The Equity Premium in India

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January 06

Prepared for the *Oxford Companion to Economics in India* edited by Kaushik Basu

The *equity premium* is the return earned by a risky security, such as a stock, *in excess* of that earned by a risk free security, such as a Treasury Bill. It is a crucial input into financial decisions such as asset allocation, capital budgeting and planning for retirement.

Historical data provide a wealth of evidence documenting that over long periods of time, stock returns have been considerably higher than returns for T-bills. As **Table 1** shows, the average annual real return (that is, the inflation-adjusted return) on the U.S. stock market for the past 115 years has been about 7.5 percent. In the same period, the real return on a relatively riskless security was a paltry 1.0 percent.

Table 1.
U.S. Returns, 1802–2004

	Mean Real Return		
Period	Market Index	Relatively Riskless Security	Risk Premium
1802–2004	6.9%	2.9%	4.0%
1889–2004	7.5	1.0	6.5
1926–2004	8.0	0.7	7.3
1947–2000	7.5	0.5	7.0

The difference between these two returns, 6.5 percentage points, is the *equity premium*. This statistical difference has been even more pronounced in the post-World War II period. Data on U.S. stock and bond returns going back to 1802 reveal a similar, although somewhat smaller, premium for the past 200 years.

Furthermore, this pattern of excess returns to equity holdings is not unique to U.S. capital markets. **Table 2** documents that equity returns in other developed countries also exhibit this historical regularity when compared with the return to riskless debt holdings.

Table 2
Returns for Selected Developed Countries

		Mean Real Return		
Country	Period	Market Index	Relatively Riskless Security	Risk Premium
United Kingdom	1947–1999	5.7%	1.1%	4.6%
Japan	1970–1999	4.7	1.4	3.3
Germany	1978–1997	9.8	3.2	6.6
France	1973–1998	9.0	2.7	6.3
Sweden	1919-2003	11.1	5.6	5.5
Australia	1900-2000	13.3	4.6	8.7

The annual return on the U.K. stock market, for example, was 5.7 percent in the post-WWII period, an impressive 4.6% premium over the average bond return of 1.1 percent. Similar statistical differences have been documented for France, Germany, and Japan. And together, the United States, the United Kingdom, Japan, Germany, and France account for *more than 85 percent of capitalized global equity value.*

Table 3 details the equity premium for India for the "post liberalization" period, using both the BSE 100 and the Sensex index as a proxy for the return on equity. Since

participation in the T-bill market was highly regulated before 2000, we report the equity premium relative to the Bank Deposit Rate, using the later as a proxy for the return on a risk free security.

Table 3
India Returns, 1991-2004

	Relatively Riskless Security	BSE 100	Equity Premium (BSE 100)	Sensex	Equity Premium (Sensex)
Mean Real Return %	1.28	12.6	11.3	11.0	9.7
Standard Deviation %	1.73	37.2	37.7	32.6	33.2

For the period prior to 1991 reliable data on dividend yields is not available. In Table 4, we report the equity premium using the average annual stock price index as documented and reported by the Reserve Bank of India.

Table 4
India Returns, 1984-1991

	Relatively Riskless Security	BSE 100	Equity Premium (BSE 100)
Mean Real Return %	1.13	22.4	21.3
Standard Deviation %	0.74	28.1	27.9

We illustrate the dramatic investment implications of the differential rates of return in **Tables 5** and **6. Table 5** shows the enormous disparity in capital appreciation of $1 invested in different assets in the U.S for various time periods.[1] **Table 6** displays a similar analysis for India

Table 5.
Real Terminal Value of $1 Invested

Investment Period	Stocks	T-Bills	Ratio
1889–2004	$4092.36	$3.14	1,303.30
1926–2004	$407.56	$1.67	244.05
1947-2004	$61.70	$1.33	46.39

Table 6.
Real Terminal Value of Rs 1 Invested

Investment Period	Stocks (BSE 100)	Bank Deposit	Ratio
1984–2004	Rs 19.25	Rs 1.28	15.04
1991–2004	Rs 4.68	Rs 1.18	3.97

One can gain additional insights by examining what these differential rates imply for the time it takes to double one's money. Using rates in India over the 1991-2004 period, the doubling period for investments in stocks is about 6 years compared to about

[1]The calculations in Table 5 assume that all payments to the underlying asset, such as dividend payments to stocks and interest payments to bonds, were reinvested and that no taxes were paid.

55 years for investments in a risk free asset. This kind of long-term perspective underscores the remarkable wealth-building potential of the equity premium and highlights why it is of central importance in portfolio allocation decisions, in making estimates of the cost of capital, and in the current debate about the advantages of investing Social Security Trust or retirement funds in the stock market.

A Premium for Bearing Risk?

Why has the rate of return on stocks in India and other countries been significantly higher than the rate of return on relatively risk free assets? An intuitive answer is that stocks are "riskier" than bonds and investors require a premium for bearing this additional risk. Indeed, the standard deviation of the returns to stocks in India (about 30 percent a year historically) is larger than that of the returns to T-bills (about 2 percent a year), so obviously, stocks are considerably riskier than bills.

But are they? **Figure 1** illustrates the variability in the annual real rate of return on the BSE 100 Index while **Figure 2** shows the variability of a relatively risk free security over the 1991–2004 period.

Figure 1
Real Return -- BSE 100

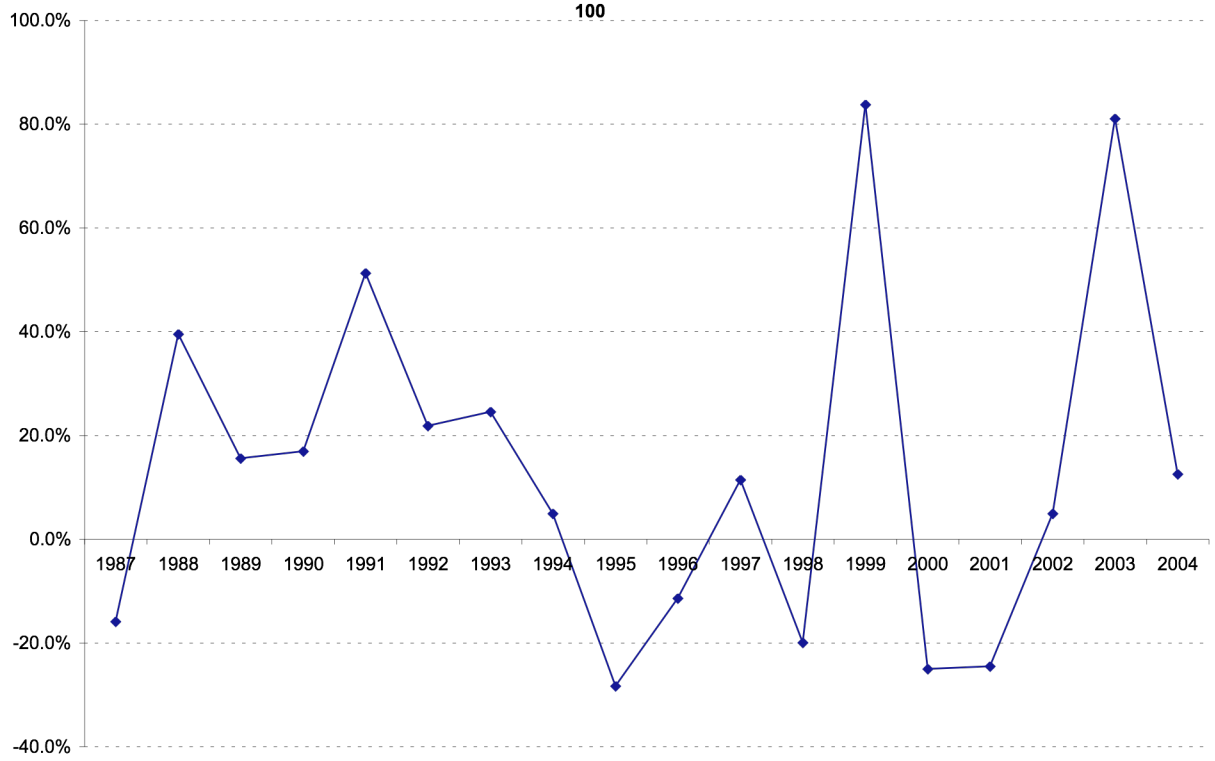
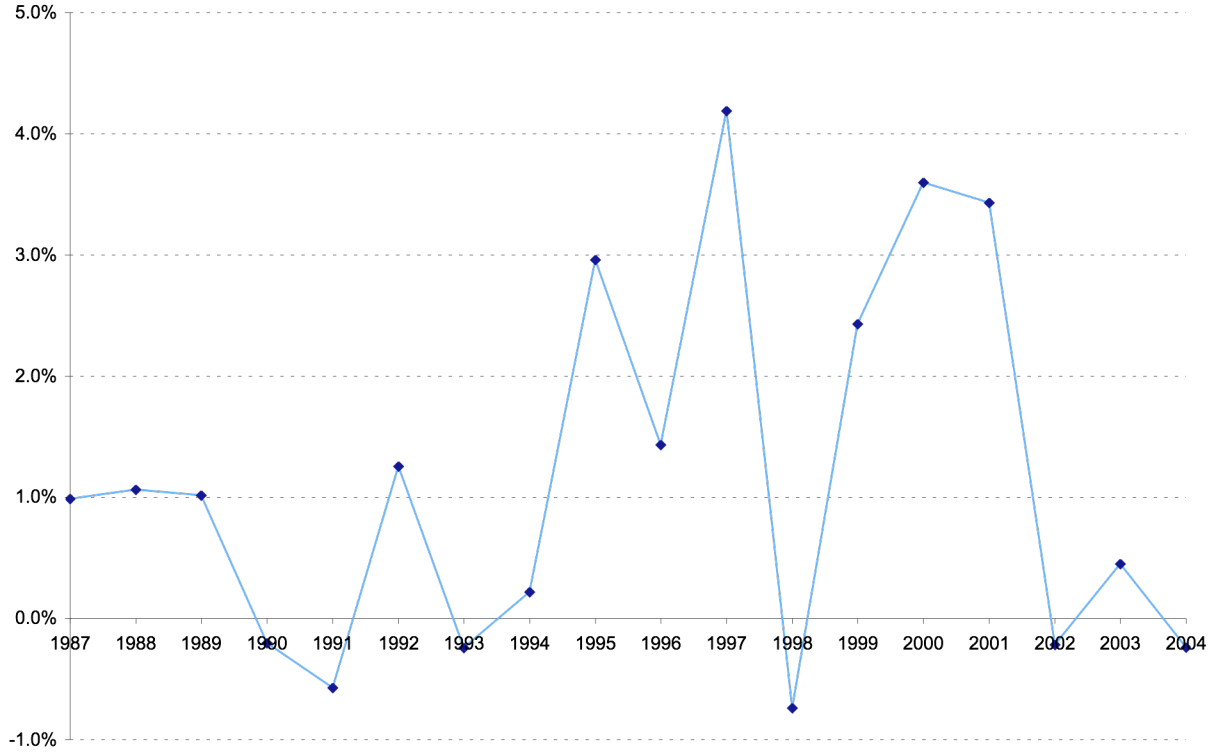


Figure 2
Commercial Bank Deposit Rate



To enhance and deepen our understanding of the risk-return trade-off in the pricing of financial assets, we make a detour into modern asset pricing theory and look at why different assets yield different rates of return. The deux ex machina of this theory is that assets are priced such that, ex-ante, the loss in marginal utility incurred by sacrificing current consumption and buying an asset at a certain price is equal to the expected gain in marginal utility contingent on the anticipated increase in consumption when the asset pays off in the future.

The operative emphasis here is the *incremental loss or gain* in well being due to incremental consumption, which must be differentiated from the incremental consumption itself. This is because the *same* amount of incremental consumption may result in different degrees of well-being at different times. A five-course dinner after a heavy lunch, for example, yields considerably less satisfaction than a similar dinner when one is hungry!

As a consequence, assets that pay off when times are good and consumption levels are high, i.e. when the incremental value of additional consumption is low, are less desirable than those that pay off an equivalent amount when times are bad and additional consumption is both desirable and more highly valued.

Let us illustrate this principle in the context of the standard, popular paradigm, the Capital Asset Pricing Model (CAPM). This model postulates a linear relationship between an asset's 'beta', a measure of systematic risk, and expected return. Thus, high

beta stocks yield a high-expected rate of return. That is so because in the CAPM, good times and bad times are captured by the return on the market. The performance of the market as captured by a broad based index acts as a surrogate indicator for the relevant state of the economy. A high beta security tends to pay off more when the market return is high, that is, when times are good and consumption is plentiful; as discussed earlier, such a security provides less incremental utility than a security that pays off when consumption is low, is less valuable to investors and consequently sells for less. Thus assets that pay off in states of low marginal utility will sell for a lower price than similar assets that pay off in states of high marginal utility. Since rates of return are inversely proportional to asset prices, the latter class of assets will, on average, give a lower rate of return than the former.

Another perspective on asset pricing emphasizes that economic agents prefer to smooth patterns of consumption over time. Assets that pay off a relatively larger amount at times when consumption is already high, "destabilize" these patterns of consumption, whereas assets that pay off when consumption levels are low, "smooth" out consumption. Naturally, the latter are more valuable and thus require a lower rate of return to induce investors to hold these assets. (Insurance policies are a classic example of assets that smooth consumption. Individuals willingly purchase and hold them, in spite of their very low rates of return.)

To return to the original question: are stocks so much more riskier than bills so as to justify a 7% differential in their rates of return as observed in the U.S?

What came as a surprise to many economists and researchers in finance was the conclusion of a research paper that Edward Prescott and I wrote in 1979. Stocks and bonds pay off in approximately the same states of nature or economic scenarios and hence, as argued earlier, they should command approximately the same rate of return. In fact, using standard theory to estimate risk-adjusted returns, we found that stocks in the U.S on average should command, at most, a 1% return premium over bills. Since, for as long as we had reliable data, (about a hundred years), the mean premium on stocks over bills was considerably and consistently higher, we realized that we had a puzzle on our hands. It took us six more years to convince a skeptical profession and for our paper " The Equity Premium: A Puzzle" to be published. (Mehra and Prescott (1985)).

For the purpose of this article, I have done a similar analysis for India using the data in Table 6, which contains the sample statistics for the Indian economy for the 1991–2004 period.

Table 6
Indian Economy Sample Statistics, 1991–2004

Statistic	Value
Risk-free rate, R_f	1.0128
Mean return on equity, $E(R_e)$	1.126
Mean growth rate of consumption, $E(x)$	1.0227
Standard deviation of growth rate of consumption, $\sigma(x)$	0.0224
Mean equity premium, $E(R_e) - R_f$	0.113

I find that the theoretical equity premium should be in the range 0.02% to 0.16% if the coefficient of risk aversion is varied from 2 to 10. Since the observed risk premium in India is an order of magnitude more, we have a puzzle with respect to Indian data as well.

I want to emphasize that the equity premium puzzle is a *quantitative* puzzle. Standard theory is qualitatively consistent with our notion of risk: stocks do, on average, return more than bonds in the theoretical model. The puzzle arises from the fact that the quantitative predictions of the theory are an order of magnitude different from what has been historically documented. The puzzle cannot be dismissed lightly because much of our economic intuition and policy directives are based on the very class of models that fall short so dramatically when confronted with financial data. It underscores the failure of paradigms central to financial and economic modeling to capture the characteristic that appears to make stocks comparatively so risky. Hence, the viability of using this class of models for any quantitative assessment—for example, to gauge the welfare implications of alternative stabilization policies—is thrown open to question.

For this reason, over the past 20 years or so, attempts to resolve the puzzle have become a major research impetus in finance and economics. Several generalizations of key features of the Mehra–Prescott (1985) model have been proposed to reconcile observations with theory, including alternative assumptions about preferences, modified probability distributions to admit rare but disastrous events, survivorship bias,

incomplete markets, and market imperfections. None have satisfactorily resolved the puzzle.

Recently some researchers and analysts that ex-ante equity premium is likely to be low. The data used to document the equity premium (over the past 100 years in some instances) represents as reliable an economic data set as analysts have, and 100 years is long series when it comes to economic data. Before the equity premium is dismissed, not only do researchers need to understand the observed phenomena, but they also need a plausible explanation as to why the future is likely to be any different from the past. Demographic shifts and changes in participation in equity markets will, of course, impact on the equity premium in India over time. For instance, greater stock market participation in particular by the younger generation is likely to reduce the equity premium. However, before these demographic effects play a role, on the basis of what is currently known, I make the following assertion: the equity premium in the future is likely to be similar to what it has been in the past and returns to investment in equity will continue to substantially dominate returns to investment in T-bills for investors *with long planning horizons*.

Further Reading: Two introductory articles are Cochrane (1997) and Mehra (2003). Kocherlakota (1996) and Mehra and Prescott (2003) provide comprehensive surveys of the literature, while Constantinides (2002) and Mehra (2006) is aimed at researchers.

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