

Review Article

The Effect of Financial Technology Regulations on Banking Company Stock Returns in Indonesia

Elza Surya Athory¹, Ida Bagus Anom Purbawangsa²

^{1,2}Faculty of Economics and Business, Udayana University (UNUD), Bali, Indonesia

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Abstract - Financial technology (fintech) is one of the developments in technology that would revolutionize the whole financial industry. The implementation of government regulations is predicted to have an impact on the rapid growth of fintech in Indonesia. This research aims to determine the impact of fintech regulations on banking company returns in Indonesia. An event study was conducted to measure the impact of fintech regulations on the stock returns of banking companies. Paired sample t-test was performed using average abnormal return (AAR) values of 18 banking companies during four fintech regulation announcements. The results in this study showed that fintech regulations have a positive effect on banking company stock returns, as can be seen from the increase of AAR values after regulations are implemented.

Keywords - Event study, financial innovation, financial technology, regulation, stock return.

I. INTRODUCTION

A. Background

Technological innovations are phenomena that spread through various industries, including the financial industry. Innovations in the financial sector are signified by the development of financial technology practices (fintech) which are spreading globally. Fintech is deemed as one of the technological developments that will revolutionize the banking industry (Wonglimpiyarat, 2017). Fintech companies make extensive use of the latest technology for banking transactions, payments, financial data analysis, capital markets and personal financial management (Huang et al., 2015).

The effects of fintech's emergence on the banking industry are still inconsistent. Jun and Yeo (2016) highlighted the complementary effect of fintech on traditional banking services. Timely integration with fintech allows banks to remain profitable in competitive situations (Romanova and Kudinska, 2016). Temelkov (2018), in his study, revealed that in the long run, fintech would become serious competition for banking companies. The PwC Institute (2016) stated that 83 per cent of financial institutions believe that various aspects of their businesses are at risk due to the emergence of fintech start-ups.

Researches on fintech are still limited to the study of qualitative concepts due to the novelty of such concepts (Jun and Yeo, 2016; Wonglimpiyarat, 2017; Gupta and Xia, 2018; Temelkov, 2018; Dialysa, 2019; Milian et al., 2019). There is a lack of quantitative researches discussing the effects of the fintech phenomenon, especially at an industrial level in Indonesia. This research was intended to fill this gap.

The development of fintech in the future will likely be driven by cross-industry collaboration and support from regulations. The fintech sector, on the other hand, also poses a significant challenge for regulators in the financial regulatory and supervisory system due to the use of a distinct business model that differs from traditional approaches to financial services (Bromberg et al., 2018; Chiu, 2016; Temelkov, 2018). The PwC Institute in 2019 stated that the implementation of regulations regarding fintech practices in Indonesia was one of the factors that spurred the rapid growth of fintech in Indonesia.

The regulations that serve as legal references for the legalization of fintech in Indonesia according to the Indonesian Fintech Association (APTECH) are The Regulation of The Financial Service Authority (POJK) Number 77 / POJK.01 / 2016 regarding Information Technology-based Lending and Borrowing Services (LPMUBTI) or Fintech Lending, Regulation of Bank Indonesia (PBI) Number 20/6 / PBI / 2018 regarding Electronic Money Practices, Regulation of The Financial Service Authority (POJK) No. 13 / POJK.02 / 2018 regarding Digital Financial Innovation (DFI) in the Financial Service Sector, and Regulation of The Financial Service Authority (POJK) Number 37 / POJK.04 / 2018 regarding Information Technology-based Crowdfunding Services through Public Offerings (Equity Crowdfunding). These regulations specifically regulate the legalization processes related to the registration, licensing, and supervision of fintech practices. Empirical evidence shows that the formation of fintech start-ups should not be left unregulated. Active policies can influence the development of this new sector (Haddad and Hornuf, 2019).



II. LITERATURE REVIEW

A. Abnormal return

An event study examines the change of abnormal returns of a company that occur around the announcement of a particular event. The market model is used to measure the expected returns, which assumes a direct correlation between the market and stock returns. The market model minimizes variations in abnormal returns by eliminating the portion associated with variations in market returns (Chamberlain et al., 2016). This would increase the probability of detecting the effects of an event (Lusyana and Sherif, 2017). The difference test on average abnormal return (AAR) is implemented to determine the significant difference in abnormal returns before and after the announcement of the event.

B. The effect of the announcement of fintech regulation on abnormal returns

Fintech is viewed as a technological innovation that will revolutionize the financial service industry. Jun and Yeo (2016) highlighted the complementary effect of fintech on banking company services. Temelkov (2018) showed that in the long run, fintech could be a serious competitor for the banking industry. If a technological disruption has affected the banking industry, then this effect should be reflected in the estimated return of the incumbent bank stocks (Benner, 2007). Miller and Liu (2014), as well as Sood and Tellis (2009), confirmed that the prospect of innovation disruptions should depress the stock prices of existing companies. Zach et al. (2020) discovered changes in the market values of incumbent companies in the hospitality industry in relation to their responses to disruptive innovations. Li et al. (2017) confirmed the existence of a relationship between incumbent bank stock returns and funding from fintech start-ups. Yang and He (2019) observed the average positive market reactions to regulations, which indicates the positive impact of regulations on financial innovations. Any regulatory initiatives that could affect the company's future earnings will be reflected in the stock price movements when these initiatives were first announced (Sawkins, 1996).

Based on the empirical studies above, abnormal returns are expected to be significantly different after the announcements of the fintech regulations, which implies that these events have information for investors. Thereby the hypotheses in this study are as follows:

- H1: There is an effect of the announcement of POJK Number 77 / POJK.01 / 2016 on the stock returns of banking companies in Indonesia.
- H2: There is an effect of the announcement of PBI Number 20/6 / PBI / 2018 on the stock returns of banking companies in Indonesia
- H3: There is an effect of the announcement of POJK No. 13 / POJK.02 / 2018 on the stock returns of banking companies in Indonesia
- H4: There is an effect of the announcement of POJK No. 37 / POJK.04 / 2018 on the stock returns of banking companies in Indonesia

Whereas the effect measured in this study is proxied by the difference between the average abnormal return (AAR) values before and after the event.

III. RESEARCH METHODOLOGY

The research analysis technique used in this research is the event study method. The research object is abnormal stock returns around the announcement of the regulations regarding the legalization of fintech practices. The population in this study consists of all banking companies listed on the Indonesia Stock Exchange. The study uses a purposive sampling technique consisting of 18 banking companies. Company stock price data was accessed from the website www.IDX.co.id.

The events as research objects are regulation announcements regarding fintech practices in Indonesia. The research object announcements are limited to those issued by the Bank of Indonesia (BI) and the Financial Service Authority (OJK), which specifically deal with the legalization processes, including registration, licensing, and supervision of fintech practices in Indonesia. The regulations regarding the legalization of fintech practices in Indonesia include POJK Number 77 / POJK.01 / 2016, which was issued on December 29, 2016, PBI Number 20/6 / PBI / 2018, which was issued on May 4, 2018, POJK Number 13 / POJK.02 / 2018 which was issued on August 16 2018, and POJK Number 37 / POJK.04 / 2018 which was issued on December 31 2018. The research period used covers 121 stock exchange days. The estimation period is 100 days, starting from t-111 to t-10 before the day of the event. The total event window used is 21 days to capture investor reactions to the event.

The estimated return under the market model is calculated by the following equation:

$$R_{i,t} = \alpha_i + \beta_i \cdot R_{Mt} + \epsilon_{i,t} \dots\dots\dots (1)$$

Testing for the existence of abnormal returns is conducted in aggregate by measuring the average abnormal returns (AAR) for all securities cross-sectionally during each event period. AAR is calculated using the equation as follows:

$$AAR_t = \frac{1}{n} \sum_{i=1}^n ARI_{i,t} \dots\dots\dots (2)$$

Test of the hypotheses is conducted by using paired sample t-test to measure AAR differences between before and after the announcements of the regulations. These difference tests are intended to detect whether there are effects of regulatory announcements as reflected by the differences in AAR between before and after such events.

IV. RESULTS AND DISCUSSION

A. The Announcement of Financial Service Authority Regulation (POJK) Number 77 / POJK.01 / 2016 on Fintech Lending

The influence of information such as regulation regarding fintech practices on banking companies can be perceived differently by investors, as can be seen from the market reactions to this information. The market reaction in this study is represented by the difference between

average abnormal return (AAR) before the regulation announcement and AAR after the announcement.

This event was good news for investors because there was a notable increase in the AAR value after the announcement of the regulation, as indicated by the negative t value, as shown in table 1. However, the significance of the AAR variable is 0.474, meaning that there is no difference between the average abnormal return (AAR) value before and after the announcement of POJK Number 77 / POJK.01 / 2016. In other words, there is no significant effect of this event on the returns of banking companies in Indonesia. Investors may have welcomed this regulation positively, but the effect was not significant. This shows us that this regulation has no significant effect on the stock returns of banking companies in Indonesia. The efficient market hypothesis posits that positive information will have an effect in the form of a rapid increase in stock prices. In this event, there was good news content in the event, but it was not immediately responded to by investors.

Table 1. Result Of Difference Test Using Paired Sample T-Test on AAR Around The Announcement of Financial Service Authority Regulation (POJK) Number 77 / POJK.01 / 2016

		t	Df	Sig. (2-tailed)
Pair 1	AARED1BEFORE - AARED1AFTER	-.747	9	.474

The POJK Number 77 / POJK.01 / 2016 is the first regulation that specifically regulates the legalization of fintech, especially fintech's lending practices in Indonesia. Subsequent to this announcement, investors have yet to show significant reactions. Banking companies, as financial institutions, have already had a large and strong base in the financial industry. Fintech lendings, on the other hand, have a different customer base from incumbent banks. Thus fintech lending is considered incapable of posing a significant effect but can potentially become a complimentary service for banking companies.

The result of this study is in line with the result of research from Li et al. (2017) that revealed a positive but insignificant relationship exists between fintech growth and the rate of return of banking stocks. This implies that the role of fintech companies are limited to the complementary effect rather than the substitution effect. Zach et al. (2020), in their research results, showed that the effect of innovative disruptions on incumbent companies is not adequately responded to by investors but still bears a positive value nonetheless. This is because innovative disruptions cannot alter the dominance of the incumbent companies in a relatively short time.

B. The Announcement of Bank of Indonesia Regulation (PBI) Number 20/6 / PBI / 2018 regarding Electronic Money

The t value shown in table 2 below has a negative value, which implies that the AAR value after the event is greater than the AAR value before that event. The

significance value of the AAR variable in this event study is less than 0.05, which means that there is a significant difference between the average abnormal return (AAR) value before and after the announcement of Bank of Indonesia Regulation (PBI) Number 20/6 / PBI / 2018. So it can be concluded that there is a significant effect of the announcement of this regulation on the returns of banking stocks in Indonesia. This announcement has meaningful information content for investors. The announcement of PBI Number 20/6 / PBI / 2018 provided a signal that drives market reactions in the form of increased AAR after the regulation was introduced.

Table 2. Result Of Difference Test Using Paired Sample T-Test on AAR Around The Announcement of Bank of Indonesia Regulation (PBI) Number 20/6 / PBI / 2018

		t	Df	Sig. (2-tailed)
Pair 1	AARED2BEFORE - AARED2AFTER	-2.596	9	0.029

Based on the efficient market hypothesis, positive information will drive a rapid increase in stock prices. In this event, there is good news content in the event. Investors can utilize this information for obtaining better returns. This event is a new phenomenon with informational content, which results in the difference in abnormal returns. This event study can also be used to test the efficiency of a semi-strong market by looking at the difference between abnormal returns before and after the event. There is a significant difference caused by this event that supports the semi-strong market hypothesis.

PBI Number 20/6 / PBI / 2018 is a regulation that deals with the legalization of electronic money. The payment feature of the fintech service is the most widely used feature by fintech users in Indonesia compared to other features. The regulation on electronic money itself has undergone two revisions due to the rapid development of financial and payment technologies. Electronic money, including electronic wallets, is a form of fintech that initially impacted the banking industry. This third regulatory update on electronic money has driven a strong investors reaction.

The result of this test is in line with the result of the study by Xiao and Gao (2017), which stated that the legislation process, especially the timing of a regulation implementation, has a significant effect on investor reactions. The adoption of digital technology has a positive effect on the performance of banking companies (Scott et al., 2017). Fintech innovation in the form of electronic money can be a solution in improving the performance of banking companies (Putri et al., 2019).

C. The Announcement of Financial Service Authority Regulation (POJK) Number 13 / POJK.02 / 2018 regarding Digital Financial Innovation (DFI)

Information relevant to the capital market is one of the determinants of investor decisions. However, not all

available information is necessarily regarded as valuable information by investors. The efficient market hypothesis describes the conditions in which the market processes information to reach a new equilibrium. This study measures market reaction in processing information from regulatory announcements using the average abnormal return (AAR) value.

The t value in table 3 shows a negative value, which implies that there is an increase in AAR value after the event. However, the significance of the AAR variable in this test is more than 0.05, which means that there was no significant difference between the AAR values before and after the announcement of the Financial Service Authority Regulation (POJK) Number 13 / POJK.02 / 2018. The conclusion derived from this result is that the event had no effect on the returns of banking stocks in Indonesia. The announcement of POJK No.13 / POJK.02 / 2018 did not bear meaningful information for investors. Based on the efficient market hypothesis, positive information will cause a rapid increase in stock prices. In this test, there was good news contained in the announcement despite the fact that it was not responded to immediately by investors.

Table 3. Result Of Difference Test Using Paired Sample T-Test on AAR Around The Announcement of Financial Services Authority Regulation (POJK) Number 13 / POJK.02 / 2018

		t	Df	Sig. (2-tailed)
Pair 1	AARED3BEFORE – AARED3AFTER	-1.076	9	0.310

POJK Number 13 the Year 2018 is the legal basis for the fintech practice or Digital Financial Innovation (DFI) for services other than payment and loan. The services, in this case, include investment, insurance, and other market support services. Investors consider digital financial innovation (DFI) as complementary services which can be utilized by banking companies to increase the added value provided by the company. Investors positively welcomed the regulation as it serves as the legal basis for DFI practice in general. The participation of fintech as an integral part of the Indonesian financial system can promote healthy competition and provide an added benefit for banking companies. Collaboration between fintech start-ups, banking companies and regulators can ensure the continuation of positive trends in the development of the Indonesian financial system.

This result supports the result from research conducted by Romanova and Kudinska (2016), which showed that timely integration of fintech into the banking business could provide better comparative advantages in an increasingly fierce competition. The more intensive the use of fintech, the better it will allow banks to improve the quality of their products that require extensive expertise (investment, insurance, market support, etc.). Iman (2019) stated that banking companies in Indonesia have relatively good innovation adaptability in the face of the fintech

phenomenon. From this test, it can be concluded that investors did not perceive this type of fintech service as a disruptive threat. On the contrary, this type of service can be treated as complementary services for incumbent banking companies.

D. The Announcement of Financial Service Authority Regulation (POJK) Number 37 / POJK.04 / 2018 regarding Equity Crowdfunding

The t value in table 4 is a negative value, which implies that the AAR value has increased after the event. The significance of the AAR variable in this event is less than 0.05, which can be concluded that there is a significant difference between the average abnormal return (AAR) values before and after the announcement of the Financial Service Authority Regulation (POJK) Number 37 / POJK.04 / 2018. In other words, the announcement had a significant effect on the stock returns of banking companies in Indonesia. The POJK announcement No. 37 / POJK.04 / 2018 conveyed meaningful information to investors. This event provided signals that resulted in a market reaction in the form of increased AAR after POJK Number 37 / POJK.04 / 2018 was issued. Investors positively welcomed this regulation, and its effect was significant.

Table 4. Result Of Difference Test Using Paired Sample T-Test on AAR Around The Announcement of Financial Service Authority Regulation (POJK) Number 37 / POJK.04 / 2018

		t	Df	Sig. (2-tailed)
Pair 1	AARED4BEFORE – AARED4AFTER	-2.639	9	0.027

Based on the market hypothesis, positive information will cause a rapid increase in stock prices. In this event, there was good news contained therein. Investors can utilize this information as a reference for obtaining higher returns. This event is a new phenomenon with informational content, resulting in a significant difference in abnormal returns. The event study in this research can also be used to test the efficiency of a semi-strong market by examining the difference between abnormal returns before and after the event. There was a significant difference observed in this event, thus indicating a semi-strong market form. Prices and returns of banking companies reflect all relevant published information, which in this case is the announcement of fintech regulation. Apart from being determined by historical stock prices, the subsequent prices also reflect existing information or events. The result of this test shows the speed at which stock prices and returns of banking companies reflect regulatory information regarding equity crowdfunding.

The POJK Number 37 the Year 2018 specifically regulates the equity crowdfunding practices in Indonesia. Crowdfunding services aim to increase financial inclusion for small and medium enterprises (SMEs), which

otherwise would have limited access to banking services due to various limitations, can now easily raise capital from investors through equity crowdfunding platforms. This service further drives the market expansion for incumbent banking companies. The legalization of equity crowdfunding practices will also push banks to collaborate and further accelerate financial innovation. Public and investors' awareness of the existence of fintech has grown considerably. This forces regulators to continue to form legal bases for various fintech services. Bank of Indonesia and the Financial Service Authority are highly responsive in regulating fintech practices in Indonesia. Investors see this as an opportunity and have high expectations for the future of fintech development. This is evidenced by the positive and significant investor responses to the announcement of this regulation.

Dranev et al. (2019) stated that there is a significant positive abnormal return shortly after fintech companies collaborate through mergers and acquisitions in developing countries. Even more so, banks can collaborate or combine through mergers or acquisitions with fintech start-ups to allow for greater integration in an innovative system with a strong customer base. As stated by Gupta and Xia (2018), the government and central bank play important roles in opening the landscape for banking companies so they can take full advantage of the fintech phenomenon in the coming years. Sjamsudin (2019) concluded that when the cooperation between banks and fintech is symmetrically balanced, they will be able to collaborate and synergize under cooperation-based operations. Nicolau and Santamaria (2013) stated that companies that better implement the latest innovations would provide positive abnormal returns. If fintech start-ups can collaborate with banking companies under the support of proper regulations, an innovative financial ecosystem can be created that can benefit all parties.

E. The regulation with the Highest Effect

This study examines the difference between average AAR values before and after four regulation announcements regarding fintech practices in Indonesia to determine the event with the greatest influence on the stock returns of banking companies in Indonesia. The differences between average AAR values before and after these regulatory announcement events are shown in table 9.

Statistical test using paired sample t-test shows that there is a significant difference between AAR values before and after the announcement of PBI Number 20/6 / PBI / 2018 regarding Electronic Money and POJK Number 37 / POJK.04 / 2018 regarding Equity Crowdfunding. These two events had significant effects on the stock returns of banking companies, as evidenced by significant increases in AAR values after the events. In order to determine which fintech regulation had the greatest influence on banking company stock returns, this study examines the differences between AAR values before and after the announcements. Based on the results, it can be concluded that the announcement of the Financial Service

Authority Regulation (POJK) Number 37 / POJK.04 / 2018 regarding Equity Crowdfunding had the largest difference in AAR values compared to other events and hence the biggest effect.

Table 5. Summary of Data Analysis Results

Regulation	AAR Difference	Sig.	Conclusion
POJK 77/POJK.01/2016 (fintech lending)	- 0.00324	0.474	The event has a positive effect (good news) but not significant
PBI 20/6/PBI/2018 (electronic money)	- 0.00481	0.029	The event has a positive and significant effect (good news)
POJK13/POJK.02/2018 (digital financial innovation)	- 0.00119	0.310	The event has a positive effect (good news) but not significant
POJK 37/POJK.04/2018 (equity crowdfunding)	- 0.00601	0.027	The event has a positive and significant effect (good news)

The results of this study indicate that the fintech regulations in Indonesia are generally regarded as good news by bank stock investors. Stock investors have high confidence in banking companies. Collaborations between banks and fintech equity crowdfunding can be accommodated by the right regulations so that financial inclusion can be accelerated and the customer base can be expanded. The improvement of legal certainty for the fintech industry had a significant effect in the event of the POJK 37 announcement regarding equity crowdfunding. This effect is influenced by the rapid fintech development in Indonesia. The equity crowdfunding regulation is the latest regulation issued regarding fintech practices. This may be one of the reasons why its effect is also the greatest compared to previous regulations.

This study supports the notion that innovation does not have to be disruptive and replace the business of incumbent companies. Knewston and Rosenbaum (2020) stated that fintech could complement existing financial services and even create new markets or broaden the existing market. Technology does not disrupt but rather changes consumer behaviour. Partnerships between banking companies and equity crowdfunding can be mutually beneficial by better accommodating market needs and consumer expectations for financing activities. Banks can transfer a portion of their risk and gain access to funding at a lower cost (Attuel-Mendes, 2017). Crowdfunding can be utilized by banking companies as a tool in adapting to financial innovations. Apart from maximizing profit, banking firms can also retain existing customers and attract new ones through equity crowdfunding platforms.

V. CONCLUSION AND SUGGESTIONS

In general, the findings in this study suggest that investors still have high confidence in the performance of banking companies. Investors believe that banks possess a strong advantage to thrive in the competition with fintech companies. The implementation of regulations both by the Bank of Indonesia and the Financial Service Authority is considered conducive for the competition and collaboration between fintech and banks in the form of a symbiotic mutualism.

Investors responded positively to the implementation of fintech regulations, as evidenced by the increased AAR values after the regulations were announced. These regulations provide rooms for fintech to innovate further, and it is expected that fintech will collaborate with banks to complement them in an innovative ecosystem. The regulations for fintech practices are not as elaborate as regulations for banking practices; this allows banks and fintech to collaborate for mutual benefit. Investors consider that there is good news content in the announcement of such regulations.

Future studies can further examine abnormal returns based on firm size. Large companies have higher chances to prevail in a competitive situation than small ones. Future researches may also re-analyze the effect of fintech regulations when the regulations are in the form of laws rather than institutional regulations. Regulation in the form of laws have higher legal powers and accordingly will have greater influences on stock returns.

For investors, the fintech phenomenon, especially related to its regulations, can provide good news as reflected in the increased stock returns of banking companies after regulation announcements. Healthy future collaboration between banks, fintech, and regulators in Indonesia will provide good news that can benefit banking company investors. The rapid fintech development in the future should not always be regarded as a worrying sign by investors as a potential threat. The results of this study indicate that the announcement of fintech practice regulations has actually increased the performance of banking company stock returns.

Banking companies can benefit from fintech by incorporating it as a part of a mutually beneficial financial service innovation. A solid integration with fintech companies can be viewed by bank investors as a precursor to improvement in bank performance. The market created by fintech promises better development in the future.

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