

# Market Sensitivity and Risk Management in State Bank of India

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## Introduction

The cost of capital that a firm faces represents the equilibrium return that investors expect from investing in a firm with a specific set of risks. The risks that an investor faces, in addition to market risks, are influenced by the ratio of debt versus equity that comprises the capital structure of the company.

Debt, by virtue of the fact that it has a higher priority on claims, in the event that a firm goes into bankruptcy, in addition to normally having fixed interest payments, implies a lower risk for lenders than for holders of equity, who face higher levels of uncertainty and lower priority on claims in the event of liquidation. Interest payments on debt are generally deductible for the purposes of corporate tax calculation and hence a profitable company can benefit from the effects of these tax shields in improving the value of the resulting equity. It may therefore be advantageous for a profitable company to hold a reasonable level of debt in order to maximize this effect without causing undue risk to the business.

Cost of capital represents the financial return on a group of assets, which are employed by a company or business. The cost of capital should represent a fair return to investors for the provision of capital to the firm. A business requires assets which are employed to buy and transform economic inputs into a final or intermediate product. These assets represent an opportunity cost to the firm. If they were not employed for these purposes, they could be sold and the cash used to invest in some other project.

Cash is therefore not free, it comes at a price. The price is the cost to the firm of using investors' money. The cost of capital represents the return expected by the investors for the capital they supply. Investors do not normally invest directly in projects - they invest in the firms that undertake projects. The return expected from the assets managed by a firm must be the total of the returns expected by debt holders and equity holders, weighted by their respective contribution to the financing of these assets.

In normal circumstances a business must seek to make a return on the capital that is actively employed by the business that is at least equal to the recurring cost of that capital. This ensures that investors in the business can be properly compensated for the risk that they take for supplying capital to the business. A return that is significantly greater than the cost of capital represents super-profit and is usually associated with a market structure where entry is restricted or where the market is not contestable, and which therefore is not in the best interests of consumers.

## Company Profile: State Bank of India

The evolution of State Bank of India can be traced back to the first decade of the 19th century. It began with the establishment of the Bank of Calcutta in Calcutta, on 2 June 1806. The bank was redesigned as the Bank of Bengal, three years later, on 2 January 1809. It was the first ever joint-stock bank of the British India, established under the sponsorship of the Government of Bengal. Subsequently, the Bank of Bombay (established on 15 April 1840) and the Bank of Madras (established on 1 July 1843) followed the Bank of Bengal. These three banks dominated the modern banking scenario in India, until when they were amalgamated to form the Imperial Bank of India, on 27 January 1921.

An important turning point in the history of State Bank of India is the launch of the first Five Year Plan of independent India, in 1951. The Plan aimed at serving the Indian economy in general and the rural sector of the country, in particular. Until the Plan, the commercial banks of the country, including the Imperial Bank of India, confined their services to the urban sector. Moreover, they were not equipped to respond to the growing needs of the economic revival taking shape in the rural areas of the country. Therefore, in order to serve the economy as a whole and rural sector in particular, the All India Rural Credit Survey Committee recommended the formation of a state-partnered and state-sponsored bank.

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The All India Rural Credit Survey Committee proposed the take over of the Imperial Bank of India, and integrating with it, the former state-owned or state-associate banks. Subsequently, an Act was passed in the Parliament of India in May 1955. As a result, the State Bank of India (SBI) was established on 1 July 1955. This resulted in making the State Bank of India more powerful, because as much as a quarter of the resources of the Indian banking system were controlled directly by the State. Later on, the State Bank of India (Subsidiary Banks) Act was passed in 1959. The Act enabled the State Bank of India to make the eight former State-associated banks as its subsidiaries. The State Bank of India emerged as a pacesetter, with its operations carried out by the 480 offices comprising branches, sub offices and three Local Head Offices, inherited from the Imperial Bank. Instead of serving as mere repositories of the community's savings and lending to creditworthy parties, the State Bank of India catered to the needs of the customers, by banking purposefully. The bank served the heterogeneous financial needs of the planned economic development.

### Weighted Average Cost of Capital

The combined level of returns expected, by definition represent the combined level of risk between debt and equity which is known as the Weighted Average Cost of Capital (WACC). WACC is the internationally accepted basis for the calculation of cost of capital by regulators, financial institutions, businesses and the academic community.

$$\text{Cost of Capital} = d\% \cdot K_d (1-T) + e\% \cdot K_e$$

Here,

- $d$  is the percentage of debt
- $K_d$  is the average cost of debt
- $T$  is the marginal tax rate applicable to the bank
- $e$  is the percentage of equity (i.e. equity + reserves)
- $K_e$  is the cost of equity as per CAPM (capital asset pricing model)

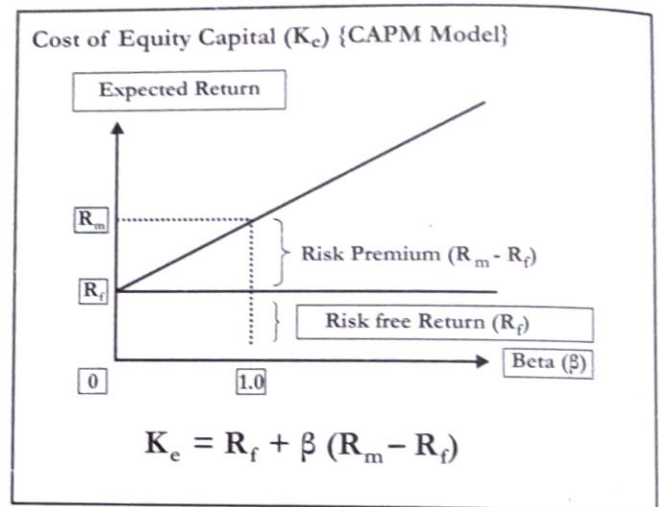
### CAPM (Capital Asset Pricing Model)

CAPM is based on the idea that investors demand additional expected return (called the risk premium) if they are asked to accept additional risk. The CAPM model says that this expected return that these investors would demand is equal to the rate on a risk-free security plus a risk premium. If the expected return does not meet/beat the required return, the investors will refuse to invest and the investment should not be undertaken. Capital asset pricing model determines a particular part of WACC calculations that is the cost

of equity that a firm has within its capital structure. As per CAPM cost of equity is calculated by the following formula:

$$K_e = R_f + B (R_m - R_f)$$

- Where  $K_e$  is the cost of equity.
- $R_f$  is the return on risk free security.
- $B$  is the beta (a measure of the covariance between the returns of a security of average risk and those of the bank's share).
- $R_m$  is the return on security of average risk.



### Components of CAPM

#### 1) $R_f$ or the Return on risk free security

The risk free factor, as the name suggests is an investment in an asset that provides a return for an investor with no inherent risk. It is a safe investment which has a stated return, set for a given time period, and where the return is to a large extent guaranteed, such that there is not the possibility that the party to the consideration will default on payment. An investment which has the lowest possibility of default is commonly regarded as being the country's sovereign bond rate.

#### 2) $B$ or the beta factor

The Beta coefficient of an asset represents the sensitivity of the asset's return to changes in the market index - it is the firm's systematic risk, measured relative to the market portfolio. In essence (and in mathematical terms) the beta of an asset measures the covariance of the returns of that asset with respect to the returns from the "market" for a unit change in the market's own return. It is obtained by dividing Covariance between market return and return



### 3) $R_m$ or the Return on security of average risk

The equity risk premium represents the additional return that an investor would require to invest in equities as a general asset category. It is the premium required above the risk free rate that an investor would require to bear the additional risk inherent in equity returns versus returns on a risk free asset.

The traditional methodology of estimating such a parameter is through historic interpretation of data on returns from risk free rates and returns from a "market".

The general idea behind CAPM is that investors need to be compensated in two ways: time value of money and risk. The time value of money is represented by the risk-free (rf) rate in the formula and compensates the investors for placing money in any investment over a period of time. The other half of the formula represents risk and calculates the amount of compensation the investor needs for taking on additional risk. This is calculated by taking a risk measure (beta) that compares the returns of the asset to the market over a period of time and to the market premium ( $R_m - r_f$ ). The CAPM says that the expected return of a security or a portfolio equals the rate on a risk-free security plus a risk premium. If this expected return does not meet or beat the required return, then the investment should not be undertaken. The security market line plots the results of the CAPM for all different risks (betas).

### Calculation of Beta (Market Sensitivity)

**Security's Beta** The market or systematic risk of a security is measured in terms of its sensitivity to the market movements. This sensitivity is referred to the security's beta.

Beta is a ratio of the covariance of returns of a security,  $j$ , and the market portfolio,  $m$ , to the variance of return of the market portfolio:

$$\text{Beta} = \frac{\text{Covariance}(j, m)}{\text{Variance}(m)}$$

#### Covariance

It represents correlation between return on SBI and Market Return i.e. NIFTY in our analysis.

Covariance = .006363 (Computed on the basis of return in form of Capital Appreciation in market (NIFTY) and individual asset (SBI).)

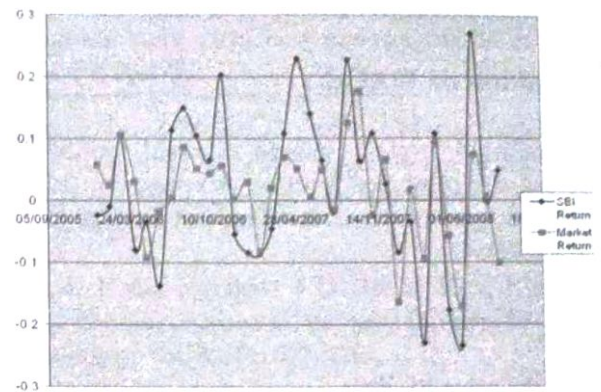
#### Variance

Variance = .00611 (based on return in form of capital appreciation in case of NIFTY)

Hence, Beta = 1.041

(Excel sheet has been attached in the appendix)

Sensitivity of SBI return Vs Market Return



### Calculation of Cost of Equity

For the calculation, following data has been taken:

Parameters for calculating CAPM and WACC (Regulatory Capital)	Estimate	Source
Risk-free rate ( $R_f$ )	6.06%	Taken from RBI's Site
Market Return ( $R_m$ )	15.47%	Based on Average market Return of NIFTY (Excel sheet attached in the appendix)
Market Sensitivity (Beta)	1.041	As Computed above

Calculation of cost of Equity as per CAPM:

$$\begin{aligned} \text{Cost of Equity Capital } K_e &= R_f + \beta (R_m - R_f) \\ &= 6.06\% + 1.041 (15.47\% - 6.06\%) \\ &= 15.85\% \end{aligned}$$

### Calculation of Cost of Debt

Cost of Debt includes all interest-bearing borrowings. Its cost is the yield (return), which lenders expect from their investment. In most cases, return is equal to annual contractual rate of interest (also called coupon rate). Interest charges are tax deductible. Therefore, cost of debt to the firm is calculated after adjusting for interest tax shield



$$\text{Cost of Debt (kd)} = \frac{\text{Interest}}{\text{Value of Debt}} (1-t)$$

Interest=29384.4

Value of Debt=389248.72

Tax rate=33%

Kd=5.0578%

(value of interest and Debt taken from the financial statement of SBI attached in the appendix)

### Calculation of WACC

The combined level of returns expected, by definition represent the combined level of risk between debt and equity which is known as the Weighted Average Cost of Capital (WACC)

$$WACC = K_d \cdot D/V + K_e \cdot E/V$$

Here,

- D is the value of debt
- K<sub>d</sub> is the average cost of debt
- e is the market value of equity
- K<sub>e</sub> is the cost of equity as per CAPM (capital asset pricing model)

### Market value of Equity

Equity Capital = Avg. Share Price \* No. of shares

Average Share price=Average market value for 52 weeks into consideration from 1-12-2005 to 1-09-2008.

Average Share Price=1719.385

No. of Shares (in millions)=634.4

Value of Equity=1090777.844

Value of Firm=value of Equity + value of Debt  
 =1090777.844 + 389248.72  
 =1480026.564

$$WACC = 5.0578 \times \frac{389248.2}{1480026.564} + \frac{15.85 \times 1090777.844}{1480026.564} = 13.0116\%$$

### Leverages

Leverage is using fixed costs to magnify the potential return to a firm.

There are 2 types of fixed costs:

- fixed operating costs = rent, depreciation
- fixed financial costs = interest costs from debt

### Financial Leverage

Financial Leverage measures the sensitivity of firm's earning per share to a change in operating income. It is the measure of the amount of debt used by the firm.

Degree of Financial Leverage (DFL)

$$\frac{\% \text{Change in EPS}}{\% \text{change in EBIT}}$$

or

EBIT

EBT

Financial Leverage measures the sensitivity of firm's earning per Share to a change in operating Income.

EBIT=576452

Interest paid=29384

EBT=547068

DFL=1.05371

### Solvency Ratios

Debt Equity Ratio=

Debt/Equity

$$\frac{389248.72}{1090777.844} = 0.35685$$

Interest Coverage Ratio=

EBIT/Interest

$$\frac{576452}{29384} = 19.6178$$

### Interpretation

Debt to Equity ratio is .35 which shows that company has strong fundamentals and has taken adequate amount of debt to finance its operations. Most of its debt comes from borrowing from RBI and other banks at a reasonable rate. It has not issued any bonds. Its debt is within manageable limits. It also shows SBI has been quite conservative in taking debts, it finances most of its operations from its equity. Value of kd is around 6% which shows that SBI has less cost of debt and its Cost of equity is around 15% which shows that RBI provides better return than the market where market premium is around 15%. Value of beta shows that SBI has high sensitivity in relation to NIFTY. During the booming period it provides better return than the market.



Its interest coverage ratio is high which shows that SBI at any time is well placed to payoff all its debt and hence has very strong fundamentals. Its value of WACC is around 13% which shows that company incurs a 13% cost while raising money for any project if it uses debt as a source of fund then it cost them around 6% else equity costs them around 15%.

## References

- Banz, R (1981); The Relation Between Return and Market Value of Common Stocks; *Journal of Financial Economics*; Vol. 9; Pp. 3-18.
- Basu, S (1977); The Investment Performance of Common Stocks in Relation to Their Price-Earnings Ratios: A Test of the Efficient Market Hypothesis; *Journal of Finance*; Vol. 32; Pp. 663-682.
- Bekaert, G and Harvey, C R (2000); Foreign Speculators and Emerging Equity Markets, *Journal of Finance*; Vol. 55; Pp. 565-613.
- Berle, A and Means, C (1932); *The Modern Corporation and Private Property*; Commerce Clearing House; New York.
- Black, B, Jang, H and Kim, W (2002); Does Corporate Governance Affect Firm Value?; Working paper 327; Stanford Law School.
- Böhmer, E (2000); Business Groups, Bank Control, and Large Shareholders: An Analysis of German Takeovers; *Journal of Financial Intermediation*; Vol.9; Pp. 17-48.
- Campbell, J Y (1991); A Variance Decomposition of Stock Returns; *Economic Journal*; Vol. 101; Pp. 157-179.
- Daniel, K and Titman, S (1997); Evidence on the Cross-Sectional Variation in Stock Returns; *Journal of Finance*; Vol. 52; Pp.1-33.
- Errunza, V and Miller, D (1998); Market Segmentation and the Cost of Capital in International Equity Markets; Working paper, McGill University and Texas A&M University.
- Fama, E F and MacBeth, J D (1973); Risk, Return, and Equilibrium: Empirical Tests; *Journal of Political Economy*; Vol. 81; Pp.607-636.
- Fama, E F and French, K (1993); Common Risk Factors in the Returns on Stocks and Bonds", *Journal of Financial Economics*; Vol. 33; Pp.3-56.
- Gompers, P, Ishii, L and Metrick, A (2001); *Corporate Governance and Equity Prices*; Working paper, Harvard Business School.