Mitigating Market Risks

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Abstract: The current economic situation is recessionary largely because of the economic turmoil caused by China and the supply shocks due to the sudden fall in oil prices. The whole world is not insulated and is in fact affected by these two major economic upheavals due to the interconnectivity of globalization. The oil exporting countries will see their country in a recessionary mode as the cash flow from oil exports are reduced. The oil importing countries will see a major improvement in their cash flow with less cost of oil imports but their primary market in China will still not expand their export receipts. The last time we had a world economic turmoil was in 2008 when the American financial industries suffered a major market systemic downturn triggered by the subprime credit problems. Financial risks are twofold and these are market or systemic risks and unsystemic or specific risk. The current thinking is that market systemic risks such as the interest rate risk, inflation risk and currency risk can be identified but impossible to mitigate. The unsystemic risk refers to the individual risks or specific risks in the market and can be mitigated by the portfolio theory of Markowitz that was improved by Sharpe with the Capital Asset Pricing Model (CAPM). Portfolio theory relies on the comfort of large numbers. If you have only one investment avenue then if it fails then you lose all your investment but if you spread it over 40 investment destinations then you are virtually insulated provided the investments are inversely correlated. If these are positively correlated then it follows only one direction and will simulate market systemic risk. Market risk is unexplored territory except the recommendation to diversify into new markets. Nonetheless the market risks can be reduced to a mere equation. Caoile (2015) in an earlier work proposed the Mexican hat theory to account for the beta risk factors. The U.S. government used a combination of bailout plan and stimulus package that Krugman criticized since the size of the package is a hit or miss game. If it is too much then fiscal imbalance might happen that will trigger budget deficits. If too little then no stimulus will happen. Krugman proposed exchange rate modification to make your currency cheaper for exports as an improvement of the Mundell Fleming model. Economics is interrelated and interconnected and this is very evident in financial economics. Mitigating market systemic risks relies on the interdependence on interest rates, stimulus package, and foreign exchange into an algorithm that involves the Mexican hat equation. The model stems from the previous model of the Portfolio theory, CAPM, and even the Krugman prescription plus the Mexican hat to plug the holes into a form of complex

Nash equation. Indeed market risks can be mitigated in a manner of mitigating specific risks.

Key words: mitigating risks, Mexican hat, systemic risk, portfolio, Mundell Fleming model.

Introduction

The economic global situation is considered recessionary with two important influences such as the supply shock caused by low oil pump prices and the other is economic downturn of China. The fuel prices had gone down to the levels of 1990's but it had been steady for a while at around U.S. $ 100 a barrel previously a few years ago. But of recent memory the economic growth and development experienced during the 1990's was largely influenced by low oil price to the level it is now. Can the low fuel prices jumpstart the world economy that is now interconnected by globalization. The other twin problem is the economic slowdown in China just as it was about to embrace more democratic space and began to level the playing field by reducing corruption. China has grown almost double digit the last two decades to become the biggest economy in the world. The country is considered the factory of the world since its manufacturing industry effectively manufactures most products in the world even the ubiquitous iPhone by Apple and its other products are manufactured in China. The adage a few years ago is that when America

sneezes. The whole world catches a cold. Apparently it is happening in China as well. When it sneezes, the whole world catches a cold now that China is the biggest economy after the former number 1 that is America.

There are two types of risk and these are systemic and unsystemic risks. Systemic risk is on the aggregate and is also known as market risk when the whole economy is imperiled. On the other hand, unsystemic risk is the individual risk covering most companies. When the government for example imposes additional hurdles for cigarette manufacturers such as graphic pictures of health conditions of heavy smokers on the cigarette packs or additional taxes, it either increases the costs of cigarette manufacturers or simultaneously reduces profits. That is a double whammy. There are three ways by which companies react to a supply shock and these are to reduce its margins and profits, pass on the costs to consumers and pass on the costs to the labor or usually a combination of these three. This impacts on the market value of the shares.

The prescription to address unsystemic is the portfolio theory of Harry Markowitz that was improved by the Capital Appreciation Pricing Model (CAPM) by William F. Sharpe. Markowitz theory works on large numbers such that the risk is spread over a portfolio of at least 40 destination investments and combination provided these investment destinations are not covariant. If the investment destinations all follow the same pattern then they are covariant and the unsystemic risk is not mitigated and is actually converted into a subtle form of market or systemic risk. It is important that the investment portfolio is not covariant. Now the CAPM is an improvement of the Portfolio theory.

Methology

The portfolio theory relies on the computation of the Beta β as follows:

$$B = w_1\beta_1 + w_2\beta_2 + w_3\beta_3 \ldots = \Sigma^n_i w\beta$$

where β is the Beta of the portfolio and it shows how volatile the portfolio is relative to the market while w_i is the function of the portfolio invested in the ith stock. Beta β is the most relevant measure of a stock's risk because the stocks β coefficient affects the riskiness of a diversified portfolio.

Suppose an investor has two stocks portfolio with P250, 000 invested in stock X and P500, 000 invested in stock Y with Xβ is 1.50 while Yβ is 0.6. The β is 0.9 computed as follows:

$$\beta = 0.3(1.5) + 0.7 (0.6) = 0.9$$

The CAPM has the following equation as follows:

$$E (R_i) - R_f = \beta_i (E (R_m) - R_f)$$

such that the individual risk premium equals the market premium and

where R_f is the risk free rate such as arising from government bond;

β_i is the sensitivity of the expected asset returns to the expected excess market returns;

$E (R_m)$ is the expected return on the market

$E (R_m) - R_s$ is the market premium that is the difference between expected market rate of return and the risk free rate of return

$E (R_i) - R_f$ is the risk premium

CAPM is still zero sum equation but it is possible to create a Nash equilibrium equation where individual risk premiums will always equal market premium, using the Mexican

Hat wavelet as the equation to make the equation Nash equivalent. The Mexican wavelet has the following equation:

$$\Psi(t)= 1/\sqrt{z\pi\sigma^3}\,(1-t^2/\sigma^2)\,e^{-t^2/2\sigma^2}$$

where it is the second derivative of normalized negative Gaussian function that is a special case of continuous wavelength known as Hermitian wavelets.

The idea is simply to add the wavelength to the previous CAPM equation.

$$E(R_i)-R_f+\Psi(t)= \beta_i(E(R_m)-R_f)+\Psi(t)$$

Discussion

The Portfolio theory was improved on by the CAPM. Paul Krugman subsequently improved on the CAPM by introducing the concept of economies of scope and scale. The Mexican wavelet further improves on the Krugman idea of economies of scale and scope by making the CAPM equation a Nash equation with the Wavelet as the point of equilibrium.

Conclusion

The Mexican Wavelet allows for a Nash equivalent equation that solves the conundrum that is the portfolio and CAPM theories.