Dissecting India's Equity Risk Premium

How much to expect on your equity investments

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Brealey Myers in *'Principles of Corporate Finance'* defines equity risk premium (ERP) as 'the difference between the returns expected on the market and the interest rate on treasury bills'. The ERP may be viewed as 'risk compensation' for investing in equity markets as against assets that are relatively risk-free.

ERP has numerous applications: valuation of companies, capital budgeting and even economic policymaking. Several papers have attempted to determine the ERP for developed markets, notably the US. The most widely used method for determining ERP is the historical method, which is based on the fundamental hypothesis that excess returns earned in the past serve as a reasonable parameter for excess returns that can be expected in the future. While the historical method may work reasonably well for developed markets like the US with a fairly long history, the same approach is likely to yield dissatisfactory results for emerging markets like India, with relatively short and volatile equity market histories. This paper attempts to evaluate the ERP for India[1] through alternate methods.

ERP parameters

By definition, the ERP is the difference between the expected return on the market and the risk free rate. Hence, it is important to first define the following:

- The market
- The risk-free rate

The market

Selection of an index as a proxy for the equity market can be quite a task – essentially, the chosen index should be reflective of the market as a whole. Hence logic dictates a compelling case for the CMIE Cospi Index (over 2800 stocks) or the BSE 500 rather than the BSE Sensex, which includes only 30 stocks.

In this context, it is important to note that the ERP is an integral component of the Capital Asset Pricing Model (CAPM) which states that a company's cost of equity is equal to the aggregate of the risk-free rate and the ERP multiplied by the said company's systematic risk (beta). Therefore, for application in the CAPM, there has to be consistency between the beta and the ERP, i.e. the beta should be measured against the same index, based on which the ERP has been determined. Since in India betas are generally measured against the BSE Sensex (or the NSE Nifty, which is highly correlated with the Sensex) it is best to measure ERP using the Sensex or the Nifty. In this paper, we consider the BSE Sensex to be our market portfolio.

The risk-free rate

The risk-free rate can be defined as the return on a security or portfolio of securities that has no default risk and is completely uncorrelated with returns on anything else in the economy. While no security may be 100% risk-free, practically there are three alternatives for determining the risk-free rate; treasury bills, 10-year treasury bonds, 30-year treasury bonds. The rate on 10-year treasury bonds is generally considered the superior choice, considering better duration matching compared to short-term treasury bills, and smaller beta and lower liquidity premium compared to longer term (30-year) bonds.

However, the risk quotient of bonds issued by the Indian government would need to be analysed further, to assess if these are really risk free. India's sovereign ratings issued by Moodys (Baa3) or S&P (BBB-) suggest that treasury securities issued by the Indian government do carry an element of default risk, and hence cannot be considered risk-less in the true sense of the term. Therefore, theoretically, the default credit spread should be ideally reduced from the yield on government bonds while arriving at the risk-free rate. Though this argument holds some merit, it is worthwhile to do a cross check whether the yields on the 10-year treasury bonds do indeed incorporate a default risk premium.

The 10-year annual inflation (April 2003- March 2012) as measured by WPI, CPI(IW) and GDP deflator are tabulated below:

Ten-year inflation

	CPI (W)	WPI	GDP deflator
Ten-year inflation	7.0%	6.1%	5.6%

Source: National accounts, Labour bureau

In comparison, the average daily yield on 10-year government bonds during the same period is around 7.3%. It is evident that the real returns on 10-year treasury bonds have been as low as 0.3 to 1.7%. Therefore it appears that the market considers the probability of sovereign default to be remote. Consequently, it may be inferred that the yield on the 10-year rupee denominated government securities can be considered a suitable choice for a risk-free rate.

Methods to determine ERP

Prof Aswath Damodaran[2] in his paper 'Equity Risk Premiums (ERP): Determinants, Estimation and Implications – The 2012 Edition' discusses three methods for determining the ERP:

- Survey method
- Historical premium method
- Implied premium method

Survey method

The survey method determines the ERP based on a survey of various market participants and academics. Prof Damodaran has cited several issues with the survey method. Survey responses tend to vary significantly based on various factors such as recent stock price movements, who is surveyed (academics vs CFOs vs investment professionals), how survey questions are framed, etc. Subjectivity of the questionnaire and respondent proves to be a hurdle. Hence, we did not attempt this method in determining the ERP.

1. Since ERP is a function of time, the ERP has been evaluated as on 31 December 2012.
2. Prof. Aswath Damodaran is a Professor of Finance at the Stern School of Business at New York University, where he teaches corporate finance and equity valuation. He is best known as author of several widely used academic and practitioner texts on Valuation, Corporate Finance, and Investment Management, and is widely recognised as an authority in the field of valuation.

Historical premium method

The historical risk premium approach is widely used for determining equity risk premiums. It is based on a geometric or arithmetic average of the annual risk premia[3], over a sufficiently long period of time. The key question here is do we have a sufficiently long and stable history to determine a reliable historical risk premium. Some of the important points to consider are as follows:

- While the base year of the Sensex is 1979, the index was actually formulated in 1986, and the series was back-calculated to 1979 with a fixed set of companies. This may have resulted in a bias in favour of companies which generated good returns over the 1979–1986 period.
- With structural changes in the economy post liberalisation in the early 1990s, the relevance of prior equity returns for predicting future expected returns is questionable.
- Participation in the T-bill market was highly regulated before 2000, and therefore there is no reliable estimate for risk-free rates prior to 1999. While some studies have computed the risk premium relative to the bank deposit rate, it is essentially a short-term rate and not consistent with our definition of the risk-free rate as the return on 10-year securities.

This leaves us with just 12 years (2000-2012) for which a representative historical risk premium can be reliably calculated. The risk premium for each of these years is tabulated below:

Historical equity risk premiums

Year	Change in index	Dividend yield	Total return	Average risk free rate	ERP
2000	34%	1%	35%	11.4%	23.6%
2001	-28%	1%	-27%	10.9%	-37.9%
2002	-3%	1%	-2%	8.8%	-10.8%
2003	-13%	1%	-12%	6.9%	-18.9%
2004	83%	1%	84%	5.4%	78.7%
2005	16%	1%	17%	6.2%	10.9%
2006	74%	1%	75%	7.1%	68.0%
2007	16%	1%	17%	7.8%	9.3%
2008	20%	1%	21%	7.9%	13.2%
2009	-38%	1%	-37%	7.6%	-44.5%
2010	81%	1%	82%	7.2%	74.8%
2011	11%	1%	12%	7.9%	4.2%
2012	-10%	1%	-9%	8.4%	-17.3%

Source: Bloomberg

Drawing any conclusions from the above data is practically impossible.

An alternative suggested by Prof Damodaran for emerging markets is to adjust the equity risk premium for a developed market, say the US, for relative standard deviations (ratio of the standard deviation of the subject country market portfolio to the standard deviation of the US market portfolio). This method is based on the hypothesis that standard deviation being a measure of risk, the higher the standard deviation of the index, the riskier the index and therefore higher the risk premium.

Equity risk premium country X = Risk premium US* Relative standard deviation country X

Annualised daily standard deviation

	Annualised daily standard deviation- BSE Sensex	Annualised daily standard deviation- S & P 500
10 Year	25.8%	21.8%
5 Year	29.5%	26.7%
2 Year	18.5%	19.7%
1 Year	19.9%	23.2%

Source: Bloomberg

This approach does not seem to work well for India, as the relative standard deviations vary significantly, depending on the chosen time period. Moreover, the relative standard deviations over a one or two-year period is less than one, implying that ERP for India should be less than that for the US, which is counter-intuitive.

Thus, while the survey method has a number of limitations, the applicability of the historical risk premium method in the Indian context is also limited. This brings to us to the implied premium method.

3. The difference between the return on the market and the returns on the risk-free security during any given year
4. This FCFE yield has been computed based on the aggregate of the FCFE for all 30 Sensex companies for the financial year ended 31 March 2012 (the latest data available) divided by the Sensex market capitalisation as on 31 December 2012. (While a six-month average market capitalisation would have been ideal, it becomes difficult to account for changes to the Sensex composition.)

Implied premium approach

The implied premium approach is based on the fundamental premise that the expected return on the market portfolio is built into the current market valuations. This is conceptually a superior approach, as it is forward looking, unlike the historical approaches.

The simplest way to compute the implied premium is by applying the Gordon Growth Dividend Discount model. The Gordon Growth model states:

$V = D_0 *(1+g)/(Re-g)$

Where

V = *Total market capitalisation of the index*

D_0 = *Dividends for current period*

g = *Expected growth rate in dividends*

R_e = *Expected return on equity*

Or

$R_e - g = D_0 *(1+g)/ V$

Or

R_e = Dividend yield *(1+ g) + g

Once the dividend yield and expected growth rate are determined, the expected return on equity and therefore, the ERP, can be estimated.

In India, the historical dividend yields have been very low, around 1%, and the returns on equity have been primarily through capital appreciation. Thus the classic Gordon Growth model will result in a very low estimate of expected returns, and therefore, the ERP.

Hence it becomes imperative to analyse dividendable cash flows as opposed to dividends. In other words, free cash flow yield is a more appropriate measure compared to dividend yield.

The free cash flow to equity (FCFE) yield for the Sensex as of 31 December 2012 is around 5.5%[4] .

Now, do we use the current FCFE yield to project future FCFEs, or use a historical average? The three-year average (FY10-FY12) is 6.1% compared to the current yield of 5.5%[4]. Here, it is important to keep in mind that ERP is very much a function of time. For example, the FCFE yield in FY09 was much higher at 11%, driven by the drastic fall in market capitalisations not accompanied by fall in free cash flows. To state differently, the ERPs were significantly higher at the time, due to heightened risk perception as a result of the then global uncertainties, as reflected in the market crash. Hence, the current FCFE yield has been assumed to reflect the best estimate of future expected free cash flows, as on 31 December 2012.

FCFE growth and earnings growth

Having arrived at the current FCFE yield, the next step is to project the growth rate in FCFE. There are no reliable estimates for FCFE growth in the short to near-term. However, analyst estimates of Sensex earnings growth are available for calendar year (CY)13 and CY14. For evaluating the relation between FCFE growth and earnings growth, we looked at a simplistic definition of FCFE (ignoring preferred capital and dividends on the same).

FCFE = net income + depreciation – capital expenditure – increase in working capital + net debt increases.

The capital expenditure (capex) can be split into two components (maintenance capex and capex for growth). In the long run, maintenance capital expenditure should approximate depreciation. Thus the formula can be restated as follows:

FCFE = net income – capex for growth – increase in working capital+ net debt increase

Or FCFE = net income – reinvestment for growth + net debt increase.

This can be rewritten as

FCFE = net income – RR * g *net income + D/C* RR*g* net income = net income *(1- RR*g(1-D/C))

Where RR = reinvestment ratio

g = growth rate in net income

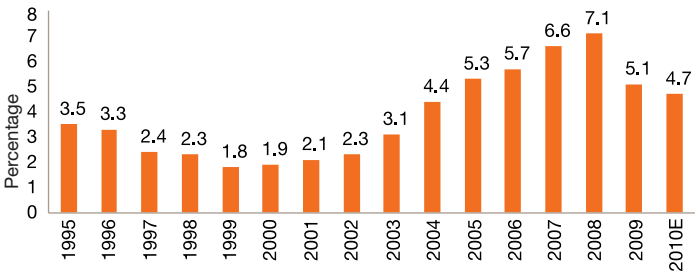
D/C = debt to capital ratio

In a long-term stable state, RR, g and D/C should become fairly constant, thus implying that FCFE would become proportionate to earnings. In other words, in the long run, growth rates in FCFE should approximate earnings growth rates. However, this may not hold in the short term as all three variables, RR, g and D/C can vary in the short term. Since we are interested in long-term FCFE growth as opposed to the short term, we use earnings growth to determine expected FCFE growth rates. While consensus Sensex earnings growth estimates are available for CY13 and CY14 [CAGR of 11% (source: Bloomberg)], determining growth beyond CY14 is essential. Hence, linking GDP growth and earnings growth becomes important.

Earnings growth and GDP growth

A study by Delta Global Partners has highlighted that over the last few years, corporate earnings growth has outpaced GDP growth. [Now, GDP growth here refers to nominal GDP growth, as opposed to real GDP growth, as earnings (and free cash-flows) are always nominal].

Corporate earnings/GDP ratio



Source: Delta global partners

4. This FCFE yield has been computed based on the aggregate of the FCFE for all 30 Sensex companies for the financial year ended 31 March 2012 (the latest data available) divided by the Sensex market capitalisation as on 31 December 2012. (While a six-month average market capitalisation would have been ideal, it becomes difficult to account for changes to the Sensex composition.)

Structural changes in the economy have resulted in relatively higher growth in earnings compared to GDP growth. Sustainability of such an outperformance needs to be analysed.

GDP, as determined by the income approach is defined as follows:

GDP = compensation of employees + rent + interest + proprietor's income + corporate profits + indirect business taxes + depreciation + net foreign factor income

This can be rewritten as:

GDP = compensation of employees + rent + interest + profits + indirect business taxes + depreciation + net foreign factor income

Profits are nothing but earnings. Thus, if the relative mix of the various components of GDP does not change, the earnings growth should mirror GDP growth. Therefore, in the long term, earnings growth, and free cash-flow growth, should converge to GDP growth. This conclusion is corroborated by a study by MSCI Barra in the US. The study examined the US GDP and corporate earnings data from 1929 to 208, and observed that the growth in GDP and aggregate corporate earnings have been remarkably similar throughout the last 80 years, thus leading to the conclusion that over the long run, aggregate corporate earnings tend to grow at the same pace as GDP.

An estimate of long-term GDP growth will comprise of two components, the long-term expected real GDP growth and the long-term expected inflation.

Long-term expected GDP growth

A number of reputed institutions have come out with their estimates of long-term (till 2050) real GDP growth forecasts for India. A synopsis of these estimates is provided below:

Real GDP forecasts - India

	Year of estimate	Forecast period	Annual real GDP growth estimate
CEPII	2006	2006 - 2050	4.5%
Citigroup	2010	2010 - 2050	6.4%
Goldman Sachs	2003	2010 - 2050	5.8%
PwC	2011	2009 - 2050	6.1%
HSBC	2011	2010 - 2050	5.5%

Source: Various reports

For the purpose of our analysis, the most conservative of these estimates - 4.5% has been chosen.

Inflation

Historical inflation figures vary depending on the proxy chosen for the estimation- the WPI, the CPI(IW) or the GDP deflator, to name a few. It is important to understand the objective, which is to arrive at the nominal GDP forecasts from the real GDP forecasts. Therefore, by very definition, the GDP deflator (defined as nominal GDP/real GDP *100), becomes the ideal choice.

While analysing the historical inflation trends, it is important to note the structural changes in the economy in the early 1990s. As per *Hindu Business Line,* historical inflation in India has been high due to a combination of factors: poor agricultural productivity and high dependence on monsoon; commodity price shocks, mainly oil prices; global business cycles and wars. During the 1970s and the early 1980s, OPEC price hike and inconsistent oil supply was one of the major factors that led to higher inflation in India. In the 1980s and the early 1990s, supply shocks (food shortages and oil price rise due to the US-Iraq war) were accompanied by demand pressures of high fiscal deficit in the 1980s and growing GDP in the 1990s. The declining trend in inflation during 1994-95 to 2004-05 was the result of structural changes in the macroeconomic framework due to liberalisation. The improved supply response, improved financial and real economy, better monetary policy and emphasis on fiscal consolidation were instrumental in bringing down the inflation.

Keeping this in mind, the inflation rates pre-1995 may be of little relevance in forecasting future inflation. The historical trends in GDP deflator, during the past 15 years, are tabulated below:

Annual inflation based on GDP deflator

Term	Inflation
15 Year	5.4%
10 Year	5.6%
5 Year	6.6%

Source: National accounts

Considering that the last three years (FY10-FY12) have witnessed relatively high inflation, the 10- or 15-year inflation numbers (which capture both high and low inflation periods) may represent a better estimate of expected future long-term inflation. Based on these, the long-term inflation is estimated at 5.5%.

Summing up the expected real GDP growth rate of 4.5% and the expected GDP deflator based inflation rate of 5.5%, the nominal GDP growth per annum is expected to be around 10%.

Perpetual growth rate[5]

Considering the long-term growth rates of developed economies, the long-term sustainable real GDP growth rate has been estimated at 2%. In conjunction with inflation of 5.5%, the long-term nominal GDP growth rate (and therefore earnings and free cash flow growth rate) is estimated at 7.5%. It is pertinent to note that the estimate of long-term growth rate is for the economy and index as a whole, and is not likely to be representative of long-term growth rates for individual companies, which would depend on the industry prognosis and company-specific plans.

5. The perpetual growth rate is the expected annual growth rate to infinity. Implicitly the growth rates are expected to decline to a low growth rate as India cannot be expected to grow at rates higher than those of developed economies beyond a finite period.

Growth rates and the three-stage FCFE model

While the Gordon Growth formula assumes a stable growth rate to perpetuity, such an assumption will rarely be in sync with market expectations. We have arrived at estimates of 11% FCFE growth per annum for CY13 and CY14, a subsequent long-term growth rate of 10%, and a perpetual growth rate of 7.5%. While the various real GDP growth estimates are for a period till 2050, considering the high degree of uncertainty relating to growth over such a long period (reflected in the differences in the various estimates), it is highly unlikely that the market is factoring in these estimates of real growth for such a long period of time. At the same time, the market will not be anticipating real growth rates as low as 2% over the next 10 to 15 years either. Hence we consider a three stage FCFE growth model as follows:

- Stage 1: Growth rate of 11% during CY13 and CY14
- Stage 2: 10% per annum for a 15-year period from CY15 to CY29
- Stage 3: 7.5% per annum thereafter.

Results and conclusions

The application of the three-stage FCFE model results in an implied expected market return of approximately 15.2%. It is pertinent to note that the implied market return of 15.2% is reflective of the expected return on the market index and asset/company/sector specific risk adjustments would need to considered for specific investments.

Considering the implied expected market return of 15.2% in conjunction with the expected yield of 8.05% on 10-year government securities as on 31 December 2012, the implied ERP for India is around 7.2%. Considering the daily fluctuations in equity market valuations as well as treasury bond yields, the current ERP can be considered to be in the 7 to 7.5% range. However, the golden rule to remember is that equity risk premiums are dynamic and subject to constant change.

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