

The Indonesia economic growth has been getting better over the years motivates both domestic and foreign investors to do the investment. One of the best return investment instruments in Indonesia is equity fund. Not all business sectors perform well at the same time, so sector rotation could be an appropriate option in an attempt to beat the market. This research aims to identify the relationship between business cycle and selected stocks performance in Indonesia Stock Exchange. Sharpe ratio, holding period return, and geometric average return are applied as the proxy to measure the effectiveness of sector rotation implementation. The secondary data such as Jakarta Composite Index, Sectoral Index, Indonesia GDP Growth, and Inflation Rate is taken to analyze business cycle identification. The author makes sector choice analysis and selects the stock based on LQ45 Index. Portfolio backdated simulation is built after defining the weight of each stock in specific business cycle phase. The results proved that sector rotation strategy are effective for maximizing investors' wealth in comparison with passive strategy. It is also possible to be implemented into the real investment world.

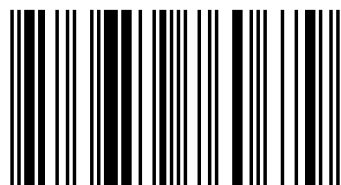


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# Optimal Portfolio Construction Based on Sector Rotation Strategy

An Empirical Study of Indonesia Stock Exchange



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# CHAPTER 1

## INTRODUCTION

### 1.1. Background

Along with the development of globalization is rapidly increasing, the importance of economic improvement is also increasingly felt in the future. Although it is regularly criticized because of the limitations of economic growth in improving living quality standards may conflict with the environment and social condition, but economic growth is still very important for almost everyone within that economy in dealing with several problems such as poverty, unemployment, government budget deficits, and competitiveness with other countries.

There are some factors that affect economic growth like productivity, demographic changes, and technology innovation. Productivity advancement generates economic growth by making products and services less expensive to increase market demand. Demographic changes means there are some changes in population, age, and gender that also affect production, consumption, and business activity. Technology innovation creates the business process activity became more effective and efficient.

The economic growth can be measured by the growth rate of Gross Domestic Product (GDP). GDP is the total market value of all the goods and services produces over a specified time period to determine the health of a country's economy. It is not only normally used to assess the economic performance of a whole country or region, but can also evaluate the relative contribution of an industry sector and specified area.

The calculation of GDP can be solved in three ways: production approach, income approach, or expenditure approach. Investopedia argues the expenditure method is the most common approach and is calculated by adding total consumption, investment, government spending and net exports. As we can see on the next page's chart, the Indonesia GDP growth rate in 2005-2015 created unique pattern: increased continuously from Q1 to Q3 but declined in the last quarter (Q4).

$$GDP = Consumption + Investment + Government Spending + Net Export$$





Figure 1.1 Indonesia GDP Growth Rate (Source: [www.tradingeconomics.com](http://www.tradingeconomics.com))

The Indonesia economic growth which has been getting better over the years indicated that there is significant improvement for the material wealth of country (real assets and financial assets). In fact, Indonesia annual economic growth from 2009 to 2012 is larger than the world's. According to Litbang Kompas, some investment sectors such as mining, telecommunication, and transportation have good benefits in the next years. Bloomberg News Consensus Surveys also recognizes that Indonesia GDP Growth of 2015 is forecasted 5<sup>th</sup> largest growth in the world. The 2015 Indonesia's new government, led by President Joko Widodo, could support the macroeconomic more powerful and generate new hopes for the investors. Furthermore, Indonesia also commit to hasten the establishment of the AEC (ASEAN Economic Community) by 2015 and ready to transform ASEAN into a region with free movement of goods, services, investment, skilled labor and freer flow of capital.

From these situations, both domestic and foreign investors are motivated to do the investment in Indonesia as the current commitment of money or other resources in the expectation of reaping future benefits (Bodie, Marcus, & Kane, 2010, Pg 2). One of the best return investment instruments in Indonesia is equity fund. The essence of this financial asset instrument is to achieve long-term growth through capital gains and dividends. Although the equity investments provide no guarantees on income or capital growth, but they can protect against Indonesia inflation rate.

Nevertheless, some investors suffer difficulties in investing on their financial portfolio. Investors usually use investment strategy as important guideline to select investment portfolio: some of them will decide to maximize expected returns by investing in risky assets, others will go for minimizing risk, but most will struggle to

hit a balance between maximizing their profits from their portfolio and risk they are willing to take by diversification. While passive strategies (index fund) are regularly applied to reduce transaction costs, active strategies such as market timing are an effort to get optimal returns. Unfortunately, countless studies show that inexperienced investors do not trust these rules and expect to have low risk and high return. As a result, they often finish up with a “buy-high, sell-low” strategy.

An active strategy that can be applied to accomplish the excellent return is **sector rotation**. The concept in managing portfolio is implying the money transfer from one industry sector to another in an attempt to beat the market. Due not all sectors of the economy perform well at the same time, investors take advantages by investing more funds in some industries or sectors that are going up and avoiding them that are falling down. Investors can predict which corporations will be successful in the coming stages of a business cycle by identifying informative signs from aggregate production, trade, and activity over several months or years in a market economy. In general, business cycle is categorized into the following four basic phases: peak, downturn, trough, and upturn (Collander, 2004, Pg 495).

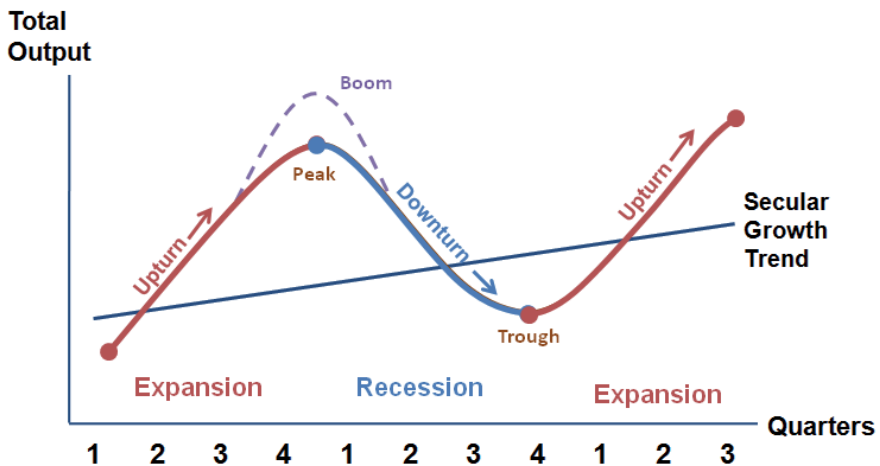


Figure 1.2. Business Cycle Phase (Source: Collander, D. C. (2004). *Economics Fifth Edition*. McGraw-Hill).

The business cycle can be rationally used to arrange one's stock collection. For example, during the early expansion phase, cyclical stocks in sectors such as commodities and technology tend to outperform. On the other hand, the defensive groups like health care, consumer staples and utilities outperform in the recession period because of their steady cash flows and dividend yields. Hence, this research plans to capture the pattern of relationship between business cycle and particular stocks in Indonesia Stock Exchange. In addition, this research also wants to formulate investment portfolio optimization by selecting based on industry sectors.

## **1.2. Problem Identification**

With the purpose of maximizing return and diversifying financial assets, every investor would use special strategy to select. Sector rotation strategy should not be simplified and have to be examined since business cycle of each nation has different effects to the industry sectors. In that case, the outcome of this study is expected to fulfill these problems below:

1. How is the pattern of relationship between business cycle and selected stocks performance in Indonesia Stock Exchange?
2. Does sector rotation strategy give better investment portfolio result rather than passive strategy?
3. What recommendations and solutions for investors in achieving optimal investment portfolio in the future?

## **1.3. Research Objectives**

The main objectives of this research are explained below:

1. Identify the pattern of relationship between business cycle and selected stocks performance in Indonesia Stock Exchange.
2. Measure the effectiveness of sector rotation strategy implementation to investment portfolio by comparing with passive strategy.
3. Provide recommendations and solutions that should be taken for investors in achieving optimal investment portfolio in the future.

#### **1.4. Research Limitations**

This research is limited through several scopes and assumptions as follows:

1. The historical data of research is selected from Q1/2000 to Q4/2014 as identification of Indonesia business cycle because it is not uniform and ranging between 2 and 10 years.
2. The period of Q1/2000 to Q4/2007 is used for sector selection as well as Q1/2008 to Q4/2014 for investment portfolio simulation.
3. Equity funds that will be applied in this research are taken from Jakarta Composite Index (JCI) stocks by diversification using sector rotation investment strategy. The initial investment is Rp 100,000,000 each for active strategy and passive strategy.
4. Investment stock alternative that selected in this research is based on LQ45 Index 2007-2008 on each sector that provided in Jakarta Composite Index (JCI).
5. Market capitalization, positive annual growth rate, and sufficient historical market price are included in selection criteria for forecasting optimal portfolio in period of Q1/2008-Q4/2014.
6. The research assumed that there is no transaction fee in stock replacement. In fact, there will be additional cost for transaction such as buying fee, selling fee and switching fee.
7. Portfolio switching can be done instantly: all stocks in portfolio can be sold at one price and at one time. In addition, the simulation is assumed one price (daily adjusted close price) in buying and selling stocks.
8. To make the calculation easier, the stock can be bought per share not per lot as well as buying and selling process not affecting the stock price. Actually, buying and selling stock in Indonesia Stock Exchange must be done in lot size (since 2004, one lot is equal with 100 shares compared with 500 shares before).
9. Optimal portfolio construction follows the rule to maximize the Sharpe ratio scenario since Sharpe ratio shows how much reward, excess return, for certain level of risk investors will obtain.

## **1.5. Work Structure**

### *Chapter 1 Introduction*

This chapter describes the background, research questions, research objectives, research limitations as well as the writing structure of the author's chosen topic.

### *Chapter 2 Theoretical Foundations*

The chapter explains all theories that support the research and previous studies from several researchers which have similar or related topic to this research.

### *Chapter 3 Methodology*

This chapter shows how the research will be performed. To be more specified, it also describes the whole process from data gathering and data processing until the final conclusion by using graphs and flowcharts.

### *Chapter 4 Data Analysis*

This chapter is the main part of this research which contains results and discussions from all data obtained for helping the reader to understand the author's findings.

### *Chapter 5 Conclusion and Recommendation*

This is the last part of this research with the purpose to conclude and summarize all the research from the beginning to the final conclusion and recommendation.

## CHAPTER 2

### THEORETICAL FOUNDATION

#### 2.1. Capital Market

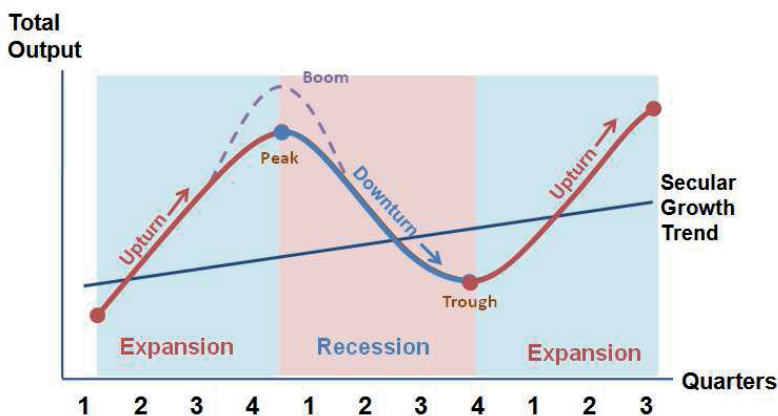
Capital market is investment transfer system from providers (retail and institutional investors) to users (businesses, governments and individuals) by using investment instruments like equity and debt securities. Equity security (stock) is an instrument that signifies an ownership position in an organization and represents a claim on its proportional share in the corporation's assets and profits. In contrast, debt security (treasury bills, bonds and commercial paper) refers to money borrowed that must be repaid which has a fixed amount, a maturity date, and usually a specific rate of interest. Moreover, capital markets consist of primary markets and secondary markets. In primary markets, new stock and bond issues are directly allocated to institutions, businesses, or individual investors. In secondary markets, existing securities are exchanged in standardized markets such as Indonesia Stock Exchange (IDX).

#### 2.2. Business Cycle

Business cycle is recognized as the asymmetrical up-and-down movement in economic activities that can be measured by real gross domestic product (GDP) and other macroeconomic factors. These fluctuations occur along with a long-term growth trend, and typically categorized by four phases—peak, downturn, trough, upturn—that imitate themselves over a period of time. However, economists state that the duration of business cycles can be anywhere from about two to twelve years, with most cycles averaging six years in length. The business cycle can be a critical determinant of equity sector performance over the intermediate term (Stangl, Jacobsen, & Visaltanachoti, 2009).

Previous study has gone into identifying business cycles and setting official reference dates for the beginnings and ends of *contractions* (the part of the business cycle below the long-term trend) and *expansions* (the part of the cycle above the long-term trend). As a result, business cycles have been divided into several stages and an explicit terminology has been developed nowadays. Business cycles have changeable

durations and intensities, but economies have developed a terminology to describe all business cycles and just about any position on a given business cycle.



Source: Collander, D. C. (2004). *Economics Fifth Edition*. McGraw-Hill.

The top of a cycle can be defined as the *peak*, while a *boom* is a higher peak that denotes a big jump in output. A *downturn* depicts the phenomenon of economic activity starting to fall from a peak. A *recession* is commonly known as a decline in real output that lasts for more than two consecutive quarters of a year which causes many people are out of a job, while a *depression* is a large recession which is much longer and more severe than a recession. The bottom of a recession or depression is named the *trough*. Once total output begins to enlarge, the economy automatically comes out of the trough; which economists identify as an *upturn*. An *expansion* is signed as an upturn that persists at least two consecutive quarters of a year which leads business cycle back up to the peak again (Collander, 2004, Pg 495).

### 2.3. Leading Indicators

Leading indicators are a set of signs that have been developed by economist that point out when the business cycle phases about to occur. They consist of several tools such as average workweek, unemployment claims, new orders for consumer goods, vendor performance, index of consumer expectations, new orders for capital goods, building permits, stock prices, interest rate spread, and money supply ( $M_2$ ). Although stock prices categorized as one of them, it does not look very far into the future – a few weeks or months at most.

## 2.4. Investment Strategy

In finance, most of knowledgeable investors usually use investment strategy as important guideline to select investment portfolio: some of them will decide to maximize expected returns by investing in risky assets, other will go for minimizing risk, but most will choose a plan somewhere in between. Unfortunately, countless studies show that inexperienced investors do not believe these rules and expect to have low risk and high return. Consequently, they often finish up with a “buy-high, sell-low” strategy.

Investors struggle to hit a balance between maximizing their profits from their portfolio and risk they are willing to take by diversification. While passive strategies are regularly applied to reduce transaction costs, active strategies such as market timing are an attempt to get optimal returns. The examples of better-known investment strategies can be described below:

- **Sheep Strategy** (trades on emotion and the suggestions of others),
- **Buy and Hold** (in the long run, equity markets give a good rate of return despite periods of volatility or decline),
- **Past Performance** (select mutual funds based on past performance),
- **Value Investment** (seek stocks of companies that are undervalued),
- **Growth Investment** (look higher growth potential of a company than others in the same industry or market),
- **Dollar Cost Averaging** (aimed at reducing the risk of incurring substantial losses resulted when the entire principal sum is invested just before the market falls),
- **Top-down** (choosing assets based on a big theme – macroeconomic condition),
- **Bottom-up** (choose stocks based on the strength of an individual company – microeconomic condition),
- **Fundamental Analysis** (evaluating all the factors that affect an investment’s performance),
- **Technical Analysis** (choosing assets based on prior trading patterns),
- **Contrarian Investment** (determine the market’s consensus about a company or sector and then bet against it),
- **Dividend Investment** (dividend funds as a regular payout for investors’ income).



## 2.5. Sector Rotation

An alternative effective strategy that can be applied to accomplish the excellent return is **sector rotation**. Sector rotation is an investment plan based on business cycle approach which provides a framework for apportioning to sectors showing the strongest performance over a particular time period. It is quite popular to improve risk-adjusted returns and automate the investing process according to the probability they will outperform or underperform. In this context, a sector is recognized as a group of stocks representing companies in related lines of business industry. Each stage of business cycle is different, and so are the relative performance patterns among equity sectors. However, using a disciplined business cycle approach, it is possible to detect key phases in the economy, and to use those signals in an effort to achieve active returns from sector allocation (Emsbo-Mattingly, Hofschire, Litvak, & Lund-Wilde, 2014).

## 2.6. Stock Market Indices

Stock price indices are the guidelines for investors to invest their funds in the stock market. It is also reflecting the stock price movements. As we acknowledged nowadays, Indonesia Stock Exchange currently has 11 types of stock price index, which is continuously broadcasted through print and electronic media. These indices are described as follows:

- Jakarta Composite Index (IHSG)

This index uses all listed companies as the components for its index calculation. In order to reveal fair market condition, IDX has the privilege to remove and/or omit one or several listed companies from the calculation of JCI.

- Sectoral Index

Sectoral Index applies all of listed companies included in each industry sector. As we can see on the table below, there are 9 sectors which consists of several sub-sector categories.

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