

***DETERMINANT OF MARKET EFFICIENCY IN
SHORT HORIZON DATA (STUDY ON NON-
FINANCIAL COMPANIES LISTED AT KOMPAS
100 INDEX IN OCTOBER 2017- MARCH 2018)***



UNDERGRADUATE THESIS

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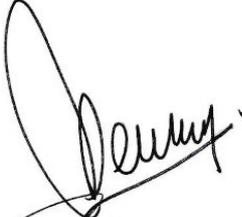
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Has been presented and defended in front of the Boards of Reviewers on 21 August 2018 for fulfilling the requirement to be accepted.

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DECLARATION OF ORIGINALITY

I, Ivan Irawan, hereby declare that the undergraduate thesis entitled: **DETERMINANT OF MARKET EFFICIENCY IN SHORT HORIZON DATA (STUDY ON NON-FINANCIAL COMPANIES LISTED AT KOMPAS 100 INDEX IN OCTOBER 2017- MARCH 2018)** is my own writing.

I hereby declare that in this essay there is no whole or part of another person's writing that I take by copying or imitating in a series of sentences or symbols that show ideas or opinions or thoughts from other authors, which I recognize as if it were writing myself, and / or there is no part or all of the writing that I copy, or do I take from someone else's writing without giving the original author's acknowledgment. This undergraduate thesis is written for the partial requirement to complete Undergraduate Program of Management and has not been presented in any other occasion before. I bear full responsibility for my undergraduate thesis.

Semarang, 8 August 2018



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MOTTO AND DEDICATION

“DO YOUR BEST, LET GOD DO THE REST”

“The heart of man plans his way, but the LORD establishes his steps”

(Proverbs 16:9)

“Do not be anxious about anything, but in everything by prayer and supplication with thanksgiving let your requests be made known to God”

(Philippians 4:6)

I dedicate this thesis for:

Jesus Christ

My beloved family

And all my friends

who will always support me in all condition

ABSTRACT

Market efficiency has become an important research since the emergence of *efficient market hypothesis* by Fama in 1970. Indonesia researchers has done so many research in accordance of market efficiency, but almost all of them are focused on long term efficiencies and not many of them are try to determine the factors or variable that has the most impact on market efficiency in Indonesia. Different from research that had been conducted in Indonesia, This research focused on short horizon interval and tries finding the determinant of short horizon return predictability which founded as the inverse indicator of market efficiency by Chordia in 2008 and developed by Chung and Hrazadil and other researcher in the following years. The objective of this research are to analyze the effects of Volume, Price, Volatility, Effective Spread, Price Impact to Short Horizon Return Predictability of Non-Financial Companies that listed in KOMPAS100 index on October 2017-March 2018.

The population of this study were 64 Non-Financial companies which actively traded and listed in KOMPAS100 Index Indonesia. This research also used the Historical Intraday Trading data from *Bloomberg* over the period of October 2017- March 2018. Intraday data will provide more specific and accurate information to give a specific result. This research used the multiple linear regression in order to determine the variable which has the most affect on Short Horizon Return Predictability.

The result of this research showed us some various result, from proving that the determinant factors used in this research had influence on Non-Financial Companies Short Horizon Return Predictability. But there is a factor that was not in accordance with the hypothesis that had been made. This research also find that *Price Impact* is the most determining variable or factors that affects Short-Horizon Return Predictability of Non-Financial Companies in Indonesia.

Keywords: Short Horizon Return Predictability, Market Efficiency, Investment, Effective Spread, Price Impact, Volume.

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Author realizes that there are still many error in the writing of this thesis. Therefore, the authors expect the existence of suggestions and constructive criticism from all parties for the revision and development of this thesis. The authors hope that this research can be useful for every reader and for further researchers who want to raise similar topics.

Semarang, 8 August 2018

Ivan Irawan

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CHAPTER I

INTRODUCTION

1.1. Research Background

Market efficiency is an important breakthrough in corporate finance theory. It's occur because of the *Efficient Market Hypothesis* theory by Fama in 1970. Since the emergence of the theory, financial researchers continue to test its validity. The theory of market efficiency is an important finding in history because it is the most noticed and has been empirically tested almost all over the world. (Miller, 1999)

In 1970, Fama defined market efficiency as a market which prices always “fully reflect” the available information is efficient. Then Beaver (1989) defined market efficiency as the relationship between securities prices and information. In addition, Jones (2014) define efficient market as a market in which the prices of securities quickly and fully reflect all available information.

Fama (1970) divided the market efficiency into three forms. First, Weak Form Market Efficiency, it is a condition when the stock price fully reflect the information from the past. Second, Semi-strong Form Market efficiency, it is a condition when the stock price fully reflect the information which included the financial report from the shareholder. Third, Strong Form Market Efficiency, it is a condition when the stock price fully reflect all information including the private information. In this study, we only focus on weak form market efficiency.

In summary, the form of market efficiency introduced by Fama in 1970 has a different source of information for each form. The source of each form of market efficiency takes a role on the testing of the market efficiency. The differences described by Jones (2014) is shown in table 1.1.

Table 1.1
Form of Market efficiency and its Information Source

Market Efficiency Form (Fama 1970)	Source of Information
Weak Form	Market Data
Semi-strong Form	All publicly available information
Strong Form	All information including public and private data.

Source: Investment Principles and Concept (Jones, 2014:324)

In 1991, Fama revised the measure of all form of market efficiency. The *weak form market efficiency* previously measured with run test to see if a market will follow a random walk or not to determine the market efficiency, Fama revised it with using return predictability to measure the weak form market efficiency which he named it as *the test of return predictability*. Fama (1991) give us two measures of return predictability which is *Short-horizon return predictability* and *long-horizon return predictability*. This research only focus short horizon return predictability.

Short horizon return predictability is a method to see whether return of a firm in a short time from the past return can predict present return (Elton, Gruber, Brown, & Goetzmann, 2014). Short horizon return predictability can only be applied to companies that are active in stock trading. It is occur to minimize impact from non-trading firms in a short interval setting (Chung & Hrazdil, 2010).

After the research from Fama in 1991, many financial and investment experts do research about the efficiency using the short-horizon return predictability. Cushing & Madhavan (2000) did a research which analyzes stock return at intraday interval across the stocks from Russell 1000. They record that short-horizon return predictability is predictable from past order flow, they also found that systematic return reversals following order imbalance publications consistent with temporary price pressure related to liquidity trading.

Chordia, Roll, & Subrahmanyam (2008) did a research entitled *Liquidity and Market Efficiency* this research has become the basis for study in *short-horizon return predictability*. They find that short-horizon return predictability (SHRP) is the inverse measurement for market efficiency, they also found that predictability decreases when bid-ask spreads are closer and rejected over time with the minimum tick size and also found that when tick size decreased, the variance ratios of open-close/close-open return are also increased, while return autocorrelations decreased. This research also became a basis on finding the determinant of short-horizon return predictability.

Visaltanachoti & Yang, (2010) do a research about speed of convergence to market efficiency in NYSE foreign stocks. They found that on average, it takes between 30 and 60 minutes for a stock that came from other countries to reach market efficiency. They also report that firm-level characteristics are negatively related to the time needed to reach efficiency. They also found that *Home market share* is the determinant of market efficiency in a multivariate setting. They also find that higher trading volume in the home market may create more pressure competition

on the NYSE market specialist. They also indicate that the stocks of firm from countries that share a common border, language, or culture with United States of America shows a faster speed of convergence to market efficiency

Chung & Hrazdil (2011) also did a research in market efficiency by using short-horizon return predictability from past order flow as the inverse indicator of market efficiency by Chordia et al. (2008), Chung & Hrazdil (2010a, 2010b) but in this research they only focus on the post-earning announcement drift (PEAD). They found that market efficiency variable is significant and negatively associated with the abnormal return in long-window post-announcement abnormal return. In multivariate setting, they find that *volume* is the most associated factor to market efficiency.

Chung & Hrazdil (2012) develop the research with short horizon return predictability and use speed to convergence as the main focus of the research which based on the Chordia, Roll, & Subrahmanyam (2005) research. They do the research on 2041 largest and actively traded firms on NYSE. The finding of this research are Electronic Communication Network (ECN) platform is significantly related with faster to reach market efficiency, they also found that when trading volume and volatility is increased the speed of convergence process is also increased, and they found that when uninformed traders and heavier order traffic activity is increased it would negate the effects of lengthening the time of convergence, the faster speed on the NYSE Arca platform (All-electronic trading platform with distinct market structure and certain advantages over the traditional NYSE floor trading) is also associated with decreasing activities of uninformed

traders, decreasing order traffic, increasing volatility, and increasing trading volume on this platform relative to the NYSE platform.

Chung & Hrazdil (2013) develop the previous research which they do in 2012. The research still take speed to convergence as the main phenomena but the focus of this research is on Exchange-traded funds (ETF) market. They do research on 273 ETFs that actively traded on NYSE Arca during the first six month of 2008. In this research Chung and Hrazdil found that although there was a significant difference in volatility, informational effects, and trading cost between ETF market and regular stocks, the price adjustments to new information for ETF market occur in 30 minutes, which makes it comparable to the price adjustment in traditional stocks that traded on NYSE Arca. In multivariate setting they found that volume is not the only significant variable that affects the speed of convergence to market efficiency of ETFs.

Chung & Hrazdil (2015) did a research about the impact of trading floor closure on short horizon return predictability (SHRP) which founded to be the inverse indicator of market efficiency. They found that the closure of a clear and complete trading floor, which caused full electronic commerce, changed the trading environment of the stock and whether and how this change affected the discovery of stock prices. They also tries to find the determinant of market efficiency with analyzing variables used such as *AS_LSB*, *AS_HS*, *PESpread*, *EFSpread*, *RZSpread*, *PImpact*, *Volume*, *Volatility*, *Price*, *MU*, *Epsilon*, and *PIN* and they found that the price impact is the factor that determine the market efficiency in short horizon return predictability.

Unfortunately, the research on finding the determinant of market efficiency by utilizing the short horizon return predictability (SHRP) as an inverse indicator of market in Indonesia is cannot be found. The most determining factor on short horizon return predictability (SHRP) which take a role as the inverse indicator of market efficiency from the previous findings is *volume*. (Chung, 2010a, b, 2011, 2012, 2013)

The finding of this study is expected to contribute to the understanding about market efficiency of Asian stock markets especially in Indonesia with the following distinct features. Unlike the most previous research, this research only focus to find the determinant of short horizon return predictability of developed country that is Indonesia by using multivariate analysis by Chung and Hrazdil (2010b, 2011) to determine the variable which have the most significant effect in Indonesia market efficiency with using short horizon return predictability as inverse indicator of market efficiency.

The previous research on determinant of market efficiency is become the main basis on this research, this research consider several variables that are significant determinants of the *short horizon return predictability*. First, the firm-level characteristics (stock price, volatility, and trading volume) by Visaltanachoti and Yang (2010) which they report that the characteristic are negatively affects the the market efficiency is used in this research. Stock price and trading volume are used to catch the impact of trading cost (Stoll, 2003). In this research, *price* (mean daily price), *volume* (mean daily trading volume), and *volatility* (volatility of daily returns) is included as the variables specific to the IDX.

Second, the Hendershott, Jones, & Menkveld (2011) effective spread model is used in this research. The measure of *effective spread* is the difference between bid-ask midpoint and the actual transaction price, divided by the bid-ask midpoint. The *effective spread* further decomposed into its two components, which is *realized spread* (as the measure of revenue to liquidity providers), and *price impact* (as the measure of the gross losses to liquidity demanders due adverse selection). The effective spread, and price impact is used as the first set of variable to obtain the effect of trading condition and quality of market on the *short horizon return predictability*.

This research is view the market from microstructure perspective and utilize short horizon return predictability as inverse indicator of market efficiency approach from Chordia et. al (2008), and Chung (2010a,b, 2011, 2012, 2013). This research only focus on the *multivariate analysis* and utilize *Multiple Linear Regression* from Chung and Hrazdil (2010b, 2011) to examine the most associated variable between market efficiency and the variable which can possibly effect the market efficiency. Sample used in this research is covered and limited only for firms listed on Kompas 100 index that listed in Indonesia Stock Exchange (IDX) in 2017 because *short horizon return predictability* need firms with the largest and actively traded to minimize the impact from non-trading in a short interval setting (Chung, 2010b). Data used in this research is from Indonesia Stock Exchange Historical Intraday Trading database covered in 2017-2018 from *Bloomberg*.

The number of research market efficiency in Indonesia continues to grow. The previous result on testing the market efficiency in Indonesia is still have

different result between efficient and inefficient. Different variable and measures already done by some researcher. But only few researcher who tries to identify the factor or variable which have the most impact on market efficiency. This thing is important because with knowing the factor or variable which have the most impact in market efficiency can help investor to know which stock have the most efficient and reliable so that can become a consideration and helping in decision making before buying a stock. The objective of this research is to determine the variable which have the most impact on market efficiency in Indonesia. From the research problem, gap and objective above, the title of this research is ***“Determinant of Market Efficiency (Study on Non-Financial Companies Listed at Kompas 100 Index in October 2017-March 2018)”***

1.2. Research Problem

From the research background that has been described, *short horizon return predictability* is a method to measure market efficiency in short term situation, the research that analyze and discuss this kind of measurement is rarely to be done and mostly done in developed countries. This kind of research is can not to be found in Indonesia, which become more attractive to be study and discuss with basis of previous research.

From the phenomenon in the research background, it can be concluded that *trading volume* is become the factor that had the most impact to short horizon return predictability. However, the previous research only tested at developed countries and there are no such research that empirically done in emerging countries. This

research utilize some variable that used in previous research, from the variable that used in this research, there are some result that done by some researcher.

Table 1.2
Research Gap

Independent Variable to SHRP	Influence	Researcher
Effective Spread 1. 2.	Not Included Positive Significant	Chung and Hrazadil (2012) Chung and Hrazadil (2015)
Price Impact 1. 2.	Not Significant Positive Significant	Chung and Hrazadil (2012) Chung and Hrazadil (2015)
Volume 1. 2. 3.	Positive Significant Positive Significant Negative Significant	Visaltanachoti and Yang (2010) Chung and Hrazadil (2015) Chung and Hrazadil (2013)
Price 1. 2. 3.	Positive Significant Negative Significant Not Significant	Visaltanachoti and Yang (2010) Chung and Hrazadil (2015) Chung and Hrazadil (2013)
Volatility 1. 2. 3.	Positive Significant Negative Significant Not Significant	Visaltanachoti and Yang (2010) Chung and Hrazadil (2015) Chung and Hrazadil (2013)

Source: Taken from some Empirical Results

From the previous research, the result are remain inconsistent which indicated that there might be another result that this research could have if it tested in Indonesia or other emerging countries, because the previous research is only tested in developed countries. Finding determinant of short horizon return is important because with knowing the factor or variable which have the most impact in market efficiency can help investor to know which stock have the most efficient and reliable so that can become a consideration and helping in decision making before buying a stock or securities. From the description above, the objective of this

research is to determine the variable which have the most impact on market efficiency in Indonesia.

From the problem statement or formulation, the questions that arise from the background and research problem in this study then are as follows:

1. Is *effective spread* becomes the factor that have the most impact to the short horizon return predictability (SHRP) of non-financial companies?
2. Is *price impact* becomes the factor that have the most impact to the short horizon return predictability (SHRP) of non-financial companies?
3. Is *trading volume* becomes the factor that have the most impact to the short horizon return predictability (SHRP) of non-financial companies?
4. Is *price* becomes the factor that the most impact to the short horizon return predictability (SHRP) of non-financial companies?
5. Is *volatility* becomes the factor that the most impact to the short horizon return predictability (SHRP) of non-financial companies?

1.3. Research Objective and Usage

The objective of this research is to determine which variable account for the largest variation in the Indonesia market efficiency.

1. To analyze the impact of *effective spread* towards the *short horizon return predictability* (SHRP) of non-financial companies.
2. To analyze the impact of *price impact* towards the *short horizon return predictability* (SHRP) of non-financial companies.
3. To analyze the impact of *trading volume* towards the *short horizon return predictability* (SHRP) of non-financial companies.

4. To analyze the impact of *price* towards the *short horizon return predictability* (SHRP) of non-financial companies.
5. To analyze the impact of *volatility* towards the *short horizon return predictability* (SHRP) of non-financial companies.

This research is hopefully to be useful for:

a. For the further research / Academic Usability

This research is expected to add insight and knowledge about testing of capital market efficiency. Especially on market efficiency in Indonesia in short horizon perspective. This research is also expected to be used as an academic reference for further research who will conduct a research with the same theme.

b. For the investor

This research is expected to add new insight and knowledge to market efficiency so that investors can consider which companies stocks are efficient that could be the main consideration for investment.

1.4. Research Systematic

In order to make easier in understanding this research, this study is divided into five sections systematically and it is organized as follows:

First Chapter: Introduction

This chapter is mainly discusses the background of the short horizon return predictability (SHRP), research objectives which will test the determinant of short horizon return predictability (SHRP) at Indonesian capital market. The problems, purpose and usage of this research will also be discussed in this chapter.

Second Chapter: Literature Review

This chapter mainly discusses the theoretical basis of the research (*efficient market hypothesis, market microstructure theory*). In this chapter previous research, research framework, and hypothesis will also be discussed.

Third Chapter: Research Method

This chapter mainly discusses the methodology to be used in research. The research variable with its operational definition, the population and sample of the research, the types and source of the data, method of collecting data, and the method of analysis of the research will also be discussed in this chapter.

Fourth Chapter: Result and Analysis

This chapter is mainly discusses the result and interpretation from the research. Description of the research object, data analysis and result interpretation will be available in this chapter.

Fifth Chapter: Conclusion

This chapter is mainly discusses the summary of the research. In this chapter the conclusion, research limitation, and the suggestion. The bibliography and attachment will be at the end after this chapter.