

PhD Tursunkhodjaeva Shirin
Tashkent Institute of Finance

BETA COEFFICIENT IN THE CALCULATION OF MARKET RISKS

Abstract. In the context of globalization and internationalization of world markets, the openness of the national economy, the growing transformation of the digital economy make the issue of financial risk management in real sector enterprises an actual. Market risk is the risk that directly affects the value of equity instruments. The beta coefficient is one of the key indicator in calculating market risk. The importance of calculating the beta ratio is that it gives a clear idea of how to get an average stable return and minimize the risk of investing in a particular financial instrument. By measuring this indicator, negative consequences for the real sector enterprise are prevented. However, this coefficient has a number of shortcomings. It does not take into account unsystematic risks and relies on historical data, and as a result, as the rate of return increases, the Beta measure and the cost of equity increase. In this study, the essence of this indicator, calculation methods and calculations on the example of real sector enterprises will be considered.

Key words. Financial risk, beta coefficient, market risk, systematic risk.

Introduction.

In the effective organization of financial risk management of real sector enterprises, it is necessary to study the systemic and unsystematic risks that affect these enterprises. Market risk is a systemic financial risk. Systematic risk is of great significance in capital markets study. The decline in the value of assets of real sector enterprises due to changes in market factors is called market risk. Hence, market risk is an important factor in the formation of the value of assets of enterprises. The growth of the level of capitalization of real sector enterprises is the basis for the sustainable development of the national economy. Therefore, market risk management of real sector enterprises is an important issue in all cases. The beta coefficient of the market model has had widely used in recent years as the relevant risk measure.

The beta coefficient is one of the most popular parameters of securities in Western stock markets. It is a useful tool of financial analysis which exactly measure market risk. In portfolio theory, it characterizes the slope of the “capital market line” for both an individual asset and the portfolio as a whole. It shows how much the return of the asset in question exceeds the average return of the market, allows you to compare assets with each other and form a market portfolio from them.

During an open conversation with entrepreneurs on August 20, 2021, the President of the Republic of Uzbekistan noted that more than 15,000 complaints were received about the problems facing entrepreneurs, 40% of which are related to financing and financial and credit, especially currency risks. For this purpose,

the President proposed the creation of a Currency Risk Management Company with branches in the regions under the Ministry of Finance.[1]

This highlights the need to develop a methodology for managing, controlling and analyzing market risks based on international experience in solving these problems determines the relevance of the chosen research topic.

Literature review

Issues of measuring, analyzing and managing market risks in real sector enterprises have been analyzed by many local and foreign economists. There are several ways to analyze market risks. The most common used and approved of these by economists is the beta coefficient. For example, beta is a term used in the CAPM to describe an asset's systematic risk [2]. The systematic risk of a company's stock is measured by beta, which is the co-movement of its stock return with the market return [3]. As a result, reliable beta projections assist investors in reducing nonsystematic risk [4]. According to James B. Wiggins for portfolios formed by size, past performance, and historical beta, the results indicate that a specification which conditions beta on the sign of the market risk premium generally provides a better description of monthly cross-sectional returns [5]. Khaled Elmoatasem Abdelghany found that, by identifying the accounting measures most closely associated with market Beta, the financial manager may be able to influence the Beta value by changing the company's structure as summarized in the successful accounting – determined risk measures[6]. Three of the most accepted processes that are in use to take account of the changes in beta include the ratios of price earnings, price-book and the dividend yield ratios. [7] However, theories of construction and use of the beta coefficient often conflict with the practice of the stock market.”- believes V.B.Degtyarev. [8]

A group of local economists investigated the valuation of capital assets in joint stock enterprises. For instance, Khudoikulov believes that the use of the discount rate of capital assets of the joint-stock company using the method of calculating the capital assets (CAPM) will determine the expected return on private capital and systemic risk, as well as harmonize national valuation standards with international valuation standards [9]. Portfolio risk assessment, according to Khamdamov, necessitates not only practical abilities, but also the ability to completely examine econometric approaches from heads of executive bodies or joint-stock company finance managers [10]. Elmirezayev further mentioned that the beta ratio is an essential indication in the calculation of market risk since it reveals whether the asset's risk is higher or lower than the market portfolio's risk, as well as its calculation technique and application areas. [11] Kahkhorov and Ibodullayeva noted that there are several difficulties in assessing the value of capital in joint stock companies. In particular, they assume about while it is simple

to calculate the sources of some capital because borrowed funds are raised on a fixed interest rate basis, in some cases the issue is complicated by aspects such as taxation and tax incentives. [12]

Research methodology

In this research work a beta ratio to assess market risk in real sector enterprises.

The formula for calculating the beta coefficient is as follows:

$$\beta = \frac{\sigma_{pm}}{\sigma_m^2} \quad (1)$$

σ_{pm} - covariance between return on investment portfolio and return on the market;

σ_m^2 - is the variance of market returns.

In addition, other methods such as, statistical analysis, group analysis, systematic analysis, comparative analysis and others are used.

Analysis and Results

Beta coefficient (β) - measures the stock's (asset's) risk in respect to the market and demonstrates the sensitivity of stock returns to market returns.

From a statistical standpoint, the beta coefficient theory assumes that stock returns are regularly distributed. Financial markets, on the other hand, are prone to significant surprises. Returns aren't always normally distributed in reality. As a result, what a stock's beta predicts about its future movement isn't necessarily accurate.

Even though a company with a low beta has less price swings, it may still be in a long-term downturn. As a result, adding a down-trending stock with a low beta to a portfolio reduces risk only if the investor defines risk only in terms of volatility (rather than as the potential for losses). From a practical standpoint, a low beta stock in a decline is unlikely to increase the performance of a portfolio.

The beta coefficient can be determined for a single stock or a portfolio of stocks. The coefficient is utilized in the U.S.Sharp model - CAPM - as a measure of systematic risk (Capital Assets Price Model). First, G.Markowitz used the beta coefficient, also known as the index of non-diversifiable risk, to evaluate the systematic risk of stocks. The beta coefficient allows you to compare the risk levels of various companies' stocks.

Table 1. Meaning of betta coefficient [13]

Indicator value	Stock risk level	Investor type	The direction in which the return on the stock changes
$\beta > 1$	High	Aggressive	One-sided
$\beta = 1$	Moderate	Passive	One-sided
$0 < \beta < 1$	Low	Conservative	One-sided
$-1 < \beta < 0$	Low	Conservative	Different sides

$\beta = -1$	Moderate	Passive	Different sides
$\beta < -1$	High	Aggressive	Different sides

The beta coefficient shows the market risk of the stock and reflects the sensitivity of changes in stocks in relation to changes in market returns. The table below shows the beta risk score. The beta coefficient can have both a positive and a negative sign, which shows a positive or negative correlation between the stock and the market. A positive sign reflects that stock and market returns are changing in one direction, negative multidirectional movement. A high beta stock that is volatile in a primarily upward direction, on the other hand, may raise the risk of a portfolio while also potentially adding returns. Before assuming that beta would increase or remove risk from a portfolio, it is recommended that investors who use beta to evaluate a stock do so from other viewpoints, such as fundamental or technical aspects.

If the market climbs 1% and a fund's beta exceeds 2.5, the fund will rise 2.5 percent on average. If the market increases by 1%, a fund with a beta of 0.4 will rise by 0.4 percent on average. In a down market, the relationship is same.

There are some concerns to be aware of when utilizing beta:

1. Betas have the potential to evolve over time.
 2. Betas may differ based on the request's direction (i.e., betas may be lower for down requests than for up requests).
 3. If the security isn't traded frequently, the projected beta will be poisoned.
 4. The beta isn't a foolproof threat indicator (you may need multiple betas).
- Also, keep in mind that the beta is a movement indicator rather than a volatility indicator. A security with zero beta and higher volatility than the request is achievable.

Beta coefficient is widely used by Bloomberg, Barra, Value Line and other similar information investment companies to assess systemic risks. Monthly / weekly data from several years are used to construct this ratio. The following table lists the key parameters used by different companies.

Table 2. Beta coefficient calculation periods [13]

Investment companies	Period of historical observation
Bloomberg	2 years
Barra	5 years
Value Line	5 years

From the data in the table above, it is clear that the beta coefficient calculation periods vary from company to company and cover a period of 2 to 5 years.

The beta ratio was established to measure the impact of market risk on the assets of real-estate businesses in Uzbekistan. (see Figure 1) Here, this coefficient is calculated separately over the years, based on 6 years of data, to clearly see the dynamics of its change.

This means that, according to estimates, the shares of these real sector enterprises have been managed by conservative investors over the years. The

reason for this halt is that the beta ratio fluctuated between 0 and 1, which indicates a low level of return and risk per share. Moreover, the beta ratio in enterprises did not record a negative level. Hence, market yields and stock yields act unilaterally.

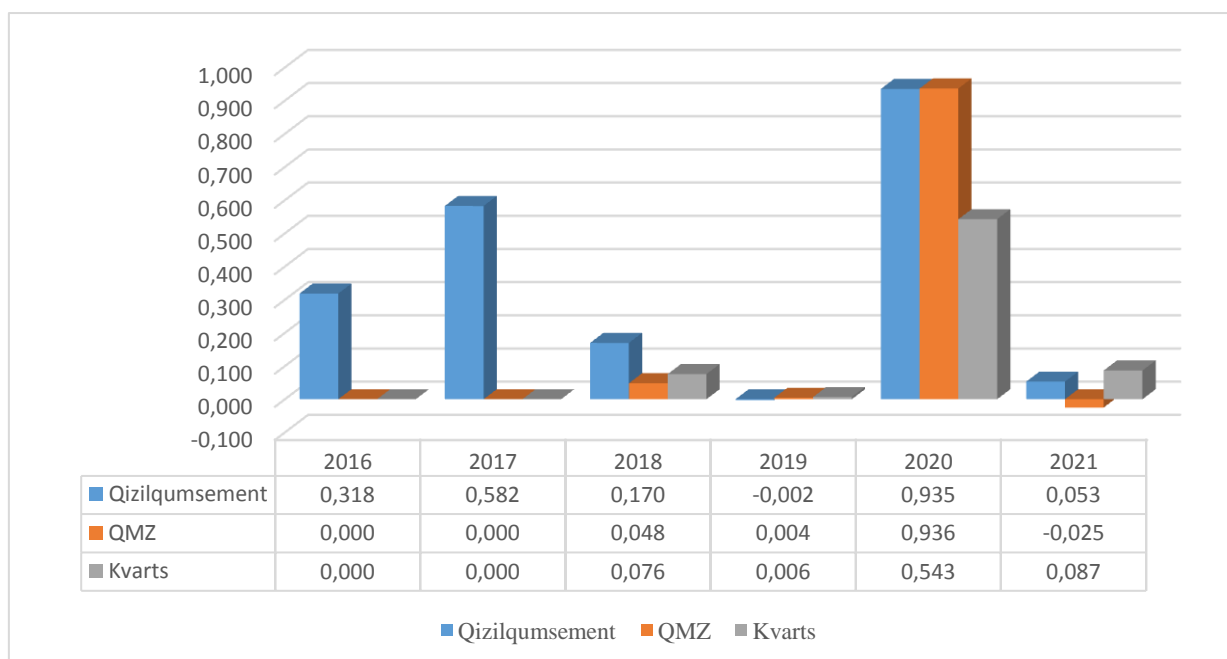


Figure 1. Calculation of beta coefficient [13]

The data demonstrates that the value of the company’s shares remained unchanged throughout the year in 2016 and 2017 in “Kokand mechanical plant” JSC and “Kvarts” JSC, hence the beta ratio was 0. The epidemiological situation in 2020 increased the volatility of the company’s shares, but there was no drastic change.

“Kyzylqumsement” JSC shares are constantly changing and have a higher volatility than other joint-stock companies and it is an absolutely stable enterprise. Therefore, the market risk level of the shares of this company does not have a moderate trend of change. For example, while in 2016 it was 0.318, in 2017 the market risk rose to 0.582 degrees and in 2018 it fell again to 0.170 degrees. but by 2019, the stock price and the market index have taken a two-way direction and the risk level has risen slightly. the most significant change was recorded in 2020. this indicates an increased level of risk. According to the balance sheet, sales volume also declined, but management costs could be maintained.

The share yield of the “Kokand Mechanical Plant” JSC remained unchanged in 2016 and 2017. it also had a significant impact on dividend policy. In 2018, this figure increased significantly, but the risk level still remained low. In 2019, stock prices again appeared to be volatile. Based on the negative impact of the 2020 pandemic on the core business of the enterprise, the beta indicator approached 1 as the enterprise went from a state of instability to a state of crisis. In 2021, the in

“Kokand mechanical plant” SJC recorded a negative level. This indicates a slight change in direction of movement.

“Quartz” JSC has a higher share price and a high level of volatility than other joint stock companies. “Quartz” JSC, like Kokand Mechanical Plant, remained unchanged in 2016, 2017 and 2019. In 2018, the volatility rate was high due to the IPO operation, so the market risk level beta ratio reached 0.48. It can be seen that the enterprise stock price and market index are one-way, have low market risk and are based on conservative management. In 2021, the company reached its level of stability as it managed to reduce interest rate and currency risks, and the market risk level of the shares returned to the previous trend.

Conclusion and proposals

Various methods and indicators are used to assess market risks. The most common of these and the most reliable indicator is the beta coefficient.

In conclusion, the beta ratio is the most optimal tool for measuring market risk. Real sector enterprises operating in the Republic of Uzbekistan should use this indicator to measure market risk in relation to their shares. Real sector enterprises operating in the Republic of Uzbekistan should use this indicator to measure market risk in relation to their shares. In addition, the calculation of the beta ratio increases the chances of optimizing portfolio diversification for investors.

It can be said that there are a number of positive aspects to the use of the beta ratio, which are:

Firstly, it's utilized in valuation models for beta regression to determine the cost of equity;

Secondly, It is based on the market's systematic risk, CAPM calculates an asset's Beta;

Thirdly, the CAPM's cost of equity represents how investors have diversified their portfolios to mitigate the impact of unsystematic risks and it provides a simple beta calculation that standardizes a risk indicator across many companies with different capital structures and fundamentals.

However, we can see that the beta ratio has the following drawbacks: Regression into beta as the rate of return rises so does the measure of Beta, and the cost of equity; though systematic risks are part of the explanation of markets of asset returns, unsystematic hazards are overlooked and there is a lot of reliance on historical returns, and it does not take into account new information or other factors that could affect future results.

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