

## **Equity Premium in Indonesian Capital Market: Sectoral Systematic Risk**

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### **Abstract**

The risk premium, or the difference between the expected returns on stocks and on risk free assets, has commanded the attention of both professional economists and investment practitioners for decades. It is not surprising that the magnitude of interest in premium is intense because of its critical role for asset allocation and wealth projections for individual investors. This research aims to generate and analyse the impact of risk premium calculation or the beta coefficient of each sector's risk premium in Jakarta Composite Index. The research focuses on providing new perspective in assessing the level of risk premium in equity market, sector market to be precise. Using CAPM model with historical data on stocks return and sector index return, the level of risk premium on each sector is generated using panel data method. The result of this paper widens the variety of research related with risk premium in Indonesian capital market and gives more focus on sector implication. This research also gives suggestions regarding equity management for investors, government policies, and the equity issuer by providing sector risk premium for the major stakeholders in Indonesian equity market.

**Keywords:** Jakarta composite index, risk premium, sector risk premium, CAPM, risk, return.

### **1. Introduction**

The risk premium, or the difference between the expected returns on stocks and on risk free assets, has commanded the attention of both professional economists and investment practitioners for decades. In the past 20 years, inordinate amount of research have been published with equity premium as the title. It is not surprising that the magnitude of interest in premium is intense because of its critical role for asset allocation and wealth projections for individual investors. The interest in academic research about the equity premium appeared after

Mehra and Prescott (1985) suggested that by examining the behaviour of the stock market and aggregate consumption, they showed that the equity risk premium can be lower than calculated from the historical data.

The equity risk premium gives investors judgments about how much risks are seen in an economy or market and the price attached to the risk. It affects the expected return and the estimated value on every risky instrument. It defines how to allocate wealth across different asset classes and which specific assets that investors should choose within each asset class. The higher degree of uncertainties found in investing on risky assets, which in this case is stocks, made investors require a higher return compared to the return of investing in risk-free asset. The difference between the return of risk free asset and risky asset is called risk premium, which reflects investors' expectations of return in investing to riskier assets. This research will figure investors' level of expectation on each sector's return by calculating the beta of risk premium. Result of sector risk premium's beta calculation will have an impact on government's policy, investors' decisions, and sector performance.

## **2. Theoretical Framework**

Studies on market risk premium have grown vast in the last decades, especially in developed countries. Stated on his paper, Robert G. Bowman considers that risk premium is an expectation, directly unobservable, and unavoidably judgmental in implementing the CAPM. However, he finally continued his research to the Australian market and also compared his research to the risk premium in United States of America. He also believes that the use of historical data to measure risk premium is flawed and investors should use American MRP as the benchmark. Ibbotson Associates is the most common reference on measuring the MRP in the United States and the period of research is from 1926, at least estimate 75 years of study to measure a market's risk premium. However, this method is inapplicable to the Jakarta Composite Index since the capital market itself had just re-established in 1977, where there was only one issuer. On the other hand, Martin Lally's paper combined his research on cross country and estimate market risk premium based on local historical data. Nevertheless, the data analyzed is over 100 years old.

In the less developed country such as South Africa, a paper by Lumengo Bonga-Bonga assesses the market risk premium in South Africa using time-varying parameter GARCH-M

model. This paper also further compares the result of time-varying risk premium model forecast with the constant risk premium model in predicting stock market returns on the South African stock exchange. He also make use of CAPM model in estimating his research objective. His research results that risk premium in South Africa is time varying.

Meanwhile in Indonesia, the study of sector analysis on returns and risk in the stock market, which uses CAPM highly, involved beta as the proxy. The research compares beta calculation using CAPM and Single Index Model and also makes use of time series analysis. In the end the writers suggest that the analysis on risk and return should be elaborated with fundamental studies and external circumstances of each sector to control the stability of the result. The list of previous studies discussed above is summarized with the table below:

Table 1: Previous Studies Related To Risk Premium

Year	Author	Title
2001	Robert G. Bowman	Estimating Market Risk Premium
2004	Muliaman D. Hadad Satrio Wibowo Dwityapoetra S.	Sector Beta As a Proxy Indicator of Return and Risk in the Stock Market
2010	Martin Lally	Estimating the Market Risk Premium Using Historical Data from Multiple Markets
2010	Lumengo Bonga-Bonga	The Assessment of Market Risk Premium in South Africa

### 3. Method and Participants

This research has two kinds of variables; dependent and independent variables. The dependent variable will be the sector returns ( $R_i$ ) of 9 sectors in Indonesia. The independent variable will be the return of Jakarta Composite Index ( $R_m$ ). The chosen variables are based on the previous theories that this research uses, which is Capital Asset Pricing Model (CAPM). There are 9 sectors in Jakarta Composite Index, which are agriculture, mining, basic industry,

miscellaneous industry, consumer goods industry, property and real estate, infrastructure and transportation, finance, and trade.

**4. Assessments and Measures**

Since the level of risk premium that we want to achieve is the slope of SML (beta), therefore, using this linear regression formula of CAPM will generate the desired result:

$$R_{i,t}-r_f = \alpha_i - \beta_i(R_{m,t} - r_f) + \epsilon_{i,t}$$

i = Sectors in Jakarta Composite Index

t = 2009 - 2014

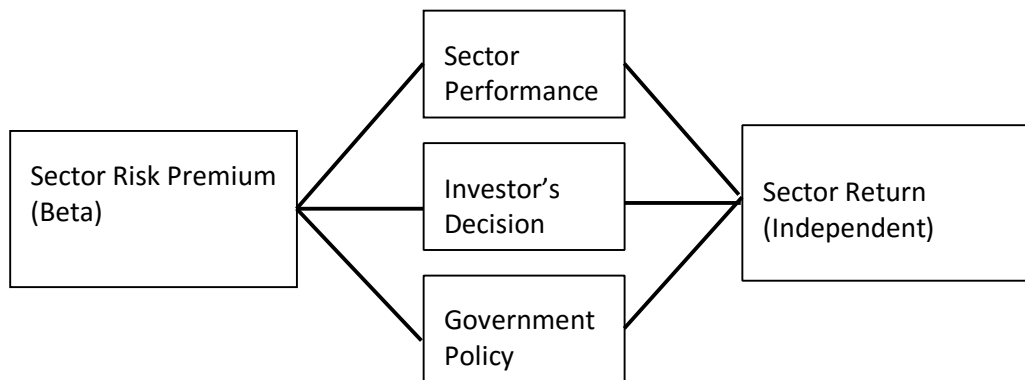
R<sub>i,t</sub> = return on assets (weighted stocks return) i at time t. r<sub>f</sub>

= return of riskless asset at time t.

R<sub>m,t</sub> = return on the market (Jakarta Composite Index) at time t.

α<sub>i</sub> and β<sub>i</sub> are the coefficients to be estimated.

The conceptual model to this research is shown in this graph below:



*Figure 1: Conceptual Graph*

**5. Data Collection**

The research used secondary data, which is collected from the ICAMEL (Indonesian Capital Market Library), Bank of Indonesia, and Yahoo! Finance during the period of 2009-2014. The data used in this research is secondary data such as the data of adjusted closing price of Jakarta

Composite Index, sector indices prices using data on daily adjusted closing price per sector indices during the study period, and the risk free rate which is the central bank rate.

## **6. Data Analysis**

This stage will explain how the researcher processes the data. In this research, the data is processed and quantitative results are generated using regression with panel data model using statistical software EViews 9.0.

### **6.1. Stock Return Calculation**

This model will calculate the return of stocks indices and chosen stocks. The equation used is:

$$R_t = \frac{(P_t - P_{t-1})}{P_{t-1}}$$

$R_t$  : Return at time  $t$

$P_t$  : Closing price at time  $t$

$P_{t-1}$  : Closing price at the previous time  $t$

### **6.2. Excel Calculation**

The researcher processes each sector return on Excel and subtracts it with the risk free rate which is the central bank daily rate. This process goes repeatedly each year and on each sector.

### **6.3. Panel Data Regression**

Panel data is a combination of time series data (time series) and the data cross (cross section). Time series data typically includes an object / individual (eg, stock prices, foreign exchange rates, interest rate of central bank, or the rate of inflation), but includes some periods (can be daily, monthly, quarterly, or yearly). The data consists of a cross on a few or many objects, often called the respondent (eg, a company) with multiple types of data (eg, income, advertising costs, retained earnings, and the level of investment) within a specified time period. The advantage of using the panel data is a combination of data and data time series cross section is able to provide more data that will produce a greater degree of freedom.

### 6.3.1. Residual Method in Panel Data.

There are 3 types of residual method in panel data; common effect, fixed effect, and random effect. Common effect in panel data incorporates cross-section data with time series data (the data pool). Then the combined data is treated as a unit of observation to estimate the model with OLS. Fixed effect allowed the intercept varies between cross-section units but still assumes that the slope coefficient is constant between the cross-section units. Random effect assumes unobservable individual effects (error term) is not correlated with the regressors, or in other words error term are assumed to be random.

### 6.3.2. Classical Linear Assumption Test.

Suggested by Gauss-Markov there are 4 types of classical linear assumption test to obtain *Best Linier Unbiased Estimation* (BLUE); normality, autocorrelation, heterocedasticity, and multicollinearity.

## 7. Results

This part will present the regression estimation result of this research and discuss it furthermore with related theories and concurrent conditions.

### 7.1. Panel Data Estimation

After conducting several prerequisite tests, the regression estimation is normally distributed, is free from multicollinearity, and cured from autocorrelation and heterocedasticity. The preferred residual model is common effect after the Maximum Likelihood Ratio Test is conducted.

*Figure 2: Panel Data Regression Result*

	<b>Dependent Variable</b>	
Intercept	-0.0020	***
	-12.4142	
_AGRI--RM_AGRI	0.2588	***
	7.9887	

	0.3627	
_BASI--RM_BASI	11.7361	***
	0.3256	
_CONS--RM_CONS	12.1390	***
	0.3658	
_FINA--RM_FINA	12.3917	***
	0.3203	
_INFR--RM_INFR	12.2755	***
	0.2820	
_MINI--RM_MINI	8.0425	***
	0.3352	
_MISC--RM_MISC	8.8027	***
	0.5283	
_PROP--RM_PROP	3.3935	**
	0.3005	
_TRAD--RM_TRAD	11.8079	***
	0.0594	
AR(1)	6.5488	***
Adjusted R <sup>2</sup>	0.079	
F Statistics	107.51	***
Observations	12402	

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The *t*-tests are presented in parentheses. \*  $p \leq 0.10$ ; \*\*  $p \leq 0.005$ ; \*\*\*  $p \leq 0.001$ .

## 7.2. T-Stat Results

Based on the results of EViews panel data regression above, the probability values of T-Stat in all cross sections (sectors) are identical at 0.0000 except for property sector at 0.0007 and all are lower than significance level 5%. This implies that the regression model can be used to

predict all the stocks return in each sectors and it is also implied that risk premium affects the returns of all stocks in all sectors in Jakarta Composite Index significantly.

### 7.3. R-Squared Results

Based on the result above, the  $R^2$  (*R Square*) value is 0.079835 (7.98%). The percentage shows the influence of independent variable to the result of dependent variable. The variation of independent variables used in the model explains 7.98% of the variation of dependent variable, while the rest (92.02%) are influenced by other variables that are excluded from the model.

### 8. Discussion

The decrease in the level of market risk implies a significant increase in market capitalization as investors bid up the prices of stocks that are expected to offer less volatile returns. The windfall of capital gain to the stockholders means that ex post realized returns exceed required returns during the period subsequent to the shift in the volatility process.

SECTORS	ALPHA INTERCEPT	BETA SECTOR
Agriculture	-0.002014	0.258834
Basic Industry	-0.002014	0.362684
Consumer Goods	-0.002014	0.325633
Finance	-0.002014	0.365767
Infrastructure	-0.002014	0.320276
Mining	-0.002014	0.281958
Miscellaneous Ind.	-0.002014	0.335217
Property	-0.002014	0.528274
Trade	-0.002014	0.300507

*Table 2: Result of Alpha Intercept and Beta Coefficient According*

to the table above, the regression equation of the model is:

1.  $(RI-RF)_{AGRI} = -0.002014 + 0.258834 * (RM-RF)_{AGRI}$
2.  $(RI-RF)_{BASI} = -0.002014 + 0.362684 * (RM-RF)_{BASI}$



3.  $(RI-RF) CONS = -0.002014 + 0.325633*(RM-RF CONS)$
4.  $(RI-RF) FINA = -0.002014 + 0.365767*(RM-RF FINA)$
5.  $(RI-RF) INFR = -0.002014 + 0.320276*(RM-RF INFR)$
6.  $(RI-RF) MINI = -0.002014 + 0.281958*(RM-RF MINI)$
7.  $(RI-RF) MISC = -0.002014 + 0.335217*(RM-RF MISC)$
8.  $(RI-RF) PROP = -0.002014 + 0.528274*(RM-RF PROP)$
9.  $(RI-RF) TRAD = -0.002014 + 0.300507*(RM-RF TRAD)$

If all of the independent variables are zero, the returns of the stocks are interpreted as the value of the intercept, which is -0.002014. The regression coefficient of the risk premium in agriculture industry is 0.258834, which means that risk premium has positive influence on the stock's return. In this case, if the values of risk premium variable increase by one unit, assuming other variables are constant (*ceteris paribus*), therefore the stocks return will increase by 0.258834 units. If the risk premium variable decreases by 1 unit, therefore the return of stocks will decrease by 0.258834 units, and so it goes in analyzing the coefficients of CAPM in each sector in Jakarta Composite Index.

### **8.1. Implications to Investors' Decision**

The highest beta coefficient of risk premium belongs to the property industry at 0.528274. This means that the sector risk premium of trade industry should be higher than the others in Jakarta Composite Index. In this case, investors expect a return as high as the sector risk premium which is the beta coefficient of risk premium multiplied by the risk premium of the sector, by investing in the property industry compared to only investing in risk free asset. These premiums reflect judgments that investors make about how much risks in a market and the price attached to it. Therefore, it will have an effect on the expected return on risky investment and the estimated value of the investment. A higher equity risk premium will increase expected return on the investment while reducing their value.

Before investing, an investor will determine how much proportion of his portfolio will go to different asset classes. Asset classes here means equities, fixed income, and real asset investments. If the investors see that the equity risk premium is high, they prefer to invest a bigger proportion

of their portfolio in stocks. If investors tend to extrapolate the condition of the market (bullish or bearish) that sometimes are irrational, then they can also change their view on allocating the assets. On valuing the asset, investors also rely on risk premium level. To generate more return, investors must pay less in advance and vice versa. Therefore, the risk premium and asset prices are inversely related. With identical expected values, investors will pay higher for a less risky asset and vice versa, the equity risk premium will determine how much lower they should pay. If equity premium rise, investors will charge higher price for the risk, and will pay lower price for the asset. Stocks will go down when equity risk premiums go up and vice versa.

## **8. 2. Implications to Sector Companies**

On investing, each firm has to know their cost of financing for decision-making. If the investors in a firm require a certain level of return, then the cost of equity in that firm must also be on that level. If the risk premiums rise, the costs of financing will also increase. As it increases, lesser number of investments will give higher returns than these costs and the firm will invest in less assets and projects. Change in risk premium have a huge impact on the overall economy condition on real investment and will lead to change in real growth of economy.

If the number of investment decreases because the level of risk premium is high, more cash should be available in the firm. Firms can choose to return it to the investors or to use it for future needs. If the firm invests in less riskier asset but the expected return is lower than the risk premium, therefore investors will prefer to have dividends than investing it in the firm.

On deciding the cost of capital on each firm, managers or the firm's decision makers should perceive the risk premium on the assets. If the risk premium is low relative to the other, the decision makers will likely choose equity more than debts or other investment assets.

The overall sector performance must improve to affect the movement and increase of share price in the future to fulfill the investors' expectation regarding the level of risk premium that the sector has. Or else if fails, the investors would likely shift from investing in equity to investing in a riskless or risk-free assets since investors won't like to bear the risks if the return obtained cannot fulfill their expectation.

### **8.3. Implications to Government**

Governments are investing funds to meet future pension fund and the health care obligations. On investing in equity market, they have their own return expectation or their own view on equity risk premium towards the asset. A higher risk premium will lead to less amount of money being set aside to cover their future fund obligations. If the risk premium is too high or the actual premium obtained is lower than the expected, it can lead to fund shortfalls that have to be compensated by raising tax. The shortfalls can happen because the fund's assets will fail to meet the liabilities.

To support the growth of equity financing and investing in Indonesia, the government will likely issue a policy by decreasing the central bank rate. If the rate increases, the level of risk premium will decrease, therefore lowering investors' expectation on equity return and lowering the risks the investors has to bear.

### **9. Conclusion**

The risk premium impacts the return of the stocks significantly; it is shown from the tstat probability result. The total risk premium for all sectors is the risk premium multiplied by the risk (beta) that is generated from the EViews using panel data approach. The risk premium of a certain sectors highly impacts the three stakeholders of Indonesian capital market, the investors, sector performance, and the government of Indonesia. To investors, it gives impact on allocating assets and asset valuations. To the sector performance on financing, risk premiums gives views on how much to invest, its cost of capital, and dividend policy. Therefore, further research on risk premium with a better methodology and qualitative review is highly suggested.

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