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THE IMPACT OF THE COVID-19 PANDEMIC ON INFLATION: THE CASE OF ASEAN-6 ECONOMIES

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Abstract – *The COVID-19 outbreak has significantly impacted the economies and financial systems of ASEAN countries, particularly the ASEAN-6. These nations are struggling with the virus's spread and assessing its economic consequences. The pandemic has halted global economic progress due to financial difficulties. Completing this impact assessment is crucial for revitalizing the ASEAN-6 economies and understanding the effects of the pandemic on fiscal strategies and society. This study highlights key factors such as policy rate (PR), gross domestic product (GDP), money supply (MS), and exchange rate (ER), all of which drive inflation. The empirical model utilizes a panel data regression model and uses time-series data from 2000 to 2022. Rising consumer exposure during the pandemic is linked to higher prices for goods and services in the region, contributing to inflationary pressures. A new challenge has emerged, requiring collaboration among ASEAN countries to control inflation effectively. Governments have implemented various strategies, focusing on interest rates and monetary policies to alleviate the economic effects of COVID-19. These efforts include managing the impact on the consumer price index (CPI) to ensure economic stability and prevent excessive inflation. The pandemic has created inflationary pressures due to changes in currency rates and government policy rates. The study's findings offer valuable insights for the future development of financial policies in ASEAN-6 countries, helping them navigate inflation and stabilize their economies moving forward.*

Keywords: ASEAN-6, COVID-19, financial crisis, inflation, public finance.

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I. INTRODUCTION

The initial documentation of COVID-19 took place in Wuhan, China, in 2019. The COVID-19 pandemic later spread globally, starting in February 2020. The World Health Organization (WHO) declared COVID-19 a global pandemic on March 11, 2020, exerting significant impacts on global public health, economic and financial systems. Association of Southeast Asian Nations (ASEAN), along with nations worldwide, have undoubtedly experienced the financial repercussions of the COVID-19 crisis, as no nation is exempt from the effects of this pandemic. The pandemic has led to high inflation and low growth in the region, raising concerns about a prolonged period of stagflation. In most nations, inflation has surged to multi-year highs due to a resurgence in economic activity and a significant increase in supply chain disruptions. These repercussions manifest as challenges related to stability and economic growth that must be addressed. Inflation is considered a significant concern in many countries, garnering considerable attention, which will be examined in this paper. Inflation is widely regarded as a significant factor in assessing possible economic circumstances, particularly in the pursuit of sustainable economic growth, which remains a primary objective for all nations. The aforementioned COVID-19 scenario presents a significant obstacle to preserving the economic equilibrium of the ASEAN-6. Rising demand makes it imperative to uphold monetary stability and effectively control inflation to prevent excessive escalation of exchange rates in each country's system. The implications are as follows: 1) Research on the relationship between the inflation rate and the variables of money supply, gross domestic product, and government expenditure is highly interconnected; 2) It is clear that the inflation rate moves in the opposite direction of the loan interest rate; 3) The assessment of the economy and financial crisis in ASEAN countries is significantly influenced by inflation rate variability; 4) The effects of inflation on both society and the domestic economy have been observed during the ongoing pandemic, requiring government intervention. The objective of this study is to examine the determinants that impact inflation in ASEAN-6 and assess the consequences of rising inflation on the economy amidst the COVID-19 pandemic. The findings will serve as a valuable resource for financial policymakers in their analysis and formulation of economic strategies. The questions raised on these issues include: 1) What factors affected the inflation rate during the COVID-19 pandemic in ASEAN-6 countries? 2) How did these factors affect the inflation rate in the economies of the ASEAN-6 countries under study?

II. LITERATURE REVIEW

A. *Historical overview of inflation in ASEAN-6*

Inflation is a significant economic occurrence that has attracted considerable attention and has been the focus of intensive efforts to develop solutions. The result arises from the escalation in the prices of goods and services across many sectors. Specifically, inflation is caused by an excessive money supply [1] and exchange rate depreciation, researching the pandemic [2], and its impact on the evolution of economic and financial systems to demonstrate the survey's validity [3], which focuses on inflation targeting in developing countries [4]. The analysis examines the effect of the outbreak on regional economic forecasts and public concern arising from its expansion [5] and problem involving the balance of payments. In industrialized economies, the increase in the money supply leads to inflation. In developing economies that have developed infrastructure domestically, these inflations may come from excessive money supply, exchange rate depreciation, and the balance of payments crisis [6]. Inflation risks the economic growth of ASEAN [7]. High inflation is frequently linked to diminished economic growth and financial crises within nations. Therefore, this financial crisis makes it imperative to combat and sustain control over inflationary pressures [8]. The need to exercise prudent management of both public and private debt to mitigate the issue of unemployment and the labor market must generate viable work prospects for individuals. They also emphasize the existence of substantial real exchange rates and direct output spillover effects in ASEAN-6, with a focus on identifying the underlying causes of inflation. There is research evidence of significant inflation during the 1970s, which showed that alterations in monetary regimes had a substantial impact on the increase in inflation [9]. Furthermore, the result indicated negative impacts on the global economy, raising the possibility of a worldwide inflation crisis, and ASEAN member nations' responses to the government's financial policies toward the people. This study focuses on the technical aspects of inflation analysis employed to analyze the correlation between inflation and the degree of uncertainty over inflation [10]. ASEAN-6 countries' inflation shows that inflation rates have varied over the years, and the region has experienced significant inflationary pressures in recent times. The risks to inflation will continue to evolve based on domestic and global economic conditions. COVID-19's impact on inflation in ASEAN-6 nations has been significant, with various factors such as policy rates and exchange rates playing a role. According to a study during the COVID-19 pandemic, only monetary policy and financial activities had a major negative impact on consumer price index (CPI) in ASEAN-6 countries [11].

The WHO has urged governments to enforce

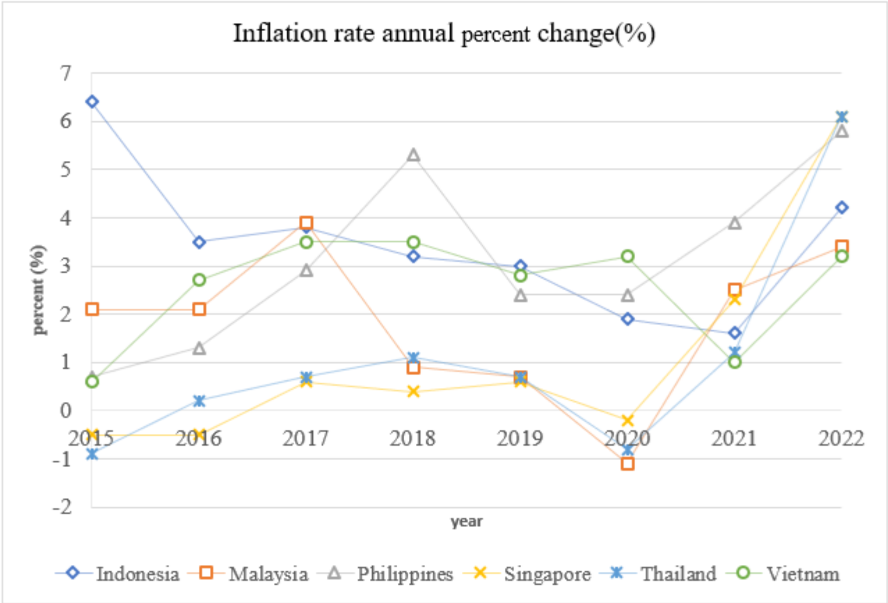

Fig. 1: Inflation rate and average consumer prices in ASEAN-6 countries (2015–2022) [12]

rigorous measures of social separation and quarantine protocols in order to mitigate the spread of the infection and ensure the protection of public health. Although, the international efforts to control the spread of SARS-CoV2 have been divided and incomplete, since its formal identification in Wuhan, China, in December 2019 [13]. The ASEAN-6 implemented various measures to mitigate the transmission of the COVID-19 virus and proactively address its potential consequences. However, these substantial responses were enacted on a national scale [14]. The national governments of the ASEAN member nations implement individualized national actions in response to the COVID-19 epidemic taking into consideration their distinct national interests. The economy of the ASEAN region is a collective entity. Currently, the economic indicators of the ASEAN economy are being analysis to assess the effects of COVID-19 on ASEAN at the national level [15]. This paper presents an analysis of the responses of the ASEAN at the regional level, as well as the responses of individual ASEAN member states, to the start of the COVID-19 epidemic. The government has also enforced border closures, travel restrictions, and quarantine measures, sparking fears of an economic and global financial crisis. The result of this study has a significant impact on education, social life, politics, the economy, and national security [16].

B. The effect of COVID-19 crisis on the inflation in ASEAN-6

The COVID-19 pandemic has significantly impacted inflation in both developed and developing countries, with distinct effects observed in Southeast Asia. The pandemic's influence on inflation can be attributed to various factors, including supply chain disruptions, changes in consumer behavior, and government interventions. In developed countries, the initial response to the pandemic involved substantial fiscal stimulus aimed at stabilizing economies. For instance, the United States implemented extensive financial support measures, which, while necessary to mitigate immediate economic shocks, contributed to rising inflation rates as demand surged post-lockdown [17, 18]. The combination of pent-up consumer demand and ongoing supply chain issues led to a notable increase in inflation, with many advanced economies experiencing inflation rates that exceeded pre-pandemic levels [19, 20]. The inflationary pressures were exacerbated by the geopolitical tensions arising from events such as the Russia-Ukraine conflict, which further strained global supply chains and increased commodity prices [21, 22]. In contrast, developing countries, particularly in Southeast Asia, faced a different set of challenges. The pandemic initially resulted in decreased economic activity, leading to lower inflation rates as demand plummeted. For example, studies indicated that the severity of COVID-19 outbreaks in countries like Indonesia correlated with reduced inflation, as lockdowns and restrictions curtailed consumer spending [23, 24]. However, as these economies began to recover, inflationary pressures emerged due to a combination of factors, including rising global commodity prices and local supply chain disruptions [25]. The inflation rates in Southeast Asia saw significant increases during the pandemic, particularly in 2020 and 2022, as the region grappled with both the health crisis and its economic ramifications [26, 27]. The psychological aspect of inflation also played a crucial role during the pandemic. Consumer expectations shifted dramatically, influenced by the uncertainty surrounding the pandemic and its economic fallout. This phenomenon, referred to as 'psychological inflation', reflects how consumers' perceptions of price changes can affect actual inflation dynamics [28]. In Southeast Asia, as in other regions, the pandemic altered consumer behavior, leading to increased volatility in inflation expectations and actual inflation rates [29]. Moreover, the impact of COVID-19 on inflation in Southeast Asia was compounded by external factors, such as the global economic recovery and supply chain disruptions. The region's reliance on imports for essential goods meant that rising global prices directly affected local inflation rates [30]. For instance, the inflation rate in Indonesia and other Southeast Asian countries rose significantly as the economy reopened and demand surged, coupled with persistent supply chain issues [30, 31]. The COVID-19 epidemic has significantly influenced the worldwide economy and government financial systems potentially leading to a recession. However, this impact could be mitigated by implementing measures such as providing financial compensation to companies and households affected by social distancing and lockdown policies. In addition, as mentioned the cost of essential health care to the severity of this situation can be assessed by the rate at which prices for goods and services are rising, along with a growth in unemployment and poverty [32]. This study holds significance in analyzing the equilibrium of interest rates, and the balance of payments such as inflation rate, exchange rate, and money supply within the community [33]. Each nation's economic structure is distinct and complex, making it challenging to understand and predict. The ASEAN-6 has enacted financial and institutional integration initiatives to realize the goal of becoming a cohesive ASEAN economic community. This endeavor has the potential to significantly influence economic growth [34]. Empirical research conducted in the 1970s corroborates the notion that inflation is linked to heightened uncertainty regarding future prices, and this concern intensifies as the inflation rate increases [35]. The COVID-19 crisis and the continuous rise in the inflation rate have also emphasized the challenges that developing country governments face in implementing basic policies to combat the dissemination of the COVID-19 illness, particularly in cities with high levels of poverty and a lack of income and inflation is still an issue in the ASEAN-6, especially in collecting CPI data and recommending that the average value of the index be calculated to depict spending habits during the epidemic [36]. Currently, ASEAN-6 is struggling with the negative consequences of inflation, which is increasing daily due to global economic changes. The effects of financial strain on the economy and the correlation between monetary policy and financial strain in the ASEAN-6 in terms of referred to as the inflation rate marginally higher than the situation as result in uncertainty, causing challenges for the economic system [37].

The empirical studies highlight the critical role of money supply, government interventions, and unique local factors. Wulandari [38] utilized a Panel Vector Autoregression (PVAR) model to analyze the effects of the pandemic on inflation in five ASEAN nations, revealing a substantial impact of the money supply on inflation rates, consistent with the economic principle that increased money supply typically leads to inflationary pressures. Similarly, Zhao et al. [39] emphasized that the pandemic's effects on financial markets varied between developed and developing economies, indicating that supply and demand disruptions were significant drivers of inflation across the region. Government responses to inflation during the pandemic were also crucial. Ridzuan et al. [40] examined the fiscal policies implemented by ASEAN countries, finding that monetary policy adjustments, such as interest rate changes in Malaysia and credit expansion in Vietnam, were essential for stabilizing inflation [39, 40] further supported this by demonstrating that accommodative policies in response to COVID-19 positively affected consumer price indices, underscoring the importance of coordinated policy measures [41]. Moreover, unique local factors influenced inflation in specific countries. For instance, while the money supply significantly impacted inflation in Malaysia and Indonesia, global commodity prices and local economic conditions were more pronounced in Singapore and Thailand, as indicated by Yahya [42]. This complexity illustrates that, despite a common inflationary challenge, the mechanisms and factors driving inflation varied across the ASEAN-6 countries, necessitating tailored policy responses to effectively manage inflation during the pandemic [42, 43]. This study shows that the inflation rate is influenced by exchange rate volatility and the amount of money circulating within society. Therefore, this study emphasizes the techniques employed for dealing with the difficulties encountered by every member nation within the ASEAN. The researcher expresses optimism that this work will contribute to the existing knowledge on ASEAN-6, particularly in terms of strategies to prevent disease and control the inflation rate in line with macroeconomic standards. Based on existing research, it is evident that the global economy has been adversely impacted by the COVID-19 epidemic. First, it is crucial to comprehend the significance of finances, system resilience, and the potential impact of a global inflation crisis. This is particularly relevant to government policies, such as exchange rates and policy rates. The inflation rate can influence production costs, consumer decisions, and foreign investor investment decisions. Therefore, this study endeavors to address the issue by employing available evidence to examine and assess the occurrences of the COVID-19 outbreak and its transmission. Additionally, these findings offer valuable insights for academic inquiry, facilitate informed research, and foster economic development within ASEAN-6 and the global community.

III. RESEARCH METHODS

A. *Research design*

The purpose of this research is to assess the impact of the COVID-19 pandemic on the ASEAN-6 countries of Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam between 2000 and 2022. This statistical modeling is used to analyze descriptive and quantitative data. These are used for descriptive analysis to describe the general situation of inflation in ASEAN countries, which is the quantity of money in circulation, the exchange rate, the gross domestic product (GDP), and the management strategy for COVID-19. This study method can provide a great understanding of processes, phenomena, and various viewpoints about the event. Moreover, it provides valuable insights into lessons regarding the dependability of the outcomes and the opportunities that may arise by examining economic metrics and management approaches. An economic statistic known as the GDP calculates the total worth of all products and services generated inside a nation's boundaries over a specific time period, the study focuses on determining if the present rise in prices of products and the COVID-19 pandemic may be to blame for services in the country. This study method can provide a great understanding of processes and phenomena and various viewpoints about the event provide valuable insights into lessons regarding the dependability of the outcomes and the opportunities that may arise by examining economic metrics and management approaches. Additionally, this study aims to uncover valuable insights into the reliability of outcomes and potential opportunities resulting from these complex phenomena. This scholarly pursuit enhances our comprehension of the complex economic processes within the COVID-19 pandemic period around the world.

B. Variable description and expected relationship result

The study's major goal is to discover the variables involved (CPI) in a manner that is correctly indicated and consistent with the conditions of inflation. Economic analysis regarding the monetary policy of the central bank to find the relationship and expectations of the increase or decrease of the future inflation rate in a strict technical framework using scientific analysis to help as Table 1. Therefore, these are good for creating knowledge to solve and prevent problems that will occur in the future.

C. Empirical model

In this study, the relationship between the stringency index (SI) of the COVID-19 crisis and the effect of the CPI in ASEAN countries is explored using panel data regression analysis involving the committee and the person responsible for maintaining strict standards. All regressions include country fix effects model to account for the unique characteristics of each country. Estimates are adjusted for economic and social constraints related to the COVID-19 pandemic as calculated by the SI of the COVID-19 as Equation (1).

$$CPI_{it} = \alpha + \beta_1 MS_{it} it + \beta_2 ER_{it} it + \beta_3 PR_{it} + \beta_4 SI_{it} + \beta_5 GDP_{it} + \varepsilon_{it} \quad (1)$$

Where:

Table 1: Variables description and expected relationship

Abbreviation	Description (based on source)	Expected result
Independent variable		
MS	Central banks and domestic financial institutions supply money to society for financial stability (Average in Unit)	+
ER	Exchange rates represent the exchange of one currency against another and contribute greatly to global trade and finance (Currency per U.S. Dollar)	–
PR	The central bank's policy rate is the interest rate at which the bank lends as a tool for managing the economy's money supply (Annual Percent)	+
SI	Measures to prevent the spread of the COVID-19 disease that affects society (Count from 0 to 100 indicates a stricter)	+
GDP	The monetary value of products and services produced in a country is calculated to reflect economic progress (Current international $)	–
Dependent variable		
CPI	Economic indicators by tracking changes in consumer prices and general services (Annual Percent)	

CPI_{it} is the consumer price index for country i at time t.

α_i represents the country-specific fixed effect, which captures time-invariant characteristics of each country that might influence CPI (such as institutional or geographic factors).

SI_{it} the Savings/Investment variable for country i at time t.

$log(ER_{it})$ is the log of the exchange rate for country i at time t, representing how currency fluctuations relate to CPI.

$log(GDP_{it})$ is the log of gross domestic product for country i at time t, representing economic output.

PP_{it} is the policy rate for country i at time t.

MS_{it} is the money supply for country i at time t.

β_1, β_2, β_3, β_4, β_5 are the coefficients estimating the impact of each independent variable on CPI.

ε_{it} is the error term, capturing the unobserved factors that change over time within each country.

Equation (1) reflects the fixed effect model (FEM), where the constant α_i varies across countries but remains constant over time for each country. By including these country-specific effects, the model controls for unobserved heterogeneity that could otherwise bias the estimates.

The model selection approach by using the Hausman statistic is calculated as Equation (2) [44].

$$H = (\hat{\beta}_{RE} - \hat{\beta}_{FE})'[Var(\hat{\beta}_{FE}) - Var(\hat{\beta}_{RE})]^{-1}(\hat{\beta}_{RE} - \hat{\beta}_{FE}) \quad (2)$$

Where:

$\hat{\beta}_{RE}$ and $\hat{\beta}_{FE}$ are the coefficient vectors from the random and fixed effects models, respectively. The covariance matrices for both estimators are used to determine the consistency and efficiency of the estimators.

In the context of the FEM, the Hausman test would help to decide whether to continue using FEM or switch to REM. If the country-specific effects (which remain constant over time but vary across countries) are correlated with the independent variables (like exchange rate, GDP, etc.), then FEM is the correct model. Otherwise, if these effects are not correlated, REM could provide more efficient estimates with less bias. After conducting the Hausman test, the results indicated a p-value less than 0.05, leading to the rejection of the null hypothesis. This suggests that the FEM is more appropriate, as the random effects model is inconsistent.

D. Data source

The COVID-19 pandemic's effect on the inflation rate in ASEAN countries, the outcomes of the research have provided an understanding of the economic policy to evaluate the impact of each variable, especially the CPI in the ASEAN countries. Therefore, the technical discussion of the relationship between the spread regarding the COVID-19 crisis and inflation is an indicator of the economic and financial policy across the ASEAN region as Table 2.

Table 2: Characteristics of variables

Variable	Unit	Mean	SD	Min	Max
Dependent					
Consumer price index (CPI)	%	3.61	3.50	-1.71	23.12
Independent					
Money supply (M2) (MS)	bil. USD	94.05	40.27	36.00	148.95
Exchange rate (ER)	USD/ currency exchange rate/Asean-6	1,871.33	4,246.89	1.25	14,849.85
Policy rate (PR)	%	4.04	2.78	0.18	15.00
Stringency index (SI)	%	50.66	15.90	21.08	72.81
Gross domestic product (GDP)	bil. USD	22,380.55	27,274.09	2,552.68	127,564.56

IV. RESULTS AND DISCUSSION

A. Results and interpretation

The model includes variables that reflect the effect of the COVID-19 outbreak on inflation as in Table 3. These are related to economic theory, the external effects of variables that can cause economic damage to inflation. The data encompasses the inflation rate of ASEAN-6 countries at different periods of the COVID-19 crisis, together with factors representing the impact of COVID-19 such as the SI variable as a determining factor. Stringency index (SI): Across all models, the coefficient for SI is negative in most cases but not statistically significant. The small coefficients (e.g., -0.029, -0.017, etc.) suggest that SI has little to no effect on the CPI, and the lack of statistical significance (p-values much greater than 0.05) means we cannot confidently say there is a relationship between SI and CPI in these models. Exchange rate (LogER): In Models 2 and 5, logER has a negative and statistically significant coefficient. For example, in Model 2, the coefficient is -5.789, significant at the 1% level ($p < 0.01$). This indicates that as the exchange rate increases (a depreciation of the local currency), CPI tends to decrease significantly, meaning currency depreciation is associated with lower inflation in these specific models. logGDP (gross domestic product): In Model 3, logGDP is negative but not statistically significant. However, in Model 5, the coefficient is -4.993, significant at the 5% level ($p < 0.05$), suggesting that an increase in GDP leads to a decrease in CPI. This might imply that higher economic growth is associated with lower inflation in certain contexts. Policy rate (PR): In Models 4 and 5, PR is positive and statistically significant at the 5% level and 1% level, respectively. For example, in Model 5, the coefficient is 1.322, significant at 1%. This suggests that higher PR is associated with an increase in CPI, possibly indicating that a higher policy rate or increased political risk leads to higher inflation. Money supply (MS): In Models 5 and 6, MS has very small coefficients, but it is statistically significant at the 1% level in both models. This suggests that even though the effect of money supply changes on CPI is small (close to zero), it is highly significant, indicating that it may still be an important factor in influencing inflation.

Table 3: The regression result using the fixed effect model for all model base

Variables	Model (1) CPI	Model (2) CPI	Model (3) CPI	Model (4) CPI	Model (5) CPI	Model (6) CPI
SI	-0.029	-0.024	-0.021	0.001	-0.017	0.019
	(0.015)	(0.012)	(0.012)	(0.014)	(0.018)	(0.011)
logER		-5.789**				-15.465*
		(2.045)				(5.446)
logGDP			-0.878			-4.993**
			(0.927)			(1.520)
PR				0.971*		1.322**
				(0.437)		(0.286)
MS					-0.000	0.000***
					(0.000)	(0.000)
Constant	3.807***	24.976**	12.100	-0.565	3.494***	88.183*
	(0.098)	(7.554)	(8.803)	(1.837)	(0.015)	(30.037)
Observations	138	138	138	124	87	83
R-squared	0.031	0.093	0.039	0.304	0.008	0.488
Number of country	6	6	6	6	4	4

The SI does not exert a substantial impact on the countries included in the sample's CPI. The SI is an all-inclusive index. created by aggregating data that can be regarded as a measure of the seriousness of the pandemic in a certain country at a specific point in time. The outbreak and circulation of the COVID-19 infection along with the frequency and severity of the lockdowns have raised concerns for developing economies. However, the findings suggest that the intensity of the pandemic does not exert a substantial influence on the CPI for the chosen nations.

The correlation between the exchange rate and the inflation rate in ASEAN-6 has a direct influence on the research results from analyzing statistics shown in Table 4. This is a case study in which the exchange rate increases by 1 percent of the exchange rate variable leading to a decrease in CPI of 15.465 percent at the 0.1 statistically significant level. This study demonstrates that changes in the exchange rate directly impact the rise in the prices of commodities and amenities, reflecting the fluctuations in the CPI. This research holds significant value for the central bank as it aids in determining the trajectory of the economy and effectively regulating inflation within the country. This indicates that the exchange rate is related to the COVID-19 crisis, the inflation rate was high and is an important economic indicator that plays a role in analyzing the promotion of the stability of the economic system.

Table 4: Estimation of FEM

Variable	Coefficient	Probability	Results
Stringency index	0.018	0.197	Not significant
Exchange rate	-15.465	0.066	Negative significant
GDP	-4.992	0.046	Negative significant
Policy rate	1.322	0.019	Positive significant
Money supply	1.04e-15	0.001	Positive significant

GDP variable does not exert a correlation between fluctuations in the proposed inflation rate. It is other control variables are omitted during economic expansion an increase in the GDP may not increase inflation. This study utilized supplementary data shown as a time series for the ASEAN-5 countries of Indonesia, Malaysia, the Philippines, Thailand, and Singapore between 2000 and 2016. These nations are recognized as the largest economies in Southeast Asia. indicating that there is currently no universally accepted approach for analyzing non-linear correlations between inflation and economic growth [45].

The policy rate of the central bank has used a strategy to adjust the policy rate to reduce the inflation rate that was too high during the COVID-

19 pandemic. Therefore. these affect directly the inflation rate in ASEAN-6. The central banks of ASEAN member countries have resolved the COVID-19 crisis by implementing fiscal support measures. These policies are designed to protect household income and consumption, protect employment, and support companies through emergency funding. Based on the findings of the statement analysis, this is a case study in which the policy rate increases in 1 percent of the policy rate variable lead to an increase in CPI is 1.322 percent at the 0.05 statistically significant level. This analysis emphasizes the significance of synchronizing the central bank's policy rate has increased due to the inflationary pressures observed in ASEAN countries during the COVID-19 pandemic. Policy adjustment will lead to a simultaneous increase in both products and domestic services. The inflation rate rise significantly influences the central bank's monetary policy orientation. Thorough analysis and prioritization of this matter by each nation's central bank is vital due to the direction impact on the government's endeavors to foster economic expansion.

The relationship between money supply and inflation may not have a direct impact on the economy's inflation rate with omitted control variables. The transmission of changes in the amount of money circulating in the economy and subsequent impact on pricing can be considered a time-consuming process. Consequently, alterations in the money supply may not yield an instantaneous impact on inflation to summarize. Although there is a theoretical link between the money supply and inflation, empirical evidence suggests that the relationship is not always straightforward. Several factors include money velocity, real production, other inflation-related factors, and time lags. Inflation can also be influenced by additional factors such as economic growth, the velocity of money, which forms the aggregate supply curve, and other economic conditions. The analysis revealed that a sustained expansion of the money supply leads to long-term inflation, while a continual growth in the money supply does not result in immediate inflation and this was examined using the theory of monetary quantity. Furthermore, the link between the rise of the money supply and inflation in China and Vietnam is 99.1 percent. The correlations exhibit a high degree of proximity [46]. This research has found empirical evidence indicating that the index of concentration and money supply does not possess the ability to accurately forecast the primary direction of inflation rate fluctuations. The findings suggest that variations in the money supply do not align with distinct oscillations in inflation and do not have an impact on inflation.

The money supply variable and the SI play an important role in statistical analysis, as they show the overall relationship with the variable by controlling for inflation using the stringency index. The results of the empirical model, which included all control variables in Model 6, show that the exchange rate, policy rate, GDP, and money supply become significant, allowing for the analysis of the effect of adding additional factors. The study not only produces academic results but also raises our awareness of the influence of monetary policy, pointing to the need to address inflation in the ASEAN-6 region.

B. Factors contributing to inflation in ASEAN-6

The inflation rate in the ASEAN-6 countries has been influenced by numerous causes during the COVID-19 pandemic. The virus's severity and the implementation of lockdown measures have hindered any alteration in consumer behavior within the supply chain, resulting in a rise in demand for products and services contributing to inflationary pressure. As the result of the study exchange rate fluctuations are significant as they directly affect the prices of products and services. The policies implemented by central banks, such as changes in policy rates and measures to provide financial support during the COVID-19 crisis, have had a substantial impact on inflation. This research is crucial for the central bank since it allows them to closely track the direction of the economy and effectively control the domestic inflation rate. These findings indicate that the

COVID-19 crisis has had a significant influence on both the exchange rate and the inflation rate. The exchange rate and policy rate of the central bank can be considered crucial economic indicators for evaluating the stability of the economic system. There is no discernible association between the GDP variable and the anticipated adjustment in the inflation rate.

Indonesia

Sasongko et al. [47] examined the impact of the currency rate and the impact of Indonesia's money supply on inflation during the COVID-19 pandemic, finding that the increase in the country's foreign debt and money supply effectively contributed to reducing inflation. The inflation rate in Indonesia is influenced by variations in money production. Inflation has been observed in the majority of locations in Indonesia with larger cities exhibiting a higher inflation rate than smaller cities. Indonesia is currently witnessing a decline in inflation as the sickness continues to spread. In July 2020, these experienced a decline of 0.01 percent. Other emerging market economies have experienced comparable repercussions from the pandemic. The producer inflation data reveals a decline in inflation rates, dropping from an annual rate of 4.2 percent in the third quarter of 2018 to 0.7 percent in the first quarter of 2020 and coinciding with the onset of the pandemic. Furthermore, it declined even lower to -0.7 percent in the second quarter of 2020. This suggests that the pandemic has had a significant impact on inflation. The causal correlation between currency exchange rates and inflation of money supply in Indonesia during the COVID-19 outbreak is unknown. However, inflation has become prevalent in the majority of locations in Indonesia, while the country's inflation rate demonstrates a declining pattern amongst the ongoing proliferation of the disease.

Malaysia

The research on the consequences of the COVID-19 pandemic Malaysia's money supply and inflation conducted by Suid [49] is essential for examining the financial crisis. The study

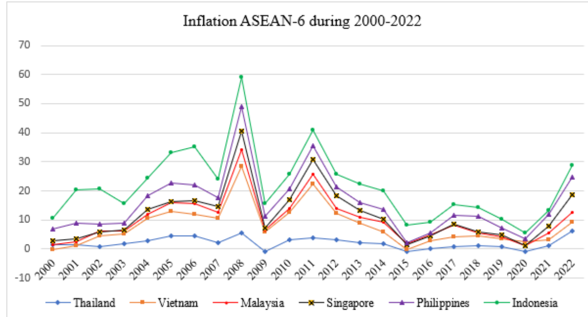

Fig. 2: Inflation rates in ASEAN-6 during 2000–2022 [48]

identified a clear and direct correlation between Malaysia's inflation and money supply. Cheng et al. [50] stated that the money supply is the main factor influencing inflation. They proved that the money supply expansion has a significant and positive effect on inflation, demonstrating that rising inflation is a direct result of rising money supply. The money supply in Malaysia is a major economic component that drives economic inflation; higher interest rates are expected to have a bigger effect on the demand for money (M1) than on the demand for money (M2). The Malaysian inflation rate may be impacted by fluctuations in exchange rates. In Malaysia, the link between the money supply and inflation is not always stable, these factors of unemployment during the pandemic and government expenditure can also impact inflation. In summary, the correlation between money supply and inflation in Malaysia is complex and dependent on various factors that contribute to inflation. The Malaysian government can conduct effective monetary policy measures to regulate inflation in Malaysia. The money supply in a particular economy was determined by the monetary policy that influenced economic activities. The money supply influenced interest rates through sales and the purchase of bonds to manage inflation.

Philippines

Conchada et al. [51] believe that the fluctuation in the money supply and GDP of the Philippines can impact the financial crises during the COVID-19 pandemic. The analysis has shown that the money supply has significantly increased to unprecedented levels due to the widespread spreading of the COVID-19 virus. Therefore, the limited availability of money leads to inflationary consequences that occur both in the short and long run. The Philippines saw strong economic growth with a GDP growth rate of 7.2 percent, despite facing numerous challenges posed by the COVID-19 pandemic. The easing of COVID-19 restrictions in 2022 results in a surge in expenditure on services. The level of income within a household plays a crucial role in promoting strong and sustainable economic growth. Anticipated factors driving the growth of the Philippine economy include a rise in domestic demand and the revival of services, particularly in the tourist industry. However, inflation in the Philippines has been rising in tandem with economic expansion. primarily driven by escalating energy costs. As a result, the CPI inflation rate rises. If the inflation rate remains high, the government may contemplate using supplementary measures to manage inflation by further modifying its monetary policy towards the public, and other factors like as global economic conditions, supply chain issues, and domestic demand may influence the effectiveness of monetary policy in managing inflation during the worldwide COVID-19 pandemic.

Singapore

The COVID-19 pandemic has affected Singapore's inflation, monetary aggregate, currency circulation, and foreign exchange rate [51]. The inflation rate plays a crucial role in Singapore's important developments and is impacted by the economy. In 2020, the governments enforced movement restrictions as a method of halting the spread of the COVID-19 pandemic. Individuals also reduced their participation in activities involving close physical contact as a means of safeguarding themselves against the infection. Consequently, there was a significant decrease in demand for services. leading to a reduction in consumer prices. Over forty years from 1981 to 2021, Singapore has consistently maintained a low inflation rate. averaging at 1.8 percent. However, there has been a 6.1 percent surge in consumer prices in 2022 when compared to previous periods. The Monetary Authority of Singapore (MAS) employs a distinctive methodology in the management of monetary policy. An alternative approach to altering a monetary system involves integrating the monetary value into a diverse portfolio of currencies and rather than depending solely on a single exchange rate. The COVID-19 crisis has significantly affected Singapore's economy. resulting in a large decrease in the demand for services compared to the ASEAN Association. The analysis reveals that the inflation rate in Singapore is impacted by factors beyond the money supply and the exchange rate are two examples. The rise in inflation may be influenced by various factors including global commodity price conflicts in multiple escalating salaries, rents, and government regulations. However, the management of inflation in Singapore is influenced by the availability of money and exchange rates. Consequently, the Singaporean government has implemented a policy aimed at ensuring the equilibrium and stability of domestic commodity prices.

Thailand

The COVID-19 pandemic in Thailand can exert an influence on inflation through the manipulation of the money supply and the implementation of policies issued by the Central Bank of Thailand [52]. Thailand is taking steps to restrain interest rates by increasing its primary interest rate by 200 basis points, commencing in August 2022. There was a rise in inflation. The adjustment in the central bank's interest rate has a direct impact on the inflation rate, causing it to rise by 1 percent. This strategy aims to decrease the inflation rate by 0.5 percentage points within the first year in response to the outbreak. This has exerted pressure on the money supply as enterprises strive to obtain loans to endure the crisis. Therefore, the Thai government has enacted fiscal and the implementation of monetary policy measures that aim to minimize the pandemic's impact on economic resource allocation by properly utilizing available resources. The government has implemented exceptional measures to alleviate the impact of the pandemic on consumption and employment. Thus. public debt has surged from 41 percent to 58 percent of GDP by the conclusion of 2021. The Bank of Thailand has revised GDP projections and increased interest rates. These are crucial to managing the increasing inflation rate. Additionally, the disruption in the supply chain has adversely affected the money supply as businesses and people experience a loss in income. The pandemic has also diminished private consumption, and it contributes significantly to the GDP of Thailand. This worsens the effect on the money supply as households face a reduction in disposable income. In order to address the impact of inflation in Thailand during the COVID-19 pandemic. The necessary parties are collaborating to maintain price stability in the retail sector. The central bank's monetary policy in Thailand has the capacity to influence inflation during the COVID-19 pandemic. The money supply was managed. The Thai government is enacting measures to regulate the expenses associated with daily life. The Central Bank of Thailand (BOT) Monetary Policy Committee is tasked with establishing the inflation rate to mitigate inflationary pressures.

Vietnam

In the context of Vietnam, the COVID-19 pandemic has had a significant impact on the financial supply of the nation [44]. The implementation of lockdown measures in response to the COVID-19 pandemic has had a significant influence on the macroeconomic system. The COVID-19 outbreak has significantly disrupted both supply and demand in Vietnam. thereby impacting the money supply and exchange rate. Consequently, the circulation of the Vietnamese Dong has fallen. Purchasing foreign currency diminishes the monetary base. The trade imbalance has minimal influence on the USD/VND exchange rate, whereas the COVID-19 pandemic in Vietnam will exert pressure on the USD/VND currency rate. The US Department of Commerce has notified the US Department of Commerce that Vietnam's currency has seen a decline of 4.7 percent in 2019. The projections indicate that Vietnam's inflation rate in 2021 is expected to be about 3 percent with the assumption that the rise in food costs will outweigh the recovery in oil prices. The COVID-19 pandemic has had a significant influence on the macroeconomic system as a result of the installation of lockdown measures. The COVID-19 pandemic has resulted in various disruptions to both supply and demand. hence affecting the money supply and exchange rate in Vietnam. Vietnam's currency supply and exchange rate have been impacted by the COVID-19 problem. The pandemic has led to a decline in the availability of money. However, Vietnam's slow economic recovery relies heavily on the increase in new export orders. The Vietnamese government has modified financial policies to augment credit expansion in key sectors and facilitate loan access for impoverished households and recipients of government assistance. The trade imbalance has minimal impact on the USD/VND exchange rate and Vietnam has bestowed its name upon the Ministry of Finance.

The governments of ASEAN-6 countries have introduced various stimulus packages and methods to reduce the economic impact of the COVID-19 pandemic. These policies included both fiscal and monetary initiatives. The spending initiatives have been designed to enhance public health, stimulate the economy, and handle the social consequences of the pandemic. The governments have faced challenges in managing the financial crisis and have had to increase expenditure to address the impact of the pandemic on their countries. However, this may increase the inflation rate. The depreciation of currencies in ASEAN-6 countries, partly due to economic uncertainty, as mentioned before contributed to the escalation in the cost of imported commodities, leading to inflationary pressure. This analysis adds to the academic discourse on the economic consequences of the pandemic by providing an understanding of the complex fluctuations of inflation across the ASEAN-6 region. Furthermore, the impact of the COVID-19 pandemic on inflation across the ASEAN-6 countries has been significant, with the money supply playing a crucial role in influencing inflationary trends. This response synthesizes relevant studies that support the claims regarding the commonality in money supply effects, pandemic-induced inflation challenges, government interventions, and unique local factors influencing inflation in these countries. First, there is a commonality in money supply among ASEAN-6. The relationship between money supply and inflation is well-documented, particularly in the context of the ASEAN-6. Studies indicate that changes in the money supply during the pandemic had a substantial effect on inflation rates. For instance, in Malaysia and the Philippines, direct monetary policy interventions were employed to manage inflation, highlighting the principle that an increase in money supply typically leads to inflationary pressures [38]. In contrast, countries such as Thailand and Vietnam employed indirect strategies, including interest rate adjustments and credit expansion facilitation, to affect inflation dynamics [40]. This aligns with the broader economic theory that increasing the money supply can lead to inflation, as evidenced by the empirical findings across these nations [53]. The impact of the pandemic on inflation is the second similarity. Due to interruptions in both supply and demand, the COVID-19 pandemic presented a distinct set of inflationary issues for all six ASEAN nations. For example, Singapore faced inflationary pressures primarily due to rising global commodity prices, while the Philippines experienced significant inflation linked to energy costs [54]. Vietnam's inflation was notably influenced by fluctuations in exchange rates, demonstrating how localized factors can exacerbate inflation during global crises [41]. Overall, the pandemic's economic fallout resulted in inflation becoming a common issue across the region, with varying drivers contributing to the inflationary landscape [54]. The third point of similarity is government interventions: every ASEAN-6 nation undertook different fiscal and monetary policies in reaction to the pandemic's increased inflationary pressures. Malaysia, for instance, utilized monetary policy tools, including interest rate adjustments, to stabilize inflation [40]. Thailand's central bank adopted policies aimed at controlling inflation through liquidity management, while Vietnam facilitated credit expansion to support key sectors impacted by the pandemic [40]. These interventions reflect a coordinated effort across the region to mitigate inflationary pressures and stabilize economies during a period of unprecedented economic disruption [40]. In conclusion, the COVID-19 pandemic has had a profound impact on inflation across the ASEAN-6 countries, with the money supply serving as a key factor influencing inflationary trends. The pandemic's economic fallout has led to common inflationary challenges, prompting governments to implement various interventions to stabilize their economies. However, unique local factors have also shaped the inflation landscape, underscoring the complexity of economic dynamics in the region.

V. CONCLUSION AND RECOMMENDATIONS

This article investigates the relationship between the COVID-19 pandemic and inflation in the ASEAN-6 countries. The data was obtained from 2000 to 2022 by using panel data regression analysis. COVID-19's impact on inflation in ASEAN-6 countries is a multifaceted matter that has been examined by multiple groups. The swift proliferation of the disease has resulted in economic disruptions, supply chain issues, and alterations in consumer behavior. hence exacerbating inflationary pressures in the region. The COVID-19 disease pandemic has had a significant impact on the ASEAN-6 countries' inflation rates. as evidenced by a variety of economic indices. The Indonesian inflation rate during the COVID-19 pandemic highlights the ambiguous short-term efficiency of the causal link between currency exchange rates and money supply in terms of inflation. The money supply in Malaysia fluctuates based on several factors such as interest rates and government expenditures. The Philippines has witnessed a substantial increase in the money supply as a direct result of the pandemic, and economic growth will undergo substantial expansion. Typically, Singapore has continually maintained a low level of inflation with noticeable increases in consumer prices. The Central Bank of Thailand implemented a monetary policy of increasing interest rates in order to mitigate inflationary pressures, while businesses pursued immediate liquidity, thereby influencing the overall money supply. The government is implementing fiscal and monetary strategies to address the economic ramifications of the crisis. These policies aim to stabilize inflation in the retail sector and focus on regulating expenses. Additionally, the government is using monetary policy to establish inflation rates and reduce inflationary pressures. Vietnam is currently facing the difficulty of achieving an equilibrium between money supply and demand. The impact of inflation in the ASEAN region has been significant. Additionally, the COVID-19 pandemic has further exacerbated the situation. Consequently, the ASEAN-6 has faced the outcomes of implementing measures such as currency provision and exchange rate adjustments as well as strengthening financial policies to support economic recovery. The distinctive attributes of these countries underscore the need for an appropriate approach to address inflation challenges in the ASEAN region.

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