J. Myanmar Acad. Arts Sci. 2026 **Vol. XXIII. No.8**

DYNAMIC RELATIONSHIP BETWEEN CHINA AND MYANMAR GDP GROWTH RATES: A VAR AND IMPULSE RESPONSE ANALYSIS

Hnin Hnin Aung[1]

Abstract

This study examines the influence of China's GDP growth rate on Myanmar's GDP growth rate by using time-series data from 1961 to 2023. Unit root tests, cointegration analysis, and Vector Autoregressive (VAR) models are employed to assess the impact of China's GDP on Myanmar's economic growth in both the short and long term. The findings indicate that China's GDP growth rate and Myanmar's GDP growth rate are stationary at the 1%, 5%, and 10% significance levels, with an optimal lag length of I (2). The VAR results highlight that Myanmar's GDP growth is primarily driven by its own past values, while China's growth is influenced by both its own past performance and Myanmar's recent economic activity. This suggests an asymmetric relationship between the two economies, with Myanmar having a short-term impact on China's growth, but China's influence on Myanmar being less immediate in the short term.

Keywords: GDP growth rate, Vector Autoregressive, Variance Decomposition.

Introduction

The global economy is characterized by complex interdependencies, where economic shocks and growth trends in one country can significantly affect others, particularly within the same region. In Southeast Asia, China has become a leading economic power, and its interactions with neighboring Myanmar are of particular interest. Given Myanmar's transitioning economy, it is crucial to understand how significant economic changes in China may influence Myanmar's growth, as this knowledge is vital for policymakers and economists seeking to leverage these interdependencies for sustainable development. It is necessary to understand how shocks in China's GDP growth affect Myanmar's economic growth and vice versa.

The Vector Autoregression (VAR) model is a widely used method for analyzing economic relationships, enabling the investigation of interdependencies among multiple time series variables without requiring strong assumptions about causality (Sims, 1980). When combined with impulse response analysis, the VAR model offers a framework to examine how shocks in one country's economic variables, such as GDP growth, may affect the economic outcomes of another.

Therefore, this study aims to enhance the understanding of regional economic integration by exploring the impact of China's economic performance on Myanmar's GDP growth through the application of a VAR model and impulse response functions. The findings provide valuable insights into the level of economic integration between China and Myanmar, highlighting the extent to which Myanmar's growth is influenced by fluctuations in China's economy.

Literature Review

GDP represents the sum of gross value-added by all resident producers in the economy, along with any product taxes, minus any subsidies not accounted for in the value of the products. The GDP growth rate is the percentage change in a country's Gross Domestic Product (GDP) over a specific period, typically a year or a quarter. It indicates the rate at which the economy is

[1] Department of Statistics, Yangon University of Economics

expanding or contracting. Essentially, it reflects the increase or decrease in the total value of goods and services produced within a country's borders. Several studies have explored the relationship between the GDP growth rates of countries using annual data and Vector Autoregression (VAR) models to estimate the interactions among relevant variables.

Lynn (2014) investigated the relationship between foreign trade and economic growth in Myanmar from 1990 to 2014, using annual data on GDP, exports, and imports spanning the period 1980 to 2014. The study employed the Augmented Dickey-Fuller (ADF) unit root test and Granger causality test within a Vector Autoregressive (VAR) framework, a novel approach for Myanmar. The results indicated that foreign trade had no significant effect on Myanmar's economic growth, with import growth being negatively influenced by economic growth. In contrast, exports were driven by GDP growth, suggesting a growth-driven export strategy during this period. Furthermore, the study identified a unidirectional causal relationship from export growth to import growth.

Lin and Li (2017) examined the spillover effects of China's economic growth on its neighbors, utilizing annual GDP data from the World Bank for the period 1985 to 2015, covering China, Myanmar, Vietnam, and Laos. Their multivariate time series analysis revealed significant GDP spillovers from China, with Myanmar displaying moderate sensitivity to Chinese economic shocks. The findings suggested that China's rapid economic expansion accelerated growth in neighboring countries, although the extent varied by nation.

Zhang and Zhao (2018) investigated economic growth interactions in East Asia using GDP data from the World Bank for ten economies, including China, Japan, South Korea, and ASEAN countries, from 1980 to 2016. Their VAR analysis identified substantial spillover effects from China's growth to ASEAN economies, highlighting China's dominant influence on regional growth. While Japan and South Korea also affected regional dynamics, their impact was comparatively lesser.

Park (2020) analyzed the effects of China's economic growth on Southeast Asia through a VAR approach, focusing on GDP and trade flows between China and Southeast Asian nations, including Myanmar, from 1995 to 2018, utilizing data from the IMF and World Bank. The study found that China's economic growth positively impacted Myanmar's GDP growth, with trade linkages serving as a key transmission channel for Chinese economic shocks. The relationship intensified after China joined the World Trade Organization (WTO) in 2001.

Data and Methods

Data

In this study, the secondary data such as annual percentage growth rate of China's GDP and Myanmar's GDP from 1961 to 2023 are utilized. The annual percentage growth rate of GDP at market prices is calculated based on constant local currency. Aggregates are expressed in constant 2015 prices, measured in U.S. dollars. The dataset is obtained from the World Development Indicators (WDI), which is the principal dataset on development indicators compiled by the World Bank from official international sources. It provides accessible and reliable data on global development trends.

Methods

Modern econometric models are commonly employed to analyze the impact of China's GDP growth on the Myanmar economy. In this study, the Vector Autoregression (VAR) model was chosen for several reasons. First, as the variables are time series data and exhibit autocorrelation, the VAR model is particularly well-suited for addressing such issues. Second, the VAR model captures dynamic and causal relationships among economic variables, a significant advantage over traditional regression models, making it ideal for both policy analysis and macroeconomic planning.

To conduct this analysis, the study employs the following econometric model. First, a unit root test is performed to determine whether the variables are stationary and to identify any lag or trend. Subsequently, the cointegration model is tested to examine the long-term relationship between the two economies, with the unit root test results forming the basis of this analysis. The unit root test is a widely used method for determining whether a time series is stationary. Specifically, following the model proposed by Dickey and Fuller (1981), the ADF extended unit root test is applied. In this context, Myanmar's GDP growth rate is considered as the dependent variable, while China's GDP growth rate serves as the independent variable, expressed in the following form:

$$\Delta_{\mathrm{GDP_t}} = \alpha_0 + \beta \mathrm{GDP_{t-i}} + \sum_{j=1}^{n} \gamma_j \Delta_{\mathrm{GDP_{t-i}}} + \varepsilon_t \qquad (1)$$

and $$\Delta_{\mathrm{GDP_t}} = \alpha_0 + \delta_t + \beta \mathrm{GDP_{t-i}} + \sum_{j=1}^{n} \gamma_j \Delta_{\mathrm{GDP_{t-i}}} + \varepsilon_t \qquad (2)$$

In which: $\Delta_{GDP_t} = GDP_t - GDP_{t-1}$; GDP_t: time-series data over time; n: stationary time series; ε_t: white noise.

Equation (2) differs from Equation (1) by including an additional trend variable over time, denoted as t. This trend variable takes values from 1 to n, representing the time points in the series. The term "white noise" refers to the random errors in the model, which are assumed to have a mean of zero, constant variance, and no autocorrelation.

The results of the ADF test are highly sensitive to the choice of the lag length n, which affects the stationarity of the series. To determine the optimal lag length k for the ADF model, the Akaike Information Criterion (AIC), proposed by Akaike (1973), is employed. Specifically, the value of n is selected to minimize the AIC, ensuring the best fit for the model.

Testing hypothesis:

H_0: $\beta = 0$ (GDP_t is the non-stationary data time-series)

H_1: $\beta < 0$ (GDP_t is the stationary data time-series).

To test the null hypothesis (H_0), the calculated t-statistic is compared to the critical value. If the calculated t-value exceeds the critical value, the null hypothesis (H_0) is rejected, indicating that the data series is stationary. Conversely, if the calculated value is less than the critical value, the null hypothesis is accepted, implying that the data series is non-stationary.

When using ordinary least squares (OLS) to analyze time series, it is assumed that the variance and mean of the series are constant and independent of time, which characterizes stationarity. Non-stationary time series (or unit root variables) violate this assumption, leading to biased or misleading results in hypothesis testing. Therefore, non-stationary series must be analyzed using alternative methods, such as cointegration analysis. Cointegration occurs when two integrated I(1) time series, X_t and Y_t, can be expressed through a stationary process (Dinh, 2020b).

The OLS equation is expressed as: $\varepsilon_t = \mathrm{Myanmar\ GDP_t} - \beta_2 \mathrm{China\ GDP_t}$ where β_2 represents a stationary process. Myanmar GDP and China GDP are considered cointegrated if there exists a vector such that the two variables are in equilibrium over time. Conducting unit root and cointegration tests is essential to avoid the problem of spurious regression.

Tests for cointegration aim to identify stable, long-term relationships between variables. However, as noted by Rao (2007), the failure to find such a relationship does not conclusively prove its absence; it merely suggests that one may not exist. Among the most widely used cointegration tests are the Engle-Granger test, the Phillips-Ouliaris test, and the Johansen test. In this study, the Johansen test is applied, as it offers improvements over the Engle-Granger test. Specifically, it avoids the need to choose a dependent variable and mitigates issues caused by error propagation across steps. Additionally, the Johansen test is capable of detecting multiple cointegrating vectors (Dinh, 2019a).

The Vector Autoregression (VAR) model describes the evolution of a set of k endogenous variables over a given sample period (t = 1, ..., T), where each variable is modeled as a linear function of its own past values. The variables are represented in a a k-vector ((k × 1)-matrix) Y_t, with $Y_{i,t}$ denoting the observation of the i-th variable at time t. For example, if the i-th variable represents GDP, then then $Y_{i,t}$ refers to the GDP value at time t. The VAR model is formulated as follows:

$$\mathrm{M\ GDP_{1t}} = \alpha_0 + \sum_{i=1}^{n} \alpha_i \mathrm{\ MGDP_{t-i}} + \sum_{j=1}^{n} \beta_j \mathrm{C\ GDP_{t-j}} + U_{1t} \quad (3)$$

$$\mathrm{C\ GDP_{2t}} = \beta_0 + \sum_{j=1}^{n} \beta_j \mathrm{\ MGDP_{t-i}} + \sum_{j=1}^{n} \alpha_i \mathrm{M\ GDP_{t-j}} + U_{2t} \quad (4)$$

In this model: U_{1t} and U_{2t} represent white noise error terms. As previously stated, the primary objective of this paper is to analyze and evaluate the VAR model in relation to the GDP growth rates of China and Myanmar, focusing on the optimal lag selection, impulse response functions, and the model's goodness of fit. To examine the VAR Granger causality based on equations (3) and (4), the hypotheses are formulated as follows:

The hypothesis $H_1: \sum \alpha_i = 0; \sum \beta_i \neq 0$; the Myanmar economic growth rate causes the China economic growth rate (M GDP → C GDP), one-way Granger.

The hypothesis $H_2: \sum \alpha_i \neq 0; \sum \beta_i = 0$; the China economic growth rate causes the Myanmar economic growth rate (C GDP → M GDP), one- way Granger.

The hypothesis $H_3: \sum \alpha_i \neq 0; \sum \beta_i \neq 0$; both China and Myanmar economic growth rates cause interactions (C GDP ↔ M GDP), two-way Grange, where the arrow indicates causality.

As discussed, in a VAR model, each variable is expressed as a linear function of its own lagged values as well as the lagged values of other variables in the system. The general form of the VAR model is presented as follows:

$$Y_t = A_1 Y_{t-1} + A_2 Y_{t-2} + \ldots\ldots + A_n Y_{t-n} + S_t + U_t \quad (5)$$

$$\text{In which : } Y_t = \begin{bmatrix} Y_{1t} \\ Y_{2t} \\ : \\ : \\ Y_{mt} \end{bmatrix}; U_t = \begin{bmatrix} U_{1t} \\ U_{2t} \\ : \\ : \\ U_{mt} \end{bmatrix}$$

In this model, Y_t includes m the lag of random walk variables; where u denotes the white noise error term. S_t comprises elements that may include constants, linear trends, or polynomial terms. A is a square matrix of size (m x m), i = 1,2…n; $S_t = (S_{1t}, S_{2t}, \ldots, S_{mt})$.

The results presented below indicate the influence of the government's trade policy on GDP growth, which is further detailed in the subsequent section.

An impulse response function (IRF) describes how a system reacts to a brief, sharp input signal (an impulse). It's a way to characterize the dynamic behavior of a system by analyzing its output in response to this specific input. IRFs are used in various fields like signal processing, control theory, and economics to understand how systems respond to changes or "shocks".

Results and Discussion

The study aims to analyze the impact of China's GDP growth on Myanmar's GDP growth using a collected sample. As detailed in the methods several individual null hypotheses were tested, including stationary time series, optimal lag selection, and vector autoregression estimates. Additionally, tests for model fit and statistical significance included the Granger causality test, cointegration test, VAR residual serial correlation, impulse response analysis, and stability condition assessments. The sample was examined to determine whether the time series is stationary or non-stationary. Non-stationarity indicates that the mean or variance of the series changes over time. The results of the unit root test are presented in Table 1.

Table 1: Unit root at Lag Length: (0) of the GDP Growth for Myanmar and China

Model: Myanmar GDP of a unit root - Lag Length: 0 (Automatic - based on SIC, maxlag=10)		**t-Statistic**	**Prob.***
Augmented Dickey-Fuller test statistic		-4.934063	0.0001
Test critical values:	1% level	-3.540198	
	5% level	-2.909206	
	10% level	-2.592215	
Model: China GDP of a unit root - Lag Length: 0 (Automatic - based on SIC, maxlag=10)		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.715378	0.0000
Test critical values:	1% level	-3.540198	
	5% level	-2.909206	
	10% level	-2.592215	

Source: Own Calculation

The results show that all tests have critical values greater than the test statistics and 0.0000 of Prob* is less than $t_\alpha = 0.01$, that is, the China GDP growth rate variable is stationary time series. And the test statistic is greater than all test critical values and $t_\alpha = 0.05$ is greater than the 0.0001 of Prob* i.e., the Myanmar GDP growth rate variable is stationary time series. These variables are tested at lag (0) with 1%, 5% and 10% levels.

The unit root test results show that both Myanmar's and China's GDP growth variables are the stationary time series at lag (0) with 1%, 5% and 10%, after comparing statistic and test critical values, which are the value of the test critical values is less than the value of the statistic test.

These results are utilized to establish the criteria for optimal lag selection in the VAR model. When constructing a VAR model, it is essential to determine the optimal lag length. The optimal lag is selected based on the Akaike Information Criterion (AIC), the Schwarz Criterion (SC), and the Hannan-Quinn Criterion (HQ). The lag length that minimizes these statistics is regarded as the optimal lag for the model. In this study, the AIC criterion was employed for lag selection and the results are shown in Table 2).

Table 2: Optimum lag selection criteria of VAR Model

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-359.0730	NA	709.1121	12.23976	12.31019	12.26725
1	-343.3878	29.77513	477.2675	11.84366	12.05493	11.92613
2	-335.1495	15.08032*	413.6601*	11.69998*	12.05211*	11.83744*
* indicates lag order selected by the criterion LR: sequential modified LR test statistic (each test at 5% level)						

In the VAR model, the AIC standard suggests an optimum lag of 2, considering macroeconomics, lag 2 is very suitable. So, the test shows that at lag 2, the VAR model has no statistical error. Thus, the statistical tests of the VAR model are reliable. The results of VAR model that is the goodness-fit model as shown in Table 3.

Table 3: VAR model at the Selected Optimum lag (2) – Vector Autoregression Estimates

Model	M GDP (-1)	M GDP (-2)	C GDP (-1)	C GDP (-2)	C
1. MYANMAR_GDP	0.310427 (0.12842) [2.41725]	0.303888 (0.13720) [2.21492]	-0.155686 (0.16953) [-0.91832]	-0.061847 (0.11726) [-0.52741]	3.881619 (1.50186) [2.58455]
2. CHINA_GDP	0.249250 (0.08819) [2.82619]	-0.017135 (0.09422) [-0.18186]	0.509859 (0.11643) [4.37921]	-0.338368 (0.08053) [-4.20171]	5.855608 (1.03140) [5.67735]
Note: Standard errors in ( ) & t-statistics in [ ]					

In Model (1), Myanmar's GDP growth is influenced by its own past values and China's lagged GDP growth. The positive coefficients for Myanmar's first and second lagged GDP (0.310427 and 0.303888) suggest that past growth reinforces current growth. However, China's lagged GDP values negatively impact Myanmar's growth, with coefficients of -0.155686 and -0.061847 for the first and second lags, respectively. This indicates that China's past growth, particularly from the previous period, exerts a dampening effect on Myanmar's economy, potentially due to competitive pressures or trade imbalances.

In Model (2), China's GDP growth is influenced by both its own past values and Myanmar's lagged GDP growth. The positive coefficient for Myanmar's first lag indicates that Myanmar's previous growth positively impacts China's current growth, likely due to trade or investment links. A small negative coefficient for Myanmar's second lag shows a minimal negative effect. China's own first lagged GDP growth has a strong positive effect (0.509859), highlighting the persistence of its economic momentum, while the negative second lag (-0.338368) suggests a slight dampening effect, possibly reflecting cyclical economic adjustments.

In Table 4, a cointegration test is employed to determine whether a long-term relationship exists between the time series. These tests identify instances in which two or more non-stationary time series are integrated in such a manner that they do not deviate from equilibrium over the long term. The tests also assess the degree of sensitivity between the two variables.

Table 4: VAR Unrestricted Cointegration Rank Test

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.418439	36.29901	15.49471	0.0000
At most 1	0.061003	3.776602	3.841466	0.0520
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.418439	32.52241	14.26460	0.0000
At most 1	0.061003	3.776602	3.841466	0.0520
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				

According to the Table 4, both the Trace and Maximum Eigenvalue tests indicate the presence of one cointegrating equation. For the "None" hypothesis, the trace statistic (36.29901) and maximum eigenvalue statistic (32.52241) exceed their respective critical values, both with p-values of 0.0000, leading to the rejection of the null hypothesis at the 5% significance level. This confirms the existence of at least one cointegrating equation. For "At most 1," both tests yield p-values slightly above the 5% threshold (0.0520), indicating that there is no evidence to suggest more than one cointegrating equation between Myanmar's and China's GDP growth.

Then, residual analysis is employed to assess the model's goodness of fit, ensuring that the underlying assumptions are met, as most linear regression estimators require a correctly specified regression function and independent, identically distributed errors for consistency. To detect serial correlation in the residuals of the Vector Autoregressive (VAR) model, the VAR Residual Serial Correlation LM Test is applied. The null hypothesis assumes no serial correlation at the specified lags, and if the p-value exceeds the threshold (usually 0.05), the null hypothesis is not rejected, indicating no serial correlation in the residuals.

Table 5: VAR Residual Serial Correlation LM Tests

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	4.168050	4	0.3837	1.052643	(4, 106.0)	0.3838
2	2.033464	4	0.7296	0.508431	(4, 106.0)	0.7296
Null hypothesis: No serial correlation at lags 1 to h						
Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	4.168050	4	0.3837	1.052643	(4, 106.0)	0.3838
2	6.642151	8	0.5757	0.832604	(8, 102.0)	0.5760
*Edgeworth expansion corrected likelihood ratio statistic.						

Table 5 presents a p-value of 0.3837 for lag 1, which exceeds the 0.05 significance level, indicating that the null hypothesis of no serial correlation cannot be rejected, and thus, the residuals show no evidence of serial correlation at lag 1. The Rao F-statistic p-value of 0.3838 further corroborates this result. Additionally, the combined lags test provides a p-value of 0.5757, suggesting no significant serial correlation across lags 1 and 2, a finding supported by the Rao F-statistic p-value of 0.5760.

Variance decomposition involves the analysis of forecast error variance over a specific time horizon, providing insights into the short-term and long-term effects of various variables on the GDP of Myanmar and China. This method allows for the assessment of the proportion of fluctuations in a time series that can be attributed to specific variables at designated time intervals, as illustrated in Table 6.

Table 6: Variance Decomposition

Variance Decomposition of MYANMAR_GDP:				Variance Decomposition of CHINA_GDP:			
Period	S.E.	MYANMAR_GDP	CHINA_GDP	Period	S.E.	MYANMAR_GDP	CHINA_GDP
1	5.378132	100.0000	0.000000	1	3.693423	0.526661	99.47334
2	5.672880	98.97798	1.022016	2	4.314869	8.169868	91.83013
3	6.053763	97.77215	2.227852	3	4.459121	13.07750	86.92250
4	6.136541	97.31780	2.682200	4	4.612183	13.86138	86.13862
5	6.182009	97.28734	2.712656	5	4.638352	13.79692	86.20308
6	6.198033	97.29538	2.704619	6	4.639062	13.79955	86.20045
7	6.207787	97.29827	2.701726	7	4.643352	13.79676	86.20324
8	6.212299	97.29208	2.707922	8	4.644842	13.83521	86.16479
9	6.214486	97.28630	2.713698	9	4.645752	13.85859	86.14141
10	6.215360	97.28437	2.715630	10	4.646281	13.86317	86.13683
Cholesky Ordering: MYANMAR_GDP CHINA_GDP							

Table 6 reveals that 100% of the forecast error variance in Myanmar's GDP is initially explained by its own shocks, indicating that Myanmar's GDP is fully driven by its past values in the short term. Over time, China's GDP begins to influence Myanmar's GDP, with 1.02% of the variance explained by China's GDP by Period 2, gradually rising to 2.71% by Period 10. This suggests that while Myanmar's GDP remains largely self-determined (97.28% by Period 10), China's impact increases slightly over time. Similarly, 99.47% of China's GDP variance is initially driven by its own shocks, with only 0.53% explained by Myanmar. However, Myanmar's influence grows over time, rising from 8.17% in Period 2 to 13.86% by Period 10, indicating a gradual but increasing impact of Myanmar's GDP on China's economic performance.

Impulse response analysis is a crucial component of econometric analysis utilizing vector autoregressive models. Its primary objective is to illustrate the dynamics of the GDP growth variables for both Myanmar and China in response to a shock affecting these variables are shown in Figure 1.

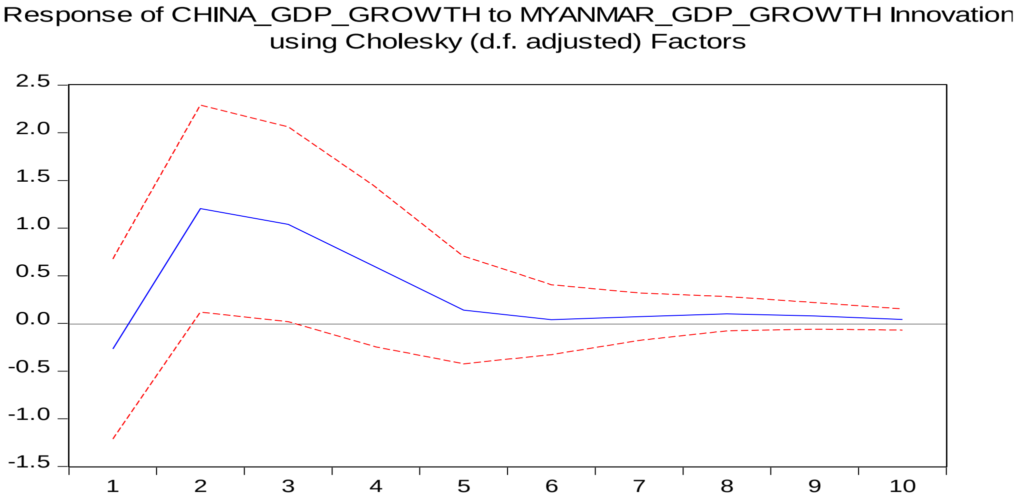

Figure 1: Impulse Response

According to Figure 1, in the first period, there is a positive response from China's GDP growth to a shock in Myanmar's GDP growth. This indicates that initially, a shock in Myanmar's GDP growth leads to a noticeable increase in China's GDP growth. The positive impact reaches its peak around Period 2, with China's GDP growth showing a substantial positive response to the shock in Myanmar's GDP growth. After Period 3, the response starts to decline, though it remains positive in the short term. After the peak, the response starts to gradually decline toward zero. By around Period 5, the response becomes nearly negligible and levels off, indicating that the effect of the shock fades away over time. By Period 10, the response of China's GDP growth to the shock in Myanmar's GDP growth becomes statistically insignificant as it stabilizes around zero.

The dynamically stable model is evaluated after fitting the VAR, using the roots of the characteristic polynomial to assess the condition for dynamical stability. The VAR model is considered stable if all eigenvalues lie within the unit circle, indicating that the modulus of each eigenvalue is strictly less than 1. Furthermore, by selecting the graphing option, a plot of the eigenvalues is produced, with the real components represented on the x-axis and the imaginary components on the y-axis. The graph below visually demonstrates that these eigenvalues are well within the unit circle. These findings serve as a basis for analyzing the impact of China's GDP growth on Myanmar's GDP growth from 1961 to 2023, along with various indicators of Myanmar's economic growth, as depicted in Figure 2.

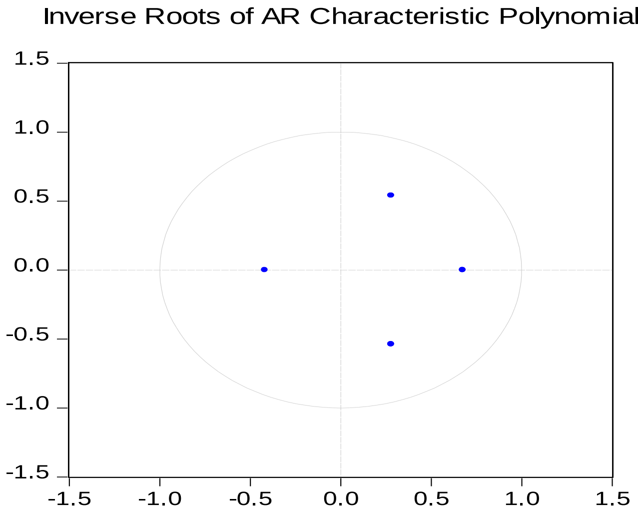

Figure 2: Dynamically stable test

As previously indicated, a Vector Autoregression (VAR) model is deemed dynamically stable if the residuals exhibit stationarity and all coefficients of the characteristic polynomial lie within the unit circle, or if the estimated modulus is less than one. Consequently, following the estimation of the VAR model, it is essential to assess the stability of the resulting modes. The analysis of the residuals can serve as a unit root test, demonstrating that the selected sample exhibits stability, aligns well with the model, and possesses statistical significance.

Conclusion

This study conducts a comprehensive analysis of the dynamic interactions between the GDP growth rates of China and Myanmar using a Vector Autoregression (VAR) model. The results reveal a significant relationship between the two economies, with China's GDP growth notably influencing Myanmar's economic performance. This relationship is substantiated by Granger causality and cointegration tests, which indicate a long-term association between the two-time series. Both China's and Myanmar's GDP growth rates are confirmed to be stationary time series, as evidenced by unit root tests that demonstrate stable statistical properties over time, thereby validating the use of VAR modeling. The optimal lag length for the VAR model, determined by the Akaike Information Criterion (AIC), is two, which allows the model to effectively capture the temporal dynamics of GDP growth.

The VAR results show a bidirectional relationship between Myanmar's and China's GDP, where Myanmar's GDP has a short-term positive influence on China's growth. Conversely, China's GDP growth does not significantly affect Myanmar's GDP in the short term. However, China's GDP is more dependent on its own past values, while Myanmar's GDP shows a more modest internal influence. Impulse response analysis indicates that a shock in Myanmar's GDP growth initially results in a positive response in China's GDP growth, suggesting that fluctuations in Myanmar's economic performance can influence China's growth trajectory. Additionally, variance decomposition results show that while Myanmar's GDP growth is mainly driven by its own historical values, the influence of China's GDP on Myanmar's growth gradually increases over time.

The residuals from the VAR model exhibit no signs of serial correlation, indicating that the model is appropriately specified and reliable for economic forecasting. These findings highlight the interconnectedness of the Chinese and Myanmar economies, emphasizing the role of China's economic policies and performance in shaping Myanmar's economic landscape. While Myanmar’s GDP shows little immediate influence on China’s growth, the positive significant relationship at lag one suggests potential for mutual benefits. Policymakers should consider strengthening bilateral trade agreements and economic partnerships to enhance these short-term interdependencies for mutual economic growth.

Since Myanmar’s past GDP growth has a significant positive effect on its future growth, it is crucial for Myanmar to focus on sustaining its economic stability. Early-warning indicators and economic stabilization policies should be implemented to minimize volatility. Both countries can benefit from deeper regional integration initiatives, particularly infrastructure development and investment. This will foster stronger long-term economic linkages, allowing Myanmar to better position itself as an economic bridge between China and Southeast Asia.

Future studies should expand the scope by including additional economic variables such as trade, foreign direct investment, and regional factors to gain deeper insights into the broader economic relationship between Myanmar and China. Regional integration initiatives, including infrastructure investments and strengthened trade relationships with neighboring countries, could position Myanmar as a crucial bridge between China and Southeast Asia, thereby contributing to regional stability.

Acknowledgements

I would like to express my sincere gratitude to Professor Dr. Tin Tin Htwe, Rector of Yangon University of Economics, for her guidance and support throughout this study. Additionally, I am deeply grateful to Dr. Aye Thida, Professor and Head of the Department of Statistics, for her invaluable assistance in completing this paper.

References

Canova, F. (2005). The transmission of US shocks to Latin America. Journal of Applied Econometrics, 20(2), 229-251.

Chen, R., & Rau, J. (2018). China's influence on Southeast Asia's economic development: A case study of Myanmar. Asian Economic Policy Review, 13(1), 50-65.

Dinh, D. V. (2019a). Analysed money supply and inflation: evidence from vietnam economy. Advances and Applications in Statistics, 56(2), 125-142. doi:10.17654/AS056020125.

Dinh, D. V. (2020). Impulse response of inflation to economic growth dynamics: VAR model analysis. The Journal of Asian Finance, Economics and Business, 7(9), 219-228.

Hsiao, F., & Shen, H. (2020). Spillover effects of China’s economic growth: Evidence from Southeast Asia. Journal of Asian Economics, 22(4), 275-290.

Lin, J., & Li, H. (2017). Spillover Effects of China's Economic Growth on Neighboring Countries: Evidence from a Multivariate Time Series Analysis. International Journal of Economics and Finance, 9(3), 89-99.

Lynn, K. K. (2014). An analysis of the relationship between foreign trade and economic growth in Myanmar during 1990-2014.

Myint, U. (2017). Economic reforms and Myanmar’s transition: Perspectives and challenges. Southeast Asian Economic Outlook, 29(3), 89-112.

Park, J., & Song, M. (2019). Cross-border economic spillovers: A case of China and South Korea. Journal of International Economics, 18(2), 205-222.

Park, S. (2020). The Impact of China’s Economic Growth on Southeast Asia: A VAR Analysis of GDP and Trade Flows. Economic Modelling, 52, 102-115.

Rao, B. B. (2007). Cointegration for the Applied Economist. London, UK: Palgrave Macmillan.

Sims, C. A. (1980). Macroeconomics and reality. Econometrica, 48(1), 1-48.

Zhang, L., & Zhao, Y. (2018). Economic Growth Interactions in East Asia: A VAR Approach. Journal of Asian Economics, 45, 67-80.