An economic, empirical, and emerging perspective on the equity risk premium

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7. Summary and conclusion

Investing in equity has historically provided investors with a return above what could rationally be expected. This is the claim Mehra and Prescott [1985] put forth two decades ago. Neoclassical theory is unable to explain why the return on risky equity has exceeded the risk free rate of return by so much. It must be that either consumers do not behave as theory predicts or it is an empirical issue, possibly arising only for a particular sample period or country. We started our study on the equity risk premium with an overview of the literature. In Chapter 2 we demonstrated that the excess return equity has enjoyed over bonds is fairly stable across time and that the same phenomenon is observable in many developed economies.

There are several ways to improve the basic equity risk premium model. We have listed some and shown that the most promising studies focus on either market inefficiencies or on changes to the standard utility framework. The inability of young agents to borrow and invest in equity markets is an important argument for the high excess return of equity. Habit persistence could be a reasonable alternative explanation. Whilst these theoretical advances go a long way towards solving the equity risk premium puzzle, the puzzle still remains. No current model generates the equity premium with a low and relatively constant interest rate, low risk aversion, predictability of equity returns and consumption that is roughly a random walk. This leads some to argue that any hope of tickling, or torturing, some reasonable measure of the risk premium out of consumption data is forlorn; it resides on the hope that investors are rational. We did not dwell much on irrationality issues, but note that progress in the field of behavioural finance is leading to some promising results.

On the empirical side, the magnitude of the excess return is independent of the choice of the sample period as Siegel [1992,1998] shows. Moreover, it is robust to the selection of developed markets (eg, Campbell [1999] and Dimson et al. [2001]). However, one of the arguments for the high excess returns on equity is that we all study successful and developed equity market(s); in effect this boils down to picking a biased sample since the rate of success might not have been expected ex ante. Major advances in the empirical research on equity markets have used fundamentals (dividends and/or earnings) as a guide for expected equity return.

Fama and French [2002] have forcefully demonstrated that unconditional expected equity returns on US equity markets have been far shy of the actual returns received. Especially in the post-war period actual equity returns were far higher than reasonably should have been expected. We concluded Chapter 2 by reviewing the literature using fundamentals to generate the ERP.

In Chapter 3 we modelled the equity risk premium in a long-run theoretical growth model to identify its driving forces. When we assume heterogeneity between equity and bonds, due to voting power and inflation, several factors can be shown to affect the ERP in theory: depreciation, marginal utility of consumption and leisure. Using a cross-sectional data set we find that the ERP is primarily determined by productivity growth, population growth and inflation.

In Chapter 4 we built upon the economic research of Bernanke et al. [1999] and incorporated equity into a theoretical business cycle model. It can be argued that changes in equity prices amplify the business cycle and raise inflation via wealth effects and collateral effects. This would justify the devoted attention of central bankers. In a dynamic New Keynesian business cycle framework we added stochastic bubbles in equity markets and found that simple inflation targeting is sufficient to smooth inflation and growth. There is no need to target equity prices directly. However, the results do not mean that equity markets are irrelevant to policy makers, as the effects of leverage are substantial in a business cycles framework. If policy makers are concerned about the detrimental after-effects of equity bubbles, attention should be directed towards credit.

From Chapter 5 onwards we were interested in the relevance of the predictability of equity returns for finance practitioners. By examining long-term data for the United States equity markets and contrasting these data with that of other major markets, we saw that investors in US equity have been fortunate. In none of the other major developed markets has the excess return been so far above expectation. One of the main reasons for these excess returns has been the change in valuation ratios. We demonstrated that valuation ratios are mean reverting processes and can be used as a guide to expected return. The longer the investment horizon, the better the predictability of valuation ratios for subsequent equity returns. Scaling equity prices by trend earnings (ie, the past 10-year earnings in order to eliminate business cycle effects) explains 30% of the variability of total real equity returns

over a 10-year investment horizon in the sample period 1881 – 2003. For investors, this is a deep insight, which should guide their strategic asset allocation decisions. We also shattered a widespread misconception that plagues many investors: the conventional view that models that compare the earnings yield and the bond yield add value to the investment process. Such models are theoretically flawed, do not pass the empirical tests, and long-term investors should ignore them.

The main message is that absolute valuations are a prime determinant of future returns; historical returns are a poor guide for the future. Seeing that current valuations are far above their long-term averages does not bode well for equity returns. We hold the view that the recent revaluation of equity is only transitory. Mean reversion will bring valuation ratios back in line with the historical norm. History suggests that this can be achieved via a period of stagnating prices and rising earnings (see 1900 – 1920), or that prices will fall (see 1930).

Chapter 6 extended the equity risk premium work to emerging markets. First our study on emerging markets showed that excess returns in those markets, measured in US$ terms, surpass those of developed markets. This even holds after correcting for the standard deviation of excess return. However, we also note that standard risk measures do not capture fully the perceived risks of investors. If things go wrong, the damage is severe and the "true" risk in emerging markets is only laid bare when downside risk measures are used. Investors looking to take advantage of the excess returns should keep that in mind. It is also noted that excess returns in those markets are varying across time and correlated with the global economic cycle. Excess returns in emerging markets seem to be cyclically determined, not structural; there is no evidence of a difference in excess return arising from liberalisation.

Next we applied the notion that valuation ratios predict subsequent returns to emerging markets. We showed that in a cross-section of emerging market countries a portfolio of value (low price-to-book) countries outperforms a portfolio of growth (high price-to book) countries. Moreover, we link this superior performance to the development of several macroeconomic indicators and show that investors in emerging market countries seem to extrapolate past economic developments.

7.1 Implications of low expected equity returns

It is evident that understanding the process driving the equity risk premium is crucial for progress in many important problems in (financial) economics. We need a reliable ERP for proper asset allocation, we must apply appropriate hurdle rates for investments, and we should value asset markets accurately. This section offers two final thoughts on some practical implications.

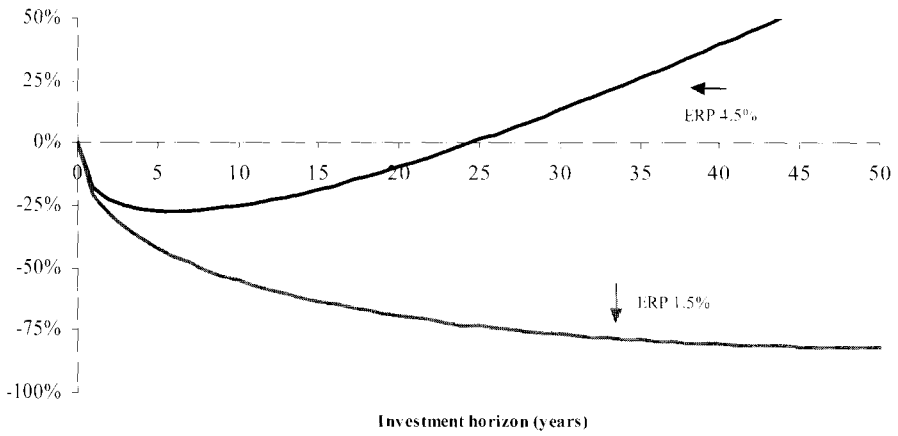
First, following two decades of enormously favourable equity returns, valuation ratios are stretched: US dividend yields are at historic lows and price-to-earnings ratios are at least one standard deviation above their long term average. Where does this leave expected equity returns? Based on the data available at the end of 2003 and the methodologies outlined in this thesis, we can only conclude that equity returns will be below average and investors face a slender ERP. All approaches lead to broadly similar conclusions:

1. The trend earnings yield is around 3.7%, which, based on the estimation results linking earnings yield and subsequent returns (see Table 5.7), caps real total equity returns for the coming 10 years at roughly 3%. With a real 10-year bond yield of around 2%, this leads to an ERP of only 1%.
2. Combining dividend yield (1.6%) and earnings growth (for lack of a reliable estimate for future growth we take the historical average of 1.6% from Table 5.2) results in an expected real total equity return of 3.2%. It must be stressed that we abstract from changes in valuation ratios. If one further assumes that the price-to-trend-earnings ratio will revert back to its historic mean (or worse), equity returns will be even lower. Combined with the real bond yield, this leads to an ERP of 1.2%.
3. Finally, the Rozeff [1984] method of using the dividend yield as the best proxy for the equity risk premium results in an ERP of 1.6%.

The implications from this lower equity risk premium are substantial. By way of illustration we replicate Figure 1.1, which calculated the worst possible outcomes for an ERP based on our [provocatively labelled] 'sensible' equity returns. With this 1.5% ERP, the worst reasonable outcome would never get much worse than -82%!

Equity returns would finally surpass bond returns with 95% confidence after a long wait of 220 years. Naturally, if you're willing to settle for an 80% or 90% confidence level, the time span will be shorter.

Figure 7.1: Worst possible outcomes for a sensible ERP.
The figure gives the worst possible (5th percentile) outcomes at different investment horizons for our best estimate of the ERP (1.5%). It is the left tail of a probability distribution showing the excess return of equity to bonds. Investors have a 95% chance of seeing better returns on equity. For comparison, we also graph an ERP of 4.5%, which is the historical excess return on equity. Both probabilities are calculated using the same standard deviation of 13.5%, the historical standard deviation of excess returns in US data for the period 1871 – 2003. The algorithm used to generate the 5th percentile in year t is: t*ERP–1.645*13.5%*$\sqrt{t}$.



The implied low expected equity returns combined with low dividend yield are even more profound for investors in the spending phases of the life cycle. In extremis, investors might end up in a position where they need to draw down their capital base for consumption if returns are insufficient. Here investors care about short-term volatility and, as Benartzi and Thaler [1995] show, loss aversion is then unavoidable. When expected returns are low having a long investment horizon is an illusion. An example might be illustrative. Consider the case of a hypothetical insurance company that has (mostly) guaranteed liabilities with a long duration. In order to match these liabilities the assets need to have a long duration and tend to be invested in bonds, which currently matches the duration, but does not ensure that

returns are sufficient to meet the liabilities. The insurance company needs to add equity to capture the equity risk premium. In a world with low expected equity return the probability of a large (-10%) negative excess return in a particular year rises substantially (see Table 7.1) compared to the probabilities calculated using historical returns (see Table 1.1). When negative returns occur, the insurance company finds itself in a position where current cash flows cannot be met and needs to draw down or replenish capital. In a position where the regulator is increasingly forcing companies to mark-to-market their assets, investors care about the short-term volatility and the evaluation horizon shortens. So even while equity is likely to return more than bonds in the long run, the probability of a negative return might force long-term investors out of the equity markets for fear of short term losses. Policy makers should keep this in mind when setting rules for solvency.

Table 7.1: Probability of loss with sensible returns.
In this table we report the probabilities of a 10% loss of equity relative to bonds as defined by a (A) average annual loss, (B) cumulative loss, (C) loss of at least 10% in at least one period and (D) cumulative loss of 10% at some point. Returns are based on an equity risk premium of 1.5% and standard deviation of 13.5%, the historical standard deviation of excess returns in US data for the period 1871 – 2003. For detailed algorithms see Kritzman [2000].

Horizon (years)	A	B	C	D
1	18.63%	18.63%	18.63%	39.79%
2	10.37%	23.92%	33.79%	53.05%
3	6.13%	26.01%	46.13%	59.49%
4	3.73%	27.01%	56.16%	63.44%
5	2.31%	27.51%	64.33%	66.18%
10	0.24%	27.49%	87.28%	73.03%
20	0.00%	25.10%	98.38%	77.77%

Second, low expected returns will cause a revolutionary change in the asset management industry. It will be pushed more towards absolute return (alpha) strategies. Anson [2004] divides the asset allocation decision into two asset classes: beta drivers and alpha drivers. Beta drivers, which provide broad economic exposure to the financial markets, are established by the strategic asset allocation decision. Alpha drivers are designed to provide added return beyond the return offered through passive exposure to the financial markets. Alpha drivers, chosen as part of the tactical asset allocation decision, are designed to facilitate the investment objectives by seeking added value. When expected returns are low, benchmark

(beta) returns are low and beta drivers are insufficient. As the example above shows, meeting investment objectives with strategic asset allocation alone is problematic.[36] In a low return environment the need for active management of (equity) portfolios increases (Bernstein [2003b] and Molinas [2003]). Broadly speaking, there are two ways of achieving this: the first focuses on absolute returns (Kneafsey [2003]) and the second on market timing (Bernstein [2003a]), or tactical asset allocation. Kneafsey's view is that the asset management industry should get rid of benchmarks, ending their almost sacrosanct status. Bernstein argues that, with the trend from ever-rising valuations gone (and likely in reverse), the cycle gets more important. Investing over the business cycle and timing the markets are crucial.

The importance of active management is clear, but so are the risks. During the 1980s and 1990s the need for an extra percentage point via active management was negligible on the total returns achieved. In addition, actual returns have been higher than what could reasonably have been expected. It was easy to meet investment targets even if one was wrong in one's forecast or asset allocation because returns were forgiving. Nowadays, in a world of low expected returns, the extra active percentage point is really needed and could decide whether liabilities are met or not. However, the risks of active management have also risen; it could well precipitate insolvency. Not making the returns needed and failing to meet liabilities is precarious; large forecast errors and/or asset allocation mistakes may be disastrous.

7.2 Research agenda

A wide range of different topics has been covered in this study. In our view three topics are promising, thought provoking, and deserve future research. First, in our study on the issue of equity in monetary policy we noted that several observers claim that bubbles will automatically unravel, limiting social costs. More studies on how bubbles are formed and prolonged are probably needed and a link with

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[36] Bernstein [2003a] provocatively states that policy portfolios are obsolete. Kneafsey [2003] thinks that this is pushing it too far. His view is that policy portfolios are simply mismanaged as they need to satisfy two objectives (match liabilities and add value) in one. In his view the decisions should be separated. First you match liabilities. Next you add value via a range of alpha type products.

structures in the asset management industry bears thinking about. A bubble reflects, among other things, a lack of stabilising speculation. The rise of index tracking has been a boon for retail investors, but not for the wider market place since index trackers are the opposite of contrarians. For them, as far as equity market valuations are concerned, what is is right. And then, of course, we have closet indexing, which reflects the portfolio managers' desire to minimise business risk (tracking error versus the index). As well as being a dereliction of fiduciary duty, this is an opt-out from the stabilising speculator's role. The structure of the asset management industry is such that while you can identify a bubble, the pressure for short-term performance still pushes the bubble to more extremes (see Montier [2004]). It might well be the case that the private sector knows it is a bubble, but that it does not unravel because momentum and agency theory prolong and extend overvaluation even when investors are fully aware of it. It is still uncertain what the eventual social costs of the 1990s bubble and subsequent collapse in the first decade of the 21st century will be. However, instead of damage control in the post bubble world, it would be fascinating to study the breeding ground conditions because most observers agree that bubbles are undesirable. Is it possible to contain bubbles by changing the rules of the game?

Second, related to this debate on monetary policy is the importance of the financial structure. It was noted that there is no need for policy makers to target equity prices directly, but that this should not be taken as a sign to ignore them completely. Various authors have argued that differences in financial structure lead to substantial differences in monetary policy transmission mechanism with bank based economies being more volatile in comparison to market-based economies due to lack of alternative financing (BIS [1995], Kashyap and Stein [1997] and Cecchetti [1999] provide evidence for the EMU). We have just lived trough one of the biggest equity bubbles of all times. Yet it has not (yet) been followed by a financial crisis. Why? What was different was the spread of equity holdings among a wide spectrum of economic agents. This reduces the risk of systemic banking problems. To us, this suggests that policy makers should encourage open and transparent markets, deeper financial markets, and risk spreading among more investors. Greenwald and Stiglitz [2003] have noted that alternative sources of finance are key and equity rationing should be minimised. It might be argued that

policy makers should be touting the virtues of equity to supplement bank lending. Linking financial structure with monetary policy will remain an interesting topic for further studies.

Third, future research should be aimed at delving deeper into the demographic aspects of equity markets. The ERP is not a single number but a quantity that varies though time with demographics and evolutionary phenomena. It is also not a universal concept like the speed of light or gravity. There are two avenues along which to proceed. First there is the evolutionary approach which states that the ERP is determined by the nature of the specific population at hand, whose risk preferences are determined by their collective past experiences in a path-dependent way. Someone brought up in the midst of the Great Depression will be less inclined to buy the dips as opposed to someone whose risk preferences were shaped in the 1980s and 1990s. The point is that the history of market conditions and economic cycles determines the risk preferences of individuals in the market place today. How likely is it that the experiences change over the next 10 years when the population changes? Second is the issue of supply and demand in an aging society. Within the developed world, a whole cohort of baby boomers is and will be retiring from the labour force. This view has led Poterba [2001] and Arnott and Casscells [2003] to sound the alarm bell. More retirees than ever before will be selling assets to a proportionately smaller roster of potential buyers. Demographics that arguably played a part in the bull market will now cap future returns. Geanakoplos et al. [2002] have examined the predictability of equity returns from this approach.

This study has examined equity markets from several non-exclusive angles; for a deeper understanding of the drivers of equity markets a wide range of topics is important. The risks and rewards of equity are determined in a melting pot that includes pure macroeconomics, valuation theory, psychology and demographics. The quest for the answer to the equity risk puzzle continues. Since the study of economics and of financial markets remains a study of human behaviour, we doubt a definitive answer will ever be found. Luckily, that ensures that equity markets will remain as exciting as ever.