REGIONAL EFFECTS OF MONETARY POLICY IN INDONESIA

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ABSTRACT

The main objective of this paper is to measure and interpret the dynamic effect of monetary policy on regional or provincial macroeconomic indicator such as Regional Gross Domestic Product and a response of Provincial Government as indicated by their Consumption. Regional economic differences may exist, making the implementation of monetary policy based on national averages controversial. We explore this possibility by measuring the impacts of monetary policy across province of Indonesia. Using regional VAR, we find differences in the effects of monetary shocks across province of the Republic of Indonesia. Our regional VAR suggest that aggregate VARs that ignore regional variations can suffer from severe aggregation bias. Impulse response functions from estimated regional VAR models reveal differences in policy responses. The size of a monetary response is significant related to regional economic activity.

Keyword : *Monetary Policy, Regional effects, Vector Auto Regressions*

INTRODUCTION

A widely held conventional view is that monetary policy should focus on aggregate economic conditions because it cannot control or target the conditions of particular geographic regions. Regional economic conditions can (and do) significantly influence aggregate response to monetary policy actions, for two simple and intuitive reasons (Fratantoni, Mae, and Schuh, 2001). First, economic sensitivity to monetary policy vary across regions, as recently by Carlino (1998) and Defina (1999). Second, economic conditions prevailing at time of monetary policy actions vary across regions. For both reasons, aggregate dynamic responses to monetary policy actions are nonlinear so the magnitude and duration of the responses vary over time.

In other words, although monetary policy cannot target regional economic performance, regional heterogeneity may matter for the efficacy of monetary policy. For example, the extent to which the economic slows in response to monetary tightening will depend on issues such as which regions are growing fastest, and whether the most rapidly expanding regions are the most interest sensitive. More generally, the aggregate effects of monetary policy depend on the distribution of regional sensitivities to monetary policy and on the initial distribution of regional economic conditions at the time of

monetary tightening. Both distributions vary over time, so small changes in the configuration of heterogeneity can produce economically significant changes in aggregate responses.

The Bank of Indonesia's as monetary authority implementation of monetary policy assumes that's its effects will be uniform across regions. However, regional economic differences do exist, making the implementation of monetary policy base on national averages controversial and more than that each regions in Indonesia has more power to manage their own economic activity since decentralization era begun at 1999. This condition makes Bank of Indonesia must be more careful to implementation monetary policy.

The Bank of Indonesia takes little account of spatial business cycle patterns when it makes monetary decisions, despite large differences in regional business cycles. Although Bank of Indonesia collects information at regional level, this is used primarily to measure aggregate economic condition, with little regard for the regional distribution of condition that underlies the aggregate. Presumably, the Bank of Indonesia holds the view that monetary policy can not and should not be used to effect particular regions. Even, if macro economic indicator such as inflation in each region could be see at national level but the sources of inflation may be different at regional level. While agreeing with this view, this paper demonstrates how an understanding of the regional effects of monetary policy can help policy makers to understand how the regional economy response to monetary policy.

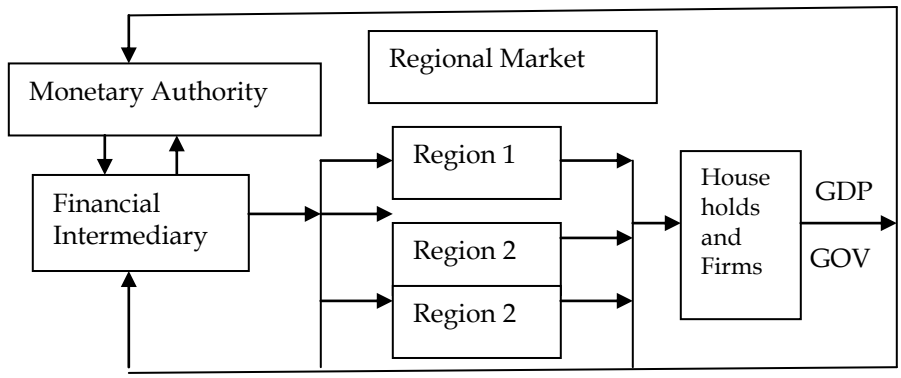
The objective of this paper is to measure the differential impacts of monetary policy across regions of Indonesia and describe how the provincial government response monetary policy shocks. The regional effects will be measured through the implementation of Vector Auto Regressions (VARs) and Impulse Response Analysis that explicitly take into account the dynamic response of regional output to monetary policy shocks.

The paper proceeds as follows: section 2 examines some theoretical review and previous research about regional effects of monetary policy. Section 3 discusses VAR and identification issues involved in estimating the economic effects of monetary policy shocks. The VAR model in this paper is try to investigate two main objectives. First, investigate synchronization between centralistic monetary policy and provincial government expenditure. Second, investigate effect of monetary policy on provincial income. Do they differ with the aggregate. Section 4 discusses to discuss general regional economic performance. Section 5 produces impulse responses at provincial economic activity and section 6 provides summary remarks and extensions for further work.

THEORETICAL AND PREVIOUS RESEARCH REVIEW

The monetary transmission mechanism can be defined as the process through which monetary policy decisions are transmitted into changes in economic growth and inflation [Taylor (1995)]. In most empirical work, monetary policy decisions are modeled as changes in the short-term interest rate set by the central bank [Leeper, Sims, and Zha (1996)]. These affect aggregate demand through a large set of variables, including the real cost of capital, the real exchange rate, income, wealth, and credit availability. In view of the many excellent surveys in this area Bernanke and Gertler (1995) and Mishkin (1996)], we will refrain from giving a complete overview. Instead, we will briefly discuss the factors which may give rise to differential regional effects of monetary policy.

Figure 1 : Regional Monetary VAR framework



Source : Fratantoni and Schuh, 2001

Fratantoni and schuh (2001), explain some theoretical review. Figure 1 provides an overview of the theoretical framework underlying the VAR model. In this flow diagram, the boxes denote agents and markets, and arrows denote the economic connections among agents characterizing monetary transmission. The economy comprises two main sectors. At the national level, the monetary authority and financial intermediary determine inflation and interest rates. The monetary authority follows a policy rule to achieve a price or inflation goal P the weighted average of P^h and P^n using a monetary instrument, M the short-term federal funds interest rate. The financial intermediary matches savers and investors by creating mortgages secured by the housing stock, and determines the mortgage asset prices, long-term interest rate R by a term-structure relationship with expected future, M .

At the local level, households and firms take *R* as exogenous and determine income *yi* investment and the real price for region *i*. The macroeconomic values of these variables and are simply the appropriately weighted aggregates across all regions.

Obviously, this theoretical framework quickly becomes econometrically intractible as the number of regions increases, so we impose three simplifying assumptions. First, we adopt the traditional representative agent view for macroeconomic agents. The monetary authority and financial intermediary consider only, *GDP, GOV* and in their decision making, and not particular regional values *rgdp, rgov.* Second, only *R* influences regional activity contemporaneously. Regional agents don't particularly care about *per se*, only its indirect effect on *R*. Regional agents also don't care about *P per se*, only its indirect effect on , real interest rates. Because moves sluggishly, and expectations of even more so, real interest rates defined with lagged *P*– which are embedded in the system – are quite similar to real rates defined with current or expected *P*. Third, activity in individual regions does not affect other regions contemporaneously. The latter two assumptions only apply contemporaneously; all variables and all regions influence each other with a one-period lag.

This theoretical framework yields the following monetary transmission mechanism. The monetary authority sets policy by moving the funds rate to achieve an aggregate price target. This policy decision directly, and indirectly with a lag, affects the mortgage rate. Movements in the mortgage rate then directly affect regional income, housing investment, and housing appreciation, both contemporaneously and with lags.This monetary transmission mechanism is a bit simplistic because it focuses on an interest rate spread and excludes traditional money and banking channels. However, spread-based transmission mechanisms have some empirical support, as shown in Stock and Watson and Friedman and Kuttner .

At the firm level, differ with regard to their sensitivity to interest rate shocks, depending on their type of product and their leverage. A tightening of monetary policy may reduce demand for investment goods and (durable) consumer goods by increasing the real costs of capital of firms and consumers. Taylor (1995) provides a survey of the so-called interest rate channel. Regions with a high share of interest-sensitive industry may therefore be especially vulnerable to monetary tightening.

Monetary policy shocks also affect other asset prices, such as exchange rates and equity prices. Through the exchange rate channel, monetary policy affects competitiveness and net exports. Regional effects may arise in the presence of petitiveness and net exports. Regional effects may arise in the presence of cross regional variation in openness; see Dornbusch, Favero, and Giavazzi (1998). A third channel of monetary transmission is the equity channel. It may work through Tobin's q theory of investment demand or through a wealth effect on consumer demand; see Mishkin (1996). Regional differences in Tobin's q or in the distribution of wealth may lead to regional effects.

Recently, economic theory has focused on the role of information problems in credit markets. This so-called credit view of monetary

transmission identifies two transmission channels: the bank lending channel and the balance sheet channel. The former channel looks at the ability and willingness of banks to lend; see Kashyap and Stein (1997). As some borrowers (notably small firms) lack easy substitutes for bank loans, monetary policy may influence the economy through the supply of bank credit. Regional effects arise when regions differ in the dependence on and availability of bank credit. The balance sheet channel works through the net worth and cash flows of firms. An expansionary monetary policy will raise both, thereby reducing asymmetrical information problems in credit markets. As a result, lending and investment spending may increase. In the credit view, differential regional effects of monetary policy may be attributed to cross-regional differences in financial structure. For these, several measures have been employed, including the proportion of small banks and small firms in an economy, the health of the banking sector, the availability of non-bank funding and the amount of collateral; see Kashyap and Stein (1997) and Dornbusch, Favero, and Giavazzi (1998). It can be argued that credit market imperfections can best be interpreted as factors that may amplify or propagate the more traditional effects of interest rate shocks, rather than as channels which work independently from other transmission channels [see Bernanke and Gertler (1995)].

All transmission channels described above relate to the effect of monetary policy on aggregate demand. The final effect on output and prices is the result of the interaction of supply and demand. Differential effects of monetary policy could therefore also be the result of regional differences in the supply curve, which may be caused by, for instance, differences in the flexibility and institutional features of labor and product markets; see De Grauwe (2000).

George Georgopoulos (2001) explains Economic theory that suggests three prominent ways in which monetary policy could affect regions differently. The first deals with the standard feature of the monetary transmission mechanism, that being the interest rate channel. Interest rate elasticities differ across industries. For example, manufacturing and residential construction are highly interest-sensitive relative to agriculture. If a relatively high proportion of a region's output is from interest-sensitive industries, these regions will experience a relatively larger impact on output from monetary policy actions.

Second, Gertler and Gilchrist (1993, 1994) investigate the credit channel of the monetary transmission mechanism and argue that monetary policy has different effects on credit flows to small borrowers (consumers and small firms) versus large borrowers. They find that loans to small firms decline relative to large firms after contractionary monetary policy, reflecting imperfections in the credit market. If a region has a high concentration of these type of borrowers, then this region will also experience a relatively larger impact on output from monetary policy shocks. We will present data on the distribution of employment across firm sizes.

Third, for a small open economy such as Canada, the exchange rate is an important channel in the monetary transmission mechanism, as reflected in the Bank's adoption of the Monetary Conditions Index as a guide to policy. A rise in the interest rate caused by contractionary monetary policy makes domestic dollar deposits more attractive relative to deposits denominated in foreign currencies, leading to a rise in the Canadian dollar, making Canadian goods more expensive than foreign goods, thereby causing a fall in net exports. Differences in the importance of the export sector in each region is a third explanation for differential impacts of monetary policy.

There is currently little work on the differential impact of monetary policy in Canada.Beare (1976) investigates the impact on prairie provinces during 1956-1971 and finds a differential impact to money supply changes. A major shortcoming is that he does not employ VAR techniques in measuring the effects, thus ignoring the importance of feedback effects among the variables. Carlino and DeFina (1998) investigate regional effects in the U.S. by employing VAR analysis and find three regions that respond differently from the U.S. average, those being the Great Lakes, the Southwest and the Rocky Mountains. They also estimate state responses and find that they all take the same profile as the regional data.

In the discussion on joining the EU monetary union (EMU), monetary transmission mechanism through changes in the policy-controlled interest rate have attracted particular interest with respect to asymmetric responses to monetary shocks across Europe. Maclenna, Muellbauer and Stephens (1998) study the 15 member states of the European Union and describe the institutional difference in housing tenure patterns, housing finance system, transactions cost as well as debt market and corporate finance. These differences across countries necessarily imply heterogeneous responses both to interest rate changes and world – wide equity price volatility. They demonstrate that changes in asset prices are the most important mechanism through which changes in interest rate effect expenditure and inflation.

The theories of monetary transmission have been applied by identifying the characteristics of the various economic situations. Along these dimensions of transmission mechanism, several studies have tried to identify heterogeneous performance of regional markets as a result of monetary policy. The regional effects of monetary policy across the eight Bureau of Economic Analysis regions in the United States are examined by Carlino and DeFina (1995). They provide evidence for interest rate channel based on the fact that the interest - sensitive industry in the state is more responsive to changes in monetary policy shocks. They find the imperfect credit market effect is mixed, because the states which have a relatively large concentration of small firms tend be more sensitive to monetary policy shocks, but the correlation is only marginally significantly. Arnold and Vrugt (2001) also analyze monetary policy shocks on regional and sectional output in Netherlands. Their results indicate and confirm that the industrial composition matters on a regional basis when it comes to the effects of monetary policy. Their study also concludes that interest rate shock is more important for sector – specific variation than for a region – specific variation.

There are a very few studies that have analyzed monetary policy on the regional level of the property market. Baffoe-Bonnie (1998) analyzes the dynamic impact of macroeconomic factors including mortgage rate at the national and regional levels. His study relates house price elasticity and transactions volume to the changes in mortgage rate and identifies the heterogeneous responses to interest rate changes across regions. Painter and Redfearn (2002) estimate the efficiency interest rate changes as a policy to increase the homeownership rate. They indicate that homeownership rate is largely determined by heterogeneous regional fundamentals as income and demographics while low interest rates have no significant role in increasing homeownership rate. In the study by Turner and Yang (2004), the existing differential effect of interest rate shocks in the regional markets are empirically analyzed both in the long run and in the short run. In particular, the study indicates a significantly higher persistent effect of interest rate changes in several influential regions, as Stockholm, Göteborg and Malmö.

ECONOMETRICS OF VECTOR AUTO REGRESSIONS

VARs have proved to be a convenient method of summarizing the dynamic relationships among variables. Given certain conditions, VARs can also be used to determine the response of economic variables to a fundamental economic shock, a procedure called Impulse Response Analysis (Georgopoulos, 2001). This is of particular interest as we are interested in the response various variables monetary policy shocks. We begin by formally introducing a VAR and discuss the issues involved in measuring the response of variables to fundamental shocks.

The ultimate objective of making accurate short-term forecasts is best served by purging insignificant parameter estimates from the model (Enders, 2004). Sims (1980) criticism of the "incredible identification restrictions" inherent in structural model argue for an alternative estimation strategy. Consider the following multivariate generalization of an autoregressive process :

$$Y_t = A_0 + A_1 Y_{t-1} + A_2 Y_{t-2} + ... + A_p Y_{t-p} + e_t \qquad (1)$$

Where : y_t = *an (n . 1)* vector containing each of variables included in the VAR

Ao = an (n . 1) vector of intercept terms
A1 = an (n . n) matrices of coefficients

e_t = *an (n . 1)* vector of error terms

The system represented by (1) is a VAR in standard. It is important to note that each element of *e* does not necessarily correspond to a particular economic shock, but may instead be a composite of all the fundamental shocks. If so, then we cannot use the estimates of *e* to measure dynamic responses of the variables in *Y* to fundamental economic shocks. To see this, it may be the case that equation (1) is a reduced-form VAR corresponding to the following primitive or structural VAR:

$$B_0 Y_t = B_1 Y_{t-1} + ... + B_p Y_{t-p} + \varepsilon_t \qquad t = 1,\ldots., T \quad (2)$$

where B is a $k \times k$ matrix of constants, $i = 1, ..., p$, $å$ is the vector of the fundamental economic shocks, where $E(å\, å') = D$, D being a positive definite matrix. Equation (1) is simply equation (2) pre multiplied by B_0^{-1}, where :

$$A_i = B_0^{-1} B_1 \qquad i = 1, \ldots., p \quad (3)$$

Where :

$$V = B_0^{-1} D \left(B_0^{-1}\right)' \qquad (4)$$

The relationship between the VAR disturbances and the fundamental economic shocks is given by $B\, e = å$. Thus as long as B is not an identity matrix, e comprises the fundamental economic shocks, as $e = B_0^{-1} å$

In carrying out Impulse Response Analysis, to determine the response of variables to a structural shock, as opposed to a shock in e , one needs to know the parameters in Bo - the matrix of contemporaneous coefficients - and A , i = 1,2..p. One can get estimates of A simply through OLS estimation of the reduced-form VAR, but deriving Bo is not as simple. In general, the structural parameters can be recovered if and only if the structural system is identified.

In identifying the structural parameters, the VAR literature begins with imposing the restriction that the structural shocks are uncorrelated, i.e. D is a diagonal matrix, and that $D = I$. The literature further imposes two restrictions: (i) a sign condition on B in that the diagonal elements of B are positive, and (ii) an order condition where there are at least $(k - k)/2$ linear restrictions on the structural model. Typical linear restrictions are zero restrictions, coefficient restrictions and/or symmetric restrictions on the elements of Bo . Cross equation restrictions, i.e. restrictions across the elements of different rows of Bo , are uncommon. Also, unlike the simultaneity literature, there are no restrictions on Bi , i = 1,2,... p.

The identification of the VAR model is very affected by the selected variable including in VAR model and the lag length. Sims methodology entails little more than determination of the appropriate variable to include in the VAR and determination of the appropriate lag length. The variables to be included in the VAR are selected according to the relevant economic model. Lag length test select the appropriate lag length. Otherwise, no explicit attempt is made to " pare down " the number of parameter estimates. The matrix Ao contains n parameters and each matrix Ai contains n^2 parameters; hence, $n + pn^2$ coefficients need to be estimated. Unquestionably, a VAR will be over parameterized in that many of these coefficients estimates will be insignificant. However, the goal is to find the important interrelationships among the variables and not to make short term forecasts. Improperly imposing zero restrictions may waste important information. More over, the regressors are likely to be highly collinear so that the t-test on individual coefficients are not reliable guides for paring down the model.

Note that the right hand side of (1) contains only predetermined variables and that error terms are assumed to be serially uncorrelated with constant variance. Hence, each equation in the system can be estimated using OLS. Moreover, OLS estimates are consistent and asymptotically efficient. Even though the errors are correlated across equations, seemingly unrelated regressions (SUR) do not add to the efficiency of the estimation procedure since all regressions have identical right-hand-side variables (Enders, 2004).

There is an issue of whether the variables in a VAR need to be stationary. Sims (1980) and Sims, Stock, and Watson (1990) recommend against differencing even if the variables contain unit root. They argue that the goal of a VAR analysis is to determine the interrelationship among the variables, not to determine the parameter estimates. The main argument against differencing is that it "throws away" information concerning the co movements in the data (such as co integrating relationships). Similarly, it is argued that the data need not be de trended. In this paper we use argument above to estimate the model. In a VAR, a trending variable will be well approximated by unit root plus drift. However, the majority view is that the form of the variables in the VAR should mimic the true data generating process. This is particularly true if the aim is to estimate a structural model.

MONETARY VAR

Innovations to monetary policy can occur in two forms: changes in the implementation of policy and changes in the objectives of policy. We focus on the former, which is typically modeled as vector innovations to a system of equations (e.g., a VAR) in which monetary policy has been identified by structural restrictions on either the contemporaneous impacts of the variables (e.g., Christiano, Eichenbaum, and Evans, 1999; and Bernanke and Mihov, 1998) or the long-run effects on the system of variables (e.g., Blanchard and Quah, 1989; and Shapiro and Watson, 1988). This structural VAR literature has identified a number of stylized facts about the effects of a contractionary monetary shock: a U-shaped output response, a permanent decrease in the price level, and a temporary rise in interest rates.

A structural economic system can be written as

$$A_0 y_t = \sum_{j=1}^{k} A_j y_{t-j} + B w_t + v_t \qquad (2)$$

Where, y is the period t vector of n variables in log levels w is a vector of exogenous variables, k is the number of lags, and $\nu \sim N(0,.)$ assumes that the system's primitive shocks are uncorrelated with each shock j having variance ω . The vector of endogenous variables y can be partitioned as follows: $y = [rgdp_t r_t, pf_t]'$ =where rdgp is provincial gdp with a lag, r is monetary variable that is interest rate and pf is provincial fiscal at

provincial level. VAR model in this paper is to investigate how regional economic activity and policy response monetary policy that is interest rate.

We estimate two versions of the VAR: a benchmark VAR that uses aggregate data and another that uses regional data. In the benchmark aggregate VAR, includes GDP government expenditure and the interest rate. In the regional VAR, aggregate GDP and government expenditure are replaced by the provincial GDP and provincial government consumption of the twenty six provinces.

A REGIONAL VAR

The first intent of this paper is to investigate synchronization between centralistic monetary policy and provincial government expenditure. Second, investigate effect of monetary policy on provincial income. To do this, I modify the aggregate VAR above to account for regional differences. Thus in the non policy block will be replaced aggregate Government expenditure and Gross Domestic Product with its twenty six regional counterparts.

In addition to the standard assumption about the contemporaneous effect of policy, I try to make assumption regarding the propagation of the regional income, and regional fiscal policy. As in Carlino and DeFina (1998, 1999) and Fratantoni and Schuh (2003), I assume that the idiosyncratic regional Income and Fiscal policy shock does not affect other regions contemporaneously, although it is allowed to affect other regions in subsequent years.

In the textbook of econometrics, VAR has been explained that it had several weakness or critics. Gujarati examines several critics for this methodology (Gujarati, 2004), those are :

1. Unlike Simultaneous Equation Models, a VAR model is a-theoretic because it uses less prior information. Recall that in Simultaneous Equation Models exclusion or inclusion of certain variable plays a crucial role in the identification of the variable.
2. Because of its emphasis on forecasting. VAR models are less suited for policy analysis.
3. The biggest practical challenge in VAR modelling is to choose the appropriate lag length. Suppose you have three variable VAR model and you decide to include eight lags of each variable in each equation. You will have 24 lags parameters in each equation plus the constant term, for a total of 25 parameters. Unless the sample size is large, estimating that many parameters will consume a lot of degrees of freedom with all the prolems associated with that.
4. Strictly speaking, in an m-variable VAR model, all the m variables should be (jointly) stationary. If that is not the case, we will have to transform the data appropriately (e.g.by first differencing). As Harvey notes, the results from the transformed data may be unsatisfactory. He further notes that “the usual approach adopted by

VAR *aficionados* is therefore to work in levels, even if some of these series are non-stationary. In this case, it is important to recognize the effect of unit roots on the distribution of estimators. Worse yet, if the model contains a mix of I(0) and I(1) variables, transforming data will not be easy. This is an issue of wether the variables in a VAR need to be stationay. Sims (1980) and Sims, Stock, and Watson (1990) recommend against diffrencing even if the variables contain a unit root. They argue that the goal of VAR analysis is to determine the parameter estimates. The main argument against differencing is that it "throws away" information concerning the comovements in the data.

5. Since the individual coefficients in the estimated VAR models are often difficult to interpret, the practitioners of this technique often estimat so called impulse reesponse function (IRF). The IRF traces out the response of the dependent variable in the VAR system to shocks in the error terms. The IRF trace out the impact of such shocks for several periods in the future. Although the utility of such IRF analysis has been questioned by researcher.

THE DATA

The source of the data especially for regional GDP at market prices and Regional Government Consumption at market prices is come from Badan Pusat Statistic (BPS) Central Beaureu of Statistic, Indonesia, and for National GDP at market prices and Government Expenditure at market prices from and International Financial Statistic (IFS) from IMF.

Estimating the preceeding three variable aggregate VAR with OLS equation by equation using yearly data . The full sample estimation uses data for 1975 – 2002. the low frequency of the data seems to be the source of the weak results.

AGGREGATE VAR VERSUS REGIONAL VAR

Several differences between the aggregate VAR and regional VAR was happen. First, they are different in their behavior affecting each other. Their shock is response to the other variable and the size of their effect. Second is the time of impulse response. Responses of the local government must be adjusted with monetary policy if we want to synchronize the macro economic policy. How we imply the target of macroeconomic policy if the policy is eliminate each other. The policy will useless.

The aggregate VAR indicates that monetary policy instrument, interest rates, is response by GDP and since initial period of the impulse response and moving positively. For symmetric behavior of fiscal and monetary policy at aggregate level is shown by impulse response positively and for the impact of fiscal policy to GDP is not start at initial period.

The facts at regional or provincial level VAR indicate various results. In the province where is the economic activity crowded, the response of monetary policy will more quickly. For example in Sumatra, Aceh is one of the regions which is low industrial economic activity. That's why the response of policy is very low. It happens at the region which has the same condition. So, monetary policy impact has very large differences impact to each region. At the Java, response to monetary policy can be guest that the impact will be quick and so volatile. In Irian Jaya, which is known as the less developed province in Indonesia, the impact of monetary and fiscal policy is response slowly.

Because of the differences in regional economic condition the regional fiscal policy has to improving this condition than just following monetary policy. Which one of the regional government has to be allowed, the former or the latter, if the monetary policy is not synchronized with the regional economic condition

The finding that a monetary shock has very different effects across regions is interesting on its own, but perhaps of more interest to monetary economists is that these findings might allow greater insight into the transmission of monetary shocks. As in Carlino and DeFina (1998, 1999), multiple observations of the effects of monetary-policy shocks can be used to estimate the role of a list of monetary-transmission mechanisms. My 26 regional impulse responses, however, are inadequate for the job and more dis-aggregation is necessary.

Textbook explanations of the impact of monetary policy typically show that a monetary contraction reduces the demand for capital and durables, thereby reducing aggregate demand. Cecchetti (1995) has termed this the *money channel*. Because manufacturing industries (particularly capital- and durable-goods industries) are the most sensitive to interest rates, the importance of the money channel would be indicated by a positive relationship between the loss of PI following a monetary policy shock and the size of the manufacturing sector.

If the differences between sub-regions in the effects of monetary policy are due to differences in the ability of their banking sectors to provide loans, then monetary policy can be said to work through *credit channels* (Gertler and Gilchrist, 1994). Small firms are thought to have higher information and transaction costs when dealing with banks, thereby making it more costly for them to obtain financing (Bernanke and Blinder, 1988; Bernanke, 1993).

CONCLUSION

The paper establishes some new facts about the effects of monetary policy at the provincial level. Unlike other paper on the regional effects of monetary policy, this paper investigate the response of the government consumption beside the own economic condition as regional GDP shown.

Provincial business cycles are not synchronized: at any given point in time, some provinces are growing much faster and some much slower than the average. The Bank of Indonesia, however, conducts monetary policy to stabilize the national business cycle. One of the questions we investigate in this paper is whether this environment leads a common change in The BI (Bank of Indonesia) policy to have differential effects across province.

There are several aims of this study. First, investigate synchronization between centralistic monetary policy and provincial government expenditure. Second, investigate effect of monetary policy on provincial income. As with the previous literature, we have shown that there are large differences in the effects of monetary policy shocks. The differences of industrial concentration are the big source of regional differences from monetary policy.

This paper has three main findings. Firstly, with the technology of impulse response in the VAR model, this paper try to identify the unsystematic impact of national interest rate shocks on regional income, in which regions as Aceh, Irian Jaya and maluku have so little response to monetary policy both their income and government consumption. Contrast with the former, regions in Java has volatile impact and quick response as shown in impulse response function. The simple logic behind this argument is industrial concentration in each regions. More concentrated industrial sector, more big and more fast the response to monetary policy.

Secondly, monetary policy in Indonesia is not always symmetry with the regional government consumption. As we know, in the macroeconomic theory, if the central bank of the country imply monetary policy (say, tight money policy), so government must coordinate their policy to hold the target of macroeconomic policy will attained. Coordinating in policy between central bank and central government and regional government is must be done at best.

Thirdly, the length of the response to shock of monetary policy is also different to each other. Some regions return to their level, and the other is not. The initial response period is different too. The response of the regional government consumptions is also depend on the condition of those regions, developing or developed regions, having industrial concentrations or how concentrated industry on those regions.

Monetary policy may have differential regional effects if regions differ in the mix of interest – sensitive industries, small versus large firms, and export based output. If industries have different interest sensitiveness and if regions have different industry concentration this will be the main source of regional differences from monetary policy

We also provide strong evidence against symmetry in the impacts of monetary policy in our specification. Relatively low-growth regions experience smaller increases in economic activity in response to a monetary expansion than does the average region. Collectively, we conclude that monetary policy has large distributional implications across regions of

Indonesia. Our results suggest that monetary policy does, in fact, help least those areas that need the help the most, in that their local economic conditions were worse relative to a national average when the policy was enacted. Put another way, while expansionary monetary policy may lead to an overall increase in aggregate output, the majority of that increase will occur in the parts of the country that were already performing better than average. There will be much less stimulus in those parts of the country that had been performing relatively worse than average.

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