Effectiveness of CAPM in Projects Identification

By

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1. Introduction

CAPM or Capital Asset Pricing Model is an important model which describes relationship between expected return as well as risk of investing in a particular security. Moreover, it shows that expected return on a selected security is equal to its risk-free return added with risk premium based on the beta of that security. There are several other models used in the industry for determination of cost of capital but CAPM is widely used. This study aims at evaluating the application of CAPM in identifying the cost of capital of projects in the foreign market. The study includes findings from several literatures on the basis of which findings have been derived. At the end conclusion have been presented upon the effectiveness if CAPM in identifying the cost of capital of foreign projects.

2. Literature review

Need of CAPM

CAPM is the invention of financial economist William Sharpe in the year 1970 (Ai *et al.* 2018). The model begins with an idea that any kind of investment in foreign project involves both unsystematic and systematic risks. Systematic risk is the risk which cannot be diversified unlike unsystematic risks which can be diversified. According to the modern portfolio any kind of risk related with foreign project can be mitigated by diversification which is not possible in case of systematic risk (Apergis and Rehman, 2018). However, the investors can select projects for investment on the basis of minimum risk present with it. In this situation the need of CAPM was felt where estimation of risk helps in selecting feasible foreign projects for investment. Moreover, Sharpe understood that the expected return should be equal to the cost of capital which can be identified with the help of CAPM.

Concept of CAPM

Capital Asset Pricing Model includes three important components in order to derive the cost of capital which includes risk free return, beta and expected market return (Bai *et al.* 2019). The cost of capital can be calculated by CAPM with the help of:

Ra = Rrf + β (Rm - Rrf)

Where, (Rm - Rrf) is the risk premium

Ra = Expected return on a security or cost of capital

Rrf = Risk-free rate

β = Beta of the security
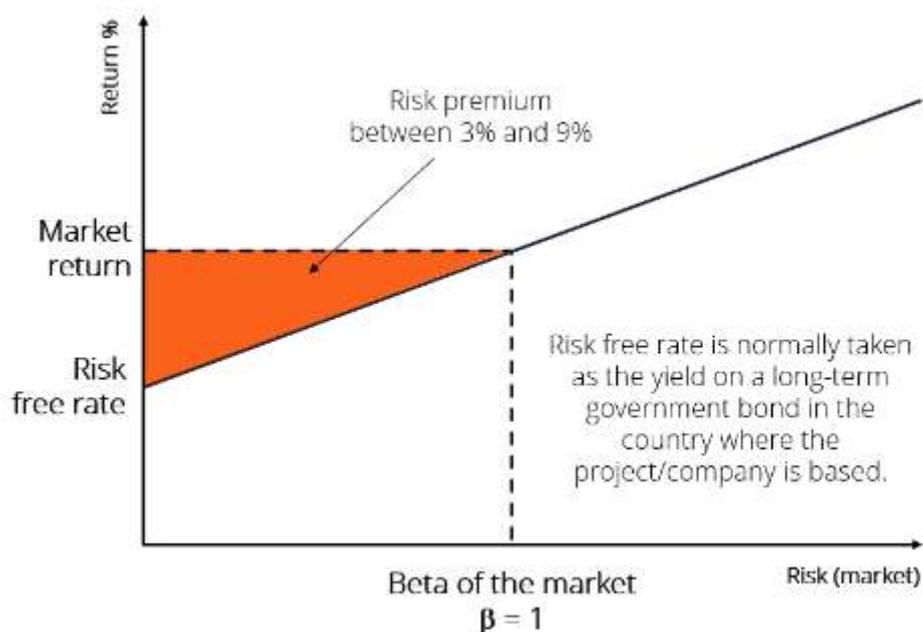
Rm = Expected return of the market

Figure 1: Capital Asset Pricing Model

(Source: Bai *et al.* 2019)

The above presented model reflects the projections of the three elements with the help of which cost of capital is identified. The shared portion in the figure reflects market premium represented as (Rm - Rrf). Based on the understandings of Barberis*et al.* (2015), CAPM is based on the idea of non diversifiable risks or systematic risk which means that in the form of risk premium the investors need to be compensated. For this the expected market return should be greater than the risk free rate which is represented as (Rm - Rrf). Therefore, a positive market premium is required and preferred instead of the negative one. In the opinion

of Campbell*et al.* (2017), while making investments in foreign projects investors wish to have a higher expected market return for the risk undergone by them.

Components of CAPM

a. Risk-free rate

Risk free rate can be defined as the yield on the ten year US Government bond in respect to the country where investment is done. Moreover, maturity of that particular bond should meet the horizon of time. It is suggested by Carter*et al.* (2017), to make use the ten year bond as it is the most liquid and quoted one.

b. Beta of security

Beta can be defined as the tool of measuring risk associated with the stocks on the basis of fluctuation in prices as compared to that of the market. In other words, beta measures volatility of stocks due to the fluctuation in prices. For instance, if an organisation has beta if 1.5 then it indicates 150% volatility over the market.

c. Expected market return

Influenced from the ideas of Chen*et al.* (2017), expected market return is the amount of return which an investor estimates to earn by taking the risk of investment in the market. It is basically an assumption of return rate on the basis of which investments are made.

Application of CAPM in deriving cost of capital

In order to understand the process of applying CAPM, n instance need to be cited. For instance, Rrf or Risk-free rate of an investment is 4.5, β or Beta of the security is 1.2 and Rm or Expected market return is 9. Therefore cost of equity can be calculated as:

Rrf + β (Rm - Rrf)

= 4.5 + 1.2 (9 - 4.5)

= 4.5 + 1.2 * 4.5

= 4.5 + 5.4

= 9.9%

Therefore, cost of capital for the investment is 9.9%. In this way financial analyst and accountants use CAPM to derive the cost of capital for investments and foreign projects. As opined by Fabrizio (2017), CAPM successfully analyses the relationship between expected return and systematic risk involved in a foreign project.

Significance of CAPM

CAPM comes as a rescue when investors are unable to decide which option to select among several foreign projects. The model is significant for the investors as it helps in identifying the systematic risks associated with a project. The efficiency of the model helped it to dominate the modern financial theory. The significance of CAPM in determining cost of capital has been cited below.

a. Ease in use

As analysed by Furman and Zitikis (2017), the formula used to determine cost of capital of foreign projects is simple and convenient for the user. The model takes into consideration three elements such as risk free rate, beta and expected market return only. This makes the model simpler as compared to other methods of investment appraisal.

b. Systematic risk taken into consideration

Systematic risks are among one of the most important risks which cannot be diversified by the investors involved in investment in foreign projects. CAPM takes into consideration the systematic risks which are not found in other models such as Dividend Discount Model. This attracts the investors towards the CAPM over other models of investment appraisal.

c. Diversified portfolio

Influenced by the views of Habibi*et al.* (2016), CAPM assumes that the investors generally hold a diversified portfolio which excludes systematic risks like market portfolios. This assumption reduces the burden of investor's such as dealing with several risks as only systematic risks are considered.

d. Financial and business risk variability

Sometimes business mix as well as financing differs from the current business of the investors, in this case only CAPM comes to the rescue. In this case other models such as WACC cannot be used by the investors which create a space for CAPM (Hens and Rieger, 2016).

Shortcomings of CAPM

Application of CPM led investors to come to know about the shortcomings of this model in determining cost of capital of projects.

a. Too many assumptions

CAPM works upon too many assumptions which make calculation of cost of equity time consuming. Some of the assumptions such as all investors are risk averse and rational are unrealistic which can result into incorrect outcomes.

b. Determination of Beta

Identifying the discount rate for specific projects can be a difficult task for the investors. In the views of Jarrow (2017), the beta for investment or portfolios differs from that of equity shares for which proxy beta is considered. However, identifying correct proxy beta is difficult for the investors affecting final outcome.

c. Allocation of values to CAPM variables

In the process of calculating cost of capital using CAPM three variables are there such as Rrf, β and Rm assigning values to which is difficult. This is because the value of these variables changes very often resulting into several outcomes.

d. Ability of borrowing at risk free rate

The model mentions that investors can lend and borrow funds at risk free rate which is not possible practically (Kisman and Restiyanita, 2015). This is because investors individually are unable to lend or borrow at the same time due to which expected rate of return cannot help in generating true results.

3. Analysis

Researching into the usefulness of CAPM highlighted both the positive and negative impacts of the model in the process of determining cost of capital of foreign project. The analysis has been presented with the help of themes mentioned below.

Theme 1: CAPM an imperfect but useful model in determining cost of capital

The CAPM developed by Sharpe is one of the workhorses in finance for estimating cost of capital. As per the views of Mackaya and Haque (2016), the model has faced several criticisms but its application cannot be neglected. Investors have been found to use the model widely in international finance as investment appraisal. While measuring cost of equity the shortcomings of CAPM is not greater than other models and approaches.
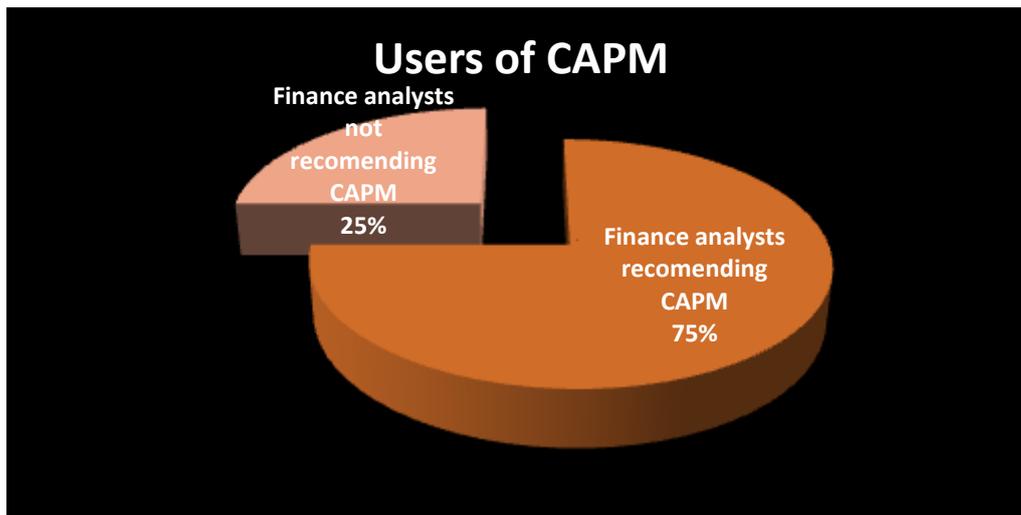
Figure 2: Users of Capital Asset Pricing Model

(Source: Influenced from nd.edu, 2019)

According to a recent study, 75% of finance analysts recommend usage of CAPM as an estimator of cost of capital (nd.edu, 2019). Moreover, 73.5% of finance analysts are already using CAPM as a tool of capital budgeting. Moreover, it comprises of certain benefits which other approaches does not such as quantification of risks. The model is highly beneficial for the decision makers who are willing to invest in the foreign projects. Information related to the three variables is available online for the investors which makes the process of calculation easier (Mazzola and Gerace, 2015). The model helps in providing sound judgement over risks involved in a particular foreign project.

Theme 2: Does CAPM work in determining cost of capital

Looking at the model's assumptions it can be said that they are highly unrealistic and hard to be achieved. Firstly, beta is related with past returns as a measure of risk. Moreover, differentiating systematic and total risk is empirically difficult due to the close relationship between them. If systematic risk remains unidentified then the outcome of CAPM is ineffective (Shah, 2015). Empirical SML or Security Market Lines result to be less steep than the theoretical SML which can be seen in the below mentioned figure. This is because securities with low beta earn higher than CAPM can estimate whereas securities with high beta earn lower than CAPM can predict (hbr.org, 2019).
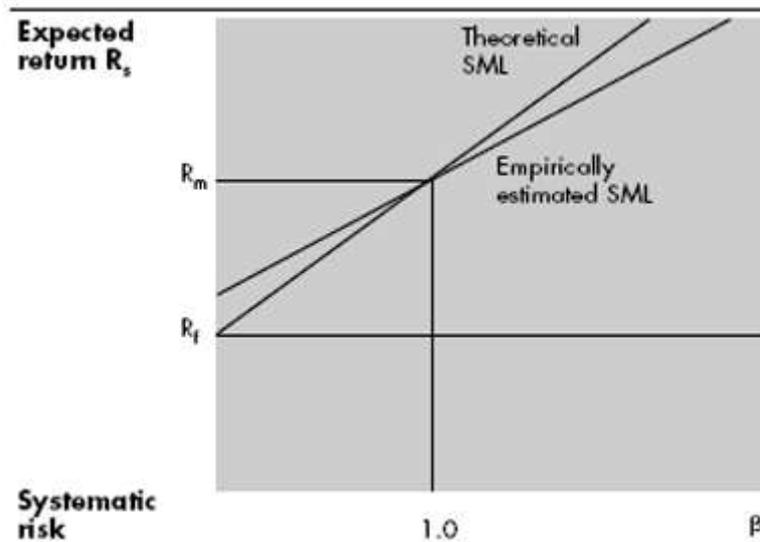
Figure 3: Users of Capital Asset Pricing Model

(Source: Influenced from hbr.org, 2019)

Thus it can be said that the prediction made by CAPM is not effective enough to determine cost of capital in the presence of associating factors. However, the other models present in the financial studies are not free from shortcomings which make the financial analysts to use it in calculating cost of capital. Several empirical tests performed by the financial analysts do not validate CAPM totally but they support its key implications such as positive trade off between risks and return (Shoaib and Siddiqui, 2016).

Theme 3: Ease in employment of Capital Asset Pricing Model

Figure 4: Employment of Capital Asset Pricing Model

(Source: Inspired from hbr.org, 2019)

Employment of CAPM in practical world for calculation of cost of capital of foreign projects is straightforward way.

For instance, when an investor calculates cost of capital of a foreign project then the rate reflects the risk inherited in that investment rather than that of the company. If the investor finds the investment to be riskier and cost of capital is higher then it can be rejected for a better option. Based on the understandings of Song (2018), CAPM comes to the rescue for determining cost of capital which helps in understanding whether the investment is profitable or not. Beta of the companies is available in the online database reflecting the level of risk it holds in the industry. The employment of CAPM is not only restricted to capital but can be applied in case of evaluating discounting cash flow of acquisitions (Squartini*et al.* 2017). In case of acquisitions cost of capital reflects the risks present in discounting cash flows. The presence of convenience is the driving factor which drives investors to use the model. In the above mentioned figure the shaded portion reflects risk involved in the foreign project by Multinational Corporation.

Theme 4: Problems related with application of CAPM

With the use of CAPM several error were identified by the financial analysts. Firstly, inadequacy related with CAPM includes ineffective description of the financial markets and uncertainties related with it. Secondly, instability of betas is known to everyone who creates difficulties in estimation of cost of capital. In the opinion of Zhao and Jin (2018), Multinational corporations face issues when they try to calculate the future cost of capital on the basis of historical beta. The historical beta is exposed to the risk of statistical estimation error. Thirdly, CAPM involves risks related to the risk free rate as well as expected return due to the quick changing rates. Due to these reasons some financial analysts prefer the Dividend growth model as current rates are used to determined future return on the basis of growth rates (Apergis and Rehman, 2018).

4. Future Outlook

Multinational corporations have to face fundamental question: should the rate of return on foreign projects be lower, higher or same as that for the domestic projects. In these process multinational corporations uses the CAPM for determining cost of capital of foreign projects. In solution to this question it can be said that higher risks are related with domestic projects as the MNCs considers systematic risks to be more relavant (Furman and Zitikis, 2017). The

solution to this question remains associated with several factors affecting the outcome such as size of the organisation, access to capital markets, exposure to risk of exchange risks, international diversification and exposure to country risk. This study helps the multinational corporations to understand the benefits of CAPM in identifying cost of capital. The study paves the way whether multinational corporations should use CAPM in determining cost of capital or go for alternative options. The figure mentioned below presents a summary of the factors which differentiates the risks related to foreign projects as compared with domestic projects.
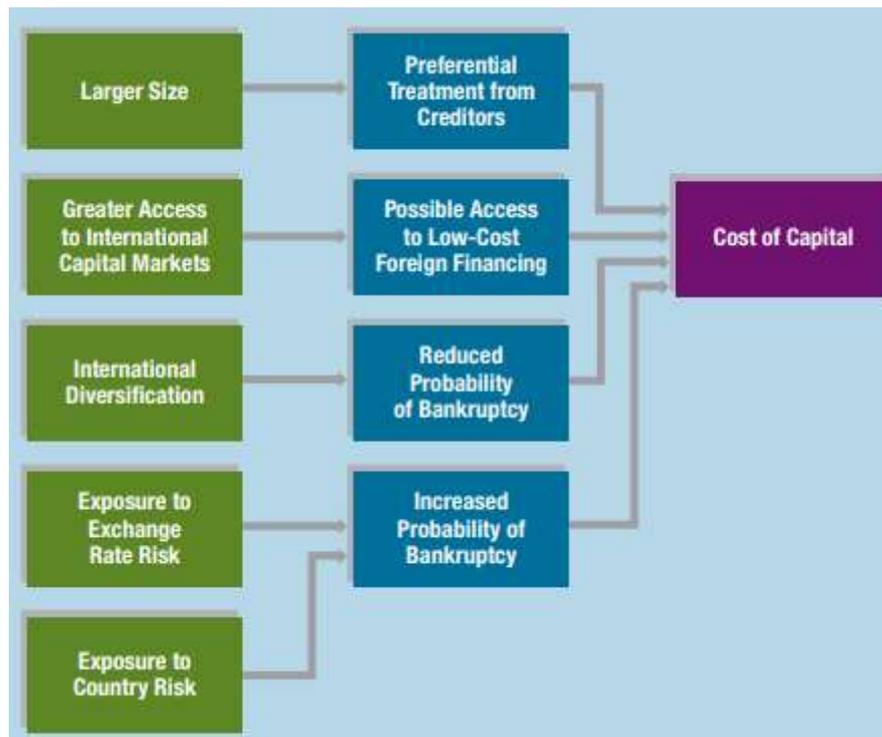

Figure 5: Factors affecting cost of capital

(Source: Inspired from cengage.com, 2019)

5. Conclusion

International finance requires suitability of a rage of both short term as well as long term sources which is available for an organisations. Moreover, determination of accurate rate of discount for capital investment appraisal in the context of international finance is required. The expected return should be equal to the cost of capital of foreign projects which can be identified with the help of CAPM.

The efficiency of the CAPM in calculating cost of capital helped it to dominating the modern financial theory. Moreover, the model is quite beneficial for the decision makers who are willing to invest in the foreign projects. Due to the frequent changes in the beta and risk free rates financial analysts often prefer the Dividend growth model. The main reason behind this is that the model uses current rates in order to determine future return on the basis of growth rates.

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