightarrow$ <u>Results</u>

1. **Global** factor and **non-financial** factor are **almost identical**

2. The orthogonal financial factor could potentially capture some **leading information**

Global, Financial and Real Factors
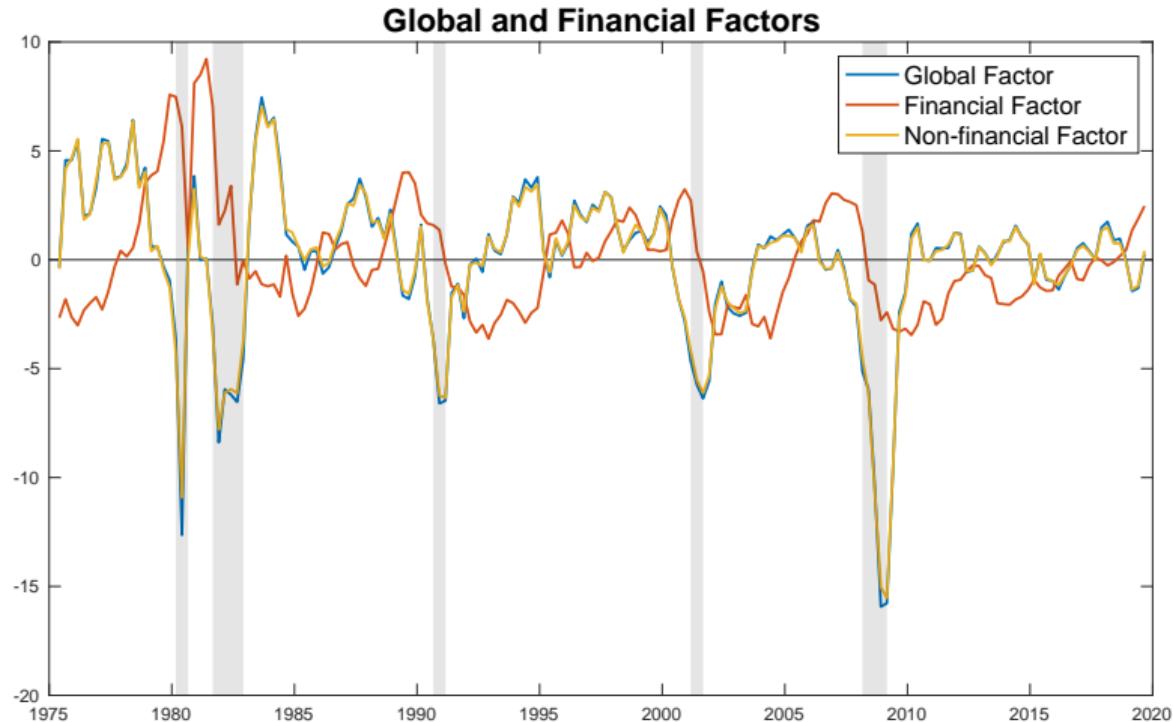
Global and Financial Factors

Step 2: Out-of-Sample Analysis and Nowcasting in Real Time

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1. The global factor helps predict the mean – no additional predictive power from the financial factor
2. Higher moments difficult to predict
3. Limited predictability at the nowcasting horizon for the mean

Forecasting the GDP Distribution of the Great Recession

One quarter ahead
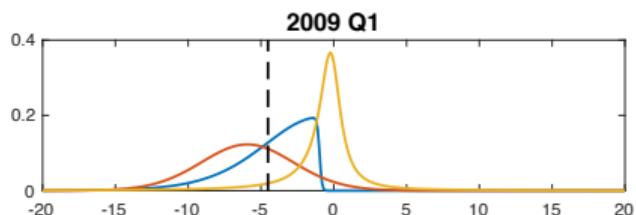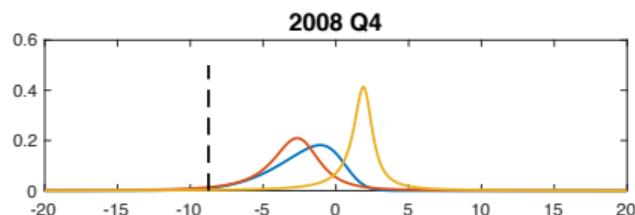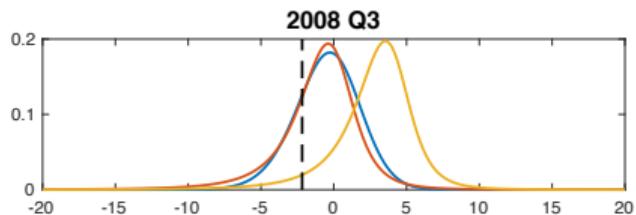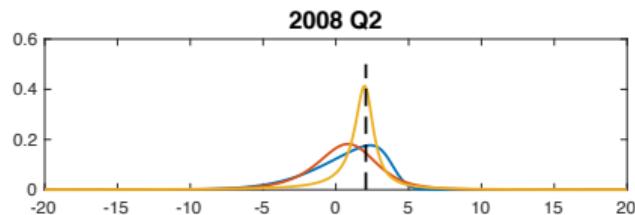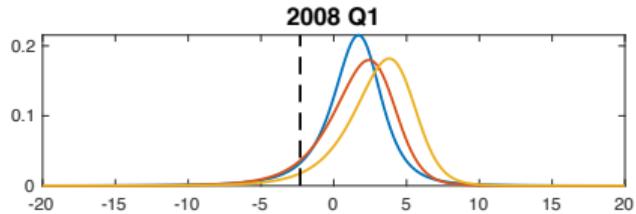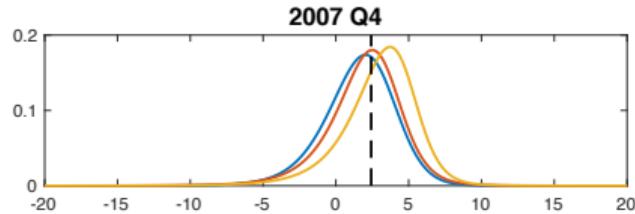
Global factor, Financial factor, and GDP — Global factor and GDP — GDP only

Nowcasting in Real-Time: RMSFE and Predictive Score
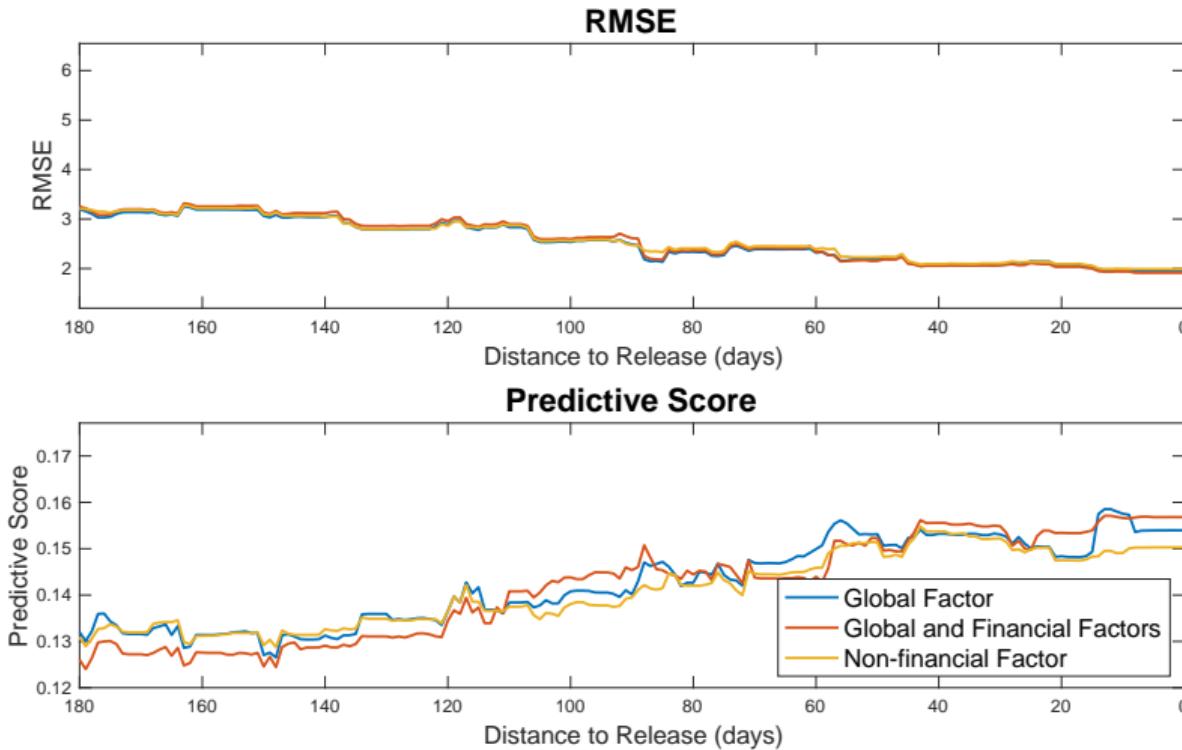
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⇒ Results:

1. The **global factor** helps predict the **mean** – **no** additional **predictive power** from the **financial factor**
2. **Variance and mean** are **negatively correlated** via the global factor
3. Financial-specific information has a small, positive association with the variance of the predictive distribution
4. But the effects on the **variance** and **skewness** are **imprecisely estimated**

Posterior Distribution of Moment Coefficients

Posterior distributions
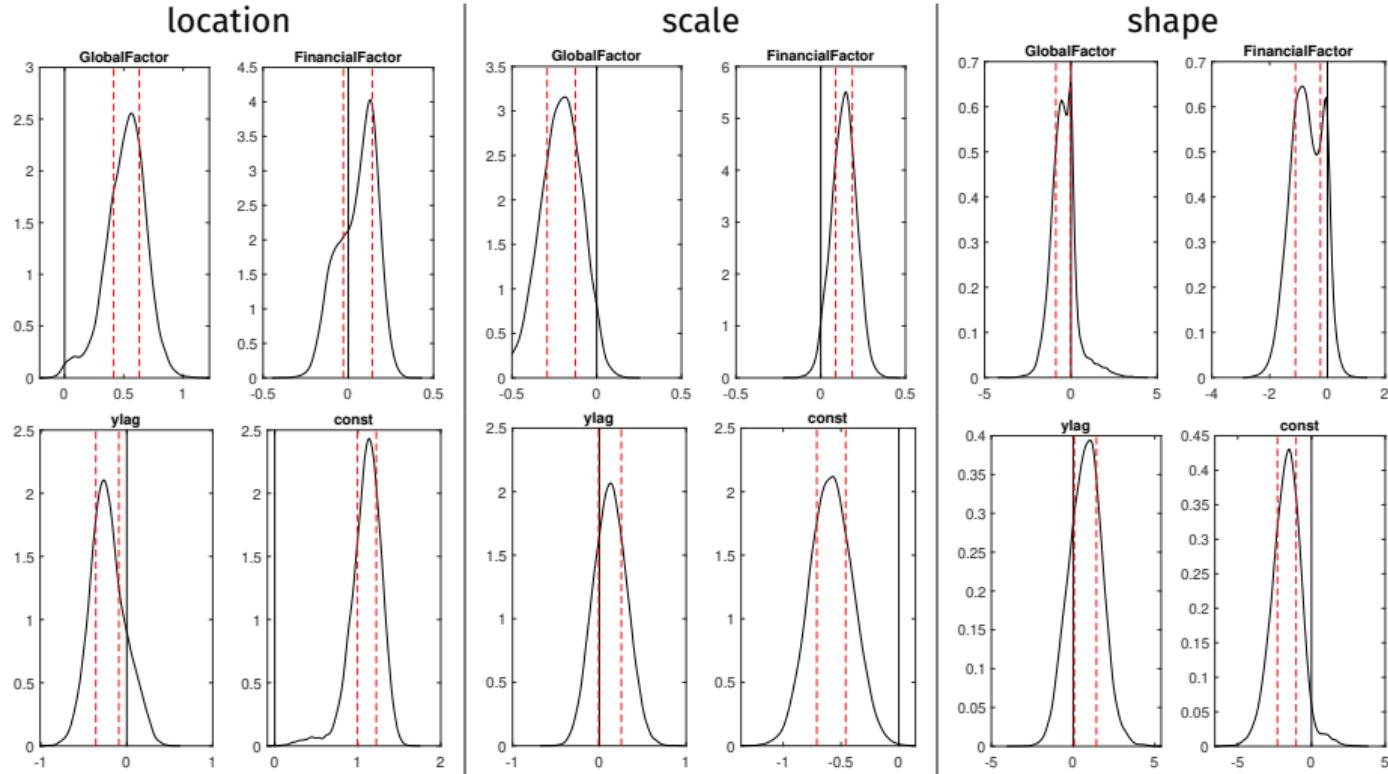
Dynamics of Estimated Moments

Global & Financial Factor
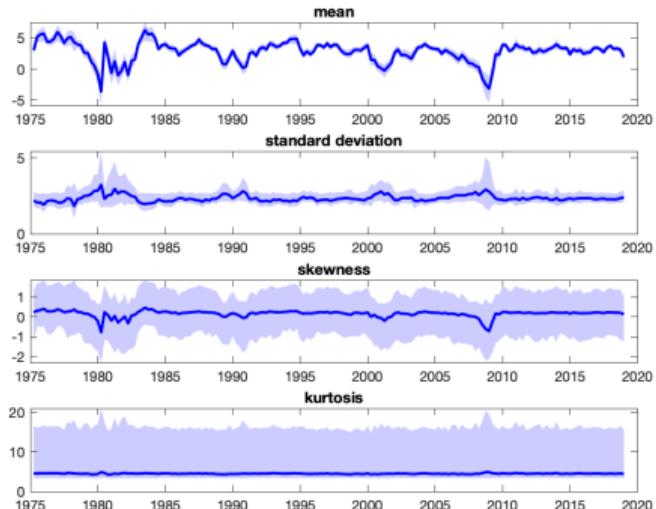
Only Global Factor
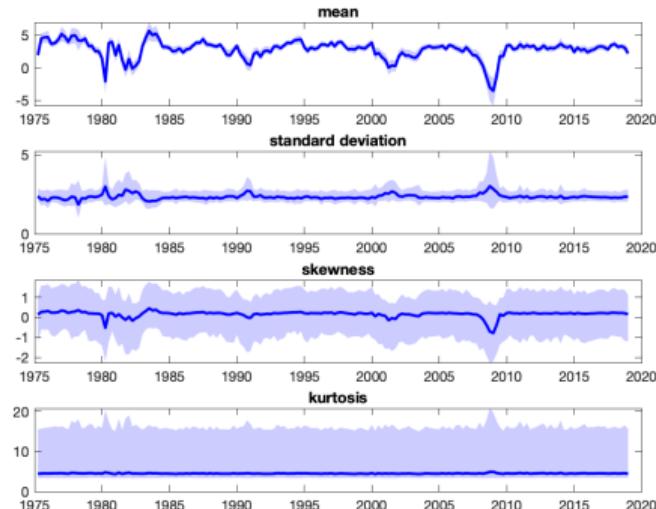
Step 4: Contribution of Individual Variables

Objectives

▶ Evaluate whether we can **identify** some **key individual financial predictors**

$\Rightarrow$ Method and data

▶ Bayesian parametric model (as in Step 3) but combined with a variable selection algorithm
▶ Data: quarterly US and 12 other OECD countries

$\Rightarrow$ Results:

1. For the US, **few real and financial variables** have **predictive power** for the mean
2. Very limited predictability for higher moments
3. **No variables robustly predict** any **moment** across more than a handful of the 13 countries

US: Predictors of the Mean
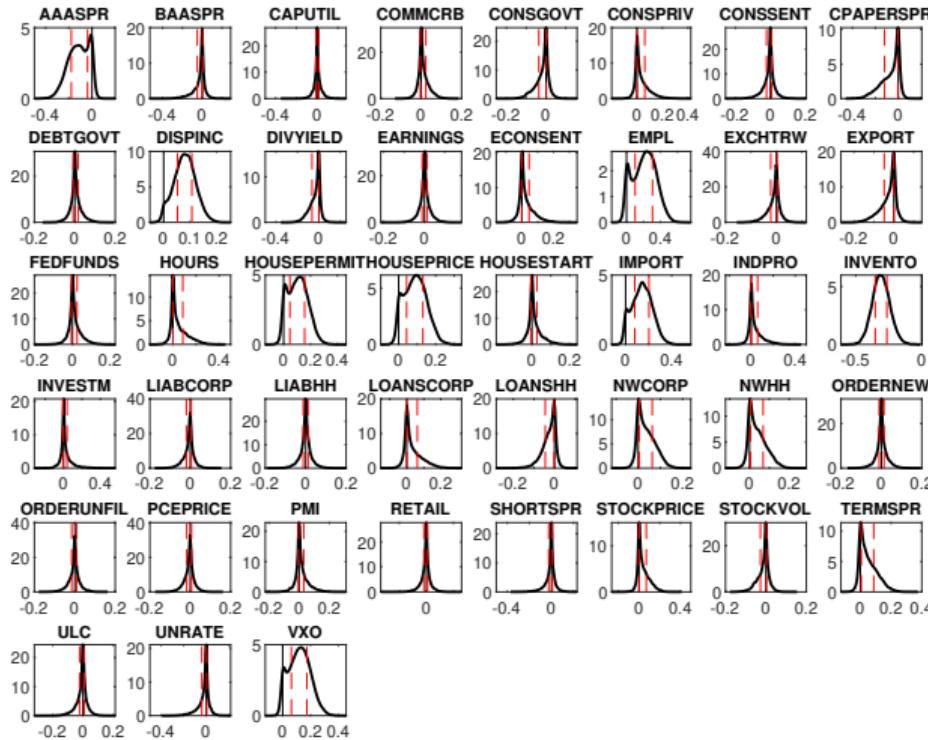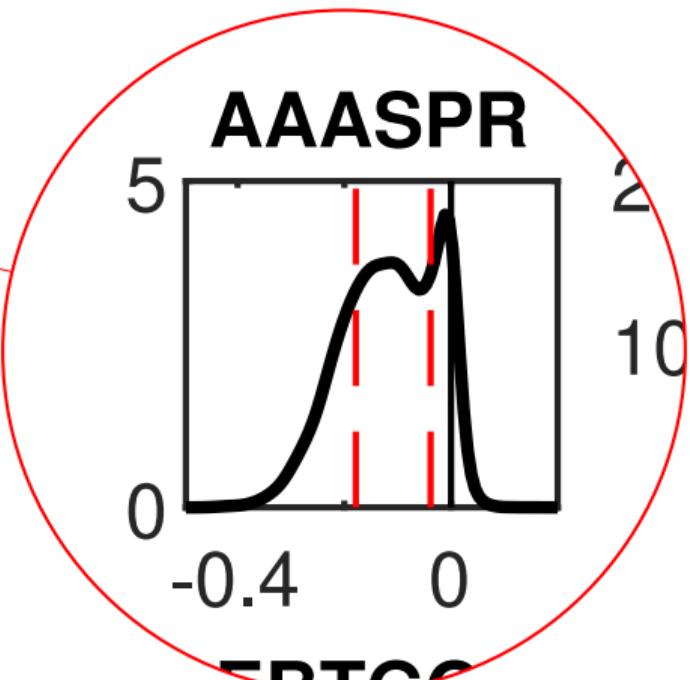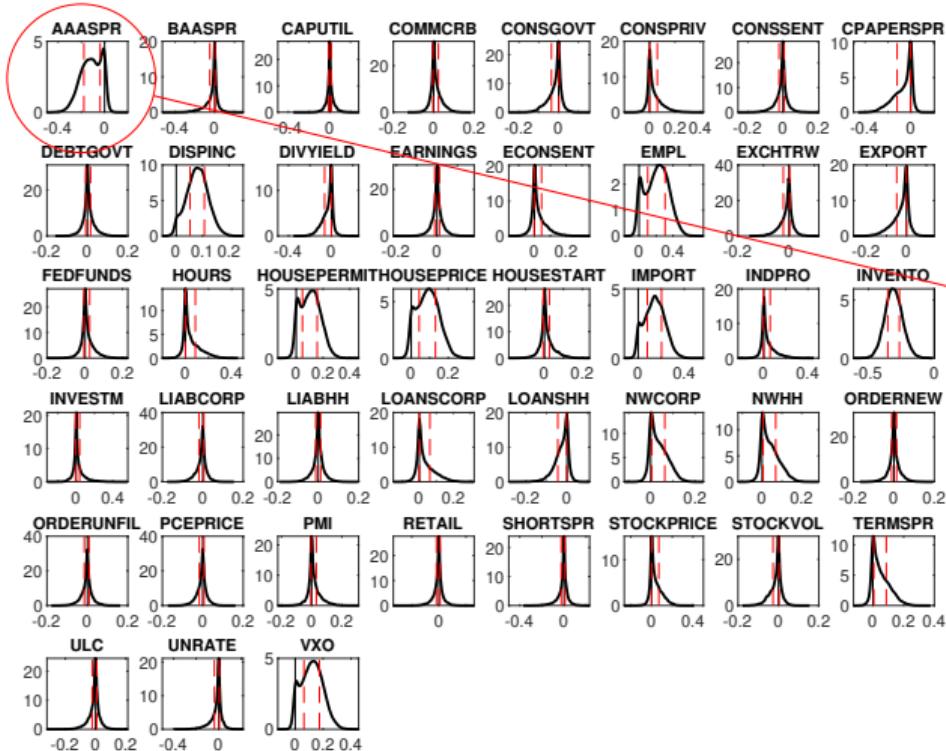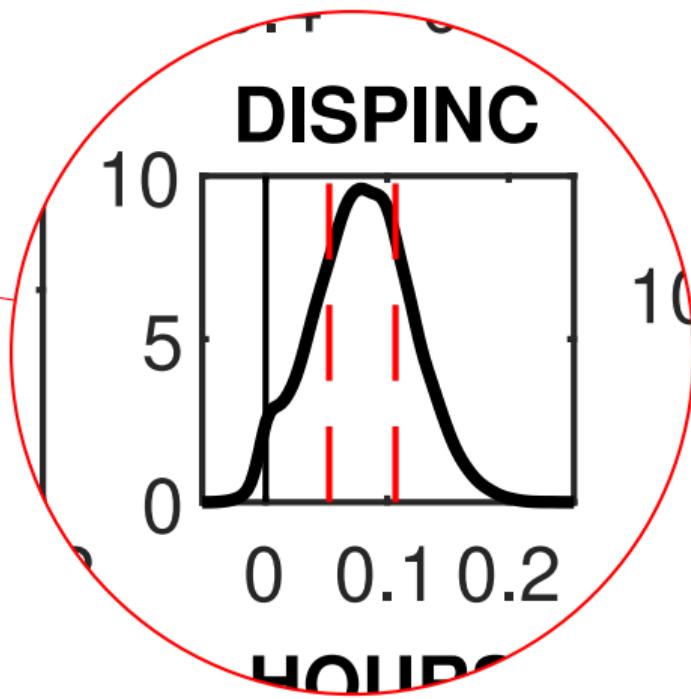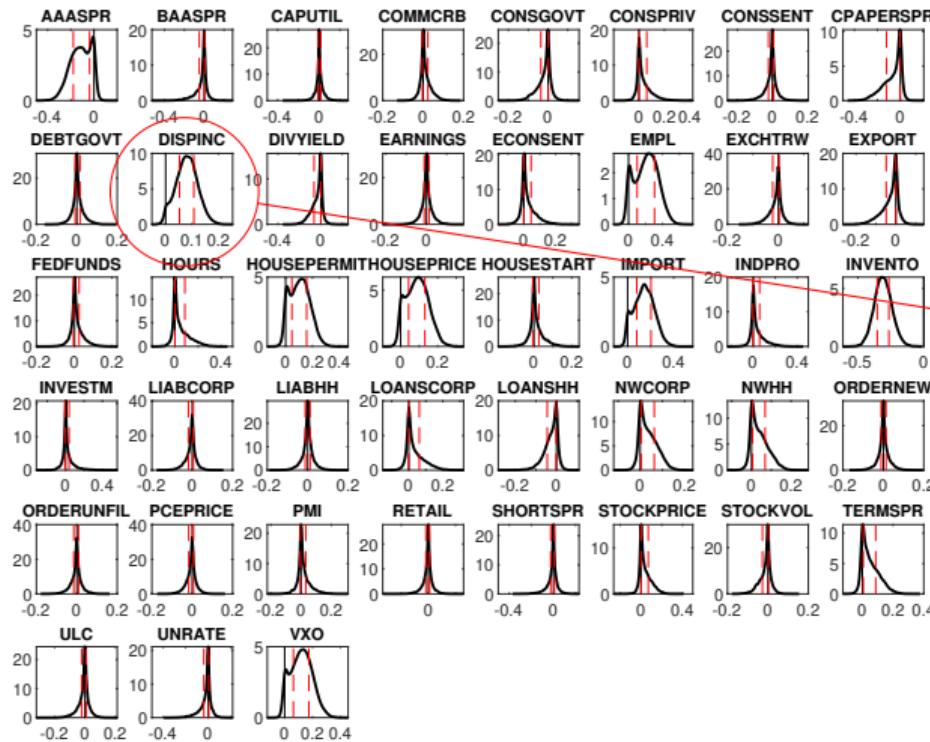
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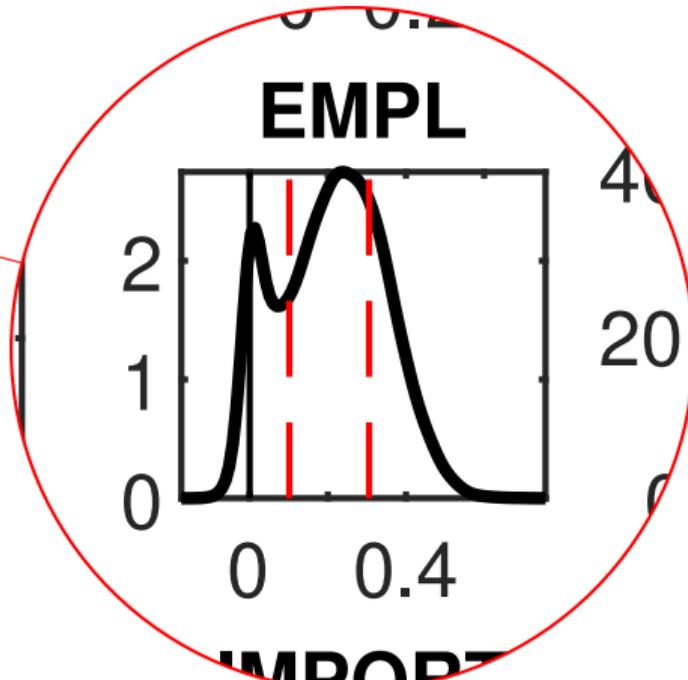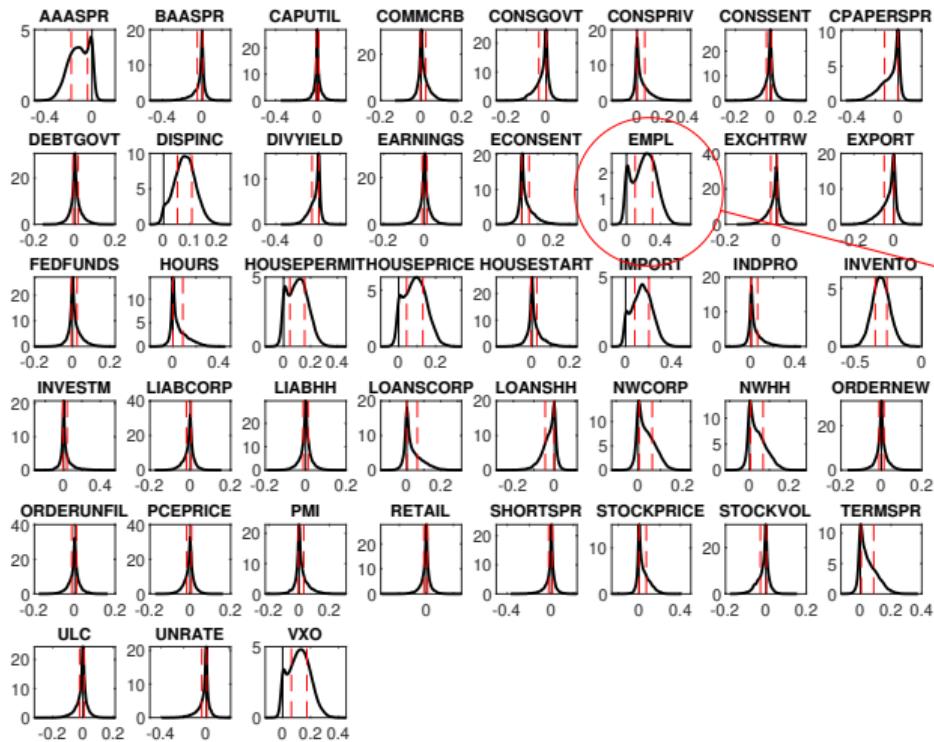
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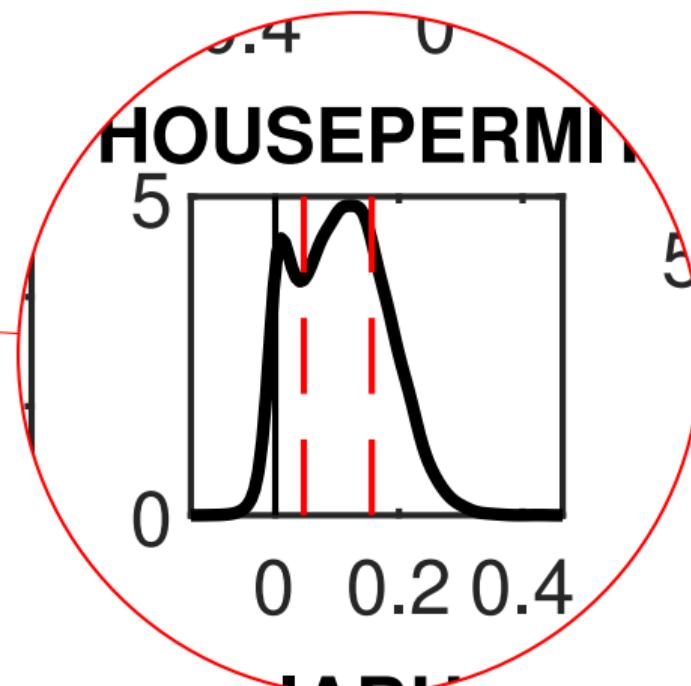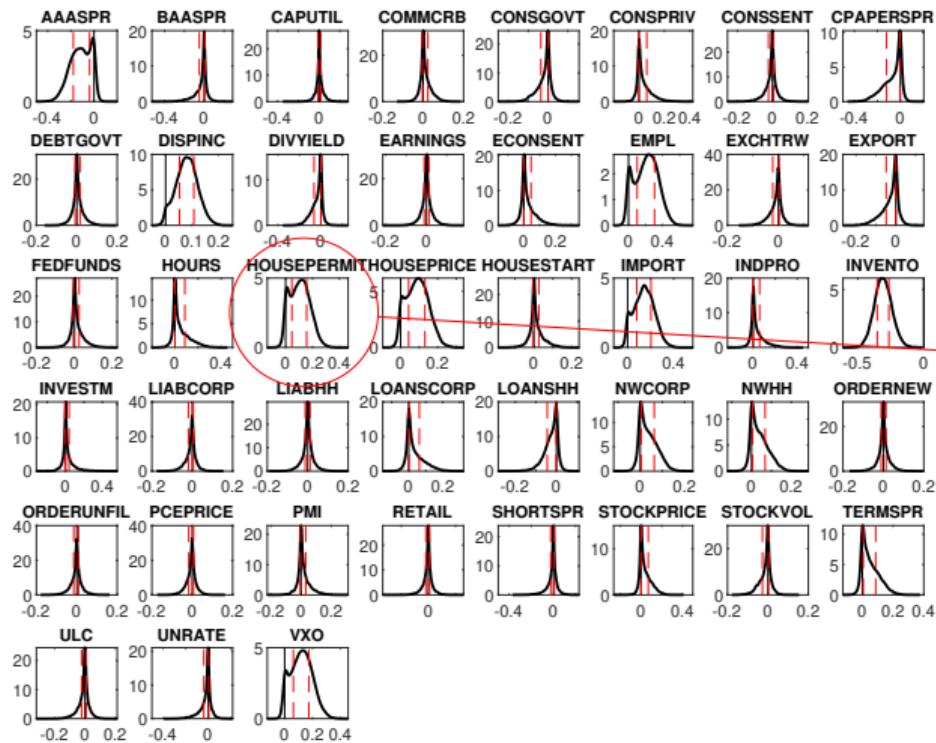
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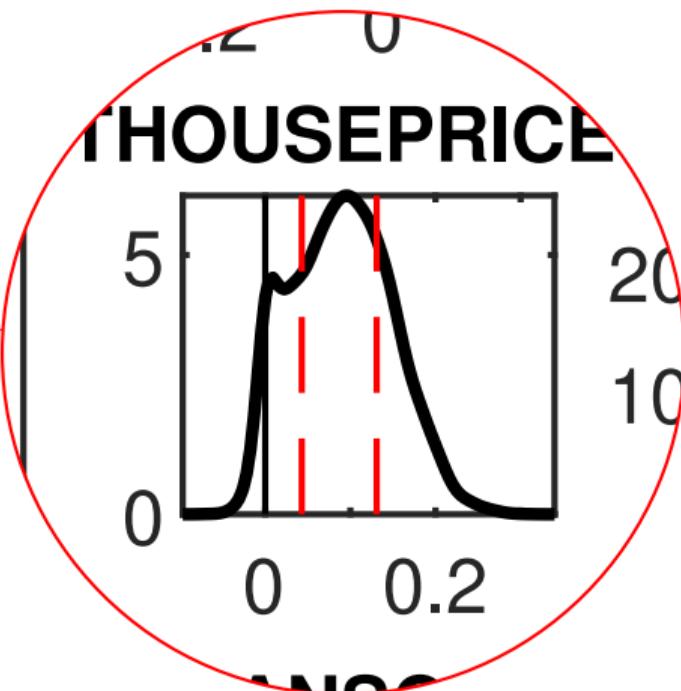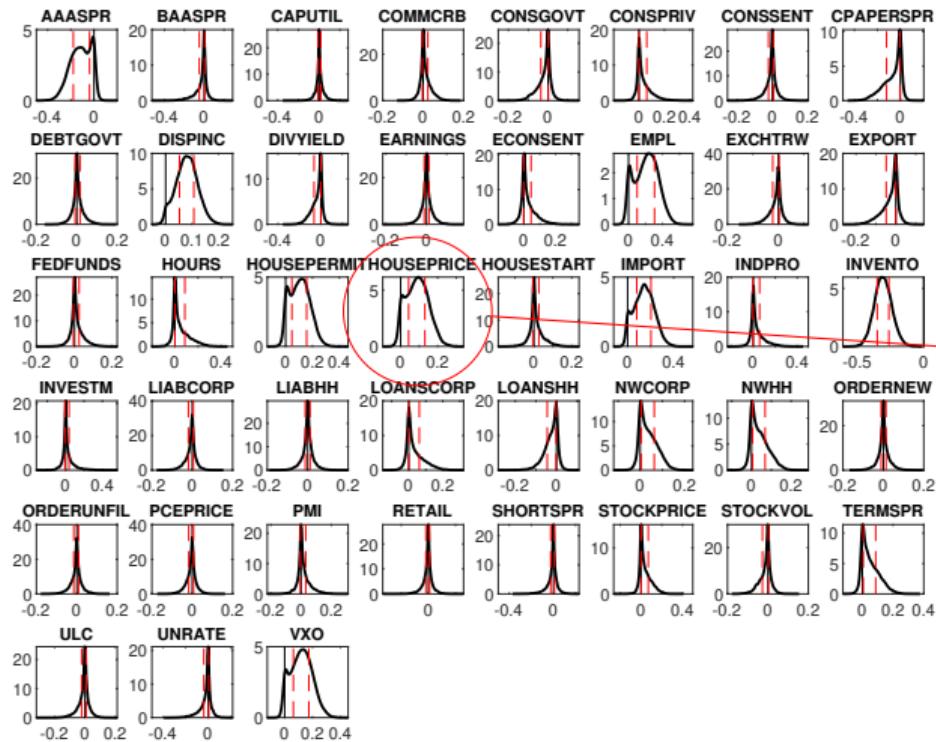
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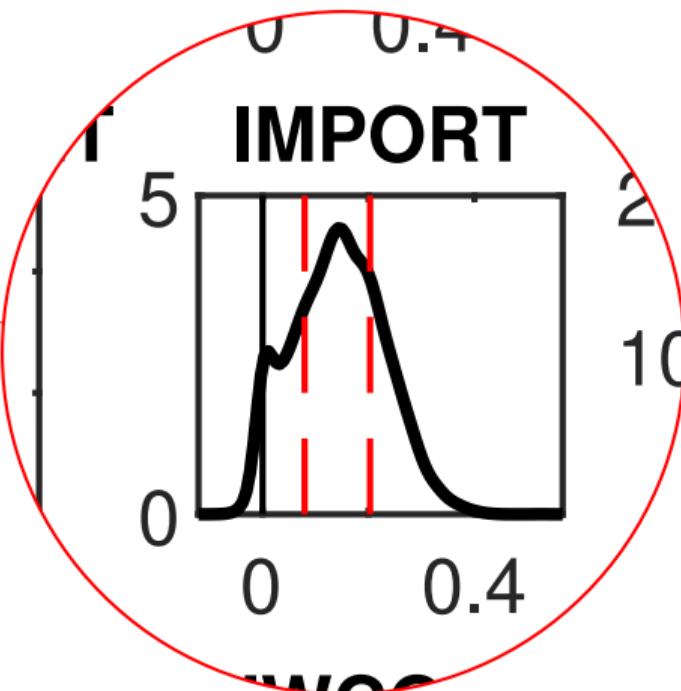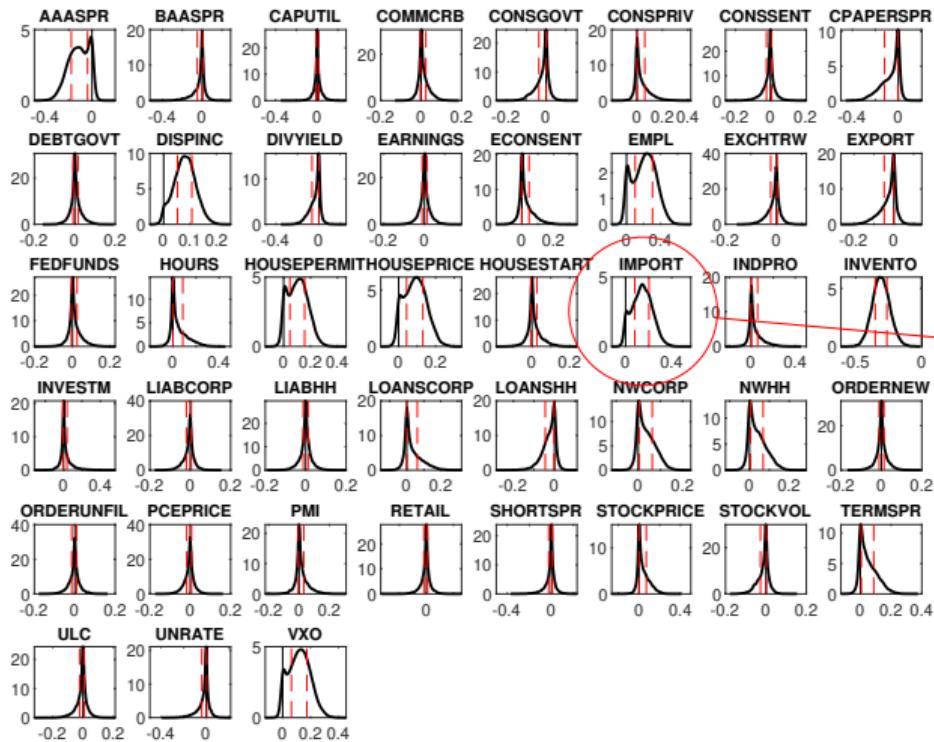
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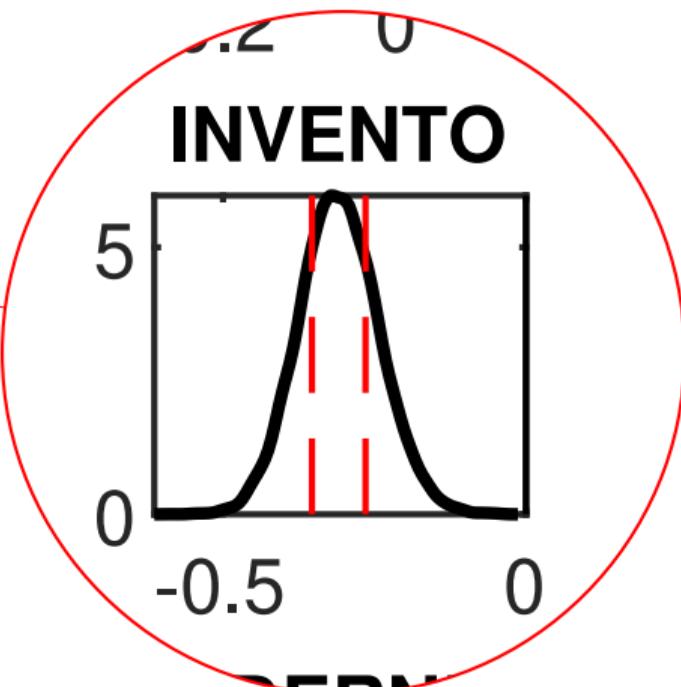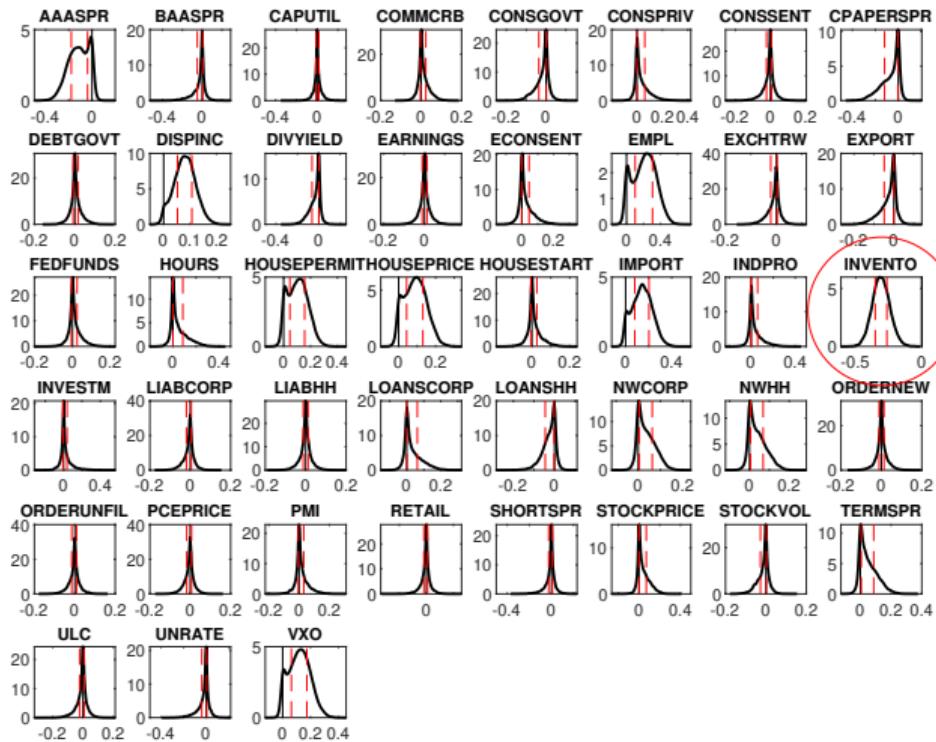
US: Predictors of the Variance
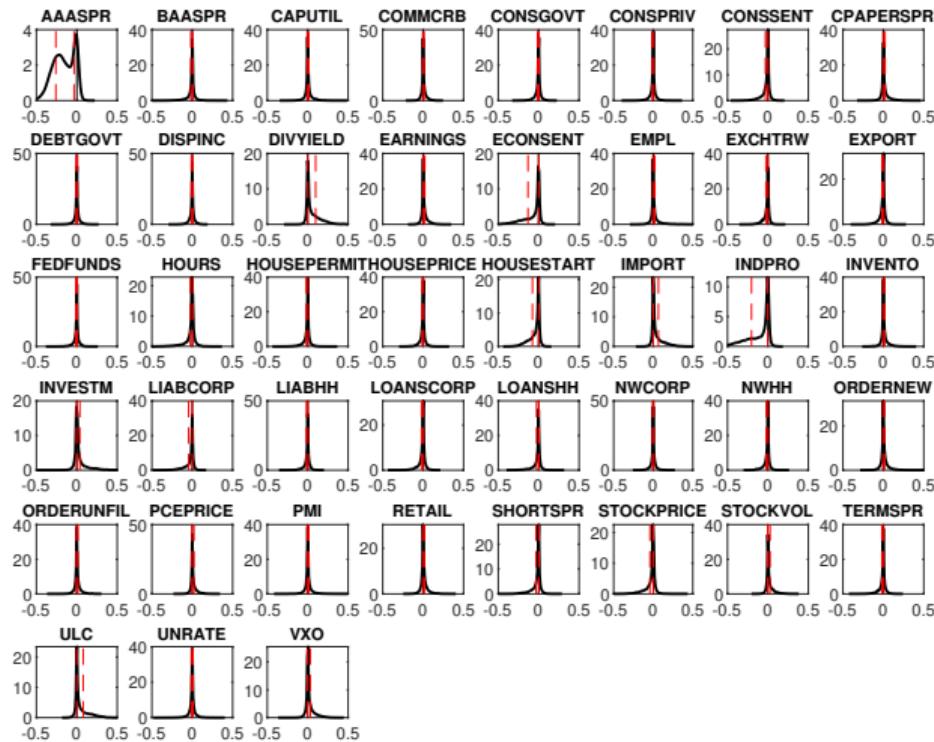
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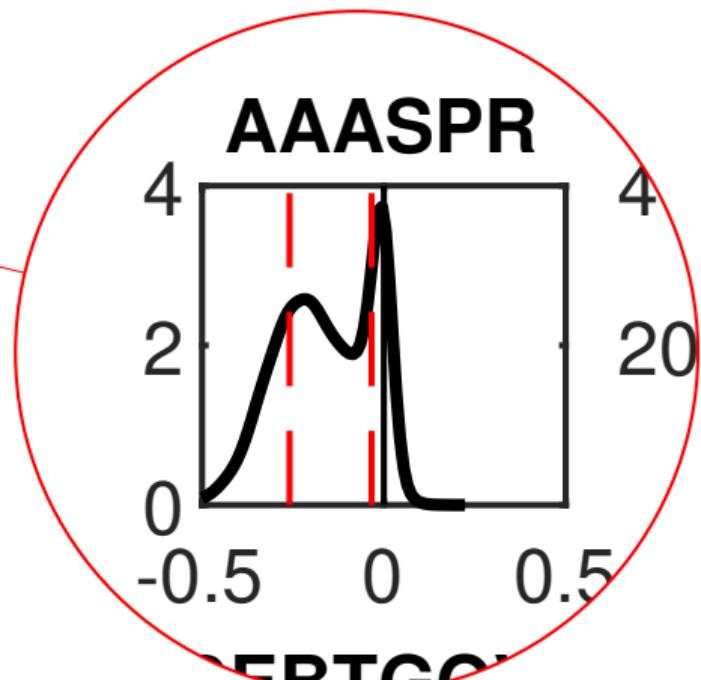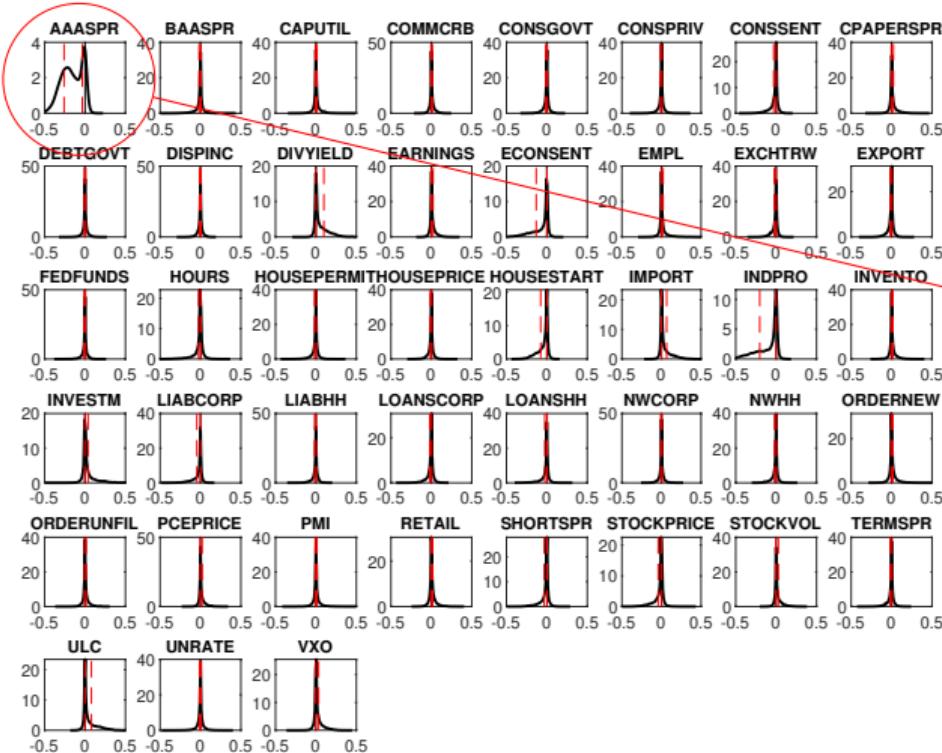
Cross-Country Data: Predictors of the Mean
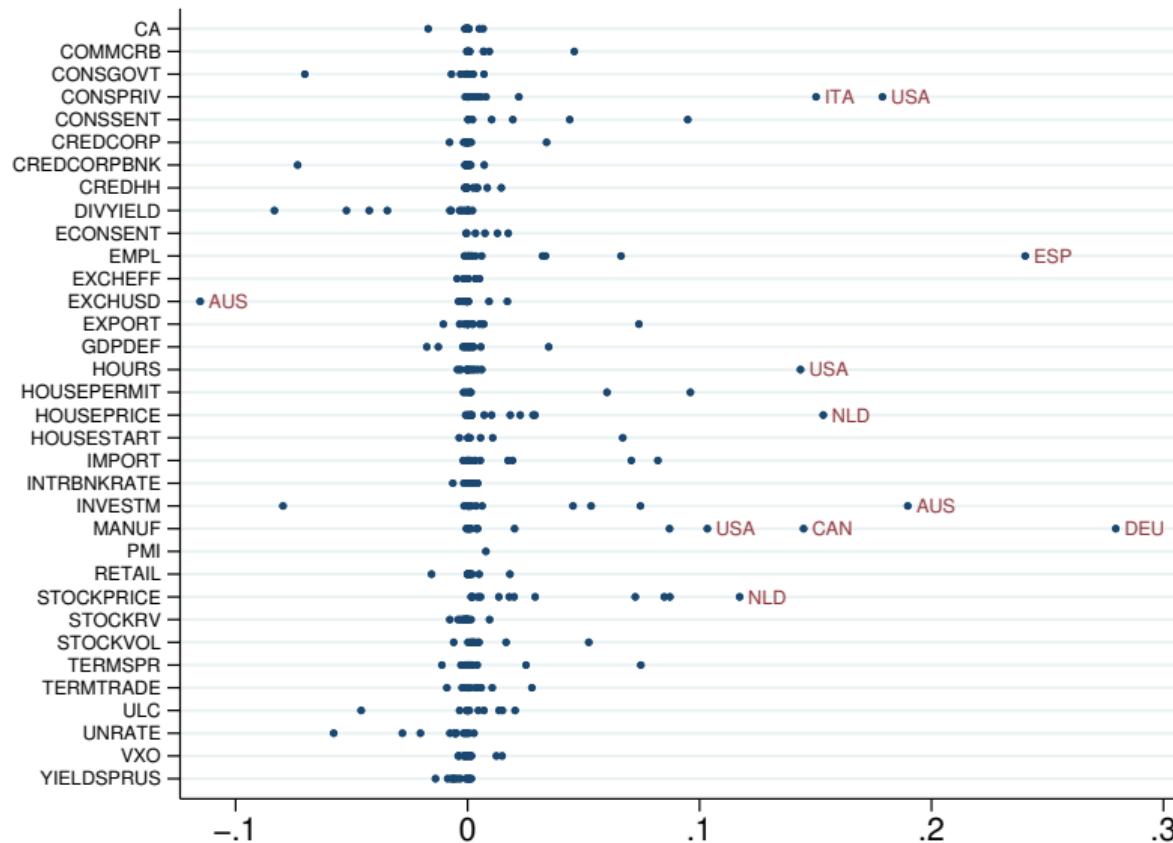
Conclusions & Open Questions

1. **Markets** have **limited forward information** – most information is **contemporaneous**

2. Most of the **action is in the mean,** not the tails

3. **Non-linear relationships hard to capture,** either because of the small number of recessions/crises or because the magnitude of the non-linearity is small

4. However, some indication of **negative correlation between mean and variance**, although imprecisely estimated

5. **Be cautious when drawing structural conclusions** for modeling macro-finance link

$\Rightarrow$ **Future research**: Lots to understand!

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Now!