

Risk Tolerance Assessment: Research and Practice

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Overview

How to measure the Risk Tolerance and to incorporate the theoretical and practical perspective

Maintain the balance between the heuristic approach and algorithmic approach

Standardized risk-assessment approach

Comments

Risk Pricing in Finance Literature

Jensen's Alpha = $\alpha_J = R_i - [R_f + \beta_{iM} \cdot (R_M - R_f)]$

Sharpe ratio = $\frac{E[R_i - R_f]}{\sigma}$

Treynor Ratio = $\frac{R_i - R_f}{\beta}$

$$\text{Sortino Ratio} = S = \frac{R - T}{DR} \quad \text{where} \quad DR = \left(\int_{-\infty}^T (T - x)^2 f(x) dx \right)^{1/2},$$

Distinction between Risk and Risk Aversion

During the recessions

Higher Risk : Constantinides and Duffie (1996, *JPE* 104(2) 219-240)

Higher Risk Aversion : Campbell and Cochrane (1999, *JPE* 107(2) 205-251)

Time-varying volatility, correlations, and Betas

Macro-economic variables/Finance Interface

Counter-cyclical of Excess Return for Stocks (Lettau and Ludvigson, 2001 *JF* 56(3) 815-849) and Bonds (Cochrane and Piazzesi, March 2005 *AER* 95(1) 138-160)

Torben G. Andersen, Tim Bollerslev, Francis X. Diebold, and Jin Wu "A Framework for Exploring the Macroeconomic Determinants of Systemic Risk" *American Economic*

Review, May 2005, Vol. 95, No. 2, 398-404

Expected Excess returns are counter cyclical

Counter-cyclical of Beta with Industrial economic growth during the recession

Campbell Sean D. and Francis X. Diebold "Stock Returns and Expected Business Condition: Half a Century of Direct Evidence", *Journal of Business and Economic Statistics*, April 2009, Vol. 27, No. 2, 266-278

Time Varying Expected Business Condition --> Time Varying Risk

Consumption/Wealth ratio --> Time Varying Risk Aversion

Different Attitudes towards Asset Volatility

Financial Innovation or Financial Stagnation

Asset Backed Securities, CDO, Financial Derivatives such as CDS

Mark-to-market Leverage (Adrian and Shin 2009 *JFI*)

Procyclical Leverage --> Largely increase the risk of boom and bust

Value at Risk/total asset is starkly increased among the IBs in 2007-2008

Hidden Risk

Risk Tolerance grows too high during the boom--> High risk de facto

Volatility Risk Premium = difference between the VIX index and Realized volatility

VIX index

Ticker symbol for the Chicago Board Options Exchange Volatility Index.

A popular measure of the implied volatility of S&P 500 index options.

Mark to market accounting: source of hidden risk

Aggregate liquidity is intimately tied to how hard the financial intermediaries search for borrowers. In the subprime mortgage market in the United States we have seen that when balance sheets are expanding fast enough, even borrowers that do not have the means to repay are granted credit—so intense is the urge to employ surplus capital. The seeds of the subsequent downturn in the credit cycle are thus sown.

Hyun Song Shin (2009)

Rising tide of Global Liquidity can float every ship stranded ashore, but receding tide will soon show who is not prepared

Warren Buffet (2009)

Unplugging the swimming pool will show who has been paddling without wearing swimming suits.