INTEREST RATE POLICY, INFLATION AND ECONOMIC GROWTH
A Policy Evaluation of Indonesia, 1969-1997

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According to Shaw (1973) and McKinnon (1973), the most important element of economic development is financial liberalization. This action will eliminate the distortion, as what the government of Indonesia did on June 1, 1983 through deregulation of banking. The government eliminated the ceiling of credit and gave a full authority to each bank to determine their interest rates.

This study looks up to Fry (1995) model to test McKinnon-Shaw hypothesis. The models were regressed with dummy variable. This effort will give illustration or conclusion of the structural change, that happened specifically caused by environmental or policy changes.

Generally, insignificant in the relationship between interest rates in national saving and investment in Indonesia could be caused by financial mechanisms those very long and complex channels. That is why real interest rates could not give effect to national saving directly. Export, especially from oil and gas and foreign debt were growth-stimulating factors. Meanwhile, money supply, which supported by tight money policy and balance budget policy caused Indonesian inflation along those periods.

The periodically analysis shows that deregulation of June 1983(PAKJUN) were success to mobilize public fund, encourage investment on real sector, and increase the economic growth, but failed to control the inflation rate. The implementation of October 1988 deregulation (PAKTO) had flourished the establishment of new banks and created good competition among them. The competition had no longer on interest rate. Therefore, it can be said also the easy requirements of establishing banks become contra productive for PAKJUN policy, which had laid to the market mechanism.

Basically, either PAKJUN or PAKTO was not policies in which urgently implemented in Indonesia. Those financial deregulations were not supported by the existence of deregulation on real sectors, so that the financial deregulations were not effective to achieve their goals.

Keywords: banking deregulation; econometrics; financial liberalization; financial reform; interest rate policy; monetary policy; PAKJUN, PAKTO

Introduction

In many developing countries, the governments normally restrict the on-going interest rates for both credits and deposit accounts. The government of Indonesia also did it before June 1, 1983. This limitation gives negative real interest rates, after it is subtracted by the rate of inflation. This is due to the nominal interests implemented by the government is lower than the rate of inflation. So the rates which are drawn by subtracting interest with nominal interest rates will be negative. Interest rate limitation tends to distort productive resources allocation, through accumulated capital decrease and also allocation of capital at any level of savings. Many economists, such as Shaw (1973) and McKinnon (1973) had stated that the distortion due to financial repression in developing countries is more important than other policies, such as trading limitation.

The above economists also stated that the most important factor in economic sector is financial liberalization. This action will eliminate the distortion, as what the government of Indonesia did on June 1, 1983 through the deregulation of banking. The government eliminated the ceiling of credit and gave a full authority to each bank to determine their interest rates. This regulation was meant to eliminate and or to loosen any rules, which made, they believed, the distortion emerge. The term deregulation was meant to substitute liberalization. The action was aimed at increasing interest rates and/or to decrease rate of inflation. Although many economists agreed that financial reformation program which the key element is interest rate would benefit the developing countries, other economists questioned that policy. Vogel (1979), Galbis (1981), McKinnon (1981, 1982), and others had

tested on the problems that might emerge if the program is done in the developing countries. Since each developing country has its own characteristics, it seems impossible to generalize from one country to another. Galbis (1981) said that the success of financial reformation program, in any names (deregulation or liberalization) depends on the followings:

(1) The government should follow the basic principles of market forces,
(2) The structure of financial market and its size are big enough to support an effective competition,
(3) The freedom of joining and removing themselves.

If all the above conditions or one of them did not exist, free interest rates would potentially cause market instability, increase in oligopoly power, and stimulate a lower deposit account situation. In this case interest rate was the main subject (key variable) as mentioned by Gonzalez-Vega (1981) that interest rates were a relative important price in market; interest rates determined and guided prices of other goods; and interest rates had commonly been known as the cause of market distortion.

This research is carried out to see the problems that might occur in Indonesia from 1983, when deregulation of banking was implemented, until 1997, before the economic crisis in Indonesia. The problem might be worse, if there had not been any reformations done by the government of Indonesia. This was because there would be no sufficient regulations for the successful reformation.

Objective of Research

This research attempts to know the influence of controlled interest rates by the government towards price and economic

growth, and also the influences of freed interest rates to the same variable and finally try to test whether the financial deregulation is worthwhile to control inflation and to push economic growth, rather than hider it and lead to inflation.

Specifically, this research aims to know if there is a positive relationship between interests controlled by the government and inflation rate. In other words lower interest rates will bring lower inflation, and vice versa. Through this research it will be seen whether there is a relationship between interests and economic growth. Lower interest rate will increase economic growth through investments. There is a negative relationship between interests and investment demands in one hand, a positive relationship between investments and economic growth on the other hand. It means that lower interest rates will increase the demand of inflation,

due to the fact that interest rate is a factor of investment cost. The multiple increases in investment will increase economic growth. The process will be just on opposite; higher interest rate means decrease in investment demand that will lead to decreasing economic growth. Financial liberalization is expected to lower interest rates, followed by inflation and increasing economic growth.

Theoretical Framework

Theoretical Model

McKinnon (1973) and Shaw (1973) Model. The main intellectual basis for financial sector analysis and policy advice over the past 30 years lies on the work of McKinnon (1973) and Shaw (1973). McKinnon and Shaw analyze developing economies that are financially repressed.

Figure 1. **Saving and Investment under Interest Rate Ceilings**
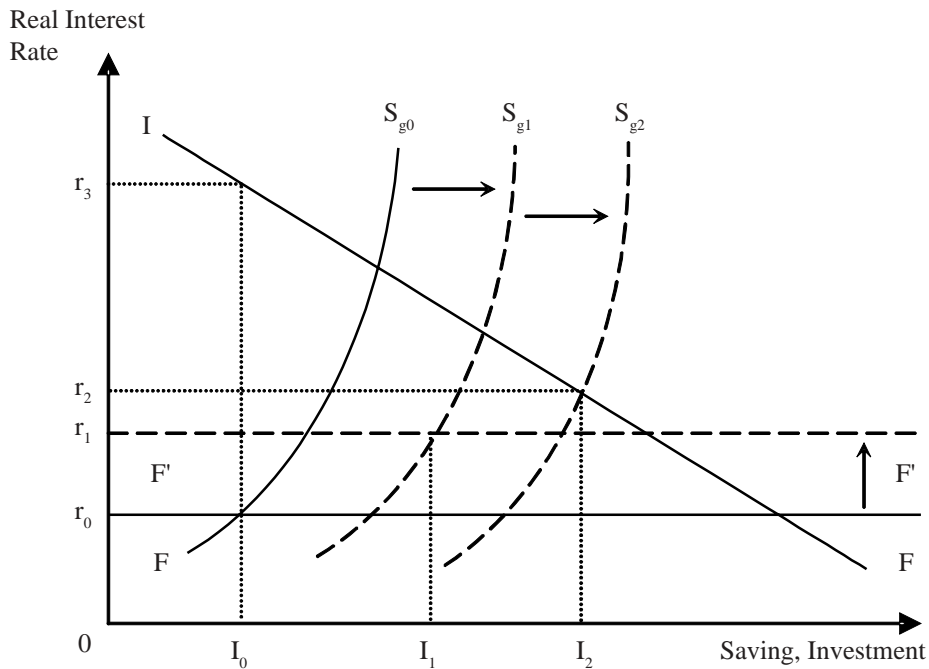
Their main argument is that financial repression –indiscriminate "distortions of financial price including interest rates and foreign exchange rates"- reduces "the real interest rate of growth and the real size of financial system relative to non-financial magnitudes". In all cases this strategy has stopped or retarded the development process" (Shaw 1973). The solution is to remove these distortions imposed by governments in developing countries.

The essential common elements of the McKinnon-Shaw in money model, in which financial institutions as intermediary between savers and investor, are illustrated in Figure 1.

Saving S_{g_0} at a rate of economic growth g_0 is positive function of the real rate of interest (McKinnon 1973, and Shaw 1973). The line *FF* represents financial repression, taken here to consist of an administratively fixed nominal interest rate that holds the real rate r below its equilibrium level. Actual investment is limited to I_0, the amount of saving forthcoming at the real interest rate r_0.

One reason why saving may fall when inflation accelerates or the nominal interest is lowered, can be analyzed by considering nondepreciating assets in fixed supply. With higher real land and no change in real incomes, the household sector's wealth/income ratio rises. All saving theories based on intertemporal utility maximization show that greater wealth raises consumption in present and the future. It therefore includes a decline in saving out of current income (Fry and William 1984).

If the interest rate ceiling applied only to savers' interest rates (only to deposit but not to loan rates of interest), the investor/borrower would face an interest rate of r_3, the rate that clears the market with the constrained supply of saving I_0 (see Figure 1). The spread r_3-r_0 would be

spent by a regulated yet a competitive banking system, on non-price competition (advertising and opening new bank branches). These non-price services, however, may not be valued at par with interest payment; real money demand invariably declines with a decrease in the explicit real deposit rate of interest.

Interest rate ceiling distorts the economy in four ways. *First*, low interest rates can produce a bias, in terms of current consumption and against future consumption. Therefore, they may reduce saving below social minimum level. *Second*, potential lenders may engage in relatively low-yielding direct investment instead of lending by way of depositing money in banks. *Third*, bank borrowers who are able to obtain all the funds they want at low loan rates will choose relatively capital-intensive projects. *Fourth*, groups of potential borrowers consist of entrepreneurs with low-yielding projects would not want to borrow at higher market-clearing interest rate. To the extend that banks' selection process contains an element of randomness, some investment projects that are financed will have yields below the threshold, that would be self-imposed with market-clearing interest rates.

The policy prescription for the financially repressed economy, examined by McKinnon and Shaw, is to raise institutional interest rates or to reduce the rate of inflation. Abolishing interest rate ceiling altogether produces the optimal result of maximizing investment and rising still further investment's average efficiency. This is show in Figure 1 by the equilibrium I_2, r_2, and the higher rate of economic growth g_2.

Galbis Model (1977). This model was known as a two-sector model in capital usage in a separated economy. It means that there is a dualism in the usage of

capital. In this model there were high equilibrium real interest rates that support growth although total amount of savings were not influenced by interest rate incentives. It occurred even in high interest rates, distribution will be better since better quality of capital will support the increase of capital productivity. Therefore, previous higher capital used can be minimized so that the rest can be allocated in other sectors. In other words, this model showed that efficiency in capital use would support the economic growth and restore income distribution.

Galbis' analysis can be simplified by zero-cost; a competitive banking faces deposit account interest rate but not effective credit interest rate. In this case deposit account interest rate should always be bellow equilibrium. Higher real deposit account interest rates probably restore average investment efficiency through financial institution, not only among sector but also within the sectors.

Gonzales-Vega (1980). The model tested the influence of interest limitation to socially optimum allocation of credit. This kind of credit was defined as allocation, which will maximize net income in aggregate for every economy participant, including producers as well as financial intermediaries. This micro economy model described social cost in relation to unified interests and interest rate limitation in the market. It suggested to achieve an optimum mechanism for income distribution constitutes a loan cum-lump-sum. It implied that unified interests would emerge social cost or it will need a plot of credit.

This Gonzales-Vega model worked under four assumptions:
(1) Two producers, bigger and smaller ones, where their profits are influenced by their productivity,

(2) Bigger producers are more superior then smaller ones, especially on resources ownership,
(3) Marginal cost of loan for bigger producers is lower then that to smaller ones,
(4) The requirement for socially optimum allocation of credit are that each producer will get credit if marginal cost upon loan is equal the value of marginal product upon input variable bought with the loan, which mathematically can be formulated as follows:

$$MC^*_k = VMP^*_k, \text{ for bigger producers buying input } K,$$

$$MC^{**}_k = VMP^{**}_k, \text{ for smaller producers buying input } K.$$

Krugman Model (1978). Krugman model was based on Fisher model, which was known as two period time model. The difference was in time for income allocation. According to Fisher if profit is spend out at the moment; consequently there is no more profit in the future; or if it consumes nothing so that all profit can be gained in the future. This model emphasized on the credit market –debtor in one hand and creditor on the other. In this case debtors were the one who spend their profit totally for today consumption (there is nothing to save); creditors were the ones who have got bank accounts for future plans and being lent in turn. In the beginning, the model considered every party was identical. Each party was as both consumer and producer for now and future plan so that transformation of consumption from now to future plans occurs. It also means that there was certain amount of money to be saved. Limitation in interests was discussed with regard to influence on wealth, efficient, and growth. The interesting description in this model was that when the interest rates were under the

government's control/supervision in equilibrium there was a dualism in financial market where some loans with lower interest rates and some other get higher interest rates.

Lee Model (1980). Limitation on nominal interests, such as in the USA and other industrial countries that limits the interest rate of deposit accounts, had brought disturbance in financial intermediaries, especially when inflation rate and interest in the market increase. Therefore, limitation in developing countries created stable portfolio, in the sense that there is a shift in asset possession from financial asset to physical assets. In the single bank Lee considered that the benefit of monopoly is paid as transfer payments. One of the impacts on bank accounts as real interest rates decreased, due to increase of inflation rates, was described as a case where supplies are the same as land. The price of a piece of land was expected to increase, as inflation did with the same amount at least. When real saving interest rate decreased, land asset becomes more interesting than deposit account. Therefore, when the real interest rate decreases many families withdraw their savings or deposit accounts and spend them on land. Consequently, the increase in price of land is faster than the rate of inflation.

Gurley and Shaw (1960) had left intellectual heritage with modern approach for financial reformation and it had been upgraded and developed by McKinnon (1973) and Shaw (1973), especially in developing countries. They both argued that financial repression by combining between tax within monitoring interest rate and government's invasion in credit allocation processes had led to decreasing financial systems as well as saving efficiency. This argument assumed that sudden and overall financial liberalization

would increase system of financial and efficiency. McKinnon (1988) suggested that financial reformation should be done gradually. Whereas Stiglitz and Weiss (1981) stated that even a free-market system with no credit allotment, a rapid and completed government role dismantle in making credit allocation is something optimal. Experiences in Latin America suggested that financial reformation in any form should be postponed until real sectors adjusted themselves. There is a kind of consensus that gradual financial liberalization is preferred.

Cho and Khatkhate (1989), McKinnon (1988), and Villanueva and Mirakhor (1990) mentioned the importance of liberalization where macro stability and enough control from banks are the two requirements of successful financial reformation. Calvo (1988) and Rodrik (1989) used credibility to support a narrow outlook upon this adjustment program where they let financial liberalization in the last to adjust. Other sectors came first before financial.

Dornbusch and Reynoso (1989) even doubted on the benefits of that kind of liberalization except leading to macro economic stability to countries that hold financial repression because people think that tax is burdensome. Dornbusch and Reynoso cited John Stuart Mill that financial sectors and factors will be important when stability becomes a dominant power upon economy. This sentiment seems to be extreme to old Keynesian, although it is not Keynes itself. They only see that the so-called money is only a veil.

Gertler and Rose (1994) said that financial liberalization especially on banking failed to reach the goals for three reasons, namely:

(1) Accompanying the rise in loan rate was a rise in the required external final

premium for a substantial class borrower.

(2) Timing.

(3) The failure in the most cases to adequately coordinate liberalization with the design of the financial safety net.

To avoid bigger loss due to any liberalization or deregulation, especially on financial, the government should pay attention to the timing and coordinate the safety net of financial system.

Empirical Model

Fry Model (1980). Fry model was explicitly the results of empirical experiments. The components had been taken in his paper since 1977. This model quantitatively presented to estimate costs as the results of financial repression in the developing countries. The model follows McKinnon, considering the influence of the real interest rates for deposit account toward money demand and credit offered, as well as the relation between two of them and investment, capital usage capacity and growth. In interest imbalance situation, due to financial repression, the decrease in real interest rate of deposit account will reduce the demand of real money and credit supply. This situation would decrease demand of both working and capital. The use of existing capital decreased as well. Finally, the economy would also decrease. The estimation of the samples taken from some developing countries show that the cost of people paid due to financial repression decrease growth by 5 percent for each per cent of real interest rate changes. This was due to lower recommended interest rate compared to the market equilibrium.

Fry Model is described as follows:

$$S_n = a_o + a_1 g + a_2 Y + a_3(d\text{-}i^*) + a_4\, SF\,/\,y + a_5\, S_n\,/\,yt\text{-}1 \qquad (1)$$

$$I\,/\,y = S_n\,/\,y + S_t\,/\,y \qquad (2)$$

$$g = b_1\, I\,/\,y + b_1\,(d\text{-}i^*) \qquad (3)$$

Equation (1)-(3) give after substituting $g\text{-}n+y_{t\text{-}1}$ for each Y.

$$g = [a_o b_1 - a_2 b_1 n + a_2 b_1 Y_{t\text{-}1} + (a_3 b_1 + b_2)(d\text{-}i^*) + b_1(1 + a_4\, SF/y) + a_5 b_1\,(S_n/y_{t\text{-}1})\,]\,/\,1\text{-}\,a_1 b_1 - a_2 b_1 \qquad (4)$$

Short-term impacts $(d\text{-}1^*)$ at g in equation 4 are:

$$\Delta g = \frac{a_3 b_1 + b_2}{(1 - a_1 b_1 - a_2 b_2)}\, \Delta(d\text{-}1^*) \qquad (5)$$

Whereas long term impacts are:

$$\Delta g = \frac{[(a_3 b_1\,/\,C_1 - a_5) + b_2]}{(1 - a_1 b_1 - a_2 b_2)}\Delta(d\text{-}1^*) \qquad (6)$$

Notes:

Sn/y = Gross National Saving ration at present prices at GNP

I/Y = Gross investment ratio at present prices GNP

g = real GNP growth in proportion

y = logarithm of real income

SF/Y = *Foreign Saving* – GNP ratio

d = nominal interests at 12 month deposit account

b = expected result at government's obligation (nominal)

i^* = expected inflation rate

Research Hypothesis

Due to the objectives of this research that shortly tries to find answers about economic situation in Indonesia post de-

regulation; the tentative answers are as follows:

(1) There is a positive relation between real interest and economic growth
(2) There is a negative relation between real interest and inflation
(3) There is an inverted U curve relationship between interest rate and economic growth.
(4) Inflation rate is significantly and negatively affected by real interest rate.

Research Methods

This study tries to make a policy evaluation toward interest rates policy that was made by the Indonesian government. For that, this study makes division of history into periods, based on government policy to each period. *First*, Pre-Deregulation covers the period Pelita I, 1969 until June 1983. In this period, nominal interest rates and the rate of credit ceiling are defined by the government. *Second*, covers the period 1983 reform until before 1988 reform. In this period was marked by abolitions of credit ceiling system and interest rates that had been used to control the monetary system directly. *Third*, covers the period since 1988 reform until 1997, before the economic crisis. After the second period, it was easy to build a bank, even with non-professional banking resources. That is why there was unhealthy competition in the commercial banking industry.

Data

The data used in this study is secondary data that has been published. This study covers the period 1969 to 1997. The data is taken from various references such as; The International Financial Statistic (IFS) Yearbook (various years of publica-

tion) and CD-ROM 2000 edition, The World Development Indicator (WDI) (various years of publication) and CD-ROM 1995 edition and some other relevant references.

Model Used in the Research

A problem rose in McKinnon and Shaw's thesis, as it was shown by Galbis, considering three positive relationships between investment ration and real interest rates:

(1) The specification of the model done by Kapur (1978) leads to a conclusion, which is reverse to the model proposed by McKinnon and Shaw.
(2) Some writers also doubt McKinnon and Shaw's thesis in relation to its validity for the underdeveloped economy, which still needs self-support in finance. In this case, impact of financial repression on the investment might be very small in quantity.
(3) The empirical failure in the test of McKinnon and Shaw's thesis might be due to speculative asset factor and inflation in the definition of investment. It may also cause by structural gap factors (lag) related to the relationship between investment and real interest as suggested by McKinnon.

Considering that the focus of this research is to find out the influence of interest on macro economic variable, especially economic growth and inflation rate in Indonesia, the behavior model can be formulated as follows:

Saving Function:

$$SNY_t = \alpha_0 + \alpha_1 YG_t + \alpha_2 RD_t + \alpha_3 SNY_{t-1} + \alpha_4 DUM1 + \alpha_5 DUM2 + \varepsilon_t \qquad (7)$$

Investment Function:
$$IY_t = \beta_0 + \beta_1 YG_t + \beta_2 RW_t +$$
$$\beta_3 IY_{t-1} + \beta_4 DCPY_t +$$
$$\beta_5 DUM1 +$$
$$\beta_6 DUM2 + \xi_t \qquad (8)$$

Growth Function:
$$YG_t = \chi_0 + \chi_1 RD_t + \chi_2 XKG_t +$$
$$\chi_3 SFY_t + \chi_4 DUM1 +$$
$$\chi_5 DUM2 + \varsigma_t \qquad (9)$$

Inflation Function:
$$INF_t = \delta_0 + \delta_1 MNG_t + \delta_2 YG_t +$$
$$\delta_3 RD_t + \delta_4 DUM1 +$$
$$\delta_5 DUM2 + \upsilon_t \qquad (10)$$

where:

SNY = national saving/GNP ratio —in percent,

YG = rate of GNP growth —in percent,

RD = real deposit rate of interest rate (12-month deposit minus inflation) —in percent,

IY = national investment/GNP ratio —in percent,

RW = world interest rate (proxy US T-bills) —in percent,

DCPY = domestic credit to the private sector/GNP —current price in percent,

XKG = rate of growth in export —constant price in percent

SFY = foreign saving/GNP ratio —in percent,

INF = inflation (growth of consumer price index) —in percent

MNG = rate of growth in per capita M2 —in percent

The author used the dummy variable approach (See Gujarati 1995: 512-514) to find out the effect of the 1983 financial reform (PAKJUN 1983) and the 1988 of financial, monetary and banking reform (PAKTO 1988) toward Indonesian economy.

The Empirical Evidence

Saving Function

The dummy variable estimation for saving function is:

$$SNY = 3.15808 + 63.4056 * DUM1$$
$$(1.0815) \qquad (1.76346)$$
$$- 63.5324 * DUM2 + 0.3346 * YG$$
$$(-1.7057) \qquad (2.447293)$$
$$+ 1.3779 * (DUM1 * YG)$$
$$(0.639468)$$
$$- 1.2092 * (DUM2 * YG) - 0.1040 * RD$$
$$(-0.55251) \qquad (-1.25339)$$
$$+ 0.4717 * (DUM1 * RD)$$
$$(0.78162)$$
$$+ 0.0907 * (DUM2 * RD)$$
$$(0.127021)$$
$$+ 0.7709 * SNY(-1)$$
$$(7.860978)$$
$$- 2.1967 * [DUM1 * SNY(-1)]$$
$$(-1.56884)$$
$$+ 2.0630 * [DUM2 * SNY(-1)]$$
$$(1.446032)$$

$R^2 = 0.891349$ DW Stat. = 3.077989

The estimation results above show that there is a significant relationship between national saving rates, economic growth rate and national saving in the previous period. Furthermore, interest rate variable seems not to have effect on the rate of national saving. It follows the skeptic point of view that there is a small relationship between interest rates and national saving. Empirically, insignificant

relationship between interest rates and national saving in Indonesia could be caused by a very long and complex channel in financial mechanism. So the real interest rates cannot give, effect to national saving directly.

From the estimation results, there is a significant and direct effect of June 1983 financial policy on the rate of national saving. In order to find out, whether the change of function happens before or after the deregulation, the observation is divided into two periods, before and after the deregulation. Analysis of the role of saving on economy can also be evaluated periodically by dividing the analysis period into two (before and after PAKJUN Deregulation 1983).

Before PAKJUN

$$SNY = 3.1581 + 0.3347*YG - 0.1040*RD$$
$$\quad\quad (1.014)\quad\quad (2.295)\quad\quad (-1.176)$$

$$\quad\quad + 0.7709*SNY(-1)$$
$$\quad\quad\quad (7.372)$$

$$R^2 = 0.874244 \quad\quad DW\ Stat. = 3.116240$$

After PAKJUN

$$SNY = 11.9195 + 0.2278*YG + 0.4877*RD$$
$$\quad\quad (1.426)\quad\quad (0.707)\quad\quad (1.598)$$

$$\quad\quad + 0.4446*SNY(-1)$$
$$\quad\quad\quad (1.804)$$

$$R^2 = 0.514608 \quad\quad DW\ Stat. = 2.267335$$

The intermediary function of financial institutions before the PAKJUN had not been optimum yet since the real interest rate was always negative. Although PAKJUN was authorize, still the real interest rate did not affect saving. This circumstance might become the consequence that the on going competition among banks was not on interest rate but more on supplying gift away (presents), improving

services, easy access, and also on management improvement. Variable SNY(-1), before and after deregulation shows a significant effect on SNY that public's ability to save was determined by the saving in the previous period.

The CUSUM test result shows the unchanged parameter estimation of saving function in both before and after the deregulation. We can see it in the following graph of saving function using a 5 percent degree of significance.

Besides conducting analysis of PAKJUN deregulation, periodic function estimation is also conducted to observe the impact of the deregulation before and after PAKTO 1988.

Before PAKTO

$$SNY = 2.6325 + 0.3017*YG - 0.0243*RD$$
$$\quad\quad (0.842)\quad\quad (2.015)\quad\quad (-0.323)$$

$$\quad\quad + 0.8449*SNY(-1)$$
$$\quad\quad\quad (9.129)$$

$$R^2 = 0.842254 \quad\quad DW\ Stat. = 2.977524$$

After PAKTO

$$SNY = 3.0313 + 0.5033*YG + 0.4584*RD$$
$$\quad\quad (0.331)\quad\quad (1.372)\quad\quad (1.304)$$

$$\quad\quad + 0.6373*SNY(-1)$$
$$\quad\quad\quad (2.434)$$

$$R^2 = 0.751887 \quad\quad DW\ Stat. = 3.096717$$

Financial deregulation on October 27, 1988 (PAKTO) had created an easy access to bank establishments and attracting as many customers as possible. Having the policy applied, banks were expected to generate economic growth by mobilizing funds and distribute credits for real sector investment. Though the PAKTO had flourished bank establishments and created good competition among them, competition had no longer on interest rate. This fact has been proven that empirically

interest rate did not affect national saving for both, before and after the applied deregulation of PAKTO. Therefore, it also can be said that the easy requirements of establishing banks become contra productive for PAKJUN policy.

CUSUM test before and after PAKTO shows the changing national saving estimation parameter. Before PAKTO saving function graph is still at its 5 percent significance range but become insignificant after then

Investment Function

The dummy variable estimation for investment function is:

IY= 4.739123 + 23.7679*DUM1
    (1.575008)   (0.759287)

    - 11.3376*DUM2 + 0.0725*YG
      (-0.2724)   (0.669703)

    - 0.8333*(DUM1*YG)
      (-0.04745)

    + 1.0899*(DUM2*YG) + 0.5568*RW
      (0.062031)   (1.533462)

    - 0.887*(DUM1*RW)
      (-0.03178)

    + 0.376*(DUM2*RW) + 0.725*IY(-1)
      (0.013443)   (4.457154)

    - 0.9948*[DUM1*IY(-1)]
      (-0.10913)

    + 0.8272*[DUM2*IY(-1)]
      (0.090507)

    + 0.0746*DCPY
      (0.443795)

    + 0.6269*(DUM1*DCPY)
      (0.047021)

    - 0.7774*(DUM2*DCPY)
      (-0.05831)

R^2 = 0.951560   DW Stat. = 2.383360

The investment model shows that there is a significant relationship between present investments and the previous period investment. Economic growth, real interest rate, and domestic credit variables do not have significant effect to investment.

Related to this result, there was inelastic investment expenditure toward real interest rate. To explain this condition, it needs to consider a fact that there is fewer interest costs related to total cost of investment. A lot of economists have been argued that the roles of interest rate are limited in influencing investment. The investment variations particularly come from long-term interest rates, which mean that the long-term interest rates indicate short-term interest rates expectation. It means that the long-term interest rates alteration reflect future short-term interest rate alteration.

From investment model above, intercept and slope coefficient are not statistically significant. It means there are no effects from both deregulations (PAKJUN 1983 and PAKTO 1988) in investment, in other word, the model is not stable.

Investment role analysis on the economy can also be found out periodically by dividing the period into before and after deregulation. Please refer to the following description to see the result of investment function estimation:

Before PAKJUN

IY = 4.7391 + 0.0725*YG + 0.5568*RW
    (1.420)   (0.604)   (1.383)

    + 0.7246*IY(-1) + 0.0746*DCPY
      (4.019)   (0.400)

R^2 = 0.826123   DW Stat. = 2.279857

After PAKJUN

$$IY = 21.499 + 0.6662*YG - 1.4234*RW$$
$$\quad (3.038) \quad (4.700) \quad (-2.886)$$
$$+ 0.3680*IY(-1) - 0.0335*DCPY$$
$$\quad (1.800) \quad (-0.989)$$

$R^2 = 0.886879 \qquad$ DW Stat. = 3.175816

The non-performing role of real interest rate deregulation in affecting investment was due to the world's low real interest rate; even it had been negative during 1974-1980. On that circumstance, it means that the debtors enjoyed double advantages; cheap credit form the state bank and receiving transfer despite paying interest rate, because the consideration on determining credit allocation lied on non-economic factors rather than economic ones. The too-low credit interest had stimulated non-optimum usage, e.g. funding unfeasible investment projects; capital and foreign currency intensive projects that created less contribution to economic growth, employment absorption, and equal development.

The existence of PAKJUN 1983 has made the role of real interest rate significant. Selective credit policy to optimal the performance of bank's credits was being used to raise production and export by increasing production capacity. Subsidy to push interest rate was aimed to stimulate investment because interest rate was considered to be an important factor to determine the rate of public investment expenditure.

CUSUM test result before and after deregulation of June 1, 1983 shows that investment function remains the same. This is also shown in the investment function graph, which is still at its critical line. As the conclusion, the parameter of investment function has been stable during the observation period.

Before PAKTO

$$IY = 4.1832 + 0.0825*YG + 0.5035*RW$$
$$\quad (1.517) \quad (0.748) \quad (1.457)$$
$$+ 0.7136*IY(-1) + 0.1202*DCPY$$
$$\quad (4.283) \quad (0.775)$$

$R^2 = 0.875128 \qquad$ DW Stat. = 2.288296

After PAKTO

$$IY = 17.1694 + 0.3291*YG + 0.0463*RW$$
$$\quad (0.954) \quad (0.885) \quad (0.033)$$
$$+ 0.5569*IY(-1) - 0.0758*DCPY$$
$$\quad (1.264) \quad (-1.094)$$

$R^2 = 0.637243 \qquad$ DW Stat. = 3.075372

Real interest rate unaffected national saving for both before and after the PAKTO deregulation. It also has a significant effect of the real interest rate to investment. The establishment of new banks had distorted banking competition in distributing credits that also related to banks' limited ability in issuing credits. Thus, decisions of issuing credits were not based on accurate analysis. Low interest rate had brought credits allocation to non-economic considerations, reflected in worst process of credit selection, monitoring, and credit recollecting. PAKTO 1988 also emerged liquidity problem from banking industry to non-bank financial institution due to more requirements, such as the health of source structure and the fund used by financial institution. Although PAKTO decreased the minimum reserve requirement from 15 percent to only 2 percent, banks and other financial institutions must hold it in the form of "*Sertifikat Bank Indonesia* (SBI)". Therefore, the fund available to distribute was also limited.

The CUSUM tests result before and after PAKTO shows the unchanged parameter of investment function. From the result, we can conclude that the parameter has been stable during observation period.

Growth Function

The dummy variable estimation for growth function is

YG= 6.084484 - 1.2797*DUM1
    (3.386839) (-0.14722)

    - 4.1919*DUM2 + 0.1921*RD
      (-0.33564)   (1.279086)

    + 0.0783*(DUM1*RD)
      (0.080071)

    + 0.1793*(DUM2*RD)
      (0.157066)

    + 0.1646*XKG
      (2.658229)

    - 0.1426*(DUM1*XKG)
      (-0.67423)

    + 0.4221*(DUM2*XKG)
      (0.532833)

    - 0.7449*SFY
      (-2.26085)

    + 1.1728*(DUM1*SFY)
      (0.933441)

    + 0.0121*(DUM2*SFY)
      (0.007497)

  R^2 = 0.502135   DW Stat. = 1.774899

From the result of model regression, t-value (in parenthesis) shows that export and foreign saving variables significantly related to economic growth. Meanwhile, real interest rate does not have effect on economic growth. Related to economic growth function, from intercept and slope coefficient provide evidence that the function is stable. The existences of financial reform do not change economic growth function in long period.

The method used in the previous two analyses can also be applied in that of economic growth.

Before PAKJUN

YG= 6.0845 + 0.1921*RD + 0.1646*XKG
    (3.045)   (1.150)   (2.390)

    - 0.7449*SFY
      (-2.033)

  R^2 = 0.471109   DW Stat. = 1.671630

After PAKJUN

YG= 2.6901 + 0.4641*RD + 0.0777*XKG
    (1.001)   (1.762)   (0.877)

    + 0.1559*SFY
      (0.676)

  R^2 = 0.315815   DW Stat. = 1.660788

Before PAKJUN the real interest rate did not affect on economic growth. The low real interest rate (even negative) and the non-performing banking intermediation brought a small amount of fund mobilization from society. Therefore, there was only a little fund available for investment in real sector. In a ceiling-based, selective, and interest subsidy credit system, government directly allocate credit for banks. Such banking industry repression had created burrier to mobilize saving and to develop national financial system.

After PAKJUN the real interest rates was determined by the market. The role of market had become increased in mobilizing fund and credit allocation. However, the banking freedom on setting interest rate was not effective enough to attract customers. In other words, there was something more than just the interest rate. In this research, the role of real interest rate to national saving is not as it was expected, that is, the higher interest rate the more mobile the fund will become, which is reflected in the higher rate of national saving. Moreover, the national saving gath-

ered by banks was due to factors outside interest rate (excluded in this research). Theoretically, mobilized fund collected by banks will be used in funding development through credit distributions on real sector investments. Investment function estimation result shows that the real interest rate before PAKJUN does not have any effect on investment expenditure but the effect began to rise after the PAKJUN. Through this policy the real interest rate has its power to stimulate investment actions and development in real sector. The result of empirical study on growth model is also related to this result. Growth function before deregulation was affected by real export growth and ratio of foreign saving to GDP. It makes sense that before PAKJUN, economic growth was not related to real interest, that the rate was so low even negative. As the result, there was an excessive credit demand allocations to non-performing investment that contributed nothing to economic growth. It then depends on export especially from oil and gas, also from foreign debt and aid. Both growth-stimulating factors were considered to have many weaknesses then. Foreign currency income from export growth was not reliable for long term as after the so-called *bonanza* era the world's oil price had a decreasing trend. Besides, the continuing foreign debt and aid can only create financial burden to the state and its society in the future. PAKJUN 1983 aimed to stimulate economic growth by increasing fund mobilization, efficiency on financial institution, and economic resources rationalization. During the implementation interest rate was set according to mar-

ket mechanism. Indeed, the policy proves to have a significant effect on economic growth after the PAKJUN 1983. The market-based interest rate is no longer negative and in return has succeeded in stimulating investment. Higher investment that had been done would push economic growth to higher level. Therefore, June 1983 financial deregulation succeeded to push economic growth through public fund mobilization.

The CUSUM test before and after PAKJUN deregulation shows a stable estimation function parameter during the period of observation.

Before PAKTO

$$YG = 5.8055 + 0.1044*RD + 0.1581*XKG$$
$$(3.519) \qquad (0.795) \qquad (2.702)$$
$$- 0.6194*SFY$$
$$(-2.002)$$

$R^2 = 0.452767 \qquad$ DW Stat. $= 1.833385$

After PAKTO

$$YG = 0.6129 + 0.4496*RD + 0.4440*XKG$$
$$(0.083) \quad (0.911) \qquad (0.714)$$
$$+ 0.4400*SFY$$
$$(0.511)$$

$R^2 = 0.283721 \qquad$ DW Stat. $= 1.561269$

The role of economic growth on development affects the limited available fund in banking sector to distribute. Investment activities become less expanded and directly affect economic growth.

The CUSUM test, before and after PAKTO deregulation, shows stability during the period of observation.

Inflation Function

The dummy variable estimation for inflation function is:

INF = 3.227153 + 4.3861*DUM1
     (1.563947) (0.380163)

     + 3.3153*DUM2 + 0.3803*MNG
       (0.282365)   (5.759771)

     - 0.0096*(DUM1*MNG)
         (-0.01898)

     - 0.4072*(DUM2*MNG)
         (-0.79263)

     - 0.3342*YG + 0.8244*(DUM1*YG)
       (-3.11523)   (0.671839)

     - 0.5807*(DUM2*YG)
         (-0.46148)

     - 0.732*RD - 0.4266*(DUM1*RD)
       (-12.3096)   (-0.6152)

     + 1.041*(DUM2*RD)
       (1.409345)

   R^2 = 0.948161   DW Stat. = 1.866982

Along observed period (1969-1997), the Indonesian inflation was affected by per capita money supply growth rate, economic growth, and real interest rate. However, the existence of financial deregulation does not give impact to inflation in Indonesia.

Using the same method, the observation is divided into two periods, before and after PAKJUN.

Before PAKJUN

INF= 3.2272 + 0.3803*MNG - 0.3342*YG
     (1.279)   (4.710)   (-2.547)

     - 0.7319*RD
       (-10.065)

   R^2 = 0.933887   DW Stat. = 1.689143

After PAKJUN

INF= 11.5332 - 0.0379*MNG + 0.0175*YG
      (7.576)   (-0.661)   (0.110)

     - 0.2943*RD
     (-2.187)

   R^2 = 0.408897   DW Stat. = 1.818007

Analysis of inflation on the economy shows that during 1969-1983, inflation was caused by the growth of money supply, economic growth, and real interest rate. Those factors were related to one another and created an undivided chain. Moreover, under employment and blur economic policy inflation had become so difficult to control. During that time inflation control policy was conducted by controlling the amount of money supply. The state's financial problem after oil boom was also covered by money printing. Thus, the exceeding money supply had raised inflation rate.

Financial deregulation of June 1, 1983 was aimed to increase economic growth and decrease inflation velocity by letting the market to meet the desirable interest rate. Interest rate was expected to be a good instrument to control inflation rate. Indeed, this policy brought a favorable result, at which the rate of inflation succeeded to absorb money supply from the public. We can see it from the higher amount of less-than one-year deposit, clearing account, as well as more-than one-year deposit. This circumstance reflects people's effort to make transaction payment more efficient to replace higher opportunity cost of transaction in cash (interest rate for time deposit). Inflation control policy can also be applied through minimum reserve requirement, discount facil-

ity, or open market operation. Those policies affected inflation growth through interest rates mechanism which no longer regulated by government after the 1983 PAKJUN deregulation.

Policies to control inflation, however, have changed the inflation function. The instable inflation function before PAKJUN was caused by the uncontrollable inflation growth. After *Malari* incident in 1974 there was a cheap credit policy and inflation was set to be not more than two digits. Both monetary and fiscal policies were aimed to control inflation growth. Therefore, inflation function after the deregulation became stable.

The CUSUM tests result before and after the deregulation of June 1 1983 shows that inflation function parameter has changed. Before 1983 the inflation function graph was still at its critical line, but in the mid 1977, it has gone outside its 5 percent degree of significance.

Before PAKTO

INF= 6.9259 + 0.3032*MNG - 0.3357*YG
       (2.969)   (3.697)   (-2.365)

   - 0.6568*RD
     (-9.271)

R^2 = 0.901911   DW Stat. = 1.572166

After PAKTO

INF= 10.9285 - 0.0365*MNG - 0.0905*YG
        (8.042)   (-0.791)   (-0.670)

   - 0.1175*RD
     (-0.993)

R^2 = 0.495920   DW Stat. = 2.302706

Before PAKTO deregulation inflation function was determined by the amount of money supply, economic growth and real interest rate. Inflation growth during that period relatively high due to the absence of inflation control policy. National

income had been increased from oil export currency during the period of oil boom but on the other side the expenditure increased as the consequence of balance budget policy. However, Indonesian economy, which still did not meet the full employment, could not balance between aggregate demand and aggregate supply. This condition had raised the price rate and than stimulated cost-push inflation.

In addition, inflation growth was also affected by the amount of money supply; in which monetary policy almost always use this instrument. The undesirable experience during the oil boom as the result of government inability to manage its budget had stimulated inflation and caused the increase in narrow money (M1). These raises in turn, directly create budget deficit, which easily can be overcome by printing more money (Hill 1996).

After 1983 the amount of quasi money exceeded M1. This means, since 1983 deregulation, fund mobilization especially in deposits had increased, which shows an improvement in banking sector. To control the rapid growth of money supply, government at that time applied tight money policy to control inflation growth.

In the post 1983 deregulation period, which let market mechanism to set its interest rate and PAKTO 1988, which make bank establishment easier, the amount of money supply, relatively, tended to have a rapid rate of growth. Not until economic crisis started in the mid 1997 causing the rapid growth of money supply.

Indonesian economic growth that always followed by rising inflation causes economic overheating. Therefore, the government must control inflation growth, in order to avoid economic instability. But the government has been facing barriers to control, although monetary authority has been trying tiding up monetary sector.

This might happen because monetary policies are not supported by real sector, which plays a big role in inflation control (Sabirin 2000).

The CUSUM test before and after the deregulation of October 27, 1988 shows that the parameter of inflation function estimation remains stable.

Conclusions and Policy Implications

Conclusions

First hypothesis, which stated that there is a positive relationship between real interest rate and economic growth, was rejected. The empirical results show that both PAKJUN 1983 and PAKTO 1988 do not influence to economic growth. They cannot become a leading sector in accelerating economic growth. PAKJUN 1983, which liberate interest rate to follow market mechanism, have successfully mobilized capital in the beginning of the period. Nevertheless, interest rate liberalization has increased nominal interest rate in both private and government banks. The empirical findings indicated that real interest rate in Indonesia, insignificantly influenced economic growth. It strengthened the supposition that in developing countries, financial sector tends to grow defeating. Estimation result from growth model shows that export growth and foreign saving for period 1969-1983 caused Indonesian economic growth. Furthermore, Indonesian oil and gas export had contributed to the government revenue and economic growth sustainability. Whereas, foreign saving also gave contribution to economic growth in Indonesia, though it would cause dependency for the country.

Second hypothesis, which stated that there is a negative relationship between real interest rate and inflation, was accepted. Inflation model, which is used in this research, showed that per capita money growth, economic growth, and real interest rate influenced inflation in Indonesia for period 1969-1997. For that period, inflation relatively under control, but when oil boom happened, it increased for more than two digits. The rise in world oil price gave benefits to Indonesian economy through the rise in government revenue from export. Nevertheless, the rise in government revenue causes government expenditure increase (as consequences to balanced budget policy). The bigger government expenditure, the higher aggregates demand. It caused higher inflation in oil boom period. For period after deregulation, Indonesian economy more open and integrated with the world economy. For that reasons, Indonesian inflation source not only from domestic, but also from foreign (external factors, or it called imported inflation).

For observation 1969-1997 periods, inflation function had changed structurally, as a result in both deregulation packages. This empirical result indicated that:

a. Real interest rate did not influence national saving. For that period, national saving was influenced by economic growth and national saving previous period. The finding showed that there was a skeptic for low relationship between interest rate and national saving. Theoretically, no relationship between interest rate and national saving in Indonesia can be caused by long and complex path for interest rate to influence national saving.

b. Correlated with the results above, investment expenditure was inelastic to real interest rate. The fact is that the interest rate cost relatively small than the investment cost, so that the capital

owners prefer to save their money in banks or to buy the fix assets. Actually, interest rate does not influence the investment directly. Many economists stated that the change of interest rate had a little effect to influence the investment. Investment variation especially comes from the change of the long-term interest rate, which indicates short-term interest rate expectation in the future. On the other hand, the change of long-term interest rate reflects the change of short-term interest rate in the future.

Before PAKJUN 1983, real interest rate did not influence economic growth. For that period, financial repression policy had caused nominal interest rate lies under market interest rate. Because of it, real interest rate had negative value. Along that period, economic growth had caused by real export growth and foreign saving. Whereas, after PAKJUN 1983 it had caused only by real interest rate. The reason was the real interest rate was able to mobilize fund from people and increased the investment. The finding indicated that McKinnon-Shaw hypothesis had proved. It means that the rise in investment would cause economic growth to increase as well.

Along period 1969-1983, per capita money growth, economic growth, and real interest rate caused inflation. McKinnon-Shaw's hypothesis was accepted. But, after 1983 reform, real interest rate played main role to control inflation. The higher the real interest rate, the lower the inflation. In other word, there is negative relationship between real interest rate and inflation.

Real interest rate towards saving ratio and investment ratio have various effect according to the periodically function.

a.   Saving function before PAKJUN 1983 had a negative relationship with real interest rate, but after PAKJUN 1983, it insignificantly influenced saving function.

b.   Furthermore, investment function had no relationship with real interest rate because it was very low. But after PAKJUN 1983 was applied, real interest rate significantly influenced investment. This finding indicated that real interest rate lies on the level, which could stimulate the investment. This phenomenon has continued up until now.

Policy Implications

1.   Considering to the successful and failure of the countries that have carried out financial reforms, both government and monetary authorities should carefully apply these policies, for the reason that they are playing the main role as a monetary and macro economic policy maker.

2.   Both government and monetary authorities should not 'neurotic' to establish the deregulation that they choose. It means that if a country does not ready yet to establish financial deregulation, it should be cancelled until the real sector adjusts first. Real sector adjustment can be done through allowance, ease bureaucracy, tax holiday, safe and conducive regional condition. Furthermore, it needs regulatory framework about certainty —especially involve market information, law, and certainty about rights and duties.

3.   The empirical result a negative relationship between inflation and real interest rate. It suggests that the authority has consequences establishing inflation target carefully. The finding implies if

monetary authority or government will target the inflation, they have to consider many factors that influence the inflation, including internal and external factors. For example, preparing domestic supply for goods and services, which have high weight to inflation and the import content that influence domestic inflation through the cost of production.

4. Performing/pursuing the intermediation function of the banks that follow market mechanism. Non-pricing competition should be reduced. This reason was supported the findings that the fund from people only could be collected through gift presented by financial sectors, but they cannot steer into their fund to the investors who need it. It could be happen because there is no stimulus and easiness from financial sectors to investors who need the fund.

5. To prevent conflicting goals among monetary authority and fiscal authority, they needs to coordinate better. They also need to develop beneficial cooperation to reach macro economic goals for the country.

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