

The Relationship between Money Supply and Economic Activity in Countries Dependent on Natural Resources

Enayati, Morteza¹ Yazdan Gudarzi Farahani²

1. MA from Economics, University of Tehran, Alborz compus, Tehran, Iran

2. Ph.D. student in Economics, Department of Economics, University of Tehran, Shomali Kargar, Tehran, Iran

Abstract

The aim of this article was to show the influence of money supply and positive and negative shocks on part of the real economy in countries with natural resources in the form of panel data model with the approach of vector error correction model (VECM). For this purpose, using information from GDP, money supply, bank credits, the general level of prices, capital, trade openness degree, government spending, direct foreign investment, natural resource abundance and institutional quality indices for the period of 1990-2013, the relationship between variables was assessed. The results indicate that in all cases negative monetary shocks had far more effects than positive monetary shocks in the same period. Positive monetary shocks had a negative effect on output growth, as in the case of implementation of monetary policy after a period based on adjustment of the price of manufacturing institutes, the load of monetary policy would be more transferred on prices and its effects on the production would neutralize, also by entering the variable of natural resource abundance and institutional quality index (the average of institutional quality indices) in the economy of these countries almost had significant effects on economic growth, but this effect is weak. The variable of credits assigned to the private sector has a significant positive impact on economic growth in these countries. The results also indicated a negative relationship between inflation rate and economic growth based on the theories outlined in this field. Error correction coefficient related to the speed of adjustment of the variables rather than monetary imbalances reflected this subject that the output growth compared to monetary imbalances (the surplus of the money supply) really reacts significantly.

Keywords: monetary policy, bank credits, economic growth, sticky price, New Keynesian, vector error correction model (VECM)

Classification JEL: E21, E42, E63

1- Introduction

In the structure of Keynesian literature, the stickiness of prices and wages is known based on asymmetric effects of positive and negative changes in nominal demands. The asymmetric monetary changes causes changes in expectations of institutes about the future of economy so that in accordance with the principles of signal extraction error can be argued that manufacturers against positive monetary policies that lead to an increase in the general price level they would adjust their prices quickly, but against friction monetary policies and negative changes in aggregate demand that may result in reducing prices they would not reduce the prices of products and this would cause that the negative shocks of aggregate demand causes changes in production levels of economy because based on the theory of misperception of monetary by Lucas and based on incomplete information of firms from the market price of commodities has caused that the aggregate supply curve loses its vertical status and this would be a factor to changes of aggregate demand will have real effects on the economy. Based on economic issues it can be expected that expansionary monetary policies and ease in lending to firms has led to increasing in investments and decreasing of the deficiency of the liquidity of institutes and therefore production capacity increases. In addition, liquidity growth resulting from the demand does also stimulate economic growth. If these changes in aggregate demand and supply dose not transfer towards the economy supply and real sector would probably have a negative effect on economic growth. According to the discussions on price stickiness it can be expected that monetary shocks have not symmetrical effects on output and economic.

Most empirical evidence for developed countries implies that negative shocks of money supply shocks have far more effects than positive shocks of money on production. Suppose a model where the stickiness is downwards to nominal wages as well as the labor market is in equilibrium wage levels and according to which the price level is symmetrical with the market-clearing price level. If the aggregate supply curve is vertical, changes in aggregate demand determines the prices. This model implies that an aggregate supply curve at lower prices than the expected prices would loss its verticalness due to changes in inflation expectations and changes in aggregate supply curve of Lucas. So unexpected increase in nominal demand would seem natural but unexpected decline in nominal demands may lead to a decline in production and unemployment. Theoretically, asymmetric effects of monetary policies on the basis of price stickiness and asymmetric information will be explained. If the prices have less flexibility, the monetary policy will have asymmetric effects on actual production. Ball and Mankiew (1994) by resorting to Keynesian models suggested that tighter monetary policy leads to reduced production, while the expansionary monetary policy leads to price increases and negligible changes in production.

There are different perspectives on the interaction between the financial sector and the real economy.

Although the theory of being two-parts of classical before Great Depression in 1929 was not considered any relation between nominal and real and nominal variables in the short and long term but today, many economists believe that changes in prices and the amount of money, that is the nominal shocks, would affect the behavior of real variables such as output and employment in short term.

According to new classical theories, money is a neutral factor. According to the theory of rational expectations expressed in this school, anticipated changes in the quantity of money lead to proportionate changes in the nominal variables such as prices and wages, without any impact on real variables. The basic result of this theory is that the production, employment, interest rates, and ... does not change. In fact, many of the researchers attribute a large contribution of business fluctuations to monetary shocks. According to the new Keynesian view, monetary expansion is stimulates real economic activities. Similarly, a monetary contraction will lead to a recession. Keynesians and monetarists do not make any differences between expected money and unexpected money when analyzing the effects of monetary variables on the real variables. In these patterns expected money and systematic monetary policies would make actual effects.

Lucas proves that in Walrasian framework, monetary changes have real implications, but only because that agencies cannot fully distinguish between monetary transmission and actual demand, there is no tradeoff between inflation and real output. New classics define business cycle as fluctuations around the trend of real output that have serial correlation and are not explainable by volatility of production factors. The variability of GDP are in line with fluctuations in different time series such as price, consumption, income, investment, monetary variables, productivity and interest rates. Based on such regularities, Lucas says that as long as the business cycle be considered as repetition examples of similar events, it is reasonable that the agencies be considered as people who deal with "cyclical changes" as "risk", or assume that their expectations are rational, according to which they have stable arrangements to collect and process information and use this information to predict the future in a stable manner and without systematic and correctable bias.

The main issue of macroeconomic is finding a theoretical framework in which monetary disorders can cause significant fluctuations in real output and at the same time there are stable opportunities, recurring and non-operating profits, such as those that occurred in the Keynesian model that their main characterization was stickiness of prices and non-rational expectations. The main issue discussed in this paper is to examine the impact of money supply shocks and bank credits on real activities in the economy of countries with natural resources that based on this the analysis of positive and negative shocks in monetary policies to its effects in the form of nominal and real on the economy of countries with natural resources will be discussed.

The hypotheses tested in this paper are as follows:

First hypothesis: there is a significant relationship between money supply growth and economic growth in countries that rely on natural resources.

The second hypothesis: the effect of money supply growth on economic activities of countries reliant on natural resources is asymmetric (effects of money supply decrease on economic activities are more than the increase in the money supply).

The third hypothesis: money market disequilibrium affects the level of economic activities asymmetrically.

The structure of this study is composed of four sections. In the following we propose theoretical foundations of asymmetric effects of monetary shocks. In the third part the empirical model used in the assessment of the effect of money supply and positive and negative shocks on the real economy in countries with natural resources would be introduced and finally, we will evaluate the obtained results.

2- Theoretical Foundations of the study

Since 1930s, some economists such as Keynes and Pikou argued that monetary policy could have asymmetric effects on the periods of boom and recession of economy. In fact, if part of the supply curve could be considered vertical, monetary policy would have less effects on production in time of economic boom.

Caver (1999) emphasizes that empirical literature of the new classical make no distinction between positive and negative shocks of money in relation the effects of monetary impulses. If this argument is correct, and such a distinction is important, then the traditional approach to test the neutrality of unexpected monetary changes are not valid and economic conditions either in a recession or in a boom period for analysis ignores the effects of monetary impulses. Using quarterly data of America after the Second World War, Caver resulted that the negative shocks has far greater effects than positive shocks. Even he obtained similar conclusions with estimations of different specifications and with exiting the observation of 1979 period onwards (that probably regime of monetary policy was changed in America).

Researchers have studied the asymmetric effects of monetary shocks from two directions (being positive or negative, largeness or smallness of momentum). Caver (1992) explains the asymmetry of monetary shocks on real output based on the traditional Keynesian model that Raavan and Sola (1999) called it "traditional Keynesian asymmetry. Keynesian asymmetry implies that the positive momentum of money supply is neutral while negative

shocks have real effects. These results can be explained by the stickiness of wages downwards and its flexibility upwards and demand rationing. In these circumstances, the aggregate supply curve is convex from down and inverted L appears on the limit. Although this pattern has not strong theoretical foundations based on the principles of microeconomics, but it can be justified on the basis of nominal stickiness downwards.

The results of the pattern of asymmetry Keynes is compatible with menu cost model of Ball and Mankiew (1994). In the dynamic menu cost model assumes that there is a trend of inflation, it means that the prices on average increase in each period. In this pattern, the asymmetry of monetary shocks can be easily explained based on the assumption that firms incur cost menu with changing the prices. Assuming the other conditions being equal, a positive monetary shock leads to higher relative prices to firm's product. The negative money momentum also creates opposite effect. In the case of inflation process, by creating a positive monetary momentum, representative firms may decide to not change price of its nominal product and to not pay any cost to change the menu because the inflation automatically lowers the relative price. But since in the presence of a positive monetary momentum, the optimum relative price for the firm's product increases and inflation leading to reductions of relative price for the firm's product, the firm has paid the cost of menu in response to the positive momentum and increases the price of its product. Hence, the positive momentum of money by adjusting prices upwards would have minimal effects on production levels. So presence of the inflationary trends in the model of Ball and Mankiew implies that total production response far greater than the positive monetary shocks to positive monetary shocks.

Credits are another source of asymmetric effects of monetary. In the banking sector with relatively high interest rates, banks do not trust their risky customers. This behavior leads to credit rationing and a reduction in production, so the banks in facing with negative shocks of money instead of raising interest rates tend to ration their own funds to applicants.

In addition, great asymmetry of monetary shocks against small shocks could be explained based on the patterns of standard cost menu. In these patterns, major shocks in the money supply are neutral because firms follow a fixed price strategy and only change the prices facing a great momentum. In fact, changing of price is not affordable in these conditions. Namely, keep fixing the price would force the firms to incur costs (large) firstly. In contrast, small shocks of money supply have real effects. Because changes in prices in the face of small shocks is not cost effective and keep fixing the price, would force the firms to incur costs (small) secondly. Therefore, based on the cost of the menu, small shocks have real effects and great shocks are neutral.

If the economic uncertainty rather than monetary shocks (or policy makers) in the pattern be considered random, we would obtain different results. Consider a model in which firms must decide between indexing their prices (and pay for menu cost) and lack of indexing. As Ball and Romer (1990) have shown that firms will choose indexing provided that variance of money supply is high. In these circumstances, monetary shocks would be neutral. On the contrary, if the variance of monetary shocks is low, firms would not index and monetary shocks would have real effects. Monetary policies or momentum may have low variance in some courses and high variance in other courses also (e.g. in some times the behavior of policy maker is predictable and non-predictable in other times). In these conditions, the basis of asymmetry variance is momentums. In the above interpretation from asymmetry, monetary shocks with large variance, are neutral and with little variance produce real effects.

Some of researchers have argued that the effect of monetary policies on the production will depend on the economic situation so that during the period of recession of monetary shocks would have a stronger effect on real variables. This price adjustment models used to explain that it considered the costs of financial intermediation. This model of price adjustment leads to a convex aggregate supply curve in which monetary policy has stronger effects in periods of recession. In fact when there is information asymmetry in the financial markets loan recipients would encounter quantitative restrictions on bank credits in addition to the limitations of the price (interest rate). These financial constraints in periods of recession are higher than the boom period.

Credit channel implies that monetary policy has increased not only the general level of interest rates, but also the business margin of foreign borrowing and thus the effects of monetary shocks, especially in periods of recession intensifies. Foreign borrowing margin is the difference between the cost of internal and external resources firm. The mentioned margin reflects the lack of credit markets, information asymmetry between lender and borrower and is the risk of refusing to repay. The credit outlook, the relationship between monetary policy and foreign borrowing by mechanisms of margin balance sheet channels (net worth) and bank lending channel would be described.

In the balance sheet channel, monetary policy would affect not only interest rates, but also the financial situation of the firm directly and indirectly. A strict monetary policy would weaken the financial position of firms directly via two ways. First, since firms are dependent mainly on short-term loans to finance their inventories and working capital, rising interest rates would increase interest expense directly and reduce the cash flow of the firm. In addition, in terms of hard monetary policy, demands for short-term borrowing to loans to finance inventories would increase. Secondly, by raising interest rates, the prices of assets held as securities would reduce. The mentioned monetary policy would indirectly weaken the firm's cash flows and value of the securities. A tighter monetary policy will lead to reduced demand. Hence, the firm's revenues declined while fixed costs such as wages

and benefits in the short term remain unchanged. Therefore, the value of the firm's credit is gradually dissolves. The mentioned factors have much stronger effects in periods of recession than in periods of economic boom.

The effect of bank loan channel emphasizes on reducing the supply of loans by financial intermediaries rather than other forms of credit when monetary constraints. In general, after a tighter monetary policy interest rates risk-free assets such as government bonds increases. But banks are not able to raise interest rates on deposits on the same ration as required to keep law reserves. The share of bank deposits in the portfolio of individuals is reduced and consequently the supply of bank credit is restricted.

There are different perspectives on the interaction between the financial sector and the real economy. However, according to the assumptions of classics before Great Depression in 1929, there was no interaction between nominal and real variables in the short and long term but today many economists believe that changes in prices and the amount of money, namely nominal shocks affects the behavior of real variables such as the production and employment in the short term.

In the theory of new classics, the money is a neutral factor. According to this theory in an economy, predicted changes in the volume of money lead to proportionate changes in the nominal variables such as prices and wages, without any effect on real variables. In general, economic theory does not reject the interaction between real and nominal variables but its relation depends to the nature of the shock. However, the neutrality of the money is one of the most basic predictions of the new classical theory and accordingly monetary shocks have real effects in changes of the monetary base. Although monetary shocks make large fluctuations in prices and other nominal variables but production, employment and real wages do not change.

Most of economists do not accept the neutrality of money, at least for short periods. In fact, many researchers attribute a large contribution of business fluctuations to monetary shocks. The shared view of this group is that monetary expansion stimulates real economic activities. Similarly, a monetary contraction will lead to a recession. Keynesians and monetarists do not make any differences between expected money and unexpected money when analyzing the effects of monetary variables on the real variables. In these patterns expected money and systematic monetary policies would make actual effects. According to the referred theory by Ball and Romer (1990) and Ball and Mankiew (1994) consider an economics where there are a large number of economic agents who set prices that each of them can be producer or consumer. Each of these manufacturers produces a different commodity and sells their goods at nominal price of P_i . If there would be a cost called Menu cost in economy which displayed by $s > 0$ and assuming that a typical optimum of agency is as follows:

$$U_i = G\left(Y, \frac{P_i}{P}\right) - sD_i \quad (1)$$

So that in the above equation Y represents total actual expenditure that is spent and P represents the overall level of prices and D_i is also trap variable so that if the price level change is equal to one and for the other status is equal to zero. Assuming that all prices change with the same ratio so that $Y = M/P$, it means that for the individual its actual expenditures is equal to the true remaining of maintenance. Equation (2-1) can be rewritten as follows:

$$U_i = G\left(\frac{M}{P}, \frac{P_i}{P}\right) - sD_i \quad (2)$$

So if there is no listing for price, S becomes zero. If the price does not change desirability of agency can be shown as $U^{NA} = G(M, 1)$. If economic agents decides to change the price of desirability it can be shown as $U^{CP} = G\left(M, \frac{P_i^*}{P}\right) - s$. So, the equilibrium can be written as:

$$U^{NA} - U^{CP} > 0 \rightarrow G\left(M, \frac{P_i^*}{P}\right) - G(M, 1) < 0 \quad (3)$$

This condition implies that an interval can be considered for change in the money supply that inclusion in this balance is possible.

Results of Keynesian pattern asymmetry are compatible with cost model of prices by Ball and Mankiew (1994). In the cost pattern, the list of price assumes dynamic that there is a inflation trend, it means that the prices on average increase in each period. In this pattern, the asymmetry of monetary shocks can be easily explained based on the assumption that firms incur cost menu with changing the prices. Assuming the other conditions being equal, a positive monetary shock leads to higher relative prices to firm's product. The negative money momentum also creates opposite effect. In the case of inflation process, by creating a positive monetary momentum, representative firms may decide to not change price of its nominal product and to not pay any cost to change the menu because the inflation automatically lowers the relative price. But since in the presence of a positive monetary momentum, the optimum relative price for the firm's product increases and inflation leading to reductions of relative price for the firm's product, the firm has paid the cost of menu in response to the positive momentum and increases the price of its product. Hence, the positive momentum of money by adjusting prices upwards would have minimal effects on production levels. So presence of the inflationary trends in the model of Ball and Mankiew implies that total production response far greater than the positive monetary shocks to positive monetary shocks.

3- The introduction of Experimental theory of the study

In this section we will describe experimental methodology. To test the theory based on new classics information model used by Lucas (1972) and Barro (1975) and Boschen and Grossman (1982) and Mishkin (1982) two estimates can be made at the same time. One of these estimates reflects the relationship of anticipated and unanticipated effects of monetary shocks then these shocks will be entered in an equation of entire production. Dilang and Summers (1988) and Caver (1992) tested whether positive or negative unanticipated monetary policy shocks effect real activities of United States or not, so empirical foundations can be shows as follows. First, simultaneous equations of estimation is written:

$$\Delta m_t = \varphi(l)\Delta m_{t-1} + \Theta x_{t-1} + \varepsilon_t \quad (4)$$

and

$$\Delta y_t = \psi z_t + \beta^+ \varepsilon^+ + \beta^- \varepsilon^- + \xi_t \quad (5)$$

So that in the above equation Δ is the first difference operator and m_t represents the amount of money as a monetary policy and $\varphi(l)$ is a lag operator polynomial coefficient and Θ is a vector of parameters and x_{t-1} is the vector of estimators determined that the reaction of endogenous policy variables, including variables such as unemployment and changes in the monetary base and changes in production and government budget surpluses and changes in interest rates and inflation. y_t represents the level of real output of economy and ψ is parameter vector and z_t is the vector of estimators that includes continuous changes in production and ε^+ and ε^- are positive and negative monetary shocks inflicted on the economy.

Positive and negative shocks expressed in equation (5) can be defined as follows:

$$\varepsilon_t^+ \equiv \max(0, \varepsilon_t), \varepsilon_t^- \equiv \min(0, \varepsilon_t) \quad (6)$$

Equation (4) represents the monetary policy process and the equation (5) is also indicative of the total production. The assumption of β^+ is equal to β^- would be test. Rejecting this hypothesis is equivalent to that β^+ has not significantly different from zero, which supports our hypothesis that positive shocks have little effects on the real sector.

We can now put this methodology into two parts. The first part is based on theoretical issues raised in this case to emphasize the positive monetary shock has temporary effects on production, because the time series of real economy production has a unit root so positive monetary shock has a negligible effect and is temporary. Thus it can be explained that the above equation is changed as follows.

$$\Delta y_t = \psi z_t + \beta(e_t - e_{t-1}) + \xi_t \quad (7)$$

So that β is a vector of parameters and e_t is also indicative of unanticipated monetary shocks. This action indicates that negative monetary shocks have larger real effects than the positive monetary shock.

The second part can be expressed in this way that not only the difference must be made between positive and negative monetary shocks but also focus must be made on smallness and largeness of these shocks. So in a stochastic model, cost of price list related a distinction between large and small shocks on monetary fluctuations unforeseen shocks.

Following the modeling of the second section, we will describe the changes in unconditioned or non-conditional average in order to define the changeability or non- changeability of conditions that we represent this mode as $s_t = 0, 1$. According to the mentioned conditions, now the monetary policy equation can be estimated. To change in mean and variance of the unconditional, the following model is modified.

$$(\Delta m_t - \mu(s_t)) = \varphi(l)(\Delta m_{t-1} - \mu(s_{t-1})) + \Theta x'_{t-1} + \sigma(s_t)\eta_t \quad (8)$$

So that $\varphi(l)$ is lag operator polynomial and Θ is the vector of parameters and x_{t-1} is the vector of average variables that is pre-determined from last period. $x - \mu x$ and $\mu(s_t)$ are the average of the dependent variable and s_t also discrete values of condition variable and η_t including disrupting the normal distribution with zero mean and variance are independent alike who are dependent on the amount of allowable s_t .

Given the assumption of smallness or largeness of shocks inside the model assumes that expected monetary growth in period t with the information of t period $t-1$ is given and a collection of information that is improving gradually. In this case, expected monetary growth is as follows:

$$E_{t-1}^* \Delta m_t = (\mu_0 + \varphi(\Delta m_{t-1} - (\mu_0 + \Delta \mu \pi_{01}))) + \Theta x_{t-1} \quad \text{If } s_t = 0 \quad (9)$$

$$E_{t-1}^* \Delta m_t = (\mu_0 + \Delta \mu + \varphi(\Delta m_{t-1} - (\mu_0 + \Delta \mu \pi_{11}))) + \Theta \quad \text{If } s_t = 1 \quad (10)$$

So that in the above passages * indicates a data set that includes economic facts and π_{01} is the probability of transition from zero status to one that can be defined as $\pi_{ij} = P(s_t = i | s_{t-1} = j), i, j = 0, 1$ and π_{11} is the probability to remain in a state that in the next period on conditioned in the prior period have also been in the same situation. Unforeseen monetary policy shocks can be defined in two ways:

$$\varepsilon_{0t} = \Delta m_t - \left[\begin{array}{c} \mu_0 + \varphi \\ (\Delta m_{t-1} - (\mu_0 + \Delta \mu \pi_{01})) + \Theta x_{t-1} \end{array} \right] \sim N(0, \sigma_0^2)$$

$$\varepsilon_{1t} = \Delta m_t - \left[\begin{array}{c} \mu_0 + \Delta \mu + \varphi \\ (\Delta m_{t-1} - (\mu_0 + \Delta \mu \pi_{11})) + \Theta x_{t-1} \end{array} \right] \sim N(0, \sigma_1^2)$$

In order to use the information and estimates this model, we need to know in which situation we are. If we assume that the conditional probability information available in period t as $P(s_t = i | I_t)$, in this case, we are at the status of i at time t , in order to modify the conditions we use from Hamilton filter. Suppose that the status of zero indicates a manner that the variance of unanticipated monetary policy shock is low or in other words, volatility of monetary shock is low, so the shock behavior can be defined as follows:

$$e_t^s \equiv (\Delta m_t - [\mu_0 + \varphi(\Delta m_{t-1} - (\mu_0 + \Delta \mu \pi_{01})) + \Theta x_{t-1}]) \times P(s_t = 0 | I_t) \quad (11)$$

and

$$e_t^B \equiv (\Delta m_t - [\mu_0 + \varphi(\Delta m_{t-1} - (\mu_0 + \Delta \mu \pi_{11})) + \Theta x_{t-1}]) \times P(s_t = 1 | I_t) \quad (12)$$

Then each of these two shocks can be separated into two parts which can be shown as positive + (positive) and negative - (negative) shock according to the methods mentioned in the process can be introduced before the shock. According to the mentioned steps, four types of monetary shock as $e_t = \{e_t^{B+}, e_t^{B-}, e_t^{s+}, e_t^{s-}\}$ can be defined where e_t^{B+} positive monetary shock is large and e_t^{B-} is large negative monetary shock and e_t^{s+} is positive monetary shock small and e_t^{s-} is small negative shock. This structure allows us to test the effects of asymmetric monetary shocks with respect to the mentioned process.

Now the equation of monetary policy and the equation of production could be written as follows:

$$\Delta y_t = \psi z_t + \beta^{B+} \Delta e_t^{B+} + \beta^{B-} \Delta e_t^{B-} + \beta^{s+} \Delta e_t^{s+} + \beta^{s-} \Delta e_t^{s-} + \xi_t \quad (13)$$

First, we estimate equation (7) and (13) with the imposition of β coefficients equal to zero means that money has no real effect.

For example, testing the following hypothesis suggests that the effects of all positive and negative monetary shock either small or great are similar.

If the null hypothesis is rejected, it means that we have asymmetric monetary shocks. First, suppose we have asymmetric positive and negative monetary shocks with different effects. This can be tested by two steps. According to this assumption it should not be so important that monetary shocks are small or positive, so we can emphasize as follow that the following assumption is available: $H_0: \beta^{B+} = \beta^{s+}, \beta^{B-} = \beta^{s-}$

This assumption implies that positive and negative large monetary shocks have symmetric effects and negative large and small monetary shocks have asymmetric effects and rejecting this hypothesis implies that not only positive and negative shocks have different effects, but also large and small shocks have asymmetric effects.

In this part of the research, methods of analysis of positive and negative monetary shocks on real output will be described. Before estimation of asymmetric negative and positive effects on real production level, ways of defining and identifying these shocks would be examined. Usually, empirical studies have not predicted any time series variables to consider as the shock of that variable. For example, in studies by Mishkin (1982) and Martin Sola (2005) of the remaining money growth rate equation (M1) has been used as a monetary shocks. In fact, in these studies, the expected rate of money growth would break into two expectable and non-expectable components shocks regression analysis and residual rate of money growth as unexpected monetary shocks to investigate the asymmetric effects of monetary shocks have been used. Another method of obtaining positive and negative shocks is using from univariate filtering. A commonly used method of smoothing filter is Hodrick and Prescott. This method due to the fact that frequency-cycle variable time series apart from cyclic variable component time series, as well as very close to the actual values, and most applications of great importance. The population of this study used time series variables including GDP, money supply, bank credit, inflation, natural resource rents, capital, trade openness, government spending, foreign direct investment and institutional quality indicators for countries with natural resources between the years 1990 - 2013. In order to evaluate the effect of money supply and bank credit shocks on real activity in the economy of countries with natural resources, the unit root test to avoid spurious regression variables would be study and finally to check and test hypotheses, a multivariate regression model was used.

4- Test of hypotheses and statistical analyses

Before creating the model of research, in order to prevent false regressions in the research, first the stationary of variables is evaluated through IPS test. Using the performed experiments, it is investigated that whether the time series being used have a stationary process (with zero accumulation) and/or a divergent process (with nonzero accumulation). Therefore single root test is conducted for variables such as internal gross production, quantity of money, bank credits, inflammation, interest of natural resources, investment, openness of trading, governmental expenses, direct foreign investment and institutional quality. It should be mentioned that the variables being used are percentages of GDP. Single root test is conducted in the existence of y -intercept. The results of Table 1 Show that since all the variables of the research except bank credits and average institutional factors have a probability of less than 0.05, the hypothesis related to the existence of a single root is rejected and these variables are at the stationary level. But bank credits and average institutional average are not at stationary level and have become stationary through subtraction.

Table 1. IPS single root test

IPS test		variable
Prob	Statistic of the test	
		Internal gross production logarithm
		Quantity of money
		Bank credits
		Inflammation
		Interest of natural resources
		investment
		Openness of trading
		Governmental expenses
		Direct foreign investment
1.000	6.87	Institutional quality factor

Resource: the results of estimation

In the following, before assessing the model, we use co-integration model to investigate the existence of a long term relation between the variables of the research. In order to study the long term between the variables, we have used Cao test based upon Angel-Granger method. The results are shown in the following table:

Table 2.the results of panel co-integration test

	t-Statistic	Prob.
ADF	0.162809	0.4353
Residual variance		0.000806
HAC variance		0.001930

Regarding the fact that the reported prob is more than 0.05, the hypothesis is not rejected at the level of 5 percent fault and there is not a co-integration relation between the variables.

3-2.specifying the model and studying the hypothesis

In order to assess the effect of money quantity and bank credit shocks on real activities in the economy of countries having natural resources, self correction method has been used. In order to achieve this purpose, positive and negative fluctuations have been extracted from Houdrik-Perscut filter and the effect of these fluctuations on internal gross production of countries is investigated. According to the theory of spectrum analyses, a time series is composed of components with different frequencies. In other words, when there are issues related to econometrics in frequency amplitude, a time series is considered as the total quantity of the underlying series which have different cycle patterns. This is more understandable in the case of continuous time series. Therefore, consider the example of money quantity in a country which is calculated as a continuous value. In order to extract changing cycles of money quantity using HP filter, there have been attempts to perform this and to remove the cycle part of this variable. HP filter is an algorithm for choosing smooth variables in time series. This filter is used to explain long term results of time series through lowering the importance of price fluctuations in a short term. When the purpose is finding results in long term, data smoothing technique is used to remove the short term cycles which are caused by economical cycles. HP filter estimates the smooth series through minimizing the variance of the original series around the smooth series. A certain time series $\{yt\}_{t=1}^n$ is resolved in logarithm filter:

$$HP = \min_{\{dt\}_{T=1}^N} \sum_{T=1}^n (ct^2 + \lambda [(dt - d_{t-1}) - (d_{t-1} - d_{t-2})]^2)$$

D_t implies procedure component, $c_t = y_t - d_t$ is cycle component of series in t, λ is the penalty parameter which controls the procedures. In order to extract trade cycles, HP filter with a smoothing value of $h=1600$ is used. The results of assessing the effect of money quantity and bank credits shocks on real activities in the economy of countries having natural resources are reported in the following table.

Table 3.assessment of the effect of money quantity and bank credits shocks on real activities in the economy of countries having natural resources

The forth model	The third model	The second model	The first model	The primary model	Variables
					y-intercept
					Quantity of money
					Positive shocks
					Negative shocks
					Abundance of natural resources
					Institutional quality
					Inflammation
					Governmental expenses
					Investment
					Bank credits
					The level of economic openness
					Direct foreign investment
					Fault correction component
					Log likelihood
					F statistics
					AIC
					SBC
					R ²
					DW

in all of the assessments, all of the coefficients except governmental expenses have a significant difference with zero at the level of 10 percents. As can be seen, negative financial shocks have more effects than positive shocks in the same period. Positive financial shocks have had a negative effect on production growth, because with running financial policies, according the balance of prices, more load of financial policy is laid on the prices and its effect on production is counteracted. While, in the case of negative financial shocks, the institutions face some doubts for balancing the prices, so they do not attempt to balance and lower the prices. Therefore, the policy is towards production. This is why the financial policies and negative shocks have more effects. This approves the results of the table of estimation and the effect of negative shocks is more significant than the effect of positive shocks. In general, according to the coefficients of positive and negative financial shocks, we can conclude that in long term financial policies in the economy of countries having natural resources will have a rapid change due to the structure of markets and price of products. But in short term, due to partial adherence they do not have such consistent effects and financial shocks do not have much effect on investment and economical growth. Also, with considering the variables of natural resources abundance and the average of quality factors in the model, we can obtain the above results, as these variables have had significant effects on economic growth in these countries, but these effects are weak. This might be because of inappropriate structures of financial markets in these countries. These markets are not able to influence the variables of financial section because of lack of efficiency.

Also, the results show a negative relation between inflammation and economic growth according the mentioned theories. Because according to the issues of Kinsin, when the fluctuation of prices is high, it results in inconsistency of expectations and it has a negative effect on investment and economic growth.

The effect of economic openness and direct foreign investment in these countries has a positive and significant influence on economic growth in these countries. The variable of the granted values of private sector has a positive and significant effect on economic growth in these countries.

The coefficient of fault correction $ECM(-1)$ reflects the speed of balancing the variables to financial imbalance (financial market). Considering the evaluated fault correction coefficient in the models which are respectively -0.38, -0.29, -0.41, -0.44 and -0.42, we can conclude that production growth reacts to financial imbalance significantly. The forth model gives the fitting according to the information of Akaike (AIC) and Schwartz (SIC).

Statistics such as R² or determination coefficient in both of the fitted models show the appropriate explanatory power of the models. Also, according to F statistics and its prob value the total fitted regression is significant. Watson camera statistics in fitted models shows nonexistence of severe autocorrelation in the model.

5- conclusion and recommendation

The purpose of this article was to demonstrate the effect of money quantity and positive and negative shocks on

the real economic sector in countries having natural resources in form of panel data model. In order to achieve this purpose, the relation between the variables was investigated using the information of internal gross production, quantity of money, bank credits, general level of prices, investment, openness of trading, expenses of government, direct foreign investment, abundance of natural resources and institutional quality factor in the period of 1990-2013. Asymmetry of real sector and financial policy is a phenomenon that can be created in economics under different conditions. Asymmetric effects of monetary policies exist between different opinions and this is why it is difficult to experiment it with certain assumptions, as that it cannot be experimented with the information of macroeconomics and simple assumptions.

The results showed that in all cases negative monetary shocks have more effects than positive shocks in a same period. Positive monetary shocks have had a negative impact on production growth, because when running monetary policies after a period, according to balancing the prices of production institutes, more financial policy load is laid on prices and its effect on production is counteracted. While in the case of negative monetary shocks, the institutions face some doubts for balancing the prices. Therefore they do not attempt to balance and lower the prices in a period, so the load of policy is on production and this is why the monetary policies and negative shocks have more effects. This confirms the results of the table of estimation and the effect of negative shocks is more significant than the effect of positive shocks. In general, according to the coefficients of positive and negative monetary shocks, it can be concluded that economic policies in the economy of countries which have natural resources will have rapid changes in long term due to the structure of markets and the price of products. But in short term, due to partial adherence they do not have such consistent effects and financial shocks do not have much effect on investment and economical growth. Also, with considering the variables of natural resources abundance and the average of quality factors in the model, we can obtain the above results, as these variables have had significant effects on economic growth in these countries, but these effects are weak. This might be because of inappropriate structures of financial markets in these countries. These markets are not able to influence the variables of financial section because of lack of efficiency.

According to the results of this research, we can state that:

According to the results, although the policy maker can raise the economic growth with an unexpected increase of money growth, when decreasing the growth level of money and inflation, he should pay more amounts of money according to the decrease of economic growth.

According to the results of the research the influence of monetary shocks on production has an opposite relation with the level of these shocks. Therefore, the monetary policies which result in negative monetary shocks have more influence on real production. So, it is suggested that monetary policy makers follow the regulations and formulate the money growth rate according to the level of production.

Also, the monetary policy makers should avoid the policies which lead to negative monetary shocks in order to decrease the inflation, because the negative effects of such policies on production growth are significant. In fact, in our country, due to high rates of inflation and rapid balancing the prices, it is suggested that unnecessary monetary expansions be avoided, so people can trust the policy makers more than past, and in the case of running monetary policies according to price imbalance, we should perceive the changes of the production.