

Bond Variance Risk Premia

Philippe Mueller
LSE

Andrea Vedolin
LSE

Yu-Min Yen
LSE

Discussion by Grigory Vilkov

19 August 2011

European Finance Association 2011

Summary of the Paper

Bottom line: Variance Risk Premiums for Treasury Bond markets...

- 1 Highly volatile, positive on average and countercyclical
- 2 Predict bond/stock returns and credit spread changes
...better than equity VRP
- 3 Driven by uncertainty about nominal and real macro variables

How: Analysis is split into three parts

- 1 VRP = implied minus expected realized variances for 30 days
VRP = (MIV-SMIV-IV) minus (HAR-RV, RV) for 5,10,30 yr bonds and S&P500
- 2 Annual Returns (overlapping) = $\beta' VRP + \gamma' M + \epsilon$
 M – a number of explanatory variables
- 3 VRP = $\beta^U \hat{U} + \beta^F \hat{F} + \gamma^S \hat{S} + \epsilon$, for each asset
 \hat{U} – uncertainty, \hat{F} - macro factors, \hat{S} - volatility of macro factors

Impressions

- ① Lots of interesting empirical results to refer to!
- ② Good reference for implied/ realized volatilities/ macro variables
- ③ Still not clear why the bond VRP is superior to the market index VRP

Intuition about the Bond - Equity VRP Difference/Link

- ① Risk – Fear – Flight to Quality
- ② Nature of the assets:
 - Stock prices \Leftarrow {Cash Flows, Discount Rates}
 - Bond prices \Leftarrow {Discount Rates}
- ③ Nature of the assets + 30-day Variance Swap Maturity:
 - Stock prices \Leftarrow {Short-term sentiment about Prices}
 - Bond prices \Leftarrow {Short-term sentiment about Discount Rates}

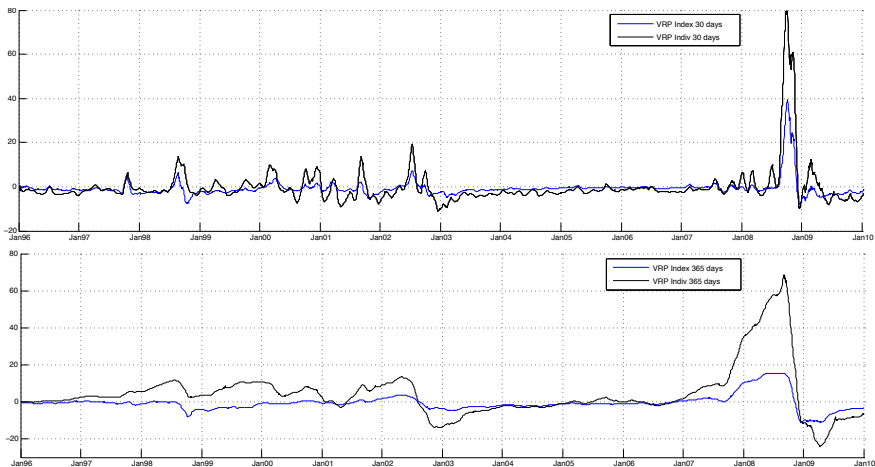
VRP: Computation and Interpretation

VRP = implied minus expected realized variances for 30 days

- 1 $VRP = E^P(\cdot) - E^Q(\cdot)$ to comply with theoretical papers
- 2 VRP for bonds zero? Compare to individual stocks? Periodicity?
- 3 VRP for longer horizons – better indication of long-term uncertainty
- 4 VRP is often assumed to be proportional to RV; try $VRP = \frac{E^P(\cdot)}{E^Q(\cdot)}$
- 5 RV ignores the overnight returns \Rightarrow understated (VRP overstated)
- 6 RV: frequency of trading in early years? Missing observations?
- 7 RV: trading time for stocks (also 7:25 to 14:00 or 8:30 to 15:15?)
- 8 MIV: too many methods – put all but one to robustness section

Comments III

Compare short- and long-term index and individual realized VRP:



Return/ Credit Spreads Predictability

- ① You say: each month we run the following regression...
$$\text{Annual Returns (overlapping)} = \beta' \text{VRP} + \gamma' M + \epsilon$$

Is that a **TSR**, or CSR, or Fama-MacBeth two-stage approach?
- ② May want to use panel regressions (Mitchell A. Petersen RFS 2009)
- ③ Returns: annual: hard to justify, easier to predict: switch to monthly?
- ④ Collinearity in Bond VRP regressors? Include only one, or take PC
- ⑤ Use the macro regressors instead of VRP to predict returns

Economic Drivers of the VRP

- ① Panel regression, or regress the first PC from the bond VRP's

Structure/ Goal

- 1 First read is nice and easy, until one gets to details
- 2 Too many points; the goal is not clearly defined
- 3 Too many alternative ways of computing the measures/ stats
- 4 Put computational detail to appendix and make a robustness section for all the alternatives

Typos/ Corrections/ Small Issues

- 1 Tables 1-3: Significance is missing
- 2 Table 3: volatility vs variances – be clear what you show
- 3 Table 3: VRP for S&P500 – put 0's on both axis at the same place
- 4 Figures (in general): legends on the figures, and not in text only
- 5 Figure 3 and page 16: ... $VRP^{(E)}$ is always positive...

Good Luck!