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# THE DETERMINANTS OF EXPECTED INFLATION IN VIETNAM

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## Abstract

The article focuses on the factors which can affect the expected inflation rate in Vietnam. The paper reviews the theories and related studies to find out the six main factors that impact the expected inflation in Vietnam: historical inflation, volume gap, effective exchange rate, interest rate, oil prices and the price of rice. The model (VAR model) is built to find out whether six factors influence the expected inflation.

*Keywords: expected inflation, inflation, interest rates, macroeconomic policies.*

## 1 INTRODUCTION

As reported by the World Bank (2013), inflation is a very serious problem of Vietnam's economy, controlling the inflation is the top priority task in comparison with other macroeconomic targets. In the crisis period, the solutions of the government in order to control inflation are less effective and cause some consequences on the economic development. In general, when the inflation rises in Vietnam, the given solutions mostly focus on monetary tightening without considerations of other important factors. As the tight monetary policy is a short-term solution and there is not fully to solve in the long term; this made inflation become more and more serious in Vietnam. Therefore, the study finds out the factors that have the influence on the inflation in order to make the overall solution. Patra and Partha Ray (2010) demonstrate that among the factors affecting inflation such as historical inflation is an important one. There have been many domestic and foreign researches about inflation (Camen, 2006; Nguyen and Nguyen, 2010). However, these authors have not considered the determinants of inflation by using the quantitative methods.

There are many studies from developed economies in the UK, U.S, Germany, Brazil, India which investigate the importance of expected inflation in predicting and controlling inflation (Patra and Ray, 2010). But there are not any studies in Vietnam about this issue. In addition, the finding will be very helpful in implementing the macroeconomic policies. Therefore, the main objective of this paper is to identify the determinants that impact the expected inflation in the Vietnamese context.

## 2 LITERATURE REVIEWS

In the current studies, the theories are normally applied: the theory of wages, consumption and unemployment rate by Keynes (1936). Meanwhile, research by Friedman (1968) not only introduced two types of Philips curve but also opens up a macroeconomic aspect of "prospect theory," that is the people's expectations of future economic events that may affect economic outcomes. Along with Friedman, Phelps (1967) has modified and adjusted Philip curve and taken expected inflation into consideration. Initially, the expectation is assumed to be oriented to the past (backward-looking), the objects make economic expectations when observed equilibrium inflation in the past. Woodford (2003) and many other researchers have made assumptions about the future expectations (forward-looking). This theory states that people can predict future inflation based on many different variables from the historical information available and the credibility of central banks. New Keynesians sought to combine the two assumptions: expectations towards the past and the future while proposing Hybrid New Keynesian Philips Curve model. Clarida (1999) developed a structural model using quarterly data to analyze a rate of companies using past behavior to set prices. Also, Clarida said that the

public, including those who are forward-looking and those who are backward-looking and the coefficients from which the authors test the dominant behavior. As a result, the forward-looking behavior dominates the backward-looking through empirical evidence. In this study, the authors also examined the cross-correlation between three factors: inflation, output gaps and labor income (a representative for the marginal cost). The estimation results show that unit labor costs dominates the output gaps when estimated by the new Philips curve. Output gap led to inflation rather than vice versa. Besides, they also showed that unit labor costs have a strong correlation with inflation. Ranyard (2008) have outlined mechanisms and factors leading to the formation of expected inflation, suggesting that inflation is formed under the influence of perceptions and attitudes about inflation from economics of the professional, the Government's policy announcements, the Central Bank speeches, the amplification of social media and word of mouth. Also, the perception of inflation impacted directly from the fluctuations of prices and income. The factors above not only impact the future expectations but these factors also affected by expectations in the past that is stored in the current period. Windram (2007) suggested that the impact of social factors - economic and cognitive impact of cognitive expectations, certain latency (latency of it) when the economy has signaled to fall, it may take for changes in inflation. The speed may vary depending on: the length of the shock, the response of the central bank policy and how to create expected inflation. Thus, from this idea, the central bank should react and implement drastic measures, effective immediately when the shocks occur to stabilize market sentiment to keep long-term expected inflation stable. There is such a drag on the inflation target will be more easily and quickly. Cerisola research and Gelos (2005) focused on testing the factors affecting expected inflation in Brazil, based on a survey of the private sector and market survey data of the Bank of Brazil. The study used regression models to test the 6 factors affecting expected inflation in Brazil include: Lagging inflation, inflation target; real effective exchange rate gap; real wage gap, interest rate; primary surplus. In addition, the study results also indicated that the level of impact of these factors on expected inflation change over time. This research has pointed out the difficulties in controlling inflation and anchor inflationary expectations when it comes to the impact of administering prices. These items are included management of some public services, such as price using gas prices, electricity prices, the price of public transport services, ... The regulation of commodity prices may be due to the private companies or are set directly by the government. Research by Patra and Ray (2010) aims to build quantitative models to calculate expected inflation and testing factors affecting expected inflation in India. The author uses the ARIMA model to calculate the expected inflation in India and used VAR models to test the 6 factors affecting expected inflation in India: past inflation, output gap, spending government consumption, real effective exchange rate, real interest rates, prices of basic commodities, the price of fuel. From these studies, the authors apply this model to study the existing practices in Vietnam, namely model using autoregressive moving average - ARIMA to simulate sequence number expected inflation from past inflation data, based on the factors affecting expected inflation are: past inflation, output gaps, real effective exchange rate, real interest rates, oil price and rice price. These factors have been used and tested in the study of Cerisola and Gelos (2005) and Patra and Ray (2010), eliminating government spending by a negligible impact on expected inflation. Besides, the authors used a model vector autoregression - VAR to test the factors affecting expected inflation. In this analysis, the impulse response functions and variance decomposition results in expected inflation would help clarify the timing and extent of the impact of these factors on expected inflation.

### 3 METHODOLOGY

#### 3.1 Research Model

This article uses two main research models: ARIMA model to determine the sequence of expected inflation in Vietnam and VAR model to test factors affecting expected inflation in Vietnam between 2000 - 2010. ARIMA model is a univariate model using time series data; the model considered the historical values of the variable  $Y_{t-1}$  to clarify some of the relationships between the values  $Y_{t-1}$ , Estimated value of  $Y_{t-1}$  in the future. This model does not need changes or a relationship complicated structure, so it is pretty simple, but there are also certain disadvantages such as: (i) not supported by the theoretical basis or a relationship basic system; (ii) ARIMA model cannot generate a result in long-term quality. However, ARIMA has been proven to generate short-term inflation forecasted reliable and showed better performance compared with other quantitative models, and it has been used in many research articles as in previous studies of Patra and Partha Ray (2010).

In this paper, the model vector autoregression - VAR is selected to conduct the factors affecting expected inflation in Vietnam. The application of VAR model of Sims (2009) has the following advantages : (i) Sims said that if relationships exist between the variables and the variables which must be considered for the same role, so it is unreality to have a complete variable which does not affect the other variables, taking into account all the variables are endogenous variables and do not need to identify endogenous and exogenous variables; (ii) the method of Sims shows ability to decompose unexpected changes in macroeconomic variables from the expected volatility was aimed at analyzing the impact of policy under sudden shocks , no are contemplated; (iii) the method of Sims also helps economists estimating the degree and response time of a particular economy to various shocks through each impulse response functions and variance decomposition . This is called "shock view" in VAR. This view points out that unless the structure changes suddenly, the value of the endogenous variables can be expected. Therefore, VAR observations focused sudden changes in  $Y(t)$  caused by the shock. Because of these advantages that this research has used VAR model to test factors affecting expected inflation in Vietnam as many previous studies did before. Among the factors affecting expected inflation in Vietnam, article 6 selected and tested the main factors affecting expected inflation in Vietnam, these factors have been used in the research of Patra and Partha Ray (2010). Besides, during the commissioning of the Vietnam sequence data, the results document that the sequence data are taken into account in the original step, the ideal conditions to use VAR models. In addition, expected inflation sequences generated from ARIMA model is also consistent with the actual string inflation in Vietnam.

#### 3.2 Research Data

The data in the article are collected and calculated from reputable sources such as the World Bank, IFS (Organization International Financial Statistics of the IMF), GSO VN (GSO), the report of the State Bank of Vietnam.

- Historical inflation (%) (Source: General Statistics Office of Vietnam): Inflation in the past to assess the persistence or inertia of the price changes as well as looking to the historical behavior of the people of Vietnam (backward-looking). In this study, inflation is calculated quarterly based on collected CPI; CPI quarterly data series is calculated from the monthly CPI data series by the General Statistics Office of Vietnam announced.

- Output gap (%) (Source: IMF, ADB): Output gap is defined as the difference between actual output and potential output, output gaps show the pressure aggregate demand. Data sequence data using quarterly real GDP in Vietnam after adjusting to seasonal factors and using Hodrick

- Prescott filter (HP) to create potential GDP chain (potential GDP). Output gap in all variables will be measured by:  $\text{Output gap} = (\text{real GDP} - \text{potential GDP}) / \text{potential GDP}$ .

- The real interest rate (%) (source: IMF): The real interest rate represents the impact of monetary policy; the real interest rate is calculated as follows:  $\text{real interest rate} = \text{nominal interest rate} - \text{inflation}$ . Interest in the study was calculated on a quarterly basis. Quarterly nominal interest rate is calculated by the average nominal interest rate of 3-month interest rate futures.

- Real effective exchange rate (source: Datastream): To represent the marginal cost, get the data changes the effective rate (REER). REER variable is the degree of variation of the real value of the domestic currency compared to the base year, while the share price target for a year (t), this index is calculated based on a base year (base), nominal exchange rate, CPI, the proportion of commercial trading partners. The date is quarterly.

- The price of oil: the history of quarterly data from the website of the Vietnamese government.

- The price of rice: is from the website of statistic department of the Vietnamese government with quarterly data.

$e_{base}^i$ : The VND and currency in this country basis

$e_t^i$ : The VND and currency country i year t

$CPI_t^i$ : Price index of trading partner i year t.

$CPI_t^{VN}$ : Price Index in Vietnam in t.

$W_t^i$ : Proportion of commercial trading partner in t i.

- Oil prices (source: [www.eia.gov](http://www.eia.gov))

- Rice prices (source: IFS)

## 4 CONCLUSION

The expected results show that the model can be used autoregressive moving average - ARIMA to simulate sequences strings expected inflation from historical inflation. Based on the analysis results VAR model, the impulse response model and the results of variance decomposition of expected inflation, the results can indicate which is the most powerful factor in expected inflation. Then inflation and oil prices may be factors which influence expected inflation. The real effective exchange rate may affect expected inflation, the remaining elements include the real interest rate and the price of rice. Furthermore, the factors as the historical inflation, output gaps, real effective exchange rate, real interest rates and oil price shocks may impact the expected inflation. Additionally, the expected inflation is quite sensitive to the news of the price of petrol prices - oil. This plays an important role in regulating macroeconomic government, in which the government should consider adjusting the price of basic commodities (oil prices) carefully and have an appropriate route to avoid causing shocks to the market and make changes in expected inflation. Furthermore, an increase in interest rates may cause unwanted effects on expected inflation. This is because the interest rate mechanism operating in Vietnam has not been uniform, corporate credit structure, the proportion of high and variable interest rates are very important for economic subjects, especially to increase costs for businesses, impact the target of economic growth. So the government should be cautious when using this tool in macroeconomic governance. The study results also imply that the control of expected inflation plays a significant role in the formulation of macroeconomic governance. All factors can be

employed to test their influence on the expected inflation rate to become the references for the government.

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