

## **Key determinants of inflation and monetary policy in the emerging markets: Evidences from Vietnam**

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### **ABSTRACT**

This study explores the key determinants of inflation in Vietnam using the explanatory variables: past inflation, real income, money supply, exchange rate, interest rate and world oil price. This study uses Vector Error Correction Model to investigate the relationship among inflation and the above variables. We found significant relationship among inflation and three variables, past inflation, real income and exchange rate, moreover, the past inflation variable is playing the most important role in explaining the current inflation in Vietnam. The exchange rate pass –through is found to have a remarkable influence on inflation in the short run, in particular, a deduction in exchange rate will lead to higher prices. Real income has a negative and small impact relationship with inflation, while the other explanatory variables have insignificant impact on inflation. Interestingly, the findings suggest that this is not the suitable time to adopt Inflation Targeting framework.

**Key words:** Inflation, Vietnam, Emerging Markets, Vector Error Correction Model, Monetary Policy

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## **Introduction**

Monetary policy plays an important role in strengthening economy and increasing the life standards of any society. Central banks and monetary authorities can change aggregate supply and aggregate demand of its economy through some main tools such as, changing monetary base, reserve requirements, discount window lending, open market operations, interest rate and exchange rate, changing the aggregate supply and the aggregate demand which affect the inflation, production and employment of the economy. Additionally, the inflation can be controlled using the governmental expenditure and taxes among other fiscal policies.

The inflation Targeting (IT)<sup>1</sup> is considered as one of the most effective frameworks that a significant number of countries have used to conduct their monetary policy in fighting inflation. It has three main benefits: firstly, it is successful in reducing inflation and keeps it more stable [see Johnson (2002), Levin, Natalucci, and Piger (2004), and Vega and Winkelried (2005)], secondly, it decreases the real costs of disinflation [see Mishkin and Hebbel (2007), and Gonçalves and Salles (2008)]. Finally, it fixes the long-run inflation expectations at - or very close - to the inflation target.

In this paper we aim to investigate the main variables that affect the inflation rate in Vietnam as well as test whether this is the suitable

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<sup>1</sup>According to Batinis and Laxton, 2006 the Inflation Targeting (IT) is one of the frameworks for monetary policy aimed at attaining price stability. The Governments set the target inflation rate where the Central bank calculates the future route of inflation and then the forecasted rate is compared with the target rate. Monetary policy has to be adjusted based on the difference between the forecasted and the target inflation rate.

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time for Vietnam to adopt inflation targeting framework in curbing inflation.

This paper has 5 sections. The first one gives an overview of the study and the objectives of the study. The second one provides a literature review on key variables that affect inflation and Inflation Targeting; the third one presents the data and methodology adopted for the research; the fourth one gives the empirical findings about the main variables that affect the inflation rate in Vietnam and the possibility to adopt the inflation targeting framework. Finally the fifth one presents the conclusion remarks.

### **Literature review**

Several reasons are expected to cause inflation, for instance, increasing input materials and natural disaster from the supply side and both the stock market shocks and expansionary monetary policy from the demand side. A significant number of studies show that money growth and inflation have close relationship [e.g. Friedman (1956), Lucas (1980), Lothian (1985), Dwyer and Hafer (1988, 1999), McCandless and Weber (1995), Rolnick and Weber (1997), Moroney (2002) and Dwyer and Fisher (2009)]. Money growth can be changed by the central banks through their monetary policy tools. It means using monetary policy can control inflation of countries. However, to find an optimal monetary policy in fighting inflation is the challenge for all the policymakers in both developed and developing countries.

Lucas (1980) uses data of M1 growth and CPI inflation in the U.S. over the period 1955-1975 to extract low-frequency components from the

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two variables. He finds a long run positive correlation between money growth and inflation. [Dwyer and Hafer \(1988\)](#) examine how changes in the money supply's growth influence the economy in the long run. They use cross-sectional data for nominal income, real income, the level of price and money stock for 62 countries. They introduce evidence that in the long run, an increase in the growth of the money supply will increase the inflation. The positive correlation between money growth and inflation has been supported by the findings of [McCandless and Weber \(1995\)](#) and the work of [Pelipas \(2006\)](#) who examines this relationship by using the equilibrium corrections mechanism taken from real money demand functions in Belarus from 1992–2003. He shows that money supply growth influence inflation in Belarus in both long – and short –run.

Furthermore, [Rogers and Wang \(1995\)](#) study the source of output instability and inflation in Mexico. They report that in addition to the money growth, exchange shocks affect inflation. To test the relationship between exchange rate and inflation [Augustine et all, \(2004\)](#) use data from 82 countries for the period from 1973 to 1998. Their results indicate that the nominal exchange rate variability has a positive and strong effect on the variability of inflation.

[Devereux \(1989\)](#) suggests that the uncertainty of real output can have a positive effect on the average inflation rate. [Ahmed and Mortaza \(2005\)](#) use annual data of real GDP and CPI from 1980 to 2005 to investigate the relation between inflation and economic growth in Bangladesh by using The Error Correction Models (ECMs). They find a long- run negative relationship between inflation and economic growth.

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Hooker (2002) investigates the relationship between oil price and inflation in two sub periods, 1962 -1980 and 1981-2000. His result shows that in early period oil prices have considerable impact on inflation however not in the later period. Cunado et al. (2005) analyze the effect of oil price shock on both economic activity and consumer price index in six Asian countries (Japan, South Korea, Thailand, Singapore and Philippines). They find that the oil price has strong effect on both variables, although in the short run, its impact is limited.

The change in the interest rate has direct impact on saving and investment decisions of householders and firms. Higher interest rates will cause higher costs of working capital therefore increase the inflation rate. Using standard New Keynesian model of the business cycle, Ravenna and Walsh (2006) and Chowdhury et al. (2006) show that interest rates influence firm's marginal costs of production that will cause inflation. Based on the cost channel, Tillmann (2008) examines the correlation between interest rate and inflation. He documents that higher interest rates will lead to higher marginal cost and higher inflation. Basher and Elsamadisy (2012) investigate the determinants of inflation in the gulf area. They find money supply; interest rate and exchange rate are the main variables that influence the inflation in this area. Lim and Sek (2014), determine the variables that affect the inflation in two groups of countries (high inflation group and low inflation group). They find that GDP growth and imports of goods and services have the significant long run impact on inflation in low inflation countries, whereas money supply, national expenditure and GDP growth are the determinants of inflation in high inflation countries.

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A few studies investigate the determinants of inflation in Vietnam. [Thanh et al. \(2001\)](#) examine the relationship between CPI, money, exchange rate and real industrial output. Their findings suggest that the exchange rate had a considerable effect on inflation. [Camen \(2005\)](#) found the main factors that affect the inflation rate in Vietnam are commodity price, the exchange rate, and total credit to the economy. [Goujon \(2006\)](#) and [Vinh and Fujita \(2007\)](#) found that the change of exchange rate and excess money can explain inflation. [Hang and Thanh \(2010\)](#) found inflation inertia is one of the key determinants of current inflation in Vietnam. Beside in the short run the cumulative budget deficit is not a vital factor in inflation determination while exchange rate passes – through is showed to be remarkable.

In the opposite of the other studies conducted on Vietnam, [Hang and Thanh \(2010\)](#) find a significant role of the exchange rate in increasing inflationary pressures. They justify their contrary results by arguing that the earlier studies used data from periods when the exchange rate was mostly kept rigid, whereas they used data from 2008 to 2011, when the exchange rate was more volatile. [Nguyen, Cavoli and Wilson \(2012\)](#) conclude that the money supply, oil prices, and rice prices have strong influence on inflation in Vietnam.

To find an optimal monetary policy in curbing inflation is not only the important task but also the challenge for all the policymakers in both developed and developing countries. In recent years, one of the effective frameworks that a lot of countries have used for conducting their monetary policy in fighting inflation is inflation targeting. There are a considerable number of studies argue that adopting IT regime can be effective in

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controlling inflation. For example, [Lin and Ye \(2009\)](#) find that countries that adopt the Inflation-Targeting regime achieve lower inflation rates and volatility compared to countries that do not apply the inflation targeting.

[Brimmer \(2002\)](#) shows that the inflation targeting brings down actual inflation because people believe more in the commitment of government in fighting inflation if it has a target. This argument has been supported by [Siregar, and Siwei \(2010\)](#) who finds that inflation rates in Thailand and Indonesia have fallen during the post – IT period.

This study will add to the literature by exploring the key determinants of inflation in Vietnam for a longer time compared with the current literature. This piece of work utilizes comprehensive explanatory variables set including: past inflation, real income, money supply, exchange rate, interest rate and world oil price. This study uses Cointegration and Vector Error Correction Models to investigate the relationship among inflation and the above variables. This paper is the first to apply the methodological frame work of [Lissovolik \(2003\)](#) in Vietnam as a small open and transition economy.

## **DATA AND METHODOLOGY**

### **Data**

In this paper we used monthly data from 2000 to 2011, All variables are collected from Bloomberg, General Statistic Office (GSO), State Bank of Vietnam, International Monetary Fund, the variables are defined as follows:

***Consumer Price Index (CPI):*** Vietnam uses CPI as index to calculate inflation rate. The Basket of commodities that Vietnam has used to analyze CPI included 429 primary commodities divided into 10 categories

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of goods and services. The General Statistic Office of Vietnam announces inflation data after analyzing CPI. The data we used for this model is monthly data that collected from the GSO, and rebased on 2000.

***Real Income:*** is the only monthly economic activity reported in Vietnam, therefore in this study we will use this variable as a proxy for real income. The data collected monthly from Bloomberg and GSO.

***Exchange rate:*** The official exchange rate is used as a proxy, and it is collected from Bloomberg as the updated monthly nominal effective exchange rate is not available.

***Money supply:*** Monthly data for M2 obtained from IMF and SBV.

***World market price:*** world oil price used as the proxy of world market price. Data are collected from Bloomberg and measured in USD/barrel.

***Interest rate:*** is the monthly lending rate. in Vietnam which is the interest rate on credits from banks to prime borrowers, i.e. to the lowest risk borrowers in the private sector. That includes firms and households. This variable has been collected from Bloomberg.

### **Model specification**

Vietnam is a small open and transition economy therefore the model that will be used to in this paper is based on the work of Lissovlik (2003). At any period, the country's level price (often measured by the consumer price index-CPI) is a weighted average of the price of tradable (can traded with foreign countries) and non- tradable goods (only sell in domestic).

$$\text{Ln}P_t = \alpha_1 \text{Ln}P_t^T + (1 - \alpha_1) \text{Ln}P_t^N \quad (1)$$

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Where:

$LnP_t$  is the overall price level at time t,  $LnP^T_t$  is the tradable price at time t,  $LnP^N_t$  is the non-tradable price,  $\alpha_1$  is the density of tradable goods in total expenditure.

The price of tradable goods in a small open economy is determined by the world market ( $LnP^f_t$ ) at time t and exchange rate ( $LnE_t$  at time t. Both an increase (i.e., depreciation) in the exchange rate and foreign prices will lead to rise in the price of domestic, therefore,

$$LnP^T_t = LnP^f_t + LnE_t \quad (2)$$

The prices of non-tradable goods depend on the money market in domestic assuming that the demand of non-tradable goods has the same trend as the aggregate demand of the economy. Therefore, the prices of non-tradable goods are determined by the equilibrium condition of money market, when money supply  $Ln(M_t^S)$  equal to the real money demand ( $Ln \frac{M^D_t}{P_t}$ ).

$$LnP^N_t = \gamma( Ln(M_t^S) - Ln \frac{M^D_t}{P_t} ) \quad (3)$$

Where  $\gamma$  represents the relation between aggregate demand and demand of non-tradable goods.

Based on the economic theory, the money demand is specified by real income (Y), interest rate (R) and changes in expected inflation. Therefore, the demand of money at time t is defined as followed

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$$\text{Ln} \frac{M_t^D}{P_t} = \beta_0 + \beta_1 \text{Ln} Y_t + \beta_2 r_t + \beta_3 \text{Ln} P_{t-1} \quad (4)$$

Alternative equation 4 and 3, we have

$$\text{Ln} P_t^N = \gamma ( \text{Ln} M_t^S - ( \beta_0 + \beta_1 \text{Ln} Y_t + \beta_2 r_t + \beta_3 \text{Ln} P_{t-1} ) ) \quad (5)$$

Finally, alternatively equation 2 and 5 to equation 1, we have:

$$P_t = f( \Delta P_t^f, \Delta E_t, \Delta M_t^S, \Delta Y_t, r_t, \Delta P_{t-1} ) \quad (6)$$

From this equation, we can see that the overall price level at time (t) depends on the price of world market, exchange rate, money supply, real income, interest rate at time (t) and overall price level at time (t-1).

This study uses the Vector Error Correction Model (VECM) to explore the relationship between real income, exchange rate, money supply, world market price (oil price), and interest rate. The Dickey Fuller test is used to check for the stationary of the variables, Johansen integration test for finding the long run relationships between these variables. Therefore, we estimate the model as followed:

$$\begin{aligned} \Delta \text{Ln} P_t = & \alpha_{11} + \beta_{12} \Delta \text{Ln} P_{t-1} + \beta_{13} \Delta \text{Ln} Y_{t-1} + \beta_{14} \Delta \text{Ln} E_{t-1} + \beta_{15} \Delta \text{Ln} M_{t-1} + \beta_{16} \Delta \text{Ln} WP - Oil_{t-1} \\ & + \beta_{17} \Delta R_{t-1} + \varepsilon_{11} ECM_{t-1} \end{aligned} \quad (7)$$

Where:  $\Delta \text{Ln} P_t = \text{Ln} P_t - \text{Ln} P_{t-1}$ , and  $\Delta \text{Ln} P_t$  is inflation at time (t) ,

$\Delta \text{Ln} P_{t-1}$  is the inflation at time (t-1) ( $\Delta \text{Ln} P_{t-1} = \text{Ln} P_{t-1} - \text{Ln} P_{t-2}$ )

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$\Delta \ln Y_{t-1}$  is the change of real income (industrial output) at time (t-1) (

$$\Delta \ln Y_{t-1} = \ln Y_{t-1} - \ln Y_{t-2})$$

$\Delta \ln E_{t-1}$  is the change of exchange rate at time (t-1), ( $\Delta \ln E_{t-1} = \ln E_{t-1} - \ln E_{t-2}$ )

$\Delta \ln M2_{t-1}$  is the change of money supply at time (t-1), ( $\Delta \ln M2_{t-1} = \ln M2_{t-1} - \ln M2_{t-2}$ )

$\Delta \ln WP_{Oil_{t-1}}$  is the change of world oil price at time (t-1), ( $\Delta \ln WP_{Oil_{t-1}} = \ln WP_{oil_{t-1}} - \ln WP_{oil_{t-2}}$ )

$\Delta R_{t-1}$  is the change of interest rate at time (t-1), ( $\Delta R_{t-1} = R_{t-1} - R_{t-2}$ )

### **Inflation targeting framework Conditions**

Zelmer al. (2002) highlight that, four main conditions that a country need to satisfy if it wants to adopt inflation targeting (IT) framework, as follow:

- The central banks have enough power to consider the a major object of monetary policy and is freely accountable for achieving this objective;
- The key objective is to maintain the stale of inflation and not to be subordinated to other objectives;
- The financial system is developed and stable enough to implement the IT framework;
- The central bank has adequate policy instruments to be able to influence inflation.

To find whether this is the suitable time for Vietnam to adopt the Inflation Targeting framework (IT), we will outline the financial system, especially banking system in Vietnam and compare with four necessary

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conditions and the categories of technical requirements above to see if this is the suitable time for Vietnam adopt IT framework or not.

## EMPIRICAL FINDINGS

### Unit root test

Firstly, we check the data series of all variables to see whether they are stationary or not. All the input data are in the log level except lending rate.

We use the Augmented Dickey-Fuller (ADF) test for the unit root test.

#### **Table 1: Augmented Dickey Fuller (ADF) unit root tests**

This Table presents unit root tests for all variables during the period 200-2011. (CPI) denotes the capital price index, (Y) is the real income, (E) denotes the exchange rate, (M2) denote money supply (WP\_OIL) denotes the oil price, and finally (R) denotes the interest rate. The Augmented Dickey Fuller that the series,  $y$ , follows an AR (p) process as given by,

$$\Delta \ln y_t = \alpha_0 + \alpha_1 t + \alpha_2 \ln y_{t-1} + \sum_{i=2}^p \beta \Delta \ln y_{t-i} + u_t \text{ where } \text{sufficient}$$

lags are added to ensure that the residual,  $u_t$  are white noise. The null hypothesis is  $H_0$ : the time series contain a unit root. Asterisks denote significant test statistics that reject the null hypothesis, (\*, \*\*, \*\*\*) denote a coefficient that is significant at 1%, 5% and 10% levels respectively. The numbers of lags that ensure white noise residuals are determined by the Schwarz (SIC) information criterion. These are given in parentheses beside the t- statistic. The models in levels are estimated with and without trend.

<b>Variables</b>	<b>Pro. At level</b>	<b>Pro. At 1<sup>st</sup> difference</b>
CPI	0.9999	0.0000(0)*
Y	0.5759	0.0001(10)*
E	0.9979	0.0001(2)*
M2	0.9873	0.0000(1)*
WP_OIL	0.7320	0.0000(0)*
R	0.0200**	0.0000(4)*

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Tables 1 shows that except for the interest rate all other variables are non-stationary at the level, however after taking the first difference they become stationary.

### **Cointegration test:**

The first stage of our analysis consists of performing the cointegration tests advocated by Johansen (1990), which are based upon a reduced rank regression technique (equivalent to Full Information Maximum Likelihood) applied to a VECM model<sup>1</sup>. In particular, when testing for cointegrating rank, we use the Johansen  $\lambda_{trace}$  statistics.<sup>2</sup> Cheung and Lai (1993) show that, the trace test is more robust to both skewness and excess kurtosis in the residuals than the maximum eigenvalues test. Furthermore, Rahbek et al. (2002), and Juselius (2006) have shown that the cointegration rank trace test is robust against moderate residual ARCH effects.

Lissovolik (2003) show that there are two transmission channels of inflation: the purchasing power parity (PPP) channel and aggregate demand channel. For testing the cointegration in PPP channel, we use CPI, nominal exchange rate VND/USD and the world oil price.

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<sup>1</sup> The lag length of the VECM has been selected using SBC criteria,  $\log|\hat{\Sigma}| + \frac{k'}{T}\log(T)$ , where  $\hat{\Sigma}$  is the variance-covariance matrix of residuals,  $T$  is the number of observations, and  $k'$  is the total number of regressors in all equations.

<sup>2</sup> In line with Reimers (1992) we correct for a small sample bias, by using a scaling factor equal to  $(T - nk)$  instead of  $T$  (with  $T$ ,  $n$  and  $k$  being the number of time series observations, the number of endogenous variables, and the number of lags used in the VECM).

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**Table (2): Multivariate Cointegration For CPI, nominal exchange rate, and world oil price**

This table shows  $\lambda_{trace}$  results for 3 cointegrating relationships among CPI, nominal exchange rate, and world oil price. \*, \*\*, \*\*\* indicate Significance at 1%, 5% and 10% levels respectively

Ho	H1	Statistics
$r = 0$	$r > 0$	50.41*
$r \leq 1$	$r > 1$	19.23*
$r \leq 2$	$r > 2$	9.24*

The results in table 2 show that in PPP there are relation between CPI, nominal exchange rate VND/USD and the world oil price in the long run. In other words for the aggregate demand, we use CPI, real income (Y), interest rate (R) and money supply (M2). Table 3 shows shows  $\lambda$  trace results for cointegrating relationship among CPI, nominal exchange rate, and world oil price

**Table (3): Multivariate cointegration  $\lambda_{trace}$  results For CPI, real income, interest rate, and money supply**

Table 3 shows 1 cointegrating relationship among CPI, nominal exchange rate, and world oil price. \*, \*\*, \*\*\* indicate Significance at 1%, 5% and 10% levels respectively

Ho	H1	Statistics
$r = 0$	$r > 0$	47.85**
$r \leq 1$	$r > 1$	29.79
$r \leq 2$	$r > 2$	15.49
$r \leq 3$	$r > 3$	3.84

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The results of this test in table 3 also suggest that there is long run relationship among CPI and real income (Y), interest rate (R) and money supply (M2).

### **Vector Error Correction Model (VECM)**

The objective of this study is to find the key variables that have impact on determinant inflation in Vietnam using VECM model as illustrated in equation 7, the explanatory variables and their estimated coefficient values of the sample as follows:

**Table 4: Vector Error Correction Model (VECM)**

$$\Delta \text{Ln}P_t = \alpha_{11} + \beta_{12} \Delta \text{Ln}P_{t-1} + \beta_{13} \Delta \text{Ln}Y_{t-1} + \beta_{14} \Delta \text{Ln}E_{t-1} + \beta_{15} \Delta \text{Ln}M2_{t-1} + \beta_{16} \Delta \text{Ln}WP\_Oil_{t-1} + \beta_{17} \Delta R_{t-1} + \varepsilon_{11} ECM_{t-1}$$

Where:  $\Delta \text{Ln}P_t$  is inflation at time (t) ,  $\Delta \text{Ln}P_{t-1}$  is the inflation at time (t-1) ,  $\Delta \text{Ln}Y_{t-1}$  is the change of real income (industrial output) at time (t-1) ,  $\Delta \text{Ln}E_{t-1}$  is the change of exchange rate at time (t-1),  $\Delta \text{Ln}M2_{t-1}$  is the change of money supply at time (t-1),  $\Delta \text{Ln}WP\_Oil_{t-1}$  is the change of world oil price at time (t-1),  $\Delta R_{t-1}$  is the change of interest rate at time (t-1) \*, \*\*, \*\* indicate Significance at 1%, 5% and 10% levels respectively

<b>Variables</b>	<b>Coefficient Values</b>
$\Delta \text{Ln}CPI_{t-1}$	0.617*
$\Delta \text{Ln}Y_{t-1}$	-0.010*
$\Delta \text{Ln}E_{t-1}$	0.195**
$\Delta \text{Ln}M2_{t-1}$	0.003
$\Delta \text{LWP\_oil}_{t-1}$	0.009
$\Delta R_{t-1}$	-0.0006

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Table (4) shows that the past inflation level has positive and significant effect on current inflation level, which means that in the short run, past inflation is the key variable to explain the current inflation in Vietnam. This implies that there is the strong inertia inflation in Vietnam. In other words, the role of the public's memory and expectation on inflation play important role in determining the current inflation. Therefore, the role of credibility of government's policy toward inflation is considerable. This result is consistent with the result of other previous studies in Vietnam [see [Camen \(2005\)](#), [Goujon \(2006\)](#) [Thanh et al \(2010\)](#)].

Findings in table (4) suggest a significant negative short run relationship between the real income and the inflation. However the coefficient is very small which mean that the inflation fluctuates slightly with the change of real income. In other words, faster real income will lead to the decrease of the pressure on inflation.

Although a significant part of the literature argue that exchange rate plays small or insignificant impact on inflation in Vietnam, our results indicate to a significant positive relationship. This controversial result can be explained by the change in the exchange rate regime after. The data of exchange rate that the previous researches used are in the period when the exchange rate was mostly kept rigid. However, from late 2008, the exchange rate has been devaluated more frequently and with larger scale. Besides, there is a significant fluctuation in the black market in Vietnam. The gap between the official exchange rate and the rate in black market sometimes rather big, therefore speculations appear. Moreover, the

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dollarization has increased because of decline trust in Vietnam dong. All reasons have raised public expectation on returning inflation.

On the other hand, At 5% level of significance, money supply and interest rate of Vietnam from 2000-2011 are insignificant in explaining inflation. This implies that it does not play role in explanation inflation in Vietnam in short term. Moreover, the positive relation between world oil price and inflation is not statistically significant. This implies that inflation is driven by domestic issues rather than international. This result is consistent with the findings of past research that world oil price does not have significant influence on inflation in Vietnam.

Disturbances that show the long run relation of PPP (measured by the Error correction term-ECM) and the money demand relation are statistically insignificant different from zero. This implies inflation in Vietnam does not depend on the adjustment of the money market and the foreign exchange market. Therefore once inflation start to increase, it is difficult to control the inflation.

To summarize, the variables that influence on the inflation in Vietnam are, past inflation and exchange rate are the key determinants of inflation in Vietnam in which past inflation is the most important variable. Real income does play role in explaining inflation in Vietnam however its role is minor and the increase of real income will reduce the pressure on inflation. Other explanatory variables such as money supply, the world oil price and interest rate, in short term and at 5% level of significant are not relevant in explaining inflation in Vietnam.

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### **Ability to adopt Inflation Targeting framework in Vietnam**

Based on [Zelmer al. \(2002\)](#), four main conditions that mentioned above are needed if a country wants to adopt inflation targeting (IT) framework. According to IMF (2006), countries who want to adopt IT need some prerequisites technical requirements such as the analytical capabilities and infrastructure as well as the banking and capital market need to be well developed. The economic structure of countries is not overly sensitive to commodity prices and exchange rate, and the dollarization of the countries is minimal.

According to the financial as well as to the banking system in Vietnam, currently, it is not the suitable time for Vietnam to adopt the IT framework because of many reasons, for instance, firstly, the financial markets in Vietnam are small and not well developed (it is not satisfied the condition about the banking and financial system that IMF, 2006 suggest for countries who want to adopt IT). Moreover, according to the finding on the determinant factors in Vietnam, at level of 5%, interest rate is insignificant to explain the inflation in Vietnam. The transparency in banking system is still small. Only senior authorities know the accountability and report of the SBV thus its decisions are not transparent and publicized to the public and market. Secondly, currently, the National Assembly of Vietnam set the annual inflation target, however this target is not the main concern of the Government in comparing with other development objectives such as rapid and sustainable growth. Among three objectives, growth, employment and inflation target, the inflation target is the least concern of the senior authorities. Although the Government believes that it is necessary to control the inflation in order to achieve sustainable growth, they are still unlikely to give up growth

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objective or employment objective to fulfill the inflation target. Thirdly, the monetary policy in Vietnam is a part of the five -year Social and Economic development which set up by the Government. The inflation rate is decided by the National Assembly. The SBV is defined as a ministerial agency of the Government. Legally, the National Assembly shows an important role in the process of the monetary decision. Not only set the policy objectives, it monitors the monetary policy's implementation as well. The strong participation of the Government and the National Assembly in the conducting of monetary policy suggests that the SBV does not have enough independence in implementing the monetary policy.

### **Conclusions**

Our findings from the estimation of our model show past inflation, exchange rate and real income are statistically significant in explain inflation in Vietnam. Past inflation is the most important determinant of current inflation in Vietnam. The exchange rate pass –through is found to have a remarkable influence on inflation in the short run, a deduction in exchange rate will lead to higher prices. Real income has a negative relationship with inflation and show small impact on inflation. The other explanatory variables in the model, money supply, interest rate and world oil price have insignificant relationship with the inflation in the short run. In other words, these three variables do not explain the inflation in Vietnam in the observation period. The speed of adjustment of foreign exchange market and the money market is very low therefore once inflation starts to increase; it is difficult to control the inflation.

Although the government's usually argue that inflation in Vietnam is mostly imported, however, from our findings we can see that inflation in

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Vietnam from 2000-2011 is mainly an internal problem. World oil price does not have an impact on inflation in Vietnam in short run while the public's memory and expectation on inflation plays the most important role on inflation. Besides, some monetary tools such as money supply and interest rate are not quick response to inflation. Therefore, commitments of Vietnamese government on controlling inflation are not only when it is high, but also keeping it low when it low.

From comparing the current situation of financial and banking systems in Vietnam with the main conditions that is specified by IMF, we suggest that this is not suitable time for Vietnam to adopt Inflation Targeting framework (IT) thus it does not meet the requirement of the Inflation Targeting framework (IT).

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