Don't Throw out the Return with the Risk: Average Variance Portfolio Management

Jeramia Poland

Indian School of Business

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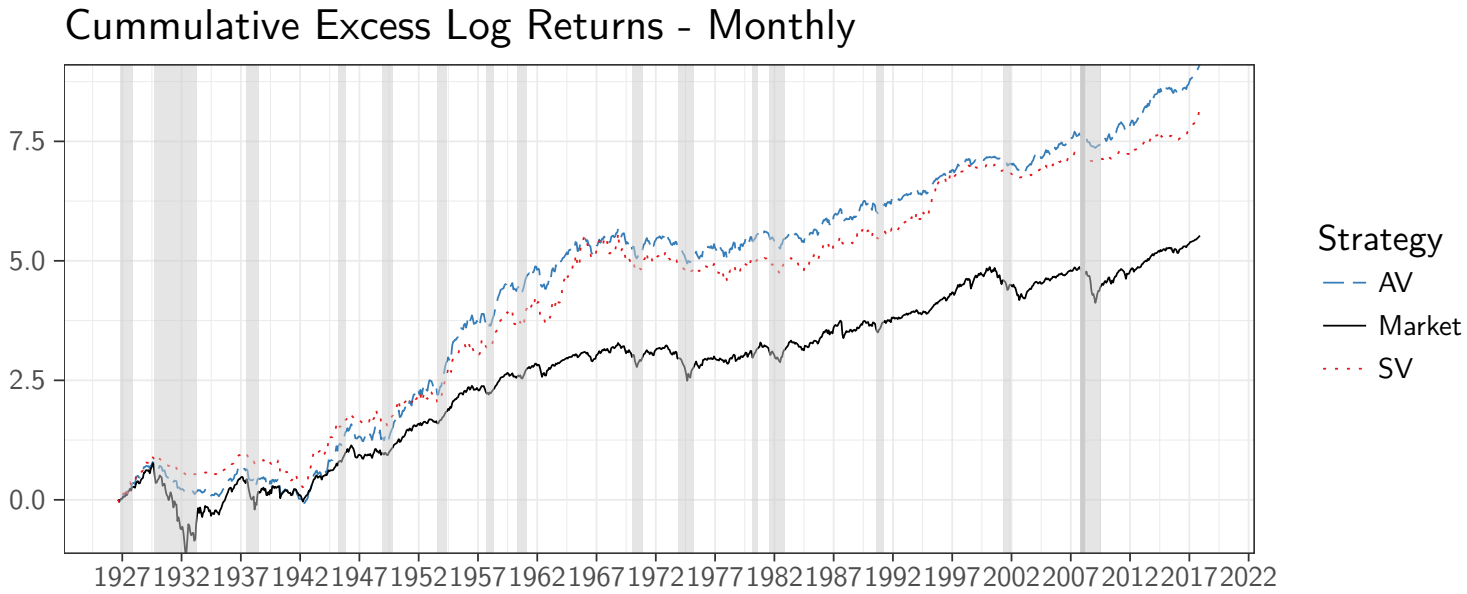
Equity Premium

A Puzzle

- Equity Premium - more risk, more reward
- Markowitz (1952) - formal portfolio variance, return optimization
- Haugen 1972 - low risk portfolios out perform
- Moreira and Muir (2017) - portfolios scaled by last months realized volatilty outperform the underlying
- Pollet and Wilson (2010) - decompose quarterly variance of market portfolio - avg cor and avg var

Average Variance



	Strategy	RET	Sharpe	Sortino	Kappa	UpsidePotential	Rachev
1	BH	6.047	0.327	0.458	0.084	0.579	0.841
2	SV	8.947	0.483	0.758	0.138	0.651	1.156***
3	AV	9.966	0.538***	0.807***	0.155***	0.704***	0.972

Data

CRSP daily returns

- NYSE daily return (1926-2017)
- NYSE-AMEX daily returns (1962-2017)
- NASDAQ daily returns (1974-2017)

Market Variance

$$SV_t = \sum_{n=1}^{N} \sum_{m=1}^{N} w_t^n w_t^m \sigma_{n,t}^2 \sigma_{m,t}^2 \rho_t^{n,m} \tag{1}$$

$$SV_t = \sum_{n=1}^{N} w_t^n \sigma_{n,t}^2 \times \sum_{n=1}^{N} \sum_{m \neq n}^{N} w_t^n w_t^m \rho_t^{n,m} \tag{2}$$

$$AV_t = \sum_{n=1}^{N} w_t^n \sigma_{n,t}^2 \tag{3}$$

$$AC_t = \sum_{n=1}^{N} \sum_{m \neq n}^{N} w_t^n w_t^m \rho_t^{n,m} \tag{4}$$

$$\tag{5}$$

Summary Stats

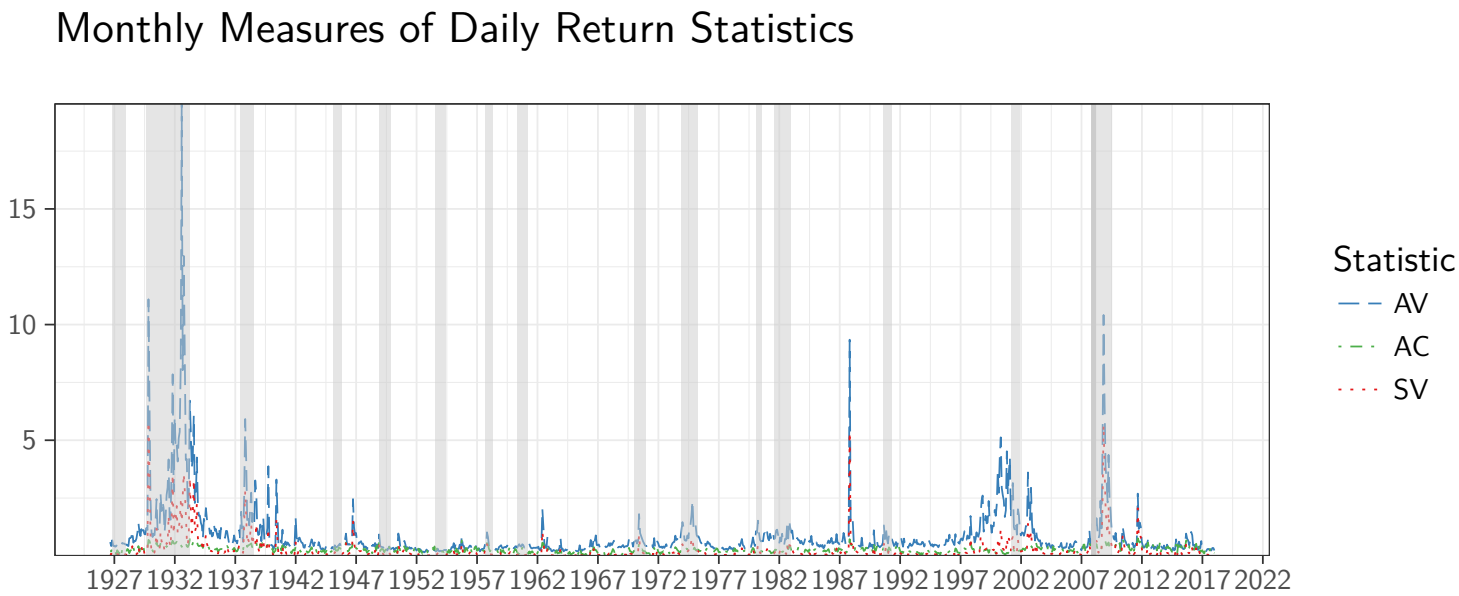
Pollet and Wilson Sample 1963Q1:2006Q4

Statistic	N	Mean	St. Dev.	Min	Max	Autocorrelation
RET	176	1.163	8.369	−30.072	19.956	0.000
AC	176	0.230	0.090	0.034	0.648	0.572
AV	176	2.218	1.828	0.634	12.044	0.696
SV	176	0.483	0.616	0.029	6.397	0.311

Monthly 1926M8:2017M12

Statistic	N	Mean	St. Dev.	Min	Max	Autocorrelation
RET	1,096	0.504	5.346	−34.553	33.258	0.106
AC	1,097	0.275	0.134	0.019	0.762	0.609
AV	1,097	0.875	1.276	0.154	19.540	0.718
SV	1,097	0.246	0.500	0.006	5.808	0.613

Time Series


Monthly Measures of Daily Return Statistics
15
10
5
1927 1932 1937 1942 1947 1952 1957 1962 1967 1972 1977 1982 1987 1992 1997 2002 2007 2012 2017 2022
Statistic
AV
AC
SV

Conclusions

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- The results of BJS, FM, BF and others are consistent with the S-L theory.