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Impact of Efficiency of Intermediation Functions from Financial Institutions on Consumer Surplus on The Balance of The Fund Market in Indonesia

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ABSTRACT

The greater the amount of savings than the loan amount in banking shows that problems on non-performing loan (NPL). The objectives of this study were: to analyze the efficiency of the intermediation function of financial institutions (banking), and the impact of efficiency of financial institution intermediation function to consumer surplus in the fund market. Partial Adjustment Model (PAM) were used to analyze efficiency and consumer surplus using panel data 2000 – 2016. The result showed that the efficiency of the financial institution intermediary function influenced the size of the consumer surplus in the fund market. Therefore, that consumer surplus in the fund market was influenced by the performance of financial institutions. This consumer surplus is of the lack of fund group (deficit unit) due to equilibrium change in fund market. To anticipate future funding needs, it is necessary to conduct a study of the consumer surplus of funds based on the type of use of financial lending in financial institutions in the economy.

INTRODUCTION

During the financial crisis in 2007 – 2009, small business enterprises experienced difficulties to obtain capital loans as the crisis was seriously affected financial institutions and no modern economy survived without having a well-functioning financial system. Hubbard et al (2012) pointed out that as the financial system provides means of funds flowing from savers to borrowers, the emergence of disruptions in the flow of funds will lead to economic disaster. Therefore, the intermediary function of financial institutions must be optimized to suppress the financial crisis.

The role of financial institution as an intermediation was one of the key factors in the development of a country (Schumpeter, 1911). The financial development, then,

encouraged growth as it increased the level of investment as well as its allocation; besides, a faster-growing economy required a higher quality of financial services (McKinnon, 1973). Evidence that the financial sector had a real effect on the economy could be observed from the ability of the financial intermediaries to shift the composition of savings into capital (Maria, 2003) resulted in the intermediation functioned to further promote the growth (Valerie R. Bencivenga and Bruce D. Smith, 1991; Nawazish Mirza, Birjees Rahat, and Krishna Reddy, 2015; Bogdan Dima & Petru Eugen Opris, 2014; Vighneswara Swamy and BK Tulasimala, 2011; Dominik Menno &Tommaso Oliviero, 2016).

Endogenous growth theory underlined the starting point of the literature on growth and finance. Classical references from Greenwood and Jovanovic (1990), Bencivenga and Smith (1991, 1993), Levine (1992), and Saint-Paul (1992) have discussed about a market model of financial intermediation credits as they assumed that financial market was an institution to provide risk pooling services and information collection on borrowers. Following the endogenous theory, Bencivenga and Smith (1991) considered financial markets as institution intended to facilitate the flow of resources from savers to investors in the imperfection market; consequently, the intermediation function thereby reduced the efficiency caused by this imperfection.

This state was identified by Swamy (2011) by showing that the encouragement of the financial institutions to growth was implied by a more efficient allocation of resources; although Andrus (2001) suggested that the financial sector would affect growth only in equilibrium. Previously, Levine (1997) explained the efficiency of banking system channeling financial resources to productive use as a powerful mechanism for economic growth. Guide et all. (2006) furthered this idea by validating the ability of the efficiently financial intermediaries to mobilize savings from multiple sources and allocate them to more productive activities as benefited approach not only for the investors but also for the entire economy. Previous discussion led efficiency as the essential aspect in this issue.

Efficiency can be written mathematically as the ratio of output and input or the amount of output generated from the input used, or efficiency is the ratio between output and input (Gordo, 2013). Matthews & Ismail (2006) described efficiency of company, particularly banking, as efficiency of the banking market, efficiency of an intermediation process, and efficiency in implementing monetary policy through regulation of bank loans.

Several related studies on the measurement of efficiency in the financial sector applied using Data Envelopment Analysis (DEA) method based on input and output variables were conducted by Bar et al (1999), Garsia (2012), Meita (2012), Fitria (2012), Gordo (2013), Dadang et al (2014), and Sufian et al (2016). Their research found a close

relationship between efficiency and bank soundness, in which the level of bank health was measured by indicators of banking performance.

As economic integration caused global finance to become more integrated, the question was whether domestic financial institutions would become irrelevant in promoting economic growth. Meshach Aziakpono (2004) examined this question using the Southern African Customs Union (SACU) and Common Area Monetary, which the finding was often cited as an example of a successful economic integration in Africa. His finding showed that the empirical evidence indicated that domestic financial intermediation is still relevant in a financially integrated market. Meanwhile, Meshach (2004) believed that to be part the economic integration, especially the monetary sector, a state must develop its financial system and address other institutional and structural issues. This was a prerequisite for obtaining optimal benefits from such integration. The benefits of economic integration are used to evaluate overall welfare.

Several studies to indicated the presence of welfare by estimating the size of the consumer surplus done by Duk Hee Lee & Dong Hee Lee (2006), Charles B & David Donaldson (1999), and Johan Stennek (1999). Their researches were conducted under the assumption that should no income be affected, then consumer surplus is consistent with the social welfare function. The consumer surplus is a value approaching consumer welfare, because it can be interpreted as the potential for willingness to pay by consumers (Koutsoyiannis, 1975). In addition, the expected consumer surplus (ECS) can also be a monetary measure for consumer welfare (Johan Stennek, 1999). Therefore, as the efficiency of the intermediation function of a financial institution affected the consumer surplus in the fund market, analyzing the interaction between financial activity and productive economy was very important.

Chin-Chan et al (2016) stated that market-product cooperation provides benefit to consumers by inducing the entry of new companies. Higher product-market cooperation tends to reduce consumer surplus by reducing competition. On the other hand, the competition of higher-market products tends to increase consumer surplus by increasing the number of active companies in the market. Therefore, the objective of this paper was to analyze the impact of bank efficiency on the consumer surplus of funds by using equilibrium market balance in the state of perfect competition. In this case, the efficiency of the intermediation function of the financial institution was determined by equilibrium condition of fund market. In addition, the analysis used in this paper was Partial Adjustment Model (PAM) with panel data. The analysis was in contrast to many previous studies used Data Envelopment Analysis (DEA) in the measurement of efficiency and the correlation coefficients to analyze the effect of financial sector on real economic activity (growth).

The paper is expected to contribute to the literature in three main areas. First, to

develop the efficiency model of financial institution intermediary function derived from the equilibrium of the fund market. Second, to develop a consumer surplus model from the equity market balance. Third, to develop a model of the impact of the efficiency of the financial institution's intermediary function on the consumer surplus of funds in the financial sector.

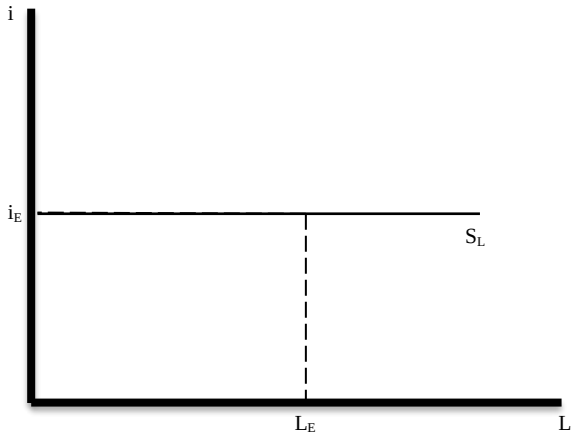
The paper is divided into five sections. Section 2 of the literature review, Section 3 presents data and models, Section 4 presents the results and discussion, and Section 5 concludes this paper.

The financial system consists of many markets, namely: the market for certificates of deposit in banks, stock markets, bond markets, stock market mutual funds, and so on. To make it easier, these markets can be combined into a single market for funds. In the fund market, the interaction between the borrower (Demand for Loanable Funds, DL) and the lender (Supply of Loanable Funds, SL) determines the real interest rate (i) and the amount of funds exchanged (Loanable Funds, L) Hubbard, 2012).

In the financial system, the interest rates the main economic variable in the financial system. The interest rate is determined using two economic models: the fund market model and the money market model, also called the liquidity preference model. The market model of funds to determine the determinants of long-term real interest rates, while the money market model to determine the determinants of short-term nominal interest rates (Hubbard, 2012).

The financial institution is the executor in the fund offering in the fund market or as an intermediary for the funds received from the over-funded community groups which are then channeled to under-funded groups (Hubbard, 2012). The financial institution (banking) that enters the market, as a seller of funds with the homogeneity of its products implies that individual banks in perfect competition are price-takers, then the desired price of funds as high as the market price of i_E (Koutsoyiannis, 1979). As fund providers are not courageous to raise the price of funds above market prices, companies (individual banking) can sell any amount of output at prevailing market prices as shown in Figure 1.

Figure 1. Supply of Loanable Funds



Source: Koutsoyiannis, 1979

The company's goal to maximize profits will be achieved when the company is in equilibrium condition, in which the resulting output can maximize profit (Koutsoyiannis, 1979). In Figure 1, the fund supply curve is a straight line indicating that the price is constant at all levels of output. In this state, individual bank as price-worker might sell some outputs at current market prices, in which their total income would increase proportionately with their sales. In this case, the marginal revenue would be constant and equal to the prevailing market price, since all units were sold at the same price. In this perfect competition MR = AR = P (Koutsoyiannis, 1979).

The demand for loanable funds curve is reflected behavior of consumer's loanable funds (Figure 2). The behavior of funds Consumer is determined by the pattern of their expenditure. The demand for funds for behavioral investment was analyzed by investment theory, which would generally account for the factors that affect investment. Aggregate investment did not depend on the absolute level of output but on the level of changes in income or changes in national output (Mankiw, 2013). The demand for investment aimed to make a profit, because this is strongly influenced by the expected return on investment (Mankiw, 2013). The demand for investment may face risk in an uncertainty condition.

Investors hoping to get a return in the future that its exact value was not yet known would choose various combinations of variants of expected returns. by comparing the amount of their investment costs. According to Blanchard (2012), as profits are measured in real terms, real interest rates are used to account for future profits. In other words: Investment depended positively on the present value of expected future profits (per unit of capital). The higher the expected profit was, the higher the expected value was, resulted in the higher the level of investment would be. When the expected of real interest rate is higher, the present value of the expected profit will be lower, resulting in the investment

rate will also be lower (Blanchard, 2012).

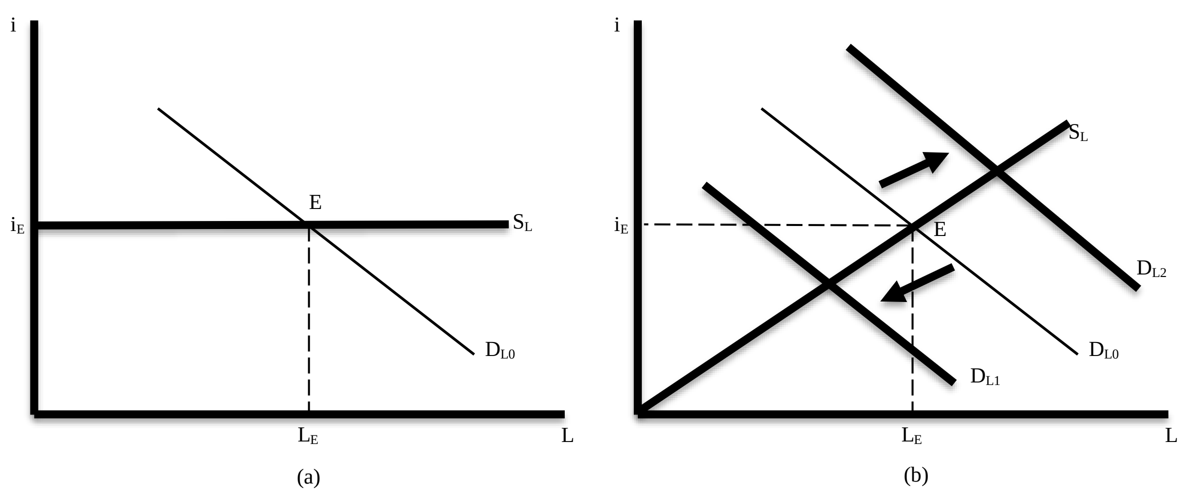
According to Colin (2012), economist Knight can be measured the risk by only an estimated average, then risk can be ascertained at a cost equal to the expected cost estimate of that risk. Given the uncertainty, when there is an increase in the money supply, the financial market will revise the expectation of current and future inflation, so the inflation is the amount of risk considered in investing (Blanchard, 2012).

The decision to make an investment loan (DL_I) is considering uncertainty which is influenced by the changes in income (ΔY), real interest rate/investment loan (i_I), and inflation (π), can be formulated as,

$$D_{LI} = f\,(\Delta Y,\ i_I,\ \pi) \qquad (1)$$

Figure 2a shows the demand for funds faced by individual banks, while, Figure 2b shows the demand for funds in the fund market. As the borrowing price increases, the amount of the loans requested will decrease, and vice versa. For example, the lower the real interest rate is, the more profitable the company's investment project can be done, thus the greater the amount of demanded loan funds is (Hubbard, 2012).

Figure 2. Demand for Loanable Funds



Source: Hubbard, 2012

The shift in the fund demand curve (Figure 2b) from D_{L0} to D_{L1} can be caused by an increase in business taxes. The increase in taxes will reduce the amount of demanded funds followed by a decrease in the real interest rates and therefore the investment activity will also decrease. Conversely, the shift in the demand for funds curve (Figure 2b) from D_{L0} to D_{L2} is due to the expectation of future profits, so that the demand for funds increases, which will be responded by the increase in real interest rates and investment.

According Hubbard (2012), that the balance of the fund market determines the amount of funds that will flow from the lender to the borrower in a period. The balance of the fund market also determines the real interest rate that the lender will receive and the borrower must pay. A shift in either the demand or supply curve will change the equilibrium at the interest rate and the amount of funds (Hubbard, 2012).

The assumption that the fund market is perfectly competitive is the equilibrium point at point *E* (Figure 2), The balance of the fund market also shows that the allocation of funds made by the financial intermediary from the surplus funds to the deficit funds is efficient (Koutsoyiannis, 1979). This means that the efficiency of the intermediary function of financial institutions is reached when the market funds in a state of equilibrium. Since prices in markets are an unique, this means that all banks in the banking industry have the same long-term average cost (LAC). But this does not mean that all banks have the same measure of efficiency, despite the fact that their LACs are equal in equilibrium (Koutsoyiannis, 1979).

According Nicholson (2008), the efficiency criterion refers to objectively measurable economic efficiency is called the Pareto-Optimal criterion introduced by the Italian economist Vilfredo Pareto. Pareto-optimal or Pareto-efficient, situations in which something is not possible will make people better without making others worse. One of the conditions is the efficiency of commodity distribution among consumers (efficiency in exchange).

The perpetrators in the fund market, both the fund supplier and the fund demander are consistent in economic decision makers so that each of them achieves equilibrium (Hubbard, 2012). This means that the equity market balance was achieved because each decision-making unit was also in equilibrium. The balance of the fund market in perfect competition could also mean that the intermediation function of financial institutions (banking) had been efficient. Therefore, the efficiency of the intermediary function of financial institutions in the equity fund market could be identified from the real interest rates.

Several studies have been conducted to measure bank efficiency by analyzing the ratio between banking output and input using Data Envelopment Analysis (DEA) method (Bar et al., 1999; Garsia, 2012; Meita, 2012; Fitria, 2012; Gordo, 2013; Dadang et al., 2014; and Sufian et al., 2016). Banking efficiency was calculated by DEA and then analyzed by linear regression in order to identify the factors that influence it, such as banking performance. Their finding showed that there was a close relationship between efficiency and bank soundness, from which the level of bank health was measured by indicators of banking performance (Meita, 2012; Dadang et al, 2014). According to Meita (2012), there is no real difference between the efficiency of sharia banks and the efficiency of conventional banks. Moreover, Fitria (2012) found that the efficiency of

conventional banking does not significantly affect the stock return of banks in the stock exchange. The efficiency of banking also reflects the competitiveness; the higher the efficiency of banking, the lower the lending rate will be (Dadang, et al, 2014).

Meanwhile Matthews & Ismail (2006) pointed out that the efficiency of a company, particularly bank, is closely linked to the efficiency of the banking market and the efficiency of the intermediation process as well as the efficiency of the implemention of the monetary policy through bank loans regulation. As a result, in perfect market competition, the efficiency of intermediation function of financial institution (banking) is shown by the amount of equity fund price or interest rate of balance loan. The efficiency of the intermediary function of the financial institution (the interest rate of the loan) will be greatly influenced by the large demand for funds and the soundness of the bank. The bank soundness can be seen through banking performance indicators. So, the efficient equations can be modulated,

$$i = f\,(Loans\ amount,\ Bank\ Health\ Level) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ (2)$$

The bank health level is shown by the availability of sufficient capital, the ability to maintain the quality of its assets well, generate sufficient profit to maintain its business continuity, maintain its liquidity so that it can fulfill its obligations at all times, well managed and operated based on prudential principles (Law No .10 Thn 1998, Banking Act).

In addition, the bank may assess the health of its own bank by using the government newly issued method in Bank Indonesia regulation number 13/1 / PBI / 2011 article 2, which is mentioned that the bank is required to conduct a bank health level by using risk approach (Risk Based Bank Rating) individual or consolidated. The Bank health level can be seen from banking performance indicators. The indicators of bank performance in accordance with the definition of Law No. 10/1998, So that the efficiency equation (2) of the intermediary function of the financial institution from the equilibrium of the fund market can be formulated, to be:

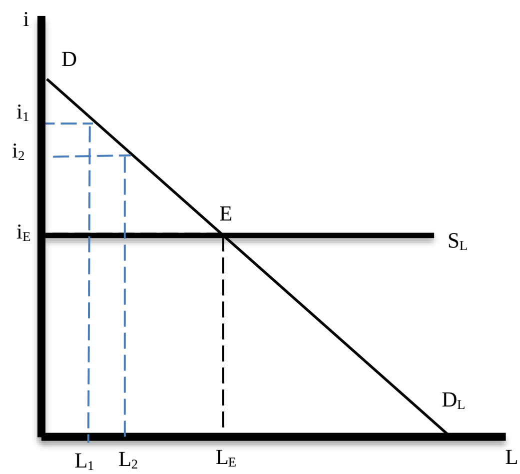
$$i = f\,(LnL,\ CAR,\ ROA,\ BOPO,\ LDR,\ NIM,\ NPL) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ (3)$$

Based on Marshall's (Koutsoyiannis, 1979) idea of consumer surplus, market analysis of funds can also be observed by the amount of surplus demander fund or surplus borrower. Therefore, the concept of consumer surplus funds can be expressed as the difference between the amount of money that the borrower actually wants to pay for his loan from the loan fund (Loanable funds), and the amount that the borrower will be willing to pay for the loan amount.

The consumer surplus of funds can be found from the demand curve for borrowed funds and the price of funds in the fund market, which is assumed that fund demander can not affect the price of funds. As in Figure 3, the straight-line fund demand curve

(DD_L) and the market price of funds are i_E. At this price, the borrower asks for the L_E fund and pays a sum (i_E) • (L_E) for the loan. However, the borrower will be willing to pay i_1 for L_1, i_2 for L_2, i_3 for L_3 and so on. The fact that the market price is lower than the price the borrower will be willing to pay for the loan, implies that the actual expenditure is less than that the borrower would be willing to spend his money to raise the fund, *L*. This difference is the consumer's surplus of funds, and is the DEi_E triangle area between the demand curve and market price of funds.

Figure 3. Consumer Surplus Funds



To analyze the consumer surplus in the fund market, it is assumed that the decision to borrow funds by maximizing the utility function within its budget constraints. Because the funding loans for investment, and based on the demand for funds in equations (1), the utility function of fund demander (U_D) is

$$U_{DLI} = U(\Delta Y, i_I, \pi) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (4)$$

The consumer surplus of funds is considered a function of increased utility of changes in the price of funds. For convenience and simplicity of the estimation procedure, the assumption made that the market demand function of the fund is the usual funding demand curve with a log-linear form, namely:

$$D_{LI} = e^{\alpha_0} i^{\alpha_1} \pi^{\alpha_2} \Delta Y^{\alpha_3} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (5)$$

This functional form, in accordance with changes in the price of funds, consumer surplus funds at a certain time t ($CS_{(t)}$) is as follows:

$$CS_{I(t)} = \int_{i=1}^{t} D_{LI}(i, \pi, \Delta Y) d_L = \int_{i=1}^{t} e^{\alpha_0}\, i^{\alpha_1} \pi^{\alpha_2} \Delta Y^{\alpha_3} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (6)$$

The demand for funds is determined by the willingness of the borrowers to pay the borrowed funds at the interest rate on the loan. At the lending rate as high as i_E (Figure 3)

some borrowers get a surplus, because the borrower does not have to pay according to his ability (Koutsoyiannis, 1979). Surplus consumer funds can be interpreted as the ability of borrowers to pay the price of the loan, in economic theory known as "willingness to pay". The lower the interest rate on the loan is, the greater the consumer's surplus of funds will be. Therefore, it can be concluded that the greater the surplus of consumer funds, the more prosperous the society.

Johan Stennek (1999) in his research stated that Expected Consumer's Surplus (ECS) is often used as a monetary measure for consumer welfare. Likewise, Rogerson (1980) and Turnovsky et al. (1980) stated that consumer surplus is expected as a welfare index. They showed that the expected consumer surplus (ECS) represents the consumer preferences (the expected utility) of the price distribution if and only if the marginal utility of consumer income is independent of the price of the good (Edward E. Schlee, 2008).

METHOD

Data

Efficiency and consumer surplus were analyzed using micro and macro data in which the micro data were generated from Financial Services Authority (FSA) consisting of the performance of financial institutions (banking), lending rates, and loan amount (bank credit). Meanwhile, the macro data obtained from the publication of Central Bureau of Statistics (CBS) consisted of income and inflation. The panel data during the period of 2000-2016 were analyzed within 102 observations.

Model

This research used intermediation approach to calculate the efficiency of conventional banking. Based on equilibrium condition in fund market, the efficiency of intermediation function of the financial institution can empirically be formulated in a model as follows:

$$i_t^* = \beta_0 + \beta_1 LnL_t + \beta_2 X_t + e_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (7)$$

where, i* t = optimal loan interest rate / balance

L_nL_t = natural logarithm of the loan amount

X_t = bank soundness indicator

e_t = error term

The equation (7) explains that the optimal loan interest rate was influenced by the loan amount and the bank soundness indicator. The amount of optimal loan interest rate, i^*t could not be observed; it was only predicted. One prediction was done through an adjustment or partial adjustment model (PAM). If i^*t is the optimal loan interest rate in period t and it is the actual value of the loan interest rate, then this adjustment is called

partial adjustment model. The empirical model for the efficiency of the intermediary function of financial institutions and consumer surplus of funds with adjustment or PAM is:

Function of Efficiency:

$$i_t = \gamma_{10} + \gamma_{11} LnL_t + \gamma_{12} NPL_t + \gamma_{13} LDR_t + \gamma_{14} BOPO_t + \gamma_{15} NIM_t + \gamma_{16} ROA_t + \gamma_{17} CAR_t + \gamma_{18} i_{t-1} + e_{1t} \quad \ldots\ldots (8)$$

i_t is the actual loan interest rate, $LnLt$ = loan amount, while banking soundness indicators are NPL, LDR, BOPO, NIM, ROA, and CAR, and e_{1t}= error term.

Consumer Surplus Function:

$$LnL_t = \gamma_{20} + \gamma_{21} \Delta Y_t + \gamma_{22} i_t + \gamma_{23} \pi_t + \gamma_{24} LnL_{t-1} + e_{2t} \quad \ldots\ldots (9)$$

As the equations (8) and (9) have simultaneous equations, both equations can be examined by a simultaneous test, but the simultaneous equations cannot be estimated using the OLS method. Based on the identification of the order and rank condition, equations (8) and (9) are over identified; thus, it will be estimated using Two Stage Least Squares (TSLS) approach and, it is necessary to derive the reduced-form equation. The TSLS process is as follows:

Stage 1.

a). The reduced-form equation for efficiency function

$$i_t = \widehat{\Pi}_0 + \widehat{\Pi}_1 \Delta Y_t + \widehat{\Pi}_3 \pi_t + \widehat{\Pi}_5 LnL_{t-1} + \widehat{\Pi}_6 NPL_t + \widehat{\Pi}_7 LDR_t + \widehat{\Pi}_8 BOPO_t + \widehat{\Pi}_9 NIM_t + \widehat{\Pi}_{10} ROA_t + \widehat{\Pi}_{11} CAR_t + \widehat{\Pi}_{12} i_{t-1} + \hat{e}_{1t} \quad \ldots\ldots (10)$$

b). The reduced-form equation for Consumer Surplus function

$$LnL_t = \widehat{\Pi}_{13} + \widehat{\Pi}_{14} \Delta Y_t + \widehat{\Pi}_{16} \pi_t + \widehat{\Pi}_{18} LnL_{t-1} + \widehat{\Pi}_{19} NPL_t + \widehat{\Pi}_{20} LDR_t + \widehat{\Pi}_{21} BOPO_t + \widehat{\Pi}_{22} NIM_t + \widehat{\Pi}_{23} ROA_t + \widehat{\Pi}_{24} CAR_t + \widehat{\Pi}_{25} i_{t-1} + \hat{e}_{2t} \quad \ldots\ldots (11)$$

Stage 2.

a). The reduced-form equation for efficiency function:

$$i_t = \gamma_{10} + \gamma_{11} \widehat{LnL}_t + \gamma_{12} NPL_t + \gamma_{13} LDR_t + \gamma_{14} BOPO_t + \gamma_{15} NIM_t + \gamma_{16} ROA_t + \gamma_{17} CAR_t + \gamma_{18} i_{t-1} + u_{1t} \quad \ldots\ldots (12)$$

b). The reduced-form equation for Consumer Surplus function:

$$LnL_t = \gamma_{20} + \gamma_{21} \Delta Y_t + \gamma_{22} \hat{\imath}_t + \gamma_{23} \pi_t + \gamma_{24} LnL_{t-1} + u_{2t} \quad \ldots\ldots (13)$$

It should be noted that in the reduced-form (12) and (13) equations there was only one endogenous variable, the dependent variable, which was a function of the exogenous and stochastic variables. Therefore, the reduced-form (10), (11), (12) and (13) equations could be estimated using the OLS method.

ANALYSIS AND DISCUSSION

Estimated Investment Loan

The first objective of this study is to analyze the banking intermediation function on the equilibrium of the fund market. This study examines whether the efficiency of the banking intermediary function is influenced by the performance of the banking system or that the efficiency is due to the market conditions faced by the banks, which forces the banks to perform their intermediary function.

Table 1. Result of Running Data for Efficiency and Consumer Surplus

In Case Demand for Leonable funds For Investment

Variables	**Efficiency**				**Consumer Surplus**			
	Stage 1		**Stage 2**		**Stage 1**		**Stage 2**	
	Coefft	**t-Statc**	**Coefft**	**t-Statc**	**Coefft**	**t-Statc**	**Coefft**	**t-Statc**
Constanta	8,508	2,005	14,219	2,887	1,713	5,534	0,516	2,485
i	-	-	-	-	-	-	-0,010	-1,641**
LLI	-	-	-0,925	-2,633*	-	-	-	-
i(t-1)	0,411	4,522*	0,355	3,597*	-0,031	-4,749	-	-
LLI(t-1)	-0,267	-0,888	-	-	0,911	41,451*	0,953	42,755*
Y	-0,816	-3,074*	-	-	0,006	0,303	-0,017	-0,950
Inflasi	0,248	5,541*	-	-	-0,006	-1,704**	0,004	1,191
CAR	0,006	0,226	0,014	0,432	-0,002	-0,842	-	-
ROA	-0,492	-1,973**	-0,776	-2,735*	-0,051	-2,810	-	-
BOPO	0,035	1,142	0,018	0,522	-0,005	-2,222	-	-
LDR	0,001	0,119	-0,020	-2,028*	-0,002	-3,227	-	-
NIM	0,309	2,767*	0,169	1,342	-0,002	-0,285	-	-
NPL	0,011	0,318	0,079	2,198*	0,006	2,549	-	-
R^2	0,724		0,619		0,976		0,983	
F-Statistik	27,537		21,531		368,079		649,270	
DW	1,826		1,827		1,701		1,879	

Source: result of the Running data

Note, *significance at 5% and **significance at 10%

Table 1 shows that the performance indicators of the bank that greatly affected the efficiency were not only ROA, LDR, NIM, and NPL, but also macro variables such as changes in national income and inflation at 5 percent and 10 percent confidence level (stage 1 and stage 2). There was still another banking performance ratio in the model that does not individually affect the efficiency of the banking system. Statistical test result showed that there was no negative autocorrelation of information magnitude on Durbin-Watson value (1.826 and 1.827).

The efficiency could be explained by variations of the independent variables of 72.4 percent (stage 1) and 61.9 percent (stage 2). Those values meant that there were about 27.6 percent (stage 1) and 38.1 percent (stage 2) variations of the independent variables outside the model that might affect the efficiency. The F-count value was greater than the F-table value in step 1 (27,537 > 1,94) and stage 2 (21,531 > 2.04), meaning that the efficiency was affected by together all independent variables on the model.

The second objective of this study is to analyze the effect of bank efficiency on consumer surplus in the fund market, Table 1 shows the result that consumer surplus was influenced by the loan interest rate (i), the amount of loan of the previous period (LLIt-1), and the inflation for about 5 percent and 10 percent confidence (stage 1 and stage 2). The value of DW = 1,701 (stage 1) and DW = 1,879 (stage 2) showed that as no detectable residual value existed, there were positive autocorrelation and negative autocorrelation.

Consumer surplus could be explained by variation of the independent variables of 97.6 percent (stage 1) and 98.3 percent (stage 2), meaning that there were about 2.4 percent (stage 1) and 1.7 percent (stage 2) variations of the independent variables outside the model that might affect the consumer surplus. As the F-count value was greater than the F-table value in step 1 (368,079> 1,94) and stage 2 (649,270> 2,47), together all the independent variables existed in the model were capable of affecting the consumer surplus.

Discussion

This study used a sample of six conventional bank groups with total data of 102 panel data from 2000 - 2016. The analytical tool used was PAM of Two Stage Least Squares (TSLS). The results shown in Table 1 exhibited that efficiency was influenced by banking performance indicators consisting of ROA, LDR, NIM, and NPL. This was in accordance with banking health assessment which emphasizes on risk aspect. (PBI No.13 / 1 / PBI / 2011).

In this study, the efficiency value was equal to the real interest rate in equity market balance, which was in contrast to the previous research of Fitria, (2012); Meita, (2012); and Dadang, (2014); which measured the efficiency using Data Envelopment Analysis (DEA) based on the ratio between outputs banking and inputs banking. However, from

the regression analysis, the results of this study were similar to those of the previous research of Fitria, (2012); Meita, (2012); and Dadang, (2014); that banking efficiency is influenced by banking performance. This can be interpreted that only banks with good performance would be efficient in channeling funds to the community in need.

The result of this research was that consumer surplus was influenced by the real interest rate, the previous loan amount, and the inflation as in the investment theory of Mankiw (2013). According to Mankiw (2013), the consumer surplus in the fund market is as large as the amount of investment loan, which is influenced by changes in income, investment return and risk; whereas, the variable return investment is the real interest rate, and as the risk variable is inflation. In this study, the real interest rate was identic to the value of bank efficiency in the fund market. Therefore, the results of this study indicated that consumer surplus is influenced by banking efficiency.

In this study the consumer surplus was identic to the size of the investment loan; therefore, if the investment loan increases, the greater the investment, so that the national capacity can be increased, and this will have an impact on the increase of public income (Gregory P, 2015; NM Kadagi, Ahmad & Wafula, 2015). So that consumer surplus can be used as an indication of the prosperity enjoyed by the community, as research from Johan S (1999), Charles B & David D, (1999), and Duk HL & Dong HL (2006). Thus, the result of the ordinary least squares regression (OLS) of this study showed that the efficiency of banking affected consumer surplus could be interpreted that the efficiency of banking affected the welfare of society.

CONCLUSION, LIMITATION AND SUGGESTION

With the enactment of risk-based bank risk assessment (PBI No 13/1 / PBI / 2011), banks are required to be efficient in channeling funds. Therefore, banking performance indicators such as ROA, NPL, NIM and LDR as reflecting the risk in channeling funds by banks to the public.

Consumer surplus is strongly influenced by the efficiency of banking, also by variable investment behavior, namely; return on investment, risk and revenue growth. Thus, the rational behavior of investors, in obtaining loans also depends on the efficiency of the banking system. On the other hand, banks in channeling funds are also faced with the risk of stalled credit. Therefore, it can be concluded that the new banks can distribute credit (loans) to the community when it is efficient. Thus, banking efficiency is a prerequisite for disbursing funds as the implementation of the intermediation function in the fund market.

If the equity market is in equilibrium, then the real interest rate determines the welfare effect. Because there are two types of usage of bank loan, that is for investment and consumption, so welfare study is needed in each kind of loan usage. This is to know

what kind of loan usage of banking which is more effective to influence public welfare. So the results of this study will be able to establish a policy to improve welfare.

REFERENCES

Andrus Oks. 2001. *Efficiency of the Financial Intermediaries and Economic Growth in CEEC.* Tartu University Press. Faculty of Economics and Business Administration. University of Tartu.

Bencivenga, V. & B. Smith. 1991. Financial intermediation and endogenous growth. *Review of Economic Studies 58, 195–209.*

Bencivenga, V. & B. Smith. 1993. Some consequences of credit rationing in an endogenous growth model. *Journal of Economic Dynamics and Control 17, 97–122.*

Blanchard, O and David R. Johnson. 2013. *Macroeconomics*. Sixth Edition. Pearson Education, Inc. United States of America.

Chih-Chen Liu, Arijit Mukherjee, Leonard F.S. Wang. 2016. Product market cooperation, entry and consumer welfare. *International Review of Economics and Finance 44 (2016) 277–280*

Colin Read. 2012. *The Portfolio Theorists, Von Neumann, Savage, Arrow, and Markowitz.* Palgrave Macmillan. The United Kingdom.

Edward E. Schlee, 2008. Expected consumer's surplus as an approximate welfare measure. *Economic Theory (2008) 34: 127–155.*

Gulde, A., et al. 2006. Sub-Saharan Africa: financial sector challenges. *International Monetary Fund working paper.*

Greenwood, J. & B. Jovanovic. 1990. Financial development, growth, and the distribution of income. *Journal of Political Economy 98, 1076–1107.*

Hubbard RG, AP O'Brian, M Rafferty. 2012. *Macroeconomics*. Prentice Hall,

Koutsoyiannis, A. 1979. *Modern Microeconomics*. Second Edition. St. Martin's Press, Inc. United States of America

Levine, R. 1991. Stock markets, growth, and tax policy. *Journal of Finance 44, 1445–1465.*

Levine, R. 1992. Financial intermediary services and growth. *Journal of the Japanese and International Economies 6, 383–405.*

Levine, R.. 1997. Financial Development and Economic Growth: Views and Agenda. *Journal of Economic Literature, 35(2), 688-726.*

Mankiw, NG. 2013. *Macroeconomics*. Eighth Edition. Worth Publishers. New York.

Nicholson, W and C, Snyder. 2008, *Microeconomic Theory, Basic Principles and Extensions.* Tenth Edition. Thomson South-Western. United States of America.

Saint-Paul, G. 1992. Technological choice, financial markets and economic development. *European Economic Review 36, 763–781.*

Schumpeter, J.A. 1911. *The Theory of Economic Development.* Cambridge, MA: Harvard University Press.

Swamy, V and Tulasimala, B.K. 2011. Financial Intermediaries and Economic Development: Evidence on Transaction Costs of Borrowing by the Poor**.** *International Journal of Banking and Finance: Vol. 8: Iss. 3, Article 3.*

Maria F Morales. 2003. Financial Intermediation in A Model of Growth Through Creative Destruction. Cambridge University Press. *Macroeconomic Dynamics,7, 2003, 363–393.*

McKinnon, R. 1973. *Money and Capital in Economic Development.* Washington, DC: Brookings Institution.