Discussion of "Variance Risk Premia on Stocks and Bonds"

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Introduction

- Paper's goal: examine forecasting power of variances and variance risk premia
  - VRP: statistical minus option-implied volatility forecast
  - VRP is expected return for exposure to realized volatility (gamma)
- Uses state-of-the-art methods for calculating both parts of VRP (and to get correlations)
- My discussion:
  - VRP, why it is interesting
  - Robustness of the regressions
  - VRP vs Implied VRP

The variance risk premium

- Definition:

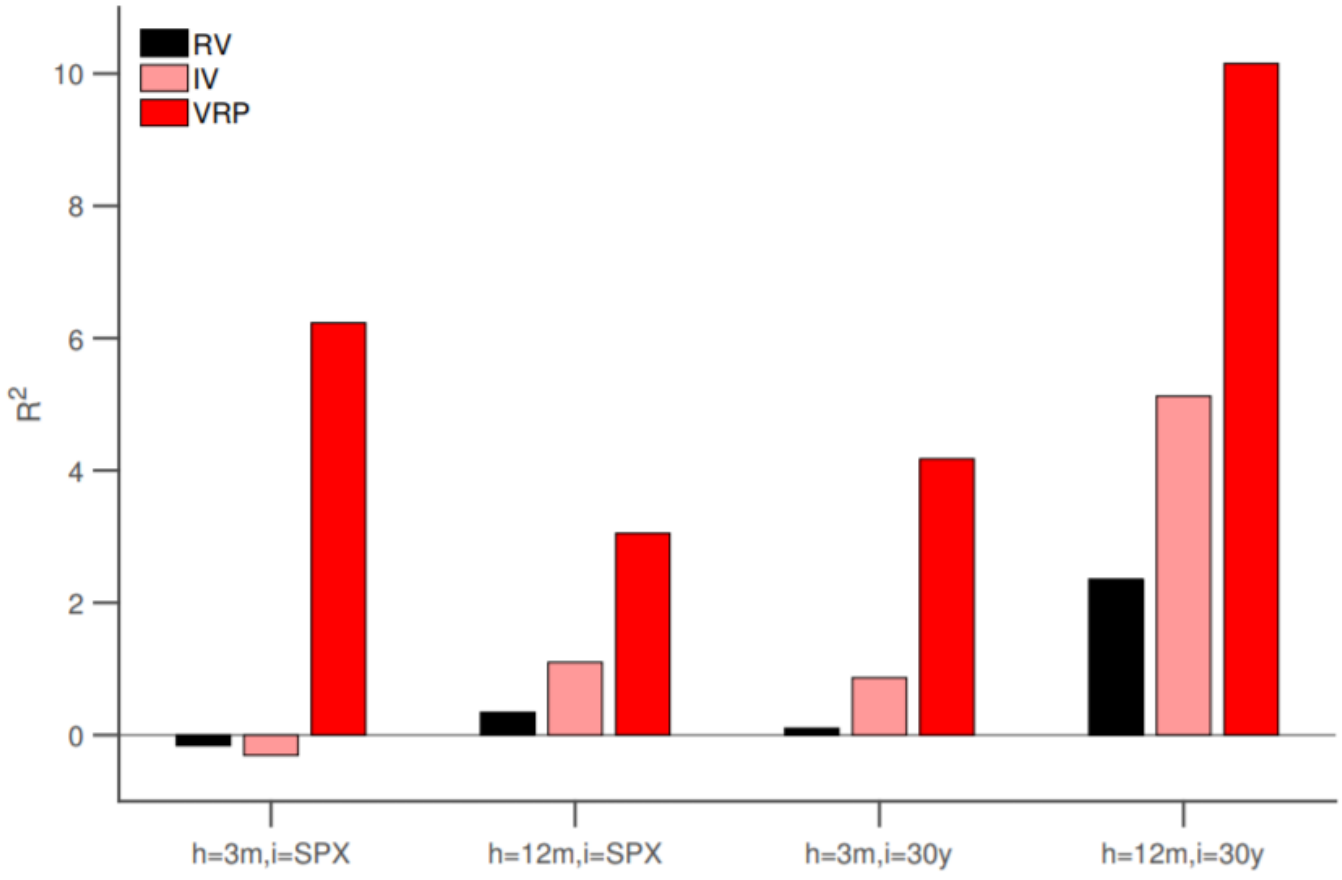
$$VRP_t = E_t^P \left[RV_{t+1} \right] - E_t^Q \left[RV_{t+1} \right]$$

  - P expectations: statistical measure
  - Q expectations: risk-neutral (market-price implied) measure

Why care about the VRP?

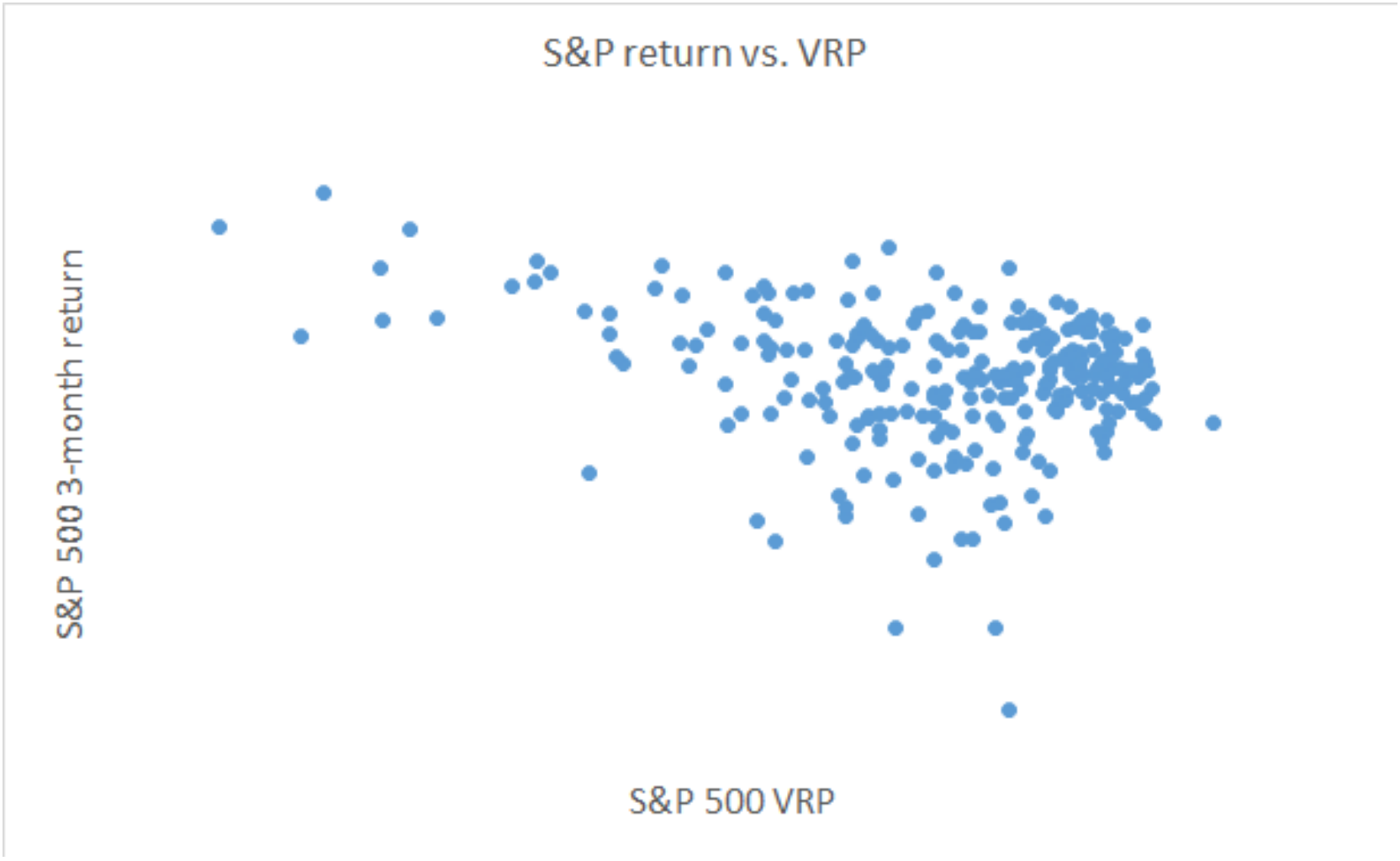
1. The VRP is very large, $\sim$3x larger than S&P 500 Sharpe ratio
2. S&P 500 VRP forecasts returns (Bollerslev, Tauchen, and Zhou)
3. VRP robust across asset numerous classes (stocks, bonds, commodities)

R2s with RV, IV, and VRP

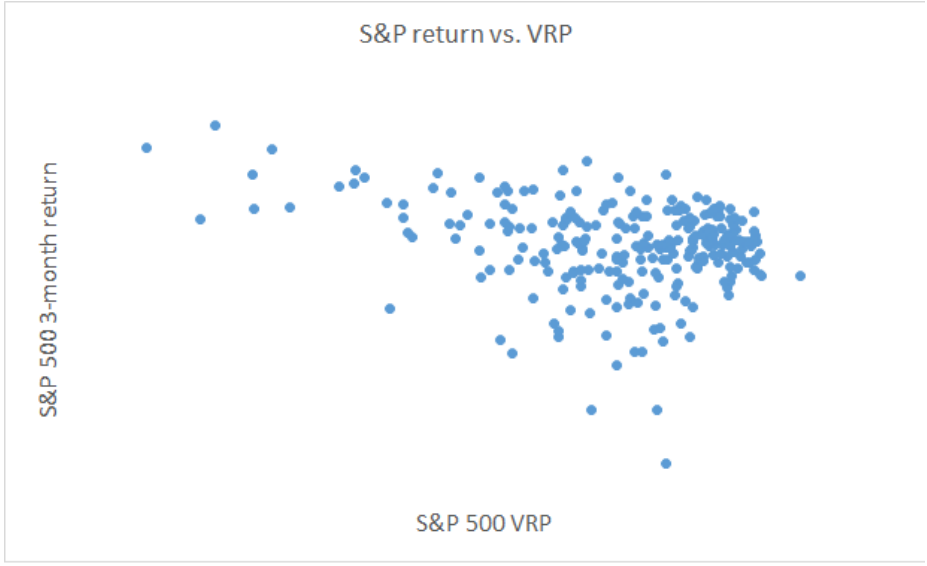


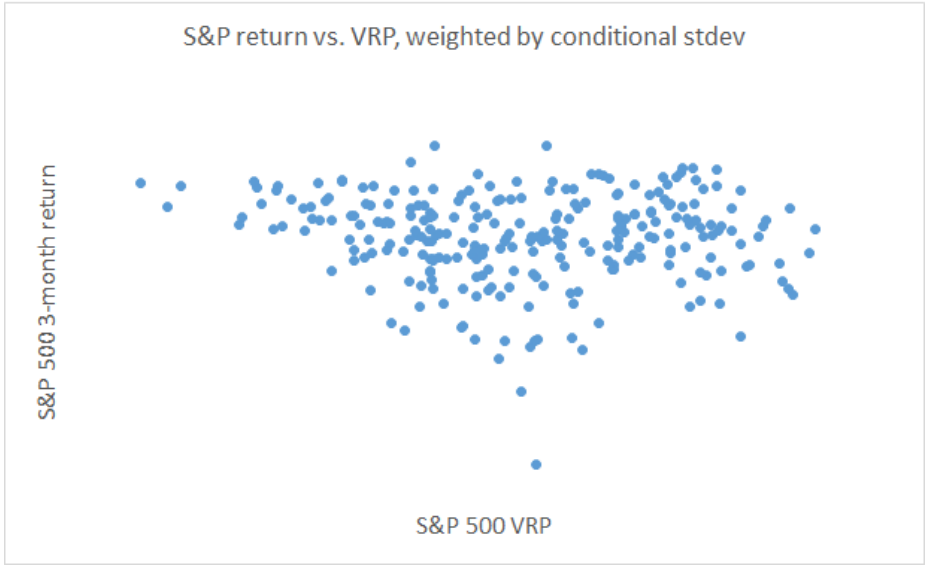
IV and RV do not forecast; IV minus RV does...

Implies key driver is price of risk, not quantity


S&P return vs. VRP
S&P 500 3-month return
S&P 500 VRP

- Johnson (2016): VRP is high when conditional vol. is high
- Worry about results being driven by outliers
- More efficient to weight by conditional stdev



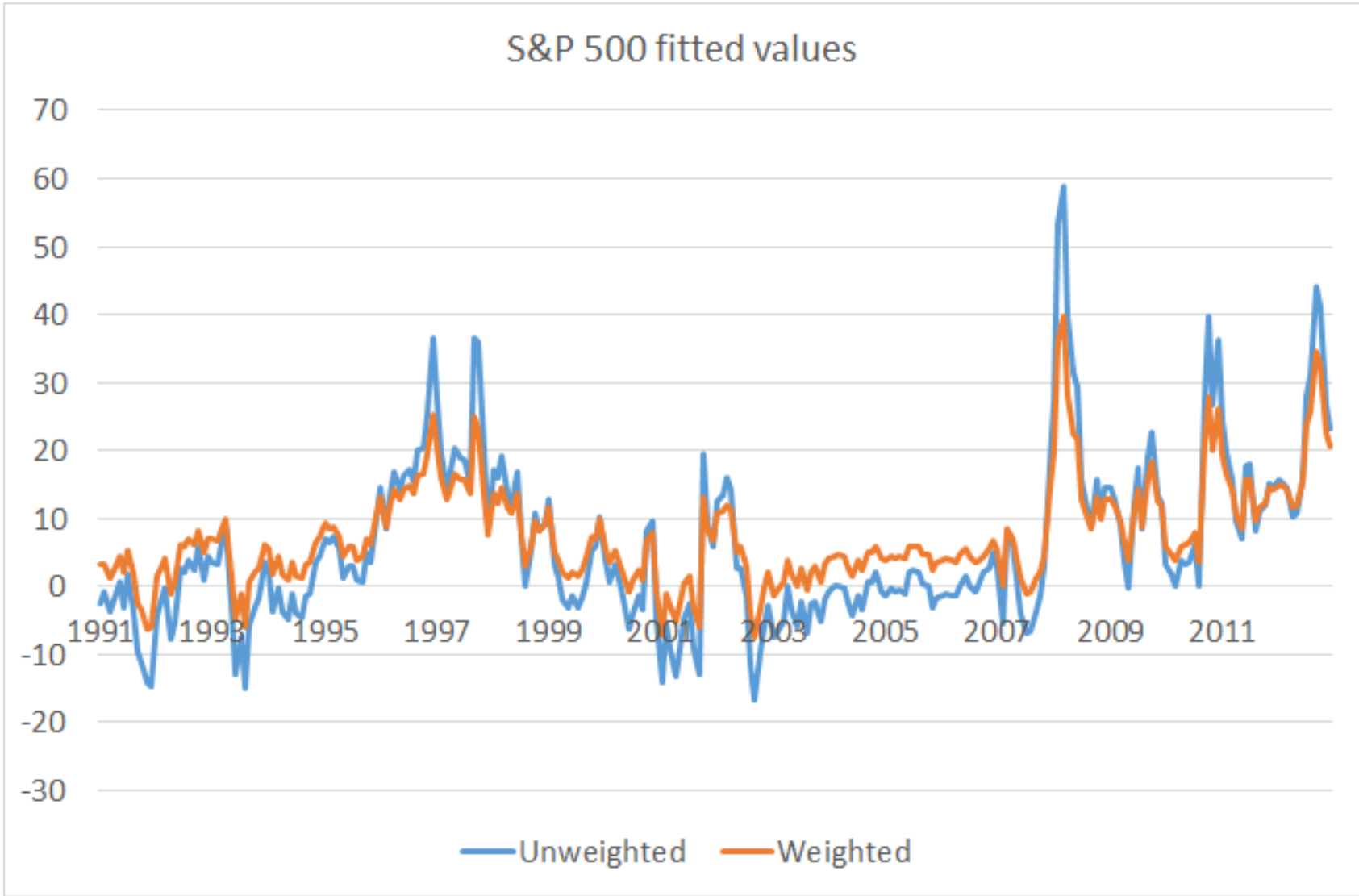


- Forecasting result goes away

Main SPX forecasting results

		Weighted		Weighted
VRP_{SPX}	-0.081***	-0.036	-0.078***	-0.042***
Spread_{30-10}			-0.905***	-0.625***

- Weights kill univariate VRP result
- Coefficients shrink by $\sim$half
  - That is a good thing here...



- SD ratio: 0.63
- 38% of unweighted forecasts <0, only 10% weighted

10-year T-bond forecasting

		Weighted		Weighted
VRP_{10y}	-0.10*	-0.12*		
$Spread_{30-10}$			0.17**	0.14**

- Weighting makes no difference – spread uncorrelated with IV levels

$$spread = \frac{VRP_{30}}{std\left(VRP_{30}\right)} - \frac{VRP_{10}}{std\left(VRP_{10}\right)}$$

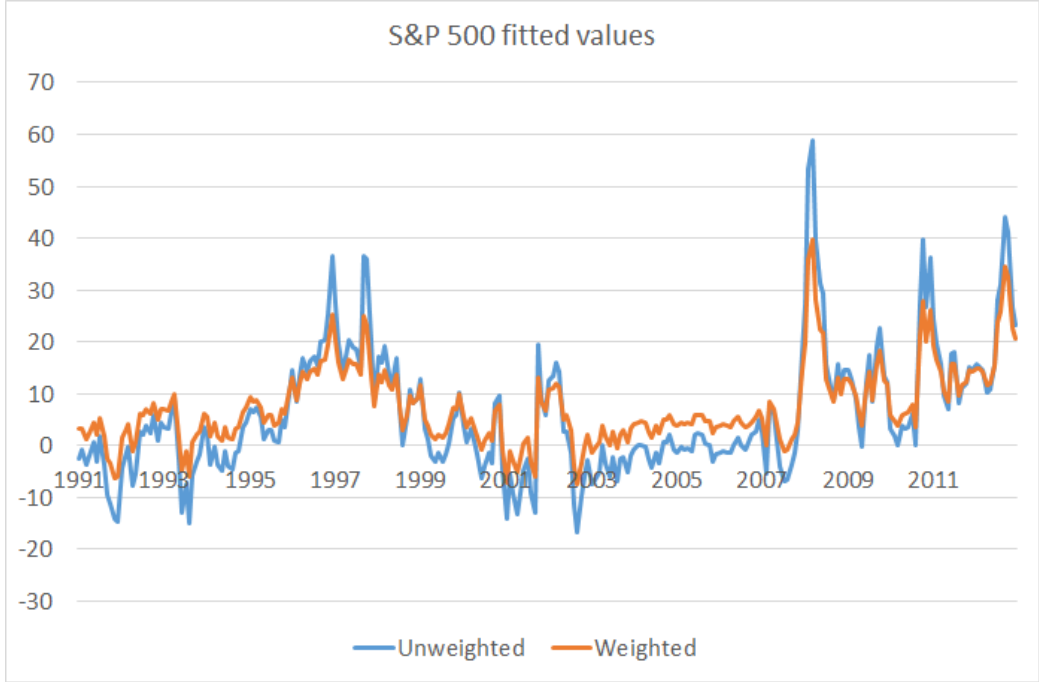
- Definition of spread involves scaling by SDs – involves forward-looking data
- What happens if we forecast using only backward-looking scaling?

	Baseline	Recursive SD
$Spread_{30-10}$	0.17**	0.12**

- Further shrinks coefficients (again probably good...)

- Main worry: persistent fluctuations

- Many models: risk premia vary with business cycle
- Implies cycles $\sim$5 years
- Infeasible to get accurate SEs with 22 years of data (unless extremely conservative)

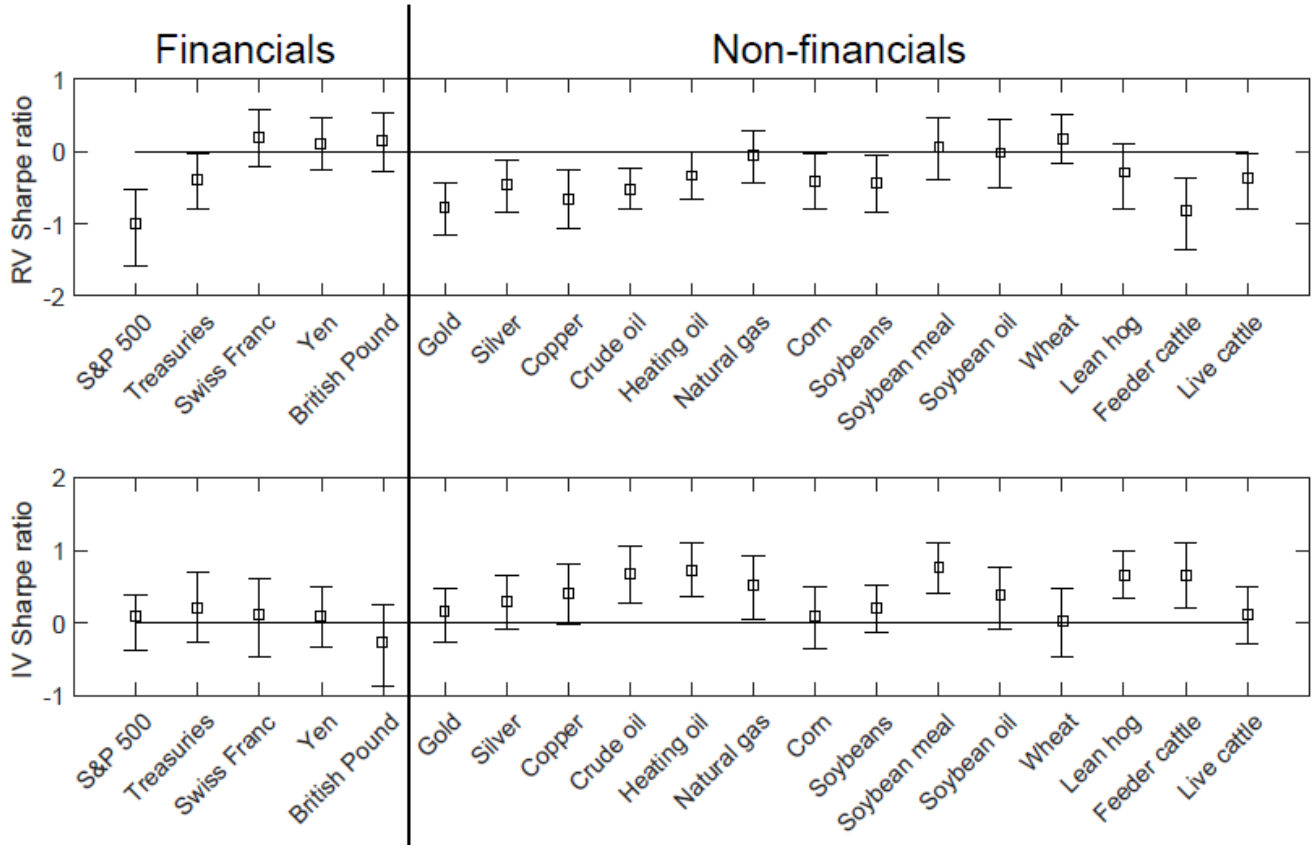


- Only $\sim$2 business cycles in this sample

Extending MSVW's results

- MSVW study variance risk premium
  - Premium on realized volatility
- Can extend to the **implied volatility** risk premium
  - What do investors pay to hedge shocks to implied volatility? (nothing!)

Premia for realized and implied volatility



Dew-Becker, Giglio, and Kelly (2017)

Conclusion

- Paper studies dynamics of equity and T-bond VRPs
- Large variation over time, both help forecast returns
- Spread between (scaled) VRPs on long- and short-term bonds forecast bond and stock returns