Using System Dynamics Approach to Support Sustainable Growth of Small and Medium Enterprises' Quantity in Indonesia: Some Policies Consideration[1]

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ABSTRACT

This 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. 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). 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

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.

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[1] The first version of the paper has been presented at II Conference of WCSA-World Complexity Science Academy, September 26th – 27th, 2011, Palermo, Italy

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 (2011), 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.

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 Figure1:

Figure 1: Historical data behavior

Legend:
--1-- : Small Enterprises   --2-- : Medium Enterprises   --3-- : Large Enterprises
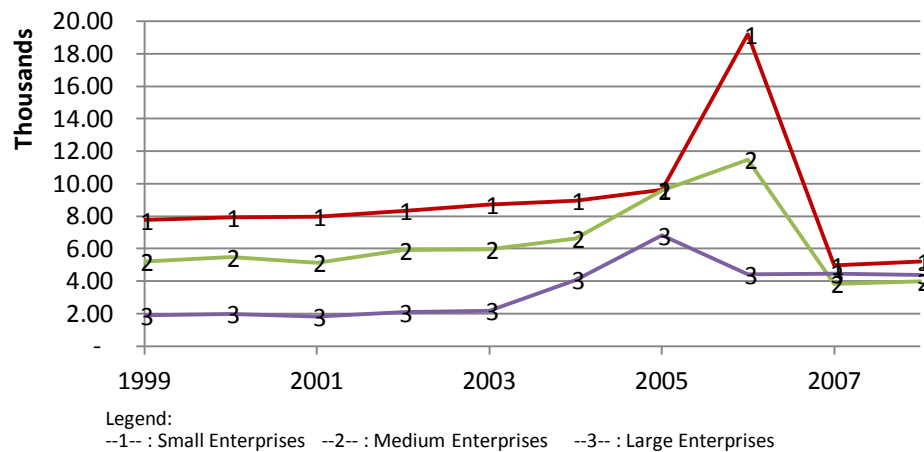
Source: Subroto (2011)

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 Table1 below:

Table 1. Exported SMEs product

	2004	2005	2006	2007	2008
GDP (billion rupiah)	1,271,990.10	1,491,061.90	1,786,218.30	2,105,135.10	2,609,360.10
EXPORT (million rupiah)	95,548.24	110,338.07	122,310.86	143,012.33	183,759.08
Export percentage	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 2 below:

Table 2. Main Problem of SMEs in the Manufacturing Industry

|	Small Enterprise (%)	Micro Enterprise (%)
Have no problem	**19.48**	**25.21**
Have problems of:	*80.52*	*74.79*
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*
Total (Unit)	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 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 1 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 2 below:

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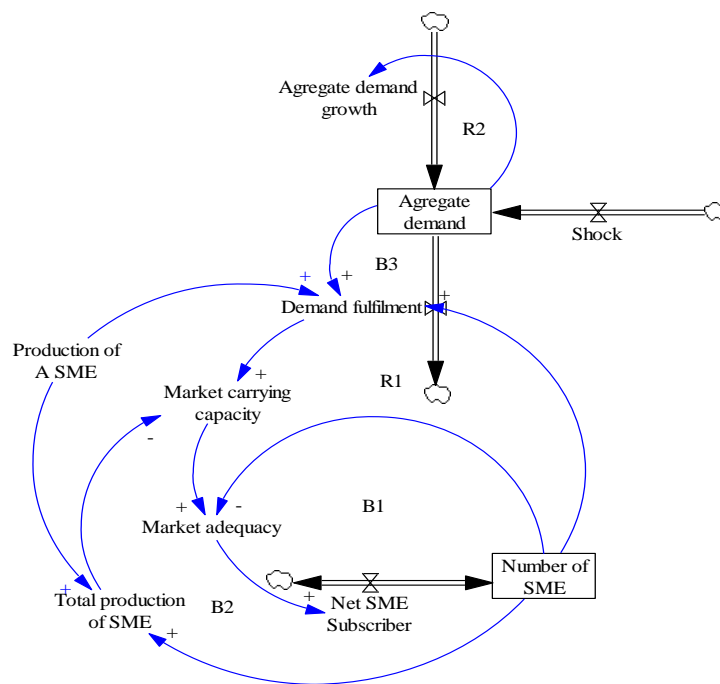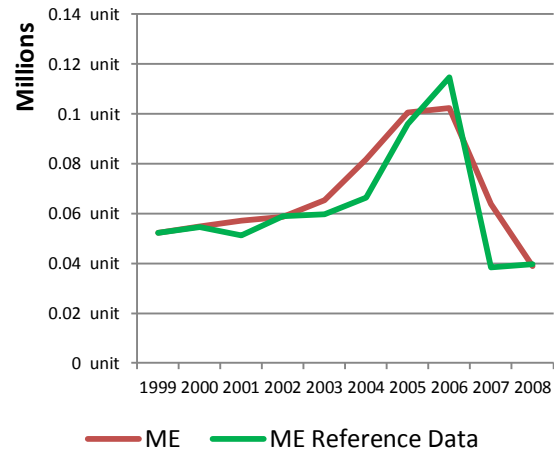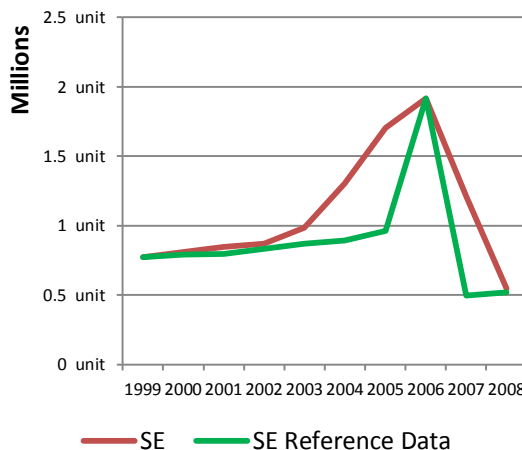

Source: cited from Subroto, 2011.

Figure 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 3a and.3b.

Figure 3a: Small Enterprise Behavior **Figure 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[2] as the amount of SMEs were not growing endurably 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 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

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[2] According to oxford dictionary, sustainable (adjective) is able to be maintained at a certain rate or level

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 idea is adopted by a general angle point of view which appears in Figure 4.

Figure 4: Stock and Flow Diagram of Production Co-Ordination
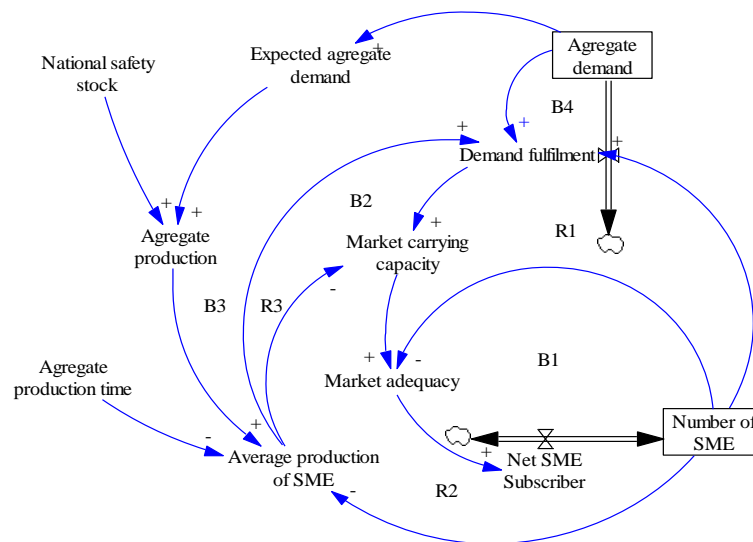
Significant step in coordinating the production needs to be taken without violating the principle of free competition, such as; first, by providing credible information about the current of market demand and the conditional optimal safety stock for entrepreneurs. The logics of this step are as follows: 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 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 paper 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 *mudarabah* 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 5:

Figure 5: Venture Capital Organization Establishment
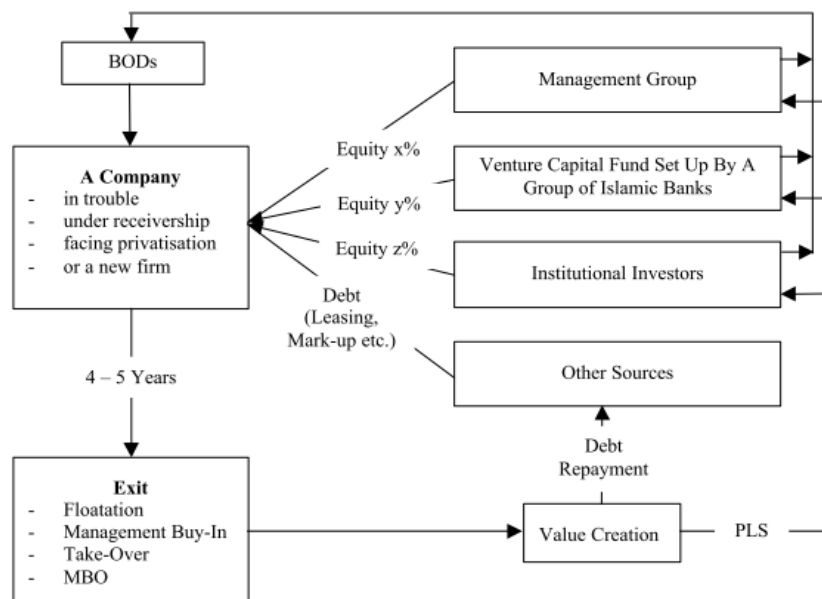
Source: Dar and Presley, 2000

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 qualify 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 6. 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 valuated 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 6: Stock and Flow Diagram of *Profit Sharing Principle (PSP) and Double Layer Referencing* System
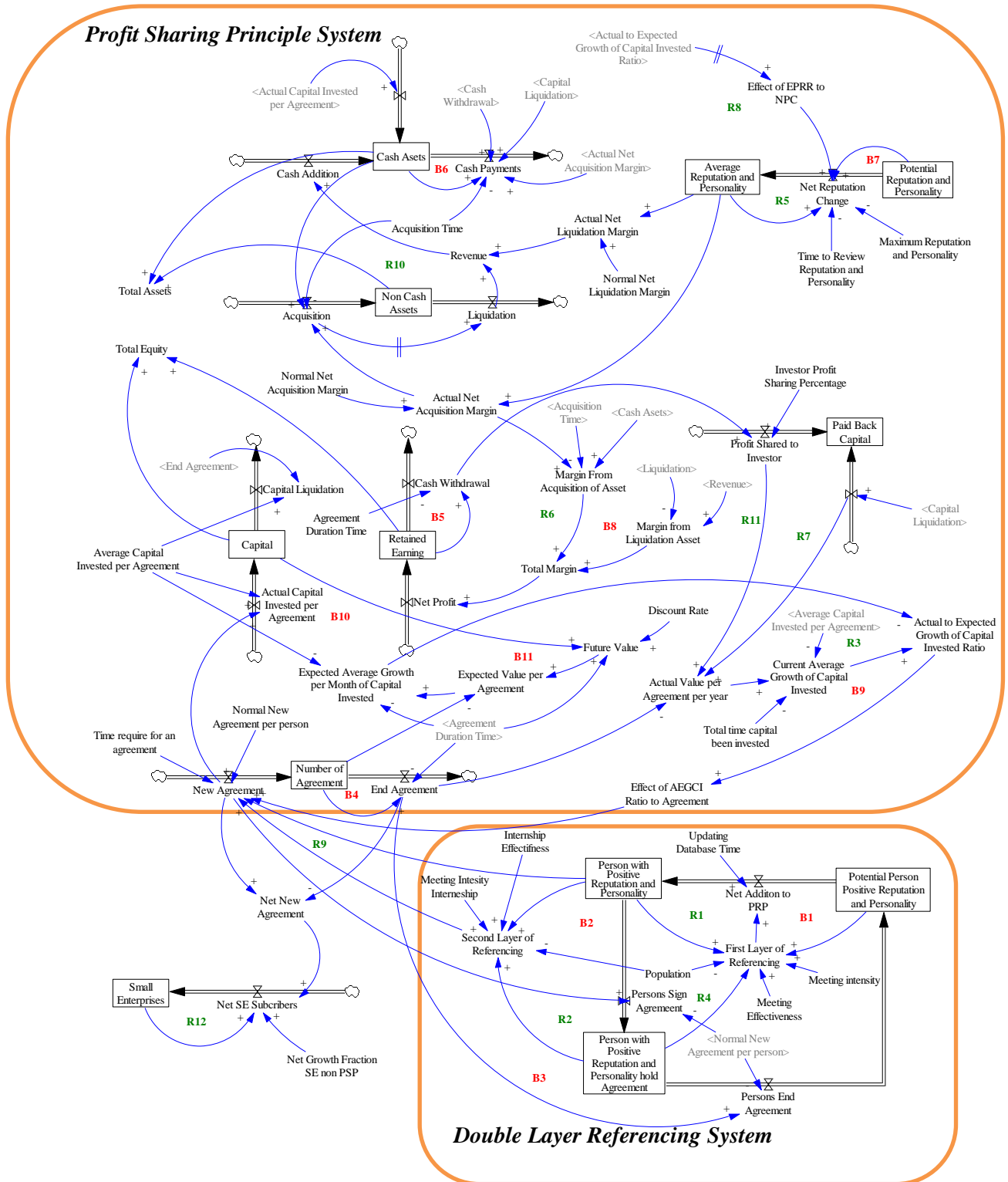
The higher ratio in another way will lead to the increment of the average reputation and personality on the entrepreneur through a positive nonlinear effect on its net change, which has been quantified as the following Figure 7:

**Figure 7: Quantification of Effect AEGCI ratio to ARP net change**
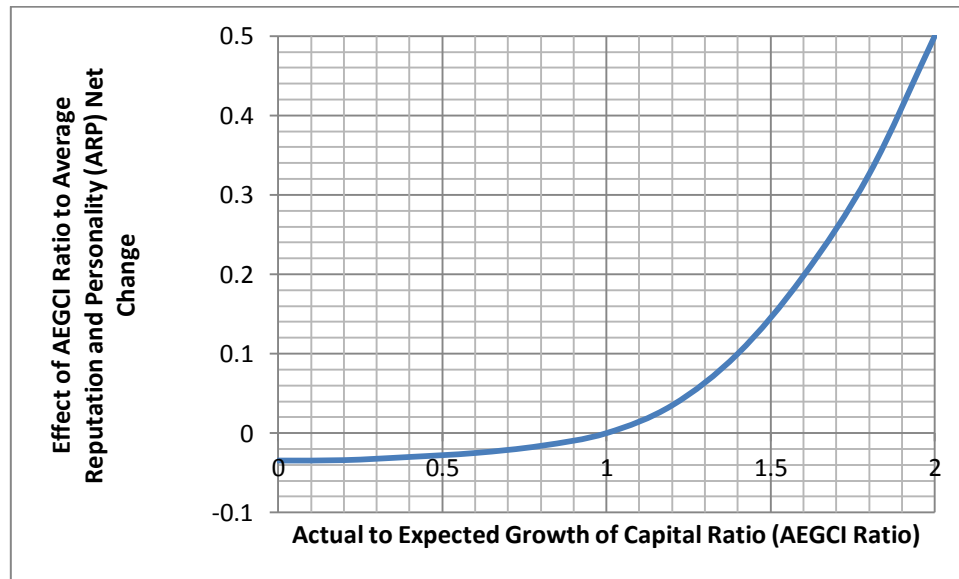
If AEGCI ratio is 1 (one), then there will be no change for average reputation and personality (ARP) in the system; less than 1 means a decrement on ARP and otherwise an increment. The decrement is set to far flatter than the increment effect, since there is a sense that funds owner far more concern 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 8:

Figure 8: Behavior of AEGCI ratio in 1 (one) year simulation
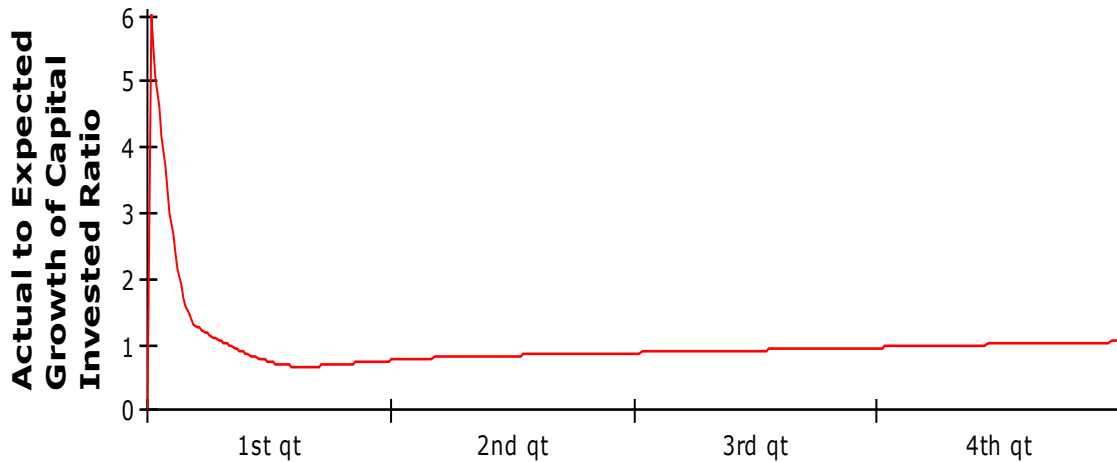
The sharp increase of the ratio is mainly caused by the total time capital been invested where for the initial simulation its value is almost zero thus will set the ratio increase sharply.

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 paper 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 3 and Figure 6. Both figures are connected by a variable namely Net SMEs Subscriber. However, since the PSP contract in the paper 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. *mudarabah* 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 3a below and 3b. These tables give clues on the initial value used on the simulation and its final result. Expectations on some variables have been reached.

**Table 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
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

No	Variable	Type	Initial Value	Expected Value	Final Value	Unit
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 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).

Table 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 2; simple production co-ordination, refer to Figure 4; and financing system according to PSP, refer to Figure 6 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 9:

Figure 9: The Difference Behavior of SE with different policy
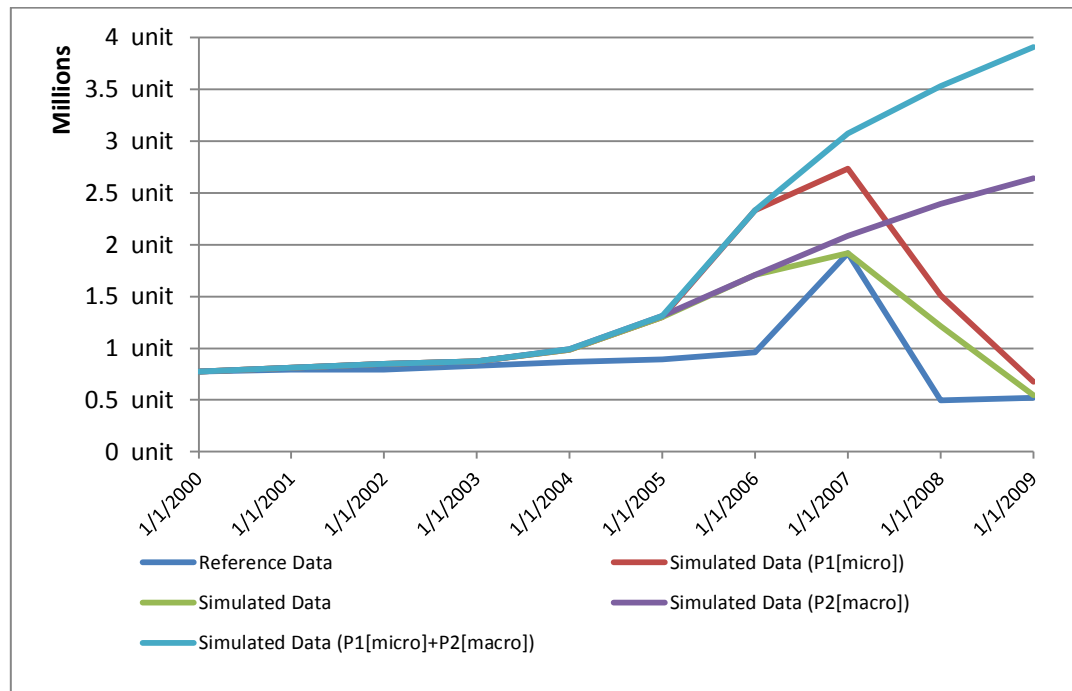
As can be seen on above Figure 9, policy on production coordination (P2 [Macro]) has a significant role to support sustainable development of small enterprises while the policy on the use of PSP financing system (P1 [Micro]) is able to boost the number of small enterprise but could not able to support 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 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 10a and 10b:

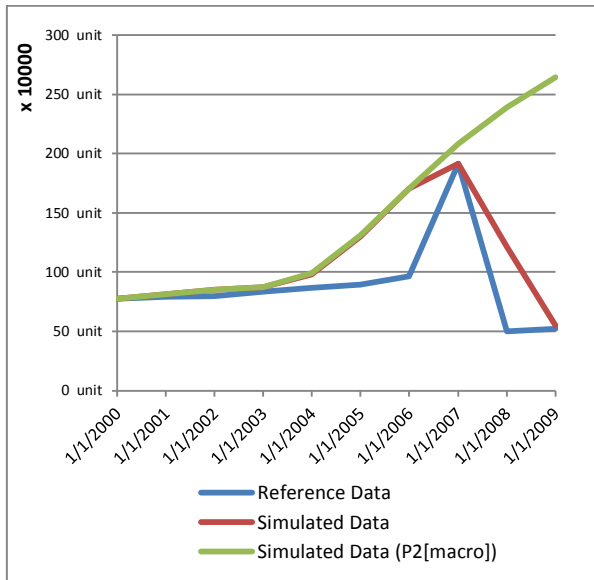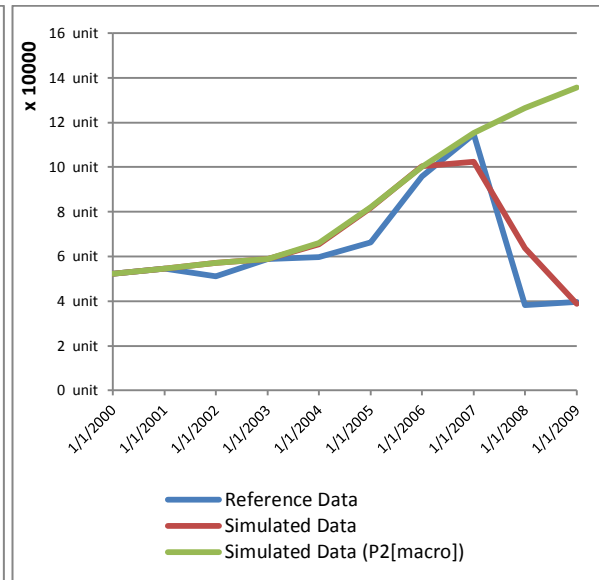**Figure 10a: SE Simulated data**   **Figure 10b: ME Simulated   data**

Figure 10a and 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 Figured 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 9. 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 6); 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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