INVESTIGATING IMPACTS OF MONETARY FACTORS ON INFLATION IN VIETNAM AND SOME SUGGESTIONS TO THE OPERATION OF MONETARY POLICY

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To control inflation has become the mission of the Vietnam's government throughout its close integration into the world economy. Since the 1986 hyperinflation, Vietnam has managed to maintain its inflation rate at a single-digit level in such a long period. Yet within four recent years when the economy integrated more closely into the world economy, the inflation rate has bobbed up and down and become unpredictable, from 25% in 2008 down to 6.88% in 2009; and the CPI as of December 2009 has risen to 1.38% - the highest level in 2009, set the alarm bells ringing for the reoccurrence of high inflation in 2010. In December 2010, Vietnam's GSO did admit a rise of 1.98% in the CPI, pushing the whole-year growth rate up nearly to 12%.

Inflation has been the matter of concern to many of monetarists thus far. Their debates on monetary factors affecting inflation derive from a best-known assertion of Friedman that "inflation is always and everywhere a monetary phenomenon." (Mishkin, 2003). From this perspective, preventing inflation means controlling monetary factors. This study, by means of empirical methodologies, is to investigate monetary factors impinging on inflation in Vietnam. Consequently, empirical outcomes show that variables namely income, money supply, interest rate, capital inflow, and exchange rate have sharp impacts on inflation; and their influential direction suits research hypotheses.

Keywords: inflation, money supply, interest rate, exchange rate, capital flows

1. Conceptual framework

In the context of an open-door economy, capital inflows (i.e. FDI, ODA, and foreign debts) will cause a rise in the demand for consumer goods. If E is labeled as a nominal expenditure on commodities and services, $\overline{M}$ as the nominal money amount excluding foreign capital flows, e as the exchange rate, and G as capital inflow, the equation of total expenditure is as follows (Abdul Rashid & Fazal Husain, 2010):

$$E = \overline{M} + eG \qquad (1)$$

Based on money market equilibrium conditions, the equation (1) can be rewritten as follows:

$$M^d = M^s + eG \qquad (2)$$

The nominal price P, as in the money equilibrium conditions, can be defined as:

$$P = \frac{V \times M^s}{Y} = \frac{V \times (\overline{M} + eG)}{Y} \qquad (3)$$

Where, V denotes the velocity of circulation of money and Y represents the gross output of commodity which can be calculated as per real GDP. Suppose that V is kept constant, the

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equation (3) shows price levels (P) to be affected by M, e, G, and Y as follows:

Firstly, the price level has a positive rapport with the exchange rate and the capital inflow (i.e. $\frac{\partial P}{\partial G}\rangle 0$ and $\frac{\partial P}{\partial e}\rangle 0$). Provided that the government permits a huge capital inflow, the money supply will definitely go up and thereby devaluing the domestic currency and boosting inflation. It is implied that independence of monetary policies, in the context of an open market and with impacts of international capital flows, is limited to some extent (Abdul Rashid and Fazal Husain, 2010).

Secondly, the domestic price level (P) has the negative relationship with Y (i.e. $\frac{\partial P}{\partial Y}\langle 0$). That is, if the gross output of commodity goes up, the price level goes down. The Keynesian model of capital absorption asserts that fluctuations of Y depend on the productivity of both foreign and domestic capital. If capital inflows enhance the domestic capital productivity, then Y will arise and P plunges accordingly. Similarly, the growth of domestic capital will also produce the same outcome. In other words, if the economy cannot absorb capital, inflation will consequently increase.

Thirdly, the money supply is identical to the function of the interest rate (i) and the gross output of commodity (Y), i.e. $M^s = M^d = f(i,Y)$; and the relationship between the money supply and the interest rate is negative. Yet, the interest rate is a tool of monetary policies and many economists have unanimously agreed that monetary policies control inflation via appropriate adjustments to interest rate. Inflation can also be manipulated by a rise in real interest rate. To put it another word, it is possible to control the inflation by controlling the growth of real interest rate and money supply (Fernando Alvarez, 2001).

In sum, from the equation (3) there are four transmission mechanisms of monetary policy that affect the price level and inflation in the context of an open economy, that is, income, money supply, capital inflow, and interest rate and exchange rate.

2. Investigating monetary factors and inflation in Vietnam

a. The transmission mechanism of monetary policy:

In Vietnam, the SBV assumes control over inflation and price. The 1998 State Bank Law and modifications and amendments in 2003 provide that the SBV shall be responsible for stabilizing the value of domestic currency, securing the safe and sound operation of banking system and other banking institutions, beefing up and facilitating the socialism-oriented socioeconomic development (Article 1, Item 3); and the SBV shall employ tools of the monetary policy to achieve targets of inflation and annual growth as approved by the Vietnam's National Assembly.

The SBV governance of monetary policies has evolved along with certain financial and economic conditions. As of 2000 backwards, the SBV monetary policy just aimed at manipulating money by means of credit ceiling, and interest rate ceiling and framework. Under the financial liberalization policy promulgated in May 2002 (i.e. omission of interest rate ceiling, undertaking the agreed-upon interest rate regime, and the application of a flexible exchange rate in lieu of the fixed one), the SBV started controlling the money supply via indirect tools (i.e. base rate, open-market operations, etc.) so as to impinge on the growth of money supply, market rate, and exchange rate. Figure 1 reflects the transmission mechanism of Vietnam's monetary policy, and also the transmission mechanism of impacts of Vietnam's monetary policy on inflation control.

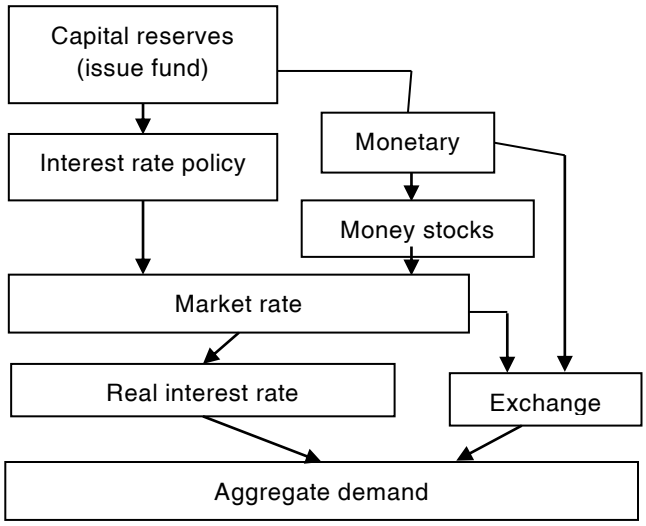


Figure 1: The transmission mechanism of Vietnam's monetary policy

b. Vietnam's inflation:

Figure 2 illustrates the underlying trend of inflation in Vietnam within the period 1990-2009. In the late 1980s, Vietnam did confront hyperinflation; the rise in CPI reached a three-digit level. To weather inflation, Vietnam employed basic measures like budget expenditure cuts, a halt in issuing money to make up for budget deficits, and reforms in the financial and banking system. Consequently, inflation was curbed and it took the government around six years to make the CPI reduce to 12.7% in 1995 from 410% in 1988. In the period 1996-2000, the inflation rate was kept at a single-digit level. Yet, the 1997 crisis did adversely influence the Vietnam's economy. The GDP growth plunged to 4.7% from eight to nine percent; and the economy suffered deflation (-0.6% in 2000). Thus, the government, in order to regain the health of the economy, undertook loose fiscal and monetary policies by means of demand-side stimulus programs in the period 2000-2005 with a result that the growth rate was consecutively remained higher than inflation rate in the period 2000-2004. Since 2006 till now when Vietnam has closely integrated into the world economy and been influenced by the global inflation, the high inflation rates in 2007 (12.7%) and 2008 (25%) and macroeconomic volatility have generated negative impacts on the social life. In this period, the average economic growth rate is always smaller than the inflation rate.

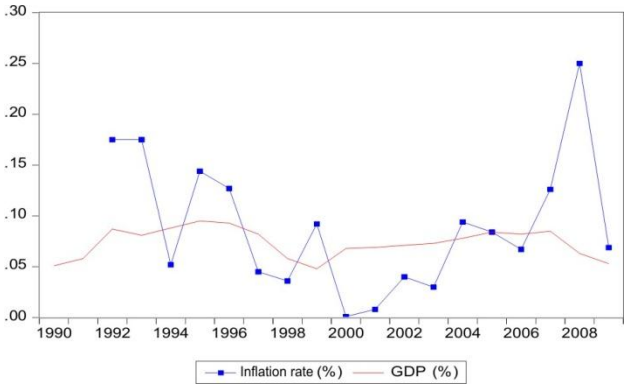


Figure 2: Vietnam's inflation and economic growth rates in 1990-2009

Source: ABD (2010), *Key Indicators for Asia and the Pacific*

c. Monetary factors:

- Money supply: To investigate money supply channels can help discover the relationship between inflation and money supply. Figure 3 describes the trend of the money supply (M_2) in Vietnam.

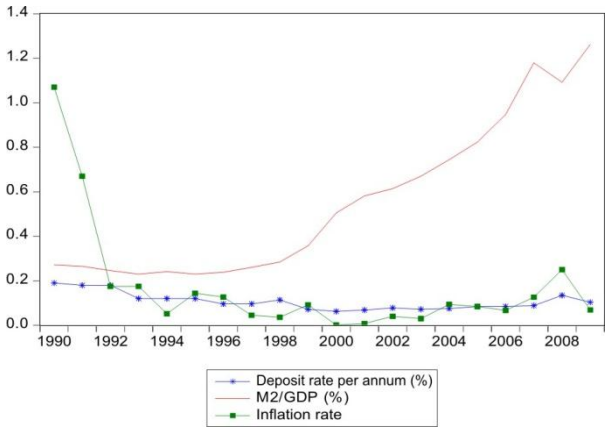


Figure 3: Money supply, interest rate, and inflation rate in 1990-2009

Source: ABD (2010), *Key Indicators for Asia and the Pacific*

The ratio of money supply (M_2) to GDP, in the period 1990-2005, was merely ranging between 23% and 24%. This is to say, the SBV weighed up the execution of a dear-money policy to curb inflation. Yet within the next five years (1996-2000), the money supply shot up, especially after the 1997 crisis, from 26% in 1996 to 50.5% in

2000 (i.e. a nearly double rise). Apparently, the SBV had employed the open monetary policy as a backup to the fiscal policy with a view to regaining the health of the economy after the crisis and restructuring the economy in time to come. The open fiscal and monetary policy was kept effective later on. Figure 3 shows that the money supply doubled in the period 2000-2009 (i.e. from 58% in 2001 up to 129% in 2009). The high rise in the money supply in the period 2008-2009 derives from the government's economic stimulus packages which are to weather recession and regain the economic health after the 2008 global financial crisis. In this period, the inflation rate was very high, especially in 2008 (25%).

- Interest rate: In the traditional macroeconomic paradigm, interest rate is deemed as the basic channel of transmission where a rise in the nominal rate by the SBV can produce a rise in the real interest rate and capital costs, thereby influencing the aggregate demand and inflation.

In order to tackle hyperinflation in the late 1980s, the deposit rate soared up, nearly 208% per annum. After hyperinflation was controlled, the SBV gradually reduced the interest rate in a hope of stimulating the development of production. In 1995, the market rate stayed at a single-digit level (i.e. 9% p.a.; see Figure 3). In 1998, the interest rate, due to impacts of the 1997 crisis, jumped by 11.4% p.a. Then, the annual interest rate varied between seven and nine percent for a long time (from 1999 to 2007). The fact that this interest rate is greater than the inflation rate secures the positive real interest rate and helps control inflation in this period. Unfortunately, the 2008 crisis exacerbated inflation, making inflation control the goal of macroeconomic policies. Consequently, the market rate was constantly adjusted up, the deposit rate rose to 13.4% p.a., and the lending rate soared up to somewhere between 18 and 19 percent in 2008-2009.

Overall, positive changes in the interest rate policy have mainly derived from the attempt to renew the monetary policy management mechanism of the SBV. The SBV has also realized that in the market economy it is necessary to make the best use of the authority of the central bank, that is, utilizing interest rate as a price and as a tool for the central bank to supply liquidity to the money market, and simultaneously employing real resources to proactively control the liquidity of banking institutions and create an effective interest rate transmission mechanism which is pervasive in the financial market. As a result, the monetary policy transmission mechanism of the SBV, from a focus on controlling money via direct tools like credit ceiling, interest rate ceiling and framework, has gradually been oriented towards indirect tools and financial liberalization such as using the agreed-upon interest rate mechanism in lieu of the interest rate ceiling and framework.

- International capital flows and exchange rate: Figure 4 shows that capital inflows have the same trend with inflation, especially from 2003 onwards. This raises a need to investigate the effect of foreign capital flows on money supply, exchange rate, and price level. For one thing, as from 2003 to now, together with the rise in foreign capital flows, the money supply had to increase accordingly, and thus entailing the onward trend of inflation. For another, the rise in foreign capital inflows also produces certain effects on the exchange rate, which depends on the way the SBV control the exchange rate.

Since 1990, Vietnam has transited from a multiple exchange rate regime to a unified one under the state control. From 1990 to 1996, the nominal exchange rate was pegged at VND10,800 – VND11,750 to the US dollar. In 1997, due to effect of the crisis, the Vietnam's dong fell dramatically by nearly 15% against the US dollar. Being swept into the tornado of the 1997 inflation, the SBV repeatedly adjusted the exchange rate by widening the band on either side of the rate to 5% and 10%. After the Asian financial crisis, the exchange rate policy of SBV was switched from the official exchange rate to the interbank average rate so as to correspond to

the market mechanism. In the past decade, the value of Vietnam's dong, on average, was depreciated by 3% p.a. and without great volatility. Overall, while the exchange rate is creeping in a narrow band (see Figure 4), the inflation rate gained wider fluctuations. After a period of moderate stability, inflation abruptly shot up in the years 2006-2009.

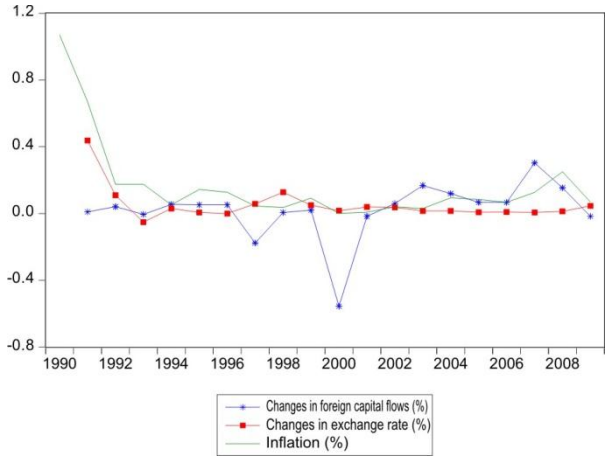


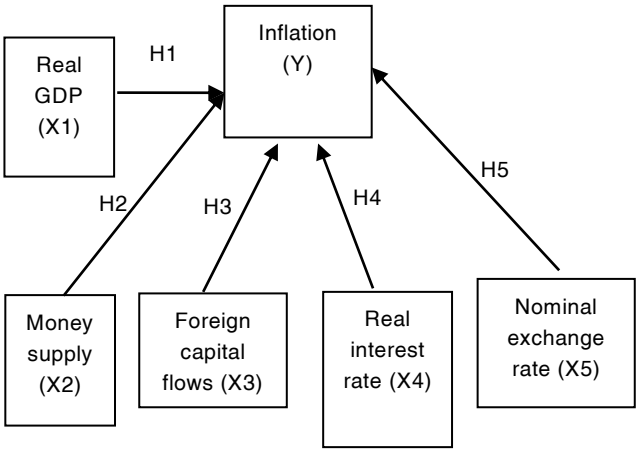
Figure 4: Changes in foreign capital flows, exchange rate, and inflation in Vietnam in 1990-2009

Source: ABD (2010), *Key Indicators for Asia and the Pacific*

3. Research model and empirical results

a. Research model:

From the conceptual framework a paradigm of monetary factors influencing inflation will be set up as follows:



The regression equation of inflation and monetary factors will be written as:

$$Y = \alpha_0 - \alpha_1 X1 + \alpha_2 X2 + \alpha_3 X3 - \alpha_4 X4 + \alpha_5 X5 \quad (4)$$

It is hypothesized that:

H1: There is a negative relationship between the real GDP and inflation.

H2: There is a positive relationship between the money supply and inflation.

H3: There is a positive relationship between foreign capital flows and inflation.

H4: There is a negative relationship between the real interest rate and inflation.

H5: There is a positive relationship between the nominal exchange rate and inflation.

H0: Above-mentioned variables do not generate inflation (i.e. $\alpha = 0$).

Statistical data in the period 1990-2009 will be employed in the research. These data were compiled by ADB and printed in "Key Indicators for Asia and the Pacific 2010". Variables include the real GDP (X1) expressed in the 1994 fixed price (VND billion), the money supply (X2) calculated according to M2 (VND billion), foreign capital flows (X3) based on FDI and foreign debts (US$ million), the real interest rate (X4) calculated as the inflation rate subtracted from the nominal interest rate (%), and the nominal exchange rate calculated as per the annual average exchange rate of VND to USD.

b. Empirical outcomes:

The OLS method and the Eview7 software will be employed to evaluate regression coefficients of the equation (4). Accordingly, the regression coefficients of five given variables are statistically significant at 5%; in other words, the H0 is nullified and other hypotheses (from H1 to H5) are acceptable. The vector direction of regression coefficients is appropriate to hypotheses. The Durbin-Watson test with d equaling 2.3 shows that there is no autocorrelation in the model. With R^2 and adjusted R^2 being larger than 0.9, the research model is proven to be highly appropriate to data and employable.

To sound more sure, the test of standard normal distribution of residuals will be run so as

to estimate model errors. If residuals are not random and lack normal distribution, the regression model is erroneous. To test the normal distribution of residuals, the statistic JB will be employed together with H0 as "there is a normal distribution of residuals". Table 2 shows that the null hypothesis is acceptable because the p-value of the JB statistics is equal to 0.59 and larger than 5%. Akaike, Schwarz, and Hanna-Quinn are all at -4, proving that the chosen model is highly appropriate. In sum, via testing results it is possible to assert that the research model and regression results are reliable and usable.

5. Conclusions and monetary policy implications

a. Conclusions:

In the research, monetary factors influencing Vietnam's inflation has been investigated. Based on the monetary exchange equation, the research, with addition of some more variables namely interest rate, exchange rate, and foreign capital flows, has been extended for the sake of an open market. The testing results shows that variables viz. income, money supply, interest rate, foreign capital flows, and exchange rate

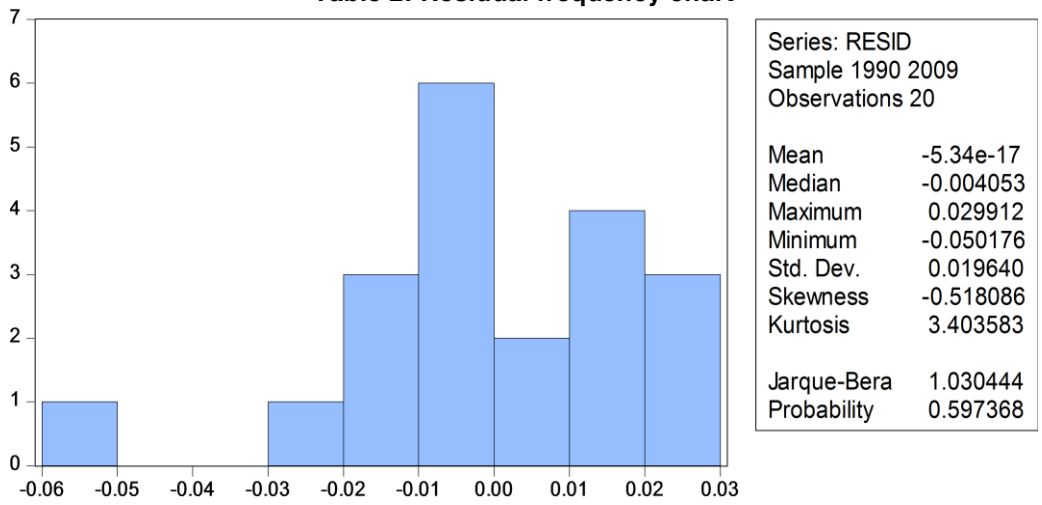
Table 1: Empirical results

Dependent Variable: LAMPHAT

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.113312	0.103917	-1.090409	0.2939
GDP (X1)	-1.09E-06	3.05E-07	-3.574983	0.0030
Money supply (X2)	0.163060	0.079654	2.047092	0.0599
Foreign capital flows (X3)	5.90E-06	1.34E-06	4.398691	0.0006
Real interest rate (X4)	-1.019125	0.048603	-20.96854	0.0000
Exchange rate (X5)	2.23E-05	9.56E-06	2.336591	0.0348

R-squared	0.992999	Mean dependent var	0.161740
Adjusted R-squared	0.990499	S.D. dependent var	0.234730
S.E. of regression	0.022879	Akaike info criterion	-4.473826
Sum squared resid	0.007329	Schwarz criterion	-4.175106
Log likelihood	50.73826	Hannan-Quinn criter.	-4.415513
F-statistic	397.1695	Durbin-Watson stat	2.390293
Prob (F-statistic)	0.000000		

Table 2: Residual frequency chart



have impacts on inflation; and the influential direction is in accordance with the hypotheses. Expectedly, these findings can help Vietnam's authority better operate monetary policies with a view to controlling inflation in the context of world economic integration.

b. Monetary policy implications:

Firstly, GDP has an adversely proportional relation with inflation (the regression coefficient equals -1.1). It implies that the higher the real GDP, the more controllable inflation is. Accordingly, in the operation of macroeconomic policies, it is necessary to assure that the GDP growth rate must be larger than the inflation rate. To do thus, capital absorption capacity is really a vital component. Thus far, Vietnam's economic growth has mainly based on capital flows. In the period 2000-2005, capital flows did contribute around 65% to the national economic growth (Chung, 2011). The Vietnam's ICOR shows an onward trend, reaching 0.39 in 1991, 3.82 in 2001, and over 8 at present. The increasingly high ICOR means an increasingly poor efficiency of investment. It is also noteworthy that Vietnam always attempts to attract foreign capital flows when implementing the capital-intensive economic growth model. Yet in fact, as per the research results, it is apparent that the variable "foreign capital flows", in comparison with other ones, strongly impinges on inflation (the regression coefficient is +5.5). This is to say, quick rises in foreign capital flows along with prolonged poor quality of economic growth constitute prerequisites for inflation. In the context of an open market, the monetary policy has its own certain weaknesses in controlling foreign capital flows. Therefore, the monetary policy must be associated with many of other macroeconomic policies with a view to improving the foreign capital absorption capacity and facilitating the sustainable economic growth.

Take it from some other countries, the closer a country integrates into the world economy, the less initial competitive edges there will be. If initial competitive edges are not exploited to the best and no new edges are worked out, an expected economic growth seems unreachable. Therefore, Vietnam, in time to come, needs attempt to restructure its economy, veer its capital-intensive growth model to a quality-weighted one, and develop the hi-tech industry so as to enhance the national competitiveness. The Global Competitiveness Report 2010-2011 by WEF puts forth that Vietnam's competitiveness reaches 4.3 points, higher than the 4.0 of the 2009-2010 report and the 4.1 of the 2008-2009 report. Nonetheless, Vietnam's competitiveness is still humble as compared to other countries in the Southeast Asia like Singapore (5.5, ranked 3), Malaysia (4.9, ranked 26), Brunei (4.8, ranked 28), Thailand (4.5, ranked 38), and Indonesia (4.4, ranked 44). According to WEF, of 139 countries ranked in the report, Vietnam is placed nearly bottom in terms of investor protection

(placed 133), infrastructures quality (placed 123), and the availability of novel technologies (placed 102).

Secondly, with the regression coefficient equaling +0.16, the impacts of money supply on inflation are a little bit weaker than other factors. The research shows that the SBV policy on money supply is cautiously operated and the implementation of positive real interest rate policy is extremely significant to inflation control.

Theoretically, the inflation rate will go down once the money supply is tightened or the credit growth is reduced. However, due to the need to beef up economic growth and secure the liquidity of the finance market, the credit supply is still problematic to monetary policy makers. Over the past time, the credit growth has reached higher when banks aims at an increase of 25%. The point is that why enterprises still thirst for capital while credit and total liquidity soar up. This can be explained that a large amount of credit from commercial banks has been poured into the public sector via government bonds. Bonds ensure high interest rate and can be mortgaged to make loans from the SBV, which have caused a vicious circle of money flows, and thus enterprises hardly access bank loans (Thành, 2010). Thus, it is necessary to enhance the efficiency of the monetary policy transmission mechanism via measures that are to enhance the access of enterprises and individuals to business loans. Besides, a remedy to unify interest rates should be taken into contemplation so as to avoid the trend of multiple rates at present and help the market-oriented interest rate regime operate better. The market will create an interest rate curve which is appropriate to the pervasive impacts of operations of the central bank.

Thirdly, the positive real interest rate strongly influences inflation (the regression coefficient is -1). Yet the implementation of the positive real interest rate policy leads to two problematic things. The first thing is that the capital absorption capacity of the economy is still poor. This can be reasoned that the economic structure is partly inappropriate and the interest rate is so high that borrowers cannot afford it by their own retained profits. Secondly, the deposit rate of banks, under the pressure of inflation, must go up so as to satisfy expectations of depositors, and thereby causing a hunger for capital. To tackle these problems requires the SBV to proactively ensure the liquidity for the banking system at a suitable rate of interest, and force commercial banks to observe market principles and fair competition rules. Nonetheless, the use of interest rate as an instrument for the monetary policy is facing certain difficulties, that is, the role of base rate set by the SBV is not effective enough because it does not correspond to the market rate, or the market cannot catch orientations of the SBV. The idea is that whether Vietnam should exclude

the base rate from the Amended Law on SBV, and instead flexibly employ the recapitalization rate and the rediscount rate with a view to orienting the market rate. If the SBV at present just permits banks to employ the agreed-upon interest rate regime for the sake of medium- and long-term loans, it is encouraged to apply this rule to short-term loans and moreover, remove the rule that prevents the lending rate from exceeding 150% of the base rate. In doing so, it will be very difficult for commercial banks to dodge policies by turning short-term loan contracts into the long-term ones and disturbing the market. However, if the interest rate liberalization mechanism is allowed for short-term loans, the interest of both borrowers and lenders is in the perfect harmony.

Fourthly, the impacts of exchange rate on inflation, with the regression coefficient set at +2.2, are just placed right behind the variable "foreign capital flows". Hence, Vietnam, in order to control inflation, should implement an appropriate policy on exchange rate. However, it is also the most problematic thing to Vietnam's economy in that it directly relates to the trade deficit. In 2010, Vietnam's trade deficit reached US$12.5 billion, and the trade deficit with China was US$13 billion which, due to the opposite monetary policy of the two countries, put Vietnam under the great pressure of exchange rate. Vietnam has allowed its currency to rise against the US dollar (i.e. the VND exchange rate to USD is VND21,000 in the free market), and VND19,500 in the official market. Meanwhile, the Chinese authority maintains a weak RMB against the US dollar, causing the VND to be dearer than the RMB. Owning to disadvantages in exchange rate, Vietnam's goods have faced a lot of difficulties in its commercial relationship with China. To overcome this problem, Vietnam should adjust the exchange rate to revalue its currency and curb inflation. To back up the operation of exchange rate policy, the government needs to stringently supervise the use of foreign currency in domestic business transactions, import and export, foreign currency loans, and transactions in gold market. The manipulation of foreign currencies should be tightened and the SBV must assume responsibility for controlling the operation of the forex market■

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