A MULTINOMIAL LOGIT MODEL AND THE DIRECTION OF MONETARY POLICY IN VIETNAM

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ABSTRACT

Using both monthly and quarterly data of Vietnam over the period 2000-2008, this study attempted to investigate the effects of several regressor variables (namely the output gap, inflation gap, exchange rate and the ratio of trade balance over nominal GDP) on the choice of the State Bank of Vietnam between discrete alternatives (i.e., to raise, to cut or to keep interest rates unchanged). The logit estimation results clearly show the relationship between the output gap and inflation gap and the directional change of interest rates while the other two regressor variables including exchange rate and ratio of trade balance over nominal GDP could not explain the fluctuation of interest rates in Vietnam. These estimation results have been verified by comparing with the official statements of the Government, the State Bank of Vietnam and other monetary authority.

Key words: Multinomial Logit Model, Interest Rates, Monetary Policy.

Introduction

Monetary policy is referred to as either an expansionary policy or a contractionary policy. Traditionally an expansionary policy will be conducted to combat unemployment in a recession by lowering the interest rate. On the contrary, a contractionary policy will raise the interest rate to curb inflation. From another point of view, monetary policy is classified as to be accommodative, if the interest rate set by the central monetary authority is intended to stimulate economic growth; neutral, if it is intended neither to stimulate growth nor curb inflation; or tight if it is intended to reduce inflation. Thus, through raising, lowering or merely keeping the interest rate unchanged, the central bank can attain monetary policy's objectives which are generally oriented towards the economic growth and stability of the whole economy.

Taylor (1993) has suggested a simple rule (hereafter called the Taylor rule) by which the central bank adjusts the monetary policy instrument, namely the short-term interest rate according to the deviation of the inflation rate from its target (or inflation gap) and the deviation of the real output from its trend (or output gap). Chevapatrakul et al., (2001) claimed that the Taylor rule is an effective way of summarizing the behavior of the level of interest rates using the information set of the inflation gap and output gap. However, studying the behavior of the interest rate level only is not enough for a monetary policy decision maker. As mentioned above, investigating the directional change of interest rates is of equal importance because how the central bank affects the interest rate, namely "up", "down" or "no change" will ultimately affect the output, employment and inflation.

As stated in the Law of State Bank of Vietnam (SBV) in 1997, interest rates including refinancing rate and discount rate are the frequently used instrument of the SBV in conducting the national monetary policy. Refinancing interest rate is the interest rate determined by the SBV when granting guaranteed credit terms in order to provide short-term capital and payment facilities to commercial banks. On the other hand, discount interest rate is a form of refinancing interest rate set by the SBV when re-discounting commercial bills and other quasi-money valuable documents of commercial banks. These two kinds of interest rate have the characteristics of not being frequently changed, normally every four months or six months. In this study, the discount rate is conventionally chosen to be the response variable.

Multinomial Logit Model is a regression model which generalizes logistic regression by allowing more than two discrete outcomes. MLM is used to model the relationship between a polytomous response variable and a set of regressor variables. Depending on the characteristics of the response variable, MLM can be classified into two types: MLM with an ordered structured response variable and MLM with an unordered structured response variable (So and Kuhfeld (1995). The MLM is estimated by maximizing a likelihood function with respect to parameters. The maximum likelihood estimates of the parameters are defined as the set of parameter values which bring the largest value of the likelihood function evaluated from the whole observations of the sample.

Multinomial Logit Model has been used in applications in many fields of economics, especially in marketing. The common applications are to predict consumers' choice, for example what product or what brand the customer will choose. In the monetary field, the MLM was estimated to investigate the choice of exchange rate regime [Levy-Yeyati and Sturzenegger (2001)]. Chevapatrakul et al., (2001) also used the MLM to investigate how useful the information set (including inflation and output gap) is in the prediction of the directional change of interest rates in the United Kingdom over the period 1992-2001. In Vietnam, the applications of the MLM have been done mainly in studying social issues, for example the poverty impact of Vietnam's trade

liberalisation [Niimi et al., (2003)], travel mode choice for domestic tourists [Vo, V. Can, (2013)]. However, there are few studies using the MLM to explain the monetary issues in Vietnam. This empirical study is an attempt to fill this gap by estimating the MLM to investigate the relationship between several regressor variables (namely the output gap, inflation gap, exchange rate and the ratio of trade balance over nominal GDP) and the directional change of interest rates in Vietnam.

Objectives and Methodology

A key application of the Multinomial Logit Model is to determine the effects of regressor variables on a subject's choice between two or more discrete alternatives. In this study, the subject's choice implies the choice of the SBV in the conduct of monetary policy, and there are three discrete alternatives: to raise, to cut or to keep interest rates unchanged. As one of the popular instruments of the SBV, discount rate is chosen to be the response variable with the characteristics of not being frequently changed. To deal with the rarely changed interest rate, estimation of the Multinomial Logit Model (MLM) is often suggested to be done [Kazumi and Satoru (1989)].

The objective of this study is to investigate the effects of several regressor variables (namely the output gap, inflation gap, exchange rate and the ratio of trade balance over nominal GDP) on the choice of the SBV between discrete alternatives (namely raising, cutting or keeping the interest rate unchanged).

In order to attain the above objective, a Multinomial Logit Model with an unordered structured response variable (the SBV's choice relating to the interest rate) is set up and the maximum likelihood estimation method is used to estimate the relationship between such response variable and a set of regressor variables. Monthly data is used and the sample period is from 2000 to 2008. The total number of observations is 108. The discount rate is used in most cases (except one case the treasury bill rate is used).

First, the real output gap and inflation gap which were described as the "information set" by Chevapatrakul et al., (2001) are chosen as the regressors to explain the directional change of the interest rate. The industrial production (IP) is used as a proxy for the real output (real GDP) because the monthly real GDP data are not available. The real output gap and inflation gap reported here are the deviation of the real output and inflation from its trend values by using Hodrick-Prescott (HP) Filter. Furthermore, the real output is seasonally adjusted because seasonal effects are observed. *Second*, the exchange rate which characterizes the open economy is also added in the information set to investigate whether the exchange rate's movements can affect the SBV's policy actions relating to the interest rate. *Third*, based on the objectives of monetary policy of the SBV, another macro-economic variable, namely the ratio of trade balance over nominal GDP is chosen as another regressor. *Finally*, the logit estimation results are compared to the official statements of the Government, the SBV or any monetary authority to verify the estimation results.

Description of the Multinomial Logit Model

Supposed the response variable (interest rate) Y may take one of three categories 1 (no change in interest rate), 2 (a cut in interest rate), and 3 (a rise in interest rate).

Supposed there are several explanatory variables including X_1 (real output gap), X_2 (inflation gap), X_3 (exchange rate), X_4 (ratio of trade balance over nominal output) which vary across observations.

The multinomial logit model (Greene, 2008, Chapter 23.11) assumed that the probability of observing each category in Y is given by:

$$\Pr(y_i = j) = \frac{\exp(\beta_{0j} + \beta_{1j}x_{1i} + \beta_{2j}x_{2i} + \beta_{3j}x_{3i} + \beta_{4j}x_{4i})}{\sum_{k=1}^{3}\exp(\beta_{0k} + \beta_{1k}x_{1i} + \beta_{2k}x_{2i} + \beta_{3k}x_{3i} + \beta_{4k}x_{4i})} = P_{ij}$$

for j = 1, 2, 3. The parameters are not all identified unless a normalization is imposed (Green, 2008), thus, the parameters of the first choice category j=1 are normalized to be all zeros:

$$\beta_{0,1} = \beta_{1,1} = \beta_{2,1} = \beta_{3,1} = \beta_{4,1} = 0$$

Specifically, the probability of interest rate to be unchanged, cut and raised are respectively determined as follows (y_i = 1 is the reference category):

$$\Pr(y_i = 1) = \frac{1}{1 + \sum_{k=2}^{3}\exp(\beta_{0k} + \beta_{1k}x_{1i} + \beta_{2k}x_{2i} + \beta_{3k}x_{3i} + \beta_{4k}x_{4i})} = P_{i1}$$

$$\Pr(y_i = 2) = \frac{\exp(\beta_{02} + \beta_{12}x_{1i} + \beta_{22}x_{2i} + \beta_{32}x_{3i} + \beta_{42}x_{4i})}{1 + \sum_{k=2}^{3}\exp(\beta_{0k} + \beta_{1k}x_{1i} + \beta_{2k}x_{2i} + \beta_{3k}x_{3i} + \beta_{4k}x_{4i})} = P_{i2}$$

$$\Pr(y_i = 3) = \frac{\exp(\beta_{03} + \beta_{13}x_{1i} + \beta_{23}x_{2i} + \beta_{33}x_{3i} + \beta_{43}x_{4i})}{1 + \sum_{k=2}^{3} \exp(\beta_{0k} + \beta_{1k}x_{1i} + \beta_{2k}x_{2i} + \beta_{3k}x_{3i} + \beta_{4k}x_{4i})} = P_{i3}$$

The log likelihood function for the multinomial logit can be defined as follows:

$$l = (1 - d_{i2} - d_{i3}) \log(P_{i1}) + d_{i2} \log(P_{i2}) + d_{i3} \log(P_{i3})$$

where d_{ij} is a Dummy variable which takes the value "one" if observation *i* has chosen the alternative *j* (*j*=2 means interest rate cut, *j*=3 means interest rate rise) and "zero" otherwise.

The analytic derivatives for the multinomial logit were calculated together with the numerical ones and the results should be closed to each other.

Estimation of the parameters of this model by maximum likelihood method with the probabilities p_{ij} viewed as functions of the β_{0j} and β_{ij} parameters in the above equations. This numerical procedure has been done by using Eviews 6.

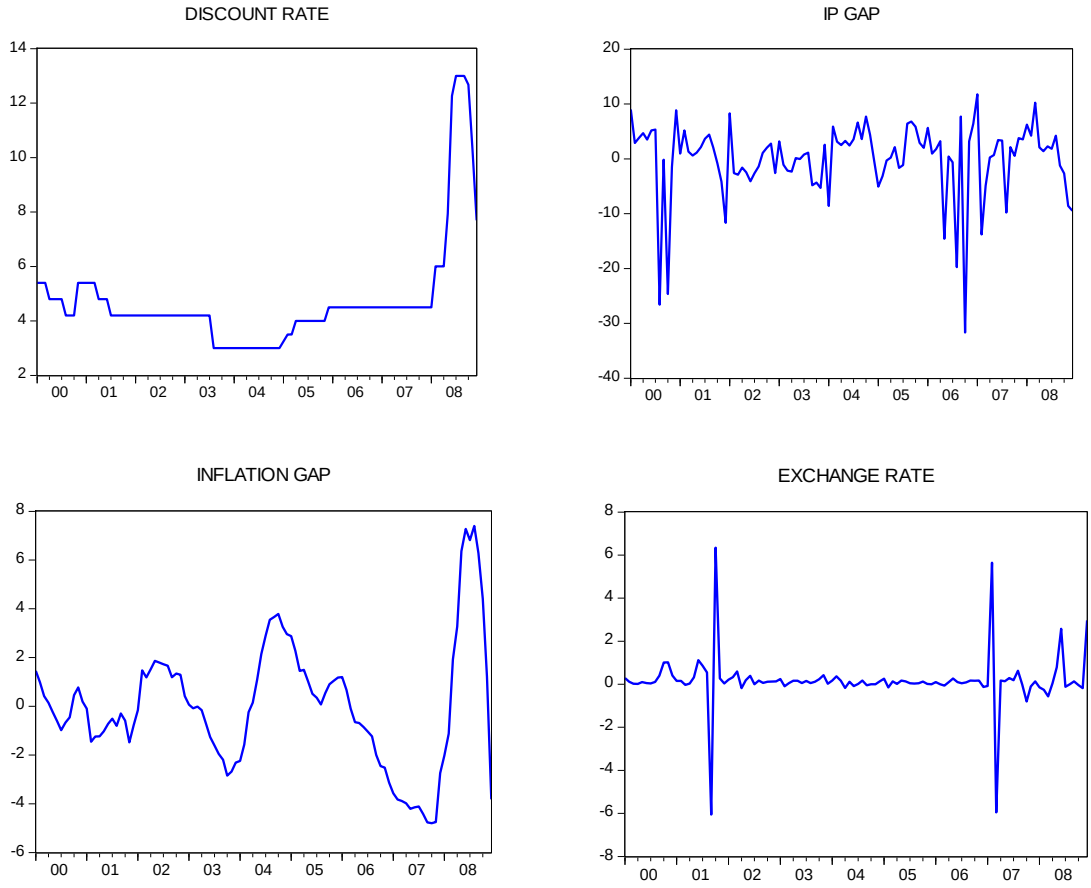
Data and Chosen Period

To evaluate how fluctuations in the real output gap, inflation gap and exchange rate affect the directional change of the interest rate, monthly data was used and the chosen period of this study was 2000-2008. However, monthly data of industrial production was used as a proxy for real GDP since the statistical data of real GDP in Vietnam are announced on a quarterly and semi-annual manner. Data of the discount rate was used in this model.

In case of adding ratio of trade balance as an explanatory variable, quarterly data was used in replace since monthly data of trade balance is not available. To deal with small sample size, the study period was extended to 1999-2008. Thus, discount rate was replaced with the treasury bill rate since discount rate was first introduced at the end of 1999. Real output gap and inflation gap reported here were the deviation of real output from its potential trend and of inflation from its target by using Hodrick-Prescott Filter. Inflation is determined to be the change of this month's Consumer Price Index (CPI) compared with the one of the same month of the previous year. Exchange rate was the monthly change (percentage) by taking the first difference of natural logarithms of the original data. Moreover, in order to remove possible effects of seasonal fluctuations, industrial production is first seasonally adjusted then transformed to the natural log.

Sources of Vietnam data are from IFS, Data stream, General Statistics Office of Vietnam and the SBV.

Figure 1: Monthly data series, seasonally adjusted, 2000-2008



Estimation Results

Response of Interest Rate to Changes in Real Output Gap and Inflation Gap

The two key macroeconomic variables, i.e., output and inflation were chosen as regressors to examine how the SBV executed the interest rate policy responsively to fluctuations of the output gap and inflation gap.

Table 1: Estimated Multinomial Logit Model with two regressors

Method: Maximum Likelihood (Marquardt) Sample: 2000m01 2008m12 (included 108 observations) Initial Values: b21= -2.64638, b22= -0.07027, b23= -0.00691, b31= -3.02118, b32= -0.03522, b33= 0.49507 Convergence achieved after 24 iterations.					
Relative odds of interest cut			Relative odds of interest raised		
Constant (b21)	Real output gap (b22)	Inflation gap (b23)	Constant (b31)	Real output gap (b32)	Inflation gap (b33)
-2.54** (0.41)	-0.073* (0.04)	0.046 (0.17)	-2.93** (0.52)	-0.045 (0.11)	0.498** (0.155)

* indicates statistical significance at the level of 10 percent, ** indicates 1 percent with estimated standard errors in parentheses.

Table 2: Comparison of numeric and analytic log-likelihood derivatives with two regressors

Coefficients	Sum over all observations		Maximum difference	
	Numeric derivatives	Analytic derivatives	Absolute value	Percent
b21	0.576332	0.576332	1.12E-08	2.78E-05
b22	-1.564188	-1.564188	-5.72E-07	0.005653
b23	1.523717	1.523718	-1.02E-06	0.005972
b31	0.494416	0.494416	-1.55E-08	0.000160
b32	-2.294988	-2.294987	-4.91E-07	0.028292
b33	0.834980	0.834980	8.98E-08	0.000702

The estimation results of Table 1 show that in case of discount rate cut, only the coefficients of constant (b21) and of real output gap (b22) are statistically significant. The sign of real output gap's coefficient is correct (negative) as expected while coefficient of inflation gap has the wrong sign. Normally, when the economy goes down (decline in real output), the probability of interest rate to be cut down tends to increase, and vice versa. Thus, b22 is expected to be negative since a negative relation between real output and the probability of interest rate to be cut down is observed. In the same way, when inflation goes up, the probability of interest rate to be cut down tends to decrease, and vice versa. Thus, b23 is expected to be negative since a negative relation between inflation and the probability of interest rate to be cut down is observed.

On the contrary, in case of discount rate rise, only the coefficients of constant (b31) and of inflation gap (b33) are statistically significant. Furthermore, only inflation gap's coefficient has correct sign (positive). Both b32 and b33 are expected to be positive since a positive relation between real output (or inflation) and the probability of interest rate to be raised is observed. If real output declines, the probability of interest rate to be raised tends to decrease while if inflation goes up, such probability tends to increase, and vice versa.

The above estimation results indicate two important directions of monetary policy practices in Vietnam. First, the SBV would reduce interest rate to stimulate economic growth if the economy went down, however no action would be done if the economy was growing. It is often argued in developed countries that raising interest rate is necessary to cool off the economy if it is growing too fast. However, "no action" response is conceivable for a developing country's central bank. Clarke (2003) argued that economic growth is desirable in developing countries since it is the best means to increase social wealth and welfare. And Vietnam is not an exception, the Government of Vietnam has been always specifying objective of annual economic growth and trying to achieve that. At present, Vietnam has become one of the fastest-growing economies in the world, however, there are still numerous issues to be solved to improve living standard (US$1,024 GDP per capita in 2008).

Second, interest rate would be raised if inflation went up but the SBV seemed not to reduce interest rate when inflation was under control. This can be explained by looking back the country's history. Vietnam went through 30 year-resistance war until the whole country's unification in 1975, and one of the long lasting war's aftermath was hyperinflation. Inflation escalated from 30-50 percent annually in early 1980s to 587.2 percent in 1985, peaked at 774.7 percent in 1986 and remained at three-digit level in 1987-1988. Although inflation was gradually put under control and except two years 2000-2001 with deflation, since 2004 inflation has going up. Ohno (2008) reckoned that during 2004-2007, Vietnam's inflation exceeded other neighbor-countries' inflation (except Indonesia due to serious political and economic problems) and Vietnam currently has the highest inflation among East Asian countries. That's why pressure of rising inflation always exists in Vietnam and has currently become hot issue of Vietnam economic press. "The key tasks of Vietnamese government are curbing inflation, maintaining macroeconomic development, and ensuring social welfare and sustainable growth, of which inflation reduction is put on top priority" said Prime Minister of Vietnam Nguyen Tan Dung (interviewed by Vietnam News on March 31st, 2008). In fact, inflation might go down (in the period of 2000-2003), however interest rate was not lowered as predicted because lowering interest rate may intensify inflationary pressure that always exists in the economy.

Figure **Error! No text of specified style in document.**: Probability of discount rate to be cut and raised

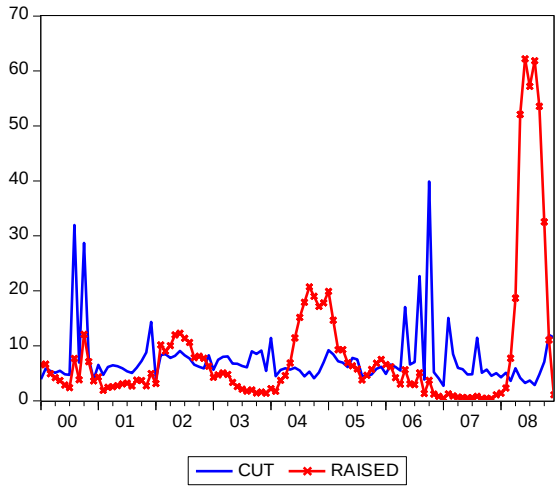


Table 3: Descriptive statistics of probability of discount rate to be cut and raised

Descriptive stats	Probability of discount rate	
	to be cut (%)	to be raised (%)
Mean	7.41	8.33
Median	6.05	4.46
Maximum	39.87	62.19
Minimum	2.73	0.40
Std. Dev.	5.32	12.18
Skewness	3.93	3.18
Kurtosis	20.64	13.18
Jarque-Bera	1,679	649
Probability	0	0
Sum	800	900
Sum Sq. Dev.	3,030	15,861
Observations	108	108

The change of probability of the discount rate to be cut and raised is illustrated in Figure 2. During the period 2000-2008, in fact there were eight times the discount rate was cut and nine times it was raised. As shown in Table 3, the highest probability of interest rate to be cut and raised is respectively 40% and 62% while its average probability is 7.41% and 8.33% for the whole period 2000-2008. By comparing the point of time the discount rate was cut (or raised) in reality with the time the probability of discount rate to be cut (or raised) reached high value, there are four times (over total eight times) these two points of time coincided for interest rate cut, and six times (over total nine times) for interest rate raise. In other words, the high probability values of interest rate cut and raise can give the signal for the interest rate to be cut or raised in reality.

The direction of conducting monetary policy through instrument of interest rate mentioned above has been certified by the Government's resolution and official statement of the Governor of the SBV. Firstly, with regard to the direction of reducing interest rate to promote output growth, according to Resolution no. 30/2008/NQ-CP dated December 11th 2008 of the Government of Vietnam, one of the urgent solutions to prevent from economic downturn is cutting interest rate and facilitating credit provision to enterprises, aiming at boosting production and businesses. At the press conference held on August 27th 2009, the former Governor of the SBV revealed that during a long period of 2003-2007, Vietnam maintained a loosened monetary policy due to pursuing high level of economic growth. Unsurprisingly no official statement on raising interest rate to constrain fast-growing economy was found in Vietnam. Secondly, as regards the direction of raising interest rate to restrain inflation, a great number of official statements were found. For example, on February 10th 2005, the Governor in office Le Duc Thuy replied in an interview by Vietnam Economic Times that interest rate would be raised in 2005, but not much, to cope with inflation which started rising in 2004. Dr. Cao Sy Kiem, member of Consultant Board on National Monetary Policy claimed that the Government of Vietnam would insist on executing tightened monetary policy during the first six months of 2008 to curb rising inflation. However, since October 2008, the SBV has shifted to loosened monetary policy in order to prevent the economy from deteriorating.

As shown in Table 2, the computed numeric derivatives are expectedly almost the same with the analytic derivatives.

Response of Interest Rate to Changes in Real Output Gap, Inflation Gap and Exchange Rate

The previous section indicates that the multinomial logit model could explain the relationship between the directional fluctuation of interest rate (namely discount rate) and the two macroeconomic variables, i.e., real output gap and inflation gap. This section tries to explain such relationship but in the open economy by adding one more regressor called the exchange rate. Exchange rate here is the percentage change in nominal exchange rate.

Table 4: Estimated Multinomial Logit Model with three regressors

Method: Maximum Likelihood (Marquardt) Sample: 2000m01 2008m12 (included 108 observations) Initial Values: b21=-2.67871, b22=-0.06792, b23=-0.00322, b24=0.11873, b31-3.07303, b32=-0.03095, b33=0.48891, b34=0.23015 Convergence achieved after 25 iterations.							
Relative odds of interest cut				Relative odds of interest raised			
Constant (b21)	Real output gap (b22)	Inflation gap (b23)	Exchange rate (b24)	Constant (b31)	Real output gap (b32)	Inflation gap (b33)	Exchange rate (b34)
-2.58** (0.44)	-0.07* (0.04)	0.054 (0.2)	0.144 (0.42)	-2.99** (0.53)	-0.041 (0.12)	0.493** (0.16)	0.245 (0.72)

* indicates statistical significance at the level of 10 percent, ** indicates 1 percent with estimated standard errors in parentheses.

Table 5: Comparison of numeric and analytic log-likelihood derivatives
with three regressors

Coefficients	Sum over all observations		Maximum difference	
	Numeric derivatives	Analytic derivatives	Absolute value	Percent
b21	0.596	0.596086	-9.75E-09	3.69E-05
b22	-1.508	-1.507684	9.76E-07	0.007769
b23	1.607	1.606678	-7.30E-07	0.005709
b24	0.383	0.382754	-5.87E-07	0.008738
b31	0.500	0.500229	-2.00E-08	0.000113
b32	-2.231	-2.231353	-1.29E-06	0.014197
b33	0.810	0.809963	7.74E-08	0.00092
b34	0.295	0.295058	1.82E-07	0.044717

Table 4 clearly shows that there was no relation between interest rate and exchange rate. Both the coefficients of exchange rate (b24 and b34) are not statistically significant, and b24 has the wrong sign (positive). Normally, b24 is expected to be negative since the probability of interest rate to be cut due to a higher exchange rate (devaluation of Vietnam dong) is low. Conversely, coefficient b34 should be positive since the probability of interest rate to be raised to deal with domestic currency's devaluation is high.

The above result is not out of expectation. As stipulated in the Foreign Exchange Ordinance no. 28/2005/PL-UBTVQH11 dated December 13th 2005, exchange rate is determined on the basis of supply and demand of foreign currency on the market under the management of the State, in other words, Vietnam adopted the so-called "the managed floating exchange rate regime". However, practices of exchange rate policy implicitly revealed that Vietnam pursued a fixed exchange rate regime. Ohno (2008) pointed out that during late 1991 to early 1997 (more than five years), the SBV maintained the exchange rate (VND/US$) at around 11,000. The IMF also classified Vietnam's exchange rate regime as a "de facto conventional fixed peg" in 2005. As a result, a fixed or pegged exchange rate could not explain interest rate raise or cut of the SBV.

The estimation results for the two variables of output and inflation are virtually identical to the previous section's results. Table 4 once again confirms the two directions of interest rate practices executed by the SBV: first, to reduce interest rate to boost economic growth, and second, to raise interest rate to curb inflation.

Table 5 shows the computed numeric derivatives are identical to the analytic values as expected.

Response of Interest Rate to Changes in Real Output Gap, Inflation Gap and Trade Balance/Nominal GDP Ratio

This section tries to find other macroeconomic variables which might have impact on the decision of changing the interest rate of the SBV. Trade balance is regarded one of the key macroeconomic variables in Vietnam, and interest rate movement might have effects on trade balance through an intermediate policy variable of exchange rate. During the past ten years, Vietnam's trade balance has gone from bad to worse, trade deficit in 2008 even reached US$18 billion, or over 20 percent of nominal GDP. The deterioration of trade balance in Vietnam was alerted to be "a level that signals vulnerability to a sudden change in investor sentiment" by 2008 Memorandum of Fulbright Economics Teaching Program. Thus, it is argued that the Government of Vietnam should take measures to improve the balance of trade. That's why trade balance was chosen as another regressor to add in the model. The ratio of trade balance herein is determined as the ratio of trade balance over the nominal GDP (seasonally adjusted data).

Table 6: Estimated Multinomial Logit Model with three regressors, including trade balance/nominal GDP ratio

Method: Maximum Likelihood (Marquardt) Sample: 1999q1 2008q4 (included 40 observations) Initial Values: b21=-0.83381, b22=0.14788, b23=-0.02309, b24=0.15926, b31=-3.45965, b32=-0.47918, b33=-0.10655, b34=-0.13869 Convergence achieved after 22 iterations.							
Relative odds of interest cut				Relative odds of interest raised			
Constant (b21)	Real output gap (b22)	Inflation gap (b23)	Trade balance ratio (b24)	Constant (b31)	Real output gap (b32)	Inflation gap (b33)	Trade balance ratio (b34)
-0.75 (0.48)	0.13 (0.21)	-0.03 (0.18)	0.15 (0.09)	-3.21* (1.28)	-0.48 (0.46)	-0.11 (0.3)	-0.13 (0.1)

* indicates statistical significance at the level of 10 percent with estimated standard errors in parentheses.

Table 6 shows that all the coefficients (except the constant b31) are statistically insignificant, in other words, no relation between interest rate movement and trade balance ratio was observed.

In order to improve the trade deficit, domestic currency should be devaluated to encourage exports and limit imports through depreciation of exchange rate, and a cut in interest may help depreciate exchange rate. Thus, b24 is expected to be negative since the probability of interest rate to be cut due to a reduction in trade balance (or worse deficit) is high. On the contrary, b34 should be positive since probability of interest to be raised is high if trade balance increases. As shown in Table 6, both coefficients of trade balance ratio (b24 and b34) have the wrong signs.

Another trial of estimation was conducted by removing two variables of output and inflation, keeping only trade balance ratio as the explanatory variable. Yet again the estimation results in Table 7 confirm that trade balance ratio could not explain the fluctuation of interest rate (treasury bill rate). The coefficient of trade balance ratio (b22) is statistically significant at the level of 5%, however, it has the wrong sign (positive).

Table 7: Estimated Multinomial Logit Model with trade balance/nominal GDP ratio

Method: Maximum Likelihood (Marquardt) Sample: 1999q1 2008q4 (included 40 observations) Initial Values: b21=-0.80557, b22=0.17054, b31=-2.85567, b32= -0.10520 Convergence achieved after 102 iterations.			
Relative odds of interest cut		Relative odds of interest raised	
Constant (b21)	Trade balance ratio (b22)	Constant (b31)	Trade balance ratio (b32)
-0.72* (0.43)	0.16** (0.08)	-2.55** (0.72)	-0.09 (0.06)

* indicates statistical significance at the level of 10 percent, ** indicates 5 percent with estimated standard errors in parentheses.

Although trade balance is regarded one of the key macroeconomic variables of any economy including Vietnam, it is under the influence of other tools of management rather than the indirect effect of interest rate. That's why no official statement of the Government or the SBV was found regarding raising (or reducing) interest rate (discount rate or treasury bill rate) to affect the trade balance of Vietnam.

Conclusion

Using monthly and quarterly data of Vietnam over the period 2000-2008, the logit estimation results reveal several important directions of monetary policy practices in Vietnam. First, the State Bank of Vietnam would reduce interest rate to stimulate economic growth if the economy went down, however no action would be done if the economy was growing. Second, interest rate would be raised if inflation went up but the SBV seemed not to reduce interest rate when inflation was under control. In addition, exchange rate regressor variable could not explain interest rate raise or cut of the SBV because Vietnam's exchange rate regime was regarded as a "de facto conventional fixed peg". Finally, although trade balance is one of the key macroeconomic variables of any economy including Vietnam, no relation between interest rate movement and trade balance ratio was observed. The direction of conducting monetary policy through instrument of interest rate mentioned above has been certified by the official statements of the Government, the SBV and other monetary authority. For the period from 2008 onwards, further study should be done to investigate the effects of chosen regressor variables on the choice of conducting monetary policy through interest rate instrument of the SBV.

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