IMPACT OF FISCAL DOMINANCE ON INFLATION IN VIETNAM

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Abstract: ***In emerging economies including Vietnam, fiscal policy is expected to be expansionary to promote economic growth. However, expansionary fiscal policy can be seen as the determinant of high inflation in emerging economies. Fiscal dominance is the situation where expansionary fiscal policy dominates monetary policy and cause high inflation. This paper employs a VAR model with four variables including inflation rate, budget deficit, government internal debt and money supply to investigate whether there is fiscal dominance in Vietnam and the determinants of inflation fluctuation in Vietnam from 2001 to 2020. The findings are: (1) there is no significant evidence of fiscal dominance in Vietnam, (2) both fiscal and monetary policies have impact on inflation of Vietnam, and (3) among all, lagged inflation rate and domestic debt are found to be important determinants of inflation fluctuation in Vietnam.***

• Keywords: *inflation, monetary policy, fiscal dominance, Vietnam..*

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Tóm tắt: *Tại các nền kinh tế đang phát triển như Việt Nam, chính sách tài khoá nới lỏng thường được sử dụng để thúc đẩy kinh tế. Tuy nhiên, chính sách tài khoá nới lỏng có thể gây ra lạm phát tại các nền kinh tế này. Lấn át tài khoá cho thấy tình trạng chính sách tài khoá nới lỏng lấn át chính sách tiền tệ và gây ra lạm phát. Bài nghiên cứu này sử dụng mô hình VAR với bốn biến gồm lạm phát, thâm hụt ngân sách, nợ trong nước của chính phủ và cung tiền để phân tích tình trạng lấn át tài khoá tại Việt Nam, cũng như những nhân tố của lạm phát trong giai đoạn 2001-2020. Các kết quả cho thấy: (1) chưa có bằng chứng đáng kể về lấn át tài khoá tại Việt Nam, (2) cả chính sách tài khoá và tiền tệ đều có tác động nhất định đến lạm phát tại Việt Nam, và (3) nợ trong nước của chính phủ và lạm phát kỳ trước là những nhân tố quan trọng tác động đến lạm phát tại Việt Nam.*

• Từ khóa: *lấn át tài khoá, chính sách tiền tệ, lạm phát, Việt Nam.*

1. Introduction

The fiscal deficit is largely financed by the issuance of government bonds. However, government bonds are mainly sold to large commercial banks. These bonds are then used by commercial banks to borrow money from the State Bank of Vietnam (SBV) through lending facility or open market operation (OMO). Ultimately, this will increase the money supply and cause inflation in the economy. The data from the Hanoi Stock Exchange (HNX) shows that in the period of 2006-2017, the volume of government bonds issued reached over VND 1000 trillion, accounting for nearly 50% of the total government debts in the period of 2006-2017, which also means an average of more than 100 trillion VND per year borrowed by the Vietnamese government. Thus, together with the high credit demand from the private sector, public spending financed through bond issuance has also indirectly led to a sharp increase in money supply in recent years.

The increase in money supply has been widely known as the main source of inflation, as Milton Friedman famously said "Inflation is always and everywhere a monetary phenomenon". It can be seen that there is the risk of fiscal dominance in Vietnam. Therefore, this paper is motivated to investigate whether Vietnamese economy is exposed to the risk of fiscal dominance. Together with the mission of determining whether monetary policy or fiscal policy has stronger effect on inflation in Vietnam, the paper has also discovered the determinants of inflation fluctuation in Vietnam. The rest of the paper is organized as follows. Literature review is shown in section 2, while section 3 introduces methodology and data. Section 4 discusses the

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results, while section 5 provides conclusions and policy recommendations.

2. Literature review

The relationship between fiscal dominance and price stability is a matter of concern for many countries, especially developing countries, whose fiscal discipline is still not strong enough, compared to developed countries. It can be seen that the studies on the relationship between fiscal dominance and price stability are divided into two phases. Phase one includes studies from the 1990s to the 2000s. These studies mostly focused on examining the impact of fiscal policy on inflation in the relationship between monetary policy and fiscal policy. Phase two includes studies from the late 2000s to the present. The studies in this period have focused on analyzing the quantitative effects of fiscal dominance on the general price level or the inflation rate in the economy. Some studies also measure the degree of fiscal dominance of several countries.

First of all, about the studies from the 1990s to the 2000s, most studies in this period agreed that the inflation is not only determined by monetary policy but also the fiscal policy. Prominent studies in this subject are Woodford (1994, 1995, 2001), Sims (1994, 1997), Leeper (1991), and Cochrane (1998, 2000). These studies showed that it is not only monetary policy that is related to price behavior, or that both monetary and fiscal policies are related, but in some cases, only fiscal policy is related. Another study by Michael Woodford (2001) pointed out that "a central bank charged with maintaining price stability cannot be indifferent as to how fiscal policy is determined". In other words, a commitment to fighting inflation and maintaining a low inflation target cannot guarantee price stability by itself. According to Sargent and Wallace (1981), budget deficits cause inflation because governments tend to run long budget deficits.

Regarding the studies from the late 2000s to the present, these studies have focused on in-depth quantitative analysis of the impact of fiscal dominance on the inflation. Some studies also measure the degree of fiscal dominance in several countries. It can be seen that since the public debt crisis in Greece in 2009, followed by the public debt crisis in other European countries, researchers have focused more on the issue of budget deficit and how this deficit is financed in different countries. Accordingly, the issue of fiscal dominance is paid more attention, especially in developing countries, where the degree of monetary independence is not as high as in developed countries and the central bank can print out money to finance the budget deficit. Some of the notable studies in this phase include Sulaiman et al. (2009), which studied on Pakistan, Musa, Asare and Gulumbe (2013) and Afolabi and Atolagbe (2018), which both studied on Nigeria, Aguilar and Samano (2018) on Mexico, Tan and Mohamed (2019) on Thailand, and most recently, Sanusi (2020) on Nigeria and South Africa.

Foremost, Sulaiman et al. (2019) which studied about money supply, government spending, output and prices in Pakistan showed that the government spending has an effect on inflation of Pakistan in the long run. Both studies on Nigeria, Musa, Asare and Gulumbe (2013) and Afolabi and Atolagbe (2018), showed that the fiscal policy variables have impact on inflation in this country. Specifically, Musa, Asare and Gulumbe (2013), by using the VAR model and co-integration test, concluded that there is a positive effect of fiscal revenue and consumer price index (CPI) of Nigeria. The study also suggested that this positive effect comes from the positive relationship between public revenue and government expenditure. Meanwhile, the later empirical study of Nigeria, Afolabi and Atolagbe (2018), showed that the fiscal policy variables do not have a direct impact on the price level in Nigeria. This study analyzed Nigeria's fiscal dominance and examined the impact of fiscal policy variables on the price level in the economy, in order to make the following main conclusions: (1) There is no empirical evidence of fiscal dominance in Nigeria; (2) The budget deficit and the government's internal debt have no impact on the general price level, but have a significant impact on the money supply in the short run.

Aguilar and Samano (2018) has provided empirical evidence on Mexico that budget deficits financed by money issuance have a significant effect on inflation in this country. In addition, this study also showed that the exchange rate and the interest rates on public debt have significant influence on expected inflation, and accordingly, price volatility in Mexico. In addition, Tan and Mohamed (2019) attempted to assess the long-term relationship between monetary policy, fiscal policy and inflation in Thailand. This study applied the ARDL

(Autoregressive Distributed Lag) model to the quarterly data series from 1980 to 2017. The results showed that the long-run relationship between government spending and inflation is positive. Compared with monetary policy, fiscal policy has a stronger impact on inflation in Thailand. One of the latest studies on fiscal dominance is Sanusi (2020). This study measured the fiscal dominance degree in two African countries, Nigeria and South Africa. The degree of fiscal dominance in South Africa was found to be higher than in Nigeria. However, the inflation in South Africa is lower than in Nigeria. Accordingly, the study concludes that the degree of fiscal dominance does not have a significant effect on inflation. This result is also consistent with the results of the previous study by Afolab and Atolagbe (2018) on Nigeria.

It can be seen that the relationship between fiscal dominance and inflation has received much attention in many countries, especially in developing countries where fiscal discipline is not as strong as in developed countries. Most studies showed that the fiscal policy variables such as government spending, budget deficit have the effect on inflation in the economy. In addition, a noticeable trend in research methodology on this topic is that the studies have been applying more and more quantitative techniques to measure the degree of fiscal dominance of a country, as well as correlation between fiscal policy and inflation in the economy.

Even though fiscal dominance and its effect on inflation have paid more attention in the world, especially in developing countries, there is a shortage of studies on this subject in Vietnam. The most related study, Le Thi Dieu Huyen (2014), studied the possibility of fiscal dominance in Vietnam and its effect on monetary policy of the State Bank of Vietnam. The study showed that fiscal policy has dominated monetary policy in the period of 2008-2013 due to expansionary fiscal policy and increasing budget deficit. However, this study did not provide conclusion about the impact of fiscal dominance on inflation in Vietnam.

It can be seen that there has not been any study focusing on the impact of fiscal dominance on inflation in Vietnam, which is the goal of monetary policy of SBV. However, the inflation rate can be easily affected by fiscal policy rather than monetary policy in developing countries, where the fiscal discipline is not as strong as in advanced countries. Therefore, there is a strong motivation for the authors to investigate the impact of fiscal dominance on inflation in Vietnam.

3. Data and Methodology

3.1. Data

The time series data of four variables including inflation (INF), money supply (M2), budget deficit (BDF) and internal debt (DOMD) was collected from IMF and SBV database. The collected data frequency is annual, from 2001 to 2020. In order to generate more observations, these annual time-series data were interpolated into quarterly data with the total observations of 80.

3.2. Methodology

This study employs Vector Auto-regression (VAR) model, which was first introduced by Christopher A. Sim in 1980, to examine the impact of monetary and fiscal policies on inflation in Vietnam.

A model of VAR(p) has a form:

$$y_t = \Phi_0 + \Phi_1 \times y_{t-1} + \Phi_2 \times y_{t-2} + \cdots + \Phi_p \times y_{t-p} + \epsilon_t$$

Where Φi with i = 1,…,p are coefficient matrices, ϵt is error term.

In order to examine the impact of monetary and fiscal policies on inflation in Vietnam, this study follows the study of Afolabi and Atolagbe (2018) and the VAR model is applied to a vector of variables y = (INF,BDF,M2,DOMD), where INF is inflation rate, which is measured year-over-year, BDF is budget deficit as a percentage of Gross Domestic Product (GDP), M2 is growth rate of money supply, which is measured year-over-year, and DOMD is government internal debt as a percentage of GDP. All time-series have measurement unit of percentage.

Specifically, this study will focus on the estimation of inflation rate on its determinants:

INF = f(M2,DOMD,BDF)

This equation will be used to estimate whether the monetary policy, fiscal policy, or government internal debt of Vietnam has significant impact on the inflation rate. Moreover, the magnitude of these effects will be estimated.

Unit root tests and lag selection

Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests are used to test the stationarity of the time series data of four variables.

Table 1: Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests

Variable	ADF	PP
INF	-1.390501	-2.387407
D(INF)	**-3.614571*** **	**-5.404576*** **
BDF	-1.655469	-2.388997
D(BDF)	**-3.385095** **	**-5.936272*** **
M2	-1.096459	-2.132995
D(M2)	**-3.775334*** **	**-5.648032*** **
DOMD	-1.378967	-1.660553
D(DOMD)	**-5.755899*** **	**-3.231132** **

, **, * represent the significance level of 10%, 5% and 1%, respectively.*

The results show that all four variables, INF, BDF, M2, and DOMD, are not stationary at initial level but stationary at first difference level. Therefore, the first differences of these four variables, which are DINF, DBDF, DM2 and DDOMD will be employed into the VAR model.

Moreover, the lag of 5 is chosen for the VAR model of DINF, DBDF, DM2 and DDOMD. This selection is unambiguous among all selection criterions.

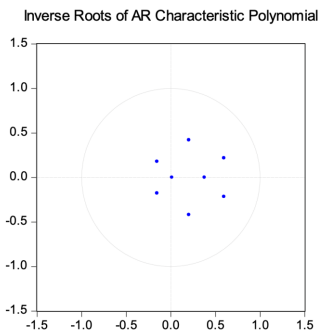
Table 2: Lag selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-144.1204	NA	0.000719	4.114456	4.240938	4.164809
1	-113.4410	57.09784	0.000479	3.706694	4.339101	3.958457
2	-110.3883	5.342268	0.000689	4.066341	5.204674	4.519514
3	-92.99904	28.49901	0.000670	4.027751	5.672010	4.682335
4	-3.232184	137.1438	8.81e-05	1.978672	4.128856	2.834667
5	50.04019	75.46919*	3.24e-05*	0.943328*	3.599439*	2.000734*
6	54.21797	5.454335	4.73e-05	1.271723	4.433759	2.530539
7	58.66464	5.311291	7.01e-05	1.592649	5.260611	3.052876

** denotes the chosen lag*

In addition, all inverse roots of AR Characteristic Polynomial are inside the unit circle (or less than 1), indicating that the stationarity condition of the VAR model is satisfied.

Figure 1: Stationarity condition of VAR



4. Results and discussion

Table 3: Estimation Results

	DINF	DBDF	DM2	DDOMD
DINF(-1)	**0.501442*** **	0.022037	0.128587	-0.166204
	(0.12574)	(0.04418)	(0.26207)	(0.19304)
	[3.98781]	[0.49880]	[0.49067]	[-0.86099]
DINF(-2)	0.046246	-0.001852	-0.004760	-0.060238
	(0.09164)	(0.03220)	(0.19098)	(0.14068)
	[0.50467]	[-0.05752]	[-0.02493]	[-0.42820]
DINF(-3)	-0.007036	-0.010550	-0.057114	-0.143740
	(0.09267)	(0.03256)	(0.19314)	(0.14227)
	[-0.07592]	[-0.32401]	[-0.29571]	[-1.01035]
DINF(-4)	0.107230	**-0.081100** **	**-0.696626*** **	-0.094785
	(0.10974)	(0.03856)	(0.22871)	(0.16847)
	[0.97713]	[-2.10335]	[-3.04587]	[-0.56262]
DINF(-5)	-0.135461	0.053945	**0.444969** **	0.052237
	(0.10650)	(0.03742)	(0.22195)	(0.16349)
	[-1.27198]	[1.44170]	[2.00481]	[0.31951]
DBDF(-1)	-0.025307	**0.787288*** **	0.050126	0.768835
	(0.33992)	(0.11943)	(0.70845)	(0.52185)
	[-0.07445]	[6.59187]	[0.07075]	[1.47330]
DBDF(-2)	0.077060	0.052372	-0.020587	0.152635
	(0.23442)	(0.08236)	(0.48856)	(0.35988)
	[0.32872]	[0.63586]	[-0.04214]	[0.42413]
DBDF(-3)	0.060439	0.040324	0.100620	0.306442
	(0.23614)	(0.08297)	(0.49216)	(0.36252)
	[0.25594]	[0.48600]	[0.20445]	[0.84530]
DBDF(-4)	**0.508122** **	**-0.931469*** **	**-1.318953** **	-0.172696
	(0.27018)	(0.09493)	(0.56309)	(0.41478)
	[-1.88068]	[-9.81231]	[-2.34235]	[-0.41636]
DBDF(-5)	0.280005	0.782165***	1.041511	0.538386
	(0.34255)	(0.12035)	(0.71391)	(0.52587)
	[0.81742]	[6.49885]	[1.45888]	[1.02380]
DM2(-1)	0.026183	0.006506	0.714612	-0.047389
	(0.05744)	(0.02018)	(0.11972)	(0.08819)
	[0.45580]	[0.32234]	[5.96896]	[-0.53737]
DM2(-2)	0.007247	0.000449	0.074892	0.014321
	(0.04733)	(0.01663)	(0.09865)	(0.07266)
	[0.15311]	[0.02697]	[0.75920]	[0.19709]
DM2(-3)	0.005409	0.001590	0.031885	0.021664
	(0.04762)	(0.01673)	(0.09925)	(0.07310)
	[0.11359]	[0.09505]	[0.32127]	[0.29634]
DM2(-4)	0.330511***	**-0.060775*** **	**-1.089472*** **	-0.086886
	(0.04890)	(0.01718)	(0.10191)	(0.07506)
	[6.75948]	[-3.53759]	[-10.6910]	[-1.15749]
DM2(-5)	**-0.136540***	0.040028	**0.710543*** **	0.006474
	(0.07287)	(0.02560)	(0.15187)	(0.11187)
	[-1.87381]	[1.56345]	[4.67874]	[0.05787]
DDOMD(-1)	-0.090525	**-0.072339** **	-0.296116	-0.006491
	(0.11035)	(0.03877)	(0.22998)	(0.16940)
	[-0.82038]	[-1.86584]	[-1.28760]	[-0.03832]
DDOMD(-2)	-0.111008	-0.038232	-0.231991	**-0.423612** **
	(0.11041)	(0.03879)	(0.23010)	(0.16949)
	[-1.00546]	[-0.98559]	[-1.00822]	[-2.49929]

	DINF	DBDF	DM2	DDOMD
DDOMD(-3)	-0.173652	**-0.085932***	-0.460921	**-1.010841*****
	(0.13479)	(0.04736)	(0.28091)	(0.20692)
	[-1.28834]	[-1.81453]	[-1.64079]	[-4.88512]
DDOMD(-4)	1.781030***	0.233969	**3.548537*****	0.102001
	(0.47235)	(0.16596)	(0.98444)	(0.72514)
	[3.77057]	[1.40978]	[3.60463]	[0.14066]
DDOMD(-5)	-1.315666*	**-0.296643***	**-2.886802*****	0.694993
	(0.46336)	(0.16280)	(0.96570)	(0.71134)
	[-2.83939]	[-1.82209]	[-2.98932]	[0.97702]
C	-0.002711	-0.015761	-0.017551	**-0.115378***
	(0.03854)	(0.01354)	(0.08032)	(0.05916)
	[-0.07034]	[-1.16404]	[-0.21853]	[-1.95023]

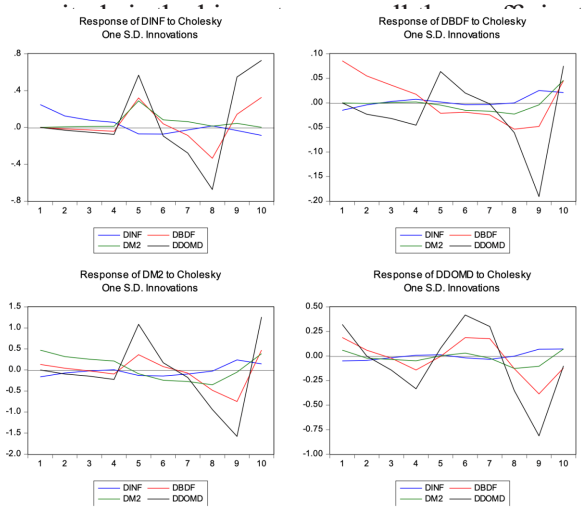
, **, * represent the significance level of 10%, 5% and 1% respectively, standard errors are inside the parentheses, t-statistics are inside the square brackets.*

Firstly, the current inflation is affected by the first lagged inflation, indicating that expected inflation has a strong effect on inflation in Vietnam. A high inflation at the current period will increase the inflation expectation of households and businesses in the economy, which unquestionably affects their behavior including consumption and investment. Ultimately, the current inflation should have effect on the inflation in the following period. For instance, if the economy is experiencing high inflation, people tend to store the goods, which makes the prices of goods are even higher, and search for different ways to store the wealth outside bank deposit, including real estate, stocks, gold and foreign currencies, which makes the prices of these assets to rise. As a matter of fact, the inflation in the economy will be eventually higher and higher, which is consistent with the results showed in the table that first lagged inflation positively affects the current inflation of Vietnam. The VAR estimation for the equation of DINF shows the coefficient of DINF(-1) having the value of 0.5 at the significance level of 1%, suggesting that when the current inflation increases by 1%, the inflation in the following period should increase by 0.5%.

Secondly, budget deficit only has statistically significant impact on inflation after a year, as the coefficient of DBDF(-4) in the equation of DINF is estimated to be 0.5 at the significance level of 5%, implying that if the current budget deficit as a percentage of GDP increases by 1%, the inflation four quarters later will increase by 0.5%. This result suggests that it takes about a year for budget deficit to have impact on the inflation of Vietnam. Moreover, this impact will not last for long, as the coefficient of further lagged DBDF, which is DBDF(-5), was found to be not statistically significant.

Thirdly, money supply also only has statistically significant impact on inflation after a year, as the coefficient of DM2(-4) in the equation of DINF was found to be 0.33 at the significance level of 1%. According the estimation result, if the current money supply growth rate increase by 1%, the inflation a year later will increase by 0.33%. This shows the positive impact of expansionary monetary policy on the inflation in Vietnam, which is consistent with the theory as an increase in money supply tends to increase the components of aggregate demand which causes demand-pull inflation.

Lastly, government internal debt was found to have statistically significant impact on inflation of Vietnam after a year as the coefficient of DDOMD(-4) in the equation of DINF was found to be 1.78 at the significance level of 1%. This



The impulse response functions of DINF to the shocks of other variables show that the inflation only significantly respond to the shocks of money supply, internal debt and budget deficit after four quarters, which is shown at the fifth quarter in the figure as the shocks of DDOMD, DBDF and DM2 starts from the second quarter. All these effects are positive as inflation increase when there is a positive shock of either DDOMD, DBDF or DM2, though the magnitudes of responses are different. Inflation increases higher to a shock of DDOMD than to a shock of DM2 or DBDF,

which implies that government internal debt may be an important indication to predict inflation in the following year.

Moreover, the impact of DDOMD on DINF was found to be closed to zero in the fifth quarter, which is equivalent to the six period in the figure. This implies that the impact of government internal debt on inflation does not last for long. As a matter of fact, there is no significant evidence of fiscal dominance in Vietnam.

In addition, both money supply and budget deficit respond to a shock of internal debt with the lag of four quarters. This finding is consistent with the previous conclusion about the strong impact of internal debt on inflation in Vietnam, through the impulse response function of DINF to other variables. Because an increase in government internal debt has a positive influence on both deficit budget and money supply, implying expansionary fiscal policy as well as expansionary monetary policy, therefore the inflation should be increased.

5. Conclusions and policy recommendations

This paper has provided empirical evidence on the impact of both monetary and fiscal policies on inflation in Vietnam, which indicates whether there is fiscal dominance in Vietnam. Besides fiscal and monetary policies variables, this paper also employs the variable of government internal debt into a VAR model in order to present important determinants of Vietnamese inflation. The main findings of this paper include: (1) there is no significant evidence of fiscal dominance in Vietnam, (2) both fiscal and monetary policies have impact on inflation of Vietnam with the lag of four quarters, and (3) among all, lagged inflation rate and domestic debt are found to be important determinants of inflation fluctuation in Vietnam.

Based on that, some policy recommendations are provided. Firstly, the Vietnamese government should apply measures to reduce the budget deficit including reducing the fund from the state budget and public credit, reviewing and cutting inefficient investment into some state-owned enterprises, lowering the recurrent expenditures. Secondly, the government should strictly manage public debt at each step including mobilization, use of loans, debt repayment, and risk handling, continue to reduce the public debt balance, ensure timely repayment of existing debts, and avoid overdue debt, which will strengthen the national credit rating. Thirdly, the Vietnamese government should strengthen the independence of the SBV. Specifically, the SBV should have the autonomy in choosing operating tools, reconciling monetary policy goals with fiscal policy objectives in a certain period and not being under any pressure from budget spending. Fourthly, the Vietnamese government should coordinate between monetary policy and fiscal policy in order to facilitate both price stability and economic growth in the economy. Lastly, the Vietnamese government may pay more attention and have controlling measurements on the internal debt as this is found to be an important determinant of inflation of Vietnam.

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