

Policy impact of the Indonesian Central Bank certificate related on loan interest rate to the demand growth of property

B Wirjodirdjo^{1*}, H Y Asjari²

¹Department of Industrial Engineering, Institut Teknologi Sepuluh Nopember, Kampus ITS Sukolilo-Surabaya 60111, Indonesia

²Telkom Indonesia, Jakarta, Indonesia

*budisantoso.wirjodirdjo@gmail.com, santoso@ie.its.ac.id

Abstract. The Indonesian economic indicators shown a positive progress in the last three years, Foreign exchange reserves position of the end of March 2017 stood at US \$ 121.8 billion higher than the position of the end of 2015 amounted to US \$ 105.9 billion of the end of 2015. This reserve would ensure the resilience and maintaining sustainable Indonesian economic growth in the future. Although Indonesia's foreign exchange is better, the structure of expenditure in the country is still less than ideal due the proportion of spending of consumer goods is far greater than the capital goods and tend to be unproductive spending. This needs to be regulated so that in the long term does not cause balance of payments deficit. Therefore, Indonesian Central Bank took a policy to raise interest rates for retail banks from 6% to 7.25% per annum gradually up to present. Policies relating to the interest rates on loans are intended to reduce the proportion of debt financing of consumer goods, however, these policies have implications to various economic sectors and one of those is property sector. A lot of research has been conducted related the impact of loan interest to the property sector but most of it is still in partial related to the ability the people to buy. However, this research has tried to see the implication of the macro Economic Policy of Indonesian Central Bank to the property sector as a systemic problem. This paper is going to present the study on the effects of these policies on the property sector, especially residence house. To obtain a comprehensive analysis and capture the relationship between interest rate policies and their impacts to the property sector, in this study the model developed and simulated using system dynamic methodology as an approach. Various scenarios are applied to the model to get an accurate information about how and when the effectiveness of the policy related to the property sector can be enforced. The result of this study can be delivered to the policy maker as feed-back to improving the policies related the interest rate.

1. Introduction

Property is a strategic and important sector as part of primary needs of human being after food and clothing. In addition, property sectors has a substantial multiplier effect to other sectors as well as supporting evolving industries. This has been the major challenges for Real Estate Indonesia (REI) considering backlog that happened in 2016 has reached 25 million units of residential needs. Time and efforts is needed in order to fulfil the residential needs [1]. Despite the major challenges ahead, property sectors business has been showing positive performance for the last three years for its attempt on fulfilling the residential needs. In 2015, the sectors donated around 28% to the economic growth. Indonesia's property development in 2017 is predicted to increase around 20% from its 2015



performance. Real estate is an interesting sector considering the need of property products keep increasing along with the economic development and population.

In May 2016, credits on flats and apartments grew about 87.4% (year on year), while back in January 2011, credit on this sector grew around 150% with relatively stable residential credit growth. Residential credit growth in 2016 was 16.96%, increased from 14.26% in May 2013 [2]. Currently, credit growth on flats and apartments is higher compare to residential (landed house).

The soaring property prices for the last few years and credit growth in Indonesia has been observed by Bank Indonesia. The central bank has been actively making efforts to anticipate crisis as happened in the United States back in 2008 considering residential property prices increased significantly during 1998-2006. Credit growth rate reach around 12.5% each year in the last eight years. Residential property prices index in 1998 is US 60 and increased to US 160 in 2006. The following year, residential property prices index was down to US 130 in 2008 and keep decreasing ever since. The crisis that was caused by subprime mortgage affected the price bubble in property sectors [3]. Property price bubble is a condition when the property price rose significantly in a short period and if ignored, the bubble bursts causing property prices fall followed by economic breakdown and might causing recession.

In order to address potential issues in the housing credits, the Government (in this case is Bank Indonesia) develop a policy or decree called Loan to Value ("LTV") where the potential properties buyers are expected to contribute down payment of 30% from the total credit, and banks are expected to provide maximum loan of 70%. This was intended to minimize bad debts and asymmetric information. As explained above, credit development in Indonesia is higher than what was expected, however, in the last few months, the property credits have been decreasing. In addition, the worsening of macro-economic condition (e.g. increase of BI Rate to 7.5%, expected inflation of 9.0%, and low economic growth) hinders the development of this sector.

This paper discusses property sector, where this sector relates to other sectors as a systemic reaction. Thus, to develop a banking policy related to the property sector, synchronization between the central bank (lending policy) and the Government (spatial policy) in the provision of housing, so it's not hampered and prudent.

This paper is trying to analyze and model the policies that were done by the central bank, which the Bank associated with the increase in loan interest rates and their impact on the property sector development plan. The methodology approach used is dynamic system methodology in the hope that the simulation result from the developed model can be used to estimate the prospects of the property sector in the future as well as to see the relation regarding the contribution of the property sector in maintaining economic growth.

2. Literature Review

Sertifikat Bank Indonesia (SBI) is the securities issued by Bank Indonesia in recognition of short term debt (1-3 months) with a discount/interest system. SBI is one of the mechanisms used by Bank Indonesia to maintain Rupiah stability. By selling SBIs, Bank Indonesia can absorb the surplus of outstanding primary money. The interest rate applicable to each sale of SBI is determined by market mechanism based on the auction system. Since early July 2005, BI has adopted the BI Rate mechanism (i.e. BI announces the target of SBI interest rate desired by BI for auction at certain period of time). BI Rate is used as a reference by market participants in following the auction.

The benchmark interest rate or BI Rate is a policy rate reflecting the monetary policy stance set by Bank Indonesia and announced to the public. In general, the function of the BI Rate is to regulate the inflation rate in Indonesia. Bank Indonesia will raise the BI Rate if future inflation is predicted to surpass the predetermined target, and on the contrary Bank Indonesia will lower the BI Rate if future inflation is predicted to be below the prescribed target [2].

Interest rates represent a future payment because there was a transfer of money in the past. Interest rates are divided into nominal interest rate and real interest rate. The nominal interest rate is the interest rate which already takes into account the rate of inflation. While the real interest rate is the interest rate

that has not taken into account the inflation rate. The real interest rate is the nominal interest rate less the rate of inflation. Real interest rate that is generally used as a reference is a risk-free rate (or BI Rate).

There are several studies related to bank interest rate, for examples are Delis and Kouretas [4] conducted an empirical study of low interest rate tends to increase the banks' risks substantially. However, this could not be applied to all bank, it depends to the banks' characteristics in facing the interest rate impact on reduced asset risk from banks with higher equity capital.

There are other researches that emphasize more on dynamic behavior of a policy impact, such as Hwang et al. [5] who analyzed the effectiveness of mortgage rental policy by reducing the LTV and DTI ratio in 2008 in Korea. The policy is aimed to manage housing demand and stabilize house prices. Similar approaches in relation to dynamic behavior of housing market supply-demand was conducted by Kwoun et al. [6] which concludes that housing supply-demand is affected by macroeconomic conditions. By using system dynamics, the analysis states that this method is proper to be used since it explains the dynamic relation on unsold housing supplies.

Bouchouicha and Ftiti [7], by analyzing the dynamic interaction of real estate market in the United States of America and United Kingdom, also the macroeconomic environment using Dynamic Coherence Function (DFC). The paper provides a point of view that monetary policy is essential to avoid disruptions towards real estate market.

Contrary to research conducted by Ibicioglu and Kapusuzoglu [8] which analyzed the decisions impacts in interest rate policy of central banks on their decision towards investment in the Istanbul Stock Exchange (ISE). By using the impulse-response analysis, they found that the price movement at ISE was an effective market in monetary policy. Therefore, it is necessary to be cautious for any monetary policy that will have impacts on investment decisions especially on price considerations.

Research conducted by Ibicioglu and Kapusuzoglu [8] still leaves some implications of a policy that needs to be further explored and therefore Papadamou and Siriopoulos [9] examined the impacts of the MPC (Monetary Policy Committee) results which have risks on interest rates and life insurance companies in the UK. As a result, there are important implications for finding monetary authorities in aiding the stability development of financial industry through central bank policies.

Rubio and Carrasco-Gallego [10] analyzed the implications from macro-prudential and monetary policies on financial and welfare stabilities. With macro prudential regulations in the form of LTV which able to affects credit growth. Likewise, obtaining the optimal parameters of monetary and macro-prudential policies that are coordinated and not. From this it was found that when there is coordination, the stability of the economy and welfare is able to be maintained.

Based on the literature study above, it is learned that there is a research gap that has not been mentioned by previous researchers related to the complexity of property setbacks which existence is not independent but related to other sectors as systemic relations. Therefore, policies synchronization are fundamental in between the central banks in terms of financing policies with the government in terms of spatial policies, hence that the fulfillment of housing demands is not hampered and still retained prudential principles.

3. Model Conceptualization

Model conceptualization begins by identifying the interacting and affecting variables towards central bank policy system and government within the property sector development. To simplify the identification and modelling, diagrams of input-output and interacting variables are constructed. Then, casual loop diagram and stock and flow diagram are formed towards object of observation.

The identification of related variables that affects the system is collected including variables in the property sector, banking and macroeconomics. Next stage is to compose input-output diagram to describe input-output variable from systemic complications related to central bank and government policies. On the input-output diagram, variables are classified between controllable and uncontrollable input, as well as controllable and uncontrollable output, and the environment. Figure 1 shows the input-output diagram used for this paper.

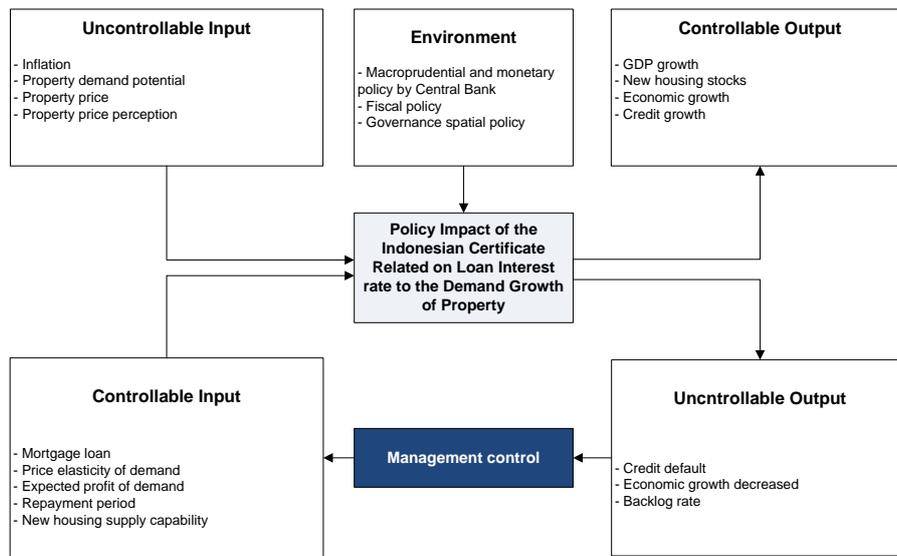


Figure 1. Input Output Diagram

The following stage is the construction of casual loop diagram in order to observe the systemic dependency between main variables on central banks and government policy complications in relation to the development of the property sector as shown in Figure 2.

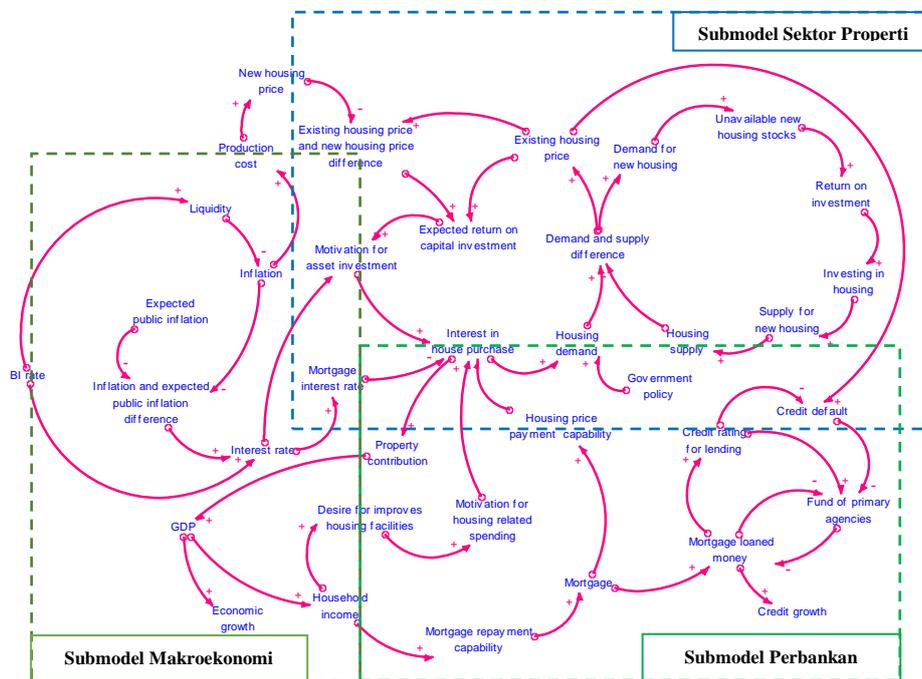


Figure 2. Causal Loop Diagram

Stock and flow diagram is constructed to illustrate the interaction between variables in accordance with logic structure on modeling software being used. The design of stock and flow diagram consider the research objective and must be able to illustrate the impact of policy instrument towards observed system.

The model is divided into 5 sub models called as a modules, each module represents the perspective of central bank and government policy sub-system within the property sector development. Those module are: 1) Supply Demand Landed House, 2) Apartment Supply Demand, 3) Macroeconomic, 4) Banking and 5) Credit default.

4. Policy Scenario Development

The policy scenarios to be taken under possible conditions can be controlled by stakeholders in handling the development of the property sector. In addition, the improvement scenario is determined based on the parameters that affect the performance of the system by testing the sensitivity or extreme test conditions that have been done on the model validation test. These policy scenario are based on the expected future conditions, where there is an increase and decrease in the value of the variables that will be used as scenarios.

- Scenario 1: Increase fraction of Central Bank's Reference Rate, this is policy rate reflecting the monetary policy stance set by Bank Indonesia and announced to the public.
- Scenario 2: Decrease of Maximum Proportion Granted for Mortgage by Banks in the form of allowable loan ratios for credit implementation. This policy is aimed at further improving the prudential aspects of banks in lending property and minimizing default. This scenario is to reduce the proportion of Loan to Value from initially 70% lowered to 50%.
- Scenario 3: Fraction of Land and Building Tax Fee, the aims of this policy to influence the aggregate demand side of an economy in the short run. The scenario is done by raising the tax fraction increased 0.5% from the existing condition.
- Scenario 4: Fraction of Residential Resettlement is intended to optimize land allocation for urban settlement. The scenario is to activate this variable and give contribution value of 10 % for 10 years
- Scenario 5: Proportion of Apartment and Housing Development, this is local government policy in managing land use by arranging the proportion of apartment and housing development to 52:48.
- Scenario 6: Combination of Scenarios, from each of the conditions described scenarios above, there are a combination that may occur between several conditions. It will be arranged for 3 scenarios: pessimistic scenario, moderate scenario and optimistic scenario (improvement scenarios). Table 1 shows the linkage between policy parameters and the expected future conditions.

Table 1. Relation between Parameter & Condition (state) of Policy Scenario

No	Parameter	Future Prospect		
		A. Pessimistic	B. Moderate	C. Optimistic
1	BI Rate	6,00	7,50	8,00
2	LTV	100%	70%	50%
3	Tax	0,25%	0,50%	1,00%
4	Resettlement	0	0	10%
5	Proportion (Apartment : Landed house)	40:60	50:50	60:40

5. Simulation Scenario Result

The pessimistic scenario is built on the following key parameter conditions: 1) the BI Rate fraction is reduced to 6.00% due to lower inflation, 2) the absence of LTV so that the borrower can borrow with 100% credit, 3) the tax rate is reduced to 0.25%, 4) the absence Resettlement, 5) the proportion of apartments: housing at 40:60 as a result of the community's desire for land ownership. It is shown that

the pessimistic scenario has an impact on the supply demand, macroeconomic, banking and credit default aspect. In the supply-demand aspect, it appears that the more stocks for housing, the greater the land needed for development. In macroeconomic aspects, there is a decrease in economic growth and consistent increase in per capita income. In the banking aspect, trade-off between credit developments with credit liquidity occurs where an increase in credit development can reduce credit liquidity. Finally for the default credit sub-model, development probability occurs so that, this risk also interference with other variables that are affected by this variable.

The moderate scenario is built on the following key parameter conditions: 1) the BI fraction rate remains at 7.50%, 2) the LTC is 70%, 3) the fixed tax rate at 0.50%, 4) the absence of resettlement, 5) no proportion of the construction of the apartment with housing. It is shown that the moderate scenario has an impact on the supply-demand, macroeconomic, banking and credit default aspects. In the supply-demand aspect, it can be seen that low stock level for both apartment and housing, causing the required land is also low. However, from here it can be seen that there are still many unfulfilled requests. In macroeconomic aspects, there is a decrease in economic growth and consistent increase in per capita income. In the banking aspect, trade-off between credit developments with credit liquidity occurs where an increase in credit development can reduce credit liquidity. Finally for the default credit sub-model, development probability occurs so that, this risk also interference with other variables that are affected by this variable.

Optimistic scenarios are built on the following key parameters: 1) the fraction of the BI Rate rises to 8.00% due to increased inflation, 2) the LTV is 50%, 3) the tax rate is increased to 1.00%, 4) the resettlement, 5) the proportion of apartments: housing at 60:40 due to the efficiency of land use for the house. It is shown that the optimistic scenario has an impact on the supply demand, macroeconomic, banking and credit default aspects. In the aspect of supply demand, it is seen that the more stock for the apartment, thus causing the efficient land needed for development. The enlargement of stock figures needed for housing. This happens because the transfer to the apartment is done, so it takes encouragement to the community to switch to the apartment. In macroeconomic aspects, there is a decrease in economic growth and consistency in increased per capita income. In the banking aspect, trade-off between credit developments with credit liquidity occurs where an increase in credit development can reduce credit liquidity. Finally for the default credit sub-model, development probability occurs so that, this risk also interference with other variables that are affected by this variable. To compare quantitatively the three combinations of scenarios, see Figure 3 below and Figure 4.

Aspect	Parameter	Pessimistic	Moderate	Optimistic
Supply Demand	Stock of Apartemen (Unit)	(15,606)	(7,477)	14,245
	Stock of Landed House (Unit)	5,112	(8,323)	(18,284)
Supply Demand	Land Occupied (m2)	7.008.205,50	6.076.447,42	3.896.017,71
Macro Economic	Economic Growth (%)	5,68	5,64	5,64
	Income per Capita (Rp)	73.945.441,50	73.851.819,12	73.930.764,03
Banking	Credit Liquidity (Rp)	28.432.021.113,44	28.825.983.759,85	29.065.165.360,53
	Credit Development (Rp)	4.882.542.530,21	4.143.367.418,53	3.714.569.636,97
Credit Default	Probability of Credit Default (%)	5,91	6,59	6,36

Figure 3. Combination Scenario Simulation Result

Figure 4 can be seen that the dominance of excellence for all aspects is possessed by optimistic scenarios, where the optimistic scenario answers the objectives of the development of the property

sector. Optimistic scenarios can reduce the rate of land use for homes, this is appropriate in supporting the needs of the government in limiting land use for buildings on the growing population. However, the stock of apartments is bigger than housing. It is considered beneficial in terms of efficiency but not for investment. What is needed is a form of social management in the transfer of residential use from housing to apartments. In addition, in terms of per capita income and economic growth, this scenario is superior and supportive in economic growth as well as for banking. In essence, with this optimistic scenario, the property sector can promote economic growth and support in terms of the fulfillment of homes by the community.

Fiscal policy has no significant effect on the development of the property sector. This can be seen from the trend of changes in the fraction of tax rates that cannot dominate against other scenarios on the response variable that has been set. But on the other hand, this fiscal policy contributes when combined with other variables in influencing response variables.

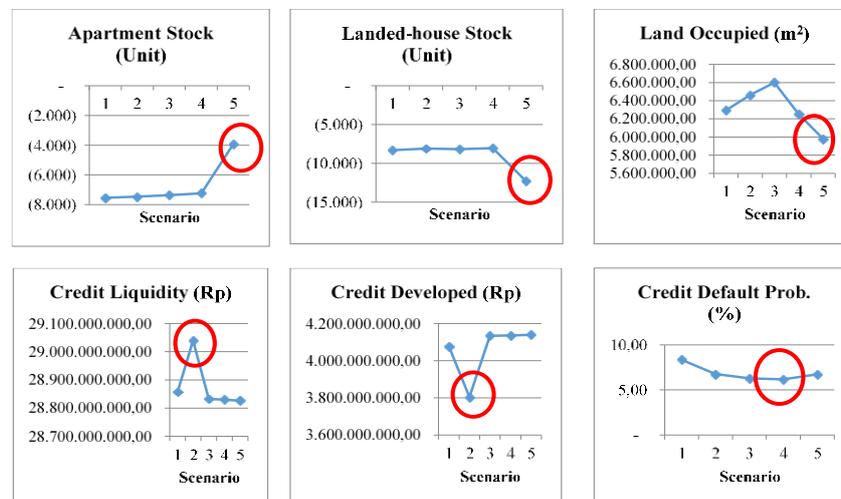


Figure 4. Combination Scenario Simulation Result

6. Conclusion

From the results of simulations and analysis that have been done, it can be concluded:

1. The policy of the central bank and the government has an impact on the development of the property sector. Policies that can be given by the central bank in the form of BI Rate determination as monetary policy, in order to manage macroeconomics, while LTV as macro prudential policy that provides limits on the amount of credit that can be done by the borrower. The policies that can be provided by the government in the form of tax rates as a fiscal policy, the implementation of resettlement and the proportion of provision of housing and apartment occupancy. The fiscal policy has no significant effect on the development of the property sector.
2. The policy giving policy partially has no significant effect and there is a trade off on the development of property sector. So it takes a combination of scenarios in the form of policy synchronization of the central bank and government in the business of fulfilling the house for the community. Combination scenario is arranged to get three kinds of scenario that is pessimistic scenario in the form of decrease parameter scenario, moderate scenario in the form of existing condition and optimistic scenario in the form of increase of reference parameter. All three combinations are selected as the greatest possibility that will happen in the future.

The scenario shows that the optimistic scenario answers the purpose of the development of the property sector. Optimistic scenario in the form of an increase in BI Rate of 8.00, a decrease in the

proportion of credit (LTV) to 50%, increase of tax rate to 1.00%, resettlement by 10% for 10 years, and the proportion of apartment development: housing by 60:40. This can reduce the rate of land use for homes, this is appropriate in supporting the needs of the government in limiting land use for buildings on the growing population. In essence, with this optimistic scenario, the property sector can promote economic growth and support in terms of the fulfillment of housing by the community.

References

- [1] Boediono 2013 *Boediono: Pemerintah-REI Kerjasama Cukupi Kebutuhan Perumahan* (M. F. Anugrah, Interview)
- [2] Bank Indonesia 2013 *Perkembangan Properti Komersial* (Jakarta: Divisi Statistik Sektor Real Bank Indonesia)
- [3] Ragimun 2012 *Overheating Sektor Properti di Indonesia*. (Jakarta: Policy Memo. Badan Kebijakan Fiskal, Kementerian Keuangan)
- [4] Delis M. D and Kouretas G P 2010 Interest rates and bank risk-taking *J. Banking & Finance* **35** pp 840-55
- [5] Hwang S, Park M and Lee H 2011 *Dynamic analysis of the effects of mortgage-lending policies in a real estate market* **57** pp 2106-20
- [6] Kwoun M J, Lee S H, Kim J H and Kim J J 2011 Dynamic cycles of unsold new housing stocks, investment in housing and housing supply-demand *Mathematical and Computer Modelling*: **57** (Amsterdam: Elsevier) pp 2094-105
- [7] Bouchouicha R and Ftiti Z 2012 Real estate markets and the macroeconomy: A dynamic coherence framework *Economic Modelling* **29** (Amsterdam: Elsevier) pp1820-9
- [8] Ibicioglu M and Kapsuzoglu A 2012 An empirical analysis of impact of central bank policy interest rate on the decisions of share investors: evidence from Turkey *Procedia-Social and Behavioral Sciences* **62** pp 489-93
- [9] Papadamou S and Siriopoulos C 2013 Interest rate risk and the creation of the Monetary Policy Committee: Evidence from banks' and life insurance companies' stocks in the UK *J. of Economics and Business* **71** (Amsterdam: Elsevier) pp 45-67
- [10] Rubio M and Carrasco-Gallego J A 2014 Macroprudential and monetary policies: Implications for financial stability and welfare *J.of Banking & Finance* (Amsterdam: Elsevier)

Acknowledgments

First of all, I would like to extend my sincere gratitude to the conference steering comite who has given me an opportunity to share and to contribute a paper in this seminar. Secondly, I would like to thank Mr. Hasyim Asjari, Mr. Allain Wijanarko, Ms. Safira Mutiara and Mr. Theodore who have prepared the proposal up to the collecting data of this research. Thanks to their help and contributions, this research can be well conducted.