

## MODELING RISK MEASUREMENT IN EMERGING MARKET

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### ABSTRACT

**Purpose** – This study aims to make modeling measurement risk in capital market variables.

**Design/methodology/approach** – Using Mathematical approaches to integrated a noticeable increase in the firm-level idiosyncratic risk, the volatility measure of coefficient is greater and has a stronger upward trend than the new idiosyncratic volatility measure.

**Findings** – Using the the model decomposing total risk in market variance extended by Bali et.al, we integrated the model with initial model, Fama-French idiosyncratic risk Model, we sugested new model:

$R_{it} - R_{ft} = a_i + b_i (R_{Mt} - R_{ft}) + \text{var.HL}_t + \text{var.SB}_t + \text{Var.MW} + \text{Var.RW} + \text{Var.CMA} + e_i$

**Originality** – This paper introduces a variance measure of aggregate idiosyncratic risk, which does not require estimation of market betas or correlations and is based on the concept of gain from portofolio diversification.

**Keywords:** Idiosyncratic Risk, New Model

**Paper Type** *Research Result*



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## **INTRODUCTION**

Emerging markets are accumulating capital at a faster rate than developed markets, and their market capitalization and share in world capitalization is growing, but they lag far behind developed markets, such as the US and European markets, in terms of growth, number of stocks listed, foreign investment, liquidity, and risk. For faster growth of capital market we need tools to measure risk in capital market base on financial statement. In a global portfolio, (Harvey, 1995) advocate, weight needs to be assigned to these markets to generate higher returns because of growth potential. The liquidity crisis began in early 2007, and a constant flow of unfavorable news about defaults and write-downs caused investor pessimism, which resulted in panic selling and redemption pressure on the financial market (Chiu, Chung, Ho, & Wu, 2018).

Some important features of EMs are higher transaction costs, multiple tax regimes, lack of transparency, illiquidity, non-synchronous trading, substandard accounting systems, lack of regulations, and weak enforcement of contracts. Financial markets cannot function smoothly because the physical and institutional infrastructure is poor or underdeveloped, and governance is weakened by corruption, an uncertain legal environment, political instability, and lack of transparency. The extant literature suggests that these markets are informationally inefficient, and how that liberalization and trading infrastructure is necessary but not sufficient to improve the quality of information in EMs. As the EMs integrate with developed markets, the higher positive correlation exposes these markets to global shocks and volatility (Kumari, Mahakud, & Hiremath, 2017) The global financial crisis has made business opportunities less certain forcing companies to postpone long-term innovation investments (Zouaghi, Sánchez, & Martínez, 2018).

Risk is one of the main factors that investors consider when making investments. The risk of securities consists of two components, which are diversifiable risk and non-diversified risk. Portfolio securities are performed by investors to reduce diversifiable risk, while non-diversified risks will remain attached to each individual securities. Capital Asset Pricing Model (CAPM) developed by Sharpe (1964) and (Lintner, 1965) have long formed the mindset of academics and practitioners on the relationship of risk and return. Persistence non-current operating accruals have a positive and significant impact on the idiosyncratic risk. Investors looking at the change in operating non-current accrual as a change on account of fixed assets is a specific risk to the company. The increase in this account tells us the increase in risk (Asri, Ali, Habbe, & Rura, 2017).

Indonesian capital market showed a positive effect of idiosyncratic volatility, although not as strong as documented evidence to Malaysia, Singapore and Thailand (Nartea, Ward, & Yao, 2011); (Nartea, Wu, & Liu, 2013) Based on these considerations, to answer the variation pattern of this relationship researchers used the idiosyncratic risk as mediating variables that explain the relationship with the accrual rate in the stock price perspective prospect theory frame.

The phenomenon of over/under reaction of investors to earnings information is an interesting issue in capital markets. The issue becomes even more interesting because it is assumed to be a factor of appearing of earnings error estimation by investors and analyst that followed by mispricing of securities (Habbe, 2017).

The ability of idiosyncratic risk in determining the formation of financial disaster becomes the focus of this research. Idiosyncratic risk as an indicator forming stock prices in the capital. Based on the above arguments, the formulation of this research are summarized as follows: in the context of Indonesia's capital market, whether there is an anomalous phenomena accrual, whether the formation of anomalous accrual and persistence of accruals affect Financial disaster and whether investors consider the idiosyncratic risk in the decisions that shape stock prices.

This study is urgent because of the different characteristics in assessing risk in the CAPM model that is not in accordance with the conditions of the Indonesian capital market. Changes in specific information that often occur affect a particular company or industry to be the main basis in risk assessment by investors. This consideration should be in the idiosyncratic model.

## **LITERATURE REVIEW**

(Merton, 1986) suggest a positive relationship between idiosyncratic risk and stock returns in markets with imperfect information. (Ang, Hodrick, Xing, & Zhang, 2009) used a sample of 23 stock markets, including Australia in search of 'risk-return puzzle'. (Ang, Hodrick, Xing, & Zhang, 2006) cross-sectional relationship between idiosyncratic risk and stock prices with a positive result. (Fu, 2009) using monthly data and the size EGARCH (Exponential Generalized Autoregressive Conditional Heteroskedasticity) found a positive relationship and claimed superiority EGARCH measurement. (Ang et al., 2006); (Ang et al., 2009) produces a positive relationship. (Brockman, Schutte, & Yu, 2009) examines this relationship in 44 international markets. For the Australian market, they find a negative relationship. (Ang et al., 2009) measures the volatility of idiosyncratic generate positive relationships using measures based EGARCH as practiced by (Fu, 2009). (Brockman et al., 2009) examined the relationship of positive returns and idiosyncratic risk in the Australian stock market using EGARCH size to measure volatility.

Idiosyncratic risk calculation allows assign largest portion of the total risk, understand the relationship of return and idiosyncratic risk is important for small investors and institutional investors (Aiyagari, 1994). (Merton, 1987) contributes associated cross-sectional relationship between idiosyncratic volatility and expected returns for the various levels of the company. (Ang et al., 2009) suggests a negative relationship between idiosyncratic risk and stock returns as a general phenomenon throughout the world called 'idiosyncratic risk-return puzzle', described by using alternative regression estimation using data Australia. Behaviour conditional distribution of extreme returns reflect differences Losses and investment gains. Characteristics relationship is not the same return on average level and can affect the conclusion. the probability distribution of the cross-correlations of the stocks during the stock market disaster is fatter than that of others. Besides, the thresholds of cross-correlations are assigned to obtain the threshold networks and the power-law of degree distribution in these networks are observed in a certain range of threshold values. The networks during the stock market disaster also appear to have larger mean degree and modularity, which reveals the strong correlations among these stock prices (Xia, You, Jiang, & Guo, 2017).

The study, applying quantile regression to overcome the return distribution, dimension squares least regression and portfolio methods are often used in research (Malkiel & Xu, 2006) (Ang et al., 2009);(Brockman et al., 2009); (Fu, 2009); (Jiang, Xu, & Yao, 2009) ; (Huang, Liu, Ghon Rhee, & Zhang, 2011) with negative results. Finally, this study provides a new perspective on the shape of a cross-sectional relationship between idiosyncratic risk and stock returns, show empirical evidence that the relationship parabolic and quantile. Companies with a higher price variation will attract trade arbitration utilizing specific information. As a result, the company will track the company's fundamental values more closely. This will ultimately reduce the problem of information asymmetry that inhibits external funding and distorts capital spending decisions.

### **Prospect Theory (Prospect Theory)**

Prospect theory states that in making decisions, people tend to focus on the prospects, namely the prospect of gains and losses prospects, rather than on total wealth. As for, which is used as a reference point in calculating profit and loss always change from time to time. Furthermore, the decision-makers perceive a person or prospect (outcomes) in the form of value function. This is consistent with the main conclusions (Kahneman & Tversky, 1979) explains that the function of the values defined in terms of gains and losses. Value function explained that in making decisions, people tend to be risk-averse when it is in the domain of profit and risk-seeking when it is at a loss domain. The loss function function is represented by a more concave and steep curve, while the function of the profit value is represented in the form of a convex curve and not so steep.

Relationships between variables in this study is based on prospect theory, the theory of real options, Financial disaster and risk model development idiosyncratic Developed in previous research. This study puts idiosyncratic risk as a mediating variable linking accrual persistence operating current, non-current operating persistence, persistence financial accruals and accrual anomaly on financial disaster . To build a model of the relationship between the operating current accrual persistence, persistence operating non-current accrual, accrual financial persistence and accrual anomaly against idiosyncratic risk used real options theory. Model of the relationship between idiosyncratic risk on Financial disaster using the prospect theory.

### **Market Anomaly**

Efficient Market Hypothesis (EMH) suggests the market is said to be efficient if stock prices reflect all available information appropriately, including accounting information (Jones, 1991). The consequences of the Efficient Market Hypothesis is the ability of analysts expect future earnings to perfection, considering the element of accrual and cash in a profit element present. If future earnings forecasts can be perfectly predicted, then the current stock price will move into equilibrium fair price because the current fair price has accommodated future earnings, then there will be no price correction in the future when profit is announced. In discussing efficient market testing, it should also discuss about the existence of irregularities (anomalies) associated with efficient market hypothesis.

### **Idiosyncratic Risk**

Idiosyncratic risk reflects specific information about the company and fluctuate according to the information itself (Goyal & Santa-clara, 2003). Factors that may affect this risk are announcements about seasonal earnings information, supplies and company requests and the dynamics of corporate competition. Company earnings information can be observed from the accrual quality in the financial statements. Idiosyncratic risk is possible also arise because of government regulations that have direct impact on certain industries.

Stock returns in the period used to estimate the regression coefficient and intercept namely beta risk, and substituting the market model to calculate the residual error between the actual return and the market return, then the residual error is used to calculate the residual error variance, the end result is called idiosyncratic risk. To calculate the value of idiosyncratic risk can also be done through Fama\_French regression model, the result of residual error variance is idiosyncratic risk. Idiosyncratic risk is the risk that a part of the overall risk of the securities that are not related to the various risk factors that are not biased diversified. The five-factor model (Fama & French, 2014) is a development of a three-factor model (Fama & French, 1993).

Based on the research of (Fama & French, 1993), there is a three-factor model which are the basis for empirical studies for Financial disaster . The third factor is beta, size as measured by market capitalization and book-to-market ratio (BMR) into the market index to describe the average rate of return. Size return premium is the difference between large and small firms are denoted by the SMB (small minus big) while the book-to-market premium is the excess return of the high and low BMR denoted by HML (high minus low).

Five models of Fama-French factors is done by regressing the difference in return (excess return) using five factors, as follows:

$$R_{it} - R_{ft} = a_i + b_i (R_{Mt} - R_{ft}) + c_i HML_t + d_i SMB_t + e_i RMW_t + r_i + c_i CMA + e_i$$

1. The difference between the return of the market portfolio,
2. Difference return of portfolio of small stocks to the portfolio return small stock large stock deductible (Small Minus Big - SMB),
3. The difference between the return of the portfolio with a ratio Book To Market (BTM) high-yielding portfolio with low BTM ratio (High Minus Low- HML)
4. RMW difference between returns on portfolio diversification and low profitability
5. CMA difference between returns lower stock portfolio diversification with high investment company.

### **Idiosyncratic Volatility and Stock Price Information**

The importance of idiosyncratic volatility in corporate decision making is of concern in recent years. States with the protection of property rights are better tend to have a lower return synchronicity which eventually leads to firm-specific information is reflected in the stock price resulting in a higher market efficiency. Idiosyncratic risk increases will increase the accounting transparency of a country. This suggests that the efficiency of capital allocation positively correlated with idiosyncratic risk and stock returns in the country.

(Chen & Chen, 2012) shows that managers of companies with high idiosyncratic risk incorporating information about the stock price into investment decisions. Several studies have questioned the use of idiosyncratic volatility as a measure of market efficiency ((David Hirshleifer & Teoh, 2009); (Schrand & Zechman, 2012); (Fan & Yu, 2013) This study attempts to examine the relationship between idiosyncratic volatility and stock prices.

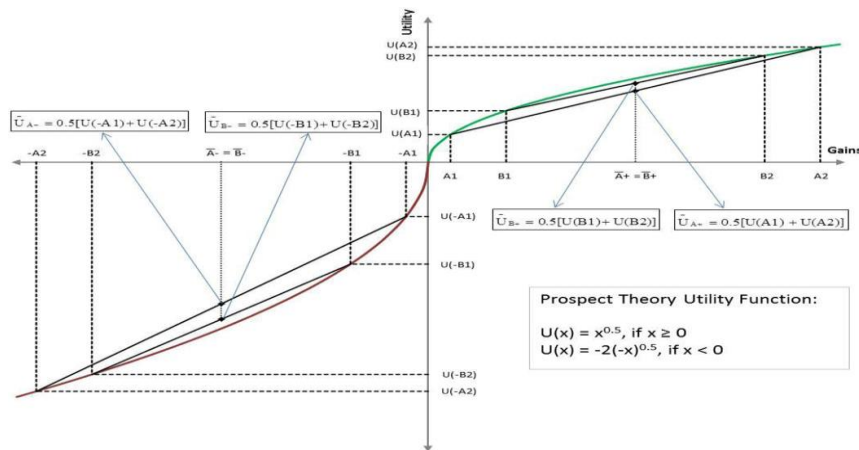
### **The theory of real options: the persistence relationship accrual and idiosyncratic risk**

Attributes are used to measure the quality include accrual quality, persistence, predictability, smoothness, value relevance, timeliness, and conservatism (Francis, Lafond, & Schipper, 2004); (Shanken & Zhou, 2007); (Dechow, Ge, & Schrand, 2010). This study focuses on measuring the quality of persistence attributes are accrued using the operating current accrual persistence, persistence operating non-current accrual, accrual financial persistence and accrual anomaly. Accrual is not only the components of profitability but also an investment component (Fairfield, Whisenant, & Yohn, 2003).

(Dixit & Pindyck, 1994) emphasized the main traits irreversible on investment decisions, sustainability, and the uncertainty in the environment where the decision is implemented. Therefore, (Dixit & Pindyck, 1994) stated that there is added value to get better information but this is never enough. (Easley & O'Hara, 2004) states that the accounting treatment and disclosure could affect the company information environment which will then have an impact on risk information, idiosyncratic volatility, and capital costs (cost of capital).

### **Prospect Theory: relationships idiosyncratic risk and financial disaster**

Prospect theory begins with Kahneman and Tversky's research on human behavior that is considered strange and contradictory in decision making. This prospect theory can be used to 'photograph' the phenomenon of investor behavior, especially in decision making process 'unreasonable'. This theory is used to measure the behavior of people or organizations in making decisions. The same research subjects were given the same options but were formulated differently, and they showed two different behaviors. This is referred to as risk-aversion and risk-seeking behavior. This behavior is described using the value function in the face of gain and loss. In the domain of gains investors tend to risk aversion and in the domain of losses tend to be risk seeking.



Source: (Bhootra & Hur, 2014)

Figure 1.

### Relationship Prospect Theory, Risk Preferences and Return Volatility

Prospect theory emphasizes the psychological factor that in making decisions individuals tend to focus on their prospects, the profit and loss prospects, not the total wealth. In the prospect theory, noted that the frame is adopted person can influence his decision, under conditions of uncertainty people will choose the option that produces the greatest expected utility. Attitudes facing profits will be very different from the attitude of dealing with losses. As for, which is used as a reference point in calculating profit and loss always change from time to time. This is referred to as risk-aversion and risk-seeking behavior. This behavior is described using the value function in the face of gain and loss. In the domain of gains investors tend to risk aversion and in the domain of losses tend to be risk seeking. The loss-loss function is represented by a more concave and steep curve, while the profit function function is represented in the form of a convex curve and not so steep.

Measurement of risk in this study using the idiosyncratic risk (volatility and idiosyncratic). Volatility of the company's risk is measured using the Fama-French model of five factors. Idiosyncratic volatility risk then grouped in the domain of the gain or loss in accordance with prospect theory utility function. This function connects the risk preference, volatility and Financial disaster . Investor psychology factors in the decision making berkaitan Financial disaster in the prospect theory associated with risk preference. In the domain of gains, investors tend to behave risk averse, so decisions tend to select stocks with lower idiosyncratic volatility because it provides high utility. In my domain loss, investors tend to behave in a risk seeking, so decisions tend to favor stocks with high idiosyncratic volatility because it provides high utility. Investor behavior with regard to decision-making can be observed based on the relationship of risk preference, volatility and Financial disaster . Investor's decision related to Financial disaster in the prospect theory envisaged utility function.



(Nartea et al., 2013); (Nath & Brooks, 2015) finds idiosyncratic volatility stronger than the risk of beta or firm size. Firm size is positively correlated with stock returns after controlling for idiosyncratic risk is thus Idiosyncratic risk is one of the important variables that affect the stock price. (Nartea et al., 2013); showed lower idiosyncratic volatility will occur when the accounting information is not found, it means that the information disclosure was positively correlated with idiosyncratic risk. Fu (2009) found the stock returns and the size of the company today has a positive correlation after controlling for idiosyncratic risk, indicates the size of the company, stock returns are higher.

(Mashruwala, Rajgopal, & Shevlin, 2006) finds stocks of small-sized companies having high risk Idiosyncratic and high transaction costs. Arbitrage risk is a part of the stock volatility (Mendenhall, 2014). (Ke & Ramalingegowda, 2005) found the transient behavior of institutional investors in response to repair the role of accounting information stock price efficiency.

(Jin & Myers, 2006) found a lower idiosyncratic volatility and lower stock returns occurs when information is not transparent accounting and investor protection worse, information disclosure is negatively correlated with risk Idiosyncratic (Pincus, Rajgopal, & Venkatachalam, 2007) (Healy & Palepu, 1990) suggest the relevance of the value of earnings and the relevance of cash flow values can affect the Idiosyncratic risk of the firm. (Lin & Wang, 2011) find that external financing activities are positively associated with risk. (Subramanyam, 1996) describes the Short-term and Long-term accruals accruals affect the risk. (Frankel & Litov, 2009) stated that accrual quality can increase or decrease stock price synchrony.

(Ali & Paul Zarowin, 1992); (Fan & Yu, 2013) examine the information content of accruals against idiosyncratic risk. Idiosyncratic risk is influenced by monetary policy, characteristic factors of the company, the funding policy the company and the company's operating activities (Fu, 2009). Current operating accruals are the current changes in net cash operating assets and short-term investments minus changes in current operating liabilities. Operating assets when focusing on receivables and inventories. (Dechow, 1994) consider that the accounts most widely used in the manipulation of revenue through early recognition of revenue.

Ang et al., (2006) found the idiosyncratic risk is negatively correlated with the size of the company. For accounts inventory, managers can defer recognize or allocate costs for inventory obsolescence (Bali, Cakici, Yan, & Zhang, 2005) As such, changes in inventory and accounts receivable account is considered a low persistency and a cause mispricing (Zhang, 2005). Research (Malkiel & Xu, 2006); (Jiang, Lee, & Anandarajan, 2008); (Ang et al., 2009); (Brockman et al., 2009); (Fu, 2009); (Huang et al., 2011) with negative results.

Publication of accounting information plays an important role in the flow of information. Transparent information will encourage investors to collect specific information. Condensed financial statements as both annual and quarterly information is an opportunity for management companies to declare the performance to all stakeholders of the company (Rura, Bambang, Made, & Rosidi, 2011).

The role of the publication of information will make a choice based on a tradeoff between cost and efficiency for the acquisition of specific information. Idiosyncratic volatility occurs when investors rely on specific information. Companies with higher transparency have lower volatility. This indicates the volatility of the company reflects more firm-specific information rather than information about the market.

Companies operating activities was measured using persistence operating current accruals provide an overview to investors about changes in current assets. Changes in current assets are company-specific information involve risks and can affect the idiosyncratic risk.

(Lin & Wang, 2011) discusses the relevance of the effect of profit values (relevance incremental value) and the incremental value relevance of idiosyncratic volatility of cash flows and the effects of external financing activities, debt financing, and equity of the company at risk idiosikratik. (Lin & Wang, 2011) predicts an idiosyncratic volatility using financial (Huang, Wald, & Martell, 2013) examined the impact of the liberalization of the financial markets on the share price and idiosyncratic risk in emerging markets. (Nartea et al., 2011) found a positive relationship idiosyncratic volatility of the return of shares in the Southeast Asian market. Positive results can also be found in the research (Cotter, Sullivan, & Rossi, 2015); (Herskovic, Kelly, Lustig, & Nieuwerburgh, 2015)

Some studies have questioned the use of idiosyncratic volatility as a measure of market efficiency (Hirshleifer, Hou, & Teoh, 2012); (Schrand & Zechman, 2012); (Fan & Yu, 2013). This study tried to examine the relationship between idiosyncratic volatility and stock prices, could not find a positive relationship. (Lee & Mauck, 2016) proposed a link nonlinear between idiosyncratic volatility and stock price information.

The importance of idiosyncratic volatility in corporate decision to the attention in recent years. States with the protection of property rights are better tend to have synchronicity return lower ultimately leads to firm-specific information is reflected in the stock price resulting in a higher market efficiency. Idiosyncratic risk increase accounting transparency of a country. This suggests that the efficiency of capital allocation positively correlated with idiosyncratic risk and return of stocks in the country. Supposedly idiosyncratic risk a key consideration in shaping investor financial disaster .

In the perspective of prospect theory, in the domain of losses investors behave risk seeking. In the domain loss curve shape prospect theory of utility function is convexity, so the demand for stocks with high idiosyncratic volatility is greater. In conditions of equilibrium, demand a rational investor is not perfectly elastic so that the demand for stocks with high idiosyncratic volatility will be greater so that the stock price is higher. For testing, the stock was separated in groups of capital loss and capital gain (positive and negative values CG).

## RESEARCH METHOD

### Research Design

This study aims to make modeling measurement risk in capital market variables.

### Data Analysis Techniques

#### Modeling measurement risk using extended modified idiosyncratic risk model

Five-factor model of Fama French (Fama & French, 2014) carried out by regressing excess return using five factors:

$$R_{it} - R_{ft} = a_i + b_i (R_{Mt} - R_{Ft}) + t_{he} + h_i HML_t + SMB_t + RMW + r_i + c_i CMA + e_i$$

1. The difference between the return of the market portfolio,
2. Difference return of portfolio of small stocks to the portfolio return small stock large stock deductible (Small Minus Big - SMB),
3. The difference between the return of the portfolio with a ratio Book To Market (BTM) high-yielding portfolio with low BTM ratio (High Minus Low- HML)
4. RMW difference between returns on portfolio diversification and low profitability
5. CMA difference between returns lower stock portfolio diversification with high investment company.

## RESULT AND DISCUSSION

Based on the framework of research already cited the method chosen for data analysis in this research. This paper introduces a model-independent measure of aggregate idiosyncratic risk based on the mean-variance portfolio theory and the concept of gain from portfolio diversification. With the new approach, there is no need to estimate the covariance terms or the industry-level or firm-level beta coefficients when constructing the average idiosyncratic risk at the industry- or firm-level.

Since there is no gain from diversification when the correlations among individual stocks equal one, the variance of the portfolio with perfectly correlated securities contains systematic risk and idiosyncratic risk of the securities in the portfolio. We also think that the stock market index can be viewed as a fully diversified portfolio, which does not contain any idiosyncratic risk.

The new measure of average idiosyncratic volatility is defined as the difference between the variance of the non-diversified portfolio and the variance of the fully diversified portfolio. We present two versions of the new methodology; one decomposing total risk into firm and market variance, and the other decomposing total risk into firm, industry, and market variance. Although the average idiosyncratic volatility measures of CLMX and the new methodology have very similar fluctuations through time, there are some significant differences

### **Methodology decomposing total risk into firm and market variance**

The idiosyncratic risk of a stock is unobservable, and is generally estimated using a return generating process. The previous research calculates idiosyncratic volatility of a stock relative to the systematic (or market-wide) returns of the stock. The excess return for each stock relative to the risk-free rate is defined as the sum of its systematic excess return component and its idiosyncratic return component. Assuming that the capital asset pricing model (CAPM) holds, the systematic excess return is a function of the excess market return:

$$R_{i,t} = \beta_i R_{m,t} + \epsilon_{i,t}; \dots \dots \dots \text{(Eq.1)}$$

where:

$R_{i,t}$  is the excess return on a stock  $i$  in period  $t$ ,

$\beta_i R_{m,t}$  is the systematic excess return with  $\beta_i$  denoting the beta for stock  $i$

$R_{m,t}$  denoting the excess market return in period  $t$ , and  $\epsilon_{i,t}$  is the idiosyncratic return component. Based on this return decomposition, total risk of the stock can be decomposed into systematic risk and idiosyncratic risk. We can define the market portfolio as a value-weighted portfolio of  $n$  stocks, and its excess return will be written as  $R_{m,t} = \sum_{i=1}^n w_i R_{i,t}$ , where  $w_i$  represents the weight of each stock  $i$  in the market portfolio, and satisfies the constraints  $0 \leq w_{i,t} \leq 1$  and  $\sum_{i=1}^n w_{i,t} = 1$ .

In the case where the return generating process is assumed to follow a one-factor model in Eq. (1), we have the following relationship:

### **New methodology decomposing total risk into firm and market variance**

Idiosyncratic risk represents the stock's variance that is should be not only attributable to overall market volatility, but is related to the firm's specific volatility. Idiosyncratic risk is unique to a stock because it is related to the part of a stock's return that does not vary with returns on other stocks or the market. With many stocks in a portfolio, idiosyncratic risk becomes less important because when the idiosyncratic part of one stock's return increases, it is likely that the idiosyncratic part of another stock has decreased, movements that cancel each other out. Hence with enough diversification as a result of a portfolio containing a large number of different stocks, the idiosyncratic risk contributes nothing to the total risk of the portfolio. In other words, the risk of a well-diversified portfolio is due solely to the systematic risk of stocks in the portfolio.

Our new methodology in estimating aggregate idiosyncratic risk depends on the concept of gain from portfolio diversification introduced by Markowitz (1952, 1959). According to the mean-variance portfolio theory of Markowitz, the risk of the portfolio of n securities

Using the the model decomposing total risk in market variance extended by Bali et.al, we integrated the model wttth initial model idiosyncratic risk we sugested new model:

$$R_{it} - R_{Ft} = a_i + b_i (R_{Mt} - R_{Ft}) + \text{var.HL} + \text{var.SB} + \text{Var.MW} + \text{Var.RW} + \text{Var.CMA} + e_i$$

1. The difference between the return of the market portfolio,
2. Difference return of portfolio of small stocks to the portfolio return small stock large stock variance (variance Small Big - SB),
3. The difference between the return of the portfolio with a ratio Book To Market (BTM) high-yielding portfolio with lowBTM ratio (Variance High Low- VHL)
4. RW difference between returns on portfolio diversification and low profitability (Variance RW)
5. CMA difference between returns lower stock portfolio diversification with high investment company. (Var.CA)

### **CONCLUSION**

Conclusion:

1. This paper introduces a model-independent measure of aggregate idiosyncratic risk based on the mean-variance
2. With the variance approach, there is no need to estimate the terms or the industry-level or firm-level beta coefficients when constructing the average idiosyncratic risk at the industry- or firm-level.

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