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**XXIII CYCLE**

**COMPLEXITY IN CO-ORDINATED PUBLIC POLICY  
MAKING TO SUPPORT THE SUSTAINABLE GROWTH OF  
SMALL-MEDIUM ENTERPRISES IN INDONESIA:  
A SYSTEM DYNAMICS APPROACH**

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# **CHAPTER I**

## **PREAMBLE**

### **INTRODUCTION**

The number of research studies that focus on Small-Medium Enterprises (SMEs) have been done by many researchers, including academician, economist, and others social enthusiasts from around the world. These huge interests in SMEs may come from its immune from economics turbulence by having production flexibility (Berry, Rodriguez, Sandee, 2002) and have long been believed to be important in supporting economics development within a country (e.g. Akhtar, 1997; CDASED, 1999; Mazzarol, Volery, Doss, & Thein, 1999). Moreover, Bianchi and Bivona (2000) also saw that the importance of such firms in today's economy has been widely recognized, both concerning the number of SMEs, which constitute the backbone of our economic systems, and with regard to their contribution to Gross National Product (GNP) and employment. To support their statement, they gave an example of the SMEs' importance role in Europe and USA. For Europe, it has been demonstrated that very small firms (i.e., those having less than 100 employees) represent 99.4% of the European Union (EU) total businesses and employ 56.2% of the total workforce (Tagliacarne Institute, 1995). For the USA, the significance of small firms also emerges from U.S. statistics, where they account for about 40% of the GNP and 60% of the workforce (Lumpkin & Ireland, 1988).

SMEs in Indonesia, according to Tambunan, are very important in employment creation and are important sources of economic growth and foreign currencies (Tambunan,

2005) although, there is an ambiguous definition on SMEs in Indonesia (Sandee and Rietveld, 2000). The definition of SME in The Indonesian Government Law in UU No.20/Th. 2008 is defined as all of enterprises, which include 95% of all enterprises, involve ownership by an Indonesian and a total net asset value not exceeding Rp 10 billion and a revenue not exceeding Rp.50 billion a year. Meanwhile, Central Statistical Bureau (BPS) used term to define Small-Scale & Micro Establishment Statistics (SMES) limited only on the establishment without having legal entity, which covers all economic activities except agriculture. Specifically, for industrial activities can be classified into two categories, namely the establishment having 1-4 employees, i.e. cottage industry; and the establishment having 5-19 employees, i.e. small industry. The detail variation in the definition can be seen on the Table IV.1 p. 69 in the next chapter.

The data figure from BPS also showed the importance of SMEs in Indonesia. In year 2007, Indonesia's Gross Domestic Product (GDP) grown 6,3 percent year on year basis. In detail, in terms of business scale contribution to the GDP's growth; small and medium enterprises' (SMEs) was 6,4% and large enterprises (LEs) was 6,2%. In previous year, SMEs' contribution to GDP only 5,7% and LEs' only 5,2%. In the year of 2008 Indonesia's GDP reaches Rp. 3.957,4 trillion in which SMEs contributes Rp. 2.121,3 trillion or almost 53,3% from total GDP. This growing GDP occurred in all SMEs sectors. The highest growth occurred in the construction sector with 9,3% growth than followed by commerce, hotels and restaurant sector with 8,5% each and 7,8% of growth in the mining sector. Total SMEs (including micro enterprises) establishment in 2007 is 49,8 million business unit or 99,99% of business unit establishment in Indonesia, which employed as many as 91,8 million people or 97,3% of total employment in Indonesia. Export value from

SMEs' product in the year 2007 worth of Rp. 142,8 trillion or 20% of total export from nonoil and gas sector which worth of Rp. 713,4 trillion. In terms of fixed asset investment (FAI) value in same year, SMEs invest worth of Rp. 462,01 trillion or 46,96% from total FAI in Indonesia during the year.

However, according to Tambunan, SMEs in Indonesia have historically been the main player in domestic economic activities, especially as a large provider of employment opportunities, and hence a generator of primary or secondary sources of income for many households. Nevertheless, compared with many others, especially more developed economies, Indonesian SMEs are not yet contributing significant value added to the national economy. Instead, they have been more important as the locus of most employment (Tambunan, 2007).

Excluded micro enterprises, growth of small enterprises (SEs), medium enterprise (MEs), and large enterprise (LEs) can be seen on the Table II.1 p.10 in the next chapters. Overall, from the year of 1999, the growths of each enterprise category are impressive until 2006 and not that impressive anymore in the year of 2007 and 2008, which declined sharply.

## **OBJECTIVES**

This thesis has three objectives that will be discussed in the next three chapters. In brief, the first aim is to explore the dynamics of the available data of SMEs and LEs in order to understand its dynamic behavior; to theoretically search and simulate the underlying causal effect. The second aim is to propose policies such as; first, from operational side: providing market information in order to give more understanding on

market demand and market capacity. This strategy will in the long term lead to a better production planning. Second, from the financing side: using profit sharing principle of financing (PSP). The third aim is to explore the dynamic complexities to enable such policies based on the policy cycle model of public policy making.

## **WRITING SYSTEMATIC**

This thesis will present discussion into three chapters. The first chapter will be dedicated to give general overview of the thesis about the importance and current condition of SMEs in Indonesia; thesis' objectives and writing systematic. The next chapter will present the exploration of the current dynamic behavior of the SMEs number. Specifically, this chapter will present the unsustainable development of SMEs in terms of its quantity, which have a rapid increment and then followed by the rapid decrement on all categories of the enterprises, i.e. small, medium, and large. Such development of the SMEs number is called "overshoot and collapse" behavior in the system dynamics literatures. Theoretically, this chapter tries to search and explain the cause of the dynamics by collecting and analyzing the event along the period of the prior the shocks (before 2005/2006) and the event along the aftershock period. Causal effect relation series between variables will be explained with causal loop and stock and flows diagram. Some assumption and quantification will be taken in order to be able to mimic the reference data and then the result will be statistically tested.

In the third chapter will be discussed about two proposed policies that could support an effort to avoid the unsustainable development of SMEs. First policy is related to production coordination among SMEs in the local or national level. Successful production

coordination can be achieved by providing SMEs updated and accurate information about the market. The second proposed policy is related to the use of profit sharing principle contract between capital owner and entrepreneur. The work of two proposed policies to support the sustainable development of SMEs will be described in the form of causal effect relationship. The advantage of the proposed policies is shown by comparing the simulation result to the former chapter's simulation result.

The fourth chapter will present complexities that might emerge in the interactions of actors' behaviors in the policy development process to enable the proposed policies in the second chapter using the policy cycle model. Complexity in this chapter will be explored in the form of causality relationships among the relevant variables or actors. Motivation to explore complexity by such form is based on Sterman's argument about complexity that the most complex behaviors usually arise from the interactions (feedbacks) among the components of the system, not from the complexity of the components themselves (Sterman, 2000). The interaction among the components will be explained through the policy cycle model perspective, stage by stage since it has five (5) stages to complete the cycle (Bridgman and Davis, 2000; Edwards, 2001).

The last chapter will be allocated for the conclusions drawn from discussion of the three papers in the second, third, and fourth chapter. The conclusions will draw back your attention to the objectives of the thesis

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## CHAPTER II

# USING SYSTEM DYNAMICS APPROACH TO UNDERSTAND IMPACTS OF CASH AND IN-KIND TRANSFER POLICIES TO SMALL AND MEDIUM ENTERPRISES: A LESSON FROM INDONESIA<sup>1</sup>

### ABSTRACT

*This paper presents the latest quantity data from the Central Bureau of Statistics of Indonesia (BPS) regarding the trend number of small, medium enterprises (SMEs) and large enterprises (LEs) in Indonesia from year 1999 until 2008 that are behaved dynamically. The discussions will be focused on SMEs rather than LEs. In the early period, the number of those business units for all categories shows more or less a linear trend. Then started in 2003, it seems to have a very high spike followed by a very drastic decline until the end of 2008. The kind of behavior is so called ‘overshoot and collapse’.*

*System dynamics approach is applied to understand this behavior. By using this approach, such behavior could be well duplicated. Some relevant variables included in the simulation model are potential demand, aggregate demand, and quantity of SMEs and LEs. The behavior of SMEs’ and LEs’ quantities was regarded as the reference data. Comparison and statistical test were performed to see the representativeness of the model developed. The tests were based on a shorter period before the shock; from 1999 to 2004 and longer period to capture such behavior; from 1999 to 2008.*

*This paper also discusses most possible implemented policies, which caused overshoot and collapse behavior on the system. The implementations of cash and in kind transfer policies by government and politicians on the year 2003 to 2009, in the short term, were followed by the increasing aggregate demand and the quantity of SMEs and LEs but not for in the longer term. Based on the model simulation, the quantity of SMEs in Indonesia will be very hard to reach the same quantity as the year 1999 even though in the far forthcoming years.*

**Key words: Small Medium Enterprise, Cash and In-Kind Transfers Policies, System Dynamics**

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<sup>1</sup> The paper has been presented at The 3rd Indonesia International Conference on Innovation, Entrepreneurship, & Small Business (IICIES 2011) July 25-28, 2011 Bandung, Indonesia

## **INTRODUCTION**

Small and medium enterprises (SMEs) have very important roles in economic development. Some of these roles are as significant contributor to gross domestic production (GDP) and employment creator. According to The Central Bureau of Statistics (BPS) Indonesia's reports, as of 2006, SMEs (including micro enterprises) contributed 53.49% to GDP and employed 85.4 million people (96,2% of total employment). In the year of 2007, SMEs including micro enterprise contributed 56.23% to the GDP meanwhile large enterprises (LEs) contributed 43.77%. And for 2008, Indonesia's GDP reaches Rp. 4.696,48 trillion in which SMEs contributed 55.56%.

In the past 10 years, despite their significant role for national economic development, the total number of SMEs has a dynamics trend. From 1999 to 2003, SMEs' quantity continues to increase with a minor oscillation. However, this positive trend does not appear sustainable since it grows up rapidly from 2003 to 2006 and then followed by a drastic decline from 2007 to 2008.

This paper aims to; 1) study the dynamics trend of SMEs' and LEs' quantity, 2) reveal underlying causal effect relationships of the dynamics trend, 3) identify possible implemented policies that caused the dynamics, 4) see the impacts of the identified policies on SMEs and LEs.

The discussions on this paper will be divided into several parts. The first part reviews on the data and its trend during the observation period. The second part reveals and explains causal relationships between variables as the dynamics hypotheses. The third part explains some assumptions and considerations to set up initial conditions to run model

simulation. The next part is dedicated to test the model such as comparison test to see intuitively the differences behavior between reference data and simulated data; tests are also conducted statistically to see variations and means between the two data. The last part is contained conclusions and implications for further research.

## DATA

Observation on the available data trend in this study is based on the quantity of SMEs starting from 1999 to 2008 regardless how the categorization is made. The transformation process based on attributes from one category to another is beyond this study. The attributes to make categorization such as number of labor employed, annual sales, and assets were considered to have attached automatically at the quantity of business units when the categorization is measured and surveyed by the data provider.

Reasons for observing this period are: 1) there is a dynamic trend in term of quantity of SMEs and 2) some policies were implemented during that period. In the mentioned period, the data for SMEs and LEs show a small growth at the beginning then increase sharply in the middle and severely decrease at the end of period. The decrease made the quantity of SMEs is fewer than the beginning period. However, the decrease did not make the quantity of LEs is fewer. For detail, see Table II.1.

**Table II.1: Number of Small, Medium, and Large in Indonesia from 1999 to 2008**

<b>Year (end)</b>	<b>Small</b>	<b>Medium</b>	<b>Large</b>
<b>1999</b>	774,912*	52,214	1,885
<b>2000</b>	791,488*	54,632	1,973
<b>2001</b>	795,262*	51,227	1,807
<b>2002</b>	833,168*	58,992	2,074

Year (end)	Small	Medium	Large
2003	869,398*	59,580	2,169
2004	893,250*	66,318	4,068
2005	962,141*	95,855	6,811
2006	1,917,897	114,687	4,398
2007+	498,565	38,282	4,463
2008+	520,221	39,657	4,372

Source: BPS and the Ministry of Cooperatives and Micro, Small, and Medium Enterprises (Appendix 1)

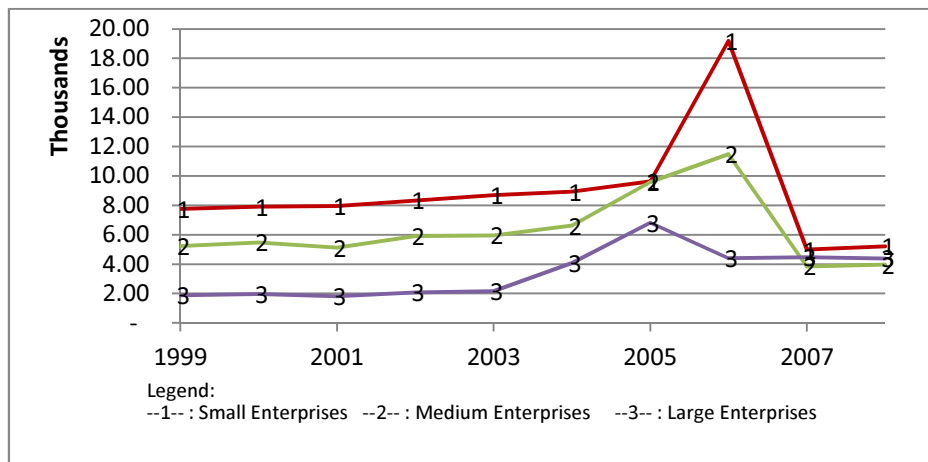
Note:

\* author's estimation based on the average growth of micro and small enterprises

+ Preliminary data

From 2005 to 2006, a significant increase can be seen on Table II.1, for small and medium enterprise category which are respectively 962,141\* units to 1,917,189 units and 95,855 units to 114,687 units. Then in 2007, they drop to 498,565 units and 38,282 units. Another case, the number of LEs has increased significantly a year before the SMEs' increment, i.e., 4,068 units in 2004 to 6,811 units in 2005. Then in 2006, it decreases to 4,398 units. That data trend shows a shock on the quantity of SMEs and LEs in Indonesia (see In Figure II.1). It is looked obvious that the shock has been started in 2003 for LEs category. Shock for the others two categories are started in mid-2003.

**Figure II.1: Overshoot and collapse pattern of SMEs and LEs quantity**



Source: BPS and the Ministry of Cooperatives and Micro, Small, and Medium Enterprises

The trend pattern in Figure II.1 is referred as overshoot and collapse behavior in the system dynamics literatures (see: Barlas, 2004; Breierova, 1997; Sterman, 2000). Such behavior is usually caused by an excessive and rapid utilization of strategic resources (aggregate demand) by the relevant parties (SMEs and LEs) in a system at the beginning period. The resources utilization is accelerated by the increasing number of new players to fulfill available space in system carrying capacity. Then along with the carrying capacity reduction, the competition to access the strategic resource is harder. This situation encourages players who are unable to compete to get out from the system.

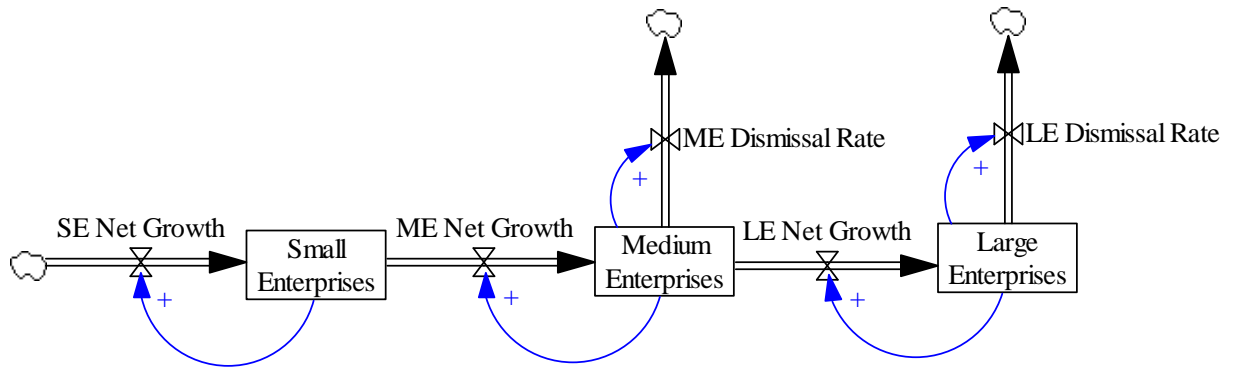
## **DYNAMIC HYPOTHESES**

Tambunan had revealed in his research that unfortunately there is no data which can show whether the transformation process or size upgrading has happened within SMEs, i.e. MIEs becoming SEs, SEs becoming MEs, and MEs being transformed into LEs. This transformation process of firms by size may show a better picture about long-term entrepreneurship development (Tambunan, 2007). Thus, the hypotheses of this study are developed based on understanding that the quantity of new SMEs and LEs are equal to a fraction of current SMEs and LEs each year.

And an assumption on transformation process has to be taken from one category to another category as follow; the 'small' business category will grow and transform to be 'medium' scale business category and then the 'medium' business category will be a stepping stone for 'small' category enterprises to be categorized as 'large' enterprises. On the other way around, failed 'large' enterprises will be scaled down only into the 'medium'

category, as well as the failed 'medium' category will be out from the 'medium' category into the 'small' category. 'Small' category enterprises will get out from the 'small' category when they are failed to the smaller category (micro). 'Micro' business unit category is not included in the model. In the real life, there is surely a possibility for an enterprise to face an extra ordinary situation or to take a managerial decision concerning infestation thus is qualified to a complete liquidation. However, this possibility is not covered in this paper due to a very rare occasion. In a simple view, the dynamic hypothesis of this paper can be seen in Figure II.2 below:

**Figure II.2: Simple dynamic hypotheses of enterprises transformation process**



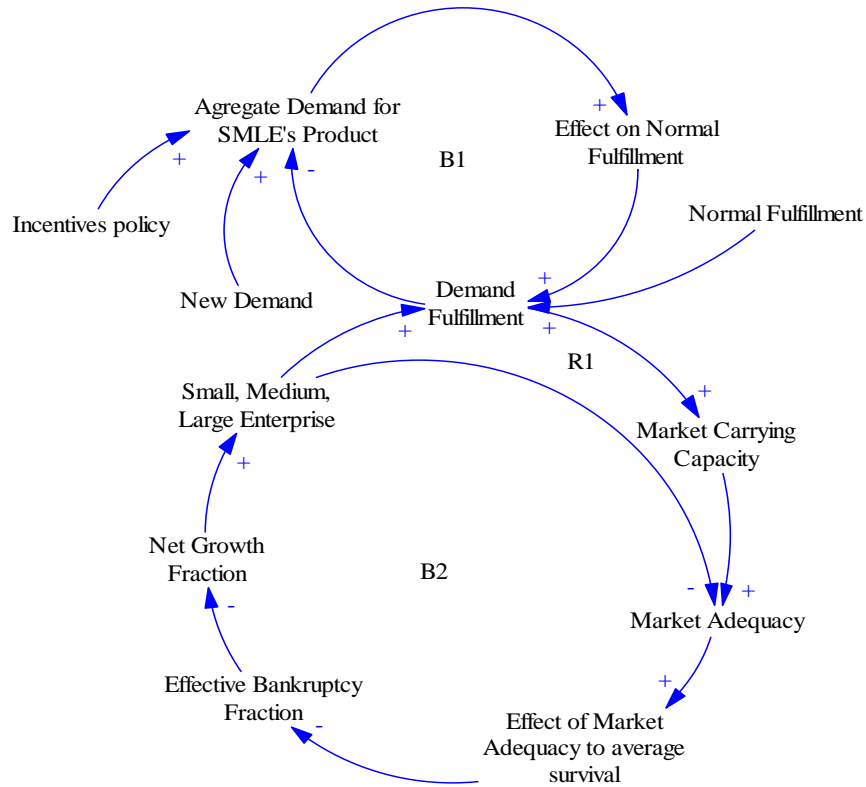
On the Figure II.2 also can be seen how the transformation growth process can happened from small category into groups of medium category and large enterprises category. Similarly, the transformation process for a failed enterprise can happened from large to medium scale companies and small. Figure II.2 is actually part of Figure II.3 below. In Figure II.3, the dynamics hypotheses are described in more detail.

Initial condition for the market capacity is assumed in equilibrium. However, the size is dynamically influenced by level of demand fulfillment and the average production

of the companies in all categories. The greater the demand fulfillment will create more room in the total market capacity. The creation of empty space in the market capacity is possible because the incumbent company is not easy to make adjustment in production, thus allowing new players to enter. The rate of demand fulfillment is influenced by the total number of firms and firms' average production per year as well as effect of the total average demand on normal demand fulfillment per year. These causal relationships will form a reinforcing loop **(R1)**.

Total market capacity is influenced by consumer demand, growing demand will make market capacity increased (Caree, 1999). Increased in demand is as a result of greater new demand than the level of fulfilled demand or sales. On the other hand, the reduced demand caused by the rate of demand fulfillment—can be said 'sales' from company point of view is greater than the rate of new demand. Increment on the total demand for products of SMEs and LEs will make 'Effect on Normal Demand Fulfillment' increase. In the end, this increment will also make the rate of demand fulfillment increase; therefore, in theory the number of demand will be reduced. These causal relationships will form a closed balancing loop **(B1)**.

**Figure II.3: Generic system causal loop diagram**



Generally, the quantity of business units who enter and exit can be estimated by a fraction of the total number of business units that are currently exist. In other words, the number of business units are influenced by the fraction, the higher the fraction, the greater the net growth. Net growth is also influenced by the size of the effective fraction of bankruptcy. The higher number of companies is in bankrupt, the smaller net growth fraction. The bankruptcy fraction is affected by the average time of a business can survive and influenced by the adequacy of the market, where the longer the average length to survive is automatically smaller fraction of the bankruptcy. The effective time for a business to survive is also influenced by the market adequacy, the greater market adequacy will make the longer the companies can survive. Market adequacy itself is defined as a

ratio of the number of companies in the market with market carrying capacity, so the growing number of companies will make the market adequacy is smaller. These causal relationships will form another balancing loop **(B2)**.

With above dynamic hypotheses the model structure is built to perform simulation. Data generated from the simulation are expected to follow the trend of data shown in Table II.1 and Figure II.2. Data generated from the simulation will then be tested statistically to see the differences in variation and the means level.

## **FORMULATION OF MODELS AND SIMULATIONS**

The main purpose of this simulation is to generate data which can replicate the behavior of reference data. Some assumptions and initial conditions are applied in simulation, as follows;

1. Companies produce normal goods with the same average cost and homogenous number of product.
2. The company is not easy to adjust the level of production, so the new entrant can easily enter the market
3. The Companies does not compete on price level and no cooperation between them.

As for the initial conditions, each business category has some exogenous variables. Such variables can be seen in Table II.2:

**Table II.2: Initial Condition**

Enterprise Category	Number+ (Unit)	Normal Survival++ (Year)	Normal Growth Ratio* (%/Year)	Crowding Out Ratio** (%/Year)
	Stock	Constant	Constant	Constant
Small	774.912	3	38	80
Medium	52.214	4	30	50
Large	1.885	4	40	15

Note: + actual data

\* based on optimistic estimate of the average growth from the year 2005-2007

+ / \*\* assumption

In this study, the crowding out ratio\*\* is introduced. This ratio is exogenous and aims to reflect the company's advantage for having access to the strategic resources such as business networks, strong stakeholders, banking trust, and other business experience to face a critical time such as economics crisis. The higher this ratio, the greater the likelihood a company will go out from the market when the competition is tightening. For some other exogenous variables can be seen in Table II.3 below:

**Table II.3: Exogenous variables**

Variable	Normal New Demand Ratio*	Demand Fulfillment Ratio*	Normal Demand+	Average Production*	Potential Demand*
Dimension	%/Year	%/Year	Goods/Year	Goods/Unit/Year	Goods/Year
Definition	Constant	Constant	Constant	Constant	Stock
Value	80	78	82.901.100	100	120.000.000

Note: \* approximations

+ product of firms' average production and total quantity of firms

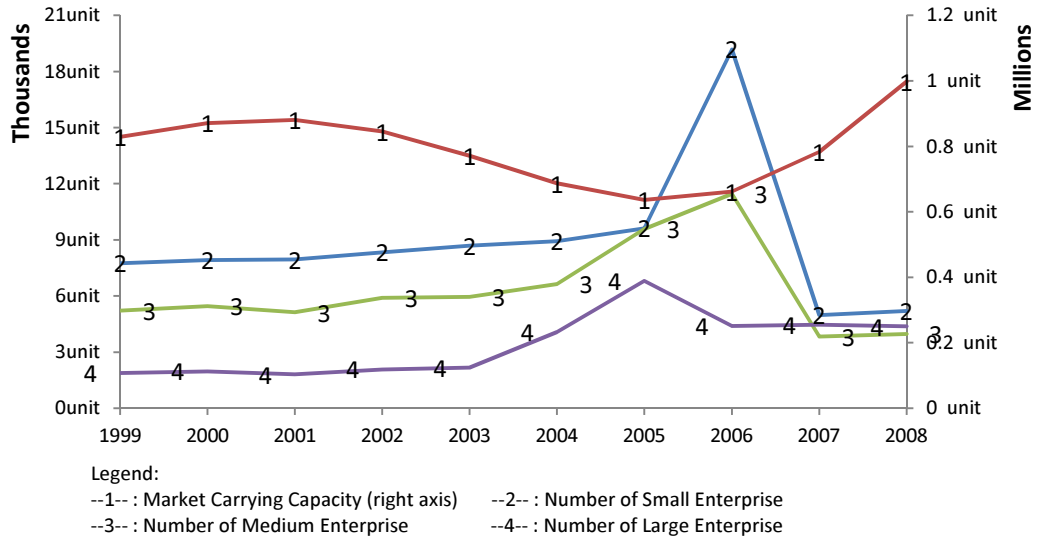
At the beginning of the simulation, market is considered in a state of equilibrium. In the equilibrium state, carrying capacity is equal to the total number of SMEs and LEs, thus the market adequacy ratio is equal to one. The market carrying capacity is defined as how many firm units that market can support and calculated from the demand fulfillment rate divided by the normal demand and the firms' average production

rate in the industry. Market capacity will change along with the changes in the ratio of demand fulfillment rate against its normal; the greater the ratio will give an indication of demand and market capacity increment to all business units. Usually, LEs respond more quickly on information about market capacity increment than SMEs.

At equilibrium state, where the demand is not changed yet, the market capacity equal to the total of SMEs and LEs therefore market adequacy ratio is one. It does not mean that the quantity of SMEs and LEs is not growing. Each period of time there will always be a net flow in a number of companies today (Van Praag, CM, Van Ophem; 1995). By using initial condition assumption in Table II.2, the survival and normal growth rate will make the effective growth percentage of small, medium, and large business scale in every year sequentially are 4.67%, 5%, and 15% . Those percentages were reasonable since there are always entrepreneurs who will go out from the market due to retirement and on the other hand there are always new entrepreneurs who want to try their luck by establishing a new business.

In general, there are several factors that have influence to the growth of firms quantity in industry, one of those factors is business cycle (Caree, 1999). During periods of a temporarily higher growth rate of new demand, entrants are attracted by profitability increase due to the inability of incumbents to expand their capacity fast enough (Hause and Du Rietz, 1984). Considering such cycle, initial condition for the normal fraction of new demand is 80% from actual demand and the normal fraction of demand fulfillment is 78% thus the net demand growth rate is 2% per year. The business cycle will make market carrying capacity and the firms' quantity moves up and down all the time as shown in Figure II.4 below.

**Figure II.4: Business Cycle's effect on Market Carrying Capacity**



On the Figure II.4, it can be seen that by using initial condition data, simulation produces behaviors that reflect business cycle on the number of companies for all three categories and market carrying capacity as well. During the simulation period, the market carrying capacity behaves dynamically and has a different effect on the SMEs' and LEs' quantity. It also indicates that the smaller the business scale category, the stronger impact from a change in market carrying capacity. Meanwhile, LEs seem to experience a little disruption during the reduction market capacity and still record growth.

**Figure II.5: Comparison reference and simulated data from 1999 to 2003**

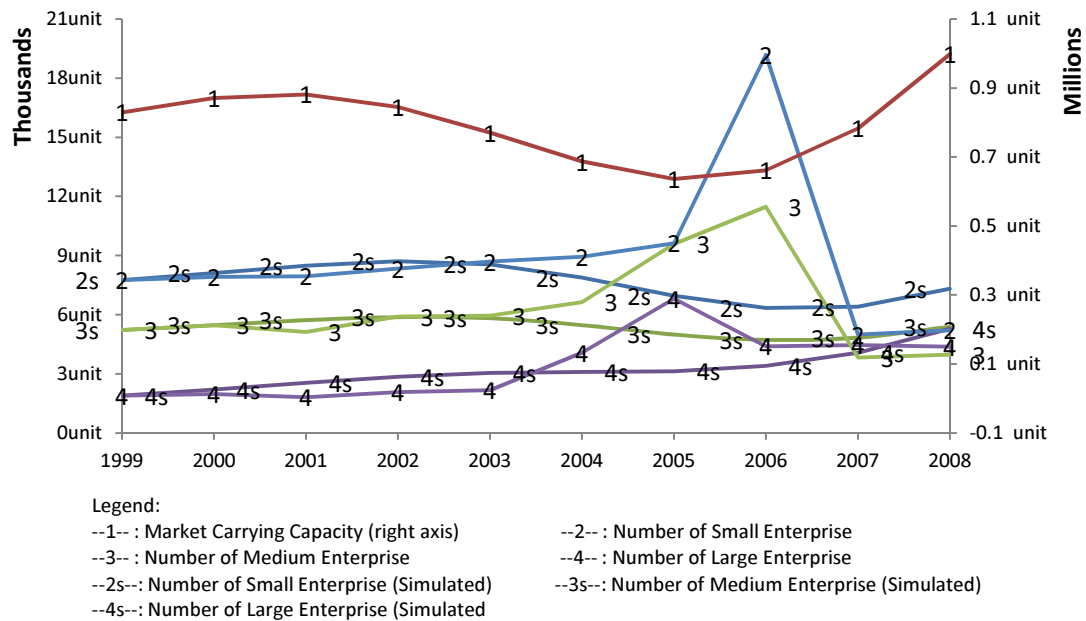


Figure II.5 constitutes a comparison between Figure II.1 and Figure II.4 that shows in the early period (from 1999 to 2003 for SMEs and from 1999 to 2004 for LEs), data generated by the simulation model is quite representative to follow the reference data behavior. Statistically, with the alpha of 5%, the difference in variation between reference data and simulated data can be said ‘not significant’. See Table II.4 below:

**Table II.4: Result of F-Stat test for observation period of 1999 to 2003 (for LEs: 2004)**

	Obs.	df	F	P(F<=f) one-tail	F Critical one-tail
<b>Small Enterprise</b>	5	4	0.968459537	0.487983841	0.156537812
<b>Medium Enterprise</b>	5	4	1.971633576	0.263511868	6.388232909
<b>Large Enterprise</b>	6	5	3.144534595	0.117140509	5.050329058

On the Table II.4 above, it appears that the probability to accept Null Hypothesis (Ho) are greater than the alpha value (0.05), so the rejection Ho unacceptable. This means that the variation between reference data and simulated are no different. For SMEs,

observation is made during the 5 years from 1999 to 2003, while for LEs, for 6 years from 1999 to 2004.

With the same observation with Table II.4 above, we also conducted statistical tests on the level of the average level of Alpha 5%, with the null hypothesis that the difference in means of the reference and simulated data are equal, where the results can be seen in Table II.5 below:

**Table II.5: Result of T-Test with Equal Variance Assumption**

	Obs.	Pooled Variance	df	t Stat	P(T<=t) one-tail	t Critical one-tail	P(T<=t) two-tail	t Critical two-tail
<b>Small Enterprise</b>	5	1477529243	8	-0.791	0.226	1.860	0.452	2.306
<b>Medium Enterprise</b>	5	11022108.56	8	-0.421	0.342	1.860	0.685	2.306
<b>Large Enterprise</b>	6	489127.6403	10	-0.677	0.257	1.812	0.514	2.228

On the Table II.5, it appears that the probability to accept Ho exceeds the alpha value (0.05) thus Ho cannot be rejected. In other words, means of reference data and simulated data are not different. With the test results shown in Table II.4 and II.5, can also be concluded that in the period prior to the shock emerged, models built with dynamic hypothesis (see Figure II.3) is quite representative.

Furthermore, based on the mentioned conclusion so far, the model will be tested further with a longer observation from 1999 to 2009. By the longer observation period, the model structures on this study accommodates overshoot and collapse behavior from the reference data. Such behavior indicates that there must be policies or events that caused such effect on the reference data.

## **CASH AND IN-KIND TRANSFER POLICIES**

In general, efforts have been done by the Indonesian government to provide positive policies to the economy, especially policies for supporting the development of SMEs including micro enterprises and LEs as well. These policies can be grouped into two categories; direct or indirect. Direct policies for SMEs are grants, credit schemes, assistances, taxes exemption, and free fees for a new establishment. Indirect policies for SMEs are the law enactment to support greater loans and to improve credit guarantee system. These kinds of policies are applied during the initial period of observation from 1999 to 2003. Nevertheless, those applied policies have no shock effect to the quantity of SMEs and LEs (see the trend on Figure II.1 from 1999 to 2003).

On the other case, because of the shock on the quantity of all business units category starts from 2003, there must be some caused to make that shock. Actually, there were some social and political policies applied starting 2003 in Indonesia.

One of those applied policies was cash transfers policy which is called 'Bantuan Langsung Tunai (BLT)' or direct cash aid program. Implementation of the policy was started by the enactment of Presidential Instruction No. 12/2005 (BN. 7277 p. 10B) about the Implementation of BLT Program for Poor Households, on September 10, 2005. Through this program that became known as "Santunan Langsung Tunai (SLT)", the government provides grants for an estimated 15.5 million poor households. The amount of funds is Rp.100.000, - per family per month and given every three months. The distribution of the first phase is realized since October 1, 2005. The government provides funds for almost Rp 4, 6 trillion in total for the program.

The cash transfer policy was continued in 2008 with the issuance of Presidential Instruction No. 3 /2008 about the Implementation of Direct Cash Aid Program for Targeted Household, on May 14, 2008. The government allocated funds of Rp 14.1 trillion on this program. This program is implemented for seven months from June to December 2008 with a target of 91.1 million households.

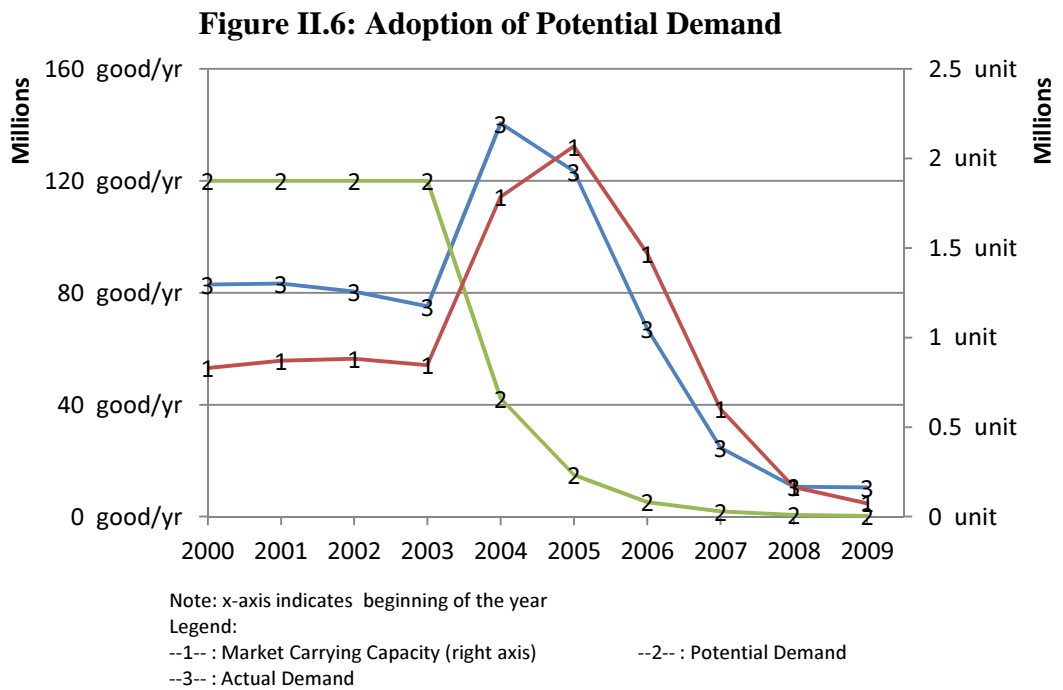
This policy is still continued in 2009 for the whole year. The program started by the enactment of Presidential Instruction No. 1 / 2009 on February 9, 2009. The presidential instruction is about the Implementation Cash Aid Program to Targeted Households for Poverty Reduction. Then, in 2010, the President did not issue similar instructions and automatically this program is stopped.

Prior to the cash transfer policies implementation, there was another transfer mechanism thru political affair which was the general election and the possibility of money politics that happened before (2003) and during this democracy process (2004). National and local government allocated some amount of their budget for the general election's logistic and political party contestant. Politicians try to provide in-kind assistance to prospective voters in order to ensure or increase the probability to be elected (Tabor, 2002). This sympathetic assistance is another form of in-kind transfer which is done not directly by government but incumbent or new politicians. Officially the 2004 general elections spent around Rp 4.45 trillion plus USD 32.367 million. Then it was followed by the implementation of the cash transfers policy from 2005 to 2008 as mentioned above.

According to Cunha, the policy cash or in-kind transfers such as the government implemented program or politician in-kind transfer as previously mentioned, will raise the

total demand for normal goods (Cunha et al, 2010). In line with his opinion, the dynamics hypotheses in Figure II.3 shown that the change in demand is influenced by those mentioned policies.

Cash and in-kind transfer can be regarded as "faucet" that open and drain the potential demand into actual demand. This study supposed that the cash and in-kind transfers occurred from 2003 to 2008 were able to create a potential demand of 120 million goods per year. Continuously, the potential demand will be adopted to be the actual demand by these two mechanisms. The adoption of the potential demand is shown in Figure II.6 below.

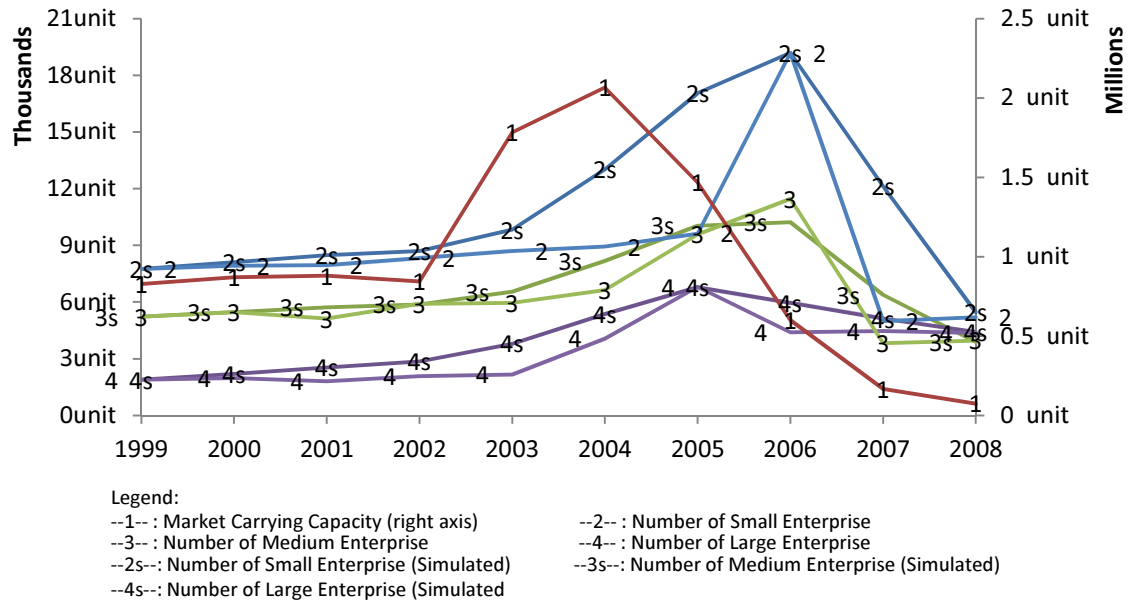


In Figure II.6, can be seen that adoption of potential demand to be the actual demand by the mechanism of cash and in-kind transfers begin from 2003. The greater the

potential demand adopted would make the actual demand higher. The greater the actual demand satisfied the greater the market carrying capacity will be.

After the simulation is done with cash and in-kind transfer policies from 2003, the results can be seen in Figure II.7 below.

**Figure II.7: Comparison between reference and simulated data from 1999 to 2008**



On above figure can be seen that market capacity has increased significantly in 2003 and then followed by drastic decline until 2008. However, the trend of simulated SMEs and LEs numbers, intuitively, can follow the reference data. Statistically, with the level of alpha is 5%, the difference in the variation of the reference and simulation data shows no significant difference. The test's results of the F-test can be seen in Table II.6:

**Table II.6: F-Test for observation from 1999 to 2008**

	Obs.	df	F	P(F<=f) one-tail	F Critical one-tail
<b>Small Enterprise</b>	10	9	0.8099	0.3793	0.3146
<b>Medium Enterprise</b>	10	9	1.3461	0.3325	3.1789
<b>Large Enterprise</b>	10	9	0.9714	0.4831	0.3146

In Table II.6, the probability to reject  $H_0$  fall on acceptance region for small, medium, and large enterprise respectively 37,93%, 33, 25% and 48.31%. With these test results, conclusion can be established that the variations between reference data and simulated data are not different statistically.

Based on the F test results in Table II.6, then homoscedastic T test is conducted to see the difference in means. The null hypothesis is the average of the two data is not different. The test results can be seen in Table II.7 below.

**Table II.7: Homoscedastic T-test for observation 1999 to 2008**

	Obs.	Pooled Variance	df	t Stat	P(T<=t) one-tail	t Critical one-tail	P(T<=t) two-tail	t Critical two-tail
Small Enterprise	10	1.722E+11	18	-1.1411	0.1344	1.7341	0.2688	2.1009
Medium Enterprise	10	5.103E+08	18	-0.4350	0.3344	1.7341	0.6687	2.1009
Large Enterprise	10	2.852E+06	18	-0.9149	0.1862	1.7341	0.3723	2.1009

In Table II.7, the probability of the test statistic is not fall into rejection area of the null hypothesis ( $H_0$ ). Respectively for small, medium and large respectively are 26.88%, 66.87% and 37.23%. Therefore, it can be concluded that on the means level there is no difference between reference data and data simulation.

### **TREND PROJECTION OF SMES**

Based on empirical data trend, the impact cash and in-kind transfer on SMEs is that in the short term are able to attract new entrepreneurs to establish new businesses,



## **CONCLUSIONS AND IMPLICATIONS FOR FURTHER RESEARCH**

Several years from 1999 to 2008, the numbers of businesses in the category of small and medium enterprises were growing with a dynamics trend. From 1999 to 2003, the numbers were growing with a linier trend and a minor oscillation following the pattern of business cycle. In this period the government implemented some social, economics, and political policies, but did not make any shock effect on the number of small, medium, and large. Nevertheless in period of 2003 to 2008, the data of business unit number for small, medium, and large category indicate a shock effect.

In general, hypotheses of this paper are built based on backwards thinking which are that the number of business depends on the market carrying capacity and market carrying capacity is influenced by the number of demand. Thus the shock on the data is caused by the significant increase then sharp decline on the demand.

Entrepreneurs' decision to establish a new business or to enter the market is based on their observation and perception on demand level through industry selling rate data (demand fulfillment rate) in a period of time. The higher selling rate will be perceived as increasing demand in the market. This perception will lead to new business establishment or attract new entrant in to the market. The decision to enter will affect the equilibrium of market carrying capacity. Increasing demand in the mid period of observation is caused by adoption process of potential demand into actual demand. Adoption process is occurred due to the cash and in-kind transfer policies either for social or political purposes.

Cash and in-kind transfer policies implementation in Indonesia have indeed an impact indirectly on the number of SMEs and even LEs. In general, the pessimistic and

moderate projections imply that the implementation cash and in-kind transfer policies have a negative impact for SMEs in the long term, which is the lowering effect is much greater than the increasing effect. As for LEs, the policies have different effects which is in the short term also able to increase the number, meanwhile in the longer time is declining, although the total number is not lower than the number on the initial observation.

Precaution should be put on the pessimistic and moderate projections where the negative effect of the policies can be exposed. The model simulation on this paper urged that without immediate proper policy to tackle the damaging effect of those policies on SMEs, the quantity of SMEs will very hard to reach the same point as 1999, even though in the far forthcoming year, beyond 2014.

However, this study still used some variables which are assumed exogenous, such as the crowding out ratio and some other variables. For further research, it would be more interesting if the exogenous variables are drawn to be endogenous variables. In addition, further research should include a model policy that could prevent the damaging effect of cash or in-kind transfer policies to SMEs.

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## CHAPTER III

# USING SYSTEM DYNAMICS APPROACH TO SUPPORT SUSTAINABLE GROWTH NUMBER OF SMALL AND MEDIUM ENTERPRISES IN INDONESIA: SOME POLICIES CONSIDERATION<sup>2</sup>

### ABSTRACT

*The current data from the Central Bureau of Statistics of Indonesia (BPS) regarding the number of small, medium enterprises (SMEs) and large enterprises (LEs) in Indonesia from year 1999 until 2008 indeed demonstrated a dynamic behavior. Thus, the paper has objectives to discuss and propose policies such as; first, from operational side: providing market information in order to give more access for market demand, market capacity. This strategy will in the long term lead to a better production planning. Second, from the financing side: using profit-sharing principle of financing (PSP) to cope with such dynamics behavior in order to support a sustainable quantity growth of SMEs.*

*System dynamics approach is applied to understand this behavior. Some relevant variables included in the simulation model are potential demand, aggregate demand, and quantity of SMEs and LEs. Modular system of simple production coordination and a guarantee mechanism based on a PSP were attached to the generic system that has generated overshoot and collapse behavior, in order to minimize or even avoids the rapid decreasing number of SMEs in stock.*

*Simulation conducted in this paper has implemented two policy levers, which are first; a production coordination system through information sharing and second; financing mechanism with PSP contract for Small Enterprises (SEs). Based on the simulation done for this paper, such policy levers could support the development of SMEs in term of its quantity in order to keep it grow instead of “collapse.” The paper also shows the added value creation of PSP principle in economy and minimization of the agency risk with double layers referencing method.*

*This paper re-emphasizes first; the use of production coordination to support positive growth number of SMEs especially to prevent collapse after experiencing overshoot growth, and second; proposes a financing mechanism for SMEs based on PSP principle to prevent SMEs from the operational failure. This paper also proposes the use of double layer referencing system to minimize agency risk in the area of PSP contract agreement.*

**Key words: Small Medium Enterprise, Production Coordination, Profit Sharing, System Dynamics**

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<sup>2</sup> The first version of the paper has been presented at II Conference of WCSA-World Complexity Science Academy, September 26<sup>th</sup> – 27<sup>th</sup>, 2011, Palermo, Italy

## **INTRODUCTION**

Small and medium enterprises (SMEs) have very important roles in economic development. Some of these roles are as the significant contributor to the gross domestic production (GDP) and employment creator. According to The Central Bureau of Statistics (BPS), Indonesia's reports, as of 2007, SMEs (including micro enterprises) contributed 53.49% to GDP and employed 85.4 million people (96.2% of total employment). In the year of 2008, SMEs including micro enterprise contributed 56.23% to the GDP meanwhile large enterprises (LES) contributed 43.77%. And for 2009, Indonesia's GDP reaches 4,696.48 trillion rupiah (Rp) in which SMEs contributed 55.56%. However, the quantity of net growth percentage of SMEs' number in Indonesia only reached an average of 5.76% per annum for the category of small businesses and 3% for medium-sized enterprises from 1999 to 2008.

The successful development of SMEs in Indonesia is still based on the net growth rate of SMEs number per annum, although some researchers urge to change the old paradigm into the new one. In conclusion, of his writings, Tambunan (2008) suggested to change the old paradigm which is the successful SMEs development strategy is marked by the annual increase in the number of units, and SMEs are important because they create employment into a new paradigm; the successful SMEs development strategy is marked by the annual increase in the number of innovated and productive enterprises, and SMEs are important because they generate high added value, export, and they support domestic industry's competitiveness. However, the offered new paradigm does not yet provide a clear-cut measurement to determine innovativeness, productiveness, high value added, and competitiveness thus can be said normative.

Therefore, the paper examines the development trend of SMEs' number pursuant to policies that directly or indirectly have an influence on such development. According to Subroto, in the research he has done, mentioning that the development of SMEs in Indonesia is even influenced by policies that are not addressed to SMEs directly. This conclusion he took after the identification of policy and empirical observation of data trends the number of SMEs in Indonesia from 1999 to 2003 and 2003 to 2008. In the period of 1999 to 2003, some policies were intended for SMEs directly but seemed unable to raise a significant amount of net growth, which on average only grows about 3,29% per year. Whereas in the period 2003 to 2008 mentioned there are several policies related to social policies that have been applied by governments and politicians are even able to increase the number of SMEs, although in the long run to clue the impact of a drastic reduction. The data shows that in 2008, the number of SMEs less than the amount in 1999 (Subroto, 2011).

This paper further aims to provide an overview that can be drawn from current data on SMEs in Indonesia and then to identify variables in the policy system's boundary which have a direct or indirect connection with the development of SMEs. The process of the identification system and the variable is done by using a causal effect relationship in a form of stock and flow diagrams (SFD). Further simulation with several initial assumptions in order to generate data whose behavior can mimic its historical or reference data. Finally, to simulate and discuss some policy recommendations that could be taken as a system intervention so that the system structure could generate the desired behavior of the data.

This paper will be presented in several sections. The discussion will be emphasized to the application of the methodology rather than to discuss the methodology

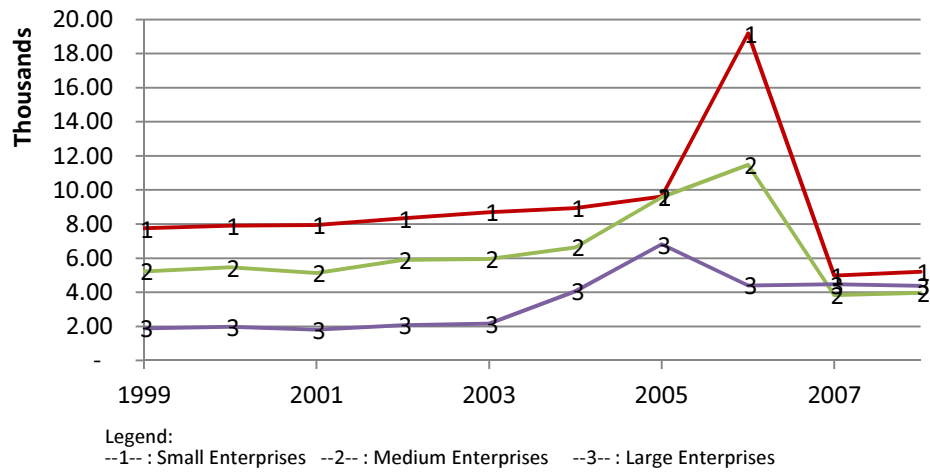
of system dynamics *per se*. In the first part will discuss the data and previous research that are well aligned with this study. The results of previous studies will also be revealed to provide a preliminary description that motivates this research to find alternative sustainable policy solutions.

Next section will briefly discuss the scope and limits of markets reached by SMEs because of its association with the effectiveness of policies implemented. In the following section will discuss the structure of stock and flow diagrams (SFD) by which can produce simulated data that is intended to mimic the behavior of the reference data. Some of the policy will be plugged on the generic model in an attempt to intervene on the structure to control the behavior of the generated data by a structure as what is the modeler desired, which is developing SMEs in a sustainable way.

## **DATA AND PREVIOUS RESEARCHES**

In the recent data published by BPS can be seen on its trend on the number of SMEs in Indonesia from 1999 to 2008 has a dynamic pattern with a sharp rise then followed by a sharp decline right after that. There is a net growth trend in the number of SMEs from 1999 to 2003, although the magnitude is less satisfactory with an average net growth of 3.29%. However, further data on how much this growth rate increase is not known precisely neither the decline. Whereas in the period of 2003 to 2008 seems the trend is very volatile, where the number of SMEs experienced a large increase (42.81%) followed by a drastic decline (70.31%). The development of these trends can be seen in the following Figure III.1:

**Figure III.1: Historical data behavior**



Source: Subroto (2011)

Nevertheless, government institutions have done some activities in favor of SMEs that were applied during the year of 1997 until 2003. Those policies are as much as 531 activities such as; capital assistance (5.3%), training (21.1%), facilitation (11.3%), information (1.9%), facilities (16.2%), promotion (3.0%), dissemination/introduction of new technology (27.9%), guideline (4%) and others (9%) (SMERU, 2004). The historical data behavior on the Figure III.1 implies that those activities have less impact to develop SMEs sustainable. In other words, there must be something else in the system i.e. endogenous variables are omitted or treated as exogenous variables.

Associated with behavioral of the mentioned historical data, Subroto revealed that along the period of the dynamic behavior of the data, the government has implemented several policies related to social policy and economic stimuli such as Unconditional Cash Transfer (UCT) or in Indonesian terms is called “Bantuan Langsung Tunai” (BLT). In conclusion, of his research, he urged that the UCT in the short term will be able to increase the demand for normal goods and will then trigger an increase in the number of SME.

However, in the long run the policy would have a deadly impact for the SME itself (Subroto, 2011).

### **BOUNDARY POLICY: DOMESTIC MARKET AND SMES PROBLEM**

Then a further question is whether it really was national policies or there are also significant external factors from abroad affecting the development of SMEs. To answer that question then we can see the comparison between the results of SMEs that exported and sold domestically.

Market targeted by the SMEs sector seems a national market. This insight is coming from the comparison data development between the value of domestic products and export value of SMEs. It appears that the products produced by SMEs only a small portion is exported. From 2004 to 2008, SMEs exported an average of only 7.12% of its GDP. Herewith, it can be said that the market of SMEs is the domestic market that is around 92.88%. More detail on export of SMEs product can be seen in Table III.1 below:

**Table III.1. Exported SMEs product**

	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
<b>GDP (billion rupiah)</b>	1,271,990.10	1,491,061.90	1,786,218.30	2,105,135.10	2,609,360.10
<b>EXPORT (million rupiah)</b>	95,548.24	110,338.07	122,310.86	143,012.33	183,759.08
<b>Export percentage</b>	7.51%	7.40%	6.85%	6.79%	7.04%

Source: BPS

With those facts, the policies that directly or indirectly aimed for the public to cope with social and economic problem that have a national coverage greatly will influence the development of businesses in terms of its number, for the category of micro, small and medium. While, on the other hand, the problems often faced by SMEs to date is difficult to know, but in general can be used the survey conducted by BPS in 2003 as the proxy.

Problems are faced by SMEs in Indonesia according to BPS' survey in manufacturing industry can be seen on the Table III.2 below:

**Table III.2. Main Problem of SMEs in the Manufacturing Industry**

	Small Enterprise (%)	Micro Enterprise (%)
<b>Have no problem</b>	<b>19.48</b>	<b>25.21</b>
<b>Have problems of:</b>	<b>80.52</b>	<b>74.79</b>
1.Raw Material	10.60	21.53
2. Marketing	40.18	29.65
3. Capital	39.96	34.56
4.Tansportation/Distribution	2.62	2.68
5. Energy	2.4	2.73
6. Labor cost	1.22	0.77
7. Others	6.04	8.09
<b>Total (Unit)</b>	238.582	2.490.118

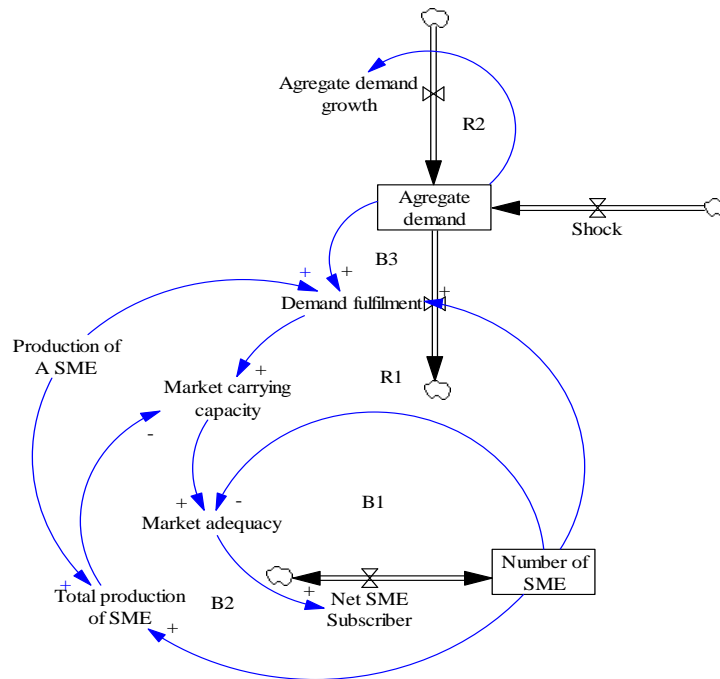
Source: BPS 2003 cited from Tambunan (2008a)

Although it is well known to the literature that the lack of adequate skills is also a major constraint to SMEs, especially SEs and MIEs, in Indonesia, they did not consider it as a serious problem. However, this may be since many owners of SEs and MIEs were not aware that their productivity is low and the quality of their products inferior compared to the products of the LEs or imported products, especially since many of these enterprises produce only for low-income consumers in local markets that enjoy natural protection from competition from similar goods produced by larger enterprises or from import (Tambunan, 2008a). Still on the Table III.2 above, it appears that capital is the major constraint for SMEs, almost 40% for small firms and 34.56% for micro enterprises. Then the other main problem is marketing. This problem may arise because the products of the SMEs did not meet the quality standards of the market expected, as has been disclosed by Tambunan in his research.

## GENERIC SYSTEM: OVERSHOOT AND COLLAPSE

In the system dynamic literatures, the behavior patterns of the historical data of the number of SMEs in Indonesia are shown in Figure III.1 p.36 is said to follow the generic behavior namely overshoot and collapse (Barlas, 2004; Breierova, 1997; Sterman, 2000). Such pattern of behavior can occur because the system received a "shock," in this case the shock is occurred in the aggregate 'SMEs produced goods demand'—goods produced by SMEs in this paper are assumed as normal goods. Such behavior can be generated by simulating the structure of the system depicted in the stock and flow diagram in Figure III.2 below:

**Figure III.2. Stock and Flow Diagram (SFD) Overshoot and Collapse Structure**



Source: cited from Subroto, 2011.

Figure III.2 above shows that aggregate demand is influenced by the growth fraction of aggregate demand growth every year (R2). Aggregate demand itself will be

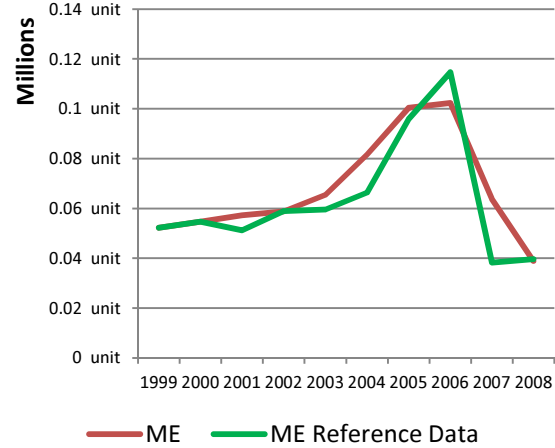
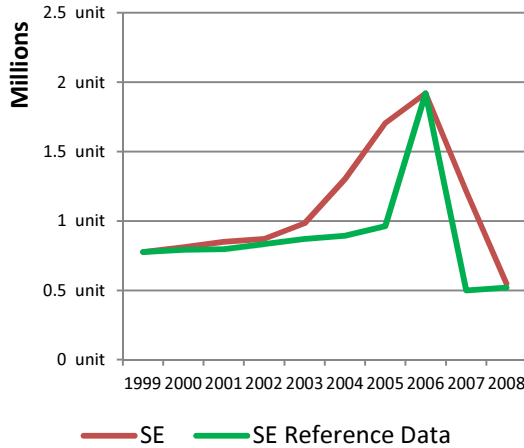
reduced when the market has been fulfilled by the growth of demand fulfillment rate. The magnitude of demand fulfillment rate is influenced by several variables such as total SMEs production of goods, total number of SMEs, and the actual aggregate demand itself. The more all the three variables increase will make the demand fulfillment is higher and the more demand fulfillment, the lesser aggregate demand (B3).

In another case, the number of SMEs is influenced by the amount of new businesses are subscribed, where its magnitude is influenced by market adequacy. The higher level of market adequacy will stimulate people to establish a new venture, but with the increasing number of new venture will further reduce market adequacy (B1). On the other hand, the numbers of existing SMEs and their production have a positive influence on the level demand fulfillment, where the higher number of SMEs and their production will create a higher level demand fulfillment. The generated data behavior from the generic model simulation included “shock” variable could more or less replicate the historical data. The small and medium generated data behavior can be seen in Figure III.3a and III.3b.

**Figure III.3a: Small Enterprise Behavior**

**Figure III.3b: Medium Enterprises**

**Behavior**



Source: Cited from Subroto, 2011

As it can be seen also on above two figures that those behaviors could not be said sustainable<sup>3</sup> as the amount of SMEs were not growing durably over the time. In the next section will be introduced some approaches or policies by which are intended to cope with the current non-sustainable trend of SMEs.

**POLICY LEVER OPTIONS**

To develop sustainable SMEs it would require efforts to synergize policies on the micro and macro aspect. Such synergy of the policy is pursued in order to make SMEs more efficient in implementing-supply chain management. In that regard, the policy makers must consider the grouping of SMEs based on its common business operations in an area, access to efficient and inexpensive raw materials as well as the information provision on the market demand. This section will discuss deeper about two options of

<sup>3</sup> According to oxford dictionary, sustainable (adjective) is able to be maintained at a certain rate or level

policy, first; policy on production coordination as a macro approach. It is already widely known that the stock management is a very important activity in business. In national level, when entrepreneurs are able to manage their stock efficiently, in the long run, it will make the industry more efficient and companies more resilient to cope with crisis situations. Of course, stock management will be more efficient when in a group which has a commonality. Another advantage could be gained by the entrepreneur while adopting the stock management, especially in Indonesia is obtain additional capital for production and business development since the Indonesian government has enacted a ministerial decree on the *warehouse receipt* to support such effort (Kep. Men No: 13.1/Per/M.KUKM/VII/2006).

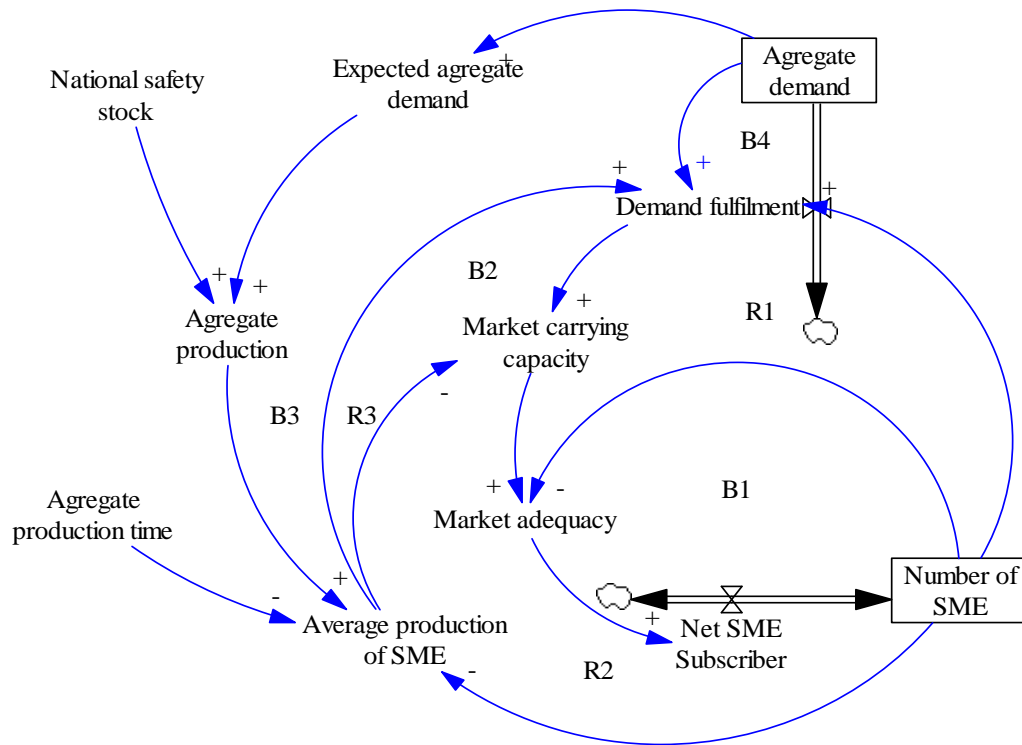
The second policy lever is about the use of profit sharing principle (PSP) financing for small enterprises (SEs) as a more micro approach. This second policy will discuss about the value creation process in PSP financing in the economy could give positive value added that able to outperform expected future value of capital invested based on the risk-free rate discount. The discussion also addresses the use of double layers referencing system as an effort to minimize agency risk.

## **MACRO APPROACH: PRODUCTION COORDINATION**

This macro approach means the provision of soft-infrastructure by coordinating the efforts of production within a national scope. The selection of this approach generally follows the idea of Mezgar, Mezgar and Kovacs about SMEs network co-ordination in production. According to them, this co-ordination is very promising, because it offers the advantages of the holonic manufacturing paradigm giving the possibility, in parallel, of keeping the traditional individualism of SMEs (Mezgar and Kovacs (1998); Mezgar et al

(2000)). The approach proposed involves the role of market demand information, production planning, and production contracts. Within this paper, such the idea is adopted by a general angle point of view which appears in Figure III.4 below.

**Figure III.4: Stock and Flow Diagram of Production Co-Ordination**



Significant step in coordinating the production needs to be taken without violating the principle of free competition, such as; first, by providing credible information about the current of market demand and the conditional optimal safety stock for entrepreneurs. The logics of this step are as follows: where if a business has never had expectations of sales than of course it is difficult to set safety stock and lead to fail to perform production planning. In the absence of production planning, then the amount of goods produced may not meet the market demand which means loss of sales opportunities or leads to excess storage costs. In the fast-changing business environment such as the market demand

condition, any fail to have good information on the market demand to create the expectation will lead to the greater loss.

The second step is to strengthen institutions that have been available, which can be utilized by small and medium companies to coordinate production independently and in groups, i.e., cooperative or business group. Market conditions, i.e. demand; are always changing and of course, it has negative impacts, but these negative impacts can be minimized if the business activities carried out in groups, i.e. clusters, the formation of a larger effort of a combination of small businesses in the form of equity partnership or joint production, i.e. plasma system.

In Figure III.4 above, in general point of view, series of causal effect relationship of the relevant variables in a production coordination system has been included. The system begins with the provision of information about aggregate demand; availability of the information will form expectations of aggregate demand. The greater the expectations will make the greater aggregate production. Similarly, the effect of safety stock management also makes the aggregate production increase. With the increment in aggregate production then automatically the average production will also rise. The rise of the average production level effects on the level of demand fulfillment rate so that aggregate demand will also be reduced (B3), then at the same time the higher level of average production will lead to the market carrying capacity reduction (R3).

## **MICRO APPROACH: PROFIT SHARING PRINCIPLES (PSP) FINANCING SYSTEM**

Another policy option proposed in this thesis is to use an approach which has more micro point of views through a financing system that does not emphasize merely on the business collateral, but gives more emphasis on the business activity and process. The financing concept with strong emphasis on business activities is offered by financing system based on the principle of *mudharabah* or profit sharing principle (here and after will be written as PSP). This choice is based on the opinion of Iqbal and Mirakhor, they stated that the concept of the PSP especially for small and medium size enterprises can play a critical role and become the backbone of the financial landscape of a developing economy (Iqbal and Mirakhor, 2007). In this regard, Institute of Islamic Banking and Insurance (IIBI) has the same tone in supporting the use of PSP to support SMEs as it says that the small and medium enterprises (SME) sector has a great potential for expanding production capacity and self-employment opportunities in developing countries. Islamic banks may introduce SME-financing funds for various places. Enhancing the role of the financial sector in the development of the SME sub-sector can mitigate the serious problems of unemployment and the low level of exports of such countries (IIBI, 2011).

In addition for another encouraging consideration for the capital owner to follow the use of the PSP system for SEs is the opportunity to reach new available market in financing area. According to the data from the BPS, small and medium enterprises, which are fully funded by another entity on average from 1998 to 2010 are 4.10% only, this can be seen as a great opportunity to support the larger SMEs to adopt the PSP financing system in Indonesia.

Conceptually, this approach is preferred because of having more emphasis on business activity not merely on collateral to minimize risk as the conventional system. So far, experts in SMEs area have agreed on the main obstacle for SMEs to grow is the limitation to access the financial resource (i.e. Tambunan, 2008a), especially in Indonesia, as it can be seen on the Table III.2 in the previous section. However, if this system is widely adopted, most of the problems faced by SMEs in the early stage of creating a new venture can be addressed. Another problem often faced by small and medium enterprises is the risks of failure that are enormous. It is also stated by Timmons that the failure rate of small and medium enterprises is over 20% of new ventures to fail within one year while 66% fail within six years (Timmons, 1994). Thus efforts to minimize the high failure rate require a different approach than usual, where the approach must be beneficial to both parties, give more emphasis on the assessment of its business activities and are able to eliminate the risk of loss that will be experienced by entrepreneurs, so entrepreneurs are more focused in the running business without a mental burden to pay back the interest.

Despite some positive reasons for the use of the PSP approach above, the application of this approach is not without challenges. Some pessimistic views are expressed by Visser and Choudury in their opinion. Visser said that SMEs are not served well by Islamic banks because of bookkeeping of SMEs in countries where Islamic banks operate is very elementary, often which works against the use of *musharaka* or profit loss sharing (here and after will be written as PLS) and PSP finance. Moreover, often small-scale entrepreneurs are not too keen on the close monitoring implied by PLS partnerships anyway, and PLS finance again does not fill the need for fluctuating funds. (Visser, 2009).

Pessimistic tones also come from Choudhury, he suggests that PSP and PLS have inherent problems (especially when combined in joint venture financing instruments) because they do not attain the ideal of co-operative participation. They lack precision in capitalizing the value of time or wages that workers and other participants contribute in any joint venture with the capital providers. He argues that the profit sharing ratios remain poorly determined, and sets out a more exact representation of the intent of Islamic law in an Islamic joint venture enterprise (Choudhury, 2001).

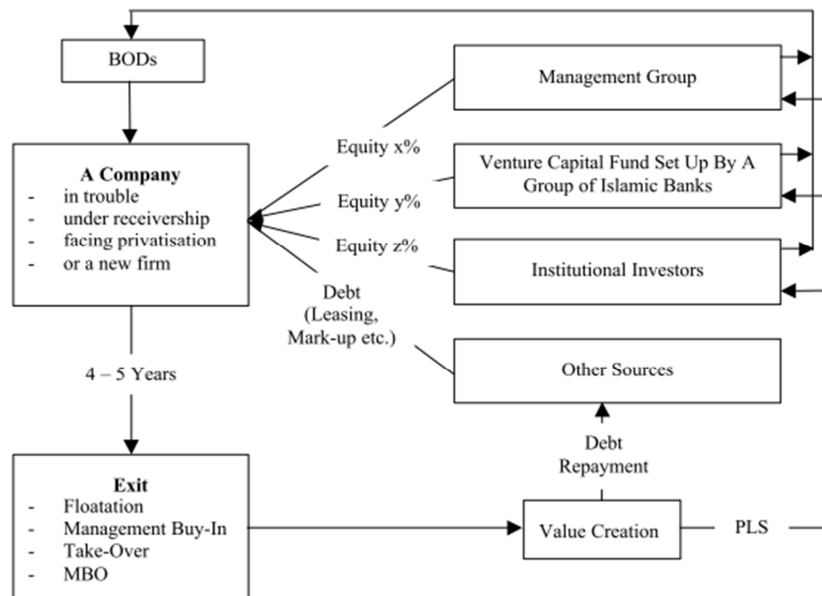
Dar and Presley have made a list related to the PSP's weakness such as vulnerable to agency problems, the requirement of well-defined property rights to function efficiently, product competitiveness, allows a sleeping partnership, less feasible for funding short-term projects, unfair treatment in taxation, and the non-existent of secondary markets thus failed to effectively mobilize financial resources (Dar and Presley, 2000).

It is often emphasized that agency problems are more severe in Islamic banks than conventional banks and non-bank financial institutions (NBFIs). Actually, the problems of identifying the good borrower (information asymmetry) and effectively monitoring (moral hazard) are not limited to Islamic finance, i.e. PSP and PLS: they are challenges in almost all financial contracts, particularly in entrepreneurial finance. Given the sensitivity of profit and loss sharing contracts to moral hazard and information asymmetry, Islamic finance, particularly profit and loss sharing contracts [PSP and PLS] contracts, have thus far failed to reach Micro and SMEs in a significant way (Gabal, Nirvana Abou, Asim Ijaz Khwaja, Bailey Klinger (2001).

Modern finance literature provides some solutions. These include monitoring and bonding arrangements (Jensen and Meckling, 1976), separation of management (initiation and implementation of decisions) and control (ratification and monitoring of decisions) (Fama and Jensen, 1983), and staging of capital provision (Sahlman, 1990). Nonetheless, these processes have some consequences, which limit the opportunity for an agent to mismanage or abuse the project, while at the same time increasing expenses and reduces profit.

There are others suggested remedy to cope with the agency problem in PSP contract agreement. Dar and Presley proposed the used of an organizational structure based on venture capital namely venture capital organization (VCO), in which a group of Islamic banks establishes a venture capital fund to invest in troubled companies or acquire public corporations facing privatization. The operationalization of the VCO can be seen on the Figure III.5 below:

**Figure III.5: Venture Capital Organization Establishment**



Source: Dar and Presley, 2000

They urged the VCO's advantages such as provides a balance of power between management and other owners, better value creation, alignment of interests between manager and shareholders thus mitigating the agency problem. Information sharing will be less costly thus quickening the pace of decision-making, and positive monitoring by the institutional investor thus reducing agency costs (Dar and Presley, 2000).

In order to tackle the problem of identifying good borrower (information asymmetry) and effectively monitoring (moral hazard), Gabal, Nirvana Abou, Asim Ijaz Khwaja, Bailey Klinger (2001) proposed the use of psychometric tests to directly measure a potential borrower's entrepreneurial ability to identify good business and honesty to help minimize the moral hazard problem since such entrepreneurs are intrinsically less inclined to cheat/hide profits and hence are more likely to repay loans and require less monitoring. They have tested the use of the their proposed test with the results are 21-40% reduction in default and a 15 to 50% increase in net profits on simulated implementations of the tool across pilot partners.

The solutions that have been discussed above in many ways have shown efforts to minimize the risk of the agency problem that caused by asymmetric information that are in practice still facing practical difficulty. Practically, VCO will almost be sure need a longer time to implement since it requires some actors with difference morality, background, and perceptions thus need very strong regulations. Nonetheless, relationship among them will raise yet another complexity. Meanwhile, the used of psychometric test to measure ability and honesty can be said a plausible innovation of selection tools. However, tools like the other tools are just like a gun behind the man. Relationship among the man with the

culture, background, and perception will be able to ‘use’ or ‘cheat’ the tools. The 3D picture cannot be revealed by once a camera’s shoot.

Those concerns above could be an obstacle in the effort to implement PSP in the real situation. Nevertheless, putting more emphasis on business activities is indeed something that is not easy, because it requires a high understanding and trust among the parties in a business agreement which is the funds owner (*rabbul mal*) and entrepreneur (*mudarib*). Reputation and personality of entrepreneurs are very significant for the *funds owner* to determine to whom they can invest their money. So, the question is about who knows and how to know the person’s reputation and personality?, one cannot be so sure the others’ reputation and personality in neither only by one shot of a test nor in a short period of observation, but it need a multiple shots and longer observation period. However, it is widely agreed that person’s reputation and good personality can be built. The former is through some experiences of skillful work, and the latter is through behavior in the community along the time. One thing that can be assured is a good and bad thing in the community is always become either a favorable or unfavorable word of mouth (WOM). Such information could be fundamentally important to determine person’s reputation and personality rating.

In the effort to cope with the concern of minimizing the agency problems in the PSP contract, this paper introduces a *double layer referencing system* as can be seen on the Figure III.6. The important and fundamental role in the system is that the existence of independent communal institutions to record and to provide information on individual or group entrepreneur’s reputation and personality. The reputation and personality rating is not solely based on records of tangible capability such as feasibility of business plans but

also notes on aspects that are more personal and intangible, such as specific or high quality skills, positive attitude references, etc. The qualifications of this individual or group should be conducted by independent professional appraiser organizations by involving variety sources of referrer, i.e. reference from persons have been appraised as having positive reputation and personality; this is the first layer of the referencing. Such agency should have a database of individuals or groups, which have a positive reputation and continuously maintained and updated. With such database, the *funds owner* could take an advantage to choose prospective *entrepreneur* and then arrange business agreements with those who are able to submit a viable business proposal.

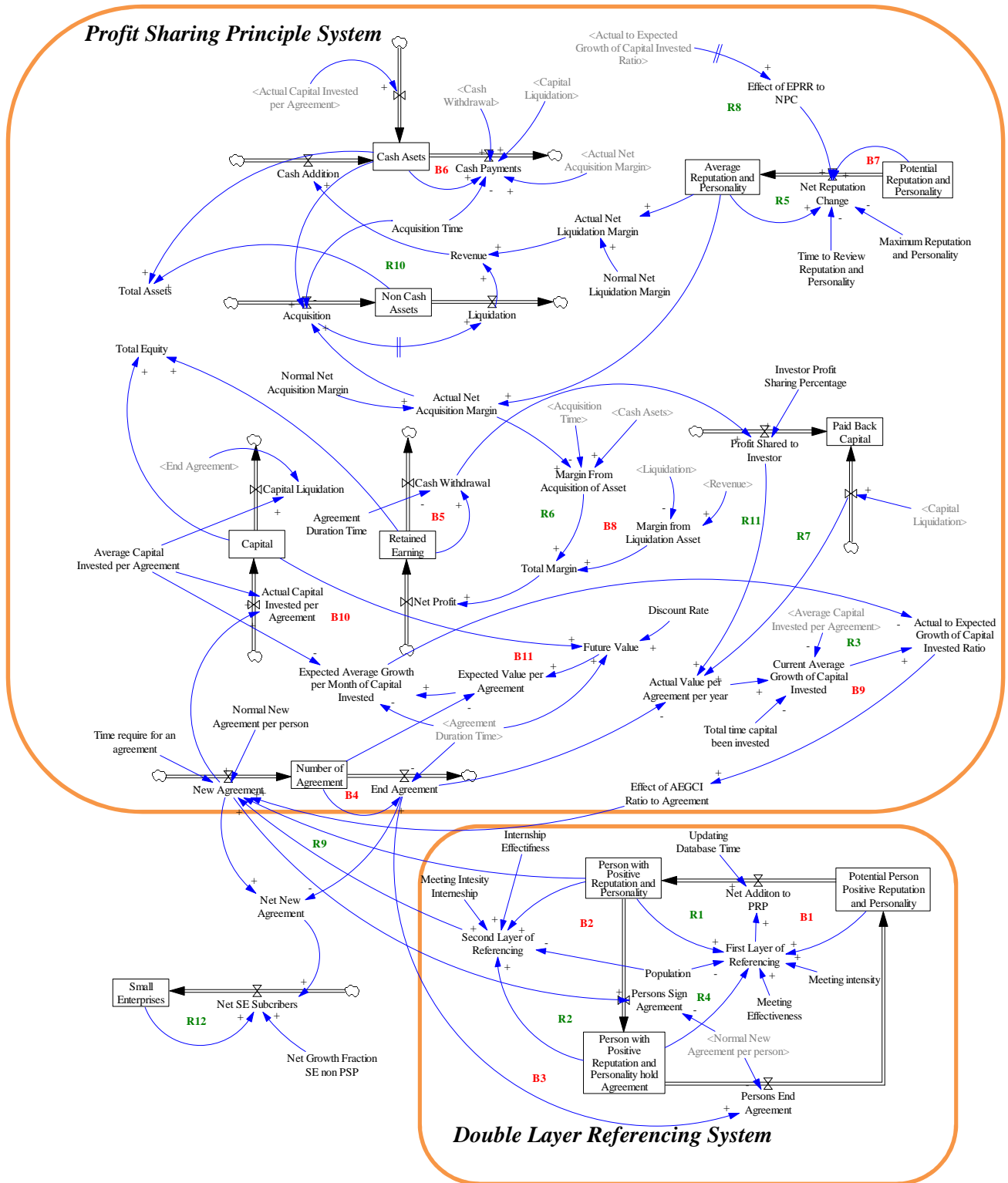
The main features of the PSP covenant such as limited time contract, profit sharing percentage, any loss is born to the funds owner; are adopted in this paper with some necessary quantification, which is illustrated in Figure III.6 p. 53. The figure also depicted the important role of ‘reputation and personality rating’ agencies. The agencies shall continually develop a database of individuals or groups, which have a positive reputation and personality (PRP). This database can be accumulated; the accumulation is depended on the magnitude of the net addition where size of this database depends on the WOM effect from the people in the database either have a PSP contract or wait for a contract (R1, R4). Such WOM effect is called *the first referencing system* in this paper.

However, the exponential growth of the database is slowly will reach the mature state where the available potential people with positive reputation and personality have been included in the database (B1) and akin of loop is applicable for the growth of new entrepreneur with a contract (B2). Nonetheless, the ended agreement will also mean a subtraction on the people with positive reputation and personality hold an agreement (B3).

On average, a fraction of person or groups in the database will sign PSP contract within a certain time, by holding the contract, entrepreneur has the capital to run their business without interference from the fund owner. The more persons with PRP in the database will lead to the more 'new agreement'. The new agreement will be signed also based on the reference coming from 'entrepreneur hold a contract', who will make a positive review on the other person with PRP by his/her best knowledge for signing a new contract through an internship mechanism; this is what is called as *the second layer referencing system* (R9). The number of new agreement is affected also by the perception of the funds owner on the actual to expected growth of capital invested ratio, specifically if the ratio is more than 1 (one) means an increment on the new agreement otherwise a decrement.

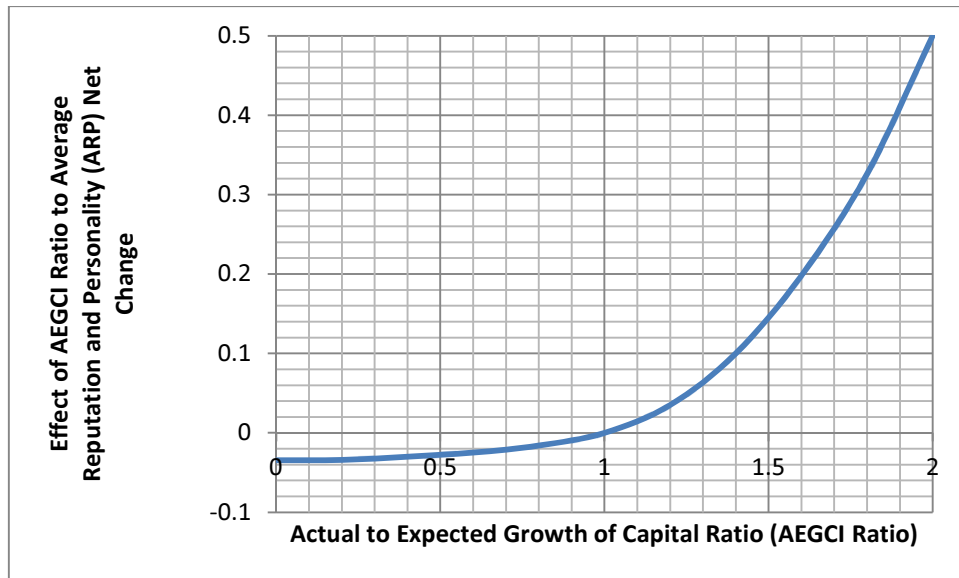
The capital will be used to enlarge the capacity to generate assets anyway, such as fixed assets and current assets (inventory, etc.). Constantly, part of the assets, i.e. inventory will be liquidated through the sale and at the end of the period of the agreement all assets must be liquidated or valued to determine the amount of profit or loss. Profit if any will be distributed strictly according to the agreement in the beginning of the covenant between funds owner and entrepreneur while a loss if any will be born to the funds owner. Distribution should be made based on a percent amount not a fixed amount. The greater amount of profit share and capital liquidation per year will make the ratio of Actual to Expected Growth of Capital Invested (AEGCI) is higher and eventually will increase the amount of capital (R7) and increase the amount of retained earnings (R11).

**Figure III. 6: Stock and Flow Diagram of Profit Sharing Principle (PSP) and Double Layer Referencing System**



The higher ratio in another way will lead to the increment of the average reputation and personality on the entrepreneur through a positive nonlinear effect on its net change, which has been quantified as the following Figure III.7:

**Figure III.7: Quantification of Effect AEGCI ratio to ARP net change**

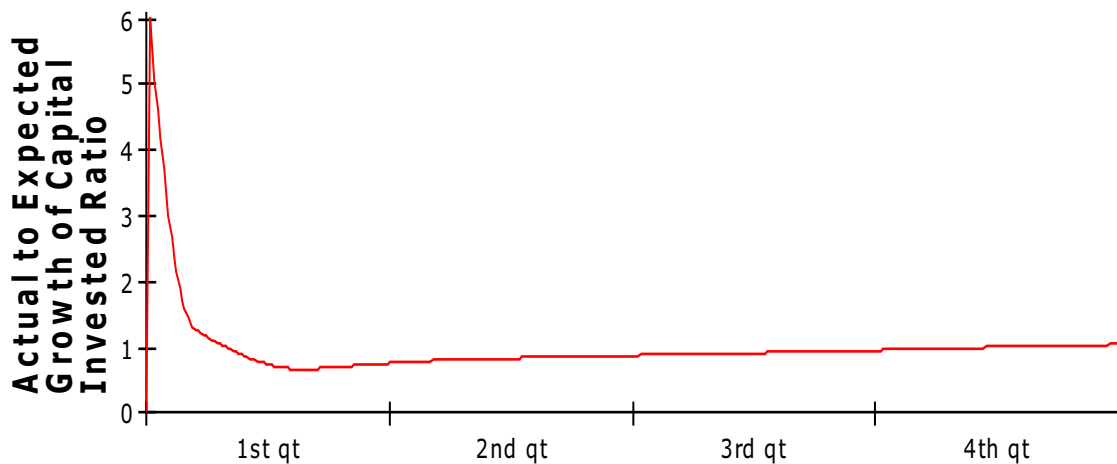


If AEGCI ratio is 1 (one), then there will be no change for average reputation and personality (ARP) in the system; less than 1 means a decrement on ARP and otherwise an increment. The decrement is set to far flatter than the increment effect, since there is a sense that funds owner far more concern on the more than 1 growth ratio because even the growth is 0, the contract cannot be canceled until the end of agreement.

The higher ARP is meant that the entrepreneurs are believed capable to create higher margin either on asset acquisition (creation) with efficiency or on asset liquidation (sales) with higher margin on sales then eventually will increase total net profit and the higher AEGCI ratio. These series of causality will create another reinforcing loop (R8).

On the other side, of course, the number of agreement could be used as an indication of good outlook on the economic growth at the same time will increase the capital invested in PSP contract and also increase the expected average growth of capital invested, but eventually these expectations will reduce the AEGCI ratio. These series of causality will create balancing loop (B11). The reinforcing for the ratio is coming from the accumulation on the agreement number; the higher the number in the system, the lesser expected value per agreement then eventually will reinforce the AEGCI ratio (R3). That is why in a year the AEGCI ratio will grow and then collapses as can be seen on the Figure III.8 below:

**Figure III.8: Behavior of AEGCI ratio in 1 (one) year simulation**



The sharp increase of the ratio is mainly caused by the total time capital been invested where for the initial simulation its value is almost zero thus will set the ratio increase sharply.

The number of new agreement also indicates how many new businesses have been founded, thus will increase the number of net new business subscriptions. In particular, this

thesis proposes the implementation of PSP contract system for SEs since it is suitable covered by private sector financing i.e. more or less for 50 million rupiah of capital. The new agreement of the PSP contract will make the Net SE subscribers increase along with the SEs subscribers without the PSP contract scheme, and finally will increase the number of SEs.

There can also be noticed a connection between Figure III.3 and Figure III.6. Both figures are connected by a variable namely Net SMEs Subscriber. However, since the PSP contract in the thesis is applied for the small enterprise, the variable name is modified to Net SE Subscriber.

To develop sustainable SMEs, it is the necessary to make efforts to coordinate the policy at the macro level in terms of production coordination and at the micro level in terms of the PSP contract base financing i.e. *mudharabah* for small enterprises. Such policy coordination is pursued in order to make SMEs more efficient in production and gain some positive impacts from the PSP financing system that is not only emphasize merely on the "bankable proposal" but give more emphasis on the "business activity skill," especially for small enterprises in order to boost the new small enterprises subscriptions rate.

In that regard to ease production coordination, the policy makers must consider some effort such as the grouping of business activities in an area, access to raw materials in an efficient and inexpensive, the provision of market demand information. Combination of such two approaches will be able to drive to the sustainable development of SMEs, as it will be shown in the simulation result discussion in the next section.

## SIMULATION RESULTS

The paper's simulation has been run based on the some initial conditions and assumptions that can be seen on Table III.3a below and III.3b p. 59. These tables give clues on the initial value used on the simulation and its final result. Expectations on some variables have been reached.

**Table III.3a: PSP contract simulation with the time step: 1 day and Simulation period: 4 years**

No	Variable	Type	Initial Value	Expected Value	Final Value	Unit
1	Cash Assets	Stock	4 billion	Max	38,018,810,659,480	rupiah (rp)
2	Non Cash Assets	Stock	0	Max	67,243,809,736,741.98	rp
3	Acquisition Time	Constant	2	-	-	Month (mo)
4	Normal Net Acquisition Margin	Constant	7	-	-	%
5	Normal Net Liquidation Margin	Constant	7	-	-	%
6	Average Reputation	Stock	.5	1	1	Dimentionless (dmnl)
7	Time to Review Reputation	Constant	1	-	-	mo
8	Maximum Reputation	Constant	1	-	-	dmnl
9	Potential Reputation	Stock	.5	0	0	dmnl
10	Investor Profit Sharing Percentage	Constant	50	-	-	%
11	Paid Back Capital	Stock	.1	Max	48,436,690,570,044.01	rp
12	Capital	Stock	4 billion	Max	38,018,810,659,480	rp
13	Retained Earning	Stock	0	Max	94,648,433,051,187,39	rp
14	Total Assets (TA)	Auxiliary	4 billion	= TE	=TE	rp
15	Total Equity (TE)	Auxiliary	4 billion	= TA	=TA	rp
16	Number of Agreement	Stock	80	maximum	760,376	Agreement (ag)
17	Average Capital Invested per Agreement (ACIA)	Constant	50 million (min. req for SE)	-	-	Rp/ag
18	Normal New Agreement per person	Constant	1	-	-	Ag/ppl (ag/people)
19	Time require for an agreement	Constant	4	-	-	mo
20	Expected Value per Agreement (EVA)	Auxiliary	66,102,693.89427	-	66,102,693.89427	Rp/ag
21	Actual Value per Agreement per year	Auxiliary	= ACIA	>EVA	112,237,897.1155	Rp/ag
22	Agreement Duration Time	Constant	4	-	-	Year (yr)
23	Potential Positive Person Reputation	Stock	1 million	minimum		ppl

No	Variable	Type	Initial Value	Expected Value	Final Value	Unit
24	Updating Database Time	Constant	20	-	-	times (dmnl)
25	Meeting intensity	Constant	1	-	-	Per day
26	Meeting Effectiveness	Constant	.5	-	-	dmnl
27	Population	Constant	50 million	-	-	ppl
28	Person with Positive Reputation and Personality	Stock	100	maximum	237,157	ppl
29	Internship Effectiveness	Constant	.8	-	-	dmnl
30	Meeting Intensity Internship	Constant	20	-	-	Time (dmnl)
31	Person with Positive Reputation and Personality hold Agreement	Stock	80	maximum	760,376	ppl

As can be seen on above table, PSP contract system has a positive impact to both sides; entrepreneur and the funds owner. From the point of view entrepreneur, PSP contract can give them higher security for doing the business without worry for being exploited. For the funds owner, investment in small enterprises with PSP contract is profitable since the return from it can outperform the future time value of their money with free rate of discount of 7%/yr. With this discount rate, Rp. 50,000,000.00 invested in 4 years PSP contract will have future value of Rp. 66,102,693.89427. However, as can be seen on the Table III.3a, with the assumption of the entrepreneur can make margin 7% on the assets acquisition and liquidation, the average value of an agreement on the end of the contract term is Rp. 112,237,897.1155,-.

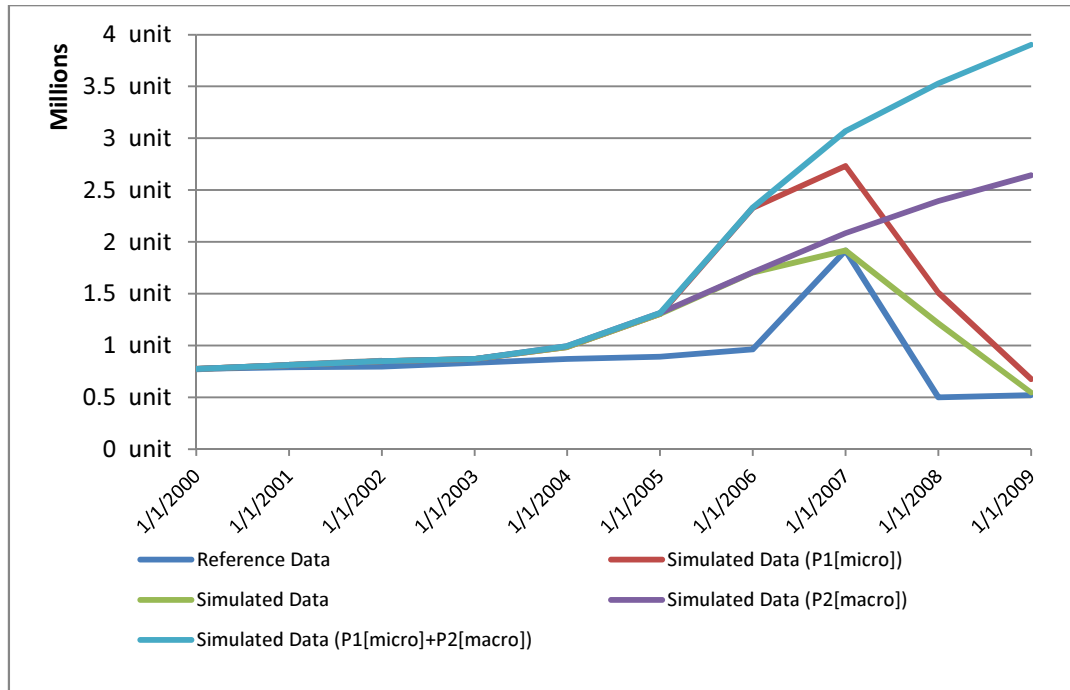
On the Table III.3b, it can be seen the some variables' initial conditions and assumptions. However, most of the variables in the Table III.3b has been discussed in the Subroto (2011) and can be referred to the previous chapter (Chapter 2).

**Table III.3b: Generic model and production coordination system with time step: 1 day and simulation period: 9 year**

No	Variable	Type	Initial Value	Expected Value	Final Value	Unit
1	Aggregate Demand (AD)	Stock	82,901,100	optimum	85,333,425	goods/yr
2	Potential Addition to AD	Stock	120.000.000	minimum	228,246	goods/yr
3	Normal New demand fraction	Constant	80	-	-	%/yr
4	Normal Demand Fulfillment	Constant	78	-	-	%/yr
5	Average Total Production without policy support	Constant	100	-	-	Good/yr/unit
6	SEs' Maximum Crowding out Fraction	Constant	-80	-	-	%/yr
7	SEs' Normal Growth Fraction	Constant	38	-	-	%/yr
8	SE's Normal Survival	Constant	3	-	-	yr
9	Market Adequacy	Auxiliary	1	optimum	1.03	dmnl
10	Small Enterprise (SE)	Stock	774,912	maximum	3,931,866	unit
11	Medium Enterprise (ME)	Stock	52.214	maximum	135,549	unit
12	MEs' Maximum Crowding out Fraction	Constant	-50	-	-	%/yr
13	MEs' Normal Survival	Constant	4	-	-	yr
14	Aggregate Safety Stock	Constant	1	-	-	Yr
15	Aggregate Production time	Constant	1	-	-	yr
16	Policy Delivery for P1 (Macro)	Auxiliary	~0	100 (starting from 2003)	100	%
17	Policy Delivery for P2 (Micro) Net New Agreement	Auxiliary	0	Maximum (Starting from 2005)	0	Ag/yr

Based on the simulation of the three SFD which are; generic model, refer to Figure III.2 p. 39; simple production co-ordination, refer to Figure III.4 p. 43; and financing system according to PSP, refer to Figure III.6 p. 53 that has been done to support this paper, now, it is more understandable that the stock management constitutes a very important role to support the sustainable development of SMEs as well as PSP financing system to boost the small enterprises' subscription. The overall simulation result of SEs can be seen on the Figure III.9:

**Figure III.9: The Difference Behavior of SE with different policy**



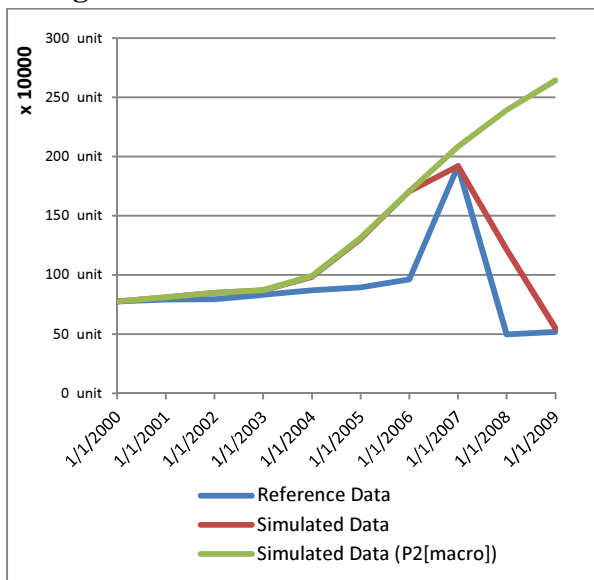
As can be seen on above Figure III.9, policy on production coordination (P2 [Macro]) has a significant role to support sustainable development of small enterprises while the policy on the use of PSP financing system (P1 [Micro]) is able to boost the number of small enterprise but could not able to support sustainable growth as in the year of 2007 it begins to decrease. However if the two policies are combined (P1 [Micro] and P2 [Macro]), the number of small enterprises grows in a strong sustainable pattern.

Entrepreneurs' ability to manage of how much they must produce in order to meet the market demand and to manage the inventory, in the long run it will make the company more resilient to crisis situations. With the good stock management, entrepreneurs will be able to run the business efficient and competitive eventually. Moreover, stock management will be more efficient when it is conducted in a group or cluster by gaining the cheaper operational cost. Another advantage can be gained from applying good stock management

that is also in line with the government programs are being implemented on the warehouse receipt program (Ministerial Decree No: 13.1/Per/M.KUKM/VII/2006), by the program, entrepreneurs can obtain an additional guarantee for their production and business development.

Putting more attention on the production coordination policy, the simulation of the system structure that is reflected in the SFD on Figure III.4 in the previous section is capable of producing more sustainable behavior patterns. The behavior of historical data for small and medium enterprises are decreasing in the last period of observation, but the simulation generated data shows an increasing behavior. More clearly about the behavior is shown in Figure III.10a and III.10b:

**Figure III.10a: SE Simulated data**



**Figure III.10b: ME Simulated data**

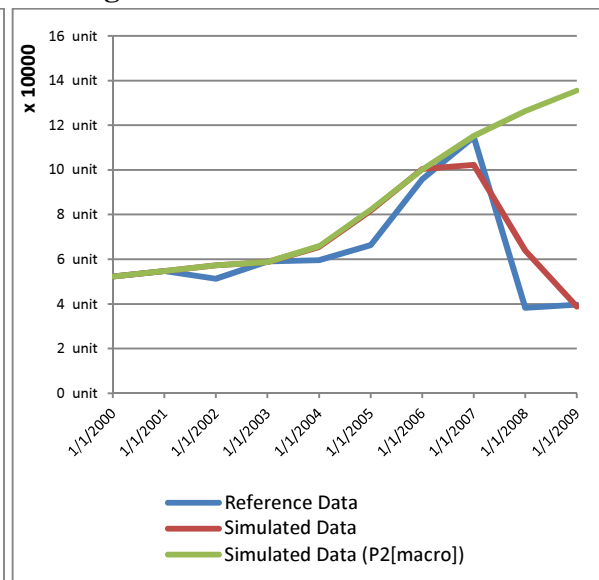


Figure III.10a and III.10b show the positive impact of the availability of information about market demand to support production coordination policy on the development of SMEs. These positive developments could occur due to the presence of

countable aggregate market demand information, then it will create the demand expectations, then this expectation will support entrepreneurs to make better planning on capacity and production. For sure, the better knowledge of the demand and production capacity could make their operations more efficient and profitable. The profit gained will attract people to follow to establish new businesses time over time.

## **CONCLUSIONS AND IMPLICATIONS FOR FURTHER RESEARCH**

The discussion on policy approaches from micro and macro side in the paper has been supported by a combined simulation of the three system structures which is the generic model combined with the production co-ordination and the PSP contract financing system, i.e. *mudarabah*. Simulation on the first model which is figured on Figure III.2 is able to produce similar behavior with its reference data. It hence can be said that the hypothesis offered in the paper which is shock in the aggregate demand can be considered as the cause of the dynamic behavior of SMEs in terms of its quantity nationally in Indonesia (Subroto, 2011).

The simulation of the second module attached to the first model which is about the use of the production coordination system in the effort to support developing SMEs in a sustainable way has shown positive insights. Information provision on the aggregate demand for SMEs product will give a signal and chance to the entrepreneurs to make better planning in production capacity and stock management. The production coordination can further prevent entrepreneurs to produce some products without knowing their market. Such insight re-emphasizes the importance of efforts to coordinate production as expressed by Mezgar and Kovacs (1998); Mezgar et al (2000).

On the other case, the simulation's result on the use of PSP contract for small enterprises is beneficial for the enterprises and for the economic as well. PSP contract could boost the number of small enterprises although it still could be affected by the crisis situation, as its behavior can be seen on the Figure III.9 p. 60. However, at the same time it is also able to create a bigger value added for the economy from the point of view employment creation and a better return for the investor with a minimum agency risk.

The investor can get a better return because the current value of a PSP contract a year can outperform the investor capital future value expectation based on the risk-free rate discount. The agency risk could be minimized through the use of *dual layer referencing* (Figure III.6 p. 53); first layer is the reference from the current person with positive reputation and personality, and the second layer is the reference from the current person who has a PSP contract based on an internship mechanism.

The issue is now when and how such policy should be implemented. Models' simulation of this paper suggests that indeed the policy of production coordination *per se* is capable to support the sustainable development of SMEs. And of course, implementation of such policy is not a standalone effort, emphasizing to alter hard-infrastructure and soft-infrastructure to support business activities among other efforts is crucial. This infrastructure includes the physical and non-physical such as the improvement of transport and energy sectors, while non-physical policy coverage, among others, is to improve the business climate, assistance for an entrepreneur in the field of quality management and inventory management.

However, implementation such policy along with the use of PSP contract financing for small enterprise will make the development of SMEs more solid. Implementation of the PSP contract will raise the need for independent institutions to provide rating of individuals or groups those are suitable for SMEs financing with the PSP contract. With this principle, entrepreneurs have a minimum or can be said almost a zero risk of being loss so that entrepreneurs can concentrate in running businesses and good assistance to prevent business failure. Some of the expected long run positive impacts of this institution are capable of managing SMEs in administrative, indirectly supporting business operations, and increase stakeholder confidence to the entrepreneurs.

Then the issue of how to implement the policy is beyond this paper's scope since this concern will bring us to the question of how to make a policy itself. However, this research also implies the search for core source of the problematic phenomenon to develop a sustainable growth of SMEs from the public institution point of view, especially in Indonesia as a developing country. It will become an interesting research to explore and reveal the complexity in order to enable policy to support a sustainable SMEs development from the public policy perspective.

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## CHAPTER IV

# UNDERSTANDING COMPLEXITIES IN PUBLIC POLICY MAKING PROCESS THROUGH POLICY CYCLE MODEL TO SUPPORT SUSTAINABLE SMES DEVELOPMENT IN INDONESIA: A SYSTEM DYNAMICS APPROACH<sup>4</sup>

### ABSTRACT

*This paper is aimed to explore theoretically the complexities and the reality in the policy making process from the point of view causality relationships among the components or actors within the system.*

*The complexities' exploration in the paper is based on the model of the policy cycle that is widely discussed in the public policy and public administration literatures. The sense of reality surroundings the policy-making process is perceived from some study cases that have been observed from Australia and Indonesia literatures. Such complexities will be described with system mapping through stocks and flows diagram and expectation on some variables behavior will be tested by system simulation.*

*Simulation throughout the paper revealed different complexities and some pitfalls in each stage of the policy cycle model on which should be given a proper attention from the policy stakeholder.*

*The paper tried to construct a different approach to understand the reality and embrace the complexities of the policy-making process in order to present a starting point for an open discussion in public policy field. The effort could be a learning tool for the public policy maker to build good awareness and understanding on their roles in the complex relationship and inter-dependent environment. Eventually, the paper can fill the gap between policy cycle model theory and the complexity in the real situation of the policy-making process.*

**Key words: Policy cycle model, Public Policy Process, System Dynamics, Simulation**

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<sup>4</sup> The first version of the paper has been presented at II Conference of WCSA-World Complexity Science Academy, September 26<sup>th</sup> – 27<sup>th</sup>, 2011, Palermo, Italy

## INTRODUCTION

Despite its important role for the Indonesia's economic development, so far it can be said that Indonesia still has great challenges in managing the small and medium enterprises (SMEs). The challenge is evident when we look at especially the meaning or definition of SMEs and its data availability. It seems that the wide variation in SMEs' definition has a direct impact on the SMEs' data availability in Indonesia.

The current available data also seems very poor, where each data is still categorized as temporary, quasi temporary, and most temporary. Even the data is still tentative; despite has been three years from its first release. The variation in definition and availability of these data also indirectly indicate the presence of overlapping SME development roles and efforts, although on the other side has become common understanding that the SME is an important factor for sustaining high economic growth in Indonesia, from the point of view of its contribution to total GDP each year.

Various definitions and data can be found in the literature (OSMERI, 2008) or related agency website which has links directly or indirectly in the development of SMEs; such as the Ministry of MSME, Social, Industry, even on the website of Bank Indonesia, as have been summarized on the Table IV.1. However, since the year of 2008 has been enacted Law No.20/2008 which gives a clearer definition of the SME.

**Table IV.1: Variation definition of SMEs in Indonesia**

No	Reference*	Micro			Small			Medium		
		Net Asset	Sales	Employee	Net Asset	Sales	Employee	Net Asset	Sales	Employee
1	UU No. 9 Th. 1995	-	-	-	<= 200 mil. rupiah	<= 2 billion rupiah		<= 200 mil. rupiah	<= 2 billion rupiah	
2	Ministry of Industry Decree				<=5 billion rupiahs			<=5 billion		

No	Reference*	Micro			Small			Medium		
		Net Asset	Sales	Employee	Net Asset	Sales	Employee	Net Asset	Sales	Employee
	No.257/MPP/Kep/7/1997							rupiahs		
3	Presidential Decree No.10/1999							>=200 million - 10 billion rupiah		
3	Central Bank of Indonesia Decree No.7/39/2005		< 100 million rupiah		< 200 million rupiah	100 - <=1 billion rupiah		>=200 million - 10 billion rupiah	>1 billion rupiah	
4	UU No. 20/2008 (Feb 2008)	<50 million rupiah	<300 million rupiah		50 - < 500 million rupiah	300 million - 2.5 billion rupiah		500 million - 10 billion rupiah	2.5 billion - 50 billion rupiah	
5	Statistics Central Bureau (BPS)			<=3 people			5 - 9 people			22 - 99 people

Source: various on the reference\*

Such enactment of regulation has been shown the will of the government to align all efforts to improve seriously the development of SMEs' sector that are as far done by several different ministerial without solid coordination. Coordination among ministerial and institutions such Ministerial of SMEs and Cooperative, Ministerial of Industry, Ministerial of Social, Ministerial of Youth and Sport, Central Bank of Indonesia, and The Central Statistical Bureau of Indonesia will play a significant role in developing sustainable SMEs since each institution has each own specific contribution in theory. However, when it comes into the practice, it may look completely on the other way around facts since the available data tells the different story. The increment of SMEs along the period of 1999 to 2005/2006 is about 2% a year, nearly equal with the Indonesia population growth which is 1, 54% a year (CIA Fact Book, 2011). In this concern, it can be considered that the SMEs development in Indonesia is *self-developing*, which means that it grown by itself either without any supports or unhelpful supports. Then for the period of 2006 to 2009, the data showed a very dynamics pattern which indicated an unsustainable development of SMEs in Indonesia (Subroto, 2011).

Such unintended development of the data also can be considered as a reflection of an uncoordinated policy and a nonsolid policy shaping process on the SMEs development. It raises the need to develop higher awareness on the important of the policy formation process which gives more emphasize on not only the result, but considers also the complexities during the process, and admits the different perception of an issue among the actors for more open policy discussion and submission, eventually will create a solid and sound public policy on the issue.

Formation of public policy is shaped through several stages; in each stage lies a multi interaction that involves more than one actor and components. It has been some model perspectives on the public policy development. The notion of a policy cycle, prominent in the classical view, has its origin in systems theory and the pioneering work by David Easton on political systems (Easton 1965, 1966). May and Wildavsky (1978) described a policy cycle in which they include: (1) agenda setting, (2) issue analysis, (3) implementation, (4) evaluation, and (5) termination. Similarly, Brewer and deLeon (1983) based their understanding of the policy process on a series, they define as: (1) initiation, (2) estimation, (3) selection, (4) implementation, (5) evaluation, and (6) termination. Hogwood and Gunn (1984) also envisage a cycle: issue search or agenda setting; issue filtration; issue definition; forecasting; setting objectives and priorities; options analysis; policy implementation; evaluation and review; and policy maintenance, succession or termination. According to Colebatch (1998) the policy cycle imagines the policy process as an endless cycle of policy decisions, implementation and performance assessment. Howlett and Ramesh (2003) conceive of a similar cycle but with more steps: agenda setting (problem recognition); policy formulation

(proposal of a solution); decision-making (choice of a solution); policy implementation (putting the solution into effect); and policy evaluation (monitoring results).

Regarding public policy-making stages; Bridgman and Davis have proposed a model called the policy cycle model (Bridgman and Davis, 2000). In another literature, Meredith Edwards called the model as a policy development framework, as based on her experience that the framework is most useful in practice, especially when chairing the government interdepartmental committees (IDCs), and which she has used with her students of public policy in an attempt to encourage the good practice, contains stages similar to those in Bridgman and Davis (Edwards 1993).

In general, public policy formation process as in the case described by Edward with a case study in Australia also occurs in Indonesia, although not at the same level. The process also can be found in the case of the Independent Commission on Transparency and Participation (CITP) formation in the District of Lebak, Banten Province, Indonesia. The commission was established as a local government's response to the public aspirations for more transparency in local government administration to create clean and good governance (Pramusinto, 2006).

However, according to Kay, policy cycle models fail to embrace the complexity of the policy-making process and the reality that policy rarely, if ever, develops in a linear progression. Stages are often skipped or compressed and the idiosyncrasies, interests, preset dispositions, policy paradigms or mental maps of the actors involved often usurp the sense of a smooth process. There is a multitude of different

processes at different scales and at different speeds occurring simultaneously (Kay, 2006, p. 9).

Edwards has been presented an insightful point of view concerning with complexities in the policy environment. She revealed that policy environments are full of complexities, usually involving a diverse range of players coming from different perspectives and spawning a host of unexpected events (Edwards, 2001). In that regard, this thesis has carried out some of the common modeling practice in system dynamics mentioned by Zagonel (Zagonel, 2006), such as; system mapping, quantitative modeling and in some degree also to test the hypothesis (expectation on the simulation result); which is based on the way as much as possible to capture the process that has been described in the cases presented in the Edwards' book. Some necessary quantification is needed in order to simulate the system. Simulation technique is used to give the sense of the reality condition in public policy-making process.

The use of simulation techniques is believed have the attractive features of allowing the construction of realistic, testable and modifiable models of real-world phenomena. This makes them of particular interest in the policy field. Simulating the complexities in every phase of the policy cycle model could support the awareness creation of the common goal among the actors involved in public policy.

## **METHODOLOGY**

This thesis uses system dynamics as a method to explore and understand the complexity in the policy cycle model applied in some cases, which are taken from literature in public policy field. Thus, for the longer term could be used as an initial

foundation for an open discussion in the public policy field. The suitability of the use of system dynamics as a method in this thesis is based on Sterman's argument that cited below:

“System dynamics is a method to enhance learning in complex systems. Just as an airline uses flight simulators to help pilots learn, system dynamics is, partly, a method for developing management flight simulators, often computer simulation models, to help us learn about dynamic complexity, understand the sources of policy resistance, and design more effective policies”(Sterman, 2000 p.4).

Within the next sections, each policy cycle phase will be presented by the following components of modeling practice in system dynamics point of view (Zagonel, 2006):

### 1. System Mapping

System mapping is qualitative and inductive; involves drawing influence diagrams, CLDs, S&F diagrams, or any form of mapping or organization of the elements forming a system; attempts to get at the key causal interrelationships; focused upon identification of inter-organizational linkages and inter-dependencies

This step is needed as a visual summary of a lengthier verbal or written discussion. It organizes information and may yield preliminary dynamic insights. For example, a stock-and-flow diagram helps to understand points of accumulation and intervention. Alternatively, causal-loop diagrams begin to explore reinforcing (R) and balancing (B) feedback. Delays can also be graphically displayed. Maps facilitate the surfacing and clarification of assumptions, and thus can help with communication.

## 2. Quantitative modeling

Quantitative modeling is quantitative and descriptive; involves formulation and simulation; largely system-focused; emphasizes stocks and flows dynamics and the effects of delays; requires specification of the decision rules governing interrelationships; focused on representing and tracking consequences; sometimes rich in detail complexity

## 3. Hypothesis testing

Quantitative and deductive; requires stating a hypothesis that explains dynamic behavior from the causal structure of the system; largely problem focused; emphasizes feedback-rich dynamics, learning, and exploration of the effect of changes in system structure; focused upon understanding and insight.

It has to be mentioned that at some points, the thesis modeling process has to judgmentally quantify the effect of a variable to another variable. Quantifying process is taken in the believe of what Akkermans urged in his paper's conclusion that in many cases, clients will not expect a quantified model for very soft issues, in contrast to the expectations for a very 'hard' problem (Akkermans, 1995). Thus, the modeling process is not omitting such effect of important variable to another variable in the consideration of what Sterman said in his book as omitting structures or variables known to be important because numerical data are unavailable is actually less scientific and less accurate than using your best judgment to estimate their values (Sterman, 2000, p.879). And taking carefully the logical sense into the judgment of the important variable effect to another variable, yet it has to be verified that it will not either overstate or understate the final simulation result from the expected behavior. In order to support the logical sense the

model, in-depth interview has been also made with some high level bureaucrat officers from related ministerial and institutions to enrich the insight.

The discussions in the paper are divided into several sections; such separation follows accordingly the policy cycle stages as the followings; 1) Identifying an issue in order to put agenda on the table, 2) policy analysis in order to prepare the green paper or recommendation paper, 3) Discussion and decision in order to prepare the white paper or policy paper, 4) implementation, and 5) evaluation. The end section will be dedicated to reveal the complexity insights of the paper and its implication for further research.

### **IDENTIFYING ISSUE**

Outline of the current subtopic can be drawn as in the following Table IV.2 for the system mapping and Table IV.3 for the variables are included in the simulation with the initial value, expected value, and the final value after the simulation.

**Table IV.2: Identifying issue system mapping outline**

The Actors	Resource Strategic	Intermediate Control	Final Result	Final Indicator
The Government: Ministerial Department Task Force	1. Perception on Issue 2. Interest on Initiative	1. Change in Perception on Issue and Pressure groups interest 2. Change in Initiative interest	Green Paper <sup>5</sup>	Sense of broad agreement in society
Pressure Groups	3. Opposing Perception on an Issue	3. Change in Opposing perception on issue and government interest		

<sup>5</sup> Government discussion paper usually with issues, options and sometimes proposals as a basis for public consultation, typically developed before a white paper

The Actors	Resource Strategic	Intermediate Control	Final Result	Final Indicator
Press/Mass Media	4. Press coverage	4. Perception Gap on an issue		
Public	5. Opinion Discourse 6. Need of Information	5. Change in Discourse intensity 6. Information Fulfillment		

**Table IV.3: Initial, expected, and final value of the identification stage**

No	Variable	Type	Initial Value	Expected Value	Final Value	Unit
1	Interest pressure release	Constant	.15	-	-	dmnl
2	Pressure Group Perception (PGP)	Stock	1	~GP	.438	dmnl
3	Government Perception (GP)	Stock	1	~PGP	.097	dmnl
4	Issues clarity	Auxiliary	.97	1	.99	dmnl
5	Standard Press Coverage	Constant	2	-	-	%
6	Normal total report in one edition	Constant	200	-	-	report
7	Effect of report to public intensity addition	Constant	.001	-	-	Per report
8	Public discourse intensity	Stock	.1	~0	.03	dmnl
9	Publicly available Information Need (PAIN)	Stock	.99	0	.00013	dmnl
10	Publicly available information	Stock	.01	1	.99986	dmnl
11	Normal Public information need	Constant	.5	-	-	dmnl
13	Normal Information Fulfillment per report	Constant	.0015	-	-	Per report
14	Time to report	Constant	1	-	-	Week (wk)
15	Broad Agreement (BA) on Issues Initiatives	Stock	0	~1	.9927	dmnl
16	Potential Broad Agreement on Issues Initiatives	Stock	1	~0	.00728	dmnl
17	Time To Change in BA	Constant	1	-	-	mo
18	Public Interest on Initiatives (PII)	Stock	.5	~1	.729	dmnl
19	Potential Public Interest	Stock	.5	~0	.27	dmnl

No	Variable	Type	Initial Value	Expected Value	Final Value	Unit
	on Initiatives					
20	Maximum Normative Minister Interest on Initiative	Constant	1	-	-	dmnl
21	Ministerial Interest on Initiatives (MII)	Stock	.001	1	.7311	dmnl
22	Potential Ministerial Interest on Initiatives	Stock	.999	0	.2688	dmnl
23	Time to Observed PII	Constant	1	-	-	wk
24	Time to adjust MII	Constant	1	-	-	mo
25	Normal pressure from poll	Constant	.5	-	-	dmnl
26	Incumbent Party Electability projection (IPE)	Stock	.4	1	.70	dmnl
27	Potential Addition Incumbent Party Electability projection	Stock	.6	0	.30	dmnl
28	Normal pressure from IPE Projection	Constant	.5	-	-	dmnl
29	Time to revise IPE	Constant	2	-	-	yr

Identifying the issues is the initial stage when an issue demands government attention and where the nature of the problem is clarified and articulated. Nevertheless, the empirical evidence is that commonly the policy process is initiated from within government (Howlett and Ramesh 1995: 105; Hall et al. 1986).

However, Cobb and Elder create two categories in the policy agenda setting as the beginning of a policy formation process. The two categories are; first, the “formal agenda,” also referred to as the institutional or governmental agenda, consists of items that have been placed for consideration on the policy agenda by Congress or the executive branch. Second, the “systematic agenda” or “agenda of controversy” consists of issues that have received enough attention to ensure public awareness, that reflect a concern shared by

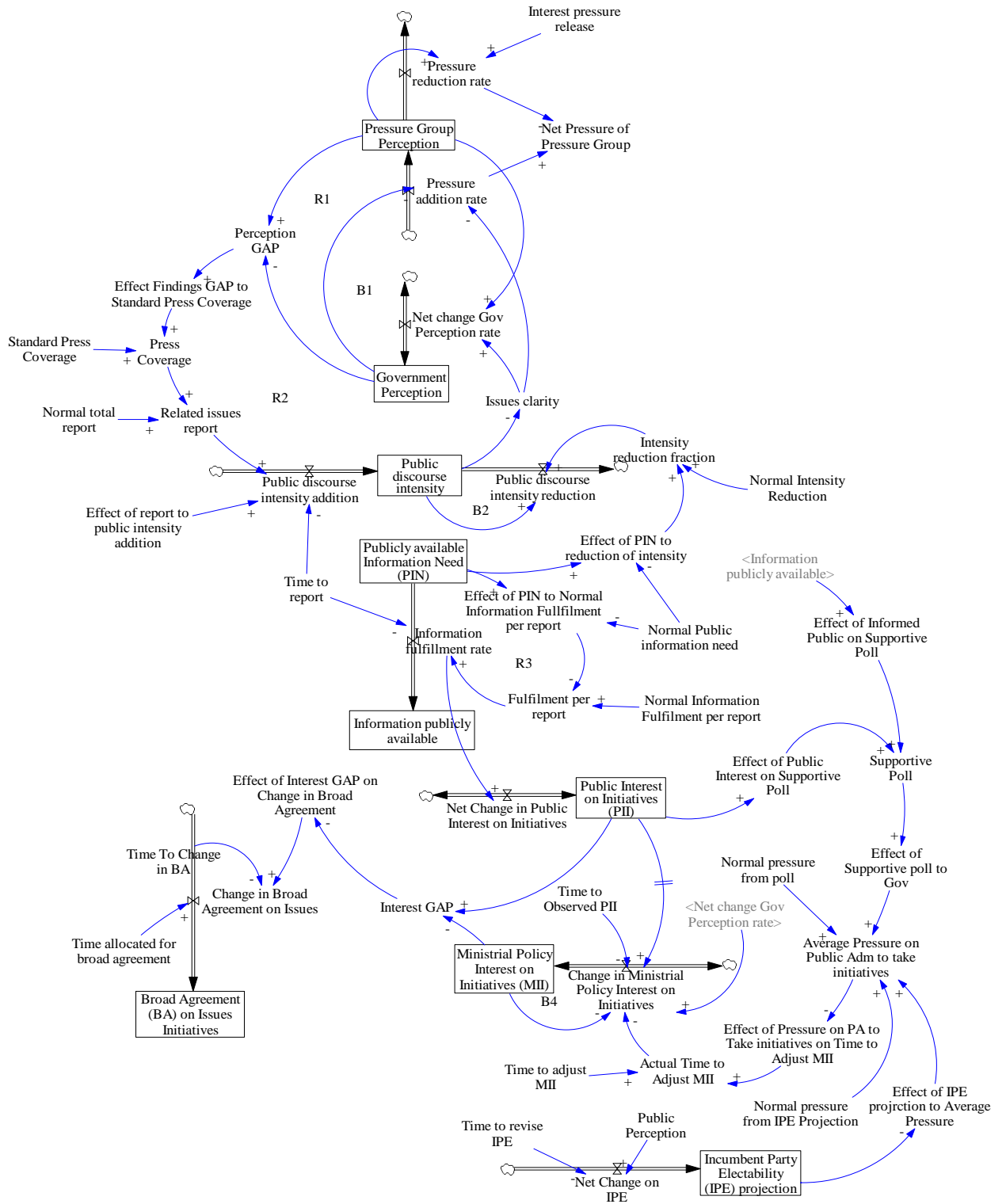
some members of the public that action is required, that are seen as appropriate for redress by government, or that are subject to resolution by citizen initiative (Cobb and Elder, 1972).

In this thesis the discussion on the issue identification stage will be based on the second category of the category of the policy agenda set forth by Cobb and Elder, although in simulations it is also possible to initiate the agenda by the government. In the final stage of this phase is expected to emerge a general consensus on an issue thus the next stage can begin.

In her book, Edwards urged more or less the same tone on the broad consensus at the end of the stage i.e. a key question to address early on, therefore, in the context of the case studies she provided in her book, is how the problem got on the agenda and how it was articulated. Until there is broad acceptance of the nature of the policy problem, it is difficult to move on.

In this stage, some actors who have prominent roles can be identified as follows; government, specifically ministerial departments, pressure groups, the press or mass media, and the latest are the public. Each actor has a strategic resource that can affect the interaction with other actors in the system. In general, the government, represented by the ministerial department and pressure group for example, each of them has its own perception on an issue. The difference on perception (perception gap) is what caused the onset of negotiation of interests between them. Negotiation of interest is facilitated by the press and the mass media because they have some degree of the communication role to

Figure IV.1a: Issue identification stock and flow diagram



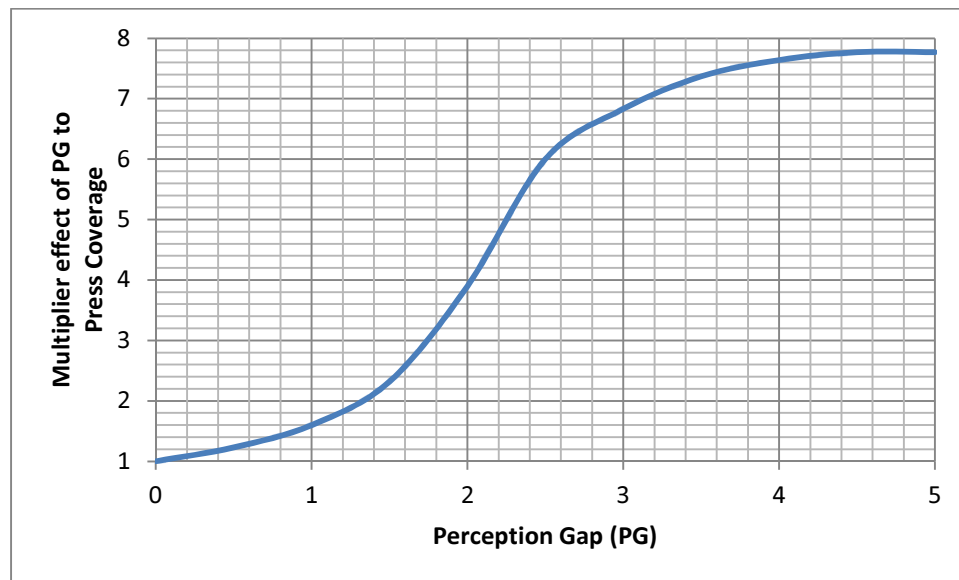
the public in an opinion forming. These negotiations will continue until the perception of an issue to be approximately the same and did not attract public attention anymore. At that time, in theory, it has been already reached what is called by Edward as a broad agreement. In Figure IV.1a can be viewed in detail on how the process of general agreement on an issue.

While the process itself will be started from the existence of an issue where every single issue could become public interest and gain attention from the government. The reason of putting "issue" as the starting point of the policy commencement development process is that the issue *per se* will always exist in a dynamic society. While the government on one side already has its own agenda more or less like what was promised to the constituents, so that the government will choose the agenda based on a popular issue, routine programs, and short cut and generic solution. Thus, the more obvious and populist an issue will lead to the more government's positive perception. While on the other hand, pressure groups are set to always have a different perception from the government in some degree. The difference of perception will be even greater if the pressure group is always opposed to the government's move, in other words the pressure groups would not reduce the pressure on the government, despite all efforts by the government.

In the simulation in the thesis, it is deliberately made that between government and the pressure group are in the different position and perception on an issue. Precisely, issues on which the government has a positive perception will be perceived differently by the pressure groups. However, either government or pressure groups will use the each other perception as a reference to change their current perception on an issue. Thus, perception gap could be minimized along the process (B1).

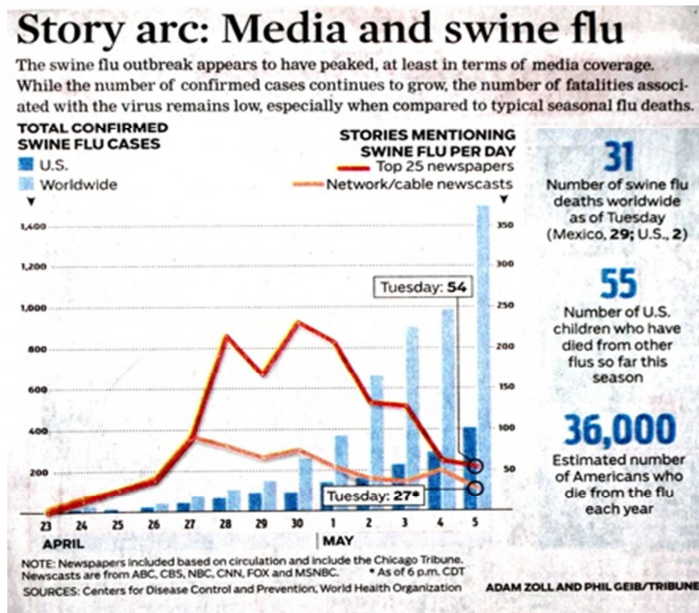
The perception gap then will be perceived and publicized by the press where the more gap will have the more coverage since “the bad is the news” for them. On average the press has a normal coverage on an issue and that is why the perception gap will have an effect to the coverage which is supposed nonlinear in this thesis. The nonlinearity of the effect is assumed and can be seen on the Figure IV.1 below:

**Figure IV.1: Effect of perception gap on press coverage**



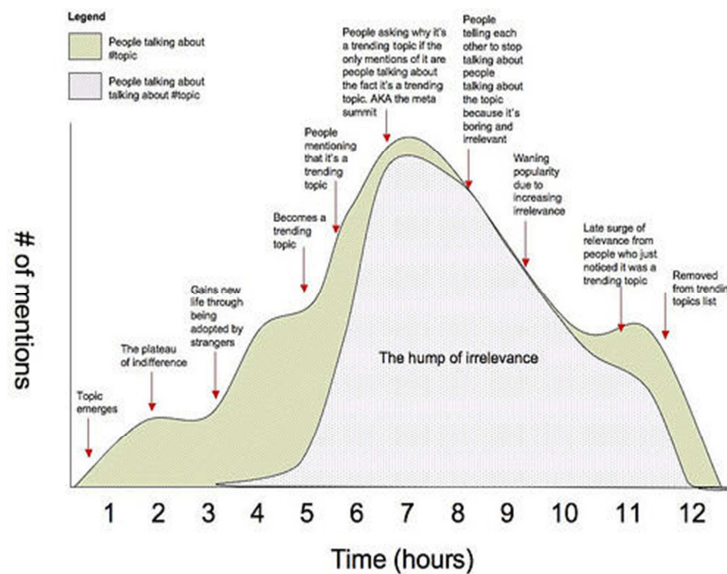
The behavior of press coverage is expected to follow the commonly believed which grows at a small percentage in the beginning period when an issue starts to be perceived by public, then keeps growing until the maturity period is reached and then starts to decline; akin behavior is called as *growth and collapse* in many system dynamics literatures. As some example of such behavior, it can be observed on one of the following figures:

**Figure IV.2: Media coverage on the swine flu**



Beside figure (the red line) tells how the behavior of the press coverage on an issue. It shows the behavior of growth and collapse

**Figure IV.3: Twitter trending analysis**



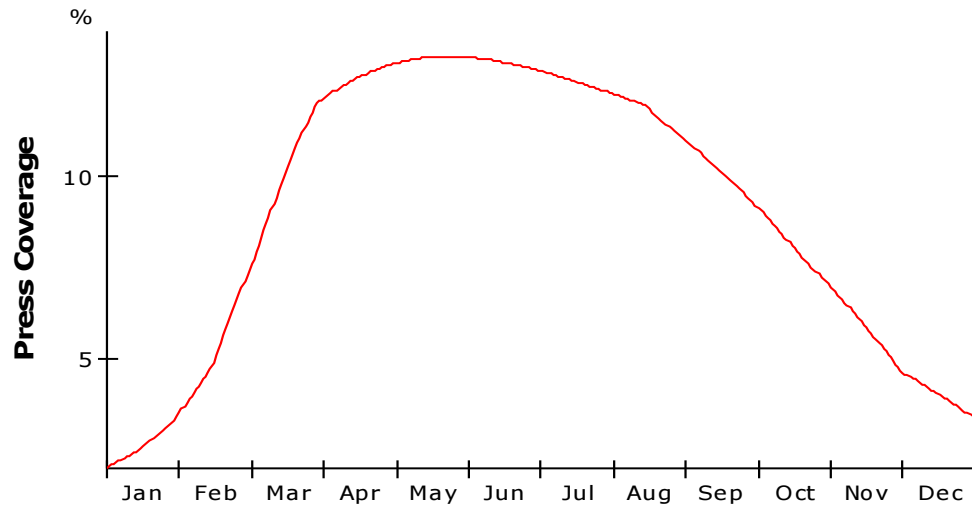
The graph compares 'people talking about #topic' and 'people talking about talking about #topic'.

Beside, graph reflects of how peoples are interested on a topic and it shows more or less similar with the 'growth and collapse' behavior phenomenon in the system dynamics literatures.

Source: Pickard (2009)

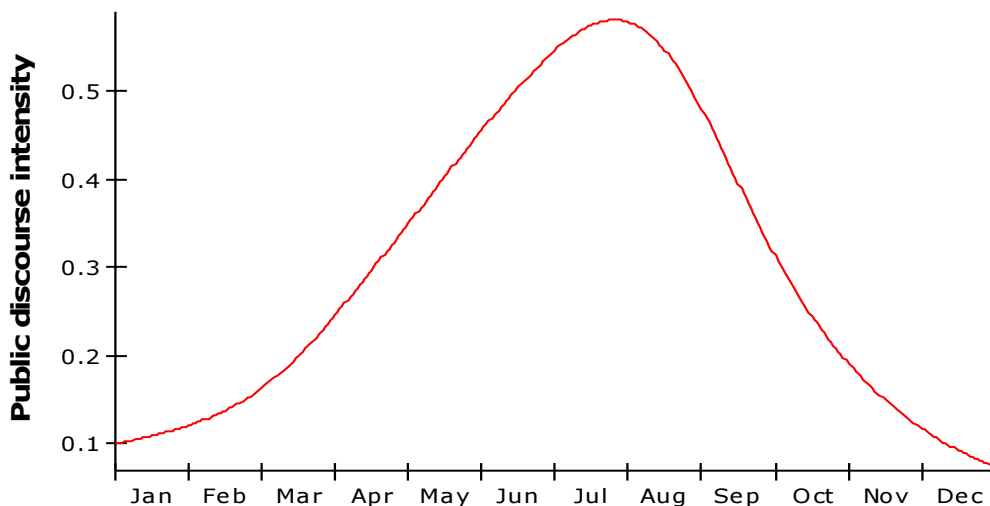
With normal press coverage of 2% the actual press coverage will be like as can be seen on the Figure IV.4;

**Figure IV.4: Simulated press coverage**



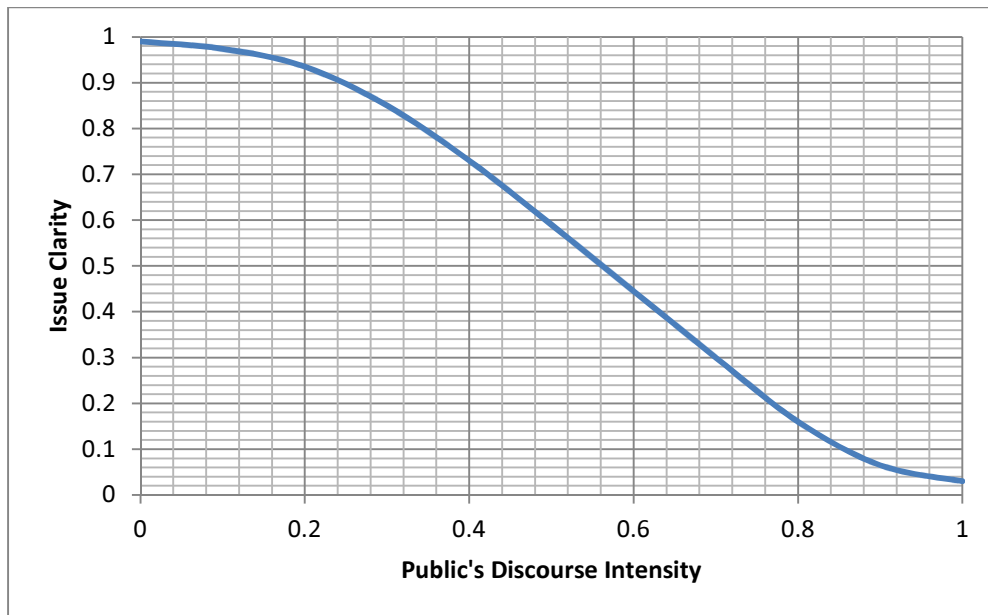
As can be seen on Figure IV.4, the simulation result meets the expectation that generates an identical behavior with the example graphs' behavior. Further, press coverage will have impacts on public discourse. The more press coverage means the higher public discourse intensity. Comparison between Figure IV.4 above and Figure IV.5 below shows the similar shape of behavior with some time delay effect on the former figure. The time delay in this case is depended on how long the public discourse will have a net change which been set up in every 2 weeks.

**Figure IV.5: Simulated public discourse intensity**



And somehow public discourse will have effect on the issue clarity. The thesis' quantification effect of public discourse intensity on issue's clarity can be seen on the Figure IV.6. It is widely considered that if there are a lot of discussions about an issue, then in the same time the issue must be still unclear. Within such circumstance, the more discourse on public means the less clear the issue which eventually will be perceived differently by the pressure group (R1) and the government (R2).

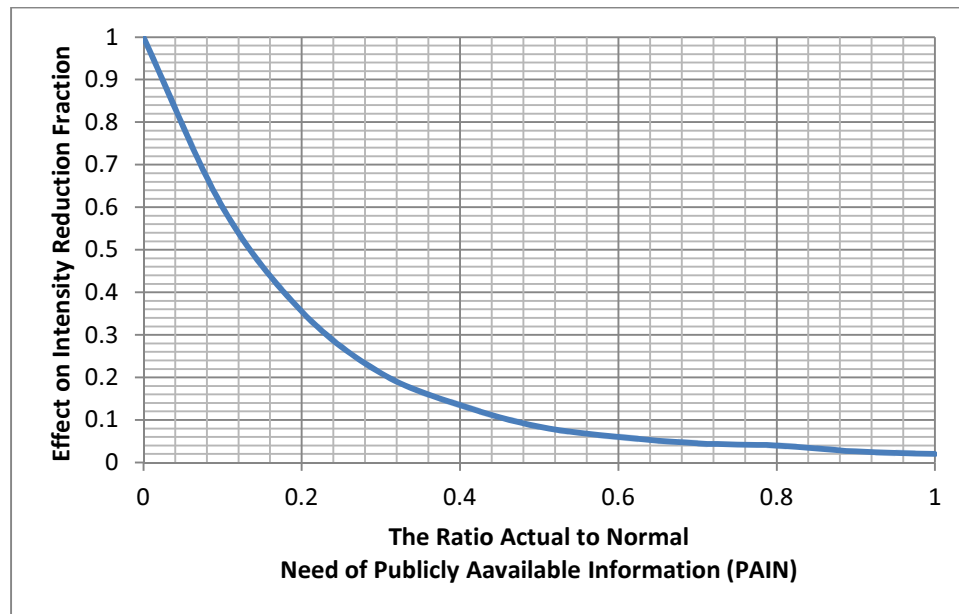
**Figure IV.6: Quantification of effect of public discourse intensity to issue clarity**



As it has been mentioned in the former paragraph, public discourse intensity is affected by the net change on its intensity. Nevertheless, the net change of its intensity consists of two changes which are 'addition to intensity' and 'reduction of intensity', the former is depended on the press coverage and the latter is depended on the actual intensity of public discourse and the reduction fraction. The intensity reduction fraction is the resulted from multiplication of 'normal reduction' for a time period and effect of 'publicly available information need (PAIN)' on the fraction. Then, such effect is driven by the ratio

of ‘normal level need of public information’ from the actual ‘need of information publicly available’. In this case, the effect is supposed to be nonlinear; specifically the more need the lesser effect on the reduction fraction which is can be seen on the Figure IV.7 below:

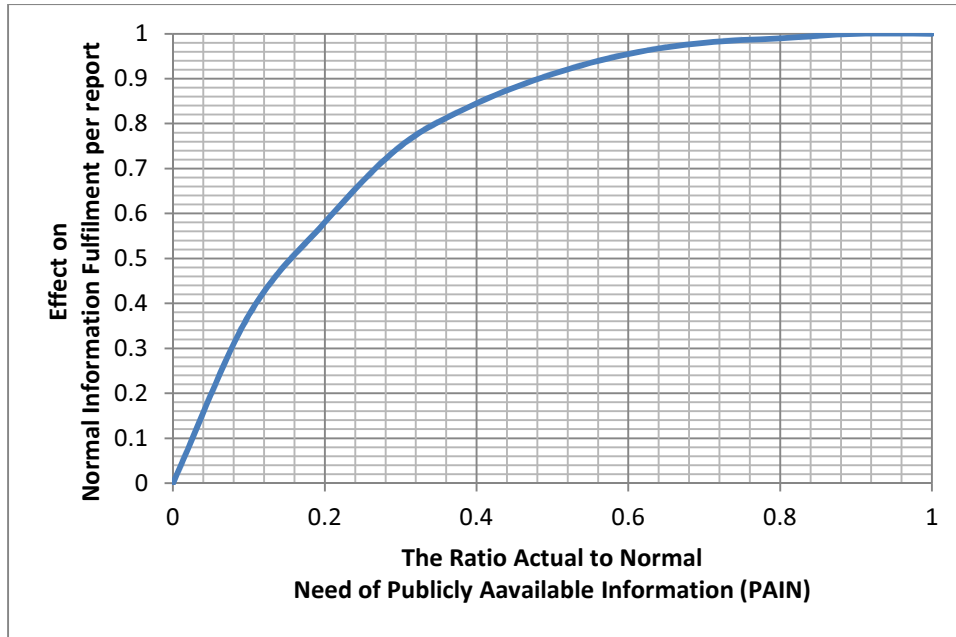
**Figure IV.7: Effect of PAIN to discourse intensity reduction fraction**



‘PAIN’ is more like a “potential” or the normative need of fully available information for the public. Thus for the initial time, it is set to have value of 0.9. The value level is set to that level for the initial time because of the sense that in the society must already available some degree of shared public information in any case; it is set in this case to the value of 0.1.

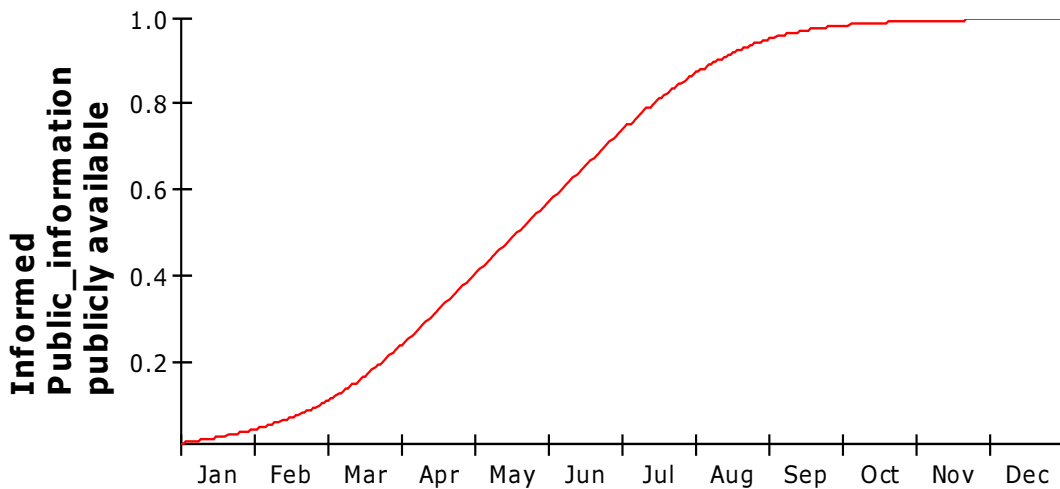
On the other hand, in the same time, the ratio of ‘PAIN’ to ‘Normal PAIN’ will also have an effect on the information fulfillment rate on a nonlinear basis, specifically the lesser the ratio; the lesser information will be supplied. The effect of the ratio on the fulfillment rate can be seen on the Figure IV.8:

**Figure IV.8: Effect of PAIN to normal information fulfillment per report**



Along the simulation, PAIN will gradually be transformed to Information Fully Available for Public (IFAP). The transformation is hinged on the information fulfillment rate where the higher information fulfillment rate the lesser the PAIN, and the IFAP will increase until its normative level is reached (R3). The simulation's result is shown on the Figure IV.9.

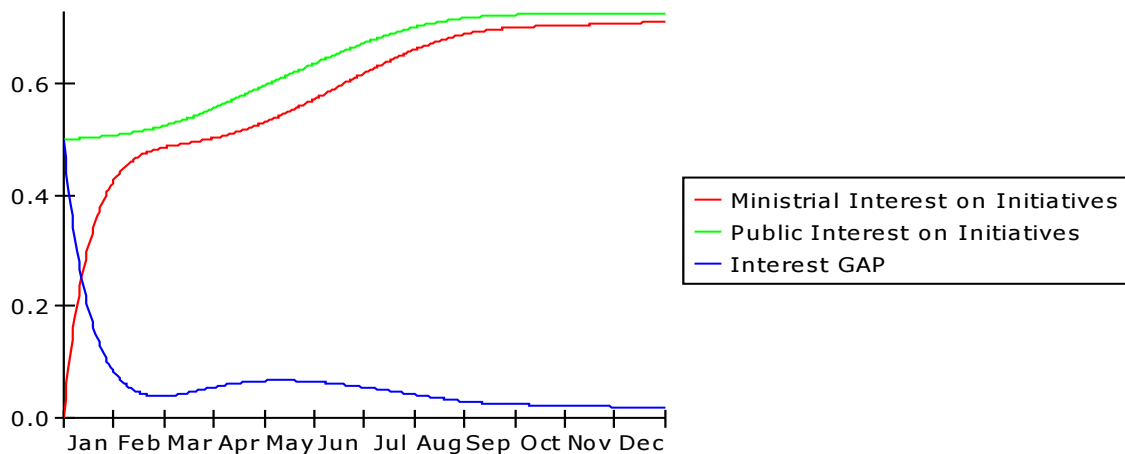
**Figure IV.9: Simulated Information Fully Available for Public (IFAP)**



Information fulfillment rate has also influence on the public interest on initiatives to cope with the issue. The public interest on initiatives itself is governed by its own net change over the time which is influenced by the rate of information fulfillment adjusted with the available normative potential public interest. Strictly speaking, this net change will transform the available normative potential public interest on the initiatives which is set to 0.5 to the actual public interest which is set to 0.5 initially (apathy).

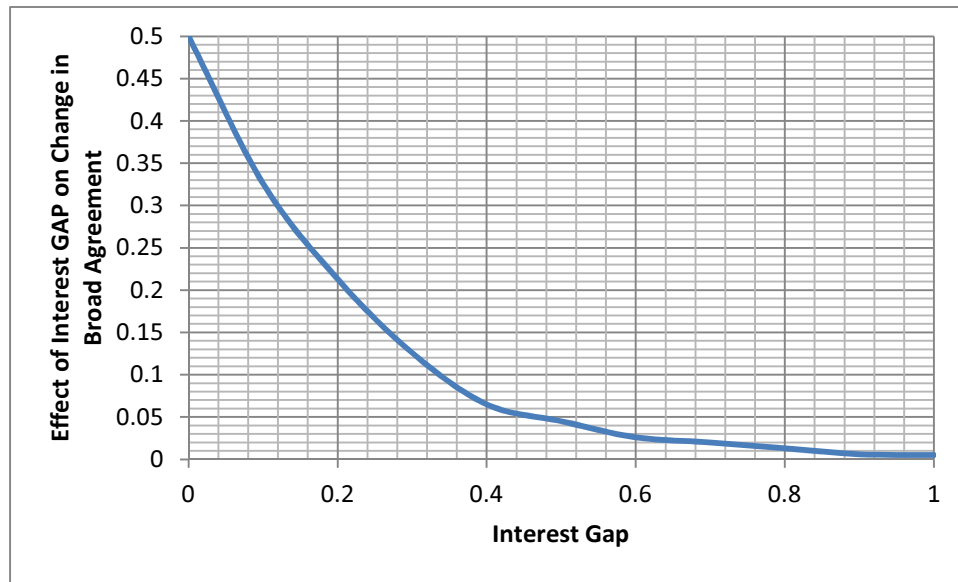
On the other side, the government is assumed to monitor closely the public interest development; however, there will be a probability of delay, since the respond from the government usually is late. In other words, development in public interest on initiative will influence the net change of government’s interest to take the initiative. Some other variables that also influence the net change are pressure from the poll and the electability projection for the next round general election. In the short term basis, polls give real pressure to the government than the electability projection which is depended on the government accomplishments during the administration mandate. The dynamic development of government and public interest on initiative is shown on the Figure IV.10:

**Figure IV.10: Simulated interest of the government and the public**



As can be seen on above figure, the government tries to follow what the public wants on the issue even though there is still a gap between the interests of the two actors along simulation time. The gap *per se* reflects a bargaining process between governments and public in general thus it will determine accumulation rate of broad agreement sense in community through a nonlinear effect. In this thesis as can be seen on the Figure IV.11, the nonlinear effect is defined as following; the more gaps on interest, the lesser effect on the change in broad agreement.

**Figure IV.11: Effect of interest gap on the broad agreement**

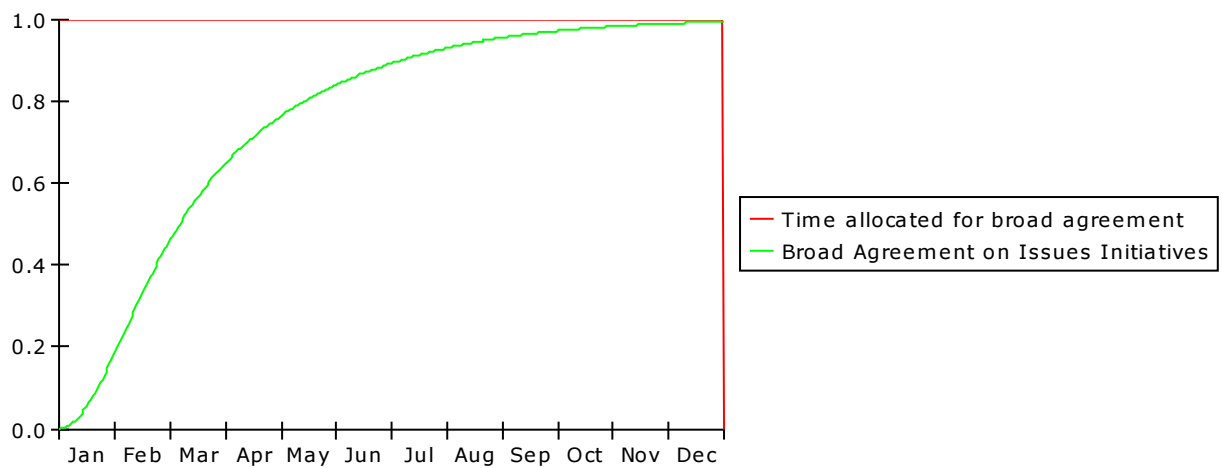


In fact, it will not be easy to reach the extreme interest gap either 0 (zero) or 1 (one), and the gap will never reach the value of 0 (zero); that is because no party always takes an extreme position and has to stand a different 180 degree all the time. Thus for the initial time, it is set the value of the interest gap up to 0.5 for a moderate case.

For initial state, there is no sense of any such broad agreement that might be caused of no social awareness about the issue. The sense of broad agreement is developed

by the change on the sense, which is driven by the effect of interest gap between government and the pressure group, the normative potential broad agreement that society can maximum reach which is set to 1 (one), and the allocated time (deadline) for broad agreement to established. Figure IV.12 shows the simulation result of the first stage of the policy cycle model.

**Figure IV.12: Simulated broad agreement**



The change rate of the sense will actually transform the normative potential broad agreement into the actual one. Sense of broad agreement will be reached when the level reaches closer to 1 (one). The closer to value of 1 will indicate the confidence in the society for the initiative willingness on the issue and be a signal for government to move on the next step of the policy-making process.

## **POLICY ANALYSIS**

Outline of the policy analysis stage can be drawn as in the following Table IV.4 for the system mapping and Table IV.5 for the variables are included in the simulation with the initial value, expected value, and the final value after the simulation.

**Table IV.4: Policy analysis stage system mapping**

The Actors	Resource Strategic	Intermediate Control	Final Result	Final Indicator
The Government: a. Ministry Steering Committee (MSC) b. Interdepartmental Task Force (ITF)	1. MSC: Confidence on the policy analysis result, key policy found, and clarified objective 2. ITF: Number of Submission received and Confidence in policy option	1. MSC: change in confidence on policy analysis, key policy found, and clarified objective 2. ITF: Submission rate and change in confidence on extracted policy option	White Paper <sup>6</sup>	Policy options
Public, including departmental national/local branch coordination meeting	3. Submitted opinion on policy	3. Submission rate	Submitted review or opinion	Number of Submission and Options

**Table IV.5: Initial, expected, and final value of the policy analysis stage**

No	Variable	Type	Initial Value	Expected Value	Final Value	Unit
1	Average Contribution on Policy Option from a Submission	Constant	1	-	-	option/unit
2	Time to Extract	Constant	2	-	-	mo
3	Interdepartmental Interest Friction	Constant	.5	-	-	dmnl
4	Weight on Steering Committee	Constant	.3	-	-	dmnl
5	Supportive External Review Report on Past	Constant	.3	-	-	dmnl

<sup>6</sup> Statement of a government's policy intention in a particular area, traditionally printed on white bond paper. (Bridgman and Davis 2000: 174)

No	Variable	Type	Initial Value	Expected Value	Final Value	Unit
	Policy					
6	Submission time	Constant	.5	-	-	mo
7	Time to revise Credibility	Constant	2	-	-	mo
8	Positive Submission	Stock	0	Max	32	unit
9	Proposed Policy Options	Stock	0	Optimum	~3	option
10	Confidence on Positive Policy Analysis	Stock	0	1	.99	dmnl
11	Potential Confidence Positive Policy Analysis	Stock	1	0	.01	dmnl
12	Credibility Ministerial Steering Committee	Stock	.5	1	.97	dmnl
13	Potential Credibility Ministerial Steering Committee	Stock	.5	0	.03	dmnl
14	Confidence on Key Policy Questions	Stock	0	1	.99	dmnl
15	Potential Confidence on Key Policy Questions	Stock	1	0	.01	dmnl
16	Objectives clarified	Stock	0	1	.999	dmnl
17	Potential Objectives clarified	Stock	1	0	.001	dmnl

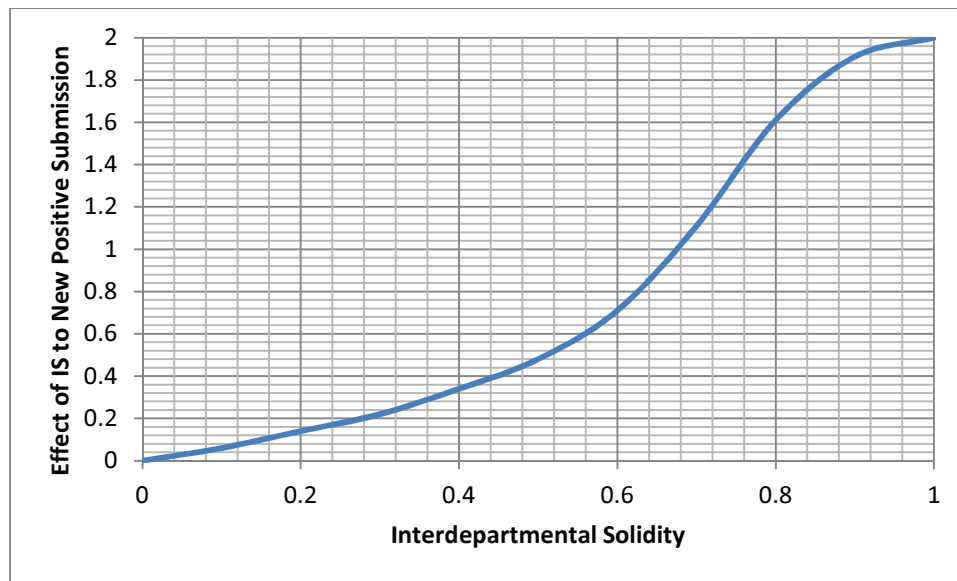
On her book, Edwards has made a slight modification of the concept of the policy cycle model from Bridgman and David. In the modified form, she described the policy analysis phase contains three major activities with some overlap in time, which are collect relevant data and information, clarify objectives and resolve key questions, and develop options and proposals (Edward, 2001., p.4; 24).

System mapping that has been drawn in this stage contains three major loops, one for reinforcing and the others two are balancing. The loops are assumed to begin after the ministerial task force has issued the green paper or discussion paper in which it is indicated



supporting department. Thus the higher solidity means the more idea, policy review or opinion coming onto the committee table and will give more policy option for the committee. Quantification is taken to reflect the effect of the interdepartmental solidity to the policy review and idea submission that can be seen on Figure IV.14 below:

**Figure IV.14: Effect of interdepartmental task force solidity**

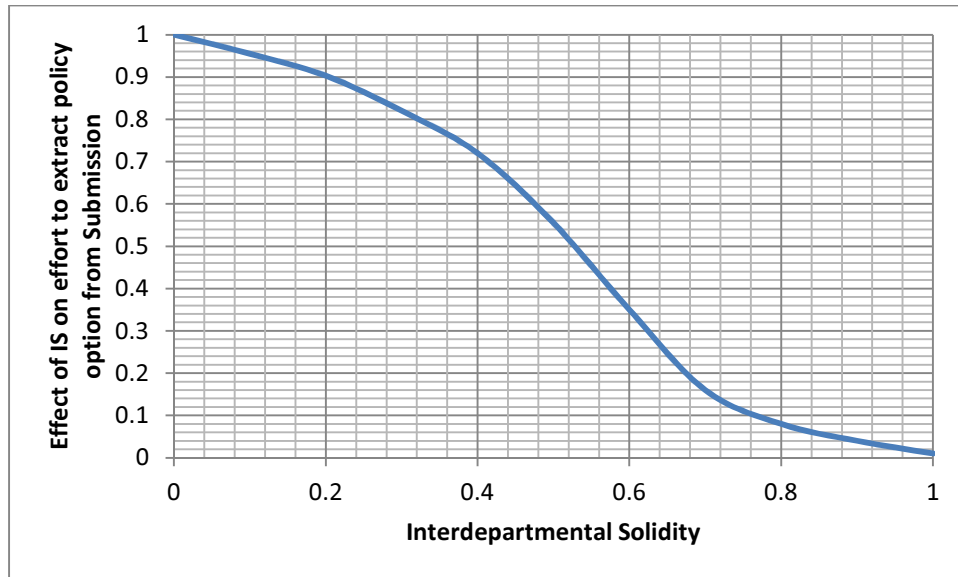


However, the credibility of the committee will be affected also by how it chooses the optimal option which is neither too much nor too less (too much option are chosen means the more ambiguity of purpose). These series of causalities create a balancing loop (B1), as can be seen on the former Figure IV.13.

Another series of causality which has created reinforcing loop (R1) also can be seen on the former Figure IV.13. Akin of loop emerges as interdepartmental solidity has another nonlinear effect to another variable, which is an effort on digesting and extracting options from the submitted idea about the policy. The effect is to follow the logic of when the interdepartmental solidity is high then the extraction efforts will less and lesser to

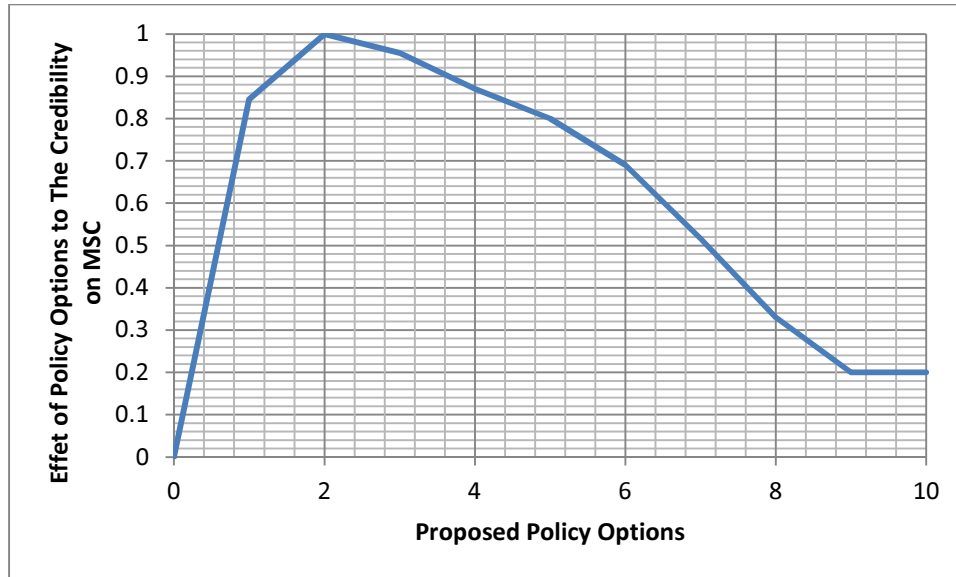
produce options with more quality, parsimonious, and robustness. The quantification effect can be seen on Figure IV.15 below:

**Figure IV.15 Effect of interdepartmental solidity to extract policy options from submission**



The robustness of extracted options in the simulation has been defined as how many options the committee will propose for the next round stage. The definition sounds like a little shallow in this way. However, the definition comes out from the fact that top executives usually demand only a few options, i.e. two or three options on their table. Thus, the higher number of options proposed by the committee will be surely to have an impact on its credibility. Specifically, the higher number of option proposed will then reduce the credibility since the more options proposed by the committee reflects a high ambiguity on understanding the policy vision of the top executive. The effect quantification of the number of option proposed to the MSC credibility can be seen on Figure IV.16.

**Figure IV.16: Effect of proposed policy options to the ministerial steering committee's credibility**



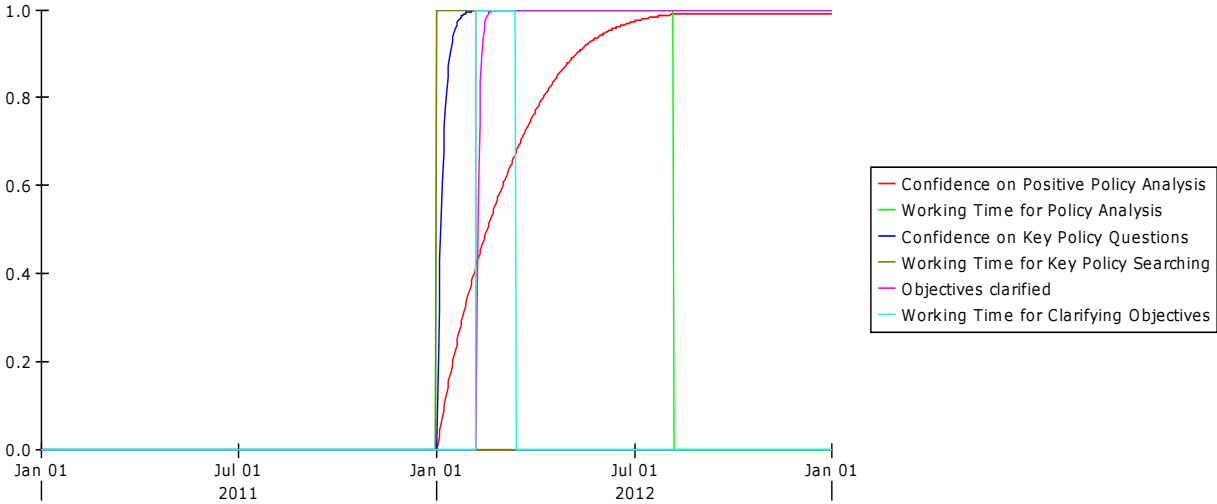
As can be observed on the above figure, the committee will be expected to propose about 2 or 3 options to the top executive which are cabinet meeting in this case. The more options proposed means the lesser credibility of the committee.

Some series of causal have also been indicated in the former Figure IV.13: The policy analysis stage stock and flow diagram creates the second balancing loop (B2). Along the policy analysis proses there is another process is done by the committee to search the policy's key questions and to clarify the policy objectives as vivid as possible. The clarity of intended policy objective will determine the success of the committee to filter the policy review and idea from public or ministerial local branch through national coordination meeting and other interested party to make a robust policy option proposal (white paper).

The development of committee confidence on the white paper is supported by the confidence on the other activities which are key policy question and policy objective

clarification. Graphically, the development of the three confidences on the three variables can be observed on the Figure IV.17 below:

**Figure IV.17: Simulated confidence on policy analysis, key question on policy, and clarified the policy objective**



As can be seen on the above figure, it clues the confidence development on the policy analysis report is preceded by the development of the key question and clarified objective of the policy. However, the confidence on policy objective is preceded by the confidence development on the policy’s key question.

**CONSULTATION AND DECISION**

Outline of the consultation and decision stage can be drawn as in the following Table IV.6 for the system mapping and Table IV.7 for the variables are included in the simulation with the initial value, expected value, and the final value after the simulation.

**Table IV.6: Consultation and decision stage system mapping**

<b>The Actors</b>	<b>Resource Strategic</b>	<b>Intermediate Control</b>	<b>Final Result</b>	<b>Final Indicator</b>
The Government: a. Cabinet Meeting (PM)	1. PM: a) Confidence on the Criterion definition and Options Selection, b) Budget	1. PM: a) change in confidence on the Criterion definition and Options Selection b) available budget	Policy option selected supported with reasonable budget	Consultation to the parliament proceeded
b. Departmental Staff (DS)	2. DS: a) Capability, b) Detail policy operationalization	2. DS: a) addition to capability b) confidence on policy operationalization	Policy Operationalization in detail and confidence on the policy operationalization	Staff's capability and Policy's detail increment
Law Maker (Legislative Body)	3. Approval Vote	3. Supporting and Opposing rate	Parliament Majority	Policy enactment
Pressure Group (Opposition Party)	4. Opposing vote	4. Change in opposition standing	Parliament disagreement	Blocked policy

**Table IV.7: Initial, expected, and final value of the consultation and decision stage**

End of Second Year

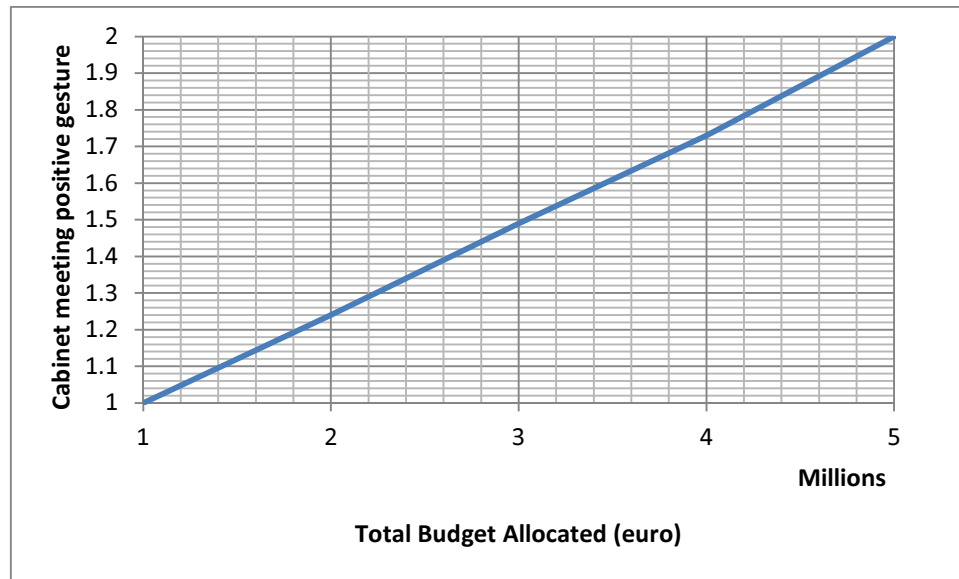
<b>No</b>	<b>Variable</b>	<b>Type</b>	<b>Initial Value</b>	<b>Expected Value</b>	<b>Final Value</b>	<b>Unit</b>
1	Potential Contradiction Opposition Party Point of View	Stock	.5	.5	.593	dmnl
2	Contradiction Opposition Party Point of View	Stock	.5	.5	.406	dmnl
3	Time to review point of view	Constant	5	-	-	mo
4	Potential Confidence on Criterion Selection	Stock	1	0	.028	dmnl
5	Confidence on Criterion Selection	Stock	0	1	.972	dmnl

No	Variable	Type	Initial Value	Expected Value	Final Value	Unit
6	Working time intensity to Find Criterion	Constant	10	-	-	da
7	Potential Confidence on Policy Decision	Stock	1	0	.001	dmnl
8	Confidence on Policy Decision	Stock	0	1	.999	dmnl
9	Working time intensity to decide Policy	Constant	15	-	-	da
10	Normal Against meeting	Constant	2	-	-	per mo
11	Against Lobby Effectiveness	Constant	.1	-	-	dmnl
12	Supportive Legislative member	Stock	50	100	94.99	Person
13	Against Legislative member	Stock	50	0	5.01	person
14	Legislative member	Constant	100	-	-	person
15	Supportive Lobby Effectiveness	Constant	.05	-	-	dmnl
16	Potential in Detail Policy Operational	Stock	1	0	.01	dmnl
17	Detail Policy Operational	Stock	0	1	.99	dmnl
18	Working time intensity to operationalize policy	Constant	2	-	-	da
19	Potential Department Staff Capability	Stock	.9	0	.06	dmnl
20	Department Staff Capability	Stock	.1	1	.94	dmnl
21	Induction time intensity	Constant	10	-	-	da

In the next step, the MSC has to bring what they have done in the former stage of policy making i.e. policy analysis and can be said MSC has three important roles in the current stage. First, its credibility is still an important part to boost the cabinet meeting positive gesture with its high confidence on the white paper. It means that the more MSC credibility will make the cabinet meeting in a higher positive gesture. However, the condition of the economic situation, i.e. the fiscal condition will give more pressure in the cabinet meeting. The tighter the fiscal environment will lead to the lesser allocated total budget. Somehow, total budget will affect the cabinet meeting gesture, specifically the

lesser the budget the lower positive gesture in cabinet meeting. The effect has been quantified in this thesis's simulation as can be observed on the following Figure IV.18:

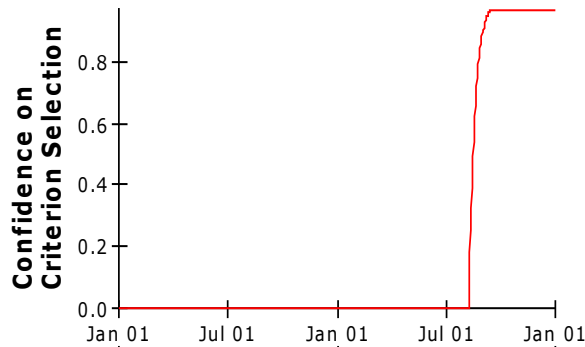
**Figure IV.18: Effect of fiscal environment to cabinet meeting gesture**



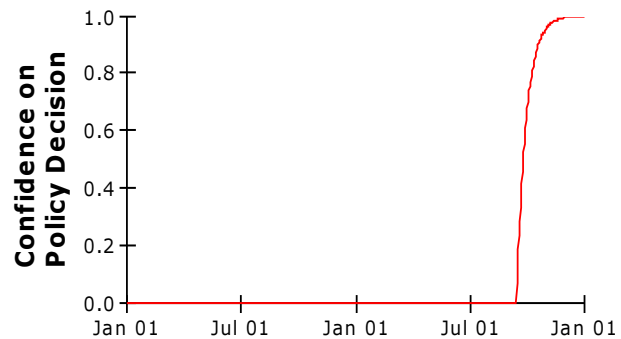
The total budget *per se* is calculated from the expected delivery of policy implementation and average budget spent for per percentage (1%) delivery, further will be discussed in the next section.

Next, the cabinet meeting must decide the criterion to select the best policy proposal. To make the best choice of policy this means to choose with high confidence and must be preceded with high confidence on the criterion selection. In other words, the more confidence on the criterion selection will lead to the more confidence in the policy decision. Thus, it will ease the departmental staff in making the details of the policy decision. The confidence development along the simulation can be seen on the figure IV.19a, b:

**Figure IV.19a: Criterion selection**



**Figure IV.19b: Policy decision**



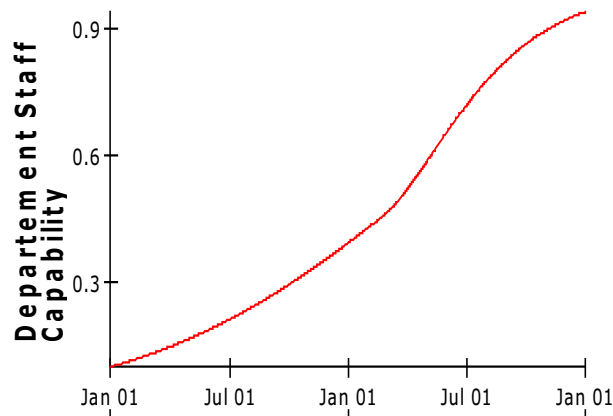
On two above figures, after the certain level of confidence is reached then the policy decision can be taken and at a given time the confidence on it will be accumulated to reach the maximum level which is 1 (one) in order to be ensued to the other step i.e. policy operationalization.

The credibility of MSC, on the other side has a second important role to be akin of ‘bridge’ from the top-level government to the lower staffs in the ministerial department as the implementation team members who are standing in the front line to make the policy implementation is successful. The higher credibility of the MSC will make the probability of success to spread the policy’s vision to the ‘front liner’ higher through an induction process, such as training, seminar, national or local coordination meeting etc. Bruijn, in his book called such role as “boundary spanners” who are the actor operating on the boundary between the managerial and the professional system (Bruin, 2002, p.66).

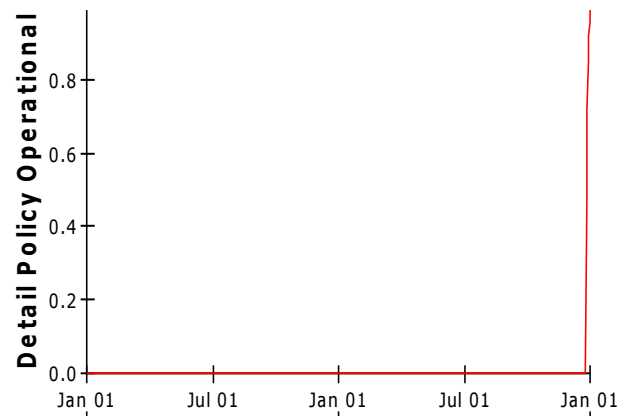
Specifically, the more MSC credibility will lead to the more induction that they can make and the more addition to the capability of the implementation team. However, this capability addition is depending on the current capability that the staffs have already (.1), its normative potential (.9), and the induction time, specifically the more actual capability will lead to the more ‘addition to the capability’ and the more capability of the

staff will be (R1). Eventually, the actual capability of implementation team will affect the confidence on the policy operationalization which is the more capable the team, the higher confidence on policy operationalization will be. The development of implementation team capability and policy operationalization in detail along the simulation can be seen on the Figure IV.20a, b below:

**Figure IV.20a: Team Capability**



**Figure IV.20b: Policy operationalization**

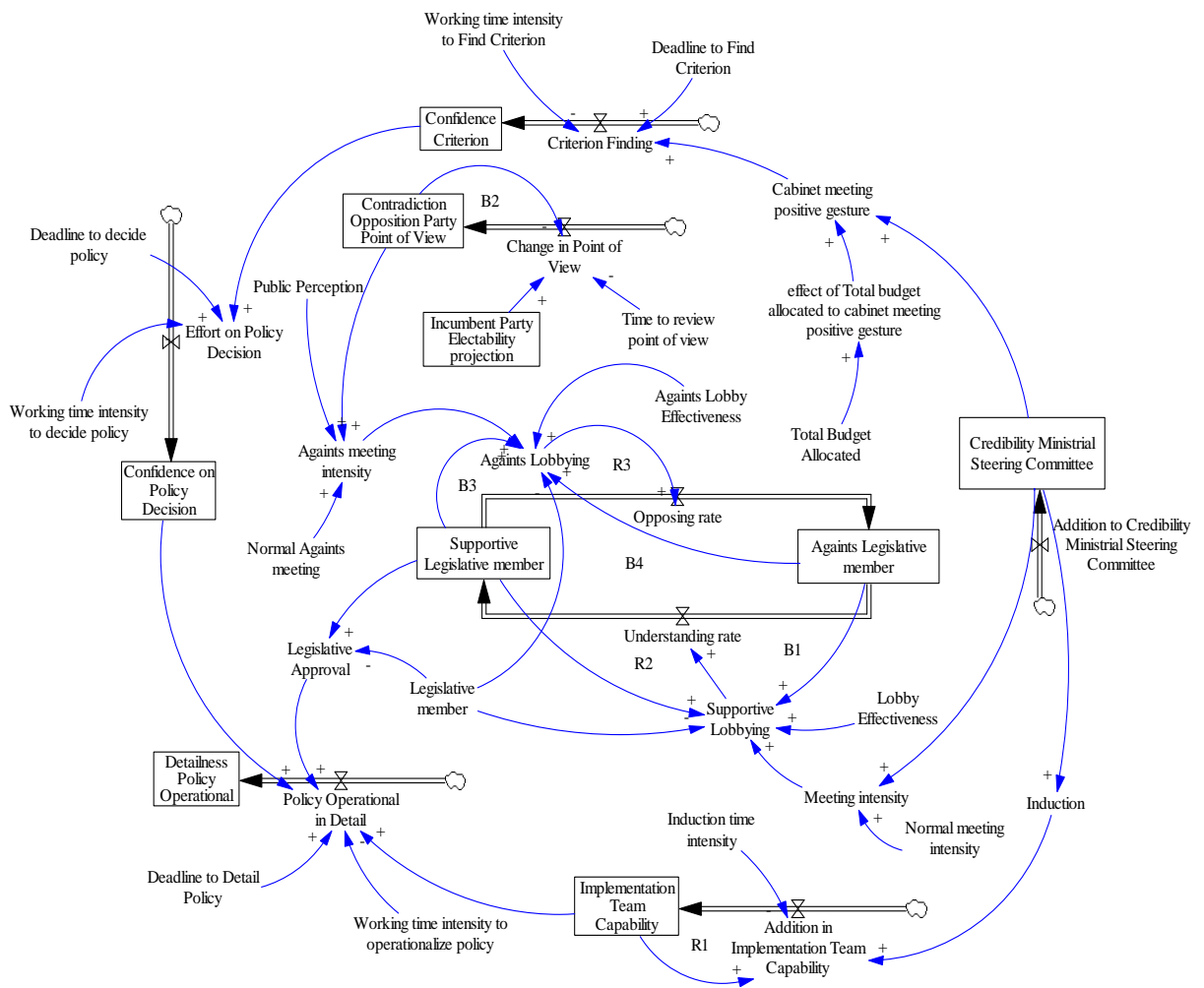


As can be observed on the above figure, at the beginning it is set that the staff capability to implement such policy is not 0 (zero). It follows the sense that it does not make sense if staff capability is zero, since they have a minimum requirement to have their job. At the end of the current stage's simulation, the value of team's capability and policy operationalization successively are .94 and .99 as it has been shown on the former Table IV.7.

The third another important role of the MSC as the boundary spanners is to deal with the law makers or legislative body through lobbying activities. The higher MSC's credibility will make them able to organize gathering, meeting, seminar, workshop, etc. for

idea and vision sharing. These efforts eventually can increase understanding from the legislative body members to support the policy implementation. It means that the more understanding rate, the more legislative member supports the policy (R2), meanwhile the more understanding rate will reduce the legislative member who against the policy implementation, and the lesser the number of opposing member, the lesser lobby to support the policy (B1). The complete series of causal relationship can be seen on the Figure IV.21:

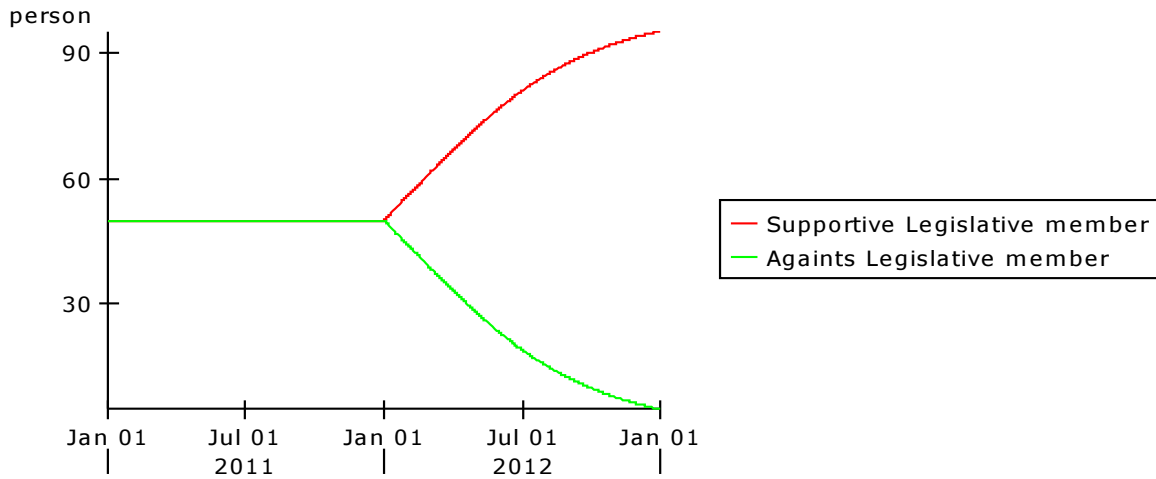
**Figure IV.21: The consultation and decision stage stock and flow diagram**



Another case, the opposition party as the real pressure group that stands to challenge the incumbent party's majority, will keep observing their opponent electability projection. The higher electability projection of the incumbent party (IPE) is perceived by the opposition party as a threat to their electability thus they will make their challenge harder the policy initiative by making tougher their contradiction perspective. In other words, if the opposition perceived that the successful implementation of the proposed policy will give the benefit to the incumbent party's electability in the next round of the general election then they are eagerly to block the policy as possible as they can. Specifically, the more IPE, the more change to the contradiction perspective, the tougher opposition standing. On the other hand, the more opposing stand; the lesser addition to it since practically there is no opposing views forever (B2).

As perception on policy can go very differently between the incumbent and opposition party if the opposing party perceived that the policy will only give its benefit to the incumbent party, they begin to lobby to against the policy implementation. The more lobby to against the policy implementation, the more opposing rate which has implications to the lesser supportive legislative member (B3) and the more legislative members who oppose the policy (R3). The development behavior of the legislative members who are supportive or against the policy implementation can be seen on the Figure IV.22:

**Figure IV.22: Simulated legislative’s member on the policy initiative**



As can be seen on above figure, it has been set for initial simulation that there is no majority figure in the legislative body (50-50, with the total legislative member is 100 person) concerning to the confidence of the policy until the MSC is established. MSC starts to make lobbies as the preparation for the proposed policy in order to reach a majority figure in the parliament which is at least 51% is in favor to support the policy. Thus, if the ‘favor’ majority cannot be reached then for sure government cannot implement the policy.

**IMPLEMENTATION**

Outline of the implementation stage can be drawn as in the following Table IV.8 for the system mapping and Table IV.9 for the variables are included in the simulation with the initial value, expected value, and the final value after the simulation.

**Table IV.8: Implementation stage system mapping**

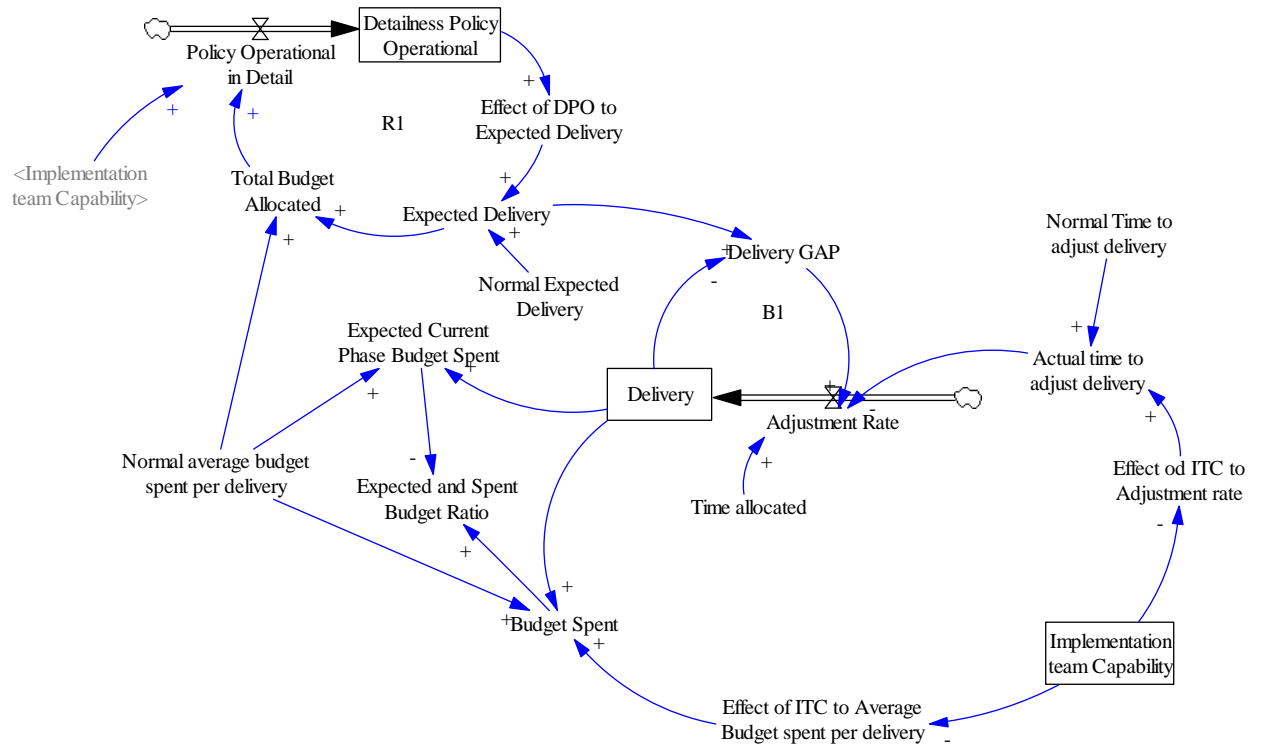
The Actors	Resource Strategic	Intermediate Control	Final Result	Final Indicator
1. Government: Implementation Team (included local branch of department)	Delivery of policy	Delivery adjustment rate	Policy delivered 100%	1. Delivery GAP 2. Expected and Budget Spent Ratio

**Table IV.9: Initial, expected, and final value of the implementation stage**

No	Variable	Type	Initial Value	Expected Value	Final Value	Unit
1	Delivery	Stock	0	100	99.66	%
2	Normal Time to adjust delivery	Constant	4	-	-	mo
3	Department Staff Capability	Stock	.1	1	.9928	dmnl
4	Normal average budget spent per 1% delivery	Constant	5,000,000	-	-	euro
5	Detail Policy Operational	Stock	0	1	1	dmnl
6	Delivery GAP	Auxiliary	100 (at the implementation starting date)	0	.34	%
7	Budget Spent Ratio	Auxiliary	1.14 (at the implementation starting date)	1	1	dmnl

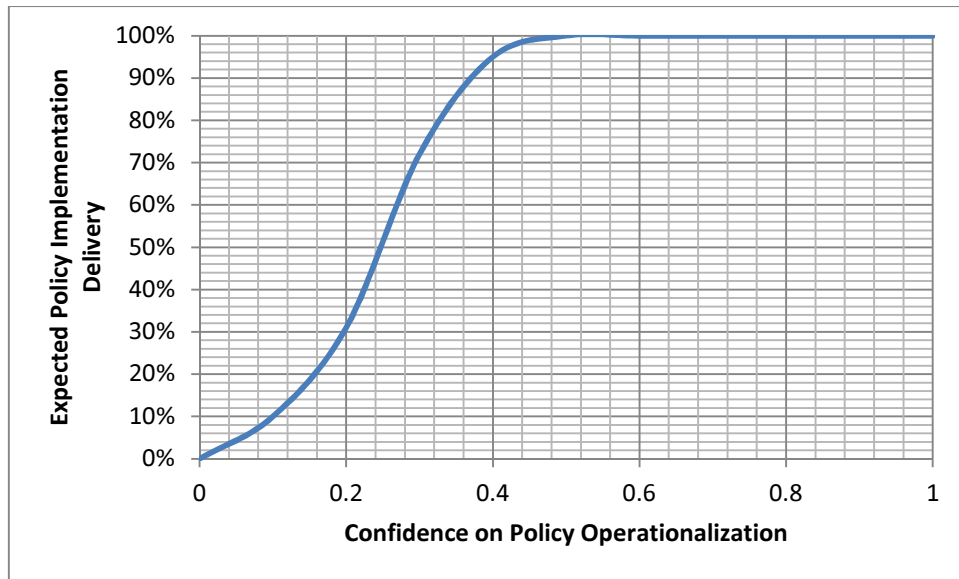
The fourth step in the policy cycle model requires firm confidence from the former stage. As can be seen on the Figure IV.23 below, the implementation team's capability in doing the required job in this stage and the detail of policy operationalization are dominating the process.

**Figure IV.23: Policy implementation stocks and flows diagram**



However, two loops are introduced in this stage; first, the confidence on the detail policy information somehow has an effect to ‘expected delivery’ which is the more confidence on the policy operationalization leads to the more expected delivery. Quantification on this effect can be seen on the Figure IV.24:

**Figure IV.24: Effect of policy operationalization on the expected policy delivery**



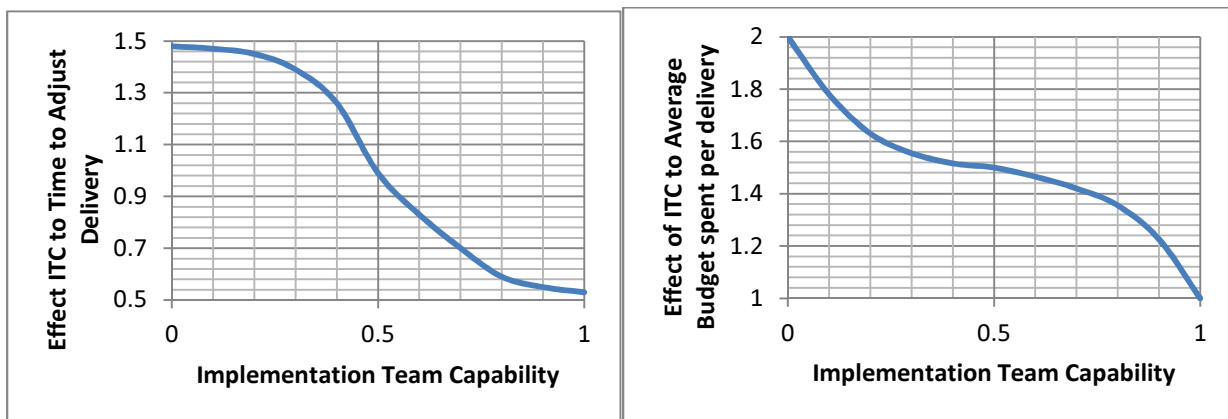
On the above figure, there can be seen a high expectation on policy implementation. The quantification follows the sense of an organization frequently likes to put their expectation as high as possible regardless the resource it has is able to support or no. In this concern, the sense implies the government still puts the high expectation to have 100% policy implementation delivery even though the confidence on policy operationalization is not perfect on the highest level which is 1 (one). In the thesis simulation, the government expectation is set on the level of 1 (one) if the level of confidence on policy operationalization is equal or more than 0.5. Below that level of confidence, the government expectation will decrease nonlinearly to 0% if there is no confidence at all on the policy operationalization which is in theory might be happened.

The expected delivery will then determine how much the budget will be allocated precisely. Thus, the more expectation on the policy deliveries means the higher budget will be allocated. And through some connecting variables as can be seen on former Figure

IV.23, the total budget has implications on the effort to detail the policy operationalization to boost its confidence. These series of causality create reinforcing loop (R1) in this stage.

On the other side, Implementation Team Capability (ITC) has been assumed to have two effects; first on the time to adjust delivery (TAD) and second on the budget spent (BS) which are quantified as the following Figure IV.25a,b:

**Figure IV.25a: Effect of ITC to TAD    Figure IV.25b: Effect of ITC to BS**

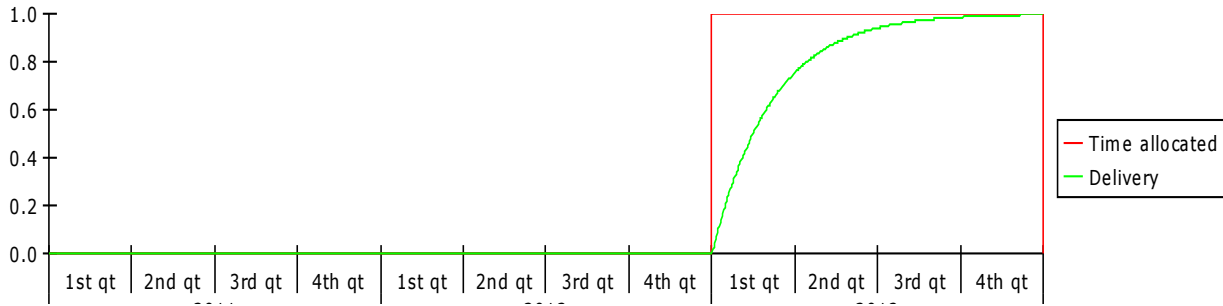


As can be observed on above two graphs, the effect of ITC on the variable of time to adjust the delivery and average budget spent per 1% deliveries are in nonlinear pattern with a negative slope. The difference is on its elasticity, specifically the effect of ITC on Figure IV.25a is inelastic and to the other Figure IV.25b the effect is elastic.

The second loop is created from series of causality as follows; the more gaps on the policy implementation delivery will lead to force the implementation team to boost their effort to minimize the gap and then the faster adjustment rate implies the more delivery is delivered. The more delivered delivery will reduce the delivery gap (B1). Thus, the behavior of the delivery is expected to be a goal seeking.

Given the time to implement the policy a year, the behavior delivery of the policy implementation is seen on the Figure IV.26 below:

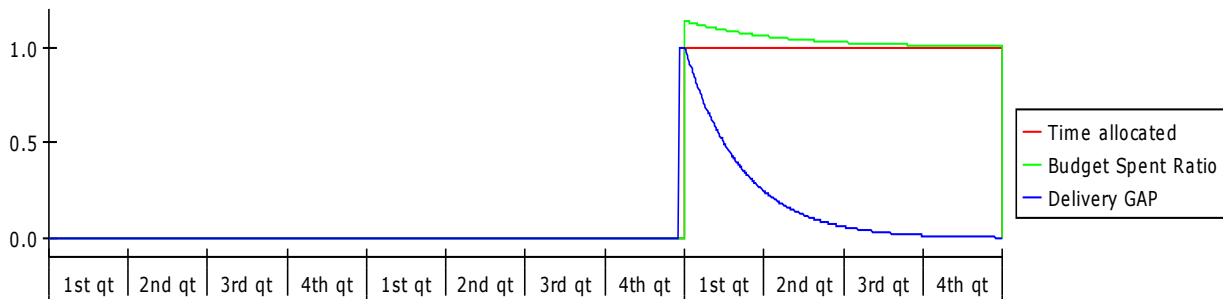
**Figure IV.26: Simulated policy delivery within the given time schedule**



It seems on the above figure that the simulation result supports the expectation on the delivery behavior which is ‘goal seeking’. It tells that on the first quarter the delivery grows very fast as the delivery gap is very wide in that time and then along with the delivery gap reduction, the delivery increment becomes lesser and lesser.

There are two variables, which are considered as the positive indicator for the policy implementation in the thesis that are ‘delivery gap’ and ratio of expected budget and budget spent. The delivery gap is expected to be 0 (zero) while the ratio is expected to reach 1 (one) at the end of the implementation time. The behaviors of the two indicators are shown on the Figure IV.27:

**Figure IV.27: Simulated expected budget to budget spent ratio**



As can be seen on the Figure IV.27, the expectations on the two indicators more or less are reached. In the end of simulation for this stage, it gives the value of 1 for the ratio and of 0.34% for the delivery gap. These two values also can be seen on the former Table IV.9.

## EVALUATION

Outline of the evaluation stage can be drawn as in the following Table IV.10 for the system mapping and Table IV.11 for the variables are included in the simulation with the initial value, expected value, and the final value after the simulation.

**Table IV.10: Evaluation stage system mapping**

The Actors	Resource Strategic	Intermediate Control	Final Result	Final Indicator
1. Government a. Ministerial related to the policy	Review on the Implemented Policy	Facts finding	Report	Public perception
2. Non-Government Organization				
3. Academicians				
4. Legislative body				

**Table IV.11: Initial, expected, and final value of the evaluation stage**

No	Variable	Type	Initial Value	Expected Value	Final Value	Unit
1	Potential Positive Policy Evaluation Report	Stock	1	0	.001	dmnl
2	Positive Policy Evaluation Report	Stock	0	1	.999	dmnl
3	Public Perception	Auxiliary	0	1	.87	dmnl

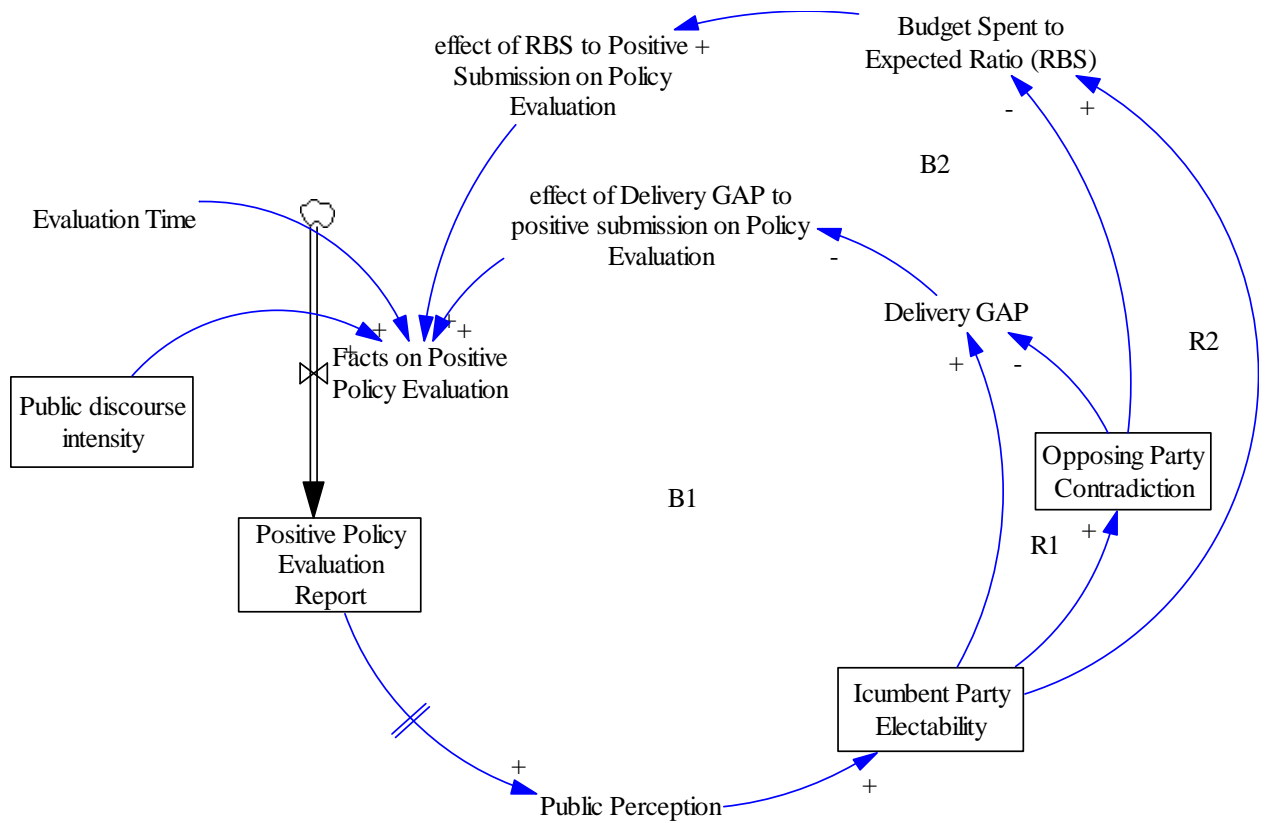
The last stage of the policy cycle finally is reached. According to Edwards, the evaluation policy stage can lead to the policy revision, and then she said that the objective of the stage is to assess the extent to which the policy objectives originally set were

actually met and met efficiently (Edwards, 2001, p. 6-7). In the thesis has been introduced the delivery gap and the budget spent and expected ratio as the final indicators. Successively, those indicators accommodate 'the policy objective originally set were actually met' is meant 100% delivered and 'met efficiently' is meant delivered with exact expected budget (the ratio budget spent to expected ratio is 1 (one)).

About the evaluation stage, Edwards has given important remarks in her book, which is the evaluation stage is not necessarily a neutral, technical exercise but can be as politically charged as any of the other policy development phases. To understand the evaluation stage, it is therefore important to consider also who initiates the evaluation, why, and how it is organized (Edwards, 2001, p. 7).

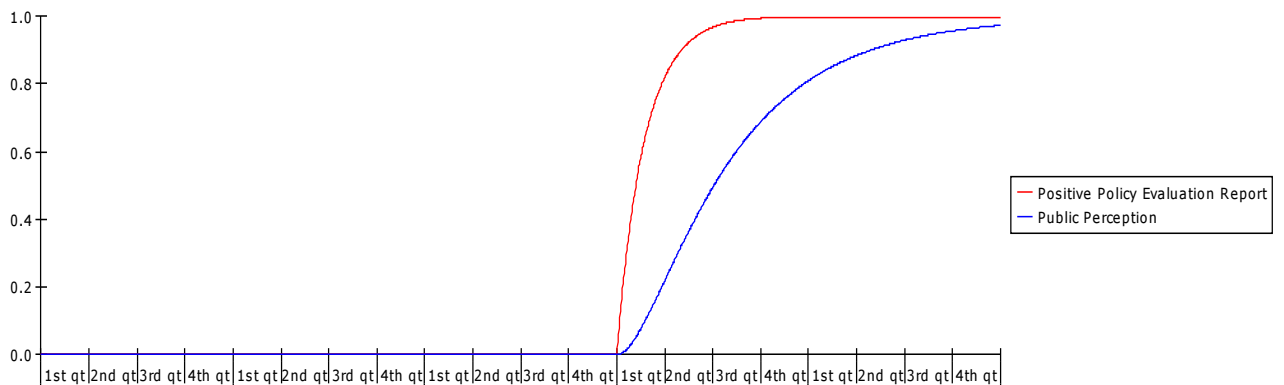
However, all policy reviews that have been posted either the negative or positive review on the policy cycle from the initial stage to the final stage will be perceived by the policy's object itself which is the public. Specifically, as can be seen on Figure IV.28: System Mapping for Evaluation Stage, the more positive outcome that public can take the benefit from the policy implementation will for sure lead the higher positive public perception.

**Figure IV.28: Evaluation stage's stocks and flows diagram**



The simulation result concerning to the public's perception can be seen on the following Figure IV.29:

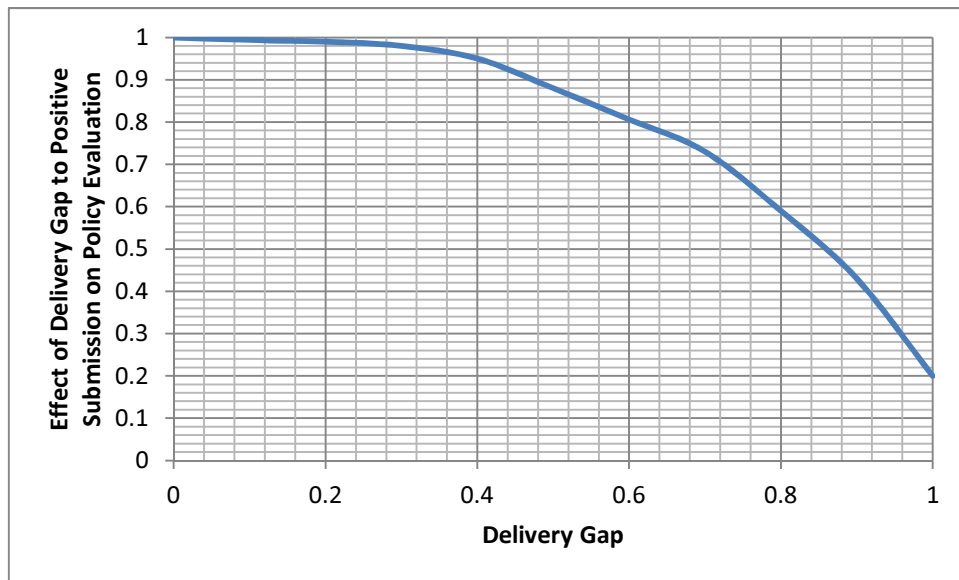
**Figure IV.29: Simulated positive policy valuation report and the public perception**



On the Figure IV.29, public perceived the positive with some time lags, but eventually public will fully perceive what have been reported positively from the policy implementation after it has felt the policy's outcome.

The more positive public perception makes the better incumbent party electability projection (IPE) in the next round general election. With involving causality series from the former stage i.e. Figure IV.21; the more IPE means the higher expected delivery and the higher delivery gap. Then, the lesser delivery gap leads to the higher effect on the facts finding (positive review) of the policy and the last will make the positive policy evaluation report is higher to the maximum normative evaluation i.e. 1 (one). The quantification effect of the delivery gap to the submission of positive facts finding can be seen on the Figure IV.30 below, meanwhile these series of causality will form balancing loop (B1).

**Figure IV.30: Effect of delivery gap on the positive report on the policy**

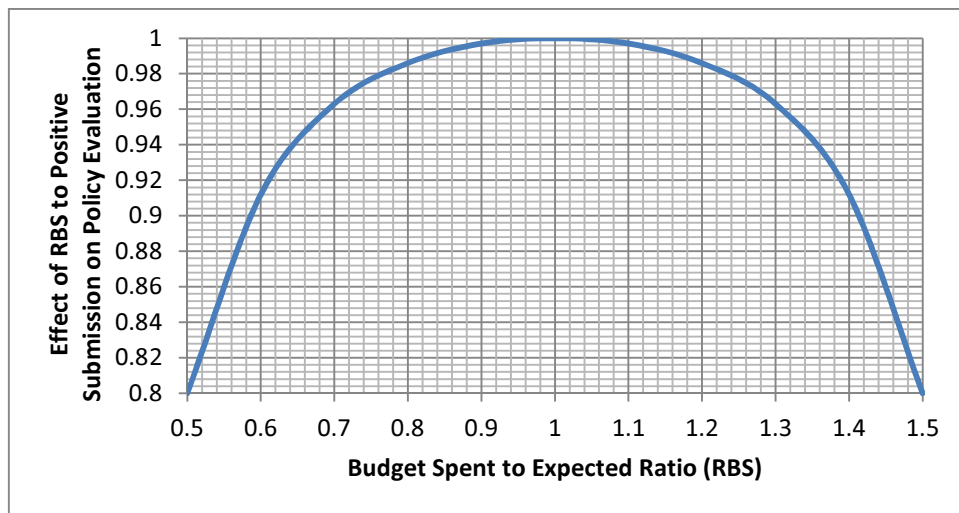


As it can be observed on above figure, the more delivery gap will lead to the lesser positive submission on the policy review. However, it also can be seen that the

lowest effect is 0.2 when the delivery gap is 1 or 100%. The sense behind such quantification is that even though there are 100% gap of delivery which the policy is failed to be implemented; there will be still a positive report concerning to the ‘lesson learned’ at least.

On the other hand, the better IPE will mean the closer budget spent to expected ratio to 1 (one) then the closer this ratio to 1 (one) leads to the much more positive evaluation reports through the quantification of its effect to the submission of positive facts finding, which can be seen on the Figure IV.31 below. These series of causality form second reinforcing loop (R2).

**Figure IV.31: Effect of RBS deviation from 1 to positive report on policy**

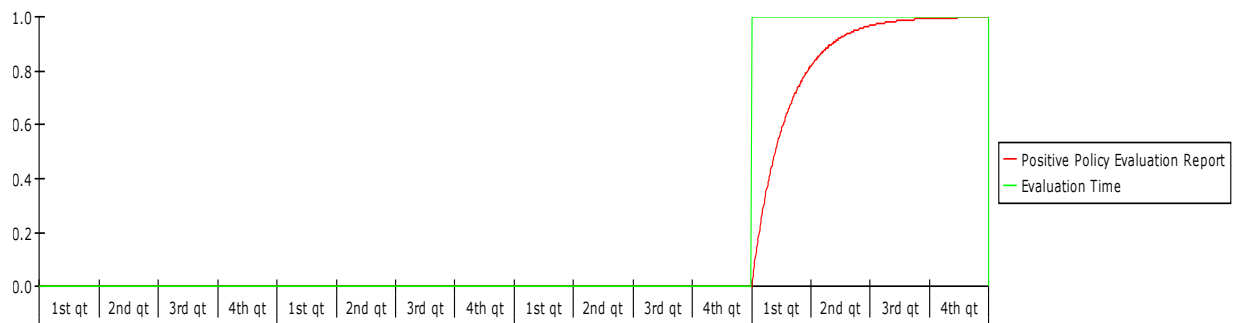


Above figure shows the effect of deviation from the expected RBS which is 1. Such quantification tells that the more deviation from 1, the lesser positive submission reviews on the policy implementation.

The other regard from the figure IV.28 is that the higher IPE will be perceived ‘bad news’ by the opposing party, that is why the higher IPE will make the opposition

party put more contradiction (challenge) to the government. Also through a long series of causality from the former system mapping stage i.e. from Figure IV.1a; IV.13; IV.21; and IV.23, the higher challenge from the opposition party will lead to the higher delivery gap. These series will create the first reinforcing loop in the system mapping (R1) and the higher deviation of budget spent to expected ratio from 1 (one) and the series create the second balancing loop (B2). For the result of the simulation of the current stage can be seen on the following Figure IV.32:

**Figure IV.32: Simulated positive report on the policy**



Policy implementation' dynamics can be seen on above Figure IV.32 where it is reflected by the delivery delivered time to time beginning from the start of policy implementation. The delivery of the policy is grown increasingly as the delivery gap is still wide. The growth is starting to decrease after the first quarter is reached and then keep on decreasing until it reaches the desired delivery which is 100% delivery (goal seeking phenomenon).

## **CONCLUSION AND IMPLICATION FOR FURTHER RESEARCH**

This paper has presented stage by stage of the policy cycle model as the basis framework to explore and understand complexities in the public policy-making process. The policy cycle model has been observed on some cases from Australia written by

Edward (Edward, 2001) and a case from Indonesia written by Pramusinto (Pramusinto, 2006).

From the first stage, complexities arise when among the government and the pressure groups have a different perception, a different point of view on an issue. Each actor has different agendas with a variety background interest, mainly political power. The perception gap is then publicized by the press to create public opinion since indeed public has the need of information to be fulfilled. This is creating another pressure to either government (issue related ministerial office) or pressure groups to align the perception until the sense of broad agreement is reached.

The second stage of the policy cycle model has other complexities that can be understood. Complexities now come from the new actors who come into the stage system. When the ministerial steering committee is established with some members coming from different background and experiences, the committee *per se* will have its credibility. The credibility of the committee will have some important roles to put the committee on a strong command and determination to make the interdepartmental team works with enthusiast. Credibility of the committee and the solid interdepartmental team will be very helpful to attract submission of ideas. On the other way, the committee should be able to find the key policy questions and clarify the findings to the top level of government, i.e. the prime minister and his cabinet since the clear objective is needed to filter the idea from the submission.

The main complexity in the third stage is coming from the vested interest of the actors in the house of legislative; either incumbent party or opposition party. Each side will

as much as possible to support policy that could raise their own prospect to win the next round general election to have a parliament majority. However, ministerial steering committee still has important roles in this concern. The committee could be a boundary spanner to alter the departmental staff capability to work on the policy. On the other hand, the committee should be able to convince and to make the cabinet meeting within a tight fiscal condition choose a solid and robust selection on the available policy options. Law makers lobbying is become another role that the committee should do to secure the legislative approval, failed to accomplish this role will block all effort to implement the policy. It implies that the committee should consider the interest of the opposition party in the parliament.

The fourth and fifth cycle discussed about implementation and evaluation. The implementation stage starts from how detail the policy operationalization is, the more detail could make the implementer team's work is easier. The implementation success indicators are 'the delivery gap' and 'the budget spending to the expected budget ratio' that depend also on the capability of the implementer team. In evaluation stage, perception from public on the different between what are the institutional reports on their review on the policy implementation and what is public receive and perceive from the policy implementation will determine the next general election winner among the incumbent party or the opposition party. The complexities that have been explored in the paper is hoped to be able to enlarge a widely open discussion further in the field of public policy field from the point of view system dynamics and the paper also support the use of system dynamics for learning tools to build pitfall awareness in the policy making for public among the public policy makers.

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## **CHAPTER V**

### **CONCLUSION**

General insights of the thesis can be drawn as the following; the effort to search and explain the dynamics behavior of SMEs development in Indonesia using system dynamics approach gave some insight findings. Such the dynamics development SMEs might not the intended result from what the policy had been implemented for, even the awareness on the impact from the policy might be too low in order to aware the unintended effect is working on. Along the simulation in the first chapter has shown that such dynamic behavior is caused by a shock in the aggregate demand which started from 2003/2004. Some series of even that can make the shock such as money politic or in-kind transfer for political party constituent and the implementation of the unconditional cash transfer along the year of 2004-2010. This finding is based on Cunha et all's observation that the policy cash or in-kind transfers such as the government implemented program or politician in-kind transfer will raise the total demand for normal goods (Cunha et all, 2010).

It seems that SMEs in Indonesia serve the domestic market rather than international market. The facts that from 2004 to 2008, SMEs, export is on average only 7.12% of its GDP. Herewith, it can be said that the market of SMEs is the domestic market that is around 92.88% of its GDP. Simulation in chapter three reveals two policies that could be supportive to cope with the unsustainable dynamics behavior of SMEs which are the production coordination system and the use of the PSP contract financing system for small enterprises (SEs).

The production coordination can further prevent entrepreneurs to produce products without knowing their market. It can be done through an information provision system about the aggregate demand of SMEs product. The provision will give a signal and chance to entrepreneurs to make better planning in production capacity and stock management. Such insight re-emphasizes the importance of efforts to coordinate production as expressed by Mezgar and Kovacs (1998); Mezgar et al (2000).

On the other case, the simulation's result on the use of the PSP contract for small enterprises is beneficial for the enterprises and for the economic as well. PSP contract could boost the number of small enterprises although it still could be affected by the crisis situation. However, at the same time it is also able to create a bigger value added for the economy from the point of view employment creation, the investor can get a better return because the current value of a PSP contract a year can outperform the investor capital future value expectation based on the risk-free rate discount with a minimum agency risk with the use of *dual layer referencing*.

The complexities to enable policy in public sectors have been revealed in the chapter fourth by exploring it through the policy cycle model stage by stage. Each stage has its own complexities since the interaction among the actors (Serman, 2000) with some degree of differences about perception, interest, and agenda. The understanding on such complexities in the policy-making proses from the point of view policy cycle model is needed to encourage an open discussion among the policy makers, politicians, the press, as well as the public to put policy to the most beneficial for all the stakeholders.

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**APPENDIX 1: SMEs' data from Central Statistical Bureau of Indonesia  
(BPS) from 1999 to 2008**

**TABEL-1.1  
Jumlah Unit Usaha Kecil, Menengah dan Besar Menurut Sektor Ekonomi  
Tahun 1999 - 2003**

NO	SEKTOR	TAHUN 1999					TAHUN 2000					TAHUN 2001				
		SKALA USAHA		UMK (unit)	SKALA USAHA		UMK (unit)	SKALA USAHA		UMK (unit)	SKALA USAHA		UMK (unit)	SKALA USAHA		
Kecil (unit)	Menengah (unit)	Besar (unit)	Jumlah		Kecil (unit)	Menengah (unit)		Besar (unit)	Jumlah		Kecil (unit)	Menengah (unit)		Besar (unit)	Jumlah	
1	PERTANIAN, PERUMAHAN KEHUTANAN DAN PERIKANAN	23.174.579	1.741	23.176.320	66	23.176.386	23.516.865	1.751	23.518.616	63	23.518.684	24.012.534	1.744	24.014.278	70	24.014.348
2	PERTAMBANGAN DAN PENGALIHAN	132.617	464	133.081	47	133.128	150.495	526	151.021	53	151.074	199.382	697	200.079	71	200.150
3	INDUSTRI PENGOLAHAN	2.526.163	10.058	2.536.221	665	2.536.886	2.699.801	10.391	2.620.192	686	2.620.878	2.551.347	7.816	2.559.163	516	2.559.679
4	LITROK, GAS DAN AIR BERSIH	4.892	395	4.887	40	4.927	3.868	401	4.269	37	4.306	4.372	453	4.825	42	4.867
5	BANGUNAN	102.332	5.914	108.246	139	108.375	130.750	6.979	127.729	151	127.880	111.033	6.418	137.451	139	137.590
6	PERDAGANGAN, HOTEL DAN RESTORAN	8.688.215	21.853	8.710.068	416	8.710.484	8.675.945	21.819	8.696.864	416	8.697.280	8.477.380	21.322	8.498.702	406	8.499.108
7	PENGANGKUTAN DAN KOMUNIKASI	1.707.762	2.084	1.709.846	100	1.709.946	1.868.081	2.279	1.870.360	119	1.870.470	1.779.150	2.171	1.781.321	104	1.781.425
8	KEUANGAN, PERSEWAAN, JASA PERUSAHAAN	24.143	5.321	29.464	261	29.725	25.034	5.517	30.551	269	30.820	25.667	5.636	31.323	276	31.599
9	JASA - JASA	1.499.206	4.384	1.503.590	161	1.503.751	1.699.416	4.969	1.704.385	183	1.704.568	1.692.876	4.950	1.697.826	182	1.698.008
	Jumlah	37.859.599	52.214	37.911.723	1.885	37.913.608	38.669.355	54.632	38.723.987	1.973	38.725.960	38.853.741	51.227	38.904.966	1.806	38.906.774



**TABEL - I.1**  
**PERKEMBANGAN JUMLAH PELAKU USAHA MENURUT SKALA USAHA**  
**TAHUN 2003 - 2004**

NO	SKALA USAHA	JUMLAH (Unit)		PERTAMBAHAN	
		2003 *)	2004 **)	JUMLAH	%
1	Usaha Kecil (UK)	42.475.756	43.158.468	682.712	1,61
2	Usaha Menengah (UM)	59.580	63.361	3.781	6,35
	Usaha Kecil dan Menengah (UKM)	42.535.336	43.221.829	686.493	1,61
3	Usaha Besar (UB)	2.169	2.248	79	3,64
<b>J U M L A H</b>		<b>42.537.505</b>	<b>43.224.077</b>	<b>686.572</b>	<b>1,61</b>

Keterangan :

\*) Angka Sementara

\*\*) Angka Sangat Sementara



**TABEL - I.1**  
**PERKEMBANGAN JUMLAH PELAKU USAHA MENURUT SKALA USAHA**  
**TAHUN 2004 - 2005**

NO	SKALA USAHA	JUMLAH (Unit)		PERKEMBANGAN	
		2004 *)	2005 **)	JUMLAH	%
1	Usaha Kecil (UK)	43.641.094	44.621.823	980.729	2,25
2	Usaha Menengah (UM)	66.318	67.765	1.447	2,18
	Usaha Kecil dan Menengah (UKM)	43.707.412	44.689.588	982.176	2,25
3	Usaha Besar (UB)	4.068	4.171	103	2,53
<b>J U M L A H</b>		<b>43.711.480</b>	<b>44.693.759</b>	<b>982.279</b>	<b>2,25</b>

Keterangan :

\*) Angka Sementara

\*\*) Angka Sangat Sementara

**TABEL - I.1**  
**PERKEMBANGAN JUMLAH PELAKU USAHA MENURUT SKALA USAHA**  
**TAHUN 2005 - 2006**

NO	SKALA USAHA	JUMLAH (Unit)		PERKEMBANGAN	
		TAHUN 2005 *)	TAHUN 2006 **)	JUMLAH	%
1	Usaha Kecil (UK)	47.006.889	48.822.925	1.816.036	3,86
2	Usaha Menengah (UM)	95.855	106.711	10.856	11,33
	Usaha Kecil dan Menengah (UKM)	47.102.744	48.929.636	1.826.892	3,88
3	Usaha Besar (UB)	6.811	7.204	393	5,77
	<b>JUMLAH</b>	<b>47.109.555</b>	<b>48.936.840</b>	<b>1.827.285</b>	<b>3,88</b>

Keterangan :

\*) Angka sementara

\*\*) Angka sangat sementara

**TABEL - I.1**  
**PERKEMBANGAN JUMLAH PELAKU USAHA MENURUT SKALA USAHA**  
**TAHUN 2006 - 2007**

NO	SKALA USAHA	JUMLAH (Unit)		PERKEMBANGAN	
		TAHUN 2006 *)	TAHUN 2007 **)	JUMLAH	(%)
1	Usaha Mikro	46.746.567	47.702.310	955.743	2,04
2	Usaha Kecil (UK)	1.917.897	2.017.926	100.029	5,22
3	Usaha Menengah (UM)	114.687	120.253	5.566	4,85
	Usaha Kecil dan Menengah (UKM)	48.779.151	49.840.489	1.061.338	2,18
4	Usaha Besar (UB)	4.398	4.527	129	2,93
	<b>JUMLAH</b>	<b>48.783.549</b>	<b>49.845.016</b>	<b>1.061.467</b>	<b>2,18</b>

Keterangan :

\*) Angka Sementara

\*\*) Angka Sangat Sementara

**TABEL - I.1**  
**PERKEMBANGAN JUMLAH PELAKU USAHA MENURUT SKALA USAHA**  
**TAHUN 2007 - 2008**

NO	SKALA USAHA	JUMLAH (Unit)		PERKEMBANGAN	
		TAHUN 2007 *)	TAHUN 2008 **)	JUMLAH	(%)
1	Usaha Mikro	49.287.276	50.697.659	1.410.383	2,86
2	Usaha Kecil (UK)	498.565	520.221	21.656	4,34
3	Usaha Menengah (UM)	38.282	39.657	1.375	3,59
	Usaha Kecil dan Menengah (UMKM)	49.824.123	51.257.537	1.433.414	2,88
4	Usaha Besar (UB)	4.463	4.372	(91)	(2,04)
<b>JUMLAH</b>		<b>49.828.586</b>	<b>51.261.909</b>	<b>1.433.323</b>	<b>2,88</b>

Keterangan :

\*) Angka Sementara

\*\*) Angka Sangat Sementara



## APPENDIX 2: Simulation Equation of SMES\_P1\_P2

```
mainmodel Component 1 {
  aux A SME Production {
    autotype Real
    autounit good/(yr*unit)
    def IF('Policy Delivery'>,5;'Av SMEL Prod with support';'Av SMEL Prod without support')
  }
  level Aggregate Demand {
    autotype Real
    autounit good/yr
    init 'Normal AD'
    inflow { autodef 'New Demand' }
    outflow { autodef 'Demand Fulfilment' }
    inflow { autodef 'Incentives payment' }
  }
  const Aggregate Production time {
    autotype Real
    autounit yr
    init 1<<yr>>
  }
  const Aggregate Safety Stock {
    autotype Real
    autounit yr
    init 1<<yr>>
  }
  aux Agregate Production {
    autotype Real
    autounit good
    def 'Expected Demand'*'Aggregate Safety Stock'
  }
  aux Auxiliary_1 {
    autotype Real
    autounit good/(yr*unit)
    def IF('Policy Delivery'>,5;'Av SMEL Prod with support';'Av SMEL Prod without support')
  }
  aux Av SMEL Prod with support {
    autotype Real
    autounit good/(yr*unit)
    def 'Agregate Production'/('Small Enterprise'+'Medium Enterprise'+'Large Enterprise')/'Aggregate
    Production
    time'
  }
  const Av SMEL Prod without support {
    autotype Real
    autounit good/(yr*unit)
    init 100<<good/yr/unit>>
  }
}
```

```

}
aux Demand Fulfilment {
autotype Real
autounit good/yr2
def 'Efective AD Fulfilment'*('Small Enterprise'+ 'Medium Enterprise'+ 'Large Enterprise')*'A SME
Production'
}
aux Demand Growth per year {
autotype Real
autounit good/yr2
def ('New Demand'- 'Demand Fulfilment')
}
aux Efective AD Fulfilment {
autotype Real
autounit %/yr
def 'Effect of AD to Normal AD Fulfilment'*'Normal Demand Fulfillment'
}
aux Effect of AD to Normal AD Fulfilment {
1autotype Real
def GRAPH('Aggregate Demand'/'Normal
AD';0;0,5;{0;0,5;1;1,5;2;2,4;2,67;2,83;2,95;3;3//Min:0;Max:3//})
}
aux Effect of Market Adequacy to average survival {
autotype Real
def GRAPH('Market Adequacy';0;0,2;{0;0,09;0,15;0,36;0,6;1;1,83;3,17;5;5,8;6//Min:0;Max:6//})
}
aux Effective Bankrupcy Fraction_Large {
autotype Real
autounit yr-1
def 1/'Effective survival_Large'
}
aux Effective Bankrupcy Fraction_Medium {
autotype Real
autounit yr-1
def 1/'Effective survival_Medium'
}
aux Effective Bankrupcy Fraction_Small {
autotype Real
autounit yr-1
def 1/'Effective survival_Small'
}
aux Effective survival_Large {
autotype Real
autounit yr
def 'Normal Survival_Large'*'Effect of Market Adequacy to average survival'
}
aux Effective survival_Medium {
autotype Real

```

```

autounit yr
def 'Normal Survival_Medium'*DELAYINF('Effect of Market Adequacy to average
survival';0,5<<yr>>)
}
aux Effective survival_Small {
autotype Real
autounit yr
def 'Normal Survival_Small'
*DELAYINF('Effect of Market Adequacy to average survival';0,7<<yr>>)
}
aux Expected Demand {
autotype Real
autounit good/yr
def DELAYINF('Aggregate Demand';6<<mo>>)
}
aux Incentives payment {
autotype Real
autounit good/yr2
def 'Incentives policy'*'Potential Addition to AD'
}
aux Incentives policy {
autotype Real
autounit yr-1
def STEP(1<<1/yr>>;2003<<@yr>>)
}
level Large {
inflow { autodef Rate_4 }
outflow { autodef Rate_5 }
}
level Large Enterprise {
autotype Real
autounit unit
init 1885<<unit>>
2inflow { autodef 'Net LE Subscribers' }
}
aux Large_Ref {
autotype Real
autounit unit
def 0<<unit>>
}
const LE_Maximum Crowding out Fraction {
autotype Real
autounit %/yr
init -15<<%/yr>>
}
level Level_1 {
autotype Real
init 5400

```

```

inflow { autodef Rate_7 }
}
level Level_2 {
autotype Real
init 0
outflow { autodef Rate_7 }
}
aux Market Adequacy {
autotype Real
def 'Market Carrying Capacity'/'(Small Enterprise'+ 'Medium Enterprise'+ 'Large Enterprise')
}
aux Market Carrying Capacity {
autotype Real
autounit unit
def 'Demand Fulfilment'/'Normal Demand Fulfillment'/'A SME Production'
}
const ME_Maximum Crowding out Fraction {
autotype Real
autounit %/yr
init -50<<%/yr>>
}
level Medium {
inflow { autodef Rate_3 }
outflow { autodef Rate_4 }
}
level Medium Enterprise {
autotype Real
autounit unit
init 52214<<unit>>
inflow { autodef 'Net ME Subscribers' }
outflow { autodef 'Net LE Subscribers' }
}
aux Medium_Ref {
autotype Real
autounit unit
def 0<<unit>>
}
level Micro {
inflow { autodef Rate_1 }
outflow { autodef Rate_2 }
}
aux Micro_Ref {
autotype Real
autounit unit
def 0<<unit>>
}
3aux Net Growth Fraction_Large {
autotype Real

```

```

autounit %/yr
def 'Normal Growth Fraction_Large'-'Effective Bankrupcy Fraction_Large'
}
aux Net Growth Fraction_Medium {
autotype Real
autounit %/yr
def 'Normal Growth Fraction_Medium'-'Effective Bankrupcy Fraction_Medium'
}
aux Net Growth Fraction_Small {
autotype Real
autounit %/yr
def 'Normal Growth Fraction_Small'-'Effective Bankrupcy Fraction_Small'
}
aux Net LE Subscribers {
autotype Real
autounit unit/yr
def 'Large Enterprise'*MAX('Net Growth Fraction_Large';'LE_Maximum Crowding out Fraction')
}
aux Net ME Subscribers {
autotype Real
autounit unit/yr
def 'Medium Enterprise'*MAX('Net Growth Fraction_Medium';'ME_Maximum Crowding out Fraction')
}
aux Net New Agreement {
autotype Real
autounit agreement/yr
def 0<<agreement/yr>>
}
aux Net SE Subscribers {
autotype Real
autounit unit/yr
def 'Small Enterprise'*MAX('Net Growth Fraction_Small';'SE_Maximum Crowding out Fraction')+ 'Net Subscriber from PSP Contract Scheme'
doc cowding out fraction will have an impact on a bad condition on economic (economic crisis)
}
aux Net Subscriber from PSP Contract Scheme {
autotype Real
autounit unit/yr
def 'Net New Agreement'*1<<unit/agreement>>
}
aux New Demand {
autotype Real
autounit good/yr2
def 'Aggregate Demand'*'Normal New demand fraction'
}
const Normal AD {

```

```

autotype Real
autounit good/yr
init 82901100<<good/yr>>
}
const Normal Demand Fulfillment {
autotype Real
autounit %/yr
init 78<<%/yr>>
}
const Normal Growth Fraction_Large {
autotype Real
autounit %/yr
init 40<<%/yr>>
4}
const Normal Growth Fraction_Medium {
autotype Real
autounit %/yr
init 30<<%/yr>>
}
const Normal Growth Fraction_Small {
autotype Real
autounit %/yr
init 38 <<%/yr>>
}
const Normal New demand fraction {
autotype Real
autounit %/yr
init 80<<%/yr>>
}
const Normal Survival_Large {
autotype Real
autounit yr
init 4<<yr>>
}
const Normal Survival_Medium {
autotype Real
autounit yr
init 4<<yr>>
}
aux Normal Survival_Small {
autotype Real
autounit yr
def 3<<yr>>+STEP(0<<yr>>;2005<<@yr>>)
}
aux Policy Delivery {
autotype Real
autounit %
def 0<<%>>

```

```

}
level Potential Addition to AD {
autotype Real
autounit good/yr
init 120000000<<good/yr>>
outflow { autodef 'Incentives payment' }
}
aux Rate_1 {
}
aux Rate_2 {
}
aux Rate_3 {
}
aux Rate_4 {
}
aux Rate_5 {
}
aux Rate_6 {
autotype Real
autounit unit/yr
def 1<<unit/yr>>
}
aux Rate_7 {
autotype Real
autounit da^-1
def -1<<1/da>>
5}
const SE_Maximum Crowding out Fraction {
autotype Real
autounit %/yr
init -80<<%/yr>>
}
level Small {
inflow { autodef Rate_2 }
outflow { autodef Rate_3 }
}
level Small Enterprise {
autotype Real
autounit unit
init 774912<<unit>>
inflow { autodef 'Net SE Subscribers' }
outflow { autodef 'Net ME Subscribers' }
}
aux Small_Ref {
autotype Real
autounit unit
def 0<<unit>>
}

```

```
aux SMEs product supply {  
  autotype Real  
  autounit good/yr  
  def ('Small Enterprise'+ 'Medium Enterprise'+ 'Large Enterprise') * 'A SME Production'  
}
```

### **APPENDIX 3: Simulation Equation of PSP Contract System for small enterprises**

```

mainmodel Component 1 {
const Acq Cost {
autotype Real
autounit %
init 10%
}
aux Acquisition {
autotype Real
autounit rupiah/mo
def 'Cash Asets'*(1+'Actual Net Acquisition Margin')/'Acquisition Time'
}
const Acquisition Time {
autotype Real
autounit mo
init 2<<mo>>
}
aux Actual Capital Invested per Agreement {
autotype Real
autounit rupiah/yr
def 'New Agreement'*'Average Capital Invested per Agreement'
}
aux Actual Net Acquisition Margin {
autotype Real
autounit %
def GRAPH('Average
Reputation',0,.1,{0.8,0.823,0.857,0.898,0.952,1,1.053,1.115,1.16,1.19,1.2//Min:0.8;
Max:1.2//})*'Normal Net Acquisition Margin'
doc akuisisi asset yang bersifat produktif (barang modal/bahan baku) dari modal yang ada secara
aggregate
akan mengurangi dampak inflasi, karena akan ada nilai tambah, nilai aset yang akan naik
}
aux Actual Net Liquidation Margin {
autotype Real
autounit %
def GRAPH('Average
Reputation',0,.1,{0.8,0.823,0.857,0.898,0.952,1,1.053,1.115,1.16,1.19,1.2//Min:0.8;
Max:1.2//})*'Normal Net Liquidation Margin'
}
aux Actual to Expected Growth of Capital Invested Ratio {
autotype Real
def 'Current Average Growth of Capital Invested'/'Expected Average Growth per Month of Capital
Invested'
}
aux Actual Value per Agreement per year {

```

```

autotype Real
autounit rupiah/agreement
def ('Profit Shared to Investor'+'Capital Liquidation')/'End Agreement'
}
const Agreement Duration Time {
autotype Real
autounit yr
init 4<<yr>>
}
level Asset {
autotype Real
init 0
inflow { autodef Rate_4 }
outflow { autodef sales }
}
aux Auxiliary_1 {
autotype Real
def DELAYINF(GRAPH('Actual to Expected Growth of Capital Invested Ratio',0,.2,{-0.0345,-0.034,-
0.03,-0.
0203,-0.0106,0,0.011,0.022,0.0294,0.0326,0.035//Min:-0.05;Max:0.05//}),1<<mo>>)
}
aux Auxiliary_2 {
1autotype Real
def DELAYINF(GRAPH('Actual to Expected Growth of Capital Invested Ratio',0,.2,{-0.0345,-0.034,-
0.03,-0.
025,-0.016,0,0.035,0.1,0.198,0.326,0.5//Min:-0.1;Max:0.5//}),1<<mo>>)
}
const Average Capital Invested per Agreement {
autotype Real
autounit rupiah/agreement
init 50000000<<rupiah/agreement>>
}
level Average Reputation {
autotype Real
init .5
inflow { autodef 'Net Reputation Change' }
}
level Capital {
autotype Real
autounit rupiah
init 'Number of Agreement'*'Average Capital Invested per Agreement'
inflow { autodef 'Actual Capital Invested per Agreement' }
outflow { autodef 'Capital Liquidation' }
}
aux Capital Liquidation {
autotype Real
autounit rupiah/yr
def 'End Agreement'*'Average Capital Invested per Agreement'

```

```

}
level Cash {
autotype Real
init 10
outflow { autodef Rate_3 }
inflow { autodef Rate_5 }
}
aux Cash Addition {
autotype Real
autounit rupiah/mo
def Revenue
}
level Cash Asets {
autotype Real
autounit rupiah
init Capital
outflow { autodef 'Cash Payments' }
inflow { autodef 'Cash Addition' }
inflow { autodef 'Actual Capital Invested per Agreement' }
}
aux Cash Payments {
autotype Real
autounit rupiah/mo
def Acquisition-'Cash Asets'*'Actual Net Acquisition Margin'/'Acquisition Time'+ 'Cash
Withdrawal'+ 'Capital
Liquidation'
}
aux Cash Withdrawal {
autotype Real
autounit rupiah/yr
def 'Retained Earning'/'Agreement Duration Time'
}
const Constant_3 {
autotype Real
autounit yr
init 1<<yr>>
}
2aux Current Average Growth of Capital Invested {
autotype Real
unit %/mo
def (('Actual Value per Agreement per year'- 'Average Capital Invested per Agreement')/'Average
Capital
Invested per Agreement')/'Total time capital been invested'
}
const Discount Rate {
autotype Real
autounit %/yr
init 7<<%/yr>>

```

```

}
aux Effect of EPRR to Agreement {
autotype Real
def GRAPH('Actual to Expected Growth of Capital Invested
Ratio',0,.2,{0.05,0.08,0.09,0.14,0.37,1,2.7,6.4,8.6,
9.6,10//Min:0;Max:10//})
}
aux Effect of EPRR to NPC {
autotype Real
def DELAYINF(GRAPH('Actual to Expected Growth of Capital Invested Ratio',0,.2,{-0.0345,-0.034,-
0.03,-0.
025,-0.016,0,0.035,0.1,0.198,0.326,0.5//Min:-0.1;Max:0.5//}),1<<mo>>)
}
aux End Agreement {
autotype Real
autounit agreement/yr
def 'Number of Agreement'/'Agreement Duration Time'
}
aux Expected Average Growth per Month of Capital Invested {
autotype Real
unit %/mo
def (('Expected Value per Agreement'-'Average Capital Invested per Agreement')/'Average Capital
Invested
per Agreement')/'Agreement Duration Time'
}
aux Expected Value per Agreement {
autotype Real
autounit rupiah/agreement
def 'Future Value'/'Number of Agreement'
}
aux First Layer of Referencing {
autotype Real
autounit ppl/da
def ('Person with Positive Reputation and Personality'+'Person with Positive Reputation and
Personality hold
Agreement')*'Potential Positive Person Reputation'/Population*'Meeting Effectiveness'*'Meeting
intensity'
}
aux Future Value {
autotype Real
autounit rupiah
def FV(NUMBER('Discount Rate')%/12,NUMBER('Agreement Duration Time')*12,0,NUMBER(-
Capital))*1<<
rupiah>>
}
const Internship Effectifness {
autotype Real
init .8

```

```

}
const Investor Profit Sharing Percentage {
autotype Real
autounit %
init 50%
}
level Level_1 {
autotype Real
init 10
3inflow { autodef Rate_6 }
}
const liq Frac {
autotype Real
autounit %
init 30%
}
aux Liquidation {
autotype Real
autounit rupiah/mo
def DELAYINF(Acquisition,2<<mo>>)
}
aux Margin From Acquisition of Asset {
autotype Real
autounit rupiah/mo
def 'Cash Asets'*'Actual Net Acquisition Margin'/'Acquisition Time'
}
aux Margin from Liquidation Asset {
autotype Real
autounit rupiah/mo
def Revenue-Liquidation
}
const Maximum Reputation {
autotype Real
init 1
}
const Meeting Effectiveness {
autotype Real
init .5
}
const Meeting intensity {
autotype Real
autounit da^-1
init 1<<1/da>>
}
const Meeting Intesity_Interneship {
autotype Real
autounit mo^-1
init 20<<1/mo>>
}

```

```

}
aux Net Additon to PRP {
autotype Real
autounit ppl/da
def 'First Layer of Referencing'*'Updating Database Time'
}
aux Net New Agreement {
autotype Real
autounit agreement/yr
def 'New Agreement'-'End Agreement'
}
aux Net Profit {
autotype Real
unit rupiah/yr
def 'Total Margin'
}
aux Net Reputation Change {
autotype Real
autounit mo^-1
def 'Average Reputation'*'Potential Reputation'/'Maximum Reputation'/'Time to Review
Reputation'*'Effect of
EPRR to NPC'
}
4aux New Agreement {
autotype Real
unit agreement/yr
def 'Effect of EPRR to Agreement'*('Person with Positive Reputation and Personality'*'Normal
New
Agreement per person'/'Time require for an agreement')-('Second Layer of Referencing'*'Normal
New
Agreement per person'))
doc new agreement didasarkan pada informasi dari sistem internship (secon layer) dan juga
berdasarkan
kebutuhan dari investor. bisa jadi investor membutuhkan lebih besar dari jumlah yang disarankan
oleh
second layer.
}
level Non Cash Assets {
autotype Real
autounit rupiah
init 0<<rupiah>>
inflow { autodef Acquisition }
outflow { autodef Liquidation }
doc asset ini termasuk, raw materials, wip, finished good, inventory, fixed asset, other asset
}
const Normal Net Acquisition Margin {
autotype Real
autounit %

```

```

init 7%
}
const Normal Net Liquidation Margin {
autotype Real
autounit %
init 7%
}
const Normal New Agreement per person {
autotype Real
autounit agreement/ppl
init 1<<agreement/ppl>>
}
level Number of Agreement {
autotype Real
autounit agreement
init 'Normal New Agreement per person'*'Person with Positive Reputation and Personality hold
Agreement'
outflow { autodef 'End Agreement' }
inflow { autodef 'New Agreement' }
}
level Paid Back Capital {
autotype Real
autounit rupiah
init 0.1<<rupiah>>
inflow { autodef 'Profit Shared to Investor' }
inflow { autodef 'Capital Liquidation' }
}
level Person with Positive Reputation and Personality {
autotype Real
autounit ppl
init 100<<ppl>>
inflow { autodef 'Net Additon to PRP' }
outflow { autodef 'Persons Sign Agremeent' }
}
level Person with Positive Reputation and Personality hold Agreement {
autotype Real
autounit ppl
init 80<<ppl>>
inflow { autodef 'Persons Sign Agremeent' }
outflow { autodef 'Persons End Agreement' }
}
5aux Persons End Agreement {
autotype Real
autounit ppl/yr
def 'End Agreement'/'Normal New Agreement per person'
}
aux Persons Sign Agremeent {
autotype Real

```

```

autounit ppl/yr
def 'New Agreement'/'Normal New Agreement per person'
}
const Population {
autotype Real
autounit ppl
init 50000000<<ppl>>
}
level Potential Positive Person Reputation {
autotype Real
autounit ppl
init 1000000<<ppl>>
outflow { autodef 'Net Additon to PRP' }
inflow { autodef 'Persons End Agreement' }
}
level Potential Reputation {
autotype Real
init .5
outflow { autodef 'Net Reputation Change' }
}
aux Profit Shared to Investor {
autotype Real
autounit rupiah/yr
def IF('Cash Withdrawal'<0<<rupiah/yr>>,'Cash Withdrawal'*100%,'Cash Withdrawal'*'Investor
Profit Sharing
Percentage')
}
aux Rate_3 {
autotype Real
autounit yr^-1
def Rate_4+(Cash*'Acq Cost'/Constant_3)
}
aux Rate_4 {
autotype Real
autounit yr^-1
def Cash*(1-'Acq Cost')/Constant_3
}
aux Rate_5 {
autotype Real
autounit yr^-1
def sales*(1+'liq Frac')
}
aux Rate_6 {
autotype Real
autounit yr^-1
def Rate_5-sales-(Cash*'Acq Cost'/Constant_3)
}
level Retained Earning {

```

```

autotype Real
autounit rupiah
init 0<<rupiah>>
inflow { autodef 'Net Profit' }
outflow { autodef 'Cash Withdrawal' }
}
aux Revenue {
6autotype Real
autounit rupiah/mo
def (1+'Actual Net Liquidation Margin')*Liquidation
}
aux sales {
autotype Real
autounit yr^-1
def Asset/Constant_3
}
aux Second Layer of Referencing {
autotype Real
autounit ppl/mo
def ('Person with Positive Reputation and Personality hold Agreement')*Person with Positive
Reputation and
Personality'/Population*'Internship Effectifness'*'Meeting Intesity_Interneship'
}
const Time require for an agreement {
autotype Real
autounit mo
init 4<<mo>>
}
const Time to Review Reputation {
autotype Real
autounit mo
init 1<<mo>>
}
aux Total Assets {
autotype Real
autounit rupiah
def 'Cash Asets'+'Non Cash Assets'
}
aux Total Equity {
autotype Real
autounit rupiah
def Capital+'Retained Earning'
}
aux Total Margin {
autotype Real
autounit rupiah/mo
def 'Margin From Acquisition of Asset'+'Margin from Liquidation Asset'
}

```

```
aux Total time capital been invested {  
  autotype Real  
  unit mo  
  def TIME-STARTTIME+.0000001<<da>>  
}  
const Updating Database Time {  
  autotype Real  
  init 20  
}
```

## APPENDIX 4: Simulation Equation of Policy Cycle Model

```
mainmodel Component 1 {
  aux Actual Intensity reduction fraction {
    autotype Real
    autounit %/wk
    def 'Effect of PAIN to reduction of normal intensity'*'Normal Intensity Reduction'
  }
  aux Actual time to adjust delivery {
    autotype Real
    autounit mo
    def 'Effect od ITC to Adjustment rate'*'Normal Time to adjust delivery'
  }
  aux Actual Time to Adjust MII {
    autotype Real
    autounit mo
    def 'Effect of Pressure on PA to Take initiatives on Time to Adjust MII'*'Time to adjust MII'
  }
  aux Addition in Implementation team Capability {
    autotype Real
    autounit da^-1
    def Induction/'Induction time intensity'*'Implementation team Capability'*'Potential
    Implementation team
    Capability'
  }
  aux Addition to Credibility Ministerial Steering Committee {
    autotype Real
    autounit mo^-1
    def 'Effet of Policy Options to The Credibility on MSC'*MAX(0,'Ministrial Interest on
    Initiatives')*'Working Time
    for MSC'/'Time to revise Credibility'*'Potential Credibility Ministerial Steering Committee'
  }
  aux Adjustment Rate {
    autotype Real
    autounit %/mo
    def 'Delivery GAP'/'Actual time to adjust delivery'*'Time allocated'
  }
  level Againts Legislative member {
    autotype Real
    autounit person
    init 50<<person>>
    inflow { autodef 'Opposing rate' }
    outflow { autodef 'Understanding rate' }
  }
  const Againts Lobby Effectiveness {
    autotype Real
```

```

init .1
}
aux Againts Lobbying {
autotype Real
autounit person/mo
def 'Againts Legislative member'*(('Supportive Legislative member'/'Legislative member')*'Againts
Lobby
Effectiveness'*'Againts meeting intensity'
}
aux Againts meeting intensity {
autotype Real
autounit mo^-1
def GRAPH('Contradiction Opposition Party Point of
View',0,.1,{0,2.55,3.5,3.94,4.26,4.55,4.74,4.87,4.97,5,5//
Min:0;Max:5//})*'Normal Againts meeting'*'Public Perception'
}
aux Auxiliary_1 {
autotype Real
def 1/15
}
aux Auxiliary_2 {
autotype Real
def 0+STEP(1,2012.53<<@yr>>)+STEP(-1,2012.62<<@yr>>)
}
aux Auxiliary_3 {
autotype Real
def 0+STEP(1,2012.5<<@yr>>)+STEP(-1,2012.53<<@yr>>)
}
const Average Contribution on Policy Option from a Submission {
autotype Real
autounit option/unit
init 1<<option/unit>>
}
aux Average Pressure on Public Adm to take initiatives {
autotype Real
def ('Effect of Supportive poll to Gov'/2*'Normal pressure from poll'+'Effect of IPE projrction to
Average
Pressure'*'Normal pressure from IPE Projection')/2
doc supaya dalam skala 1 maka efek dari poll buat pemerintah yang maksimum 2 dibagi 2.
kemudian
ditambahkan dengan efek yang datang dari IPE dan dirata-rata kan (atau dibagi 2)
}
level Broad Agreement on Issues Initiatives {
autotype Real
init 0
inflow { autodef 'Change in Broad Agreement on Issues' }
}
const Budget allocated {

```

```

autotype Real
init 2
}
aux Budget Gap {
}
aux Budget Spent {
autotype Real
autounit euro
def 'Normal average budget spent per 1% delivery'*Delivery*'Effect of ITC to Average Budget
spent per
delivery'
}
aux Budget Spent in First Phase {
}
aux Budget Spent to Expected Ratio {
autotype Real
def 'Budget Spent'/'Expected Current Phase Budget Spent'*'Time allocated'
}
aux Cabinet meeting positive gesture {
autotype Real
def 'effect of Total budget allocated to cabinet meeting positive gesture'*'Credibility Ministerial
Steering
Committee'
}
aux Change in Broad Agreement on Issues {
autotype Real
autounit mo^-1
def 'Effect of Interest GAP on Change in Broad Agreement'/'Time To Change in BA'*'Time
allocated for broad
agreement_departmental task force'*'Potential Broad Agreement on Issues Initiatives'
}
aux Change in Point of View {
autotype Real
autounit mo^-1
def ('Incumbent Party Electability projection'-'Contradiction Opposition Party Point of
View')/'Time to review
point of view'*'Potential Contradiction Opposition Party Point of View'
}
aux Clarifying Objectives {
autotype Real
2def ('Confidence on Key Policy Questions'+ 'Government Perception')/2*'Working Time for
Clarifying
Objectives'*'Potential Objectives clarified'
zeroorder
}
level Confidence on Criterion Selection {
autotype Real
init 0

```

```

inflow { autodef 'Criterion Finding' }
}
level Confidence on Key Policy Questions {
autotype Real
init 0
inflow { autodef 'Effort on Key Policy Searching' }
}
level Confidence on Policy Decision {
autotype Real
init 0
inflow { autodef 'Effort on policy decision' }
}
level Confidence on Positive Policy Analysis {
autotype Real
init 0
inflow { autodef 'Effort on Positive Policy Analysis' }
}
const Constant_1 {
autotype Real
init .3
}
level Contradiction Opposition Party Point of View {
autotype Real
init .5
inflow { autodef 'Change in Point of View' }
}
aux Copy of Time allocated {
autotype Real
def 0+STEP(1,2013<<@yr>>)+STEP(-1,2014<<@yr>>)
}
aux Copy of Working Time for MSC {
autotype Real
def 0+STEP(1,2012<<@yr>>)+STEP(-1,2013<<@yr>>)
}
level Credibility Ministerial Steering Committee {
autotype Real
init .5
inflow { autodef 'Addition to Credibility Ministerial Steering Committee' }
}
aux Criterion Finding {
autotype Real
autounit da^-1
def 'Cabinet meeting positive gesture'*'Deadline to Find Criterion'/'Working time intensity to Find
Criterion'*
'Potential Confidence on Criterion Selection'
}
aux Deadline to Decide Policy {
autotype Real

```

```

def 0+STEP(1,2012.7<<@yr>>)+STEP(-1,2012.98<<@yr>>)
}
aux Deadline to Detail Policy {
autotype Real
def 0+STEP(1,2012.98<<@yr>>)+STEP(-1,2013.1<<@yr>>)
}
aux Deadline to Find Criterion {
3autotype Real
def 0+STEP(1,2012.6<<@yr>>)+STEP(-1,2012.7<<@yr>>)
}
level Delivery {
autotype Real
unit %
init .00001
inflow { autodef 'Adjustment Rate' }
}
aux Delivery GAP {
autotype Real
autounit %
def 'Expected Delivery'-Delivery
}
level Detail Policy Operational {
autotype Real
init 0
inflow { autodef 'Policy Operational in Detail' }
}
aux Effect Findings GAP to Standard Press Coverage {
autotype Real
def GRAPH('Perception GAP',0,.5,{1,1.23,1.6,2.32,3.9,6,6.83,7.37,7.64,7.77,7.77//Min:1;Max:8//})
}
aux Effect od ITC to Adjustment rate {
autotype Real
def GRAPH('Implementation team
Capability',0,.1,{1.48,1.47,1.45,1.39,1.26,0.99,0.83,0.7,0.59,0.55,0.53//
Min:0.5;Max:1.5//})
}
aux effect of Delivery GAP to positive submission on Policy Evaluation {
autotype Real
def GRAPH('Delivery
GAP',0,.1,{1,0.994,0.99,0.98,0.95,0.88,0.806,0.73,0.59,0.43,0.2//Min:0;Max:1//})
}
aux Effect of DPO to Expected Delivery {
autotype Real
def GRAPH('Detail Policy Operational',0,.1,{0,0.1,0.31,0.72,0.95,1,1,1,1,1//Min:0;Max:1//})
}
aux Effect of Informed Public on Supportive Poll {
autotype Real

```

```

def GRAPH('Informed Public_information publicly
available',0,.1,{0.006,0.3,0.43,0.48,0.49,0.5,0.503,0.516,0.
54,0.67,1//Min:0;Max:1//})
}
aux Effect of Interest GAP on Change in Broad Agreement {
autotype Real
def GRAPH('Interest
GAP',0,.1,{0.5,0.326,0.213,0.126,0.065,0.045,0.026,0.02,0.013,0.006,0.005//Min:0;Max:
0.5//})
}
aux Effect of IPE projrction to Average Pressure {
autotype Real
def GRAPH('Incumbent Party Electability
projection',0,.1,{1,0.98,0.955,0.91,0.845,0.77,0.67,0.5,0.3,0.15,0.
08//Min:0;Max:1//})
}
aux Effect of IS on effort to extract policy option from Submission {
autotype Real
def GRAPH('Interdepartment
Solidity_IS',0,.1,{1,0.955,0.903,0.82,0.72,0.555,0.35,0.16,0.08,0.04,0.01//Min:0;
Max:1//})
}
aux Effect of IS to New Positive Submission {
autotype Real
autounit unit
def GRAPH('Interdepartment
Solidity_IS',0,.1,{0,0.06,0.14,0.22,0.34,0.48,0.71,1.11,1.61,1.91,2//Min:0;Max:2//
}<<unit>>)
4}
aux Effect of ITC to Average Budget spent per delivery {
autotype Real
def GRAPH('Implementation team
Capability',0,.1,{2,1.78,1.63,1.555,1.516,1.5,1.465,1.42,1.355,1.226,1//
Min:1;Max:2//})
}
aux Effect of PAIN to Normal Information Fullfilment per report {
autotype Real
def GRAPH('Publicly available Information Need'/'Normal Public information
need',0,0.1,{0,0.374,0.58,0.75,0.
845,0.91,0.955,0.98,0.99,1,1//Min:0;Max:1//})
}
aux Effect of PAIN to reduction of normal intensity {
autotype Real
def GRAPH('Publicly available Information Need'/'Normal Public information
need',0,0.1,{1,0.6,0.355,0.21,0.
135,0.084,0.06,0.045,0.04,0.026,0.02//Min:0;Max:1//})
}
aux Effect of Policy Analysis on IS {

```

```

autotype Real
def GRAPH('Confidence on Positive Policy
Analysis',0,2,{0,0.58,0.89,1.15,1.34,1.51,1.66,1.78,1.87,1.96,2//
Min:0;Max:2//})
}
aux Effect of Pressure on PA to Take initiatives on Time to Adjust MII {
autotype Real
def GRAPH('Average Pressure on Public Adm to take
initiatives',0,.1,{1,0.697,0.59,0.55,0.52,0.5,0.465,0.42,
0.355,0.26,0.1//Min:0;Max:1//})
}
aux Effect of Public Discourse Intensity to Net Positive Submission {
autotype Real
autounit unit
def GRAPH('Public discourse
intensity',0,.1,{0.02,0.77,1.35,1.76,2.2,2.1,2.2,2.57,3.7,7//Min:0;Max:7//}<<
unit>>)
}
aux Effect of Public Interest on Supportive Poll {
autotype Real
def GRAPH('Public Interest on
Initiatives',0,.1,{0.14,0.57,0.77,0.9,0.97,1.02,1.06,1.12,1.24,1.46,1.81//Min:0;
Max:2//})
}
aux effect of RBS to Positive Submission on Policy Evaluation {
autotype Real
def GRAPH('Budget Spent to Expected
Ratio',0.5,.1,{0.8,0.912,0.963,0.986,0.997,1,0.997,0.986,0.963,0.912,
0.8//Min:0.8;Max:1//})
}
const Effect of report to public intensity addition {
autotype Real
autounit report^-1
init .001 <<1/report>>
}
aux Effect of Supportive poll to Gov {
autotype Real
def GRAPH('Supportive Poll',0,.1,{0,.04,0.12,0.27,0.55,1,1.45,1.73,1.88,1.96,2//Min:0;Max:2//})
}
aux effect of Total budget allocated to cabinet meeting positive gesture {
autotype Real
def GRAPH('Total Budget
Allocated',1000000<<euro>>,1000000<<euros>>,{1,1.24,1.49,1.73,2//Min:1;Max:2/
//})
}
aux Effet of Policy Options to The Credibility on MSC {
autotype Real

```

```

def GRAPH('Proposed Policy
Options',0<<option>>,1<<option>>,{0,0.845,1,0.955,0.87,0.8,0.69,0.516,0.33,0.
2,0.2//Min:0;Max:1//})
}
5aux Effort on Key Policy Searching {
autotype Real
def ('Weight on Steering Committee'*Credibility Ministerial Steering Committee'+Weight on
Supportive External
Review Report on Past Policy'*Supportive External Review Report on Past Policy')*Working Time
for Key
Policy Searching'*Potential Confidence on Key Policy Questions'
zeroorder
}
aux Effort on policy decision {
autotype Real
autounit da^-1
def 'Confidence on Criterion Selection'*Deadline to Decide Policy'/Working time intensity to
decide Policy'*
'Potential Confidence on Policy Decision'
}
aux Effort on Policy Options Extraction {
autotype Real
autounit option/mo
def 'Effect of IS on effort to extract policy option from Submission'*DELAYINF('Net Positive
Submission','Time
to Extract')*Average Contribution on Policy Option from a Submission'*Objectives clarified'
}
aux Effort on Positive Policy Analysis {
autotype Real
def 'Credibility Ministerial Steering Committee'*Supportive External Review Report on Past
Policy'*Working
Time for Policy Analysis'*Potential Confidence Positive Policy Analysis'
zeroorder
}
aux Evaluation Time {
autotype Real
def 0+STEP(1,2014<<@yr>>)+STEP(-1,2015<<@yr>>)
}
aux Expected Current Phase Budget Spent {
autotype Real
autounit euro
def Delivery'*Normal average budget spent per 1% delivery'
}
aux Expected Delivery {
autotype Real
unit %
def 'Effect of DPO to Expected Delivery'*Normal Expected Delivery'
}

```

```

aux Expected Final Output {
}
aux Expected Output {
}
aux Expected Process {
}
aux Facts on Positive Policy Evaluation {
autotype Real
def 'Potential Positive Policy Evaluation Report'*(('effect of Delivery GAP to positive submission on
Policy
Evaluation'+ 'effect of RBS to Positive Submission on Policy Evaluation')/2)*'Public discourse
intensity'*
'Evaluation Time'
zeroorder
}
aux Final Output Gap {
}
aux Finalizing Implementation {
}
aux Finalizing Implementation Time {
}
aux Fulfilment per report {
autotype Real
autounit report^-1
6def 'Effect of PAIN to Normal Information Fullfilment per report'*'Normal Information Fulfilment
per report'
}
level Government Perception {
autotype Real
init 1
inflow { autodef 'Net change Gov Perception rate' }
}
aux Implementation in Progress_Time {
}
level Implementation team Capability {
autotype Real
init 0.1
inflow { autodef 'Addition in Implementation team Capability' }
}
level Incumbent Party Electability projection {
autotype Real
init .4
inflow { autodef 'Net Change on IPE' }
}
aux Induction {
autotype Real
def GRAPH('Credibility Ministerial Steering
Committee',0,.1,{0,0.0026,0.007,0.017,0.03,0.049,0.071,0.088,0.

```

```

0974,0.1,0.1//Min:0;Max:0.1//})
}
const Induction time intensity {
autotype Real
autounit da
init 10<<da>>
}
aux Information fulfillment rate {
autotype Real
autounit wk^-1
def 'Fulfilment per report'*'Related issues report'/'Time to report'
}
level Informed Public_information publicly available {
autotype Real
init .01
inflow { autodef 'Information fulfillment rate' }
}
const Interdepartment Interest Friction {
autotype Real
init .5
}
aux Interdepartment Solidity_IS {
autotype Real
def 'Effect of Policy Analysis on IS'/'Interdepartment Interest Friction'
}
aux Interest GAP {
autotype Real
def ABS('Public Interest on Initiatives'-'Ministrial Interest on Initiatives')
}
const Interest pressure release {
autotype Real
init .15
}
aux Issues clarity {
autotype Real
def GRAPH('Public discourse
intensity',0,.1,{0.99,0.974,0.935,0.85,0.73,0.59,0.445,0.3,0.16,0.065,0.03//Min:
0;Max:1//})
}
aux Legislative Approval {
7autotype Real
unit %
def 'Supportive Legislative member'/'Legislative member'
}
const Legislative member {
autotype Real
autounit person
init 100<<person>>

```

```

}
aux Lobbying Period {
autotype Real
def 0+STEP(1,2012<<@yr>>)+STEP(-1,2016<<@yr>>)
}
const Maksimum Normatif Interest on Initiative {
autotype Real
init 1
}
aux Meeting intensity {
autotype Real
autounit mo^-1
def GRAPH('Credibility Ministerial Steering
Committee',0,.1,{0,2.55,3.5,3.94,4.26,4.55,4.74,4.87,4.97,5,5//Min:
0;Max:5//})*'Normal meeting intensity'
}
level Ministerial Interest on Initiatives {
autotype Real
init .001
inflow { autodef 'Net Change in Ministerial Interest on Initiatives' }
}
aux Net change Gov Perception rate {
autotype Real
autounit yr^-1
def ('Issues clarity'*'Pressure Group Perception')/1<<yr>>
}
aux Net Change in Ministerial Interest on Initiatives {
autotype Real
autounit mo^-1
def (DELAYINF('Public Interest on Initiatives','Time to Observed PII')-'Ministerial Interest on
Initiatives')/'Actual
Time to Adjust MII'+'Net change Gov Perception rate'*'Potential Ministerial Interest on Initiatives'
}
aux Net Change in Public Interest on Initiatives {
autotype Real
autounit wk^-1
def ('Information fulfillment rate')*'Potential Public Interest on Initiatives'/'Maksimum Normatif
Interest on
Initiative'*'Public Interest on Initiatives'
}
aux Net Change on IPE {
autotype Real
autounit yr^-1
def 'Public Perception'/'Time to revise IPE'*'Potential Addition Incumbent Party Electability
projection'
}
aux Net Positive Submission {
autotype Real

```

```

autounit unit/mo
def (('Effect of IS to New Positive Submission'+ 'Effect of Public Discourse Intensity to Net Positive
Submission')/'Submission time')*'Submission Deadline'*'Broad Agreement on Issues Initiatives'
}
aux Net Pressure of Pressure Group {
autotype Real
autounit mo^-1
def 'Pressure addition rate'-'Pressure reduction rate'
}
const Normal Againts meeting {
autotype Real
autounit mo^-1
init 2<<1/mo>>
}
const Normal average budget spent per 1% delivery {
autotype Real
autounit euro
init 50000<<euro>>/1<<%>>
}
const Normal Expected Delivery {
autotype Real
init 1
}
const Normal Information Fulfilment per report {
autotype Real
autounit report^-1
init 0.0015<<1/report>>
}
const Normal Intensity Reduction {
autotype Real
autounit %/wk
init 20<<%/wk>>
}
const Normal meeting intensity {
autotype Real
autounit mo^-1
init 1<<1/mo>>
}
const Normal pressure from IPE Projection {
autotype Real
init .5
}
const Normal pressure from poll {
autotype Real
init .5
}
const Normal Public information need {
autotype Real

```

```

init .5
}
const Normal Time to adjust delivery {
autotype Real
autounit mo
init 4<<mo>>
}
const Normal total report in one edition {
autotype Real
autounit report
init 2<<report/%>>
}
level Objectives clarified {
autotype Real
init 0
inflow { autodef 'Clarifying Objectives' }
}
aux Opposing rate {
autotype Real
autounit person/mo
def MAX(0<<person/mo>>,'Againts Lobbying')*'Lobbying Period'
}
9aux Output Gap {
}
aux Perception GAP {
autotype Real
def MAX('Government Perception','Pressure Group Perception')-MIN('Government
Perception','Pressure
Group Perception')
}
level Policy Implementatated First Phase {
inflow { autodef 'Policy Implementation completes' }
}
aux Policy Implementation completes {
}
level Policy Implemented {
inflow { autodef 'Finalizing Implementation' }
}
aux Policy Operational in Detail {
autotype Real
autounit da^-1
def IF('Legislative Approval'>.5,'Confidence on Policy Decision'*'Implementation team
Capability',0)/'Working
time intensity to operationalize policy'*'Deadline to Detail Policy'*'Potential in Detail Policy
Operational'
}
level Positive Policy Evaluation Report {
autotype Real

```

```

init 0
inflow { autodef 'Facts on Positive Policy Evaluation' }
}
level Positive Submission {
autotype Real
autounit unit
init 0<<unit>>
inflow { autodef 'Net Positive Submission' }
}
level Potential Addition Incumbent Party Electability projection {
autotype Real
init .6
outflow { autodef 'Net Change on IPE' }
}
level Potential Broad Agreement on Issues Initiatives {
autotype Real
init 1
outflow { autodef 'Change in Broad Agreement on Issues' }
}
level Potential Confidence on Criterion Selection {
autotype Real
init 1
outflow { autodef 'Criterion Finding' }
}
level Potential Confidence on Key Policy Questions {
autotype Real
init 1
outflow { autodef 'Effort on Key Policy Searching' }
}
level Potential Confidence on Policy Decision {
autotype Real
init 1
outflow { autodef 'Effort on policy decision' }
}
level Potential Confidence Positive Policy Analysis {
autotype Real
init 1
outflow { autodef 'Effort on Positive Policy Analysis' }
10}
level Potential Contradiction Opposition Party Point of View {
autotype Real
init .5
outflow { autodef 'Change in Point of View' }
}
level Potential Credibility Ministerial Steering Committee {
autotype Real
init .5
outflow { autodef 'Addition to Credibility Ministerial Steering Committee' }
}

```

```

}
level Potential Implementation team Capability {
autotype Real
init .9
outflow { autodef 'Addition in Implementation team Capability' }
}
level Potential in Detail Policy Operational {
autotype Real
init 1
outflow { autodef 'Policy Operational in Detail' }
}
level Potential Ministerial Interest on Initiatives {
autotype Real
init .999
outflow { autodef 'Net Change in Ministerial Interest on Initiatives' }
}
level Potential Objectives clarified {
autotype Real
init 1
outflow { autodef 'Clarifying Objectives' }
}
level Potential Positive Policy Evaluation Report {
autotype Real
init 1
outflow { autodef 'Facts on Positive Policy Evaluation' }
}
level Potential Public Interest on Initiatives {
autotype Real
init .5
outflow { autodef 'Net Change in Public Interest on Initiatives' }
}
aux Press Coverage {
autotype Real
autounit %
def 'Effect Findings GAP to Standard Press Coverage'*'Standard Press Coverage'
}
aux Pressure addition rate {
autotype Real
autounit mo^-1
def ('Government Perception'*-'(Issues clarity)')/1<<mo>>
}
level Pressure Group Perception {
autotype Real
init 1
inflow { autodef 'Pressure addition rate' }
outflow { autodef 'Pressure reduction rate' }
}
aux Pressure reduction rate {

```

```

autotype Real
autounit mo^-1
def ('Interest pressure release'*'Pressure Group Perception')/1<<mo>>
11}
aux Process Gap {
}
level Proposed Policy Options {
autotype Real
autounit option
init 0<<option>>
inflow { autodef 'Effort on Policy Options Extraction' }
}
level Public discourse intensity {
autotype Real
init .1
inflow { autodef 'Public discourse intensity addition' }
outflow { autodef 'Public discourse intensity reduction' }
}
aux Public discourse intensity addition {
autotype Real
unit %/wk
def 'Related issues report'/'Time to report'*'Effect of report to public intensity addition'
}
aux Public discourse intensity reduction {
autotype Real
autounit %/wk
def 'Public discourse intensity'*'Actual Intensity reduction fraction'
}
aux Public Expectation on Output {
}
level Public Interest on Initiatives {
autotype Real
init .5
inflow { autodef 'Net Change in Public Interest on Initiatives' }
}
aux Public Perception {
autotype Real
def DELAYINF('Positive Policy Evaluation Report',6<<mo>>)
zeroorder
}
level Publicly available Information Need {
autotype Real
init .99
outflow { autodef 'Information fulfillment rate' }
}
aux Related issues report {
autotype Real
autounit report

```

```

def 'Normal total report in one edition'*'Press Coverage'
}
const Standard Press Coverage {
autotype Real
autounit %
init 2<<%>>
}
aux Submission Deadline {
autotype Real
def 1+STEP(-1,2012.2<<@yr>>)
}
const Submission time {
autotype Real
autounit mo
init .5<<mo>>
}
12const Supportive External Review Report on Past Policy {
autotype Real
init .03
}
level Supportive Legislative member {
autotype Real
autounit person
init 50<<person>>
outflow { autodef 'Opposing rate' }
inflow { autodef 'Understanding rate' }
}
const Supportive Lobby Effectiveness {
autotype Real
init .05
}
aux Supportive Lobbying {
autotype Real
autounit person/mo
def 'Supportive Legislative member'*('Against Legislative member'/'Legislative
member')*'Supportive Lobby
Effectiveness'*'Meeting intensity'
}
aux Supportive Poll {
autotype Real
def 'Effect of Informed Public on Supportive Poll'*'Effect of Public Interest on Supportive Poll'/2
}
aux Time allocated {
autotype Real
def 0+STEP(1,2013<<@yr>>)+STEP(-1,2014<<@yr>>)
}
aux Time allocated for broad agreement_departmental task force {
autotype Real

```

```

def 0+STEP(1,2011<<@yr>>)+STEP(-1,2012<<@yr>>)
}
const Time to adjust MII {
autotype Real
autounit mo
init 1<<mo>>
}
const Time To Change in BA {
autotype Real
autounit mo
init 1<<mo>>
}
const Time to Extract {
autotype Real
autounit mo
init 2<<mo>>
}
const Time to Observed PII {
autotype Real
autounit wk
init 1<<wk>>
}
const Time to report {
autotype Real
autounit wk
init 1<<wk>>
}
const Time to review point of view {
autotype Real
autounit mo
13init 5<<mo>>
}
const Time to revise Credibility {
autotype Real
autounit mo
init 2<<mo>>
}
const Time to revise IPE {
autotype Real
autounit yr
init 2<<yr>>
}
aux Total Budget Allocated {
autotype Real
autounit euro
def 'Expected Delivery'*'Normal average budget spent per 1% delivery'
}
aux Total Budget Spent {

```

```

}
aux Total Implementation Time {
}
aux Understanding rate {
autotype Real
autounit person/mo
def MAX(0<<person/mo>>,'Supportive Lobbying')*'Lobbying Period'
}
const Weight on Steering Committe {
autotype Real
init .3
}
aux Weight on Supportive External Review Report on Past Policy {
autotype Real
def 1-'Weight on Steering Committe'
}
aux Working Period of IS {
autotype Real
def 0+STEP(1,2011.1<<@yr>>)+STEP(-1,2012<<@yr>>)
}
aux Working Time for Clarifying Objectives {
autotype Real
def 0+STEP(1,2012.1<<@yr>>)+STEP(-1,2012.2<<@yr>>)
}
aux Working Time for Key Policy Searching {
autotype Real
def 0+STEP(1,2012<<@yr>>)+STEP(-1,2012.1<<@yr>>)
}
aux Working Time for MSC {
autotype Real
def 0+STEP(1,2012<<@yr>>)+STEP(-1,2013<<@yr>>)
}
aux Working Time for Policy Analysis {
autotype Real
def 0+STEP(1,2012<<@yr>>)+STEP(-1,2012.6<<@yr>>)
}
const Working time intensity to decide Policy {
autotype Real
autounit da
init 15<<da>>
}
const Working time intensity to Find Criterion {
autotype Real
14autounit da
init 10<<da>>
}
const Working time intensity to operationalize policy {
autotype Real

```

```
autounit da  
init 2<<da>>  
}
```