

Causality of Monetary Policy, Economic Growth and Stock Price Index

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The financial service sector is the object of research because it has the fastest growth on the Indonesian Stock Exchange (IDX) where the sector's stock price index grew about 33.16% in 2017. This paper tries to confirm the interrelation between the growth of stock price index, economic growth in the financial service sector, and monetary policy. The data used is the quarterly time series from 2000-2017. This study applies Augmented Dickey-Fuller (ADF) to test stationary data. To analyze the relationship between variables, this study uses Johansen cointegration and granger causality. The results reveal a long-term relationship of the stock price index with economic growth in the financial service sector. This study also shows a one-way causality of monetary policy on the stock price index.

Key words: *Monetary policy, economic growth, stock price index.*

Introduction

The role of the financial sector in driving Indonesia's economic growth is genuine, where the sector in 2017 reached 20% growth. Dominated by banking services, this sector grew the highest compared to other sectors (Bank Indonesia, 2017). Banking services mobilise public funds and financial engineering into efficient financial products. These financial products are then distributed to various economic sectors that need and become the driving force for investment growth and accelerate economic growth (Levine & Zervos, 1998; Cecchetti & Kharroubi, 2015). In line with these conditions, Issahaku, Harvey & Aborc (2016) stated that the macroeconomy would succeed if the financial sector can develop well.

Besides banking services, the capital market is the most attractive sub-sector, where growth is fantastic, reaching the second-highest in the world. In the context of macroeconomic policy in Indonesia, the financial sector becomes a means of transmitting monetary policy, where the transmission mechanism begins with the interest rate policy by the monetary authority of

the Central Bank of Indonesia (BI). This interest rate policy is implemented to encourage changes in lending and investment interest rates which in turn will encourage financial service growth. On the other hand, changes in interest rates can also affect the capital market. The financial literature explains that the stock price is the total present value of cash expected by changes in interest rates. The present value of the cash will change because the expected return of the investor adjusts to the interest rate. Thus, changes in interest rates will be responded by investors which will then have an impact on market prices. Interest rates are risk factors that are taken into account in the market. Changes in interest rates will be responded in balance with market prices (Sweeney & Warga, 1986), (Alam & Uddin, 2009), (Lerskullawat, 2017).

The financial sector in Indonesia is grouped into banking institutions and non-bank institutions. Banking institutions consist of commercial banks and rural banks (BPR), while non-bank financial institutions consist of financial institutions, insurance, pension funds, and pawnshops. As explained earlier, banking services are an institution that dominates the financial sector and its role in driving the Indonesian economy. However, banking services are often the beginning of the emergence of financial sector problems which subsequently spread in other sectors. Indonesia has experienced a monetary crisis that has a fatal impact on the financial sector. The first crisis occurred in 1997, which began with the Currency problem that occurred in Thailand, then spread to several Asian countries, including Indonesia. Capital inflow, which was previously a blessing, turned into a disaster because of uncontrolled capital outflows and the impact on exchange rate depreciation. During the crisis, the exchange rate has depreciated to 25%. This exchange rate crisis became a monetary crisis and had a major impact on the capital market. The second crisis began with the bankruptcy of Lehman Brothers from America and then this spread to Indonesia. Before Lehman Brothers declared bankruptcy, the rupiah exchange rate was Rp. 9000 / US \$, after it was announced it then dropped to Rp. 12,500 / US \$. The fall in the exchange rate has a fatal impact on companies in Indonesia which generally use imported raw materials, with rising prices for imported goods having a fatal impact on most industries. The next impact is the collapse of the capital market. The composite stock price index (CSPI) fell to 10.38% (Goeltom & Zulverdi, 2003). The fall in market value as a result of the monetary crisis shows a strong link between the monetary sector and the capital market in Indonesia. Related to this problem, Lerskullawat (2017), Sikarwar & Appalaraju (2018) state that changes in monetary policy have a strong relationship with changes in market prices, both in the short and long term.

The movement of market indices is determined by investor expectations of a country's macroeconomic conditions. The impact of the crisis which is quite severe on the market index in Indonesia is due to capital market liberalisation policies that encourage the entry of foreign investors. When a crisis occurs, they withdraw their investment or demand a high return. This is what drives the acceleration of the market index when the global crisis occurs. This phenomenon indicates a powerful relationship between financial services, monetary and

capital markets. This can be seen every time a crisis occurs in the monetary sector, also occurs in macroeconomic variables and capital markets. This relationship is an indication of the sensitivity and interrelationship between the three variables.

The linkage of financial services with monetary policy is explained by Copelovitch & Singer (2008) that the monetary authority system influences price stability or inflation. Other evidence explained that inflexible exchange rate policies are more vulnerable to macroeconomic and financial conditions (Ghosh, Ostry, & Qureshi, 2015). Tursoy (2019) describes the long-term relationship between the domestic interest rate and financial market prices. It was also explained that the dynamic relationship between the two prices showed a significant negative value. Tayssir & Feryel (2018) linked monetary policy to fluctuations in the financial sector. According to them, monetary policy is strongly related to fluctuations in the financial sector in developed and developing countries. Wulandari (2014) researched five ASEAN countries namely Indonesia, Malaysia, Thailand, the Philippines, and Singapore. The results of his study explained that the impact of monetary policy on stock prices in the 5 countries varies depending on how the characteristics of the capital market are managed. For example, Indonesia is influenced by past stock prices, Malaysia is influenced by exchange rates, Thailand and the Philippines are affected by interest rates, and Singapore is influenced by inflation. Assefa, Esqueda, & Mollick (2017) conducted testing in several developed and developing countries and the results show differences. In developed countries, the interest rate has a strong influence on stock returns, whereas in developing countries stock returns are determined by the global market.

The relationship of financial services with the capital market shows a two-way causality relationship where the capital market with economic growth, capital market growth encourages economic growth through increased liquidity and fund mobilisation (Mamun, Hasmat Ali, Hoque, Mowla, & Basher, 2018), (Sikarwar & Appalaraju, 2018). Ake & Ognaligui (2010) researched a country that is developing capital markets. The results show a positive relationship between stock market capitalisation and economic growth.

This study, therefore, will individually examine the causality of monetary policy with the stock price index and economic growth in the financial sector in Indonesia. This study is significant to confirm the main factors that determine the stock price index of the financial sector and the time needed to adjust the balance of the stock price index of the financial sector with monetary policy and economic growth.

Literature Review

The role of the financial sector in an economy can be seen from several indicators including financial instruments found in financial markets (commercial paper, corporate bonds, listed

equity), credit interest rates and applicable deposits, and transaction costs which can be seen from the spread of bank interest rates (Lynch, 1996). Related to the interest rate, Fry (1997) cites the concept of McKinnon and Shaw's financial liberalisation theory that limiting interest rates in the economy in developing countries can cause low public interest in depositing funds in banks, which in turn will reduce the supply of investment funds. For this reason, financial liberalisation is needed, namely releasing interest rates following market mechanisms. An increase in the interest rate means an increase in incentives that can be enjoyed by the community so that people will be encouraged to save their funds in banks which will then form the accumulation of capital that can be used to finance development. Related to this liberalisation, Fry (1997) reminded that financial liberalisation must be accompanied by fiscal reforms aimed at ensuring that government debt is controlled after liberalisation and supervision of banking system regulations.

In Indonesia, the interest rate policy is controlled by BI, an institution that has a monetary authority to maintain currency (Rupiah) stability and inflation. The monetary policy transmission mechanism is carried out through interest rate policies which can further influence other macroeconomic variables to reach the final policy target. The effectiveness of policy impacts on prices and activities in financial services is highly dependent on the behaviour or response of banks, other financial services, and other business sectors. Thus, the effectiveness of the policy occurs through interactions between BI, banking and other financial services.

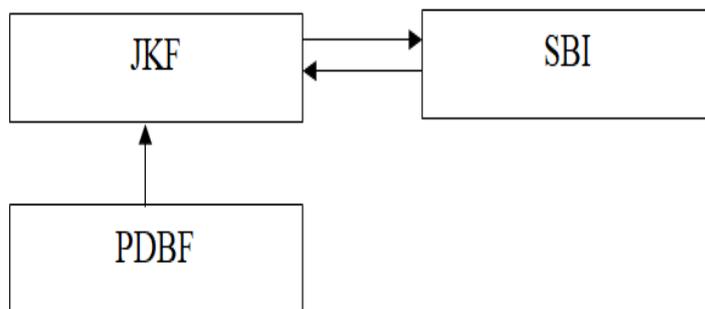
The financial literature can explain the relationship of interest rates to other financial sectors that changes in interest rates will encourage investors to adjust expected returns with changes in interest rates, where the impact on the financial sector is changing in stock prices. In other words, changes in expected return will affect the present value of cash flows that are expected to be received by investors, thereby affecting the stock price. Another alternative that can be done by investors in responding to changes in interest rates is to move investment from the capital market to other investments that are more promising. Thus, monetary policy will have a direct impact on the financial sector, especially the capital market (Wulandari, 2014; Assefa et al., 2017; Ghosh et al., 2015; Tursoy, 2019).

The capital market has two functions, namely as a source of financing for financial services and alternative investments for investors. The capital market, as a source of corporate finance, provides long-term funds that can make the company's funding structure more diversified and efficient. As a financing company, this illustrates the mechanism of the accumulation of investor funds which is then distributed to productive economic sectors (Billmeier & Massa, 2009; Cooray, 2010). Success in investment can drive the growth of the real sector, which in turn can attract investors to invest their funds in companies that have excellent performance and growth. Based on this mechanism, the concept of financial service

growth will encourage the growth of the stock market. Empirical evidence shows that high economic growth is supported by financial services and will indirectly encourage the growth of the stock market. However, no impact was found on the growth of market capitalisation on economic growth (Carp, 2012).

As an alternative investment, the capital market provides a variety of investment instruments following the needs and desires of investors. To attract more investors, the Indonesia Stock Exchange (IDX) has a capital market liberalisation policy that is not to restrict foreign investors from trading on the IDX. The high number of foreign investors (> 40%) and supported by the growth of the financial sector which reached 20% encourages the growth of stock prices that are quite fantastic so that the IDX is one of the second-highest growth stock exchanges in the world in 2017.

Figure 1. Research Framework



Note: JKF = Financial sector stock price index; SBI = Central bank interest rates; PDBF = Financial sector economic growth

Research Methods

The data used in this study are time series data for the period 2000-2017. The data is in the form of quarterly data obtained from several sources, such as Bank Indonesia, Yahoo finance and the Central Statistics Agency. The variables used in this study are financial sector economic growth (PDBF) as a proxy for financial sector growth, financial sector stock price index (JKF) as a proxy for capital market growth, and the interest rate of the Indonesian central bank (SBI) as a monetary policy proxy.

Stationary Testing

The first stage of this test is to ensure that time-series data do not produce unit-roots (not stationary). Stationary has an essential meaning in the generalisation of analysis results. If the

permanent nature is not met, the resulting analysis is casuistic. In other words, non-stationary time series data have different mean values, or both are different over time.

Johansen's Cointegration Test

The cointegration test is conducted after time series data has undergone unit-roots testing and is assumed to be integrated to the same degree. Johansen's cointegration applied in this study is multivariate cointegration. If the variables have a linear combination, the variable is cointegrated and can be interpreted as a long-term relationship.

Granger Causality

The test of the causality of the growth of the stock price index (JKF) of the financial sector with monetary policy (SBI) uses Granger causality. Granger of two stationary variables will involve estimation of the VAR model. This Granger causality approach answers the question of whether past circumstances can explain the current y or x variable. An essential statement in causality techniques is Granger Causes. What should be noted is that Granger's causality relationship does not have implications for influence relations. Therefore, Mac Kinnon (1996) modified the Dickey-Fuller testing standard.

Results

Root Test

Table 1 displays the results of the unit root tests where the ADFs of all variables used in this study were stationary in the first order I (1). Based on stationary test results, the application of first degree will apply to the Granger cointegration and causality test.

Table 1: Augmented Dickey-Fuller (ADF) Unit Root Test

Variable	Level I(0)		Level I(1)	
	t-statistic	Prob	t-statistic	Prob
JKF	0,487960	0,8864	-92111334	0,0000
PDB	-0,019639	0,9529	-3,520649	0,0105
SBI	-2,470895	0,1270	-4,678290	0,0003

Johansen Cointegration Test

Table 2 shows the results of Johansen's cointegration test conducted using lag length 2. By comparing the trace statistic with a critical value of 10%, a cointegration vector between the capital market index and the financial services sector can be seen. This indicates that the capital market with financial services tends to move towards equilibrium in the long run. In

other words, if there is a short-term imbalance between the capital market and financial services, there will be a push to reach equilibrium in the long run. The cointegration test results also showed that an increase did not follow the growth of financial services in the stock price index. This condition illustrates the existence of non-fundamental factors that drive the growth of financial sector stock price indexes.

Table 2: Johansen Cointegration Test

Hypothesized	Eigenvalue	Trace	0.05	0.1
No. of CE(s)		Statistic	Critical Value	Critical Value
None*	0.157076	21.93169	24.27596	21.77716
At most 1*	0.138564	10.48283	12.32090	10.47457
At most 2	0.007278	0.489442	4.129906	2.976163

Granger Causality

The dynamic interaction of monetary policy on the financial sector stock price index is shown through the Granger causality test, as seen in Table 3.

Table 3: Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
SBI does not Granger Cause JKF	69	3.99562	0.0497
JKF does not Granger Cause SBI		1.58707	0.2122

Granger causality test results, as shown in Table 3 indicate there is no two-way causality, but one-way causality occurs, namely the monetary policy causality to the financial sector price index. This one-way causality phenomenon in the context of monetary policy in Indonesia can be explained as follows. Monetary policy through interest rates becomes a means of transmitting monetary policy. The transmission mechanism begins with the interest rate policy by the Indonesian central bank's monetary authority, changes in interest rates will affect changes in asset prices because investors adjust the expected return to changes in interest rates. Thus, rising or falling interest rates will affect opportunity costs that drive changes in asset prices. However, the transmission of this policy requires time. On the other hand, the linkage of the monetary sector to the stock price index can also be explained through the capital market mechanism. Capital market liberalisation in Indonesia to date has encouraged the entry of foreign investors. The presence of foreign investors positively affects the volatility of the stock price index, or in other words, the sensitivity of stock prices becomes higher when there is a change in monetary policy (interest rates). This can occur because changes in the benchmark interest rate set by the monetary authorities in Indonesia

are generally an adjustment to changes in international interest rates, in particular, the FED. This is done to anticipate the flow of cash outflow, the impact of which will expand, namely not only the stock price index but also the exchange rate. This is what causes the rapid impetus for changes in the stock price index from changes in monetary policy.

Discussion and Conclusion

This study examines the relationship between monetary policy, capital market growth and financial service growth, especially in the financial service sector. During the period of observation, the financial sector has grown very encouragingly. A series of monetary and financial policies has had quite an impressive impact on economic growth. Capital market liberalisation has attracted the entry of foreign investors, which has driven the growth of the stock price index which is very fantastic, which reached 33.16% growth in 2017.

Cointegration test results indicate a long-term relationship between the stock price index of the financial sector with economic growth. The meaning is, if there is a short-term imbalance between the capital market and financial services, there will be an adjustment to achieve equilibrium in the long run. The results also show that an increase did not follow the growth rate of financial services in the stock price index. This phenomenon indicates the existence of non-fundamental factors that drive the growth of financial sector stock price indexes. Investor expectations of macroeconomic conditions determine the movement of market indices. When investors have expectations about the macroeconomy that are not following reality, there will be an index movement that is not in line with the growth of the real sector. However, in the long run, the two will find a balance (Sikarwar & Appalaraju, 2018; Ake & Ognaligui, 2010)

Granger's causality test results found a one-way causality of monetary policy to the financial sector stock price index. This finding indicates the operation of the BI rate policy transmission mechanism in influencing changes in expected return. Investors will adjust changes in interest rates. On the other hand, capital market liberalisation policies attract foreign investors into the Indonesia Stock Exchange. The presence of foreign investors is driving the growth of the stock price index. However, the presence of foreign investors also increased volatility in stock prices. When monetary problems occur, they will withdraw their investment, or demand a higher return. That is what causes sensitive changes in the stock price index from changes in monetary policy. To reduce sensitivity to monetary policy, liberalisation in the capital market and financial services must be supported by appropriate fiscal policies (Carp, 2012).



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