Revisiting the Equity Risk Premium

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Estimating Ex Ante Risk Premia—Harris and Marston (2001, *Journal of Applied Finance*)

Recap:

Estimation of Risk Premia from historical data requires ("Ex Post" Risk Premia):

- Choice of time Period for Estimation
- Choice of Arithmetic vs. Geometric Average

Variety of Risk Premia estimates

- Goldman Sachs (in 1999 EVA application) market risk premium of “3% from 1994-1997 and 3.5% from 1998-999E”
- Stern Stewart EVA application at same time (1999): market risk premium of 6%
- Ibbotson Assoc. 1998 CAPM application:7.8%
- Academics (Welch 2000): mean of 7.1% but range of 1.5 to 15% (survey response)

Alternative: Ex Ante Risk Premia Measures

- Based on future expectations, so no need for averaging past data
- Trade-off: Do not observe analysts or other forecasters making direct and updated forecasts of their expectation of what $E(R_m)$—expected return on the market portfolio—will be over a long-term specified future horizon
- Must use available data—e.g., long-term earnings forecasts--in conjunction with an equity pricing model to estimate $E(R_m)$

Ex Ante Risk Premia—Construction (1)

- Use Constant Growth Dividend Model and estimates of long-term "dividend" growth to estimate the ex ante (expected) return of all firms in the S&P 500.

$$E(R_i) = D_{1i}/P_{oi} + g_i$$

- Repeat monthly 1982 through 1998.

Ex Ante Risk Premia—Construction (2)

- D1➔Compustat (current indicated annual dividend times (1+g).
- Po➔CRSP
- g➔ consensus (across analysts) forecasts of long-term (3-5 year) growth in earnings per share➔ I/B/E/S (Institutional Brokers Estimate System)
- Note: i indexes individual firm

Ex Ante Risk Premia—Construction (3)

- Value-weight (weight by market value of equity) ex ante returns of individual firms in the S&P 500 to get $E(R_m)$—the expected return on the market portfolio
- Subtract out the yield on the 20 year Treasury Bond (constant maturity) to get a forecast of the Market Risk Premium:

  $E(R_m)$-rf

Results

- See handout
- Overall, the average ex-ante market risk premium is 7.14%
- Comparison: 7.5% arithmetic average (5.9% geometric average) of large company stocks over Treasury bonds 1926-1998.
- Risk premium varies over time

Bond Market Yields, Equity Required Return, and Equity Risk Premium, 1982-1998

Year	Div. Yield	*g*	*k*	*i*	***rp = k - i***
1982	6.89	12.73	19.62	12.76	**6.86**
1983	5.24	12.60	17.86	11.18	**6.67**
1984	5.55	12.02	17.57	12.39	**5.18**
1985	4.97	11.45	16.42	10.79	**5.63**
1986	4.08	11.05	15.13	7.80	**7.34**
1987	3.64	11.01	14.65	8.58	**6.07**
1988	4.27	11.00	15.27	8.96	**6.31**
1989	3.95	11.08	15.03	8.45	**6.58**
1990	4.03	11.69	15.72	8.61	**7.11**
1991	3.64	11.99	15.63	8.14	**7.50**

Source: *Journal of Applied Finance, 2001, p. 10*

Bond Market Yields, Equity Required Return, and Equity Risk Premium, 1982- 1998 (cont'd)

Year	Div. Yield	*g*	*k*	*i*	***rp = k - i***
1992	3.35	12.13	15.47	7.67	**7.81**
1993	3.15	11.63	14.78	6.60	**8.18**
1994	3.19	11.47	14.66	7.37	**7.29**
1995	3.04	11.51	14.55	6.88	**7.67**
1996	2.60	11.89	14.49	6.70	**7.79**
1997	2.18	12.60	14.78	6.60	**8.17**
1998	1.80	12.95	14.75	5.58	**9.17**
Average	3.86	11.81	15.67	8.53	**7.14**

Source: *Journal of Applied Finance, 2001, p. 10*

Pros

- Can do for each month—get a time series of monthly risk premia
- Thus can evaluate changes in/properties of the market risk premium over time
- Provides an independent estimate that can be compared to historical averages—can help in establishing likely ranges for the market risk premium

Cons

Resulting Ex Ante Risk Premia are only as good as:

1. The Model: ? Constant g for all firms
2. The inputs, especially estimate of long-term “growth”:
   - Optimistic bias?
   - How often updated; accurate (accountability)
   - Long-term earnings growth is used to proxy for long-term dividend growth

Data quality considerations

- **Given Cons, view 7.14% as Upper Bound**

Also, regarding estimates, we:

- Eliminate non-dividend paying firms
- Eliminate firms whose consensus is based on fewer than 3 analysts' forecasts
- Eliminate firms if the standard deviation around the mean forecast exceeds 20%

Ex Ante Risk Premia Over Time

- See handout
- Negatively related to interest rates
- Positively related to the spread between the spread between long-term corporate and long-term govt. bonds
- Negatively related to consumer confidence
- Positively related to the dispersion of analysts forecast of earnings growth
- Positively related to the volatility on the S&P 500 index implied by options data

Changes in Market Equity Risk Premium Over Time

Time Period	Intercept	i	BSPREAD	R^2
A. 1982-1998	**-.0002**	**-.869**		**.57**
	(-1.49)	**(-16.54)**		
	-.0002	**-.749**	**4.88**	**.59**
	(-1.11)	**(-11.37)**	**(2.94)**	
B. 1980s	**-.0005**	**-.887**		**.56**
	(-1.62)	**(-10.97)**		
	-.0004	**-.759**	**.508**	**.57**
	(-1.24)	**(-13.78)**	**(1.99)**	
C. 1990s	**-.0000**	**-.840**		**.64**
	(-0.09)	**(-13.78)**		
	-.0000	**-.757**	**.347**	**.65**
	(0.01)	**(-9.85)**	**(1.76)**	

Source: Harris & Marston, *The Market Risk Premium.*

Changes in the Market Equity Risk Premium Over Time and Selected Measures of Risk

Time Period		Intercept	*i*	BSPREAD	CON	DISP	VOL	*Adj. R^2*
A. 1982-1998	(1)	0.0002 (.97)			-0.014 (-3.50)			0.05
	(2)	-0.0001 (-.96)	-0.737 (-11.31)	0.453 (2.76)	-0.007 (-2.48)			0.60
	(3)	0.0002 (.79)				0.224 (2.38)		0.02
	(4)	-0.0001 (-.93)	-0.733 (-11.49)	0.433 (2.69)	-0.007 (-2.77)	0.185 (3.13)		0.62
B. May 1986-1998	(5)	0.0000 (.06)	-0.818 (-11.21)	0.420 (2.52)	-0.005 (-2.23)	0.378 (3.77)		0.68
	(6)	0.0001 (.53)					0.011 (2.89)	0.05
	(7)	0.0000 (.02)	-0.831 (-11.52)	0.326 (1.95)	-0.005 (-2.12)	0.372 (3.77)	0.006 (2.66)	0.69

Source: Harris & Marston, *The Market Risk Premium.*

Harris,Marston,Mishra,O'Brien
("HMMO," 2003)

- Address the issue of choice of index (domestic versus global) for market portfolio
- See whether global or domestic CAPM provides a better "fit" to ex ante returns (calculated in Harris and Marston (2001))

HMMO Findings

- Find the domestic CAPM “fits” the ex ante return estimates better than the global CAPM
- However, the difference is small and suggests the choice of domestic vs. global CAPM may not be a material issue for many large US firms
- Empirical evidence (across studies) on this issue is mixed

HMMO Methodology (1)

- Calculate 2 different Beta estimates for each sample firm (S&P 500 firms) in Harris and Marston by regressing the realized returns for these firms for a 60 month prior window against:

(1) S&P 500 (robustness: CRSP value weighted index) ➔Beta Domestic (Bd)

(2) Morgan Stanley Capital Internations (MSCI) World Index➔Beta Global (Bg)

HMMO Methodology (2)

- Form value weighted portfolio of each beta
- Form value weighted portfolio of ex ante premia as in Harris and Marston (subtract 20 year T bonds from ex ante returns to get risk premia
- “Back out” domestic and global market risk premiums as
  - Ex ante risk premia/beta domestic
  - Ex ante risk premia/beta global

HMMO Methodology (3)

- Then form a CAPM based risk premium for each individual stock, domestic & global as:
  - Beta domestic for stock times domestic MRP
  - Beta global for stock times global MRP
- Compare these CAPM estimates to Ex Ante returns for individual stocks:
  - Mean absolute difference
  - % estimates for which DCAPM vs. GCAPM closer fit to ex ante
  - Regression of ex ante risk premium estimates against domestic vs. global betas

Findings

- Domestic CAPM performs slightly better on all three dimensions for our sample

Other HMMO Findings:

- Calculates ex ante risk premium estimates for various industries and does some tests
- Utility industry risk premium = 4.15%

Summary Comments (1)

- Use of Ex Ante risk premium estimates based on financial analysts forecasts show some promise
  - They are related to sources of ex ante risk, showing, as expected, a relationship between risk and return
  - On average, this approach yielded a risk premium of 7.1/% over 1982-1998, but this risk premium varies over time

Summary Comments (2)

- I view 7.1% as a comparison to historical-based estimates and as an upper bound
- Given this, and historical evidence, my opinion currently of market risk premium is 5%-6 %. Using Stephen's .85 beta estimate➔

  (1) E(R) utilities = 5% + .85 (6%)=10.1%

  (2) E(R) utilities = 5% + .85 (5%) = 9.25 %
- Ex ante risk premium on ***utilities*** (using dividend growth model) was estimated at 4.15 %➔

E(R) utilities = 5% (rf) + 4.15 % = 9.15%