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Analysis of factors affecting inflation in Vietnam during the COVID-19 pandemic

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Abstract

During the COVID-19 pandemic, countries have faced various economic repercussions, including high inflation rates. By employing the autoregressive distributed lag approach and autoregressive distributed lag bounds test, this study aims to estimate the impact of macroeconomic factors and the factors related to COVID-19 on inflation in Vietnam from 2020 to 2022. The results show that both in the short and long term, factors such as FDI, short-term interbank interest rates, oil price index, real exchange rate, and import prices increase the inflation rate. By contrast, freight and carriage reduce inflation. Although the industrial production index has a negative impact in the short run, this impact is insignificant in the long term. The number of deaths, on the other hand, only has a positive impact on inflation in the long run. The findings of this study provide a foundation for future research seeking to expand the scope of factors influencing inflation. Additionally, this paper proposes recommendations to control inflation in Vietnam in the context of resuming economic activities after the pandemic.

Keywords: Inflation, COVID-19, ARDL, Vietnam

1. Introduction

The Coronavirus (COVID-19) pandemic has significantly affected the global economy, leading to increased commodity prices and heightened inflation in numerous countries. For instance, the US consumer price index (CPI) in June 2021 reached its highest point in 13 years, with a 5.4% increase. In Europe, the European harmonized index of consumer prices rose by 0.4% in August 2021, resulting in the highest annual inflation rates in Poland, Lithuania, and Estonia at 5% (MOF, 2022). In Asia, South Korea experienced its highest-ever consumer inflation rate, jumping over 3.7% in December 2021 (ADB, 2021).

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Vietnam, as an open economy, has not been immune to the inflationary pressures brought about by the COVID-19 pandemic. Following the first reported case of COVID-19 in 2020, the country experienced significant fluctuations in commodity prices due to supply and demand factors. This led to a sharp increase in the inflation rate, reaching 6.43% in January, before subsiding to 5.41% in February 2020 (ADB, 2021).

This issue has posed challenges for macroeconomic policies, particularly in controlling inflation. Therefore, a systematic and comprehensive approach to determining the factors affecting inflation in Vietnam is important. Consequently, this study analyzes the impact of factors on inflation in Vietnam during the COVID-19 pandemic from 2020 to 2022. Based on the study's findings, recommendations are proposed to control inflation in Vietnam in the post-pandemic period.

The rest of this study is structured as follows. Section 2 provides a comprehensive review of previous studies relevant to the topic. Section 3 offers a detailed description of the research data utilized, the models applied, and the variables examined in the study. Sections 4 and 5 present the empirical findings and discuss the implications of these findings, highlighting their relevance to policy and practice. Finally, section 6 concludes the paper.

2. Literature review

Many scholars have tried to develop new variables and apply new models to estimate the effects of factors on inflation: macroeconomic variables such as exchange rates, interest rates, and money supply (Cologni and Manera, 2005; Kwon *et al.*, 2006; Tufail and Batool, 2013), consumer prices (oil prices, rice prices, gold prices) or institutional variation (Tufail and Batool, 2013; Ozsahin and Ucler, 2017; Santacreu and LaBelle, 2022), and variables related to the COVID-19 pandemic such as number of cases, number of deaths, precautionary saving and global supply chain (Apergis and Apergis, 2020; Seiler, 2020; Armantier *et al.*, 2021; Santacreu and LaBelle, 2022). According to previous studies, variables related to commodity prices, index variables (IIP, IMP, etc.), and those related to the COVID-19 pandemic have affected inflation in the short term. Concurrently, the group of institutional variables has an impact on inflation in the long term. Besides, macroeconomics influences inflation in both the short term and long term.

In Vietnam, many empirical studies have been conducted to analyze the factors affecting inflation with the combination of macroeconomic, commodity price, index, and institutional variables. Most studies generally mentioned factors such as exchange rates, money supply, interest rates, production factors, and oil prices. In addition to the appropriateness in explaining the causes of inflation, one of the reasons why these factors appear many times is the availability of data. Vietnamese scholars focus on factors related to aggregate demand, such as money supply, exchange rate, and interest rate (Vo *et al.*, 2000; Huynh and Vu, 2016; Pham *et al.*, 2020). Two factors related to aggregate supply are also mentioned: oil and rice prices (Pham, 2009; Nguyen and Nguyen, 2010; Nguyen and Tran, 2013; Nguyen and Nguyen, 2015).

Most previous empirical studies on factors affecting inflation have the following outstanding advantages. First, based on macroeconomic factors such as unemployment, expectations, exchange rates, money supply, interest rates, etc., more variables have been added to the inflation model, such as prices of commodities, index variables, institutional variables, and factors related to COVID-19. Secondly, the inflation models have also been improved to analyze the relationship between variables and inflation. From basic models, the following studies have continuously applied more advanced models such as vector autoregression (VAR), vector error correction model (VECM), autoregressive distributed lag (ARDL), artificial neural network (ANN), etc.

However, there are two main limitations that almost all previous studies have. The first limitation is that these studies have not clearly explained the impact of the variables mentioned in the research model. For instance, Cologni and Manera (2005) have not explained the relationship between monetary aggregate (M1), short-term interest rates, and inflation, and Nguyen and Nguyen (2010) have not clearly explained the impact of the budget deficit on inflation. The second one is the limitation of data, which is the main limitation of Vietnamese researchers. In particular, until now, no empirical research has been conducted in Vietnam analyzing the impact of variables related to the COVID-19 pandemic on the inflation rate.

Based on the advantages and limitations of prior studies, the variables were identified to include in the study: the exchange rate, interest rate, money supply, industrial production, and oil prices. Many previous studies have proven that these variables have significant impacts on inflation in Vietnam. In addition, the ADRL model was chosen, which is commonly used by other studies such as Kim (2001), Leheyda (2006), Nguyen and Nguyen (2015), Huynh and Vu (2016). This model is useful when describing economic and financial time series fluctuations and forecasting.

3. Research methods

3.1 Data

This study uses credible monthly data sources from January 2020 to February 2022. Consumer price index, foreign direct investment (billion USD), import prices (million USD), industrial production index, freight index, and carriage index are published monthly in the socio-economic report of the General Statistics Office (GSO). The real USD/VND exchange rate is published on the official website of the Asian Development Bank (ADB). The oil prices index is published on the World Bank (WB) official website. The short-term interbank interest rate in Vietnam and M2 money supply growth are published on the official website of the Census and Economic Information Center (CEIC). The number of deaths from COVID-19 in Vietnam is published on the official website of the World Health Organization (WHO).

Table 1 presents descriptive statistics for variables used in the model.

Table 1. Descriptive statistics for variables

Variables	Code	Obs.	Mean	Std. Dev.	Min	Max
Consumer price index	CPI	26	100.332	1.365	98.46	106.43
Real exchange rate	ER	26	23055.37	209.240	22679.68	23464.23
Short-term interbank interest rate	IR	26	2.482	0.793	1.11	4.22
M2 money supply growth	M2	26	5.054	3.585	0.76	14.53
Import prices	IMP	26	25001.32	4205.548	18587	31960.13
Industrial production index	IIP	26	103.215	13.428	78.9	143.62
Foreign direct investment	FDI	26	1.631	0.483	0.9	2.78
Oil prices index	OIL	26	101.206	2.534	97.03	109.86
Freight index	FREIGHT	26	101.796	9.813	80.4	131.70
Carriage index	CARRIAGE	26	103.442	31.237	36.3	216.40
Number of deaths from COVID-19 in Vietnam	DEATH	26	1544	2874.142	0.00	9903.00

Source: Authors' calculation

4. Research model

Based on theories about the inflation model and factors affecting inflation, the autoregressive distributed lag (ARDL) model was used to estimate the impact of macroeconomic factors and factors related to COVID-19 on inflation in Vietnam. The ARDL model has been used by many studies, such as Kim (2001), Leheyda (2006), Nguyen and Nguyen (2015), and Huynh and Vu (2016), to analyze the factors impacting inflation.

The ARDL model was employed in this study due to its following advantages. Firstly, this model is more robust and performs better for a small sample size of data, which is suitable for this research. Secondly, ARDL is a single-equation approach, which makes it easier to estimate the long-run relationship between variables. Lastly, the ARDL method may tolerate different lags in different variables, which makes the method very versatile. For all the above reasons, the ARDL model was chosen to estimate the impact of factors on the inflation rate in Vietnam during 2020-2022. The ordinary ARDL model can be written as follows:

$$\Delta CPI_t = \alpha + \delta_1 ER_{t-1} + \delta_2 IR_{t-1} + \delta_3 M2_{t-1} + \delta_4 FDI_{t-1} + \delta_5 IMP_{t-1} + \delta_6 IIP_{t-1} + \delta_7 OIL_{t-1} + \delta_8 FREIGHT_{t-1} + \delta_9 CARRIAGE_{t-1} + \delta_{10} DEATH_{t-1} + \sum_{p=1}^{n} \beta_1 ER_{t-p} + \sum_{p=1}^{n} \beta_2 IR_{t-p} + \sum_{p=1}^{n} \beta_3 M2_{t-p} + \sum_{p=1}^{n} \beta_4 FDI_{t-p} + \sum_{p=1}^{n} \beta_5 IMP_{t-p} + \sum_{p=1}^{n} \beta_6 IIP_{t-p} + \sum_{p=1}^{n} \beta_7 OIL_{t-p} + \sum_{p=1}^{n} \beta_8 FREIGHT_{t-p} + \sum_{p=1}^{n} \beta_9 CARRIAGE_{t-p} + \sum_{p=1}^{n} \beta_{10} DEATH_{t-p} + \varepsilon_t,$$

where α is the intercept; ε_t is the error; δ_1 to δ_{10} represent the long-term correlation coefficients; β_1 to β_{10} are the short-term correlation coefficients; p is the corresponding lag for the variables.

3.3 Variables in the ARDL model

The model's dependent variable is Vietnam's monthly consumer price index (CPI). CPI is one of the most commonly used inflation measures. According to the previous studies, Kwon *et al.* (2006), Nguyen and Nguyen (2010), and Nguyen and Tran (2013) used CPI as a dependent variable in the model estimating factors affecting inflation. The increase in CPI means a rise in the prices of commodities and leads to an increase in inflation.

The model includes ten explanatory variables, which are divided into two groups of variables: (i) macroeconomic variables (the real exchange rate, interest rate, M2 money supply growth, FDI, import prices, industrial production index, and oil prices index); and (ii) variables related to the COVID-19 pandemic (the number of deaths from COVID-19 in Vietnam, freight index, and carriage index). Based on previous empirical research, Table 2 shows the expectations for the correlation between variables.

Table 2. Summary of the expectation sign

Variables	Code	Unit	Source	Expectation sign
Dependent variable				
Consumer price index	CPI		GSO	
Independent variable				
The macroeconomic variables				
The real exchange rate	ER	VND	ADB	+
Interest rate	IR	%	CEIC	+
M2 money supply growth	M2	%	CEIC	-
FDI	FDI	Billion USD	GSO	+/-
Import prices	IMP	Million USD	GSO	+
Industrial production index	IIP		GSO	-
Oil prices index	OIL		WB	+
The variables related to COVID-19				
Freight index	FREIGHT		GSO	-
Carriage index	CARRIAGE		GSO	-
The number of deaths from COVID-19 in Vietnam	DEATH	Case	WHO	+

Source: Author's compilation

The ARDL model process consists of five steps as follows: (i) applying the Dickey-Fuller test to check the order of integration of each variable, (ii) determining optimal lag selection, (iii) applying the ARDL bounds test, (iv) estimating the ARDL model, and (v) checking the accuracy of the model.

4. Research results

4.1 Results of Dickey-Fuller test

Table 3 shows that, at the 1% significance level, CPI turns out to be stationary I(0); the explanatory variables also turn out to be stationary I(0), including the industrial production index, foreign direct investment, freight index, carriage index, and oil prices index. The explanatory variables are stationary I(1): the real exchange rate, import prices, interest rate, M2 money supply growth, and the number of deaths from COVID-19 in Vietnam. According to Pesaran and Shin (1999), when the dependent variable stationary is I(0), and the explanatory variables are mixed-stationary, it is very suitable for the cointegration of the ARDL model.

Table 3. Results of Dickey-Fuller test

$Z_{(t)}$	T-test	1%	5%	10%	P-value	Conclusion
CPI	-11.653	-3.750	-3.000	-2.630	0.000	Stationary
ER	-0.660	-3.750	-3.000	-2.630	0.857	Not stationary
d_ER	-5.832	-3.750	-3.000	-2.630	0.000	Stationary
IIP	-6.529	-3.750	-3.000	-2.630	0.000	Stationary
M2	-2.698	-3.750	-3.000	-2.630	0.074	Not stationary
d_M2	-5.538	-3.750	-3.000	-2.630	0.000	Stationary
IMP	-2.206	-3.750	-3.000	-2.630	0.204	Not stationary
d_IMP	-6.135	-3.750	-3.000	-2.630	0.000	Stationary
FDI	-4.628	-3.750	-3.000	-2.630	0.000	Stationary
IR	-3.281	-3.750	-3.000	-2.630	0.016	Not stationary
d_IR	-7.224	-3.750	-3.000	-2.630	0.000	Stationary
FREIGHT	-5.041	-3.750	-3.000	-2.630	0.000	Stationary
CARRIAGE	-5.314	-3.750	-3.000	-2.630	0.000	Stationary
OIL	-3.866	-3.750	-3.000	-2.630	0.002	Stationary
DEATH	-2.171	-3.750	-3.000	-2.630	0.217	Not stationary
d_DEATH	-4.518	-3.750	-3.000	-2.630	0.000	Stationary

Source: Authors' calculation

4.2 Determine optimal lag selection

Based on the criteria of FPE, AIC, HQ, and SC, the optimal lag length of this model is 2, which coincides with the proposal of Pesaran and Shin (1999). According to these researchers, the Schwarz information criterion (SC) is the best for the model with small samples (about 25 observations). Therefore, this study applies the SC in the research model. VAR estimation was used to determine the optimal lag based on the SC standard. Finally, the results indicated that the best model for the monthly data is ARDL (2,2,1,2,2,2,1,2,2,2,2).

4.3 ARDL bounds test

The results of the ARDL bounds test show that the F-value is seen to be greater than the values in the upper bound at all significance levels. Consequently, there is a correlation between several time series in the long term.

Table 4. Results of ARDL bounds test

F = 30.328	**[I_0]**	**[I_1]**	**[I_1]**	**[I_1]**	**[I_1]**	**[I_1]**	**[I_1]**	**[I_1]**
t = 2.969	**L_1**	**L_1**	**L_05**	**L_05**	**L_025**	**L_025**	**L_01**	**L_01**
k = 10	1.83	2.94	2.06	3.24	2.28	3.50	2.54	3.86
	-2.57	-4.69	-2.86	-5.03	-3.13	-5.34	-3.43	-5.68

Source: Authors' calculation

4.4 Regression results of the ARDL model

Table 5 shows that the explanatory variables such as the real exchange rate, interest rate, FDI, import prices, oil prices index, and the number of deaths from COVID-19 in Vietnam have positive correlations with inflation at a significance level of 5%. In addition, the freight index has negative correlations with inflation in both the short and long term. Particularly, the carriage index only affects inflation in the short term, while the industrial production index only affects inflation in the long term. Besides, the result shows that from 2020 to 2022, M2 money supply growth did not impact Vietnam's inflation.

Table 5. Regression results of the ARDL model

Variable	**Coefficient**	**Std. Error**	**t-statistic**	**Prob.**
Long Run				
d_ER	0.015	0.003	4.55	0.010
IIP	-0.053	0.014	-3.73	0.020
d_IMP	0.000	0.000	3.47	0.025
FDI	2.127	0.722	2.95	0.042
d_IR	1.570	0.464	3.38	0.028
d_M2	0.003	0.044	0.08	0.940
FREIGHT	-0.370	0.107	-3.50	0.025
CARRIAGE	-0.036	0.014	-2.48	0.068
d_DEATH	0.000	0.000	0.49	0.647
OIL	0.157	0.552	2.85	0.046
Short Run				
d_ER(-1)	0.003	0.000	5.78	0.004
d_IMP(-1)	0.000	0.000	6.82	0.002
FDI(-1)	0.700	0.150	4.65	0.010
d_IR(-1)	0.164	0.050	3.25	0.031

Table 5. Regression results of the ARDL model *(continued)*

Variable	Coefficient	Std. Error	t-statistic	Prob.
FREIGHT(-1)	-0.171	0.017	-9.65	0.001
CARRIAGE(-1)	-0.036	0.004	-9.09	0.001
d_DEATH(-1)	0.000	0.000	3.62	0.022
OIL(-1)	0.057	0.020	2.77	0.050
R-Squared	0.995		DW-statistic	2.087
R-Bar-Squared	0.974		S.D. of Dependent Variable	1.527
S.E. of Regression	0.116		Log-likelihood	39.083
Mean of Dependent Variable	2.474		Schwarz Bayesian Criterion	-14.606
Residual Sum of Squares	0.054		F-statistic	30.200
Akaike Info. Criterion	-38.167		Prob (F-statistic)	0.002

Source: Authors' calculation

4.5 Results of testing the model's accuracy

After estimating the ARDL model, the model's accuracy was checked through the Ramsey, Breusch-Pagan, and Durbin-Watson tests. Table 6 shows that the model is correctly specified. In addition, the residuals are not heteroskedastic and not serial correlated.

Table 6. Results of testing the model's accuracy

Test	P-value	Conclusion
Ramsey test	0.857	The model is correctly specified
Breusch-Pagan test	0.709	The residuals are not heteroskedastic
Durbin-Watson test	2.087	The residuals are not serially correlated

Source: Authors' calculation

5. Discussion

After applying the ARDL model, six variables were found to have a positive impact on inflation. In particular, there were five factors as usual cases (FDI, interest rates, oil prices index, real exchange rates, and import prices), and the number of deaths from COVID-19 in Vietnam is the factor as an unusual case.

FDI has the most significant impact on the inflation rate in Vietnam; specifically, a 1% increase in FDI will cause CPI to increase by 0.7% in the short term and 2.12% in the long term. This result shows that using the foreign direct investment variable in the inflation research model in Vietnam is completely appropriate and reliable. The increase in FDI leads to the rise in imports of machinery and equipment, which pushes up the demand for foreign currency. As a result, the domestic currency has decreased in value, thereby increasing the inflation rate. This result is consistent with the opinions of Sayek (2009) as well as Do *et al.* (2020). During the first six months of 2020, the FDI in Vietnam increased sharply from 900 million USD in February to 1.950 million USD in June, which pushed up the USD/VND exchange rate and led to the rise of inflation from 2.406% to 3.173% (ADB, 2022).

The short-term interbank interest rate in Vietnam has a positive impact on inflation. If the interest rate increases by 1% in the short term, the CPI will increase by 0.16%. In the long term, a 1% increase in interest rate causes CPI to increase by 1.57%. This result is consistent with the opinions of Cologni and Manera (2005). The SBV reduced interest rates thrice in 2020 to support economic growth recovery and control inflation. These actions prove that lowering interest rates positively affects the country's currency, which contributes to reducing the domestic inflation rate.

The oil prices index has a positive correlation with inflation. A 1% increase in the oil prices index will cause CPI to increase by 0.06% in the short term and 0.16% in the long term. This result is consistent with Cologni and Manera (2005) and Pham (2009). Oil prices drive up the price of goods in circulation and generate inflationary pressure in Vietnam. From April 2020 to June 2020, crude oil prices rose from 21.04 USD to 39.46 USD, increasing inflation (WB, 2021).

The real exchange rate and import prices positively correlate with Vietnam's inflation. These results coincide with the proposal of Kim (2001), Nguyen and Nguyen (2010), Nguyen and Tran (2013). The real exchange rate increase shows that the domestic currency depreciates in the real term, encouraging exports. However, Vietnam's exports depend mainly on imported materials, whereas the rise in import prices and the simultaneous price increase during the pandemic caused cost-push inflation. Therefore, the influence of these variables on inflation during the period 2020-2022 is relatively weak. In fact, except for the first four months of 2020, the exchange rate was relatively stable in 2020-2021. This results from managing the exchange rate policy of the State Bank of Vietnam.

The number of deaths from COVID-19 in Vietnam, which is an unusual factor, also has a positive impact on inflation. This result is consistent with Apergis and Apergis (2020), Yuniarti *et al.* (2021), Santacreu and LaBelle (2022). The results show that a 1% increase in the number of deaths due to COVID-19 leads to a 001% increase in CPI in the short term. In general, the number of deaths due to COVID-19 did not have a direct impact on inflation in Vietnam. However, it will indirectly impact the supply and demand of goods, services, and expectations, which puts upward pressure on inflation. After Vietnam recorded the first case of COVID-19, consumer demand for food products and medical supplies increased sharply, especially the price of drugs and medical equipment increased by 1.35% in 2020 (GSO, 2022).

Four variables negatively impact inflation, in which the industrial production index and M2 money supply growth are considered usual factors, and the freight index and carriage index are considered unusual factors. The freight index negatively correlates with inflation in both the short-term and long-term. Specifically, a 1% decrease in the freight index will cause CPI to increase by 0.17% in the short term and 0.38% in the long term. The result shows that the freight index is one of the variables that has a relatively strong impact on inflation. Because of social distance during the pandemic, the freight index dropped sharply and caused scarce commodities. In this situation, commodity prices will rise due to increased purchasing demand, which puts pressure on inflation. During the first six months of 2020, Vietnam's

freight index decreased due to the lockdown policy, which caused supply chain disruption. At the same time, the demand for goods increased sharply; for example, worldwide rice prices rose 5.79% compared to the previous year (GSO, 2022).

Two explanatory variables (carriage and industrial production indices) correlate with Vietnamese inflation. However, the carriage index only affects inflation in the long term, while the industrial production index only affects inflation in the short term. The result of the industrial production index aligns with Pham (2009), Nguyen and Nguyen (2010), and Pham *et al.* (2020). Like the freight index, the decrease in carriage and industrial production indices will lead to scarce commodities because of shrinkage in the supply chain and supply of goods. The imbalance in aggregate supply and demand causes demand-pull inflation.

Besides, the ARDL model results show that M2 money supply growth does not impact Vietnamese inflation during 2020-2022. This result is consistent with the opinions of Vo *et al.* (2000), Leheyda (2006), Nguyen and Tran (2013) but conflicts with those reported previously in the research of Pham (2009), Nguyen and Nguyen (2010), Santacreu and La Belle (2022).

6. Conclusions

This study uses monthly data from January 2020 to February 2022 of the dependent variable (CPI) and ten explanatory variables to estimate the impact of factors on Vietnam's inflation. Applying the ARDL model and related tests, the results show that FDI, interest rate, oil price index, and freight index have significant effects on inflation in both the short and long term. The increase in interest rate, FDI, and oil prices index leads to higher inflation. By contrast, the increase in the freight index reduces the inflation rate.

In addition, the real exchange rate, import prices, and the number of deaths from COVID-19 in Vietnam positively correlate with Vietnamese inflation. However, the influence of these variables on inflation is relatively weak. The result shows that the industrial production index only affects inflation in the short term, while the carriage index only affects inflation in the long term. Besides, the growth of the M2 money supply has no impact on the inflation rate during the research period.

The results achieve an accuracy level of 99.55%, which means the model is completely appropriate and meaningful. However, the study still has some limitations when the number of observations is small, and the group of institutional variables in the model is not mentioned due to data limitations. Subsequently, this paper contributes to developing premises for future studies to expand the groups of variables in the inflation estimation model in Vietnam. Future research groups may consider using institutional variables in the model and expand the scope of research to increase the accuracy of the model.

Based on the findings drawn from this study, some solutions are suggested to control inflation in Vietnam in the context of resuming economic activities following a pandemic.

First, this study suggests solutions regarding domestic gasoline and oil prices. The government has policies to support businesses, such as reducing VAT by 2% and lending capital

for production and business (GSO, 2022). To deal with the complicated and unpredictable development of the COVID-19 pandemic, firstly, the Vietnamese government should reduce taxes and fees related to gasoline prices, particularly environmental protection taxes. Secondly, in addition to lowering taxes and fees, it is necessary to calculate and quickly change the form of the petroleum business from direct trading to indirect trading in the long term, such as oil spot prices, oil options, and oil futures. Buying and selling gasoline and oil at a predetermined price will help minimize risks for buyers and sellers when gasoline and oil prices suddenly increase or decrease. Thirdly, we need to discover and create a stable and sustainable supply of petroleum. As previously mentioned, the COVID-19 pandemic has disrupted the supply chain, leading to a scarcity of goods. Therefore, it is important to have a comprehensive solution to ensure an adequate long-term supply of petroleum for the economy.

Second, this study suggests solutions regarding interest rates. This study suggests solutions to manage interest rates through macro balances, inflation, and market development. It is necessary to persist with the principle of positive real interest rates to stimulate savings. Low interest rates would promote investment spending and economic growth after the pandemic. For the State Bank of Vietnam, it is necessary to manage policy interest rates to create conditions for credit institutions to access capital at low cost. In addition, the State Bank should direct credit institutions to balance their financial capacity and actively reduce operating costs. Finally, lending rates should be reduced to promote investment.

Third, this study suggests solutions for attracting quality FDI. In the context of limited capital supply and the impact of COVID-19, the following solutions are proposed to attract FDI to recover the economy. First, infrastructure needs to be changed more positively to attract investment. Vietnam needs to focus on finding measures to develop service industries and create motivation for increasing productivity in the service, production, and business sectors, as well as in many other areas of the economy. Additionally, we need to prepare the necessary conditions to attract investment, such as supplementing clean land funds, planning electricity, and training high-quality human resources. In addition, the government should complete the legal framework and investment policy, and develop regulations and standards to select FDI investors with advanced technology that can withstand external pressure for sustainable development and national security.

Finally, this study suggests solutions for disease control. In general, in the first four months of 2022, the COVID-19 pandemic in Vietnam has been controlled. The pandemic's decline will likely result in a sudden surge in demand for goods and services, accompanied by an increase in payments. On this basis, the following solutions are suggested to control diseases in parallel with curbing domestic inflation. The first solution is to implement a nationwide vaccination to minimize COVID-19 infections in the community. The second solution is to reduce interest and service fees to support disadvantaged groups after the pandemic. The government needs to implement policies to support people and businesses in overcoming difficulties after the pandemic. Finally, the third solution entails closely monitoring the price movements of the most critical commodities and formulating plans to regulate supply and demand.

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