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# **Economic Growth and Inflation Tradeoffs within Global Stagflation: Evidence in Vietnam Economy**

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## Abstract

The paper analyzes the interaction of economic growth and inflation rate on accounting for both capital sources and global shocks. The analysis method is a time varying coefficients Bayesian vector autoregression (TVC-BSVAR) model applied in a quarterly data sample of Vietnam economy over Q3/2008-Q4/2020. The trade-off between growth and inflation exists for an increase of credit supply but mitigates for an increase of public investment or more foreign capital inflows. For a global stagflation, Vietnam economic growth reduces but its inflation rate stabilizes. An appropriated policy can be the combination of higher credit supply growth with more public investment. If the world economic growth reduces by 1% per quarter and world oil price raises by 1 USD per quarter for 4 consecutive quarters, the domestic economic growth reduces by 4% after one year. Then, the domestic credit supply growth needs to be raised by 7.6% or the public investment increases by 12%.

Key words: *Global Stagflation; Vector Autoregression; Vietnam Economy.*

JEL classification: E52; F21; F41.

## 1. Introduction

The world economy is currently facing a risk of stagflation in which a high inflation rate goes along with a sluggish economic growth (World Bank, 2022). The risk reminds the world oil price shock in 1970s but can provide different effects since the world economy is now more integrated and the share of oil over energy demand is lower than in 1970s. This prospect motivates a research gap on the reaction of an economy against the global stagflation, especially the policy consolidation to enhance economic growth on stabilizing inflation rate. As a small open economy with a large trade openness at nearly 200% per output, the Vietnam economy is a typical case to investigate the evidence on the fighting against the stagflation.

The paper analyzes the inter-dependence of economic growth and inflation rate on accounting for both the sources of capital investment and the world economy. The employed method is a time varying coefficients Bayesian vector autoregression (TVC-BSVAR) model applied in a quarterly data sample of Vietnam economy over Q3/2008-Q4/2020. The model is featured by the time-varying coefficients to capture the potential regime changes of macroeconomy while the data sample is featured by the inclusion of recent Covid-19 pandemic.

The evidence records that a trade-off between growth and inflation exists for an increase of credit supply but this trade-off is mitigated for an increase of public investment or more foreign capital inflows. If the world economy falls into stagflation with a declining growth and a hike in oil price, the Vietnam economic growth reduces but its inflation rate is stabilized. And to enhance the economic growth and stabilize the inflation rate, the public policy can combine an increase of credit supply growth rate with an increase of public investment. If the world economic growth reduces by 1% per quarter and world oil price raises by 1 USD per quarter for 4 consecutive quarters, the domestic credit supply growth needs to be raised by 7.6% combined with an increase of public investment by 12%.

The paper belongs to the literature on the interaction of economic growth and inflation. On one hand, the economic growth is determined by the technology progress and labor force growth as uncovered by neoclassical growth model (Solow, 1956; Swan, 1956). And according to endogenous growth theory, the economic growth can be based on the capital accumulation as in AK model (Frankel, 1967), by the productivity varieties (Romer, 1990) or by the research and development expenditure (Aghion and Howitt, 1992). On other hand, the inflation rate is motivated by the monetary supply according to the quantity theory of money (Friedman, 1980) or by the financing method based on rolling over public debts on the fiscal theory of price level (Cochrane, 2001). And the connection between the economic growth and inflation is well-known recorded as a trade-off: a higher economic growth is associated with a greater inflation rate (Lucas, 1973; Ball et al, 1988).

Compared with this fruitful literature, the current paper establishes that the trade-off between the economic growth and inflation depends on the financing resources of an economy. The trade-off exists for the domestic credit supply but is mitigated for the government-budget investment, and even disappear for the foreign capital inflows. Moreover, our evidence records that both the economic growth and inflation rate can be highly persistent over time. Thus, the recovery of growth after a negative shock (which reduces growth) or the stability of inflation after a positive shock (which raises inflation) are both challenged.

The paper is also closely related to the literature on the foreign capital inflows. The foreign capital contributes to domestic economic growth provides additional financing resource for an economy to accumulate the capital stock along the convergence to its steady state (Gourinchas and Jeanne, 2013; Prasad et al, 2007). But the foreign capital can also kick off an economic crisis when it is withdrawn quickly from an economy, then, resulting in devaluation of domestic currency, as the Asian financial crisis in 1998. Moreover, the foreign capital can

crowd out or crowd in the domestic investment, depending on the absorption capacity of the host economy.

Relating to this literature, our paper records a multi-dimension impact of foreign capital inflows on the macroeconomy of Vietnam. As shown by the literature, the foreign capital inflows raise the domestic economic growth. But unlike the literature, our evidence shows that the foreign capital inflows contribute on reducing the inflation rate and evaluating domestic currency. Moreover, we also uncover that the foreign capital inflows tend to crowd out both the domestic credit supply and public investment, thus, undermining a risk of neutralizing the effectiveness of both monetary and fiscal policy.

Finally, the paper makes a contribution on the literature on the global financial cycle that describes the comovement of international financial variable, with a recent survey in Rey (2022). The monetary contractions in the United States economy results in the strong retrenchment of international credit flows as well as the tightening of foreign capital conditions (Miranda-Agrippino and Rey, 2020). The exchange rate fluctuation matters to absorb the world economic conditions: the global shocks transmission to domestic credit growth and output growth are magnified under fixed exchange rate regime relative more than under more flexible regime (Obstfeld et al, 2019).

The foreign reserves can be also helpful to cushion the effect of global shocks on the domestic output growth, especially during crisis (Scheubel, Stracca and Tille, 2019). But the transmission of global financial cycle into the cross-border capital flows can be also quite limited (Cerutti, Claessens and Rose, 2019), or that into the cross-border banking capital flows can vary over time depending on the crisis or normal period (Amiti, McGuire and Weinstein, 2019).

Our evidence complements these aforementioned papers by showing that the global stagflation results in a reduction of domestic economic growth but has a modest impact on the domestic inflation rate. Furthermore, a combination of more

credit supply with greater public investment can be useful to neutralize the effect of global stagflation.

The paper is structured as follows. After the first section on introduction, the second section provides a literature review, then, followed by one section on analysis framework. The fourth section on empirical evidence shows the evidence on the Vietnam economy. And the paper closes with a section on conclusion.

## **2. Literature Review**

The inter-relationship between economic growth and inflation is a cornerstone within a macroeconomy. The economic growth captures the expansion of production capacity over time while the inflation illustrates the increase of price level over time. These two variables are related to each other for various mechanism.

First, the interaction between the aggregate demand and supply determines the relationship between the economic growth and inflation rate. For an upward-sloping curve of short-run aggregate supply, an increase of aggregate demand raises both the output and price level. Thus, there exists a trade-off : a higher economic growth is associated with a greater inflation rate. An empirical evidence on this trade-off is first established in an annual time-series sample of 18 countries over the 1951-1967 period (Lucas, 1973). The trade-off is also affected by the average rate of inflation (Ball et al, 1988), and has a positive correlation with the globalization which is measured by trade and financial openness (Badinger, 2009). But the trade-off can also be reduced for the worker's market power in a dynamic stochastic general equilibrium model of United States economy (Justiniano et al, 2013).

There is also some evidence on the existence of trade-off in developing economies. In the India economy, there is a structural break in the correlation between economic growth and inflation (Behera and Mishra, 2017). If the inflation rate exceeds 4%, it will negatively affect the economic growth. In the Vietnam economy, the trade-off tends to be weaker for the foreign capital inflows

(Hung, 2021). The economic growth is mostly driven by the foreign direct investment while the inflation rate is largely affected by the domestic credit supply. In the China economy, the output gap, i.e, the difference between actual and potential output, tends to co-move with the inflation rate (Gerlach and Peng, 2006). The main mechanism for this trade-off can rely on the fixed investment: a higher investment raises the economic growth and also inflation rate by bringing about a higher wage cost. By simulating a small macroeconomic model, Imai (2007) shows that each additional percentage point of output growth is associated with 2.6 percent increase in the inflation rate.

Second, the interaction between the monetary and fiscal policy can also determine the inter-connection between the economic growth and inflation rate. According to the IS-LM framework (Hicks, 1980), a monetary expansion raises the economic growth by reducing the interest rate and stimulating domestic investment. A fiscal expansion also raises the economic growth through the fiscal multiplier of public expenditure, but with a cost of higher interest rate, then, leading to a potential crowding-out effect of investment against the public expenditure (Easterly and Rebelo, 1993; Argimon et al, 1997).

But the monetary expansion still undermines the risk of high inflation in the future. According to the quantity theory of money, given a stable money velocity and long-run output, an increase of money supply will be converted into a higher price level (Friedman, 1989). The commodity price shocks poses complex challenges for the effectiveness of monetary policy in the inflation rate (De Gregorio, 2012). The food inflation, more than energy inflation, has relevant propagation effects on the core inflation, thus, creating an additional constraint on the monetary policy.

Moreover, the fiscal expansion can also result in the inflation through the effect of fiscal uncertainties on the monetary policy (Sims, 2001). When the fiscal expansion is financed by combination of debts and taxes, an increase of the primary deficits, i.e, the government revenue being less than expenditure, leads

to an increase in the price level by devaluating the outstanding debt (Cochrane, 2001; Brunnermeier et al, 2020).

Third, the impact of world economic shock toward the domestic economy also shapes the inter-dependence of economic growth and inflation rate. The trade-off between the economic growth and inflation rate is mitigated through the international trade channel, ambiguous through the international investment channel, and amplified through the international finance channel.

In particular, for the international trade channel, a reduction of net exports, which can be due to a slow growth rate of world economy, results in a lower aggregate demand, then, both a lower economic growth and inflation rate (Caballero and Farhi, 2017). Also according this channel, the stagnation in a large open economy can be spread to the rest of world by reducing the net exports and corresponding aggregate demand of the latter (Caballero, Gourinchas and Farhi, 2015; Eggertsson et al, 2016).

For the international finance channel, the depreciation of domestic currency against foreign currency can stimulate the net exports, given the trading structure satisfies the Marshall-Lerner condition on the elasticity of exports and imports on exchange rate (Bahmani, Harvey and Hegerty, 2013). The increase of net exports, in turn, results in a higher output growth rate. The depreciation of domestic currency, however, can also result in a higher domestic price level by the existence of exchange rate pass-through effect (Fisher, 1989; Devereux and Engel, 2002; Campa and Goldberg, 2005). The exchange pass-through effect also depends on the currency choice. The pass-through of averaged good priced in dollars is lower than that of nondollar (in United States economy, the estimated value is 25% vs 95%) (Gopinath et al, 2010).

And for the international investment channel, a reduction of foreign investment capital, which can be due to the increase of interest rate in the world leading economies, results in a lower economic growth of domestic economy (Prasad et al, 2007; Borensztein et al, 1998). If this foreign capital reduction also



affects the value of domestic currency, it undermines the change of price level. But the effect of foreign investment on the domestic inflation rate is ambiguous.

In summary, the literature review suggests that the economic growth and inflation rate needs to be analyzed jointly as the most important factor of macroeconomic stability, especially in the context of world economic fluctuations.

### 3. Analysis Framework

#### 3.1. Theory

The interaction between the economic growth and inflation rate is based on the determinants of output, denoted by ( $y$ ), and price level, denoted by ( $p$ ). Within our paper, key determinants includes exchange rate ( $e$ ), money supply ( $m$ ), public investment ( $g$ ), foreign capital ( $k$ ), world output ( $w$ ) and world price level ( $o$ ).

The determinants of output is as follows:

$$y = \alpha^y + \beta^{e,y} \cdot e + \beta^{m,y} \cdot m + \beta^{g,y} \cdot g + \beta^{k,y} \cdot k + \beta^{w,y} \cdot w + \beta^{o,y} \cdot o \quad (1)$$

In particular, the depreciation rate of domestic currency can raise the net exports, then, increases the domestic demand and correspondingly the output, given the Marshall-Lerner condition on the elasticity of export and import with respect to the exchange rate (Bahmani, Harvey and Hegerty, 2013). The money supply can also raises the output by lowering the interest rate and stimulating the domestic investment (Takahashi, 1971). The public investment is a type of government purchase, thus, enhance the domestic output by raising domestic aggregate demand (Clarida and Findlay, 2003). The foreign capital provides additional domestic investment, then, raising the domestic output (Prasad et al, 2007). Finally, the world output raises the demand for domestic goods then increases the domestic output while the world oil price raises the cost of production then decreases the domestic output.

The determinants of price level is as follows:

$$p = \alpha^p + \beta^{e,p} \cdot e + \beta^{m,p} \cdot m + \beta^{g,p} \cdot g + \beta^{k,p} \cdot k + \beta^{w,p} \cdot w + \beta^{o,p} \cdot o \quad (2)$$

In particular, the depreciation rate of domestic currency can raise the price of import, then, increases the domestic price level through the exchange rate pass-through effect (Gopinath et al, 2010). The money supply can also results in an increase of the price level according to the quantity theory of money (Friedman, 1989; Lucas, 1980). The public investment is a type of government purchase, thus, can raise the domestic price level through the fiscal theory of price level (Cochrance, 2001). The foreign capital provides additional foreign currency reserves, then, is expected to lead to an appreciation of domestic currency, then, lowering domestic price level (Sayek, 2009; Hung, 2021). Finally, the world output raises the demand for domestic goods then increases the domestic price level while the world oil price raises the cost of production then increases the domestic price level.

The trade-off that a higher economic growth rate is associated with a greater inflation rate, is due to the various determinants within our theoretical framework. In particular, an expansion of monetary supply or depreciation of domestic currency or an increase of public investment or a higher world economic growth rate raises both the economic growth and inflation rate.

The increase of output can be also accompanied by a decrease of price level. In details, an increase of foreign capital inflows or a decrease of world oil price can both raise economic growth and reduce the inflation rate. But the common feature of these two variables is the dependence on the world economy. Thus, for a small open economy like Vietnam, the domestic policy can not account for them to drive the economic growth and inflation rate.

### **3.2. Model**

The combination of the output (1) and price equations (2) can be expressed by a closed-form equation in the following Bayesian Structural Vector Autoregression (BSVAR) model with Time-Varying Coefficients (TVC):

$$y_t = A_{1,t}y_{t-1} + A_{2,t}y_{t-2} + C_tX_t + \varepsilon_t \quad (3)$$

where lag order of 2 is selected by the Akaike information criterion (AIC).

$y_t = (VN\text{gdp}_t, H\text{cpi}_t, VND_t, G\text{credit}_t, G\text{ginv}_t, G\text{fdi}_t)$  is a 6x1 vector of endogenous variables, namely the economic growth rate ( $VN\text{gdp}_t$ ), inflation rate ( $H\text{cpi}_t$ ), depreciation rate of domestic currency ( $VND_t$ ), credit supply growth rate ( $G\text{credit}_t$ ), public investment growth rate ( $G\text{ginv}_t$ ), and foreign direct investment growth rate ( $G\text{fdi}_t$ ).

$X_t = (W\text{gdp}_t, W\text{oil}_t)$  is a 2x1 vector of exogenous variables, namely the world economic growth rate ( $W\text{gdp}_t$ ) and the world oil price ( $W\text{oil}_t$ ),

Each of  $(A_{1,t}, A_{2,t})$  is a matrix of dimension 6x6. And the  $(C_t)$  is a matrix of dimension 2x2.

$\varepsilon_t = (\varepsilon_{1,t}, \varepsilon_{2,t}, \varepsilon_{3,t}, \varepsilon_{4,t}, \varepsilon_{5,t}, \varepsilon_{6,t})$  is a vector of residuals following a multivariate normal distribution:

$$\varepsilon_t \sim \mathcal{N}(0, \Sigma) \quad (4)$$

The VAR coefficients are assumed to follow the autoregressive process:

$$\beta_t = \beta_{t-1} + v_t, v_t \sim \mathcal{N}(0, \Omega) \quad (5)$$

The covariance matrix ( $\Omega$ ) is assumed to be a random variable endogenously determined by the model.

The parameters of interest to be estimated include the VAR coefficients  $\beta = \{\beta_1, \dots, \beta_T\}$ , the covariance matrix ( $\Omega$ ) for the shocks on the dynamic process, and the residual covariance matrix ( $\Sigma$ ). We employ the orthogonalized impulse responses with the Cholesky decomposition of the residual covariance matrix.

The TVC-BSVAR model is suitable for studying changing regimes of economic fundamentals. In Vietnam economy, after the implementation of controlled floating exchange rate regime in January 2016, both the mean and variance of the inflation rate reduces substantially. This class of model is employed by Cogley and Sargent (2001) for analyzing the switching regime of

economic fundamentals after World War II, and by Primiceri (2005) for examining monetary policy in the United States.

### 3.3. *Data*

The data is a time-series sample of Vietnam economy from the third quarter of 2008 to fourth quarter of 2020. The time-series structure is useful to investigate the fluctuation of macroeconomic fundamental in the Vietnam economy.

First, the economic growth rate on percentage, denoted by (*VNgdp*), is measured by the annual growth rate of real gross domestic product (GDP) in constant 2010 national price in domestic currency (VND - Vietnam Dong). This data is from the Vietnam General Statistics Office (GSO, 2022).

Second, the headline inflation rate on percentage, denoted by (*Hcpi*), is measured by the annual change of consumer price index (CPI). This data is also decomposed into three main indicators, including (i) the core inflation rate, denoted by (*Ccpi*); (ii) the energy inflation rate, denoted by (*Ecpi*); and (iii) the food inflation rate, denoted by (*Fcpi*). These variables are from the global inflation database, constructed by the World Bank (2022).

Third, the depreciation rate of domestic currency on percentage, denoted by (*VND*), is measured by the annual change of nominal exchange rate of Vietnam Dong compared with United States Dollar (USD). This data is from the State Bank of Vietnam (SBV, 2022).

Fourth, the growth rate of credit supply on percentage, denoted by (*Gcredit*), is measured by the annual change of domestic credit supply. This data is from the State Bank of Vietnam (SBV, 2022).

Fifth, the growth rate of public investment on percentage, denoted by (*Gginv*), is measured by the annual growth rate of government-financed investment. This data is from the Vietnam General Statistics Office (GSO, 2022).

Sixth, the growth rate of foreign direct investment on percentage, denoted by (*Gfdi*), is measured by the annual growth rate of disbursed value of foreign

direct investment. This data is from the Vietnam General Statistics Office (GSO, 2022).

Finally, the world economy is represented by the world economic growth rate, denoted by ( $Wgdp$ ), and the world oil price, denoted by ( $Woil$ ). The world growth rate is average value of economic growth rate of 8 economies which accounts for most of foreign trading of Vietnam. These economies are United States, Euro Area, Japan, China, Republic of Korea, Singapore, Taiwan and Thailand. These data are from the database of Federal Reserves Bank of St.Louis in United States (2022). And the world oil price is the brent oil price in USD, which is from Reuters database.

Table 1: Descriptive Statistics

Variable	Observations	Mean	Standard Deviation	Min	Max
Economic Growth ( $VNgdp, \%$ )	50	5.78	1.31	0.39	7.46
Headline Inflation ( $Hcpi, \%$ )	50	6.71	6.39	0.31	27.75
VND Depreciation ( $VND, \%$ )	50	3.02	3.14	-0.59	9.92
Credit Growth ( $Gcredit, \%$ )	50	17.43	8.09	4.95	39.45
Public Investment Growth ( $Gginv, \%$ )	50	14.84	21.45	-37.99	78.28
Foreign Direct Investment Growth ( $Gfdi, \%$ )	50	5.33	19.98	-57.65	61.11
World Economic Growth ( $Wgdp, \%$ )	50	3.81	2.77	-5.61	9.07
World Oil Price ( $Woil, USD$ )	50	75.98	26.32	33.38	118.49

Table 1 shows the descriptive statistics of the time-series sample. The economic growth rate has a high mean of 5.78% with a quite low standard deviation of 1.31%. Compared with this variable, the headline inflation rate has both a greater mean (6.71%) and standard deviation (6.39%) while the VND depreciation rate has a lower mean (3.02%) but with a greater standard deviation (3.14%). Among three sources of capital, the credit supply growth rate has a highest mean at 17.43% while the foreign direct investment growth rate has a greatest standard deviation at 21.45%. The world economic growth and oil price also exhibit a quite high deviation at 2.77% and 26.32 USD respectively. In brief, the data sample offers a large variation to explore the macroeconomic fundamentals in the Vietnam economy.

#### **4. Empirical Evidence**

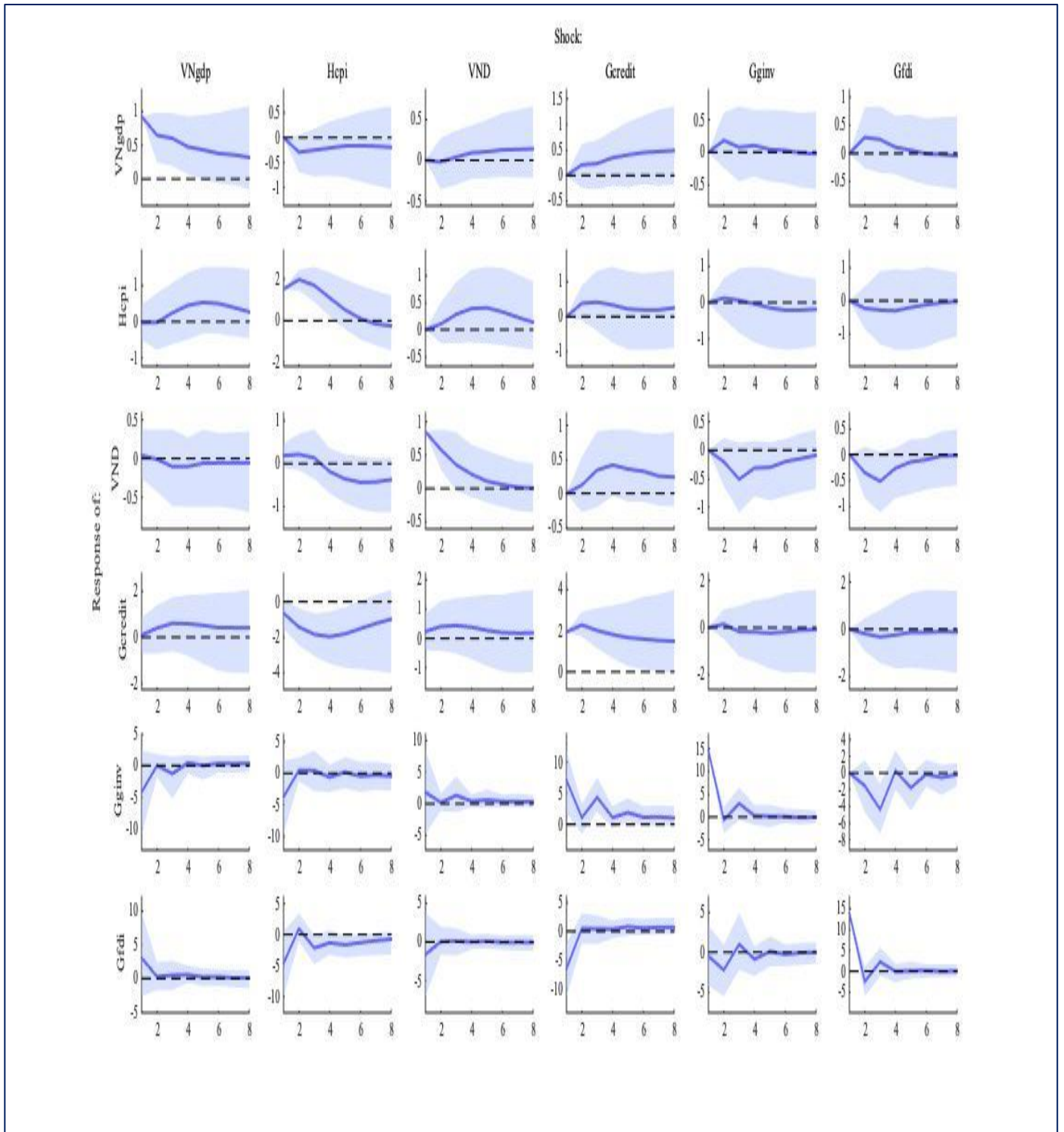
We analyze the inter-relationship between the economic growth and inflation rate, then, the combination of monetary and fiscal policy to enhance economic growth on stabilizing the inflation rate. These results are captured by the impulse response function (IRF) and forecasted error variance decomposition (FEVD).

##### ***4.1. Impulse Response Function***

The impulse response function records that the economic growth rate raises for a positive shock on the domestic credit supply, the domestic public investment or the foreign direct investment. First, the impact of credit supply exerts a long-term period. An increase of 1% in the credit supply raises the economic growth rate by 0.13% in the first quarter. The increase of economic growth tends to continue to get a peak of 0.5% in the tenth quarter. And the impact only dies out after 30 quarters (which is not shown in the figure). Second, the impact of public investment and foreign direct investment exists for several quarters. An increase of 1% in the public investment raises the economic growth rate by a peak of 0.2% in the second quarter. Then, the impact reduces and dies out after 5 quarters. Similarly, an increase of 1% in the foreign direct investment raises the economic

growth rate by 0.3% in the second quarter. Then, the impact reduces and dies out after 6 quarters.

**Figure 1: Impulse Response Function (IRF)**



Source: Estimated results from empirical model.

The inflation rate goes up for a positive shock on the domestic credit supply but goes down for a positive shock on the domestic public investment. The common feature is that all of three types of variables exert a long-term impact on the inflation rate. An increase of 1% in the credit supply raises the headline inflation rate by a peak of 0.11% in the first quarter. The increase of inflation rate tends to continue to get a peak of 0.4% in the third quarter. And the impact only dies out after 20 quarters (which is not shown in the figure). Moreover, an increase of 1% in the public investment results in the fluctuation of headline inflation rate, by first raising the inflation rate by a peak of 0.1% in the second quarter, followed by a trough of (-0.25%) in the sixth quarter. Then, the impact reduces and dies out after 10 quarters. Finally, an increase of 1% in the foreign direct investment reduces the headline inflation rate by (-0.25%) in the fourth quarter. Then, the impact reduces and dies out after 8 quarters.

For other variables, the IRF also uncovers interesting results. The depreciation rate of domestic currency tends to increase for a shock of 1% increase in the credit supply but decrease for a shock of 1% increase in the public and foreign investment. Thus, the monetary expansion destabilizes the domestic currency while the fiscal expansion stabilizes the domestic currency. Moreover, a shock of 1% increase in the foreign direct investment reduces both the domestic credit supply and the domestic public investment. Therefore, the foreign capital tends to crowd out the domestic capital which are based on the credit and public investment.

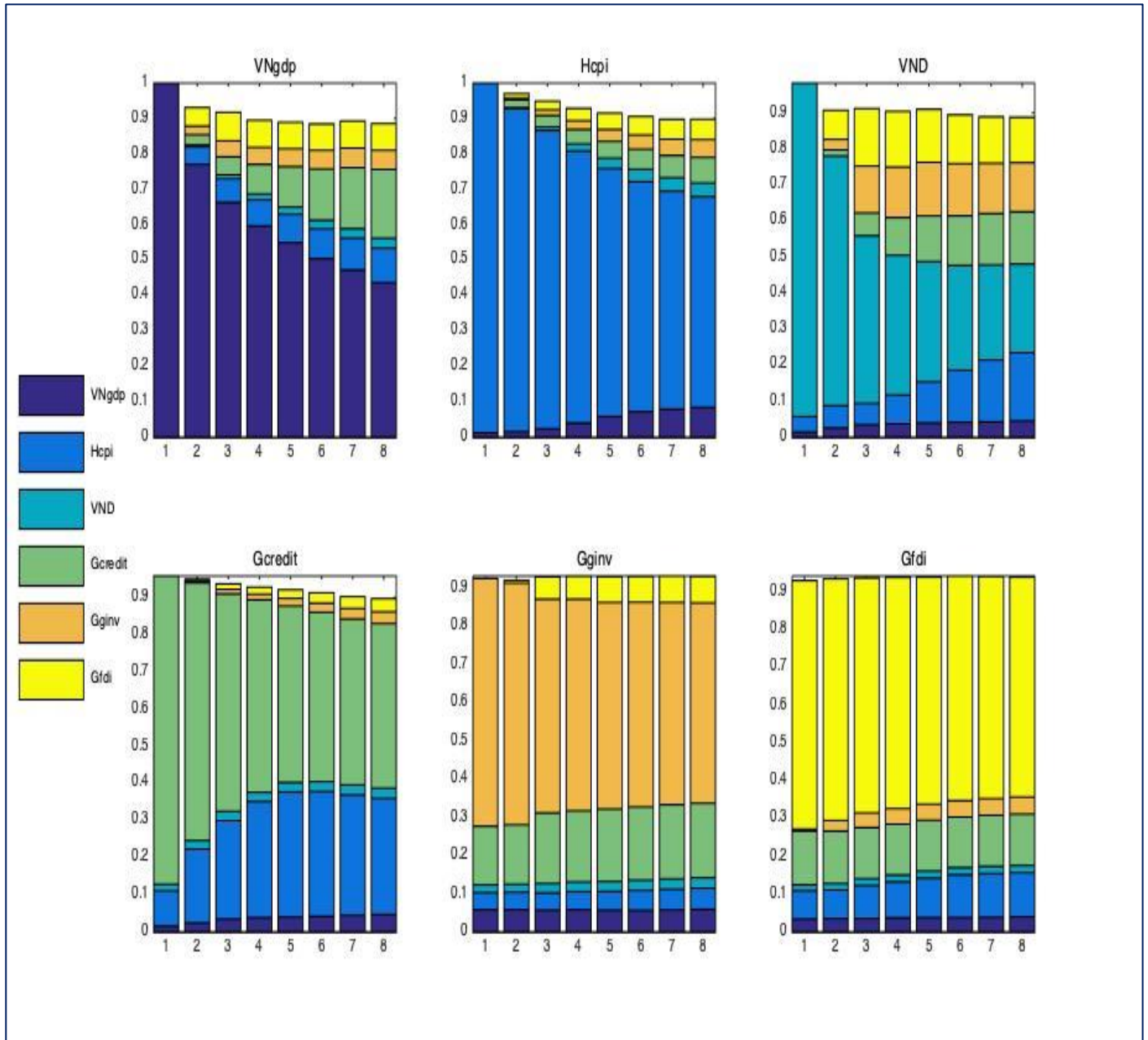
In brief, the IRF results show that the monetary policy, proxied by the domestic credit supply, can enhance the economic growth rate but impose the risk of higher inflation rate. The fiscal policy, proxied by domestic public investment, can both enhance economic growth and reduce the inflation rate. As an implication, these two policies can be combined to attain an objective of higher economic growth combined with stabilizing inflation rate.

#### ***4.2. Forecasted Error Variance Decomposition***



We investigate the relative role of each policy on the determination of macroeconomic fundamental variables. The evidence is shown by the forecasted error variance decomposition (FEVD) with a window of 8 quarters.

**Figure 2: Forecasted Error Variance Decomposition (FEVD)**



Source: Estimated results from empirical model.

The FEVD result illustrates that there exists a quite large persistency over time for both the economic growth and the inflation rate. This persistency, in turn, implies that the momentum in the past can play the most important role to forecast

the future value of both economic growth and inflation rate. As a result, it is difficult to reduce the economic growth and inflation rate while they are high as well as to raise the economic growth and inflation rate while they are low. For the average growth rate is high in the Vietnam economy (5.8% per quarter over 2008-2020), the evidence shows that when the growth rate changes its momentum, such as due to the current Covid-19 pandemic, the chance to recover quickly to its average value before the pandemic is quite limited. And for the inflation rate which is below 8% per quarter over 2008-2020, as long as the anchor of inflation expectation is firmly held, the policy of stabilizing inflation is effective.

In the decomposition of each macroeconomic variable, for the economic growth rate, the domestic credit supply plays the most important role, followed by the foreign direct investment inflows and then by the domestic public investment. For the inflation rate, a similar pattern holds in the sense that the domestic credit supply plays the most important role, followed by the foreign direct investment inflows and then by the domestic public investment. And for the depreciation rate of domestic currency, the foreign direct investment inflows play the most important role, followed by the domestic public investment, then by the domestic credit supply.

The decomposition evidence suggests that the domestic credit supply holds the most important role on stabilizing the macroeconomy. Compared with this variable, the foreign investment inflows also plays a crucial role with a less intensity while the domestic public investment seems be a weaker tool.

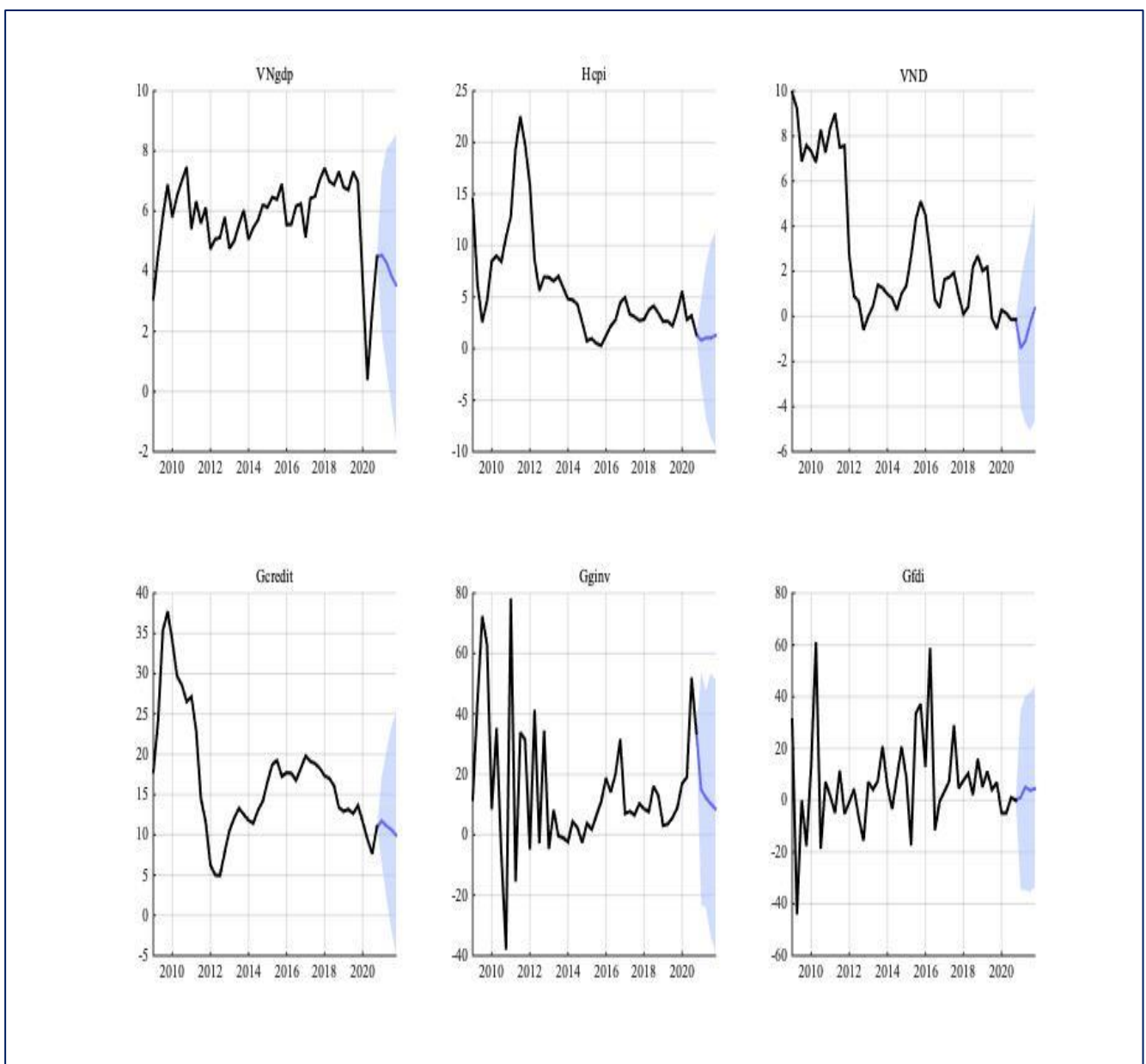
In summary, the IRF and FEVD evidence together uncovers that the domestic credit supply needs to be a prioritized tool to enhance the economic growth for its positive and large impact on the economic growth. But the credit supply also undermines a risk of higher inflation. To ensure against this risk, the public investment and foreign direct investment needs to be employed with an

appropriated magnitude. This combination of monetary and fiscal policy would be analyzed in the next subsection.

### 4.3. *Forecasting and Policy Simulation*

Next, we investigate the tendency of Vietnam economy when the world has a risk of global stagflation (Ha et al, 2022). This evidence can provide a guidance for the robustness analysis and associated policy for the Vietnam economy facing an exogenous world shock.

**Figure 3: Forecasting**



Source: Estimated results from empirical model.

We forecast the model for the situation when the world economy falls into the stagflation with a declining world economic growth rate and rising world oil price. This situation is motivated by the stagflation due to the world oil shock in 1970s. In our scenario, the world economic growth rate reduces by 1% per each quarter for 4 consecutive quarters. And the world oil price increase by 1 USD per each quarter for 4 consecutive quarters. Within this scenario, we want to observe the tendency of each macroeconomic variables, with a focal point on the economic growth and inflation rate, in the context of global stagflation.

The forecasting result shows that the domestic economic growth rate falls substantially while the domestic inflation rate stabilizes. In particular, the economic growth rate goes down continuously for 4 quarters with a total reduction of 1%. This reduction can rely on the evidence that the world economic growth rate has a large impact on the domestic growth, and the momentum of past domestic economic growth rate can contain the reduction within a quite low rate at 1% for one year. Moreover, the inflation rate is stable, that proves that the momentum of past inflation rate works stronger than the impact from the increase of world oil price. Therefore, the world stagflation would affect mostly the domestic economic growth rate.

The Vietnam economy can emphasize the monetary policy, based on the credit supply, to deal with the global stagflation. In particular, according to the impulse response function, an increase of 7.6% in the credit supply can raise the economic growth rate by 1.0%, which is equal to  $7.6 \times 0.13$ , in the first quarter. And the impact of this 7.6% increase in the credit supply can even enhance the economic growth over the next 30 quarters. But this increase of credit supply also raises the inflation rate by 0.83, which is equal to  $7.6\% \times 0.11$ , in the first quarter, and 3.04%, which is equal to  $7.6\% \times 0.4$ , in the third quarter. To curb this inflation risk, at the same time of credit supply policy implementation, the public investment can be raised by 12%, which is equal to  $3.04\% / 0.25$ . Alternatively, the foreign direct investment can also be raised by the same rate at 12%. The

effectiveness of public investment only applies in the medium-term with a peak attained in the sixth quarter while that of foreign investment realizes in the fourth quarter. In brief, fighting against the global stagflation needs a combination of monetary and fiscal policy with lagged effect in the Vietnam economy.

## **5. Conclusion**

The paper analyzes the inter-relationship between the economic growth and inflation rate in the context of one small open economy as Vietnam. The analysis employs a vector structural model with a quarterly data sample over 2008-2020 period. Our evidence records that a trade-off between growth and inflation exists for an increase of credit supply but this trade-off is mitigated for an increase of public investment or more foreign capital inflows. If the world economy falls into stagflation with a declining growth and a hike in oil price, the Vietnam economic growth reduces but its inflation rate is stabilized.

To enhance the economic growth and stabilize the inflation rate, the public policy can combine an increase of credit supply growth rate with an increase of public investment. The monetary policy can raise both the economic growth and inflation rate while the fiscal one has a modest effect on the economic growth but a great effectiveness on reducing the inflation rate. If the world economic growth reduces by 1% per quarter and world oil price raises by 1 USD per quarter for 4 consecutive quarters, the domestic credit supply growth needs to be raised by 7.6% combined with an increase of public investment by 12%.

For future research avenues, the empirical model can be extended to account for the global financial cycle which is currently proved to be important to drive the whole world economy (Miranda-Agrippino and Rey, 2020). In the new model, the impact of world economic growth and oil price on the domestic macroeconomy can depend on the position that the world and domestic economy stays during their financial cycle.

## References

Amiti, Mary, Patrick McGuire, and David E. Weinstein. "International bank flows and the global financial cycle." *IMF Economic Review* 67.1 (2019): 61-108.

Argimon, Isabel, Jose M. Gonzalez-Paramo, and Jose M. Roldan. "Evidence of public spending crowding-out from a panel of OECD countries." *Applied Economics* 29.8 (1997): 1001-1010.

Badinger, H. (2009). Globalization, the output–inflation tradeoff, and inflation. *European Economic Review*, 53(8), 888-907.

Bahmani, Mohsen, Hanafiah Harvey, and Scott W. Hegerty. "Empirical tests of the Marshall-Lerner condition: a literature review." *Journal of Economic Studies* (2013).

Ball, L., Mankiw, N. G., Romer, D., Akerlof, G. A., Rose, A., Yellen, J., & Sims, C. A. (1988). The new Keynesian economics and the output-inflation trade-off. *Brookings papers on economic activity*, 1988(1), 1-82.

Behera, Jaganath, and Alok Kumar Mishra. "The recent inflation crisis and long-run economic growth in India: An empirical survey of threshold level of inflation." *South Asian Journal of Macroeconomics and Public Finance* 6.1 (2017): 105-132.

Blanchard, O. J. (1989). A traditional interpretation of macroeconomic fluctuations. *The American Economic Review*, 1146-1164.

Borensztein, Eduardo, Jose De Gregorio, and Jong-Wha Lee. "How does foreign direct investment affect economic growth?." *Journal of international Economics* 45.1 (1998): 115-135.

Brunnermeier, M. K., & Sannikov, Y. (2014). A macroeconomic model with a financial sector. *The American Economic Review*, 104(2), 379-421.

Brunnermeier, Markus K., Sebastian A. Merkel, and Yuliy Sannikov. The fiscal theory of price level with a bubble. No. w27116. *National Bureau of Economic Research*, 2020.

Cerutti, Eugenio, Stijn Claessens, and Andrew K. Rose. "How important is the global financial cycle? Evidence from capital flows." *IMF Economic Review* 67.1 (2019): 24-60.

Cochrane, John H. "Long-term debt and optimal policy in the fiscal theory of the price level." *Econometrica* 69.1 (2001): 69-116.

Devereux, Michael B., and Charles Engel. "Exchange rate pass-through, exchange rate volatility, and exchange rate disconnect." *Journal of Monetary Economics* 49.5 (2002): 913-940.

De Gregorio, José. "Commodity prices, monetary policy, and inflation." *IMF Economic Review* 60.4 (2012): 600-633.

Easterly, William, and Sergio Rebelo. "Fiscal policy and economic growth." *Journal of Monetary Economics* 32.3 (1993): 417-458.

Friedman, Milton. "Quantity theory of money." *Money*. Palgrave Macmillan, London, 1989. 1-40.

Fisher, Eric. "A model of exchange rate pass-through." *Journal of International Economics* 26.1-2 (1989): 119-137.

Gali, J., & Monacelli, T. (2005). Monetary policy and exchange rate volatility in a small open economy. *The Review of Economic Studies*, 72(3), 707-734.

Gerlach, Stefan, and P. E. N. G. Wensheng. "Output gaps and inflation in Mainland China." *China Economic Review* 17.2 (2006): 210-225.

Gopinath, Gita, Oleg Itskhoki, and Roberto Rigobon. "Currency choice and exchange rate pass-through." *The American Economic Review* 100.1 (2010): 304-36.

Ha, Jongrim, M. Ayhan Kose, and Franziska Ohnsorge. "Global Stagflation." *Koç University-TUSIAD Economic Research Forum Working Papers*. No. 2204. Koc University-TUSIAD Economic Research Forum, 2022.

Hicks, John. "IS-LM: an explanation." *Journal of Post Keynesian Economics* 3.2 (1980): 139-154.

Hung, L. D. (2021). Output-inflation trade-off in the presence of foreign capital: Evidence for Vietnam. *South Asian Journal of Macroeconomics and Public Finance*, 10(2), 179-192.

Imai, Hiroyuki. "Output-Inflation Tradeoff in China." *The Developing Economies* 35.2 (1997): 111-141.

Justiniano, A., Primiceri, G. E., & Tambalotti, A. (2013). Is there a trade-off between inflation and output stabilization?. *American Economic Journal: Macroeconomics*, 5(2), 1-31.

Lucas, R. E. (1973). Some international evidence on output-inflation tradeoffs. *The American Economic Review*, pp 326-334.

Lucas, Robert E. "Two illustrations of the quantity theory of money." *The American Economic Review* 70.5 (1980): 1005-1014.

Miranda-Agrippino, S., & Rey, H. (2020). US monetary policy and the global financial cycle. *The Review of Economic Studies*, 87(6), 2754-2776.

World Bank (2022). Global economic prospects report: Stagflation Risk Rises Amid Sharp Slowdown in Growth. Retrieved from <<https://www.worldbank.org/en/news/press-release/2022/06/07/stagflation-risk-rises-amid-sharp-slowdown-in-growth-energy-markets>>.



Obstfeld, M., Ostry, J. D., & Qureshi, M. S. (2019). A tie that binds: Revisiting the trilemma in emerging market economies. *The Review of Economics and Statistics*, 101(2), 279-293.

Prasad, Eswar S., Raghuram Rajan, and Arvind Subramanian. "Foreign Capital and Economic Growth/Comments and Discussion." *Brookings Papers on Economic Activity* 1 (2007): 153.

Sayek, Selin. "Foreign direct investment and inflation." *Southern Economic Journal* 76.2 (2009): 419-443.

Scheubel, Beatrice, Livio Stracca, and Cedric Tille. "Taming the global financial cycle: What role for the global financial safety net?." *Journal of International Money and Finance* 94 (2019): 160-182.

Sims, Christopher A. "Stepping on a rake: The role of fiscal policy in the inflation of the 1970s." *European Economic Review* 55.1 (2011): 48-56.

Solow, R. M. (1956). A contribution to the theory of economic growth. *The Quarterly Journal of Economics*, 70(1), 65-94.

Swan, Trevor W. "Economic growth and capital accumulation." *The Economic Record* 32.2 (1956): 334-361.

Takahashi, Fusaji. "Money supply and economic growth." *The Econometrica: Journal of the Econometric Society* (1971): 285-303.

Vietnam General Statistics Office (2022). Monthly Economic-Social Report. Retrieved from <[www.gso.gov.vn](http://www.gso.gov.vn)>.