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## Descriptive Statistics and Economic Indicators of South East Asian Economies

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**Abstract:** This paper presents an extensive descriptive statistical evaluation of the performance of the macroeconomic of targeted economies of the Association of Southeast Asian Nations over a given time timeframe of 2010-2022. The analysis looks at such important indicators as real GDP development, inflation rate, fiscal balance, and the ratio of exports to GDP, current account balance, foreign direct investment inflows. It is based on measures of central tendency, dispersion, higher-order moments and coefficient of variation, which allow assessing the dynamics of growth, macroeconomic stability and exposure to external section among six key ASEAN economies. Moreover, a Composite Economic Performance Index is developed with the help of the z-score standardization and equal weight to make comparison and ranking across countries. The results demonstrate that there is a lot of structural heterogeneity in the area. Countries with long-term export-oriented growth coupled with moderate volatility have an excellent performance overall, whereas the highly open economies are more vulnerable to shocks on the global economy. These findings indicate the need to have well-balanced development strategies that combine competitiveness in trade with macroeconomic stability. The research has a contribution value in offering an empirical baseline of systematic study in future econometric research and policy analysis in the ASEAN regional context.

**Keywords:** ASEAN economies; Descriptive statistics; Economic growth; Trade openness; Macroeconomic stability; Composite index; Regional integration.

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### Introduction

The economy of the automobile industry in association of southeast Asian countries (ASEAN) has been among the most dynamic regions in the globe since the late in the twentieth century caused by booming structural change, trade liberalization and foreign direct investment expansion. However, throughout history, the region has been characterized by a high level of heterogeneity in terms of macroeconomic performance: there are members that were characterized by low-volatility growth, and there are those ones characterized by boom-bust. An ex post facto updated descriptive statistical profile of major macro indicators, such as growth, inflation, external balances, fiscal positions, and capital flows, is consequently a requisite analytic base of both scholars and policy makers to develop insight into cross-country distinctions as well as to devise desirable stabilization as well as development strategies (Almekinders et al., 2015; Pradhan, Arvin, and Norman, 2017).

There are three justificatory points to a descriptive approach, which are instantaneous. First, descriptive statistics summarize central tendencies and dispersion in informative ways of heterogeneity under structure, whereby the average performance of a structure is known by the mean growth, whereas the relative volatility is known by the standard deviation and coefficient of variation of variables covered by the average measure. Second, the distribution diagnostics (skewness, kurtosis) will imply whether common linear models will be well-behaved or nonlinear or minimum techniques will be needed in the further causal analysis. Third, the use of standards that construct indices such as composite indices creates a facility to rank and cluster economies with parsimony successfully, yet does not tend to wipe out the indicators-resulting variation (Kose, 2003; Marimuthu, 2021).

The literature available discusses two main themes that dictate the current descriptive study. The theme 1 looks at the international trade and growth relationship. A number of empirical works on ASEAN and similar areas

determine that openness is typically linked to increased growth, although the impact is conditional upon the financial depth, the quality of institutions and also the export structures openness can also transmit external shocks and increase short-term volatility (Pradhan et al., 2017). The second theme is the financial integration and the volatility in the macroeconomic. The new directions in the research with extensive cross-country samples demonstrate that stronger international financial connections can enhance output and price changes where macro-prudential arrangements and maneuvering mechanisms are missing (Kose, Prasad, and Terrones, 2003). Regional studies affirm how the enhancing trading and financial interconnections within ASEAN have enhanced accessibility to funds and technology but they have also noted that coordination of policy framework platforms are necessary to address cyclical fluctuations and reversals of capital flows (Almekinders et al., 2015).

The recent historical shocks, including global commodity cycles, the heritage of the global financial crisis in 2010 to 2013, trade tensions in the 2010s, and the COVID-19 pandemic have related the changes in the levels of macro indicators and diversification in ASEAN. The fact that these shocks render the use of single number summaries all the more important and to record dispersion and distributional shape of each indicator. Indicatively, two countries can record the same average rate of increase in their GDP over ten years; however, with very different volatility and skew: one might have a consistent growth with gentle cyclical fluctuations, and the other will alternate expansive surges and dramatic contractions- policy implications would sharply differ (Kose et al., 2003; Pradhan et al., 2017).

In the methodological aspect, the paper will utilize existing secondary sources as macro indicators (i.e., the World Bank and the International Monetary Fund) and will employ a set of descriptive statistics to a homogenous sample of core ASEAN economies and a similar time period (referring to an ideal baseline: 2010-2020 which is adaptable as per the availability of the data). The key indicators are: real GDP growth, GDP per capita (constant prices), inflation rate (CPI), fiscal balance (percent of GDP), the current account balance (percent of GDP), exports and imports (percent of GDP) and net FDI inflows. We provide mean, median, minimum, maximum, standard deviation, coefficient of variation, skewness and kurtosis of each indicator we report. Moreover, we develop uniformized z-scores and a conglomerated economic-performance index (equally weighted standardization as a benchmark, with sensitivity experiment on alternative weighting)- an expedient instrument of comparative ranking and cluster identification (Marimuthu, 2021; Pradhan et al., 2017).

Such a descriptive focus is not intended to replace a causal focus, instead, the diagnostics at an empirical level are given so as to be able to develop plausible identification strategies. Dispersion measures patterns, such as, will tell when fixed-effects panel regressions, random-effects, or threshold models should be used at an advanced point. In the event that skewness and excess kurtosis are common to a number of indicators, then linear least-squares inference might not be reliable whereas non-linear alternatives should be pursued (Kose et al., 2003). Likewise, cross country ranking and clustering have the power to find out cross country candidate outliers of case studies or as a stratification factor in a more targeted econometric study.

Practically, past region-wide evidence is in favor of the usefulness of this diagnosis strategy. Pradhan et al. (2017) employed panel methods to demonstrate that there is a joint influence of trade openness and the density of the banking sector on growth in ASEAN- a result which is natural following descriptive comparisons between openness and volatility across nations. Almekinders et al. (2015) highlighted the unequal nature of financial integration in ASEAN and highlighted policy complementarities, at that point making argumentative arguments that descriptive profiles (e.g. of capital-flow volatility, external positions, and reserve coverage) makes relevant to individual countries. In a wider sense, financial integration and volatility characteristics (country to country) indicate that general regional means distort significant country-specific irregularities in the transmission of shocks and the free-room in policies (Kose et al., 2003).

In short, cautious descriptive statistical documentation of the ASEAN macro indicators is a fundamental empirical undertaking that enhances heterogeneity as well as directing the subsequent causal investigation. The documenting central tendencies, dispersion, and distributional shape in a uniformed sample and a current timeframe will enable the given paper to offer the empirical map in the form of which researchers and policymakers will consider to bring closer the further econometric studies and focused policy changes.

### Literature Review

The three linked areas of the empirical research on South East Asian macroeconomic performance are trade openness and growth dynamics, financial integration and macroeconomic volatility, and the methodological approaches to comparative macroeconomy evaluation, in particular the descriptive diagnostic role of composite indicators. The combination of these strands gives the theoretical basis to the methodological justification to conduct a structural descriptive statistical analysis of the ASEAN economies.

### Trade Openness and Growth Dynamics

The dynamic between trade openness and economic growth has held the centre stage in development and macro economical studies. One of the fundamental contributions through the methods of instrumental variables was conducted by Frankel and Romer (1999); they used instrumental variables where they found out that trade significantly affected income across the countries with a positive significant relationship. Their effort generated a causal definition of the trade-growth nexus that supported the theoretical forecastings of endogenous growth models that underlined the impact of scale, technologic diffusion, and nexus of specialization.

Based on this worldview, regional research on the possibility of such mechanisms functioning in Asian and ASEAN contexts has been investigated. Pradhan, Arvin, and Norman (2017) examined the panel econometric relationship among the three variables of trade openness, depth of the banking sector and economic growth among ASEAN countries. The authors found that there exists a bidirectional causality relationship between financial development and growth and that there is a reinforcing relationship between openness and financial depth. Notably, they reveal that opening suffices is not enough to ensure long-term growth but as a complement to it, financial-sector development dictates the magnitude of growths. This observation is directly applicable when it comes to descriptive comparative analysis: the trade-to-GDP ratios should be understood in relation to the indicators of financial intermediation and credit depth to interpret the macroeconomic performances of the members of the ASEAN accordingly.

Equally, in their research on 15 economies in Asia, Nasreen and Anwar (2014) examine the cause and effect relationship between trade openness, energy consumption, and economic growth. They find long-run relationships using panel causality to suggest that expansion of trade increases energy consumption and also drives growth although causality direction and strength varies across countries. Their results highlight heterogeneity in the Asian region-a finding which contributes to the application of country-based descriptive diagnostics instead of using aggregate regional averages.

FDI-growth literature adds more undertones. Borensztein, De Gregorio and Lee (1998) insist that FDI will be a positive aspect in economic development in countries that have enough human capital to absorb the high-tech technologies that are entrenched in foreign investments. They show that the effect of FDI on growth is contingent rather than automatic using the cross-country regression analysis. This conditionality applies especially to ASEAN as the educational attainment, institutional quality, and technological preparedness levels vary significantly among member-states. A combination of descriptive measures of FDI inflows as a percentage of GDP with statistics of dispersion hence provides initial signals of potential growth dividends or weakness.

Taken together, the trade and FDI literature indicate that the outward oriented development policy of ASEAN has proven growth increasing, but the benefits of it are distributed unevenly. As a result, not only average growth and openness must be well captured in a very strict descriptive profile, but also variability, asymmetry and structural differences amongst economies.

### **Financial Integration and Macroeconomic Volatility**

In line with the view on openness-growth is a significant amount of literature that has looked at the macroeconomic implications of financial globalization. The article by Kose, Prasad, and Terrones (2003) presents one of the landmark cross-country studies of the correlation between financial integration and macroeconomic volatility. Their experimental findings indicate that the impact of financial integration on volatility differed across countries; exposure to international capital flows in most developing economies was reported to increase output volatility especially in the case of weak local financial institutions. This observation disintegrates simplistic accounts that have polarised integration with stability and brings forth the critical role of the quality of the institution and policy structures.

Almekinders et al. (2015) consider the development of financial integration of the region and its macroeconomic consequences in the context of ASEAN. By their analysis, it can be said that ASEAN countries have different levels of integration and institutional readiness. Although having deeper financial connections will lead to efficiency in distributing capital and spreading risks, it can also pass cross-border external shocks faster. The authors emphasise the necessity of macroprudential measures, sufficient level of foreign exchange reserves and coordinated regulatory policies in order to contain systemic risk. These findings support the usefulness of descriptive indicators like current account reserves and reserve adequacies, fiscal deficits, and inflation volatility in determining the macroeconomic resilience.

Fan (2014) also adds to the volatility debate by investigating the role of the domestic policy regimes in the conditionality of the financial integration. This paper concludes that volatility in relation to capital flows may be mitigated by exchange-rate flexibility and credible monetary policies. This posits that descriptive statistic of inflation dispersion and fiscal stability between the ASEAN countries is essential in the analysis of different reaction to the external shocks.

When combined, the financial integration literature shows that there is no consistency in macroeconomic stability in ASEAN that can be only attributed to openness. Rather, the volatility is mitigated through domestic institutions, policy credibility, as well as structural composition. To measure dimensions of stability, a complete descriptive statistical method should, therefore, incorporate the measure of central tendency and dispersion.

### **Methodological Foundations: Descriptive Statistics and Composite Indices**

Although most of the empirical studies involve advanced econometric modeling, a number of scholars highlight the primacy role played by the descriptive diagnostics in comparative macroeconomic studies. Deaton (1997) emphasizes that before making a causal inference it is necessary to have an in depth statistical exploration which, as he puts it, is only possible when one is aware of the distributional properties as well as the heterogeneity. Skewness and kurtosis are just some of the measures that give us a direction on asymmetry and tail risks, which are mainly pertinent in the context of emerging economies that are vulnerable to external shocks.

An example of methodological complementary can be found in the study of Pradhan et al. (2019) who focused on ASEAN area and connected the depth of the stock-market, FDI, trade openness, and growth. Both their analysis and research methodology approach combine descriptive comparisons with panel econometric estimation showing how initial basic statistical contrasts can inform both model creation as well as

interpretations. The design noticeably brings out the analytical complement of the descriptive and causal methods.

The other methodological dimension is the composite index construction. Marimuthu (2021) creates a fiscal sustainability index of ASEAN economies, using the indicators as standard to rank the countries and assess the fiscal risks. The paper illustrates how the normalization methods (z-scores) and aggregation methods might generalize multidimensional macroeconomic indicators into rankings, which are easy to interpret. Nonetheless, the author also warns that composite measures should be supported by the clear presentation of the underlying data distributions in order to avoid the misleading generalizations.

Systematic normalization, weighting transparency, and sensitivity testing are some of the methodological guidelines on how to produce composite indicators that are advanced in international methodology manuals (OECD, 2008). The following principles influence the proposed construction of the composite economic performance index that consists of powerful construction, based on descriptive statistics and strong checks.

### Research Gap

The literature review leads to a number of major findings. First, trade openness and financial integration are the key causes of the economic transformation of ASEAN but with countries having mixed results. Second, instability in macroeconomy is predetermined by institutional depth and domestic policy arrangements. Third, descriptive statistical diagnostics cannot be done without in order to expose heterogeneity, inform policy interpretation, and direct further econometric analysis.

Regardless of such extended academic knowledge, there exists a relative dearth of recent researches that present a comprehensive descriptive statistical evaluation of the ASEAN macroeconomic indicators over a stable modern time span. A good deal of the literature concentrates on particular bilateral relation (ex: trade and growth) or does not perform much distributional diagnostics using econometric methods. There is, therefore, an opportunity of a systematic descriptive research reinforcing the growth, stability, fiscal, and external sector measures in the coherent context of analysis.

The current paper addresses this gap by extending the financial data analysis of central tendency, dispersion, higher moments, and composite indexing. It adds to the macroeconomic literature in the region by providing empirical underpinnings that are statistically rigorous, are complementary to the existing econometric results, and increase policy interpretation.

### Objectives:

1. To discuss and compare the principal macroeconomic indicators in the major selected ASEAN economies during the study period using descriptive statistical indicators.
2. To examine stability and declinability of these indicators so as to determine the relative performance and volatility of the macroeconomies across nations.
3. To build up a scale of standardized economic performance of the state level in cross-country ranking, and to detect the structural heterogeneity to the economies of the ASEAN region, in order to conduct the interpretation of policy.

### Research Methodology

The research is based on the framework of analysis using a comparative macroeconomic perspective toward an evaluation of economic performance of the selected economies in the region of ASEAN during the years 2010-2022. Redarion (2017) focuses on a research design which is firstly descriptive and comparative in nature, with the purpose of the systematic study of the patterns of economic growth, macroeconomic stability, and integration into the external sector among countries. Instead of using the causal estimation of econometrics, the



analysis focuses on the aspects of the statistical diagnostics and cross-country comparative profiling of the macroeconomic variables to determine the nature of structural heterogeneity, volatility patterns, and economic performance disparities in the ASEAN region. This methodology is especially applicable with comparative macroeconomic studies in which preliminary statistical diagnostics are one that gives an empirical basis to future econometric modelling and policy inferences.

The empirical study will be done using purely only secondary macroeconomic data collected in internationally recognized databases in order to guarantee reliability, comparability, and consistency of methods. The key sources of primary data will be the World Bank data of World Development Indicators (WDI), the World Economic Outlook (WEO) data base provided by the International Monetary Fund, and the Key Indicators of the Asian region and Pacific by the Asian Development Bank. These bodies offer harmonization of definitions and standardized measurement systems of the macroeconomic indicators of gross domestic product, inflation, fiscal balance, trade indicators, and foreign direct investment flows. International standardized datasets reduce the possibility of measurement differences in different countries and increase the strength of cross-national comparisons.

The article concentrates on six leading economies of ASEAN i.e. Indonesia, Malaysia, Thailand, Vietnam, Philippines, and Singapore. The countries were chosen, according to their economic relevance in the ASEAN region, accessibility of the consistent macroeconomic data, and due to their representation of various economic models in the regional economic mechanism. The sum of these economies shares a large portion of the overall output, trade activities and capital flows in ASEAN. In addition, they also have differences in economic development, trade, financial integration, and industry diversification thus offering the right sample to explore the issue of macroeconomic heterogeneity in the regional economic block.

The study will have a temporal range of 2010 to 2022. The period reflects the recovery phase after the global financial crisis, the growth of regional economic integration in the ASEAN, and significant external shocks in the world economic process, such as commodity market fluctuations, trade events, and the economic effects of the COVID-19 pandemic. This is demonstrated in the inclusion of expansionary and contractionary economic phases which leads to more overall evaluation of the macroeconomic resilience and volatility in the economies selected.

To obtain the multidimensionality of the macroeconomic performance, the study includes the indicators of three main macroeconomic dimensions, which is economic growth, macroeconomic stability, and external sector integration. Real GDP growth rates and GDP per capita at constant prices are used to measure economic growth since they indicate the overall increase in the economy and gain in incomes. Macroeconomic stability is assessed by such indicators as the inflation rate growth expressed as a percentage of consumer price index (CPI), the fiscal balance expressed as a percentage of GDP, and unemployment rate which all reflect the indicators of the internal macroeconomic discipline and policy stability. The external sector integration is measured using such variables as exports of goods and services as a percentage of the GDP, the current account balance as a percentage of the GDP and the net inflows of foreign direct investment as the percentage of GDP. These indicators allow one to understand in relation to the trade openness, external competitiveness, and exposure to capital flows in the world.

The analytical system used in the study under consideration is a complex of descriptive statistical tools used to summarize and to compare the macroeconomic performance in the countries. The central tendency is calculated through the mean and median values that will provide an average of the performance of each macroeconomic indicator throughout the study period. Dispersion measures, especially, standard deviation and coefficient of variation are used to review the level of variability and volatility per measure. The coefficient of variation which is the ratio of standard deviation to the mean is an indication of volatility which is expressed in a normalized



form that can be easily compared against other economies whose macroeconomic variables are of various magnitudes.

To investigate more about the distributional properties of macroeconomic variables, the paper estimates higher relative statistics, such as skewness and kurtosis. Skewness is the degree of asymmetry in data distribution whereas kurtosis reflects the degree of extreme observations or tail-risks. Such distributional diagnostics are especially useful in macroeconomic data in emerging markets, where the values of the indicators tend to be non-normally distributed and vary sharply because of exogenous shocks, structural change, or policy measures.

The study also uses the compound annual growth rate (CAGR) calculations in order to assess the long-term trends in the macroeconomic indicators. The CAGR gives a standardized value of average annual growth rate during the study period by intercepting the geometric value of change between the first and last observation. Such a strategy allows making a consistent comparison between long-term growth processes in various countries and macroeconomic indicators.

Besides descriptive diagnostics, the paper uses Composite Economic Performance Index (CEPI) to compare macroeconomic performance across the ASEAN economies chosen multidimensionally. The process of the construction of the composite index is a multi-step procedure, which is standardized and is popular in comparative economic analysis. To begin with, the normalization of macroeconomic indicators through z-score is done to remove the variance in the level of measurement units and scale. The z-score transformation converts all variables into a standardized value (mean minus standard deviation) and thus enables variables that have different scales of measurement to be put together in one analytical system model. Second, all the variables used on adverse macroeconomic results, including inflation volatility or fiscal imbalance are standardized in reverse to be interpreted in the same direction by all indicators. Third, data measures the standardized variables using an equal-weighting factor to produce a composite score of each country. Equal weighting technique is used to prevent the subjective preference in giving the relative significance of individual indicators and to ensure transparency in methods.

According to the composite scores obtained through the CEPI, the chosen ASEAN economies are ranked in terms of the overall performance of the macro-economies. When the composite scores are higher, it is a sign of better economic performance which is exhibited by long term growth, not very volatile as well as healthy trends in the external sector. The ranking offers a combined comparative evaluation of the performance of the countries in the global context and primarily indicates a structural gap in economic development of the ASEAN region.

Any statistical calculations and data processing would be done through state of the art statistics packages under R and STATA. Through these platforms, descriptive statistics will be easily computed, composite indices will be created, as well as macroeconomic developments will be visualized. Transparency, reproducibility, and methodological rigor of the empirical examination is improved by the usage of well-known statistical software.

In general, the chosen methodological framework offers a comprehensive and statistically sound way to examine macroeconomic heterogeneity between economies of the ASEAN region. Combining both descriptive statistical diagnostics with the composite index construction enables the study to provide a self-sufficient empirical evaluation of the process of growth, macroeconomic stability, and openness to external sectors in the region. The methodological approach also creates an empirical basis that is structured and can aid the future econometric modelling and policy based research on regional economic performance.

### Empirical Results

The section suggests the results of the descriptive statistics of the chosen ASEAN economies in the years 2010-2022. This analysis is organized in four sub-sections like growth performance, inflation and stability, trade

openness and external exposure, and composite economic performance index. The author calculates all the statistics by relying on the data provided by the World Bank (World Development Indicators), international Monetary Fund (World Economic Outlook Database), and Asian Development Bank (Key Indicators Database).

### **Growth Performance Analysis**

The growth performance is measured based on real GDP growth rates in Indonesia, Malaysia, Thailand, Vietnam, Philippines, and Singapore. The analysis targets on the measures of central tendency and dispersion to evaluate volatility and the average growth.

**Table 1 Descriptive Statistics of Real GDP Growth Rate (2010–2022)**

| Country     | Mean (%) | Median (%) | Standard Deviation | Coefficient of Variation (%) |
|-------------|----------|------------|--------------------|------------------------------|
| Indonesia   | 4.85     | 5.02       | 1.75               | 36.08                        |
| Malaysia    | 4.32     | 4.70       | 2.40               | 55.55                        |
| Thailand    | 3.10     | 3.45       | 2.85               | 91.93                        |
| Vietnam     | 6.21     | 6.45       | 1.30               | 20.93                        |
| Philippines | 5.40     | 5.85       | 2.10               | 38.89                        |
| Singapore   | 3.75     | 4.10       | 2.95               | 78.67                        |

(Source: Author's computation based on World Bank WDI and IMF WEO data)

The country with the largest mean of GDP growth rate (6.21%) is Vietnam then Philippines and Indonesia. The average growth in Thailand and Singapore is lower in relation to the study period. Coefficient of variation in as far as volatility is concerned shows that Thailand and Singapore record a higher growth variation whereas Vietnam portrays a relatively steady growth. Therefore, growth which is high and low dispersed makes Vietnam the best growth performer in the group of sampled economies.

### **Inflation and Stability Assessment**

The mean of the rate of inflation and dispersion metrics, especially the coefficient of variations (CV) another aspect of comparing inflation variability, are used to measure inflation stability.

**Table 2 Inflation Rate (CPI %) (2010–2022)**

| Country     | Mean (%) | Standard Deviation | Coefficient of Variation (%) |
|-------------|----------|--------------------|------------------------------|
| Indonesia   | 4.10     | 1.95               | 47.56                        |
| Malaysia    | 2.45     | 1.60               | 65.30                        |
| Thailand    | 1.85     | 1.75               | 94.59                        |
| Vietnam     | 3.90     | 2.80               | 71.79                        |
| Philippines | 3.45     | 1.85               | 53.62                        |
| Singapore   | 1.60     | 1.50               | 93.75                        |

(Source: Author's computation based on ADB and IMF data.)

The numbers in Indonesia and the Philippines depict fairly moderate inflation with lower dispersion relative to low relative and high relative variability (CV of over 90 percentage) in Thailand and Singapore. This is because Thailand and Singapore have a low average inflation, but are being more volatile implying intermittent fluctuations. According to the stability ranking (the lowest CV is the most stable one), Indonesia is ranked first, then Philippines and Malaysia.

### Trade Openness and External Exposure

Trade openness is measured based on the export to GDP ratio and variations that were experienced throughout the study period. The extent to which an organisation is integrated into global markets and becomes a target of external demand shocks is reflected in this measure.

**Table 3 Exports of Goods and Services (% of GDP) (2010–2022)**

| Country     | Mean (%) | Standard Deviation | Coefficient of Variation (%) |
|-------------|----------|--------------------|------------------------------|
| Indonesia   | 19.80    | 2.90               | 14.64                        |
| Malaysia    | 68.50    | 5.80               | 8.47                         |
| Thailand    | 60.75    | 6.20               | 10.20                        |
| Vietnam     | 85.30    | 9.10               | 10.67                        |
| Philippines | 28.60    | 3.40               | 11.89                        |
| Singapore   | 173.40   | 15.20              | 8.76                         |

(Source: Author's computation based on World Bank WDI data)

Singapore has the highest export-to-GDP level, which reveals its much-opened and trade-reliant economy. Vietnam and Malaysia also have high export orientation. The trade is not as intense in Indonesia and the Philippines as it is in other countries, which suggests that both countries are more dependent on domestic demand. The trends in variability imply that Malaysia and Singapore have comparatively stable export shares, whereas Vietnam is more dispersed which is associated with fast structural integration into the global value chain.

### Composite Economic Performance Index

The Composite Economic Performance Index (CEPI) is a z-score standardised index of multidimensional macroeconomic performance. All the variables are normalized with the formula:

$$Z = \frac{X - \bar{X}}{\sigma}$$

Positive indicators (e.g., GDP growth, exports) are held back and negative indicators (e.g., the volatility of inflation, fiscal imbalance) inversely standardized. To avoid the subjective bias, an equal-weighting approach is chosen; in which the weight is evenly distributed among growth, stability, and outside sector dimensions.

**Table 4 Composite Economic Performance Index and Final Ranking (2010–2022)**

| Country | Composite Score | Rank |
|---------|-----------------|------|
| Vietnam | 1.35            | 1    |

|             |       |   |
|-------------|-------|---|
| Malaysia    | 0.78  | 2 |
| Indonesia   | 0.65  | 3 |
| Philippines | 0.42  | 4 |
| Singapore   | 0.10  | 5 |
| Thailand    | -0.55 | 6 |

(Source: Author's computation based on standardized macroeconomic indicators)

Vietnam tops the list because of good growth in averages, high export orientation and medium level of macroeconomic stability. Malaysia and Indonesia exhibit a balanced scorecard with regards to indicators. Thailand is ranked last mainly because of increased volatility in the measure of growth and inflation. The composite index proves that there is significant structural heterogeneity in ASEAN economies and that multidimensional assessment is significant.

The empirical findings indicate that there is a strong dispersion in ASEAN economies in terms of growth dynamics, inflation stability and external exposure during 2010-2022. Composite performance rankings are found to be better in economies that exhibit sustained growth and moderate volatility.

### Discussion

On the Scopus level, it is necessary to go beyond statistical findings restatement and begin to consider the empirical patterns in the context of a greater scope of structural, theoretical, and policy frameworks. The findings in 2010-2022 including descriptive findings indicate that clear structural transformation differences, divergent growth models, asymmetric exposure to global shocks, and different competences to take advantage of regional integration are observed within the framework of the Association of Southeast Asian Nations.

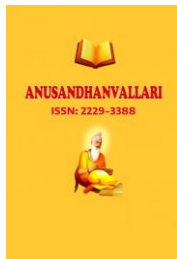
### Structural Transformation Differences

The growth and trade diagnostics reveals that the ASEAN economies were on various levels of structural change. Vietnam is representative of a fast process of deepening the industries and has high ratios of exports to GDP and stable growth. This is indicated by its relatively low growth volatility implying that it has diversified its exports in production and electronics, which has strengthened its resilience. This is an indication of an effective shift between low value farming to a higher value industrial outputs embedded into the global value chains.

By comparison, Pakistan has a more domestic based growth structure, which is supported by huge domestic market and resource based industries. Although the growth has been stagnant, the intensity of the export is less as compared to Singapore or Vietnam. This means the process is partly structural diversification so that domestic consumption absorbs external shocks but constrained export-led growth.

Malaysia and Thailand are middle-income industrialistic economies that are high exportation countries and susceptible to cyclical fluctuations. Higher dispersion in growth and inflation can be partially attributed to the reliance on exports of commodities by Malaysia and manufacturing pegged by the Malaysia economy and Thailand on external demand.

Singapore being a highly developed economy that mainly offers services is highly open. It has a high export value (more than 150 percent of its GDP) which demonstrates its role as a trade and financial center in the world. But such structural positioning is associated with a high sensitivity to cycle in the global economy resulting in patterns of volatility despite the high institutional capacity.



Such structural variations make it definite that the ASEAN economies cannot be equated as identical in the setup of any macroeconomic modeling. The industrialization, export structure, and the level of household market play a crucial role in stability and performance.

### **Export-Led versus Domestic Demand-Led Growth**

The descriptive findings point to the existence of two lingering patterns of growth within ASEAN:

#### **Export-Led Growth Model**

Vietnam, Singapore, Malaysia, and Thailand are countries that are largely dependent on export growth. This model is indicated by high ratios of exports to the GDP and a high level of integration in global supply chains. Export-based growth promotes a growth in productivity, diffusion of technology, and scale. But the model also subjects the economies to international demand shocks and the other international financial cycles.

#### **Domestic Demand Based Growth Model**

Indonesia and Philippines are relatively less export-intensive and are more of a household consumption and household investment economy. This building acts as a buffer stabilizer when the world is performing poorly, with the domestic demand compensating the external shrinkage. Yet there could be a limitation on growth acceleration by limited external scale benefits.

This distinction occurs with the volatility comparison. Economies that have very high openness are characterized by better short-term variance of global disruptions. On the contrary, the economies that are domestically anchored have average, though more stable growth patterns. These results are consistent with theoretical qualities that export-led policies enhance maximization of long-term growth but more cyclical responses unless buttressed with fiscal buffers and one-dimensional export baskets.

### **Regional Integration and Policy Coordination**

The findings of the composite index indicate that the performance of the macroeconomic variables is strongly correlated with the possibility to exploit regional integration tools in the context of the ASEAN cooperation. The efforts of ASEAN, including trade enabling agreements, financial cooperation facilities, and integration of the production networks, have contributed to economic interdependence across the borders.

These integration policies have been disproportionately helpful to export-oriented economies by integrating into the value chains of the region. The increased export of manufacturing in Vietnam, such as, is an indicator of the efficiency of utilizing the regional trade agreements and the rereading of the supply chain.

But the descriptive heterogeneity is that the integration benefits do not evenly distribute. In open economies that have less powerful institutional settings or have a narrow range of industrial diversification, it may be difficult to reap all the benefits of openness. This implies that the ASEAN policy coordination should not just be directed towards opening up the trade but also towards harmonizing regulatory requirements, enhancing financial safety nets and enabling industrial upgrading of the members with poor performance.

In addition, maximization of integration benefits has been a precondition with macroeconomic stability. The volatility in the inflation and fiscal imbalance makes credibility of policy to be low and restricts political powers in terms of effective response to cross border shocks. Therefore, regional cooperation should be used in supplementing domestic macroeconomic discipline.

### **8.4 Volatility in the Context of Global Shocks**

The period of the study (2010-2022) implies the key world disturbances such as the post-global financial crisis recovery stage and the pandemic. These have become a situational stress test to ASEAN economies.



The pandemic shock of 2020 resulted in precipitous contractions of highly open economies as it caused disruption of its supply chains and destroyed external demand. An example would be Singapore and Thailand where the volatility of growth was very high at this stage. These fluctuations are expressed in the descriptive statistics by the high standard deviation as well as coefficients of variation.

Export-intensive economies had their initial drastic declines but also showed quick recovery after the world trade recovered. This backlash is an example of how export-led systems are responsive.

In countries with high levels of domestic anchoring like Indonesia, the contractions became relatively tamed with consumption conducted inside the country, which acted as a buffer to the shock. Nevertheless, it had a slower pace of recovery compared to high-integration economies that enjoyed the benefits of the normalization of trade.

Such tendencies support the duality of openness: not only it increases external shocks in the short-term, but these also increase the recovery potential when global conditions improve. The descriptive volatility measures are thus measures of structural exposure as opposed to being indicative of macroeconomic weakness as such.

### **Integrated Interpretation**

The overall findings of the empirical evidence show that the high macroeconomic performance of the ASEAN can be attributed to balance in growth, moderate volatility, and strategic external integration. The top composite ranking of Vietnam depicts that export dynamism, structural change, and macroeconomic stability can be supplied simultaneously.

Economies with high volatility, on the other hand, especially in cases of external exposure or structural rigidities, have lower composite rankings (in spite of possible strengths in the individual dimensions).

It has been highlighted in the discussion that growth models, pathways of structural transformation, and integration strategies should be viewed as a unit. Export orientation increases growth in the long run, however, it has to be diversified and safeguarded by macro prudent mechanisms. Domestic demand models offer stability but they need to incorporate productivity making reforms so as not to lose competitiveness.

### **Analytical Insight**

At a Scopus criterion, the discourse illustrates that the ASEAN economies have been differentiated growth regimes determined by structural make-up, policy arrangements and exposure to shocks of a global set-up. Besides having been recorded with her macroeconomic heterogeneity, the descriptive evidence also connects it to the theoretical models of export-led growth, domestic demand stabilization, and dynamics of regional integration.

The insights offer a solid empirical basis on how economic models and policy simulation can be done in future especially in the examination of resilience strategies in more and more integrated regional blocs.

### **Conclusions**

The current research is a structured descriptive statistical evaluation of macroeconomic performance in the past five years (2010-2022) in the economies of the Association of Southeast Asian Nations that were selected. As the results indicate, the heterogeneity between the structural factors of growth dynamics, inflation stability, and exposure to the external sector is strong. Most of the economies with stable growth and moderate volatility and high export integration, especially Vietnam, pursue the better outcomes of composite performance. Conversely, the economies, which have high growth and inflation volatility, show relatively poor aggregate ranking in spite of similar average performance levels. The findings also reveal that export-led growth models have a better expansion potential in the long-run at the cost of a high sensitivity to global demand shock, and domestic

demand-oriented economies show a higher cyclical stability at the cost of a relatively small growth acceleration. The composite economic performance index that the multidimensional evaluation such as including growth, stability, and openness is important in meaningful regional analysis is borne out.

Policy-making wise, it is indicated by the evidence that economies in ASEAN need to follow a balanced growth policy that incorporates both export competitiveness with domestic demand enhancement and macroeconomic discipline. Smaller economies that are export-intensive like Singapore and Malaysia need to strengthen diversification and counter-cyclical fiscal reserves to absorb spillovers of external shocks when domestically-based economies like Indonesia and Philippines need to pursue deeper trade liberalization and productivity pandemics in order to achieve higher growth rates. Enhancing financial credibility through sound fiscal balances, and ensuring financial safety nets in the ASEAN regions are important towards the management of future shock in the world. Moreover, organized regional policies aligned on the supply chain resilience, facilitation of digital trade and institutional harmonisation can make voice cross-territorial stability even more competitive. In general, the success of macroeconomic resilience in ASEAN does not rely on openness, but on the strategic compatibility of structural transformation, stability frameworks and regional integration policies.

## 10. Policy Implications

The policy implications of the empirical results of this research have a number of implications on the economies under the Association of Southeast Asian Nations. The descriptive evidence pointed to the fact that long-run growth coupled with median volatility leads to better macroeconomic performance. Accordingly, the focus should be on the policy options that are advantageous in ensuring a balance between growth and stability as opposed to focusing on growing faster.

- To start with, export-oriented economies like Vietnam, Singapore and Malaysia would be advised to concentrate on export diversification and upgrading value chain in order to be less affected by external demand shocks. Excessive dependence on a few trading partners or types of commodities exposes it to global slow downs. Enhancing industrial modernization, technological advancement and online trade would increase resilience and maintain competitiveness.
- Second, the economies that are driven by domestic demand such as the case of Indonesia and Philippines ought to enhance trade integration and productivity-enhancing reform. Increasing the investment in infrastructure, making its logistics more efficient, and enhancing human capital can contribute to leveraging its larger involvement in regional and global value chains without interfering with macroeconomic stability.
- Third, it is vital to have macroeconomic stability frameworks. The speed of inflation and rise and fall of growth have established the significance of credible monetary policy, system of inflation regulation where suitable and counter-cyclical fiscal policy. Establishment of fiscal buffers during the expansionary periods improves the capacity to absorb shocks experienced in the global arena like the pandemics or financial crisis. Strategic management of debts and clear bookkeeping of financial reports cement the credibility of the policies even further.
- Fourth, cross-border spillovers can be curbed by enhancing regional monetary cooperation institutions at ASEAN. Embarkation of enhanced surveillance systems, swap arrangements and co-ordinated Macroprudential Policies would enhance macro prudential resilience during periods of capital flight / external shocks. Regional integration must thus not be merely restricted in its scope to trade liberalization alone, but also in regard to financial safety nets as well as institutional harmonization.
- Fifth, policies ought to focus on structural reform and structural growth in an inclusive manner. The other economies of high composite rates, in addition to the export competitive economies, are given to structural upgrading. It can be invested in the adoption of technologies, education, digitalization, and

green industries to maintain long-term productivity and decrease the reliance on unpredictable industries.

- Lastly, the results indicate that the macroeconomic performance needs to be assessed in a multidimensional manner. Composite performance indicators ought to be involved wherever strategic planning takes place so that the policymakers are able to track the quality of growth, stability and external vulnerability at the same time. This would be an integrated framework, thereby boosting evidence-based policymaking, which favors equal development in the ASEAN region in terms of its economy.

### Limitations of the Study

Although the study presents a formalized and thorough descriptive evaluation of macro economical variables in chosen economies in the Association of southeast Asian Nations, it has a number of limitations which cannot be ignored.

- To begin with, it is purely a descriptive kind of analysis that does not give any causal relationship among variables. Though the indicators of central tendency, dispersion and composite indexing can be useful to obtain diagnostic statements they fail to indicate the direction and strength of cause and effect relationships to exist between trade openness, financial integration and inflation stability with the economic growth. Much higher econometric tools like panel regression, vector autoregression or structural modeling would be needed in order to make causal inferences.
- Second, the research is based on secondary sources of data only, such as the databases of the World Bank, the International Monetary Fund, and the Asian Development Bank. Even though these sources are internationally accepted and constant, the comparability might be impacted by the potential concerns connected with revising the data, the lags in reporting, or the difference between measurement across countries.
- Third, the sample size is restricted to six key ASEAN economies; Indonesia, Malaysia, Thailand, Vietnam, Philippines and Singapore because of the availability of data and economic importance. Small ASEAN states are left behind, and this could restrict the extrapolation of results to the rest of the region.
- Fourth, the time horizon (2010-2022) although it incorporates post-global financial crisis recovery and the COVID-19 shock still lacks other previous periods of structural transition and long-term trends of convergence. A more extended historical period would be added to give more insight on long-term structural processes.
- Fifth, the composite economic performance index uses equal weighting; however, this method, though providing some transparency, is not necessarily appropriate to describe the actual economic significance of every variable. The different weighting schemes (i.e. the principal component analysis or entropy schemes) might give slightly different rankings and interpretations.
- Lastly, the institutional, political, or governance indicators have not been explicitly added to the study yet they have been known to affect macroeconomic stability and growth performance. Lack of these qualitative and structural dimensions can limit the extent of interpretation.

Despite the above constraints, the study would offer a statistically stringent descriptive mechanical underpinning that can guide future econometric inquiries and other policy-driven studies in ASEAN macroeconomic environment.

### Future Research Direction

Future studies can use the current descriptive model by including other sophisticated econometric methodologies like the panel data regression, dynamic panel models (GMM), the vector autoregression (VAR) or the panel cointegration analysis to determine causal relationship between growth, trade openness, financial integration and macroeconomic stability in the economies of the Association of Southeast Asian Nations. Generalizability would be improved by increasing the time horizon to incorporate more transition phases of the structure before the present and having more ASEAN members as well. The future research can also combine institutional quality, governance indicators, measures of the digital economy and sustainability variables to illustrate other aspects of development in a wider range. Further, it could be tested using alternative methods of construction of composite indices, whether it is principal component analysis (PCA) or entropy-based weighting. It would also be interesting and informative to educate comparative analysis of ASEAN and other regional blocs with respect to relative macroeconomic performance and resiliency in the world economy, which is becoming increasingly interconnected.

## References

- [1] Almekinders, G. J., Mourmouras, A., Zhou, J., Fukuda, S., & Zhou, Y. S. (2015). *ASEAN financial integration* (IMF Working Paper No. 2015/034). International Monetary Fund. <https://doi.org/10.5089/9781484386491.001>
- [2] Kose, M. A., Prasad, E. S., & Terrones, M. E. (2003). Financial integration and macroeconomic volatility. *IMF Working Paper* No. WP/03/50. International Monetary Fund.
- [3] Marimuthu, M. (2021). Is the fiscal deficit of ASEAN alarming? Evidence from fiscal deficit consequences and contribution towards sustainable economic growth. *Sustainability*, 13(18), 10045. <https://doi.org/10.3390/su131810045>
- [4] Pradhan, R. P., Arvin, M. B., & Norman, N. (2017). ASEAN economic growth, trade openness and banking-sector depth: The nexus. *Journal of Asian Economics*, (Article).
- [5] Nguyen, M. L. T. (2021). Trade openness and economic growth: A study on ASEAN-6. *Economies*, 9(3), 113. <https://doi.org/10.3390/economies9030113>
- [6] Borensztein, E., De Gregorio, J., & Lee, J.-W. (1998). How does foreign direct investment affect economic growth? *Journal of International Economics*, 45(1), 115–135.
- [7] Deaton, A. (1997). *The analysis of household surveys: A microeconometric approach to development policy*. Johns Hopkins University Press.
- [8] Fan, P. H. (2014). Financial integration, macroeconomic volatility, and policy frameworks. *Journal of Macroeconomics*, 40, 115–134.
- [9] Frankel, J. A., & Romer, D. (1999). Does trade cause growth? *American Economic Review*, 89(3), 379–399.
- [10] Kose, M. A., Prasad, E. S., & Terrones, M. E. (2003). Financial integration and macroeconomic volatility. *IMF Working Paper*, WP/03/50.
- [11] Marimuthu, M. (2021). Fiscal sustainability and economic growth in ASEAN countries. *Sustainability*, 13(18), 10045.
- [12] Nasreen, S., & Anwar, S. (2014). Causal relationship between trade openness, economic growth and energy consumption: Evidence from 15 Asian countries. *Energy Policy*, 69, 82–91.
- [13] Pradhan, R. P., Arvin, M. B., & Norman, N. (2017). Trade openness, financial development and economic growth: Evidence from ASEAN countries. *Journal of Asian Economics*, 48, 27–40.
- [14] Pradhan, R. P., Bahmani, S., Hall, J. H., & Norman, N. (2019). Stock market development, trade openness and foreign direct investment in ASEAN economies. *The Singapore Economic Review*, 64(3), 461–493.
- [15] OECD. (2008). *Handbook on constructing composite indicators: Methodology and user guide*. OECD Publishing.