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Bridging the Gender Gap: The Impact of Education, Labor Participation, and Political Representation on ASEAN's Economic Growth

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ABSTRACT

Gender inequality remains a critical challenge in achieving inclusive and sustainable economic growth, particularly in developing regions like ASEAN. Despite progress in closing gender gaps, disparities persist in education, labour market participation, and political representation, which can significantly impact economic development. Addressing these issues is crucial for achieving the Sustainable Development Goals (SDGs), particularly Goal 5 (Gender Equality) and Goal 8 (Decent Work and Economic Growth). This study examines the effects of gender inequalities on economic growth across nine ASEAN countries using cross-country and panel regression analyses. We utilize data from the World Bank Development Indicators database for the years 2012–2022. ASEAN was selected due to its notable advancements in gender-related policies and the region's growing economic influence. The findings demonstrate that gender equality in tertiary education has a significant positive impact on economic performance. Similarly, reducing the gender gap in labour market participation fosters economic growth. However, our results reveal a strong negative relationship between women's parliamentary representation and economic growth, suggesting that despite increased female political participation, structural barriers may hinder their ability to drive economic policies effectively. This study highlights the importance of narrowing gender gaps in education and employment to enhance economic expansion. The findings provide valuable insights for policymakers, emphasizing the need to implement gender-inclusive strategies that support sustainable development across ASEAN economies. By addressing gender disparities, ASEAN countries can accelerate progress toward long-term economic resilience and sustainable development.

1. Introduction

Gender inequality remains a persistent challenge worldwide, influencing social structures, economic productivity, and sustainable development. In the ASEAN region, disparities in education, labour market participation, and political representation continue to hinder economic progress.

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Despite notable advancements, female enrolment in secondary education remains approximately 10% lower than male enrolment in some ASEAN countries, women only hold 21% of parliamentary seats on average, and their labour force participation rate stands at 57% compared to 81% for men [1]. These disparities are not only social concerns but also economic constraints, limiting overall productivity, employment opportunities, and innovation [2].

While extensive research has established the link between gender inequality and economic development, many existing studies adopt a broad global perspective without considering the unique socio-economic, cultural, and institutional differences of ASEAN countries [3,4]. The region's difference stages of economic development and governance structures suggest that the impact of gender disparities on economic growth may vary across countries [5]. Additionally, most studies emphasize the benefits of gender equality in education and labor market participation but overlook the potential economic effects of women's increasing political representation. Given these gaps, there is a need for a more region-specific analysis to better understand how gender disparities influence economic growth in ASEAN nations.

Addressing gender inequality is essential for achieving Sustainable Development Goal (SDG), particularly SDG 5 (Gender Equality) and SDG 8 (Decent Work and Economic Growth). Gender disparities in education, employment, and political participation not only limit individual opportunities, but also restrict economic potential at a national level. Closing gender gaps in education and labour force participation can enhance productivity, increase household incomes, and contribute to higher economic growth rates [6]. Furthermore, while increased female political representation is essential for inclusive governance, its economic implications remain underexplored in the ASEAN context. This study contributes to the literature by providing empirical evidence on the specific gender inequality factors that most significantly impact economic growth in ASEAN. By examining education, labor market participation, and political representation, the research offers valuable insights for policymakers seeking to design gender-inclusive economic strategies. Identifying the most influential gender inequality factors can help ASEAN governments implement more effective policies that drive sustainable and inclusive economic development.

This paper aims to fulfill the following objectives:

- i. To analyze the trends and current state of gender inequality in ASEAN countries.
- ii. To examine the relationship between gender inequality (in education, labour force participation, and political representation) and economic growth.
- iii. To identify which gender inequality indicator has the most significant impact on economic performance.

Despite the existing literature, there remains a significant gap in the context of ASEAN countries. Specifically, there is a lack of region-specific studies that comprehensively analyse the trends and current state of gender inequality across multiple dimensions. Furthermore, the economic implications of women's political representation in ASEAN context have been underexplored. This study aims to address these gaps by providing a detailed examination of gender inequality in nine ASEAN countries over the period of 2012-2022, utilizing panel regression analysis to uncover the relationship between gender inequality and economic growth. By doing so, this research contributes to a deeper understanding of gender-related economic challenges in ASEAN and highlights policy measures that can promote inclusive and sustainable economic growth.

This paper consists of five sections. Section 1 provides an overview of the research. Section 2 provides summaries of previous studies on the relationship between gender inequality and

economic growth. The data and methodology are described in Section 3. Section 4 provides estimation results and discussion, and the final section summarize the key findings.

2. Unique Characteristics of Several ASEAN Country in terms of Gender Inequality

2.1 Brunei

Gender inequality in Brunei is significantly influenced by its unique socio-economic and cultural context. The country's heavy reliance on oil and gas exports limits economic diversification, creating challenges for sustainable growth and resilience [7]. Traditional gender roles, deeply rooted in Malay Islamic principles and hierarchical family structures, restrict women's participation in the workforce and politics, reducing their economic contributions and potential for innovation [8,9]. Additionally, the dominance of the public sector as the primary employer limits opportunities for private sector growth and entrepreneurship, which are crucial for economic diversification and resilience [10]. These socio-economic and cultural factors collectively hamper economic growth by limiting the full utilization of the potential of both men and women in Brunei.

2.2 Cambodia

Gender inequality in Cambodia is deeply rooted in socio-economic and cultural differences. A large portion of the female labour force is employed in the informal sector, which often lacks social protection, job security, and fair wages, limiting women's economic empowerment and contributions to economic growth [11]. The country's heavy reliance on agriculture, which employs many women in low-paying and seasonal jobs, creates economic instability and further restricts overall economic growth [12]. Additionally, women hold few political positions due to deep-rooted patriarchal values and cultural norms, and gender-based violence and harassment further hinder their ability to participate fully in political and economic life [13]. These socio-economic and cultural differences significantly impact gender equality and economic growth in Cambodia.

2.3 Indonesia

Indonesia also faced societal norms and traditional beliefs that influenced the gender inequality. Indonesian society often assigns distinct roles to men and women, with men expected to be breadwinners and women responsible for domestic duties. This traditional gender expectations become the substantial barriers in education, workforce participation, and leadership. Despite achieving gender parity in primary education, disparities persist in higher education due to cultural norms and economic constraints that prioritize boys' education over girls', especially in rural areas [14]. Additionally, many girls in rural area facing challenges like early marriage and lack of resources, limiting their access to education and career opportunities. The statistics of early marriage rate in Indonesia is 16.3% of women aged 20-24 were married before age 18 [14]. In terms of workforce participation, the concentration of women in informal and low-paying jobs, coupled with their disproportionate burden of unpaid care work, restricts their economic opportunities and mobility. In political leadership, equal representation is difficult to achieve due to structural and cultural barriers. This is evident by a low political representation by women, with only 21.9% of seats in the national parliament held by women as of February 2024 and ranking 18.1% in political empowerment [14,15]. Indonesia also has high rates of gender-based violence further restrict women's participation in economics and politics. In 2018, 8.9% of women aged 15-49 being reported experiencing physical and sexual violence from spouse [14]. These socio-

economic and cultural differences significantly impact gender equality in Indonesia and potentially hampers economic growth due to limitation in women's potential contribution.

2.4 Malaysia

Malaysia's gender inequality is shaped by a mixed of cultural, historical, and societal factors. Historically, Malay women had relatively high status in pre-colonial Southeast Asia, actively participating in agriculture, trade, small business, and household decision-making. Their involvement in the informal sector boosts household incomes and local economies, though often underreported.

However, modern Malaysia faces challenges like patriarchal norms, societal expectations of prioritizing family over career for women, which limiting their full participation in high-income sectors, as evident by a low ranking in Global Gender Gap Index. In political avenue, cultural barriers associate leadership with masculinity has undermining women's confidence and potential. Women inclusion in politics is a mere superficial representation without substantial power, thus restricted women's progression to supporting roles [16]. Another major challenge in Malaysia is the unmatched educational attainment among women and their workforce representation. Malaysia women often surpassing men in higher educational attainment, but this progress has not fully translated into workforce participation, leading to underutilization of skilled talent. Despite these barriers, there are gender-neutral practices, such as bilateral kinship systems and matrilineal residence patterns, which provide women with some autonomy and support [17]. Malaysia's kinship system, for instance, allowed women to maintain strong family ties, which can support their participation in economic activities, which contribute to more balanced workforce and economic resilience. These unique characteristics highlight both progress and persistent inequalities in Malaysia's gender dynamics.

2.5 Philippines

Gender inequality in Philippines is rooted from a mixture of historical, cultural, religious and societal factors. Spanish colonialism has introduced patriarchal values in Filipino society which reinforce male dominance in leadership and decision-making [18,19]. Gendered social norms and cultural beliefs about gender distinct roles discourage women from working outside the home, with 75% of men and 80% of women agree that the men should be the breadwinner while women should care for the family [20,21]. Limited women's participation in labor force is due to Catholicism's emphasis on traditional family structures of women's role as caregivers further shaping the gender norms [19,22]. There are limited childcare support in Philippines as over 95% of men and women believe childcare should be provided by family members [20]. As such, Filipino women's employment likelihood decreases with marriage and childcare responsibilities, reinforcing gender disparities in economic participation. This is evident by only 49% of Filipino women participate in labor force, despite higher ranking in gender equality globally [20]. Filipino women are also underrepresented in political arena due to cultural stereotypes that discourage women from pursuing leadership role. Wage disparities also present with women in lower-skill jobs earning less than men. Interestingly, women in high-skill occupation earns more than men on average [20]. All these societal norms continue to shape gender inequality in Philippines, potentially dampening economic development.

This section explores unique characteristics of several ASEAN countries pertaining to gender inequality issues. There are significant similarities in societal norms and cultural beliefs where all

countries exhibit deep-rooted patriarchal values and traditional gender roles of men as breadwinner and women as homemakers and caretakers. These societal norms limit women's participation in the labor force and leadership. While there are significant similarities in cultural norms across ASEAN countries, there are some differences in economic sectors, historical contexts, and specific challenges faced by women in ASEAN. Each country has unique factors that influence gender inequality, requiring tailored approaches to address the issue effectively.

3. Literature Review and Hypothesis Development

3.1 The Relationship between Gender Inequality and Economic Growth

Gender inequality remains a major barrier to women's empowerment, particularly in economic participation. Discrimination against women exist in economic activities that contribute to country's economy development, often fueled by stereotypes that confine women to household roles rather than professional careers. Challenging these stereotypes, such as the belief that women do not need higher education or economic opportunities, is crucial in reducing gender inequality [23]. Without women's roles in economic activities, sustainable economic growth becomes difficult to achieve. With global advancements, more women are gaining access to education, contributing to economic development. As noted by Altuzarra *et al.*, (2021) [24], expanding education opportunities for women can significantly enhance economic growth, particularly in developing nations, including those in Southern Africa. Higher education equips women with the skills and qualifications needed to enter the workforce, leading to increased labor force participation and economic productivity. To maximize these benefits, it is essential to ensure that women have equal access to job opportunities and fair wages, allowing them to fully contribute to economic development. Thus, narrowing gender gap can increase economic growth. To facilitate this, legal framework and cultural norms should be evolved to support women's active participation in politics and empower them to influence policies that promote gender equality, particularly of women in vulnerable circumstances [24]. Various indicators of gender inequality influence economic growth. In this study, we focus on three factors: the proportion of seats held by women in national parliaments, gender disparities in education and female-male ratio in labour force participation, as they play a crucial role in shaping the relationship between gender inequality and economic growth.

3.2 Women Political Representation and Economic Growth

Several studies highlight the impact of women's participation in politics on a nation's economic development. Research on South African indicates that an increase in the percentage of female seats in parliament has a significant and positive relationship with the nation's economic growth [25]. Similarly, Stolt and Denise [26] found that a higher proportion of women in legislative bodies positively influence economic growth across multiple regions, including Europe, Africa, North and South America, Asia and Oceania. Additionally, another study on European countries discovered a strong positive correlation between women's representation in parliament, their involvement in education and training, and economic growth [27]. These findings suggest that greater female participation in political decision-making contributes to economic expansion by fostering policies that promote inclusivity, social welfare and long-term development. Moreover, improved female representation in parliament, combine with better access to education, has been linked to higher GDP per capita, reinforcing the argument that excluding women from political process can hinder economic progress.

While these studies largely support economic benefits of increased female political participation, further research is needed to assess whether this trend holds true within the ASEAN context, where socio-political structures and economic landscape may differ. Societal norms have significant impact of women's political representation and consequently on economic growth. In Ghana, for instance, cultural beliefs and practices have led to differentiated gender roles that limit women's political aspiration. Patriarchal cultural norms and religious influence collectively reinforce traditional gender roles as caretakers and homemakers, discouraging women from seeking leadership position. Additionally, leadership perception associated with masculinity, inheritance practices that favor man and societal stigma over unmarried or divorced women are the other socio-economic barriers and challenges faces by Ghana female politicians [28]. In ASEAN, there is similar societal norms that associate leadership with masculinity, undermining women's potential from pursuing political roles. There are also potential for tokenism and limited policy influence, where women's involvement in politics is a mere superficial representation without holding substantial power to effectively influence in policymaking. In Malaysia, for instance, the establishment of women's wings in some parties only confine role of women as supporters, rather than a leader in the party [29]. While some studies highlight positive correlation between women's political empowerment and economic growth, there are challenges of tokenism, limited policy influence, and socio-cultural barriers which can impede the positive impact. Based on this evidence, we propose the following hypothesis:

H₁: There is a significant relationship between the proportion of seats held by women in national parliaments and economic growth.

3.3 Gender Parity in Tertiary Education and Economic Growth

Higher education plays a crucial role in fostering human capital development, enhancing productivity and driving economic growth. While primary and secondary education lay the foundation for basic skills, tertiary education provides specialized knowledge and advanced skills that allow individuals to participate more effectively in high-value industries, entrepreneurship, and leadership roles. Research has demonstrated that narrowing the gender gaps in tertiary education leads to substantial economic benefits, including increased female labour force participation, improved wages, and higher economic efficiency [4]. Studies have shown that gender disparities in higher education hinder economic growth due to constraint on women's contribution in labour market. For instance, Klasen *et al.*, (2009) [30] observed growth deficits in Middle East and North Africa, and South Asia due to lower female education attainment and workforce participation. Their findings are particularly relevant in the context of ASEAN economies, where persistent gender gaps in higher education continue to limit economic progress [31]. Conversely, some studies argue that women's access to tertiary education does not always translate to economic gains. For instance, in some developing countries, investment in female's tertiary education has not led to proportional increases in labour market due to structural barriers such as market discrimination, cultural norms, and job-market mismatches, continue to hinder women contributions to economic development [32-34]. Although there are strong evidence supporting the economic benefits of gender parity in tertiary education, there are potential challenges associated with its impact. This study aims to explore how gender gap in tertiary education influences economic growth in ASEAN countries. Therefore, the study proposes the following hypothesis:

H₂: Gender equality in tertiary education has a significant impact on economic growth.

3.4 Female Labour Force Participation and Economic Growth

Employment is a crucial determinant of economic growth, as labour force participation directly contributes to national output. Expanding the labour force, particularly by increasing gender parity in participation, can lead to higher economic productivity and growth. According to Rahman and Maliha Mahru [35], labour force participation rate expansion plays a significant role in determining GDP growth in developing economies. However, the relationship between female labour force participation and economic growth is complex. Sulaiman *et al.*, (2024) [36] highlight that while greater female labour force participation positively impacts economic growth, a persistent gap between male and female participation rates weakens this effect, particularly in countries with higher female life expectancy. This suggests that narrowing the gender gap, rather than just increasing women's participation in isolation, is essential for sustainable economic contributions. Research by Klasen *et al.*, (2009) [30] shows that gender gaps in labour retard the economic growth, particularly in developing nations, by underutilized human capital and reduced productivity. Similar evidence is found in India how restricting women from certain sectors and roles leads to a less efficient allocation of resources, thereby hindering economic growth [37]. In Sub-Saharan Africa, Thaddeus *et al.*, (2022) [38] find the gender gap in labour force participation has a negative and statistically significant impact on economic growth in the long run, suggesting structural labour market constraints and gender-specific economic barriers. This aligns with broader global findings that closing the gender gap in labour force participation enhances overall economic efficiency [31]. Given these mixed findings, it is crucial to analyse the specific effects of the female-male labour force participation ratio in ASEAN countries. This study, therefore, hypothesizes:

H₃: Female-male ratio of labour force participation has a significant effect of on economic growth.

3.5 Investment

Gross capital formation plays a crucial role in shaping GDP by enhancing capacity utilization, fostering technological acquisition, promoting employment, increasing output across sectors, supporting long-term development, and improving the standard of living. Several studies provide empirical evidence linking gross capital formation to economic growth, though the strength and nature of this relationship vary across contexts. For instance, Iftikhar *et al.*, (2016) [39] highlight a positive correlation between gross domestic capital formation and economic growth, reinforcing the argument that investment in capital assets contributes to GDP expansion. Ali [40] further supports this finding by demonstrating that gross capital formation has both a short-term and long-run causal effect on economic growth in Pakistan. Similarly, Hussin *et al.*, (2012) [41] find that gross fixed capital formation positively influences GDP across ASEAN-4 countries, indicating that capital investment is a key driver of economic performance in the region. While these studies collectively confirm the positive impact of gross capital formation on economic growth, they also emphasize that its effectiveness may depend on regional and structural factors, such as investment efficiency, institutional quality, and sectoral allocation. Given this evidence, the following hypothesis is proposed:

H₄: Gross capital formation has a significant effect on economic growth.

3.6 Trade Openness

Trade openness measures the degree to which a country is integrated into the global economy through trade. It has been widely recognized as a key determinant of economic growth, particularly in developing nations. Empirical evidence largely supports the positive impact of trade openness on economic performance, though regional variations exist. For instance, Oppong-Baah *et al.*, (2022) [42] find that trade openness, alongside real exchange rates, exerts a positive and significant influence on economic growth when analyzed using the random effects model. Similarly, Ali [40] confirms that trade openness has a strong and highly significant effect on economic growth, reinforcing its role as a growth driver. In the case of Kenya, trade openness is also shown to be positively correlated with economic expansion [43]. However, the relationship is not universally positive. Hussin *et al.*, (2012) [41] provide contrasting evidence, showing that greater openness to trade has a negative effect on Indonesia's economic growth. Moreover, the impact of trade openness is less pronounced in other ASEAN-4 countries such as Malaysia, Thailand, and the Philippines, suggesting that factors such as domestic market structure, trade policies, and industrial competitiveness may moderate its influence. Based on these insights, the following hypothesis is proposed:

H₅: Trade openness has a significant effect on economic growth.

4. Methodology

4.1 Data Collection

The data for this study were obtained from the World Bank Development Indicators database, covering nine Southeast Asian countries - Malaysia, Indonesia, Singapore, the Philippines, Cambodia, Thailand, Vietnam, Laos, and Brunei, from 2012 to 2022. The dependent variable in this study is the annual GDP per capita growth rate.

To measure gender inequality, we incorporated three key dimensions: employment opportunities for educated women, female labor force participation, and female political representation. First, gender disparities in education were assessed using the Gender Parity Index (GPI) based on the gross enrolment ratio in tertiary education. This index measures the ratio of female to male students enrolled in public and private higher education institutions. A GPI below 1 indicates a disadvantage for females, whereas a GPI above 1 suggests that women have greater access to higher education opportunities than men [44]. The Gross Enrolment Ratio (GER), previously used by the United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute for Statistics, serves as a quantitative measure of the percentage of students enrolled at a specific educational level, with this study focusing on tertiary education.

Second, gender disparity in employment was measured using the female-to-male employment population ratio for individuals aged 15 to 64. Third, female political representation was assessed by examining the proportion of parliamentary seats held by women. Lastly, control variables for the GDP growth rate models were included in the analysis. These variables consist of the gross fixed capital formation growth rate and trade openness, which reflects a country's level of integration into global markets by measuring total imports and exports as a percentage of GDP. These control variables were incorporated into the econometric model. Table 1 provides definitions for the independent and dependent variables used in this study.

Table 1
Summary of variables

Variable	Definition	Unit	Source
GROWTHpc	GDP per capita growth rate	%	World Bank
SEATS	Proportion of seats held by women in national parliaments	%	World Bank
EDTER	School enrolment, tertiary (gross) based on gender parity index (GPI)		World Bank
RLFP	Female-male ratio of labour force participation (15-64)		World Bank
GFCF	Gross fixed capital formation growth rate	%	World Bank
OPEN	Trade openness	% of GDP	World Bank

4.2 Panel Regression

Panel data consists of observations collected over time across multiple cross-sections. This study employs panel data as it offers richer information, greater variability, reduced multicollinearity, and more degrees of freedom, ultimately enhancing estimation efficiency. To determine the most suitable model for the data, three approaches are considered: pooled regression, fixed effects, and random effects models.

The pooled regression model, estimated using Ordinary Least Squares (OLS), assumes that all coefficients, including the intercept and slopes, remain constant across both time and cross-sections, while the error term varies. In contrast, the fixed effects model allows for intercept differences across cross-sections while keeping the slope coefficient constant, capturing country-specific heterogeneity. Meanwhile, the random effects model also maintains a constant slope coefficient but assumes that the intercept varies both across cross-sections and over time, accounting for unobserved heterogeneity in a more flexible manner.

4.3 Panel Regression Model

This study employs a panel regression model for the econometric analysis. The equation used is as follows:

$$GROWTHpc_{it} = \beta_0 + \beta_1 SEATS_{it} + \beta_2 EDTER_{it} + \beta_3 RLFP_{it} + \beta_4 GFCF_{it} + \beta_5 OPEN_{it} + \varepsilon_{it} \quad (1)$$

where;

- GROWTHpc = GDP per capita growth rate
- SEATS = proportion of seats held by women in national parliaments
- EDTER = school enrolment, tertiary (gross) based on gender parity index (GPI)
- RLFP = female-male ratio of labour force participation
- GFCF = gross fixed capital formation
- OPEN = trade openness
- β_0 = intercept
- β_i = coefficient where $i=1,2,3,4,5$
- ε_{it} = error term
- t = time series from 2012 to 2022

4.4 Model Best Fit

In this study, we use Hausman test, Breusch-Pagan Lagrange Multiplier (LM) test, and Chow test to compare models and determine the best-fitting econometric approach.

i. Hausman Test

The Hausman test evaluates the degree of statistical divergence between coefficient estimates from the fixed Effects (FE) model and the Random Effects (RE) model [45]. The test's null hypothesis states that RE estimates are efficient and consistent, while the alternative hypothesis suggests that FE estimates are more appropriate due to potential correlation between the regressors and the error term. The test follows a Wald test structure and is typically expressed in Chi-square form, with degrees of freedom of $k-1$, where k represents the number of regressors. If the test statistic is below the critical value, the RE model is preferred, otherwise, the FE model is recommended.

ii. Chow Test

The Chow assesses the likelihood ratio difference between the Pooled OLS model and the Fixed Effects model [46]. The null hypothesis assumes a common intercept across cross-sections (pooled regression), while the alternative hypothesis suggests multiple intercepts across cross sections (FE model). If the p-value of the Chi-square test is less than 0.05 (5%), the null hypothesis is rejected, indicating that the FE model is more appropriate than the pooled regression model. Otherwise, the pooled regression model should be used.

iii. Breusch-Pagan LM Test

The Breusch-Pagan LM determine whether country-specific variance error exists between the Pooled OLS and Random Effects model [47]. The null hypothesis states that the variance in the pooled OLS is zero (homogeneity), while the alternative hypothesis suggests that variance in the RE model is greater than zero (heterogeneity). The test follows a Chi-square distribution and is conducted at 5% significance level. If $p\text{-value} < 0.05$, the null hypothesis is rejected indicating that the RE model is more suitable than the pooled regression model.

4.5 Diagnostic Test

After conducting descriptive analysis and selecting the appropriate econometric model, it is essential to perform diagnostic tests. The purpose of regression diagnostics is to evaluate whether the selected model aligns with the data and meets the underlying assumptions. In this study, diagnostic tests like autocorrelation, heteroskedasticity, and multicollinearity metrics were performed to ensure the robustness of the result of regression analysis.

i. Autocorrelation

Autocorrelation refers to the correlation between a time series and its lagged values over time. It measures the degree to which a variable is correlated with its past values. An autocorrelation of +1 indicates perfect positive correlation, while -1 signifies perfect negative correlation. The Durbin-Watson (DW) test is the most commonly used method for detecting autocorrelation. A test statistics ranges from 0 to 4: values closer to 0 indicates strong positive autocorrelation, values near 4 suggest strong negative autocorrelation, and values around 2 imply little or no autocorrelation.

ii. Heteroscedasticity

Heteroscedasticity occurs when the variance of error terms is not constant across observations, violating a key assumption of regression analysis. If heteroskedasticity is present, estimators become inefficient, and statistical inferences, such as hypothesis tests and confidence intervals, may be biased. To detect heteroskedasticity in our model, we employ several diagnostic tests with the following hypothesis:

H_0 : The variance of the errors is constant (homoskedasticity).

H_1 : The variance of the errors is not constant (heteroskedasticity).

The Breusch-Pagan test, White test, and Goldfeld-Quandt Test are used to examine the presence of heteroskedasticity. These tests regressed squared residuals on independent variables and accessed the significance of test statistics. If the test statistics are significance, heteroskedasticity is present and corrective measures must be taken [48]. Generalized Least Squares (GLS) is the most common measure to address heteroskedasticity as it adjusts the regression model to account for non-constant variance. This correction process involves variance estimation and data transformation to improve the efficiency of the estimates. Addressing heteroskedasticity enhances the validity of the regression results and strengthens the overall reliability of the study.

iii. Multicollinearity

Multicollinearity arises when independent variables in a regression model are highly correlated, violating the assumption that independent variables should not be linearly related. Severe multicollinearity can distort coefficient estimates, making it difficult to assess the true effect of each independent variable. The variance inflation factor (VIF) is a widely used measure for detecting multicollinearity.

- A VIF of 1 indicates no correlation between an independent variable and others.
- A VIF between 1 and 5 suggests a moderate correlation that does not require corrective action.
- A VIF greater than 5 signals a high degree of multicollinearity, which may render unreliable p-values an inaccurate coefficient estimate [49].

Diagnostic tests ensure the robustness of the regression model. Ideally, the Durbin-Watson test should yield a value close to 2, indicating no serious autocorrelation problems. The Breusch-Pagan test should confirm that heteroskedasticity is not present, meaning the variance of the residuals is constant. Finally, the VIF results should be below 5 for all independent variables, ensuring that no severe multicollinearity exists. By meeting these criteria, the regression analysis remains statistically sound and reliable.

5. Results and Discussions

5.1 Descriptive Analysis

The descriptive statistics of the variables used in this study are displayed in Table 2. The results of this analysis are derived from the common sample that grouped data from 61 observations to make comparisons across the different variables more meaningful. This approach also tends to eliminate the biases of analysing individual samples that can be concentrated on certain periods of time or cross sections.

Table 2
Descriptive statistics

	GROWTHPC	SEATS	EDTER	RLFP	GFCF	OPEN
Mean	2.968489	19.13598	1.174169	73.58778	4.313433	120.8931
Median	3.886440	19.82143	1.187206	74.56532	4.458299	120.8419
Maximum	14.36197	30.26052	1.362885	89.00098	28.30922	331.6905
Minimum	-10.97819	4.800000	0.762270	61.16004	-27.31568	32.97218
Std. Dev.	3.717921	7.211006	0.116123	9.309145	8.542507	77.57867
Skewness	-1.132933	-0.189012	-1.093568	0.215875	-0.556659	1.515605
Kurtosis	6.899315	2.093914	4.774420	1.590962	6.034505	4.922922
Jarque-Bera	51.69447	2.449896	20.16084	5.519983	26.55457	32.75157
Probability	0.000000	0.293773	0.000042	0.063292	0.000002	0.000000
Sum	181.0778	1167.295	71.62432	4488.855	263.1194	7374.477
Sum Sq. Dev.	829.3763	3119.916	0.809074	5199.611	4378.465	361107.0
Observations	61					

Table 2 shows the details of the findings on the descriptive statistics for the common sample. The table provides mean, median, standard deviation, skewness, kurtosis and Jarque-Bera test statistics. The data encompasses cross-sectional findings for all the nine ASEAN countries.

The descriptive statistics give meaningful insight into the dataset. The average growth rate of GDP per capita, GROWTHPC, is 2.97% with a standard deviation of 3.72%, which indicates moderate dispersion. The range is from a minimum of -10.98% to a maximum of 14.36%, indicating heterogeneity in economic performance among the different observations.

SEATS shows an average of 19.14% of the seats in parliament held by women, while the minimum and maximum are 4.80% and 30.26%, respectively, indicating disparities in gender representation. On the other hand, it can be seen that EDTER also follows a pattern, with a mean of 1.17. This represents that the Gender Parity Index (GPI) is greater than 1 showing more advantage for women in tertiary education. However, its skewness and kurtosis values reflect a slight non-normal distribution.

The female-male ratio in labour force participation rate, RLFP, has relatively high and stable values, with a mean of 73.59% and a standard deviation of 9.31%. Investment, proxied by GFCF, is very volatile, with a mean of 4.31, a standard deviation of 8.54, while the minimum and maximum values are -27.32 and 28.31, respectively.

Among all the selected indicators, the trade openness, represented as OPEN, has the highest variability, with a mean of 120.89 and a standard deviation of 77.58. The minimum value of 32.97% and the maximum of 331.69% reflect substantial differences in trade intensity across observations.

The Jarque-Bera test gives evidence of violations of normality for certain variables; GROWTHPC, EDTER, GFCF, and OPEN are the variables where the significant probabilities indicate certain skewness and kurtosis.

5.2 Trend Analysis

Next, to analyse the economic dynamics of ASEAN countries, Figure 1 present the GDP per capita growth rates (GROWTHPC) for nine countries: Malaysia, Indonesia, Singapore, Philippines, Cambodia, Thailand, Laos, Brunei and Vietnam. Some of these values were obtained by audit from the year 2012 to 2022. The economic performance and stability trends depicted in Figure 1 for easy comparison.

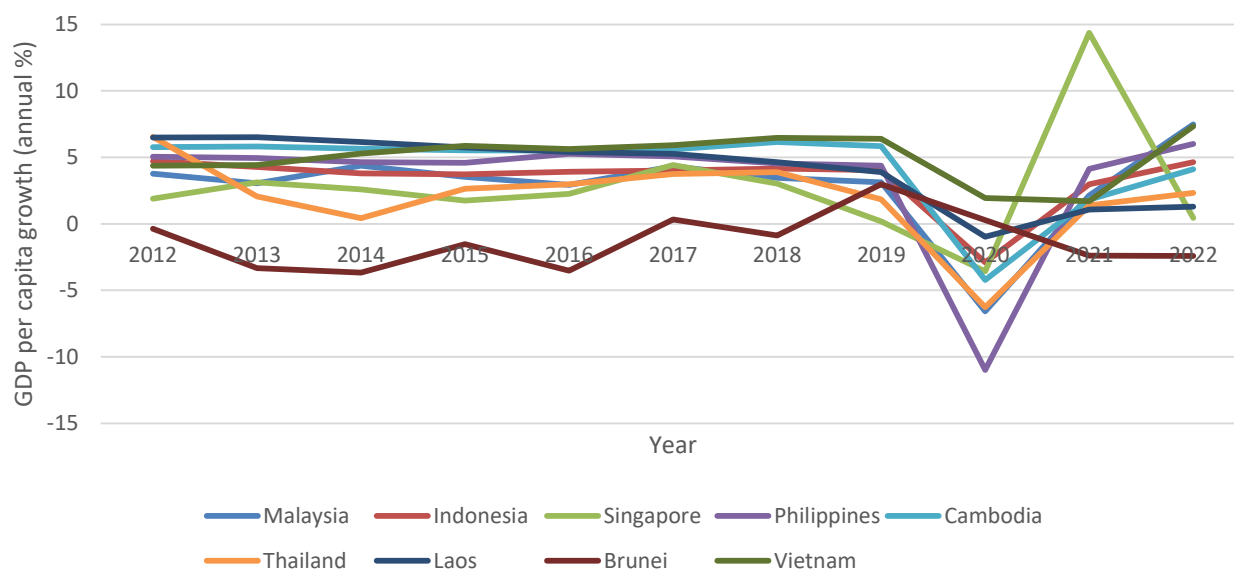


Fig. 1. GDP per capita growth rate

The statistics show that not only economic structures on country-level differ across ASEAN countries, but also economic trends and cycles differ due to the effect of external shocks, including the COVID-19 crisis. Due in significant part to their dependence on oil exports and their export-led growth domination, Singapore and Brunei fluctuated more than Cambodia and Vietnam, which maintained strong economic growth trends as a result of more economic liberalization. The reference year of 2020 saw a reduction in all countries due to the severe constraints caused by the epidemic.

Recovery trends can be seen by 2021, with Singapore's growth rate returning to a remarkable 14.36% due to the assumption of international trade. At the same time, while other countries had strong recovery, Brunei still suffers from problems to recover their economy. However, Vietnam, and in particular Cambodia, however, experienced a consistent upward trend during the whole decade, which proves their stable and resilient economic growth.

It is important to highlight that a thorough analysis of ASEAN's economic patterns has been made clearer by Figure 1. The graph provides specific national trends as well as global dynamics such as the pandemic in areas. They demonstrate the sign countries' economic diversification and the varying levels of recovery in ASEAN countries following global economic shocks.

Subsequently, to explore the trends and current state of gender inequality, Figure 2, 3 and 4 illustrate the three gender inequality factors between the countries in ASEAN. Figure 2 on women's representation in national parliaments (SEATS) reveals that the ASEAN nations' trends are fluctuate over time.

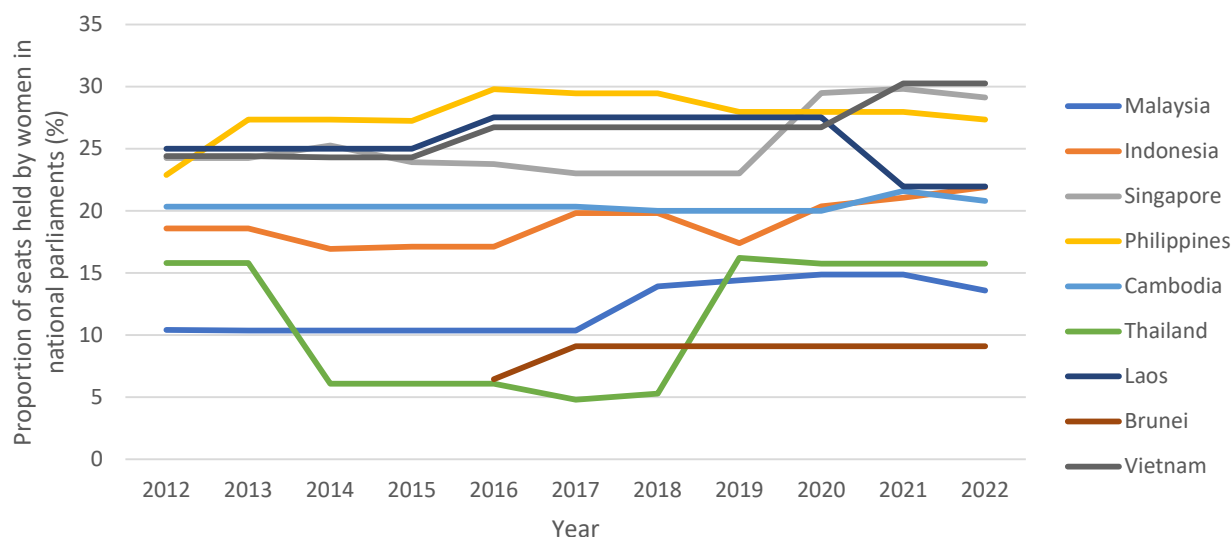


Fig. 2. Proportion of seats held by women in national parliaments

Figure 2 portrays that Vietnam, the Philippines, and Singapore are the most progressive in women's political participation with Vietnam reaching more than 30% by 2022 while Malaysia, Thailand, and Brunei are considerably less progressive, having values below 20%. Indonesia and Cambodia are at a moderate level of representation, where Indonesia has improved over time and reached the level of 21.91% in 2022. Asia Society Policy Institute [50] reported that in Indonesia, women hold only 22.1% of seats in the House of Representative, highlighting the pressing issue on women's political representation. Thailand and Brunei were among the lowest from 2014 to 2018, but only Thailand's percentage increased to 16.2% in 2019 and remained constant until 2022. Altogether, there are countries improving the situation gradually, while there are the countries continuing to face challenges related to female political participation.

Another significant measure of gender differences is enrolment in tertiary education enrolment (EDTER) that is displayed in Figure 3. Figure 3 indicates varying levels of gender inequality in tertiary education across the ASEAN countries. Countries such as Malaysia, Brunei, Thailand, and the Philippines are found to have GPIs greater than 1, meaning there is a general female advantage in education, where Malaysia ranging between 1.13 and 1.26, Brunei at 1.36 in 2017, and both Thailand and the Philippines consistently maintain values above 1. Vietnam has moderate fluctuations with the value of 1.18 in 2016 but dropping to 1.06 in 2022. Indonesia has a relatively flat line around 1, increasing from 1.08 in 2012 to 1.18 in 2022.

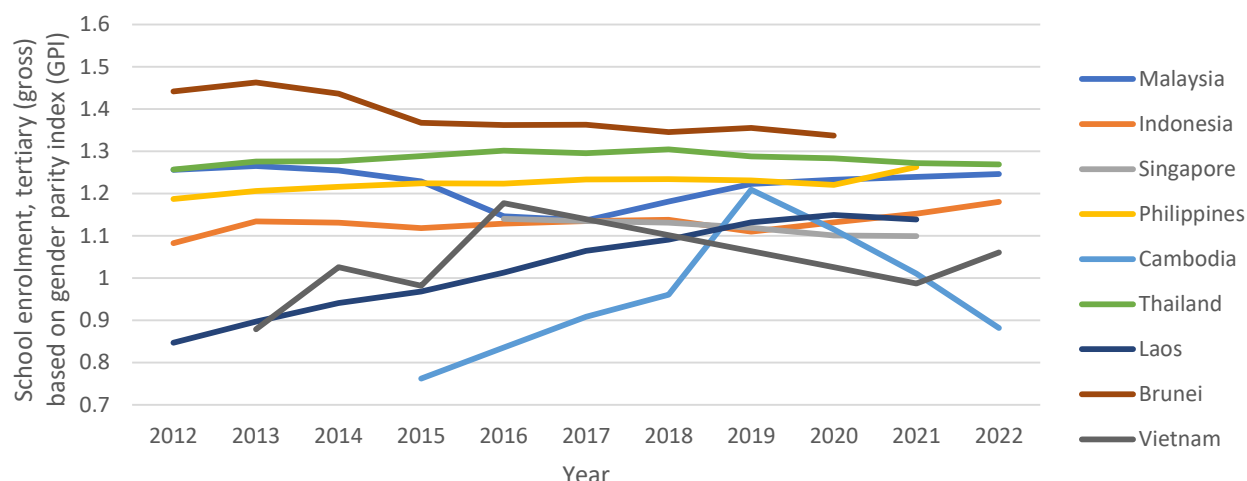


Fig. 3. Gender inequality in tertiary education

Meanwhile, Laos shows an increasing trend over time, rising from 0.85 in 2012 to 1.14 in 2021, demonstrating the progress of reducing gap of gender in education. Cambodia is the only country for most of the indicators staying below 1 and has its minimum score of 0.76 in 2015 representing a concerning level of gender inequality in access to tertiary education. Singapore has not enough data but there are benefits for women as displayed in 2016 to 2021, with the value above 1. In general, an increased trend is observed in most of the countries in the female educational attainment while countries like Cambodia reveal gender disadvantage even after a period of 11 years from the base year underlining the importance of interventions in such situation.

Following that, the gender gap in labour force participation (RLFP) is another important indicator of gender inequality and a determinant to the economic performance. Research has shown that narrowing the gender gap in labour force participation can boost GDP growth significantly [35]. Therefore, Figure 4 portrays significant differences in female-male labour force participation ratio across ASEAN countries.

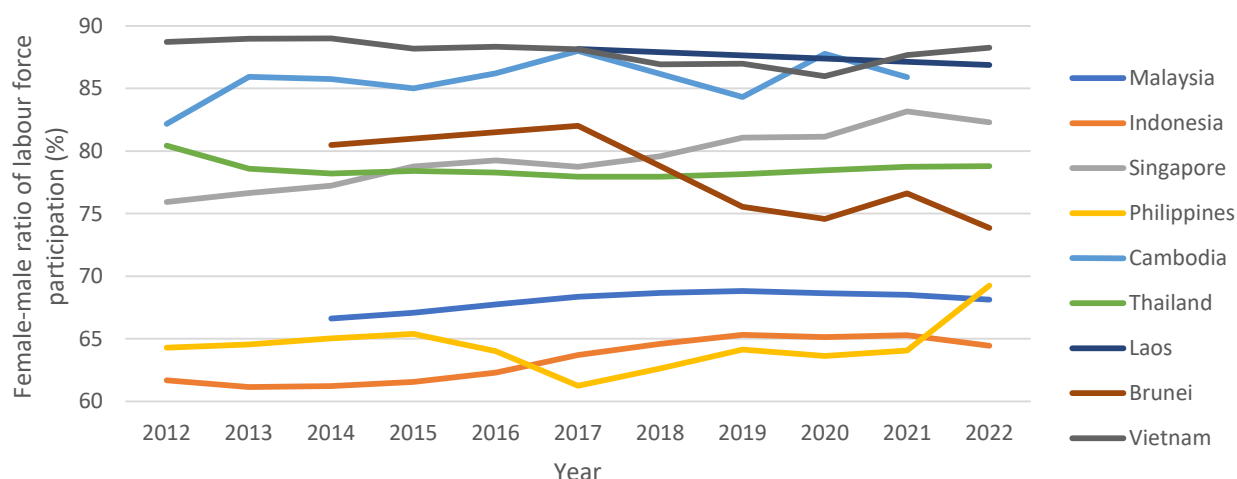


Fig. 4. Female-male ratio of labour force participation

As shown in Figure 4, Malaysia have achieved slight rise from 66.62% in 2014 to 68.14% in 2022, while Indonesia from 61.69% in 2012 to 64.45% in 2022. Singapore has high RLFP with a record of

83.16% in 2021 whereas Brunei moderately dropped from 80.48% in 2014 to 73.87% in 2022. The Philippines reveals recent improvements, with the value reaching 69.26% in 2022. Laos and Cambodia have relatively high RLFP values and increased over time, with Laos showing steady progress. Vietnam stands the most when comparing to RLFP that is above 85%. Then, Thailand maintains stability around 78%, indicating steady parity. Hence, these trends show improvement in some countries and the stabilization or worsening of the situation in others.

Based on the analysis of the SEATS, EDTER, and RLFP data of ASEAN countries, it can be concluded that a considerable amount of progress has been made toward gender equality, while at the same time, considerable challenges remain. The trends show that although progress has been achieved in terms of political activities, education and women's employment, it is still necessary to focus on concrete measures that will help equality of genders.

5.3 Correlation

In order to compare the chosen variables in terms of the economic and social impact, Table 3 shows the correlation coefficients between the variables. This examination affords a measure of the extent of linear relationship (also the direction) and might serve as a guide in probing for such relationships in regression.

Table 3
Correlation

	GROWTHPC	SEATS	EDTER	RLFP	GFCF	OPEN
GROWTHPC	1.000000					
SEATS	0.161134	1.000000				
EDTER	-0.230266	-0.450061	1.000000			
RLFP	0.021472	0.011196	-0.318215	1.000000		
GFCF	0.732510	0.168943	-0.098717	0.031531	1.000000	
OPEN	0.075218	0.140582	-0.188241	0.581258	-0.110301	1.000000

A weak positive correlation (0.161134) between GROWTHPC and SEATS indicates that a greater female parliamentary representation leads to increased economic growth, although other factors are clearly more significant. This aligns with findings suggesting that while female participation in politics is crucial, its direct impact on economic growth may be influenced by various factors [51]. On the other hand, EDTER shows an inverse relationship between GROWTHPC (-0.230266) and SEATS (-0.450061), while RLFP has nearly no correlation to GROWTHPC (0.021472) and a moderate correlation to the openness index, OPEN (0.581258).

Next, there is a strong positive relationship between GROWTHPC and GFCF (0.732510), this imply that higher gross capital formation will lead to greater level of economic growth. This aligns with expectations, as recent analyses have shown that increased government spending, particularly in infrastructure, has stimulated economic growth [52]. Such weak negative relation between OPEN and GFCF (-0.110301) may signal that while countries with openness emphasize on trade openness, they may well fund different form of capital formation as opposed to those that emphasize on domestic investment.

The above correlation findings show that economic growth and its determinants is a complex phenomenon. However, the relatively weak correlations of SEATS, EDTER, and RLFP growth suggest a more detailed understanding of structural, institutional, and policy elements influencing GFCF and GROWTHPC mutual growth.

Moreover, the moderate correlation of RLFP and OPEN suggests that the trade policies can support gender equilibrium in economic growth. Nonetheless, the negative correlation between EDTER and other variables suggests that simply increasing enrolment in tertiary education may not lead to better outcomes. A more balanced approach by emphasizing both enrolment and quality of tertiary education, as well as ensuring the availability of relevant jobs in the market, would yield more effective outcomes. Regression modelling is used in the following steps to examine the causal relationships and interactions between these variables based on these findings.

5.4 Results of Panel Regression Model

5.4.1 First estimation models: Pooled OLS, Random Effect and Fixed Effect

Three estimations of panel regression models were obtained from the Eviews statistical software. The models include the Pooled OLS model, Fixed Effect model (FE), and Random Effect model (RE) as reported in Panel A of Table 4.

Based on the Pooled OLS results in Table 4 (Panel A), the three variables that act as indicator of gender inequality, which are SEATS, EDTER and RLFP, show a negative relationship with the dependent variable, with the coefficients of -0.0531, -7.1523 and -0.0900 respectively. However, only EDTER and RLFP are significant in the relationship with economic growth, with the p-value of 0.0314 and 0.0476. Meanwhile, based on FE model, all the three gender inequality's indicators still show the negative relationship with economic growth, but only SEATS is significant, with p-value of 0.0550. Finally, the RE model shows a similar level of significant results to the Pooled OLS. The gender inequality indicators of SEATS, EDTER and RLFP display the negative relationship with GROWTHpc, with coefficients of -0.0531, -7.1523 and -0.0900 respectively, but only EDTER and RLFP, with p-value of 0.0222 and 0.0353 separately, are significant toward economic growth.

There were three tests conducted to determine the most appropriate model which are Hausman test, Chow test and Breusch-Pagan Lagrange Multiplier (LM) test as shown in Panel B of Table 4. The Chi-square p-value of Hausman test was 0.0245, which is less than the 0.05 significance level. We reject the null hypothesis and conclude that the FE model is not suitable, while the RE model is recommended. Next, the Breusch-Pagan LM test yielded a p-value of 0.3499, which is greater than 0.05. We fail to reject the null hypothesis and conclude that the Pooled OLS model is more preferred than the RE model. Finally, the Chow test produced a p-value of 0.0248, which is less than 0.05. As a result, we reject the null hypothesis and conclude that the FE model is not appropriate. Therefore, the Pooled OLS model is more suitable for the data sets in this study.

Before proceeding with the panel regression analysis, we check whether there are significant signs of multicollinearity among the set independent variables by using the variance inflation factor (VIFs). As indicated in Panel C of Table 4, the highest VIF observed was 1.7422, well below the common threshold of 5, suggesting no multicollinearity concern. Therefore, the best selected model of Pooled OLS does not suffer from multicollinearity problems.

Next, to assess the validity of the chosen Pooled OLS model, diagnostic tests for autocorrelation and heteroskedasticity were performed. The Durbin-Watson statistic was 2.299832, which is close to 2, implying that there is no significant autocorrelation in the model. To test for heteroskedasticity, the Breusch-Pagan test was applied, producing a p-value of 0.0457, which is less than 0.05. This result indicates that there is heteroskedasticity in the model. Consequently, to address the heteroskedasticity issue as well as to improve the efficiency and validity of the estimates, Generalized Least Squares (GLS) regression with cross-section weights was applied in the following step.

Table 4

Results of panel regression model, best model selection and diagnostic checks

Panel A: Results of panel regression model			
Variable	Pooled OLS	FE	RE
C	16.04757 (0.0105)*	-15.53174 (0.2715)	16.04757 (0.0066)*
SEATS	-0.053055 (0.3020)	-0.147755 (0.0550)**	-0.053055 (0.2718)
EDTER	-7.152276 (0.0314)*	-0.923127 (0.8314)	-7.152276 (0.0222)*
RLFP	-0.090003 (0.0476)*	0.128362 (0.4459)	-0.090003 (0.0353)*
GFCF	0.332489 (0.0000)*	0.398461 (0.0000)*	0.332489 (0.0000)*
OPEN	0.012599 (0.0175)*	0.093033 (0.0003)*	0.012599 (0.0117)*
R-squared	0.609390	0.699706	0.609390
Adjusted R-squared	0.573880	0.624633	0.573880
F-statistic (p-value)	17.16110 (0.000000)	9.320299 (0.000000)	17.16110 (0.000000)
Panel B: Best model selection			
Hausman Test (FE vs RE)	p-value=0.0245		
Chow Test (OLS vs FE)	P-value=0.3499		
LM Test (OLS vs RE)	p-value=0.0248		
Panel C: Diagnostic checks			
Multicollinearity	Maximum VIF = 1.742251 Mean VIF = 1.4495		
Heteroskedasticity	p-value=0.0457		
Durbin-Watson stat	2.299832	2.563798	2.299832
Note: *significant at 5% level, **significant at 10% level			

Note: *significant at 5% level, **significant at 10% level

5.4.2 Final estimation model: Pooled Effect model (Generalized Least Squares)

Pooled GLS with cross-section weights was used as the final model because the previous test results showed heteroscedasticity. The GLS regression results are depicted in Table 5. This model offers better and more accurate estimates by correcting the heteroskedasticity found in the data and allows for cross-sectional variation across countries.

The results of the Pooled GLS model reveal that all variables have a significant impact on economic performance in the ASEAN countries studied. The coefficient for SEATS is -0.089128, with a p-value of 0.0144. This negative relationship indicates that as the number of women's seats in parliament increases by 1%, the economic performance decreases by 0.09%. The findings contradict evidence by Stolt and Denise [26] and Buterin *et al.*, (2023) [27], due to challenges associated with socio-cultural barriers, tokenism and limited policy influence that could impede the positive impact of women's political representation on ASEAN economic growth.

The variable EDTER, which is used to measure gender inequality in tertiary education, has a coefficient of -5.285525 and p-value of 0.0381. This indicates that the negative relationship between gender inequality in higher education enrolment and GDP growth exists and the hypothesis is statistically significant at 5%. When the gender gap in tertiary education decreases by

1 unit, the GDP growth rate will increase by 5.29%. The findings of this study are in line with Khattak and Khan [16], who noted that higher education plays an important role in influencing economic growth.

Table 5

Pooled regression GLS (Cross-section weights)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	13.12820	4.351710	3.016792	0.0039
SEATS	-0.089128	0.035282	-2.526167	0.0144*
EDTER	-5.285525	2.487886	-2.124505	0.0381*
RLFP	-0.072185	0.035629	-2.026020	0.0476*
GFCF	0.407849	0.028299	14.41207	0.0000*
OPEN	0.012409	0.004612	2.690272	0.0094*
Weighted statistics				
R-squared			0.798427	
Adjusted R-squared			0.780102	
F-statistic			43.57087	
Prob(F-statistic)			0.000000	
Durbin-Watson stat			2.150094	
Unweighted statistics				
R-squared			0.569838	
Durbin-Watson stat			2.194022	

Note: *significant at 5% level, **significant at 10% level

The third gender inequality indicator, RLFP (female-male ratio labour force participation) has the coefficient of -0.072185 and p-value of 0.0476, suggesting that female-male gap in labour force participation has a negative effect on the economic growth, and statistically significant at 5% level. This aligns with Thaddeus *et al.*, (2022) [38], which also highlights the adverse impact of gender disparity in labour force participation on economic performance. The results indicate that reducing the female-male gap by 1 unit would increase economic growth by 0.07%, highlighting that gender disparity in the labour force negatively impacts the growth rate. This finding is consistent with Klasen [6], as their study emphasized the importance of gender equality in improving economic performance.

The R-squared value of 0.798427 suggests that the model explains 80% of the variation in GDP growth rate. This implies that all the selected variables, especially the gender inequality indicators, capture significant aspects of economic development in the ASEAN countries. The Durbin-Watson statistic of 2.150094 also shows that there is less autocorrelation in the residuals, indicating that the model's assumptions for the error terms are reasonably correct.

6. Conclusion

In conclusion, this research provides a comprehensive understanding of gender inequality in ASEAN nations and its relationship with economic growth. The findings highlight that while gender inequality remains a challenge in political representation, improvements in education and employment opportunities have a positive impact on economic performance. The results indicate that reducing gender disparities in labour force participation and tertiary education can significantly enhance economic growth, while an increase in female parliamentary representation appears to have a different effect. While increasing proportion of women in parliamentary seats is a positive move towards gender equality, it is insufficient on its own to drive economic growth. Addressing

the underlying issues of tokenism, enhancing women's policy influence, and challenging socio-cultural barriers that prominent in ASEAN region are essential to ensure that women's political representation translates into meaningful contributions to economic growth.

Among the gender inequality indicators examined, labour force participation and tertiary education had the most substantial influence on economic growth, showing a statistically significant negative relationship with GDP growth. Addressing these disparities could lead to more inclusive economic development in the region. The findings suggest that gender equality policies targeting education and workforce participation can contribute to sustainable economic development.

A key limitation of this study was the exclusion of Myanmar due to data constraints, which may have impacted the generalizability of the findings across all ASEAN countries. Inclusion of Myanmar may alter the finding of this study as women in Myanmar outnumber men in education but remain economically and politically marginalized. Education in Myanmar, despite being a cornerstone for gender equality, falls short due to systemic and cultural challenges [53]. Future research could expand the sample to provide a more comprehensive regional perspective. Further studies could also incorporate additional indicators, such as political leadership at the local level and access to healthcare, to deepen the understanding of gender inequality's impact on economic growth. Additionally, future research should consider the intersectionality of gender with other social factors, such as ethnicity, socioeconomic status, and rural-urban divides, to provide a more nuanced analysis of gender inequality. This approach would help to identify specific barriers and opportunities for promoting gender equality across different contexts.

Overall, this research contributes valuable insights into the economic implications of gender inequality in ASEAN. By emphasizing the importance of gender-inclusive policies, it provides a foundation for policymakers to foster sustainable economic growth through greater equality in education and labour force participation.

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References

- [1] Sara Duerto-Valero, Sneha Kaul, and Ryce Chanchai. *ASEAN Gender Outlook*. Jakarta, Indonesia and Bangkok, Thailand: ASEAN, ACW, and UN Women, 2021.
- [2] Cuberes, David, and Marc Teignier. "Gender inequality and economic growth: A critical review." *Journal of International Development* 26, no. 2 (2014): 260-276. <https://doi.org/10.1002/jid.2983>
- [3] Seguino, Stephanie. "Gender inequality and economic growth: A cross-country analysis." *World development* 28, no. 7 (2000): 1211-1230. [https://doi.org/10.1016/S0305-750X\(00\)00018-8](https://doi.org/10.1016/S0305-750X(00)00018-8)
- [4] Kabeer, Naila, and Luisa Natali. "Gender equality and economic growth: Is there a win-win?." *IDS Working Papers* 2013, no. 417 (2013): 1-58. <https://doi.org/10.1111/j.2040-0209.2013.00417.x>
- [5] Chant, Sylvia. "Exploring the "feminisation of poverty" in relation to women's work and home-based enterprise in slums of the Global South." *International Journal of Gender and Entrepreneurship* 6, no. 3 (2014): 296-316. <https://doi.org/10.1108/IJGE-09-2012-0035>
- [6] Klasen, Stephan. "The impact of gender inequality on economic performance in developing countries." *Annual Review of Resource Economics* 10, no. 1 (2018): 279-298. <https://doi.org/10.1146/annurev-resource-100517-023429>
- [7] Khalid, Ahmed M., and Bruno Jetin. "Brunei Darussalam's Economic Transition in a Shifting Global Asia." (2025): 409. <https://doi.org/10.1007/978-981-97-6926-1>
- [8] Commisceo Global. "Brunei – Culture, Etiquette and Business Practices." Accessed March 21, 2025.
- [9] Gender Data Portal. "Brunei Darussalam Gender Landscape." *World Bank Group*. Accessed March 21, 2025.
- [10] Aris Ananta, Chang-Yau Hoon, and Mahani Hamdan. *Stability, Growth and Sustainability: Catalysts for Socio-economic Development in Brunei Darussalam*. Singapore: ISEAS – Yusof Ishak Institute, 2023. <https://doi.org/10.1355/9789815011692>

- [11] Ty Sokun Theary. "Cambodia Must Address Structural Gender Inequality." *Cambodianess*, August 17, 2024. Accessed March 30, 2025.
- [12] Asian Development Bank. *Cambodia: Country Gender Analysis*. Mandaluyong City, Philippines: Asian Development Bank, 2012.
- [13] Chris Hunter. *Gender Equality Deep-Dive for Cambodia: Common Country Analysis*. Cambodia: United Nations Cambodia, 2024.
- [14] Von Hofmann, Norbert. "Country Fact Sheet–Indonesia." *A Global Economic Government in the Making?* (2010): 36.
- [15] Nasywa Alexia. "Gender Inequality in Indonesia: Understanding the Disparities." *Universitas IPWIJA*, 2023. Accessed March 9, 2025.
- [16] Zara Taza. "Barriers of Women in Politics." *Persatuan Pengundi Muda*, November 14, 2020. Accessed April 6, 2025.
- [17] Hirschman, Charles. "Gender, the status of women, and family structure in Malaysia." *Malaysian Journal of Economic Studies* 53, no. 1 (2016): 33-50.
- [18] Tass-Noo Pilipino. "Gender Roles in the Philippines: Shifting Dynamics and Challenges." September 24, 2017. Accessed April 9, 2025.
- [19] Epetia, Ma Christina F. "Explaining the gender gap in labor force participation in the Philippines." *Japan Labor Issues* 3, no. 17 (2019): 30-38.
- [20] Helle Buchhave and Nadia Belhaj Hassine Belghith. "Overcoming Barriers to Women's Work in the Philippines." *World Bank Blog*, April 11, 2022. Accessed April 12, 2025.
- [21] Pedragoza, Micah Angela A., Mylene C. Prado, April Samuel, and Angelene B. Santos. "Acceptance and Attitudes of Filipinos to the Evolving Gender Roles in the Philippines."
- [22] UN Women. "Take Five Philippines: Cultural Stereotypes and Beliefs Still Present Significant Challenges to Achieving True Gender Equality." *UN Women Asia and the Pacific*, September 26, 2024. Accessed April 9, 2025.
- [23] Hairina, Melisa, and Yunita Sopiana. "Study of Gender and Economic Growth in South Kalimantan."
- [24] Altuzarra, Amaia, Catalina Gálvez-Gálvez, and Ana González-Flores. "Is gender inequality a barrier to economic growth? A panel data analysis of developing countries." *Sustainability* 13, no. 1 (2021): 367. <https://doi.org/10.3390/su13010367>
- [25] Ngwakwe, Collins C. "Relating women in parliament and economic growth in an emerging economy–South Africa." *Acta Universitatis Danubius. Œconomica* 15, no. 1 (2019): 253-266.
- [26] Stolt, Denise. "Does the Level of Gender Equality in National Parliament have an Impact on Economic Growth?." (2013).
- [27] Buterin, Vesna, Barbara Fajdetic, and Barbara Funarić. "Understanding the macroeconomic effects of female participation in the labour market." *Economies* 11, no. 11 (2023): 280. <https://doi.org/10.3390/economies11110280>
- [28] Asante, A. K., and L. E. Attom. "Socio-economic and cultural barriers that affect Women's participation in local level governance in the central region of Ghana." *Univers J Soc Sci Humanit* 2 (2022): 234-58. <https://doi.org/10.31586/ujssh.2022.556>
- [29] Joshi, Devin K., and Christian Echle. *Substantive representation of women in Asian parliaments*. Taylor & Francis, 2023. <https://doi.org/10.4324/9781003275961>
- [30] Klasen, Stephan, and Francesca Lamanna. "The impact of gender inequality in education and employment on economic growth: new evidence for a panel of countries." *Feminist economics* 15, no. 3 (2009): 91-132. <https://doi.org/10.1080/13545700902893106>
- [31] Carvalho, Catarina de Oliveira. "Women, business and the law 2021." (2021).
- [32] Tansel, Aysit. "Economic development and female labor force participation in Turkey: Time-series evidence and cross-section estimates." *METU/ERC Working Paper* 02/3 (2002). <https://doi.org/10.2139/ssrn.301946>
- [33] Dauda, Risikat Oladoyin S. "Does female education promote economic performance? Evidence from Nigeria." *International Journal of Economics and Finance* 5, no. 1 (2013): 201-209. <https://doi.org/10.5539/ijef.v5n1p201>
- [34] Dadgar, Yadollah, Rohollah Nazari, and Fatemeh Fahimifar. "The Paradox of women's high-level education and low share in managerial positions in Iran: Economic Gender Inequality." *International Journal of New Political Economy* (2024).
- [35] Rahman, Maliha Mahru. "Impact of labour force participation on economic growth in South Asian countries." (2018).
- [36] Sulaiman, Noorasiah, Nurul Fathnin Muhamad Bustaman, and Chor Foon Tang. "Economic growth and female labour force participation in an ageing society: evidence from Southeast Asia." *Applied Economics* 56, no. 37 (2024): 4481-4491. <https://doi.org/10.1080/00036846.2023.2212964>

- [37] Esteve-Volart, Berta. "Gender discrimination and growth: Theory and evidence from India." *LSE STICERD research paper no. DEDPS42* (2004).
- [38] Thaddeus, Kesuh Jude, Dimna Bih, Njimukala Moses Nebong, Chi Aloysius Ngong, Eric Achiri Mongo, Akume Daniel Akume, and Josaphat Uchechukwu Joe Onwumere. "Female labour force participation rate and economic growth in sub-Saharan Africa: "a liability or an asset". " *Journal of Business and Socio-economic Development* 2, no. 1 (2022): 34-48. <https://doi.org/10.1108/JBSED-09-2021-0118>
- [39] Iftikhar, Sana, F. Nisa, M. Ali, and S. Umar. "Gross Domestic Capital Formation, Exports and Economic Growth." *Journal of Economics and Sustainable Development*.(7) 13 (2016): 44-48.
- [40] Ali, G. U. L. Z. A. R. "Gross fixed capital formation & economic growth of Pakistan." *Journal of Research in Humanities, Arts and Literature Applied* 1, no. 2 (2015): 21-30.
- [41] Hussin, Fauzi, and Nooraini Saidin. "Economic growth in ASEAN-4 countries: a panel data analysis." *International Journal of Economics and Finance* 4, no. 9 (2012): 119-129. <https://doi.org/10.5539/ijef.v4n9p119>
- [42] Oppong-Baah, Tetelesti, Yu Bo, Christiana Twi-Brempong, Elsie Odame Amoah, Nana Ama Prempeh, and Mabel Addai. "The Impact of trade openness on economic growth: The case of Ghana and Nigeria." *Journal of Human Resource and Sustainability Studies* 10, no. 1 (2022): 142-160. <https://doi.org/10.4236/jhrss.2022.101010>
- [43] Koskei, Neddy Soi1 Irene, Kibet Buigut, and John Kibet. "Impact of openness, foreign direct investment, gross capital formation on economic growth in Kenya." *Journal of Economics and Sustainable Development* 4, no. 14 (2013): 130-135.
- [44] World Bank Group. "School Enrollment, Tertiary (Gross), Gender Parity Index (GPI)." Accessed September 6, 2024.
- [45] Baltagi, Badi H. "Panel data and difference-in-differences estimation." *Encyclopedia of health economics* (2014): 425-433. <https://doi.org/10.1016/B978-0-12-375678-7.00720-3>
- [46] Jannah, W., I. D. Sulvianti, P. Silvianti, and A. Kurnia. "Analysis of Credit Bank Distribution with Seemingly Unrelated Regression Method on Panel Data." In *Journal of Physics: Conference Series*, vol. 1863, no. 1, p. 012057. IOP Publishing, 2021. <https://doi.org/10.1088/1742-6596/1863/1/012057>
- [47] Hahn, Jinyong, and Ruoyao Shi. "Breusch and Pagan's (1980) test revisited." *University of California at Riverside, Department of Economics* (2021): 1-39.
- [48] Raza, Muhammad, Mumtaz Ahmed, Shahid Razzaque, and Hafsa Hina. "Testing for heteroskedasticity in the presence of outliers." *Journal of Education and Social Studies* 4, no. 2 (2023): 313-329. <https://doi.org/10.52223/jess.2023.4209>
- [49] Frost, Jim. "Multicollinearity in regression analysis: problems, detection, and solutions." *Statistics by Jim* 2 (2017): 2.
- [50] Asia Society Policy Institute. "Gender Parity in Southeast Asia: An Imperative for Democracy, Political Empowerment, and Growth." Accessed April 10, 2025.
- [51] *Financial Times*. "The Secret to a Strong Economy Is Women." March 6, 2025. Accessed April 13, 2025.
- [52] Miyamoto, Hiroaki, Anja Baum, Nikolay Gueorguiev, Jiro Honda, and Sébastien Walker. "Growth impact of public investment and the role of infrastructure governance." *Well Spent: How strong infrastructure governance can end waste in public investment* (2020): 15-29.
- [53] Crisp, Rebecca, and Asha Clementi. "Reality or rhetoric: understanding gender inequality and education in Myanmar." *Australian Institute of International Affairs* (2020).