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THE PRICE OF RISK: WITH EQUITY RISK PREMIUMS, CAVEAT EMPTOR!

Here an ERP, there an ERP….

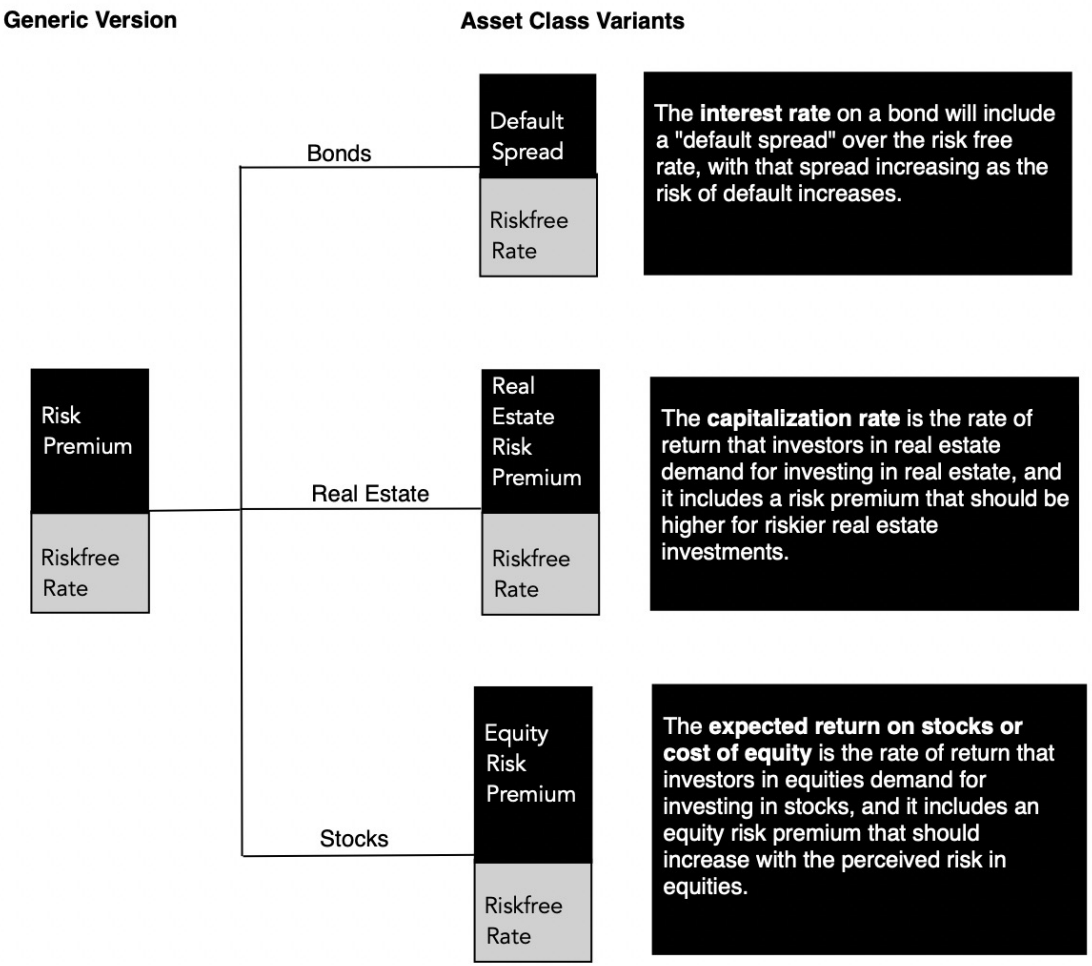
ERP: An Obsession

- If you have been reading my posts for a while, you know that I have an obsession with equity risk premiums, which I believe lie at the center of almost every debate in markets and investing.
- As part of that obsession, at the start of every month, since September 2008, I have estimated an equity risk premium for the S&P 500 and not only used that premium, when valuing companies during that month, but shared my estimate on my webpage and on social media.
- In my last session, on country risk premiums, I used the equity risk premium of 5.00% that I estimated for the US at the start of July 2023, for the S&P 500.

But confusion abounds…

- An article in MarketWatch earlier this year referred to the equity risk premium as an esoteric concept, a phrasing that suggested that it had little relevance to the average investor.
- Adding to the confusion are the proliferation of very different numbers that you may have seen attached to the current equity risk premium, each usually quoting an expert in the field, but providing little context.
- Just in last few weeks, I have seen
  - a Wall Street Journal article put the equity risk premium at 1.1%
  - a Reuters report put it at 2.2%
  - A bearish (and widely followed) money manager estimate the equity risk premium to be negative

ERP: What is it?



ERP: What drives it?

Risk Aversion

Thesis: As investors become more (less) risk averse, equity risk premiums should rise (fall).
Implication: Markets with aging investors should have higher risk premiums that markets with younger investors.

Economic Uncertainty

Thesis: As uncertainty about the economy increases (decreases), equity risk premiums should increase (decrease).
Implication: Equity risk premiums should rise during economic crises, and be higher in younger & growing economies.

Inflation and Interest Rates

Thesis: As inflation rises (falls), uncertainty about inflation will increase (decrease), pushing up (down) equity risk premiums.
Implication: Equity risk premiums should rise during periods of high and volatile infation.

Information

Thesis: As corporate disclosures becomes more (less) informative , equity risk premiums should fall (rise).
Implication: Markets with better disclosure rules and requitements should have lower equity risk premiums that markets without.

Equity Risk Premium

Liquidity and Fund Flows

Thesis: As liquiity increases and funds flow into equity markets, equity risk premiums should decrease.
Implication: Events or actions (crises, regulation) that stymie fund flows and liquidity will increase equity risk premiums

Catastrophic Risk

Thesis: As the likelihood of catastrophic events (low probability events with large consequences) increases, equity risk premiums should rise.
Implication: As investor worries about large consequence events (pandemics, nuclear war) increases, equity risk premiums will go up.

Government Policy

Thesis: Governments that are more capricious, with changing economic rules/policies, will give rise to higher equity risk premiums.
Implication: Equity risk premiums should be higher in countries/markets where there is less continuity in economic policy and regulation.

Central Banks & Monetary Policy

Thesis: Central banks that are less predictable in policy responses and more inconsistent in their actions will push up equity risk premiums.
Implication: As monetary policy becomes more unpredictable, for political reasons or because of inflation, equity risk premiums will rise.

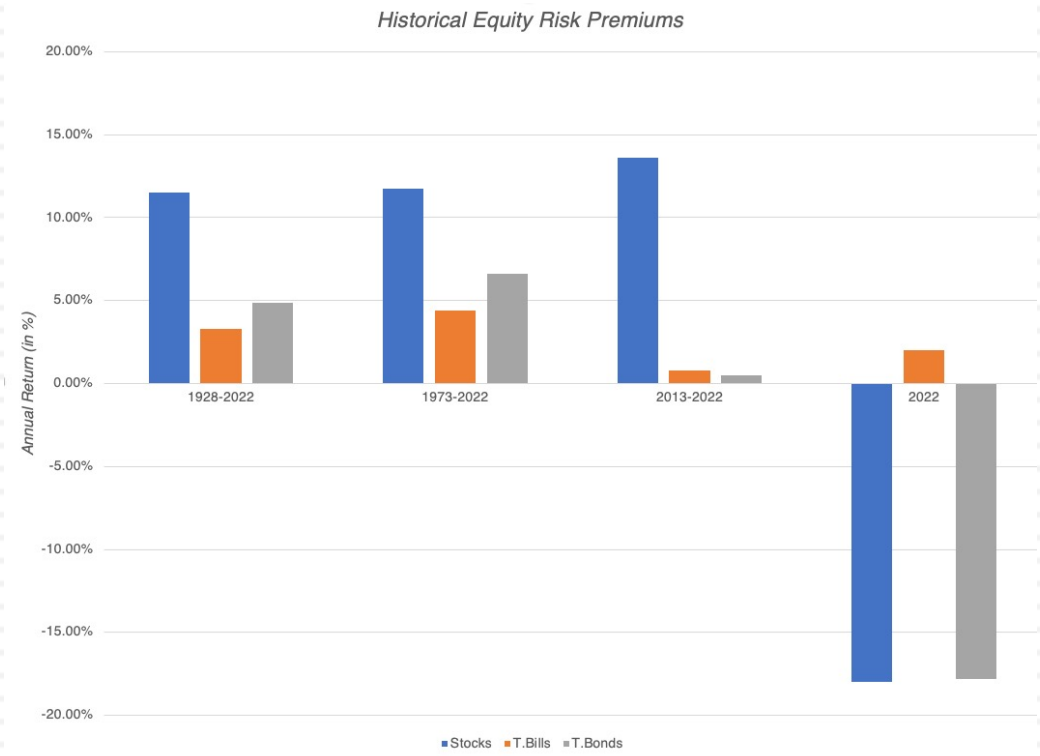
ERP: Why should you care?

1. Market Timing: Any statement about market pricing can be rephrased as a statement about equity risk premiums; if you believe that the equity risk premium, as priced in by the market, has become too low (relative to what you believe is justified, given history and fundamentals), you are arguing that stocks are overpriced (and due for a correction). Conversely, if you believe that the equity risk premium has become too high, you are contending that stocks are cheap, in the aggregate.
2. Stock Picker: When you invest in an individual stock, you are doing so because you believe that stock is trading at a price, below your estimate of its value. However, to make this judgment, you have to assess value in the first place, and while we can debate growth potential and profitability, the equity risk premium becomes an input into the process, determining what you should earn as an expected return on a stock. Put simply, if you are using an equity risk premium in your company valuation that is much lower (higher) than the equity risk premium, priced in by the market, you are biasing yourself to find the company to be under (over) valued.
3. Corporate Finance: The role of the equity risk premium in determining the expected return on a stock makes it a key input in corporate finance, as well, because that expected return becomes the company's cost of equity. That cost of equity is then embedded in a cost of capital, and as equity risk premiums rise, all companies will see their costs of capital rise.

ERP: Measurement

- If the equity risk premium is a market-set number for the price of risk in equity markets, how do we go about estimating it?
- Unlike the bond market, where interest rates on bonds can be used to back out default spreads, equity investors are not explicit about what they are demanding as expected returns when they buy stocks.
- A range of approaches have been used to estimate the equity risk premium:
  - Historical Risk Premium: Use the premium that investors in stocks have earned over history, relative to risk free investment.
  - Historical Returns based Forecasts: Using just historical returns or historical returns combined with a measure of stock cheapness to forecast expected returns on stocks.
  - Earnings Yield (Earnings to Price Ratio): The earnings yield is often used a ”short cut” to estimating the expected return on stocks.
  - Implied ERP: Go the distance with fundamentals and back out an internal rate of return on stocks, given pricing and expected cash flows.

1. Historical ERP



	Arithmetic Average		Geometric Average	
	Stocks - T. Bills	Stocks - T. Bonds	Stocks - T. Bills	Stocks - T. Bonds
1928-2022	8.19%	6.64%	6.36%	5.06%
Std Error	*2.05%*	*2.15%*		
1973-2022	7.33%	5.14%	5.90%	4.12%
Std Error	*2.50%*	*2.75%*		
2013-2022	12.81%	13.08%	11.66%	12.32%
Std Error	*5.31%*	*4.81%*		
2022	-20.03%	-0.18%	-20.03%	-0.18%
Std Error	*NA*	*NA*		

Why it remains the default approach…

- Stability and Precision: The fact that you can compute averages precisely gets translated into the delusion that these averages are facts, when, in fact, they are not just estimates but very noisy ones. For instance, even if you use the entire 94-year time period (from 1928-2022), your estimate for the equity risk premium is that it falls somewhere from 2.34% - 10.94% (Arithmetic average plus/minus two standard errors),
- Bias: It is also true that the menu of choices that you have for historical equity risk premiums, from a low of 4.12% to a high of 13.08%, gives analysts a chance to let their biases play out. After all, if your job is to come up with a low value, all you have to do is latch on to a high number in this table, claim that it is a historical risk premium and deliver on your promise.

Limits of Historical ERP

- Mean Reversion: When using historical equity risk premiums, you are assuming mean reversion, i.e., that returns revert to historic norms over time, though, as you can see, those norms can be different, using different time periods.
- Structural Stability: You are also assuming that the economic and market structure has not changed significantly over the estimation period, i.e., that the fundamentals that determine the risk premium have remained stable.
  - For much of the twentieth century, historical equity risk premiums worked well as risk premium predictors in the United States, precisely because these assumptions held up.
  - With China's rise, increased globalization and the crisis of 2008 as precipitating factors, I would argue that the case for using historical risk premiums has become much weaker.

2. Historical Returns-based Forecasts

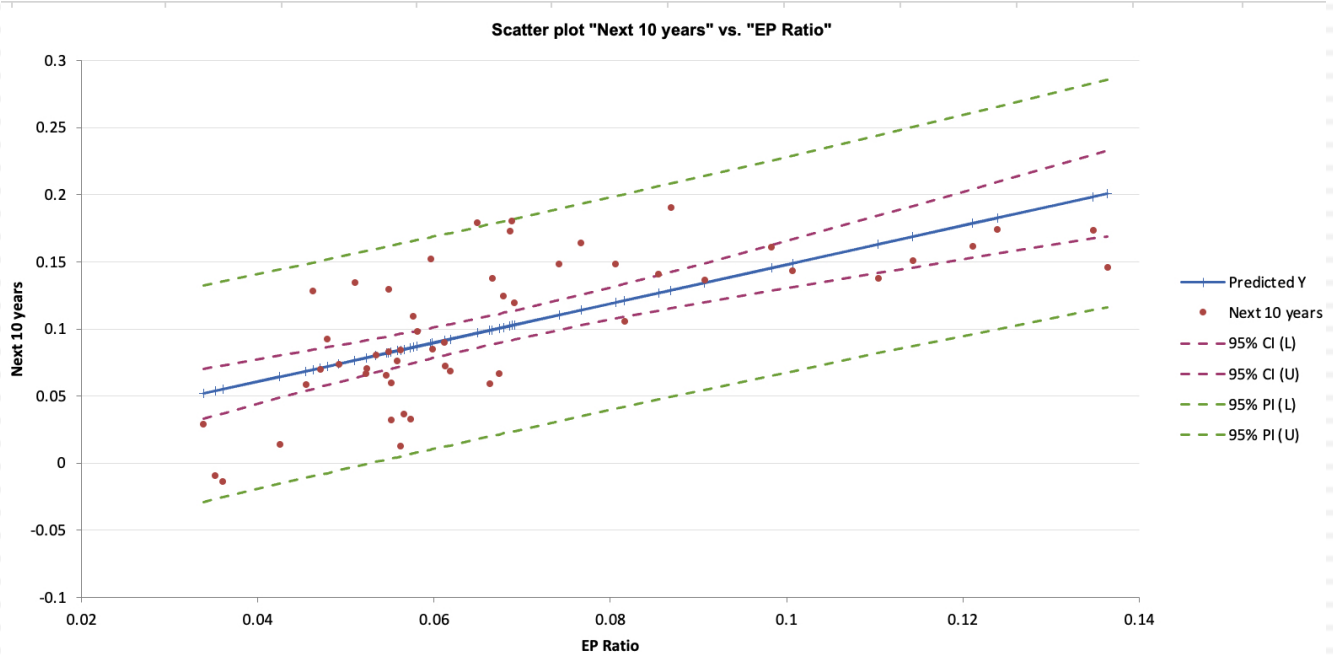
Correlations of Stock Returns over time; 1928 to 2022

This year's return correlated with…	*Correlations*
Next year's return	**-0.0157**
t	-0.1504
p-value (2-tailed)	0.8808
N	94
Compounded Annual Returns in next 5 years	**-0.1503**
t	-1.4265
p-value (2-tailed)	0.1573
N	90
Compounded Annual Returns in next 10 years	0.0241
t	0.2196
p-value (2-tailed)	0.8267
N	85

If stock returns are uncorrelated over time, i.e., this year's annual return tells you nothing about what will happen in the next year, the next 5 years or the next 10 years, you should expect to see zero correlation. A positive correlation would indicate that good year(s) follow good years (momentum), whereas a negative correlation would indicate teh opposite (reversal)

Bottom line: Across the entire time period, there is little evidence of correlation in market returns over time.

EP plus Stock Returns



Next 10 years = 0.00254 + 1.4543 * EP Ratio

ANOVA

	d.f.	*SS*	*MS*	*F*	*p-value*
Regression	1	0.06715	0.06715	44.07158	2.02623E-8
Residual	51	0.0777	0.00152		
Total	52	0.14485			

	Coefficients	*Std Err*	*LCL*	*UCL*	*t Stat*	*p-value*	*H0 (5%)*	*VIF*	*TOL*	*Beta*
Intercept	0.00254	0.01591	-0.0294	0.03448	0.15967	0.87377	*Accepted*			
EP Ratio	1.4543	0.21907	1.01451	1.89409	6.63864	2.02623E-8	*Rejected*	1	1	0.68085
T (5%)	2.00758									

LCL - Lower limit of the 95% confidence interval

UCL - Upper limit of the 95% confidence interval

Using (and misusing) the regression

- You can use the regression, in conjunction with the EP ratio today (4%), to get predictions:
  - Expected Return = .00254 + 1.4543 (.04) = .0607 or 6.07%
  - ERP = 6.07% - 3.97% = 2.10%
- It is worth remembering that the expected return predictions come with error, and the more appropriate use of this regression is to get a range for the expected annual return of 4-8%.
- Extending the regression back to 1928 increases the R-squared and results in regressions that yield predicted stock returns that can be lower than the treasury-bond rate, i.e., a negative equity risk premium.

EP-based Returns: Limits

- Data costs: With the longer time-period predictions, where the predictive power is strongest, the same data is counted multiple times in the same regression. In addition, the longer your time horizon, the more data you lose. With a 10-year time horizon, for instance, the last year that you can use for predictions is 2012, since the EP ratio in that year, will be matched up to the returns from 2013-2022.
- Structural instability: You are assuming that the structural model is stable and that there will be mean reversion. In fact, within this time period (1928 - 2022), the predictive power is far greater from 1928 to 1960 than it is from 1961 to 2022.
- You cannot trade R-squared: While these models tout high R-squared, the number that matters is the standard error of the predictions; predicting that your annual return will be 5% for the next decade with a standard error of 2% yields a range that leaves you, as an investor, in suspended animation. Bluntly put, building a model that explains past returns well does not equate to being able to make money on predictions of returns, and trying to time markets, from this model.

The Fed Model: EP and Cost of Equity

- To the extent that value is driven by expected future cash flows, you can back out an equity risk premium from current stock prices. In the simplest version of this model:

$$\text{Value of Equity} = \frac{\textit{Expected Dividends next year}}{(\textit{Cost of Equity} - g)} = \frac{\textit{Expected Earnings (Payout Ratio)}}{(\textit{Cost of Equity} - g)}$$

- If you assume no growth and that all earnings are paid out as dividends:

$$\text{Value of Equity} = \frac{\textit{Expected Earnings}}{\textit{Cost of Equity}}$$

$$\text{Cost of Equity} = \frac{\textit{Expected Earnings}}{\textit{Value of Equity}} = \textit{EP Ratio}$$

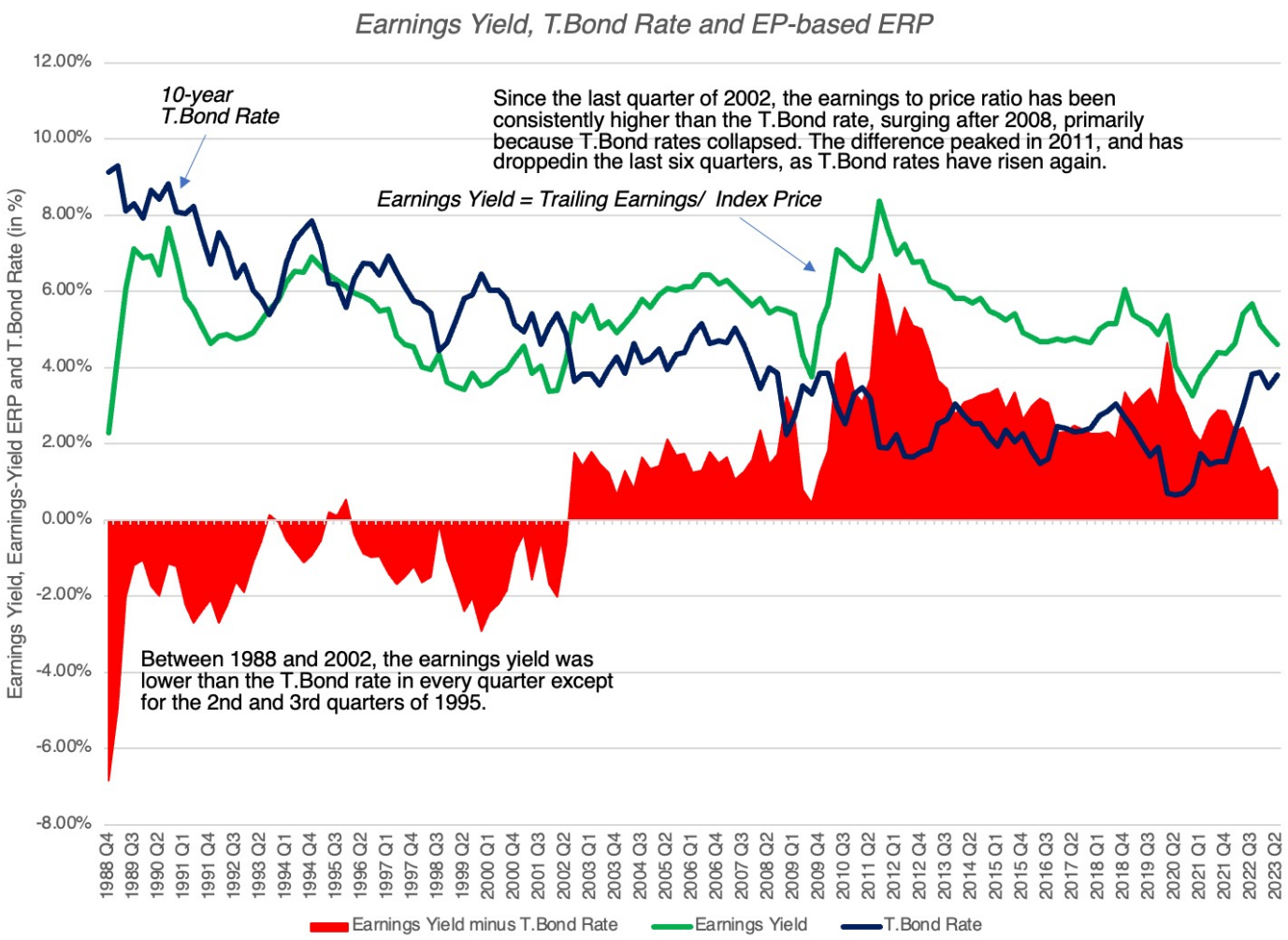
- If you assume firms make no excess returns:

$$\text{Value of Equity} = \frac{\textit{Expected Earnings}\ (1 - \frac{g}{ROE})}{(\textit{Cost of Equity} - g)} = \frac{\textit{Expected Earnings}\ (1 - \frac{g}{\textit{Cost of Equity}})}{(\textit{Cost of Equity} - g)}$$

$$\frac{(\textit{Cost of Equity} - g)}{(1 - \frac{g}{\textit{Cost of Equity}})} = \frac{\textit{Expected Earnings}}{\textit{Value of Equity}}$$

$$\text{Cost of Equity} = \frac{\textit{Expected Earnings}}{\textit{Value of Equity}} = \textit{EP Ratio}$$

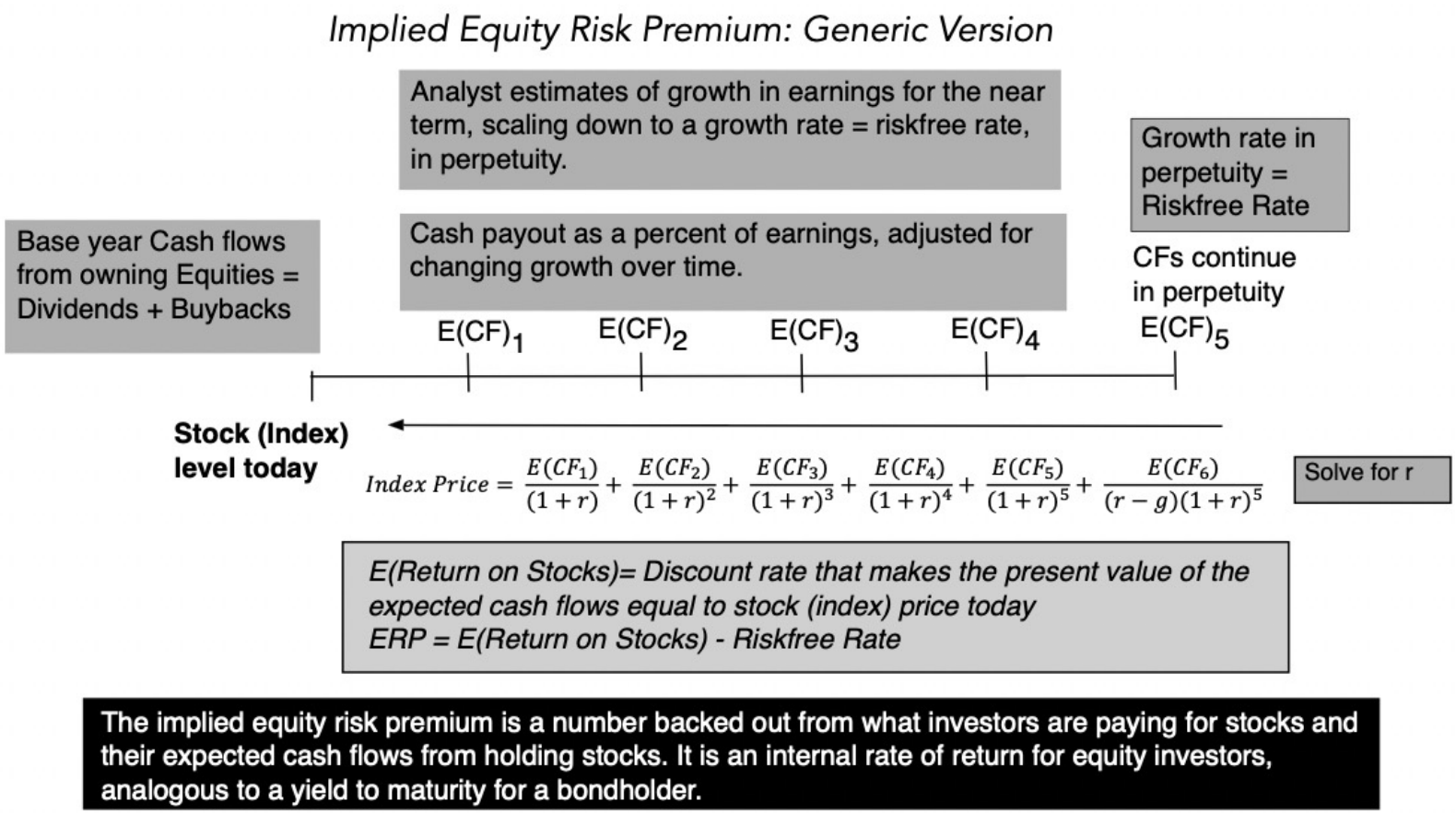
The EP-based ERP



The EP-based ERP: Limits

- My problem with the earnings yield approach to estimating equity risk premiums is that the assumptions that you need to make to justify its use are are at war with the data.
  - First, while earnings growth for US stocks has been negative in some years, it has been positive every decade for the last century, and there are no analysts (that I am aware of) expecting it be zero (in nominal terms) in the future.
  - Second, assuming that the return on equity is equal to the cost of equity may be easy on paper, but the actual return on equity for companies in the S&P 500 was 19.73% in 2022, 17.04% over the last decade and has been higher than the cost of equity even in the worst year in this century (9.35% in 2008).
- *If you allow for growth in earnings and excess returns, it is clear that while the earnings yield will yield too low a value for the ERP, because of these omissions, and will yield negative values in many periods, making it useless as an ERP estimator for valuation.*

4. Implied ERP



On August 1, 2023

In the trailing 12 months, across all companies in the index.

Base year cash flow (last 12 mths)
Dividends (TTM): 68.91
+ Buybacks (TTM): 102.96
= Cash to investors (TTM): **171.87**

Expected earnings/cashflow growth in next 5 years
Earnings based upon analyst estimates for 2023, 2024 & 2025, with earnings growth rate dropping to 3.97% over the following years.

Modified Payout
This computation assumes that the payout ratio changes over time to reflect a sustainable payout ratio = g/ ROE, in the stable growth.
Payout = 3.97%/17.04% = .767 or 76.7%

Actual numbers | Forecasted numbers

	Last 12 months	1	2	3	4	5	*Terminal Year*
Earnings Growth		-0.12%	12.54%	11.65%	7.81%	5.89%	3.97%
Earnings Growth	201.61	**217.83**	**245.15**	**273.71**	295.09	312.47	324.87
Cash Payout Ratio	85.25%	83.54%	81.83%	80.12%	78.41%	76.70%	76.70%
Dividends + Buybacks	171.87	181.98	200.61	219.30	231.39	239.67	249.19

Earnings and Cash flows grow @3.97% (set equal to risk free rate) a year forever.

S&P 500 on 8/1/23= **4588.96**

$$4588.96 = \frac{181.98}{(1+r)} + \frac{200.61}{(1+r)^2} + \frac{219.30}{(1+r)^3} + \frac{231.39}{(1+r)^4} + \frac{236.97}{(1+r)^5} + \frac{249.19}{(r-.0397)(1+r)^5}$$

The last term in this equation is the expected index level at the end of year 5 (capturing price appreciation)

Solve for r

r = Implied Expected Return on Stocks = 8.41%

Minus

Risk free rate = T.Bond rate on 8/1/23= 3.97%

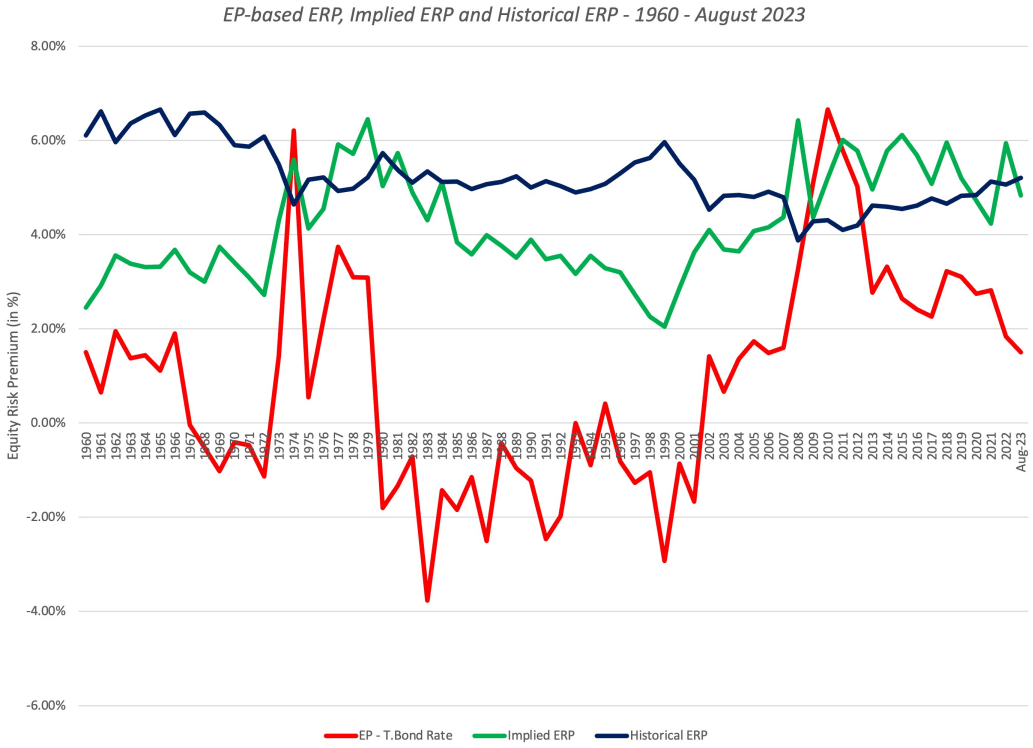
Equals

Implied Equity Risk Premium (8/1/23) = 8.41% - 3.97% = 4.44%

Implied ERP versus EP-based ERP

- To reconcile my estimate of the equity risk premium with the earnings yield approach, set the earnings growth rate to zero and the cash payout to 100%, and you will find that the equity risk premium you get converges on the 0.41% that you get with the earnings yield approach.
- Adding growth and excess returns to the equation is what brings it up to 4.44%, and I believe that the data is on my side, in this argument.
- To the critique that my approach requires estimates of earnings growth and excess returns that may be wrong, I am willing to wager that whatever mistakes I make on either input will be smaller than the input mistakes made by assuming no growth and no excess returns, as is the case with the earnings yield approach.

Picking an Approach for estimating ERP



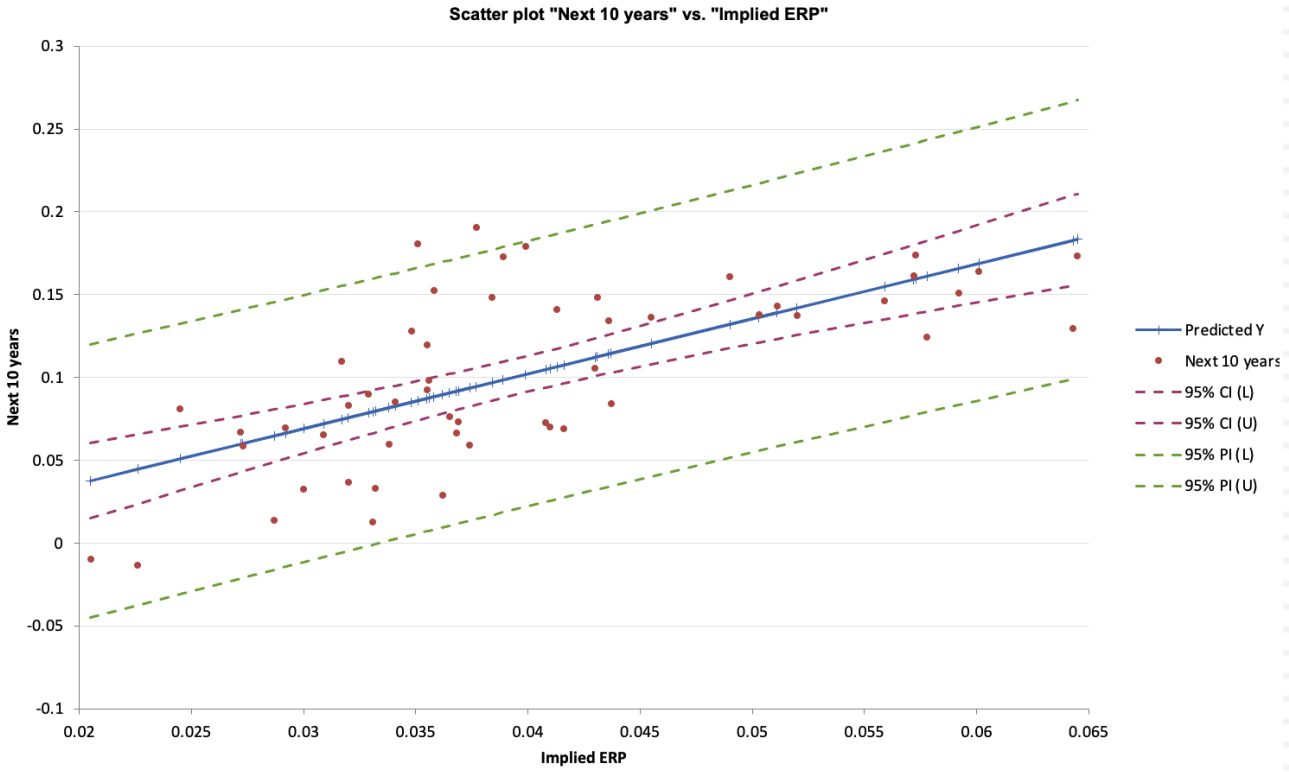
Correlations across ERP Measures

ERP Measure	EP - T.Bond Rate	Implied ERP	Historical ERP
EP - T.Bond Rate	1.0000		
t			
Implied ERP	**0.6085**	1.0000	
t	6.0385		
Historical ERP	**-0.4686**	**-0.6483**	1.0000
t	-4.1764	-6.7039	

The Ultimate Test

	ERP Measures		
Stock Returns	*EP - T.Bond Rate*	*Implied ERP*	*Historical ERP*
Return in next year	0.1124	0.1746	-0.2172
R Std Err	0.0165	0.0162	0.0159
t	0.8759	1.3737	-1.7239
p-value (2-tailed)	0.3846	0.1746	0.0899
N	62	62	62
Annual Returns - Next 5 years	0.1093	**0.4673**	**-0.4458**
R Std Err	0.0176	0.0140	0.0143
t	0.8229	3.9554	-3.7264
p-value (2-tailed)	0.4140	0.0002	0.0005
N	58	58	58
Annual Returns - Next 10 years	0.1736	**0.6713**	**-0.5509**
R Std Err	0.0190	0.0108	0.0137
t	1.2590	6.4678	-4.7143
p-value (2-tailed)	0.2138	0.0000	0.0000
N	53	53	53
Correlations in bold are significant at the 5% level (2-tailed).			

With a caveat..



	Coefficients	Std Err	LCL	UCL	t Stat	p-value	H0 (5%)	VIF	TOL	Beta
Intercept	-0.03037	0.02117	-0.07287	0.01213	-1.43446	0.15754	*Accepted*			
Implied ERP	3.31361	0.51232	2.28507	4.34214	6.46779	3.77004E-8	*Rejected*	1.	1.	0.67128
T (5%)	2.00758									
LCL - Lower limit of the 95% confidence interval										
UCL - Upper limit of the 95% confidence interval										

ERP: Concluding Thoughts..

1. There is a true ERP: The fact that the the true equity risk premium is unobservable does not mean that it does not exist. In other words, the notion that you can get away using an equity risk premium you want, as long as you have a justification and are consistent, is absurd.
2. Not all estimation approaches are created equal: While there are many approaches to estimating the equity risk premium, and they yield very different numbers, some of these approaches have more heft, because they offer better predictive power.
3. Your end game matters: I am not a market timer and estimate an equity risk premium primarily because I need it as an input in valuation and corporate finance. That requires an approach that yields positive values (ruling out the EP-based ERP) and moves with with stock returns in subsequent periods (eliminating historical ERP).
4. Market timers, beware: If you are using equity risk premiums or even earnings yield for market timing, recognize that having a high R-squared or correlation in past returns will not often translate into market-timing profits, for two reasons.
    1. First, the past is not always prologue, and market and economic structures have shifted, undercutting a key basis for using historical data.
    2. Second, even if the correlations and regressions hold, you may still find it hard to profit from them, since you (and your clients, if you are a portfolio manager) may be bankrupt, before your predictions play out.