The Weighted Average Cost of Capital in Frontier Markets: Theory and Practice

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Abstract

The demand for external financing for projects in frontier markets has increased the profile of valuation methodologies. In this paper, I discuss the theory and practice of how the component costs of debt and equity capital and the weighted average cost of capital (WACC) of a specific project domiciled in a frontier country can be calculated. This paper also discusses how the capital weights of debt and equity are adjusted to reflect the structuring of the financing and the liquidity facility provisions found commonly in financing covenants. Frontier markets are those emerging markets considered very risky for investments.

Keywords: Frontier markets; cost of debt; cost of equity capital; weighted average cost of capital; capital weights; soft capital and liquidity facility.

I. Introduction

High rates of returns on investments in emerging markets continue to soar as investors increasingly are attracted to projects in emerging economies. The integration of markets and mobility of capital have had dramatic impact on direct foreign investments and emerging markets continue to offer large opportunities to investors. According to the November 3, 2005 issue of Business Week, $14.8 billion in new cash has been invested in emerging equity funds through October 5, 2005 compared to $2.8 billion for all of 2004. However, risk and uncertainty represent a major problem in valuing emerging market investments. The demand for external financing coupled with business deregulation and privatization of markets have increased the profile of valuation techniques in emerging markets.

This paper is concerned with estimating the weighted average cost of capital (WACC) for projects in frontier markets. The International Finance Corporation (IFC) describes frontier markets as those emerging markets considered very risky when compared to the transitional emerging markets of Brazil, Russia, India and China (BRIC) and other climbing markets of Argentina, Taiwan, South Korea, Malaysia and Mexico etc. Many foreign investors prefer not invest in frontier markets such as Pakistan, Senegal, Nigeria, Nepal, Costa Rica, Maldives etc because of the risk involved. Limited stock market information and the problem of data availability are chronic in these markets. However, investment companies such as IFC and other transnational financial institutions that finance investments in these markets need to estimate the average cost of capital for projects in these markets. Current research on valuation has focused exclusively on the BRIC countries. This paper is therefore a contribution to the literature on valuation because there is no research study on frontier markets and the complex valuation problems faced by analysts evaluating projects in frontier markets.
WACC is the basic measure of financial performance because it is the minimum risk adjusted rate of return required by investors before they invest in a project. Investment decisions cannot be made without estimating the project’s WACC accurately. Therefore, the challenge in valuing projects in emerging markets and particularly in frontier markets is focused on estimating the appropriate WACC specific to a particular project and not for all projects in the frontier market economy. The estimation of the weighted average cost of capital for a specific project in an emerging market is not a science and should incorporate analysts’ judgments. According to Harvey in Budyak 2006, “A long standing problem in corporate finance is the calculation of the cost of capital in international capital markets. There is widespread disagreement particularly among practitioners of finance as to how to approach this problem. Unfortunately, many of the popular approaches are ad hoc and as such difficult to interpret.”

In the first part of this paper, I will review previous research studies on measuring project risk, the challenges of estimating the systematic risk and the cost of equity capital for emerging market projects. In the latter part of the paper, I will focus on how to estimate the component costs of capital; specifically, the before tax cost of debt to reflect foreign exchange rate risk and the cost of equity capital for projects in frontier markets. I will also show how standby liquidity facilities (i.e. soft capital) affect the capital structure weightings in estimating WACC. The rest of the paper proceeds as follows. Section II discusses project risk and some of the problems encountered when measuring project risk. Section III highlights the estimation of the component costs of capital and WACC for a hypothetical emerging market project in a frontier country. Section IV contains concluding remarks.

II. Measuring Project Risk

The three distinct types of project risk are stand alone risk, within-firm risk and market risk. Stand-alone risk views the risk of the project in isolation and without regard to portfolio effects. It is measured by the variability of the project’s expected returns. The within-firm risk also called corporate risk views the risk of project within the context of the firm’s portfolio of projects. It is measured by the project’s effect on uncertainty about the firm’s future earnings. Market risk or beta views a project’s risk within the context of the firm’s stockholders’ diversification in the general stock market. It is measured by the project’s effect on the firm’s beta coefficient. Theoretically and in many cases all three types of risk are highly correlated, thereby, if the performance of general economy is strong, the firm will do well and so will most of the firm’s projects. From a theoretically perspective, market risk is the most relevant for well diversified investors and can be estimated from the capital asset pricing model (CAPM) because of its effect on stock prices. Unfortunately, for investors that are not well diversified market risk or beta for a project is the most difficult to estimate. In many emerging markets, CAPM is not applicable as financial theory suggest because of lack of data and measurement problems. It is also important to note that CAPM ignores incorporate bankruptcy and/or expropriation costs even though such costs can be substantial. Therefore international investors should consider all three types of risk, but in practice it may be appropriate to give more weight to stand alone and corporate risk than financial theory suggests.

Estimating cost of capital in emerging markets is a challenge because financial markets and data are thin or non existent. Despite differences in culture, some of the important issues faced by analysts in undertaking valuations in emerging markets include differences in accounting practices, limited or lack of adequate market data, treatment of risk and uncertainty, and dealing with inflation pressures and currency issues.

II.1 Accounting practices and data limitation

In spite of the increasing interest in international standardization of accounting practices, substantial differences in accounting practices still exist even in mature or developed markets. Efforts to standardize accounting practices assumes compliance with either the U.S. GAAP set by the Federal Accounting Standards Board (FASB) or the International Accounting Standards (IAS) set by the International Accounting Standards Committee (IASC). However the basic challenge to valuation in
emerging markets is the absence of capital markets and the preference to use cash-based accounts in these markets rather than accrual methods used in developed markets.

Most emerging markets are characterized by lack of relevant data. The time spent by an analyst in developing and applying sophisticated mathematical models could be more productively spent on improving the data set in emerging markets. Therefore investors in emerging markets need to think around the limitation of having imperfect data set with the intent of unraveling a set of potential outcomes from differing scenarios and developing a solid base case.

II.2 Risk and uncertainty

The treatment of risk and uncertainty represent a major problem in the estimation of cost of capital for an emerging market. In a total risk perspective, the principle of corporate finance separates risk into company specific (i.e. unsystematic risk) and market-related (systematic risk) components. Systematic risk is non diversifiable and unavoidable, but unsystematic risk is assumed to be diversifiable or avoidable. Some of the sources of market risk are changes in the economy, tax reform, changes in demand and supply of world energy. These risks can not be diversified or avoided, so the investor who holds a well diversified global portfolio will be exposed to this risk. Unsystematic or diversifiable risks are often unique to a particular company and are independent of the economic, political and other factors that affect securities in a systematic manner. Examples of sources of unsystematic risk are increased competition, potential expropriation of assets by a foreign government and technological innovation.

Unsystematic risks can be factored into the valuation analysis by means of alternative scenario analysis, whereas systematic risks are built into the discount rate through the cost of cost of capital. In international corporate finance, distinguishing these two types of risks is often difficult because changes in exchange rates will affect both the systematic and unsystematic components of risks. See Roger Mills (1997) for more detailed treatment of other problems facing analysts involved in valuations in emerging markets.

III. The General Framework of WACC

The WACC equation is one of the basic finance decisions facing corporations. Mathematically, WACC is:

\[ WACC = w_d k_d (1 - T) + w_{ce} k_s + k_e \]

where: \( w_d \) = weight of debt, i.e., \( \frac{D}{V} \).
\( k_d \) = before tax component cost of debt.
\( T \) = tax rate.
\( w_{ce} \) = weight of common equity, i.e., \( \frac{E}{V} \).
\( k_s \) = component cost of retained earned earnings.
\( k_e \) = component of newly issued common stock.

In many emerging markets, long term government bonds are not quoted and even when there is a quoted market yield, it may not be default risk-free as is the case in developed markets. Corporate debt and public equities markets may be highly segmented or non-existent. In addition, estimating cost of capital of investments in emerging markets without factoring country risk, company risk, sector risk, and currency risk would provide inaccurate estimates of cost of capital. It is also important to examine the capital structure weights used in calculating weighted average cost of capital (WACC) because to mitigate the risk of investing, the financial market has developed structured mandatory notes called standby liquidity facilities (i.e. soft capital). These liquidity facilities are used for general purposes including
payment of claims on debt and equity financing. When international investing is structured to include ‘soft capital’ provisions, the capital structure weights, \( w_d \) and \( w_{CE} \), in the WACC equation need to be adjusted to reflect the provision of soft capital when applicable.

III.1 Estimating the cost of debt capital

The three main sources of international debt are international bank loans, the structured notes called Euronotes and the international bond market. An investor funding a project in an emerging economy through the debt market is concerned about the currency of denomination, maturity of the debt and the type of debt. To limit gap risk or repricing risk, the debt is structured so as to match the maturity of the cash inflows expected from the investments to the cash outflows servicing the debt. Also currency matching minimizes cash flow exposures from foreign exchange fluctuations and the resulting cost of debt.

The estimation of cost of debt capital is straightforward because interest rates are readily observable. For new investments, the appropriate cost of debt is the interest rate that the firm would issue to finance the project. In estimating this cost, it is assumed that the new debt is issued at its face value \( M \) so that the current yield \( \left( \frac{\text{INT}}{M} \right) \) where \( \text{INT} \) is the annual coupon interest payment, equals the yield to maturity or the internal rate of return on the debt. If the new debt is issued at a price different from its face value, then the cost of debt is its yield to maturity, assuming all other variables are known. In other words the unknown yield to maturity (YTM) can be estimated from:

\[
P_B = \text{INT} \times \left( PVIFA_{YTM,N} \right) + M \left( PVIF_{YTM,N} \right)
\]

where:  
\( P_B \) = price of the debt.  
\( \text{INT} \) = coupon interest payment.  
\( YTM \) = yield to maturity.  
\( N \) = years to maturity.

For example, suppose the U.S. interest rate cost of debt to fund a five year project is 12.5% in U.S. terms and the principal amount is $2,000,000. However, if the international investor requires a soft capital provision of $250,000 secured in escrow account, the face value of debt to the borrower becomes $2,250,000. The appropriate U.S. before tax cost of debt is 9.26%:

\[
$2,250,000 = \left( 0.125 \times $2,000,000 \right) \times \left[ PVIFA_{YTM,5} \right] + \left( $2,000,000 \right) \times \left[ PVIF_{YTM,5} \right]
\]

Traditionally, the interest rate on the debt is the nominal risk-free rate on U.S. Treasury security plus the premiums sufficient to compensate debtholders for default risk, maturity risk, liquidity risk, country risk, currency risk and sector risk. This nominal risk-free rate incorporates the pure or real rate of return and the inflation premium. But, emerging market debt may not be nominally risk-free because the government debt of the emerging economy is not risk-free. Also, governments of emerging markets may affect the cost of debt capital through intervention in the foreign exchange market by imposing barriers to free flow of capital across countries. As such, the yield on such government debt can not be risk free.

An accurate estimate of cost of debt capital in an emerging market should be accompanied by substantial qualitative analysis beyond financial modeling. The estimated cost of debt must be adjusted for inflation, interest rates and taxes to reflect the firm’s actual capital cost. Mills (1997) suggested that the principle of purchasing power parity and interest rate parity can be used as the starting point when estimating the cost of debt. By applying purchasing power parity whereby exchange rates adjust with the inflation rate differential in the domestic market and the emerging market, an estimate of the cost of debt capital can be obtained. Also the international Fisher effect which focuses on interest rate parity states that nominal interest rate includes an inflation premium sufficient to compensate investors for the expected loss of purchasing power. By assuming that real rates of return between countries are equal, cost of debt capital can be estimated by incorporating the effects of the purchasing power parity and interest rate parity. The cost of debt for an emerging market can be adjusted to reflect the parity theorems and
exchange rate risk. Assuming the parity conditions hold and the global currency market is in equilibrium, the cost of debt can be computed from either the perspective of the direct foreign investor or the home country where the funded investment is domiciled. In general terms, the relationship between the rate of return to the direct foreign investor and the cost of capital to home country can be expressed as:

\[
(1 + R_H) = (1 + R_F) \times \left( \frac{S_t}{S_0} \right)
\]

where \( R_H \) = Home country return  
\( R_F \) = Foreign country return  
\( S_t \) = Expected exchange rate  
\( S_0 \) = Initial exchange rate.

Now suppose the quoted cost of debt or investment return for a specific investment in South Africa is 6.85 percent in rand terms and the cost reflects the cash flow risk including sector risk. Suppose the current exchange rate of the U.S. dollar to the South African rand ($/rand) is $0.1447/rand while the expected $/rand rate one year later is $0.1522/rand. Then the return to the U.S. based direct foreign investor is:

\[
(1 + R_H) = (1 + 0.0685) \times \left( \frac{0.1522}{0.1447} \right)
\]

\( R_H = 12.39 \) percent U.S. based return.

The reliability of the estimated cost of debt depends on the accuracy of the 6.85 percent cost of debt in rand terms and if it reflects the country risk. Gendreau and Heckman (2003) suggested that investors in emerging markets often rely on sovereign yield spreads as indicators of country risk. It can be argued that sovereign yield spreads vary with the market perception of the country’s default risk and the overall investment climate in the country. Estimating the cost of debt capital for specific projects in an emerging market is not a science. Therefore the cost of debt should be qualitatively adjusted to reflect not only the country and currency risk but also the unsystematic risk components including company risk and sector risk.

III.2 Estimating the cost of equity capital

Earlier research studies in valuation methods are focused primarily on estimating the cost of equity capital. The uniqueness of this research paper is that not only do I discuss the problems in estimating the cost of equity capital for a project in an emerging market or frontier market but also this research paper relates how the overall WACC can be estimated, taking into consideration the capital structure weights of debt and equity including soft capital requirements.

The cost of equity capital is the minimum required rate of return necessary to induce the equity investor to buy the firm’s stock. It is also the rate of return used by shareholders to capitalize the residual income of the firm’s cash flows which reflects the risk of the firm’s activities. Thus the cost of equity of a firm can be used to value the future equity cash flows of the firm.

The Capital Asset Pricing Model (CAPM) – related models provide inferior explanation of equity returns in emerging markets because they focus mainly on correlations and underestimate the highly volatile markets in emerging economies. Secondly, the lack of local currency-based returns or the failure to acknowledge the relevance of currency risk, financial distress and bankruptcy costs in projects in estimating discount rates can result in inaccurate estimates of cost of capital for emerging market projects. Other models that use the Bloomberg as a source for estimating cost of equity capital in emerging markets are also inadequate and not forward looking. According to Budyak (2006) these models calculate the ratio of the historical volatility of the emerging market to the U.S market, then incorporates the ratio as a risk-adjustment factor to the U.S equity market risk premium or beta of a specific country risk.
The country risk rating model (CRRM) developed by Erb, Harvey and Viskanta (1996) is a broad based and forward looking model. It provides a framework to estimate the cost of equity capital and takes into consideration specific country risk, political risk, country ratings and currency risk. CRRM permits an analyst to estimate expected returns for investments in a particular country including emerging markets whether market data is available or not. The model positively argued that there is a strong correlation between country credit ratings and expected returns. Country credit ratings are provided by Institutional Investor based on a survey of leading international banks that rate each country on a scale from zero (low credit rating) to one hundred (high credit rating).

To use the CAPM to estimate the cost of equity capital for a project requires three numbers - the nominal risk free rate of return, the project’s beta, and market risk premium. Theoretically, cost of equity capital = Risk-free rate + Project’s risk premium.

\[ K_i = k_{\text{rf}} + (k_m - k_{\text{rf}}) \beta_i \]

where

- \( K_i \) = cost of equity capital for project \( i \)
- \( k_m \) = average historical on a stock market index (e.g. S&P 500 index).
- \( k_{\text{rf}} \) = risk free rate of return on U.S.A Treasury bond.
- \( \beta_i \) = Project’s beta.
- \( (k_m - k_{\text{rf}}) \beta_i \) = historical equity risk premium for the project.

It has been argued by a number of researchers and practitioners that the historical equity risk premium does not measure the forward looking equity risk premium that equity investors expect to earn on stocks purchased today (Shapiro 2005). In the case of estimating equity returns for emerging market projects, the controversy on the historical equity risk premium is more profound for three reasons. First, the comparable government security in an emerging market may not be risk free as is the case with U.S.A. Treasury bond and the government debt of other developed countries such as UK. Secondly, there may be limited and/or questionable estimate of average stock market return in most emerging markets if a stock market exists; and thirdly, it may be impossible to estimate \( \beta_i \) because the historical data or expected future returns relative to predicted average stock market index returns needed to estimate project’s beta does not exist.

For special cases relating to sufficiency of market data, it is necessary to distinguish between transitional economies of Brazil, Russia, India and China from other less developed countries. Further more, it may not be possible to find a comparable company in the frontier (or emerging) market whose beta can be used as a proxy for the project beta. Therefore, strict application of the CAPM would provide inferior explanation of equity returns in emerging markets. Also, the CAPM understates the highly volatile markets in emerging economies because of its focus on correlations of specific country data with another country or with the global portfolio.

The CRRM model does not factor in the correlation of specific countries with another country or global portfolio because global market portfolio beta has little influence on the expected returns in emerging markets. According to Harvey, only 5% (one in 20) emerging markets have a beta greater than one when measured against the global equity market returns. Intuitively, emerging markets should have higher betas but that is the case. Thus focusing on global CAPM that associates the correlation of returns between the global portfolio and country betas will be misleading even if the produce from the funded project has a world wide market, for example, copper, coffee, oil and cocoa. The problem is exacerbated if a global market does not exist for the funded project such as microfinance projects, breweries, development of real estate investment company, hotels etc. IFC and other transnational financial institutions provide funding for a variety of such projects.

The importance of correlation in estimating discount rate is that positive correlations of country returns are not commonly found in emerging markets as is the case in developed economies. Evidence shows that higher credit rating in developed countries is associated with lower volatility of returns and lower credit ratings in emerging markets is associated with higher volatility of returns. Thus market
returns in developed countries are more highly correlated than in emerging markets. Therefore, the CRRM focuses on volatility of emerging markets as a more important factor in explaining the risk and return of investments in emerging markets because focusing on correlation can result in significant error.

Damodaran (2003) discussed three approaches used in estimating individual project exposures to country risk premiums. The 3 approaches are the bludgeon approach, the beta approach and the lambda approach. The bludgeon approach assumes that all companies in the market are equally exposed to country risk. Thus the cost of equity capital can be derived from:

$$K_s = K_{RF} + \beta (\text{Mature Market Risk Premium}) + \text{Country Risk Premium}$$

The beta approach assumes that a company’s exposure to country risk is proportional to its exposure to all other market risks and the cost of equity capital can be expressed as:

$$K_s = K_{RF} + \beta \left( \text{Mature Market Risk Premium} + \text{Country Risk Premium} \right)$$

Both the bludgeon and the beta approaches are not appropriate for estimating project exposure to country risk because betas are not good measure for country risk as betas may not be available for most firms due to lack of data.

The lambda approach, assumes that project’s exposure to country risk is different from its exposure to all other risks. Thus the cost of equity capital is a two factor model and can be estimated as:

$$K_s = K_{RF} + \beta \left( \text{Mature Market Risk Premium} \right) + \lambda \left( \text{Country Risk Premium} \right)$$

where $\lambda$ refers to project’s risk. When $\lambda = 1.0$, the project’s risk is average risk when compared to country risk, and a lambda greater than one indicates that the project risk is above country risk.

Estimating the component cost of equity capital of a project in a frontier market is critical in the overall estimation of the WACC of the project. The equity cost of capital for a project in a frontier market can be estimated to capture country and currency risk based on the country’s credit rating, company risk based on the risk of project’s cash flows as well as sector risk. Overall, the cost of equity capital depends on three factors: the adjusted base rate of return, equity risk premium for mature market and project risk premium. Accordingly the cost of equity capital can be expressed as:

$$K_s = K_{ADJ} + \beta (\text{MMRP}) + \left( P_j \text{RP} \right); \text{ where}$$

$$K_{ADJ} = \text{adjusted base rate of return} = K_{RF} + \text{DYspread} \text{ (i.e., default yield spread).}$$

$$\text{DYspread} = \text{yield on bond issued by the frontier country minus yield on U.S. risk-free Treasury bond. If an equity market exists in the frontier country, the default yield spread can be estimated by comparing the average return of the equity market, } K_{EM} \text{ to the average return of the bond market, } K_{BM}.$$

$$\beta = \text{beta of a comparable company in a developed market (US, UK or Japan)}$$

$$\text{MMRP} = \text{Mature market risk premium} \left( K_M - K_{RF} \right) \text{ as defined earlier.}$$

$$P_j \text{RP} = \text{Project risk premium; } (\text{RSD of project}) \times \left( K_M - K_{RF} \right); \text{ and } \text{RSD} = \frac{E(\sigma_{PR})}{E(\sigma_{DR})}; \text{ where}$$

$$E(\sigma_{PR}) = \text{relatve standard deviation}; \quad E(\sigma_{DR}) = \text{the expected standard deviation of revenues from project and } E(\sigma_{DR}) \text{ is the standard deviation of revenues of comparable company in a developed market.}$$

The cost of equity capital for specific projects in frontier markets can be estimated with the above model. To estimate the adjusted base rate of return, the yield on bond issued by the frontier country is calculated. The yield on debt issued by a frontier country depends on its country risk. In contrast to traditional methods of risk measurement which are based on historical volatility of returns, country credit rating is forward looking and is a good proxy for measuring sovereign or country risk. Thus the adjusted base rate of return is the spread between the yield on debt of the frontier country and the risk free rate of return on U.S. Treasury bond. The second factor is the equity risk premium in a mature market (e.g. U.S. equity
market) which compensates an international investor assuming investment was made in U.S dollars. Finally, the third factor integrates the project’s risk premium which takes into consideration the company and sector risks because the project is domiciled within a company and the produce of the project within a sector. Note also that $P_{R}P$ reflects additional compensation to the international investor based on the risk of the project’s expected cash flows in contrast to Damodoran’s lambda model that incorporates country risk premium in stead of project risk premium. In as much as there is some relationship between specific project risk, company risk, sector risk and country risk, the estimation of the cost of equity capital for a particular project needs to reflect the risk premium specific to the project.

**Experimental Analysis:**

The process of estimating WACC for a project in a frontier markets is more than a mathematical model and should consider qualitative factors.

The following discussion in the paper represents a fictitious project in South Africa used to illustrate the estimation of WACC including adjustments in capital structure weights to account for provisions of soft capital, the adjusted cost of debt and cost of equity including project risk premium. The overall method and evidence is worth considering by investment and evaluation officers when considering the financing of frontier project.

The WACC is the appropriate cost of capital use to evaluate the potential profitability of a debt free cash flow stream considering the after tax cost of debt, and the cost of equity weighted by the relevant capital structure weights including any soft capital provisions. To begin, I assume a chemicals project being considered for development in South Africa. The total project cost is estimated to be $385 million. The proposed investment will comprise of $155 million in loans from an international investor like IFC and $230 million in equity investment. The general technique used to estimate the WACC will include the following:

- Based on the debt and equity components, the capital structure weights are 40% debt and 60% equity. For now, I assume there no soft capital requirements.
- The before tax cost of debt estimated at 12.39% from section III of paper. The applicable tax rate is assumed at an effective rate of 28.5%.
- The standard deviation of expected revenues from the project is 20% while the standard deviation of comparable project in a developed market is 15%. Thus the relative standard deviation is 1.33.
- The Treasury bond risk free rate of return, $K_{RF}$ as of the evaluation date is 4.61%.
- The yield on a South African Government Bond (in U.S. terms) is 6.85%; the default yield spread is 2.24%, thus the $K_{ADJ} = 6.85\%$.
- Based on this analysis and considering the subject industry, I assume a beta, $\beta$, of 1.05.
- The estimate of the mature market risk premium historically average about 5%. Support for this estimate is beyond the scope of this paper.

Based on the above assumptions and estimates, the components costs of WACC are:

$$WACC = 0.40\times[8.86\%] + 0.60\times[18.75\%] = 14.79\%.$$  

If soft capital of $25 million is required, the total capital for the project increases to $410 million from $385 million with debt amounting to $180 million and equity financing at $230 million. The appropriate capital structure weights become 44 percent ($180/410) of debt and 56 percent of equity. The resulting WACC is:

$$WACC = 0.44\times[8.86\%] + 0.56\times[18.75\%] = 14.40\%.$$
IV Conclusion

Investments in emerging markets particularly in frontier markets yield high rates of return and continue to be attractive to diversified foreign investors. However, the estimation of the weighted average cost of capital as the discount rate applicable to specific projects in frontier markets is a central issue in evaluating projects in emerging markets. In this paper, I discussed four key issues related to the WACC of a specific project in a frontier market.

First, international investing in frontier markets is very risky. As such, foreign investors sometimes require soft capital provisions as a standby liquidity facility. Soft capital is not a component cost, rather it is a standby liquidity provided by the borrower to the investor as a covenant to the loan agreement. In such situations, the standard capital structure weights used in estimating WACC need to be adjusted to reflect the soft capital components. The paper concludes that as the dollar amount required as soft capital increases, the estimated WACC decreases. Intuitively, this makes sense because cost of debt is cheaper than cost of equity and as the capital weight of debt increases and weight of equity decrease, the overall WACC declines. Secondly, estimating the component costs of debt and equity for a specific project in a frontier market requires specific adjustments to reflect country risk, currency risk, company risk and project risk.

The interest rate on emerging market debt is not risk-free rate because governments of frontier countries sometimes intervene in their capital markets. The estimated cost of debt must be adjusted for inflation, interest rates and taxes to reflect the firm’s actual capital cost and should also be accompanied by substantial qualitative analysis beyond financial modeling.

Thirdly and fourthly, most analysts use the CAPM to estimate the cost of equity in spite of its shortcomings. Because of inadequate data in frontier countries a rigorous estimation of the cost of equity capital should adjust the risk free rate of return on U.S. Treasury bond, $K_{RF}$, to reflect the default yield spread in the frontier country, plus the equity risk premium in a mature market (such as the U.S. market) plus project risk premium. It is expected that the project risk premium takes into consideration both company and sector risks since the project is domiciled within a company and the produce of the project within a sector. In all, a practical solution for estimating the WACC of a specific project in a frontier country should incorporate quantitative estimates as well as analysts’ qualitative judgment.

References


