
THE IMPACT OF FEMALE ENTREPRENEURSHIP ON ECONOMIC GROWTH IN THE ASEAN COUNTRIES: A PANEL MM-QR APPROACH

Sabrina CHIKH-AMNACHE¹, Lotfi MEKHZOUMI^{2*}

¹*University of Mouloud Mammeri, Tizi-Ouzou, Algeria*

²*University of Echahid Hamma Lakhdar, El-Oued, Algeria*

**Corresponding author's e-mail: lotfimekhzoumi39@gmail.com*

Received 09.02.2023; accepted 24.02.2023

Abstract. The purpose of this paper is to determine the significance of female entrepreneurship for economic growth in Southeast Asian countries. A panel data model was applied, with GDP per employed person serving as the dependent variable and seven key factors in female entrepreneurship serving as independent variables. Empirical panel quantile regression using the Method of Moments Quantile Regression (MM-QR) approach found that both the female entrepreneurship indicator and the female workplace indicator have a positive impact on economic growth. However, the Gender Inequality Index, Gender Development Index, female pay indicator, female parenthood indicator, and female marriage indicator all have negative effects.

Keywords: *ASEAN countries, economic growth, entrepreneurship, female entrepreneurs, Method of Moments Quantile Regression.*

JEL Classification: C23, F43, J16, L26

INTRODUCTION

Most countries now recognize entrepreneurship as crucial to their future prosperity (Mustapha & Subramaniam, 2016). Entrepreneurs are the driving force behind economic growth, technological advancements, and social change (Schumpeter, 1931). Neoclassical theory defines entrepreneurship as “the process by which the forces of production (capital and labour) are integrated to generate products and services that correspond to customer needs”, independent of the entrepreneur's gender (Lowrey, 2003).

Economic literature lacks explanations for differences in entrepreneurial tendencies between men and women, despite the potential of entrepreneurship for addressing poverty and inequality in developing nations (Weber et al., 2022). Women's equal participation in the economy is essential for a country's progress. Underutilization of this resource negatively affects a nation's development. Entrepreneurship fuels economic growth, and women entrepreneurs play an important role in this growth (Waseem, 2018). Women are encouraged to pursue business careers, leading to economic growth, technological advances, and new products. Ambitious women who start businesses can have a significant impact on

the economies of developing nations by creating jobs, income, and social stability. Governments provide support to women entrepreneurs to spur economic growth and boost tax revenue (Chatterjee et al., 2019).

Despite the significant contributions made by women to the Southeast Asian economy, a gap in entrepreneurial opportunities between men and women persists (Roche et al., 2020). More successful female entrepreneurs in Southeast Asia could enhance opportunities for women to support their families and advance their careers. Women who own businesses gain a new perspective on societal challenges and the flexibility to drive positive change in their communities. Women's increased participation in work and society benefits families and communities overall (SPF, 2022). Before COVID-19, there were 60 million women entrepreneurs in ASEAN countries. Most of them owned and ran small to medium-sized businesses that did not use digital technologies very much (Marsan & Sey, 2021). The COVID-19 pandemic revealed shortcomings in ASEAN nations' social, political, and economic systems, particularly for women and girls. To make people more resilient, you need a broader approach, but getting more women involved in the economy could help (UN Women, 2022). Given women's crucial role in the social and economic growth of ASEAN countries, the impact of changes in female entrepreneurship on economic growth needs to be understood. The research question is formulated as follows: How significant is the impact of female entrepreneurship on economic growth in ASEAN countries?

The aim of this research is to provide the results of a panel quantile regression analysis of ten ASEAN member economies from 1991 to 2021. The analysis uses seven socioeconomic factors for women and seven control variables and employs the Method of Moments Quantile Regression (MM-QR) approach. The study's objective is to determine the impact of each explanatory variable and provide practical recommendations to enhance women's role in economic growth and development in Southeast Asia.

1. LITERATURE REVIEW

The academic community is paying renewed attention to issues surrounding women business owners, with an emphasis on the changing gender dimension across time and location. Gender is a social construct that sets expectations for how men and women should act. One of the Millennium Development Goals is to end gender discrimination and promote equality between men and women (UNFPA, 2013). Female entrepreneurship is significant as a source of development and employment and as an understudied area. According to (Ramadani et al., 2015), academic interest in women's entrepreneurship is justified for two main reasons: on the one hand, women entrepreneurs create jobs, provide creative solutions to management, organization, and business problems and meet market needs; on the other hand, women entrepreneurs would benefit from better consideration by research, laws, and initiatives, which are often "led by men".

Women entrepreneurs drive economic growth by starting businesses and creating jobs. Scholarly interest in women's entrepreneurship has increased, as their role in the economy becomes increasingly important (Sajjad et al., 2020). Women

entrepreneurs drive economic growth and reduce gender discrimination in the workplace. Women business owners may have a positive impact on economic growth by prioritizing their families and hiring other women (Waseem, 2018). Women's entrepreneurship is critical to equitable economic growth. Women entrepreneurs boost the workforce and demonstrate resilience in difficult times through their dedication. Their adaptability and creativity enable them to recognize and solve challenges in novel ways (Deepa et al., 2022). Female entrepreneurship is key to promoting economic diversity, a sustainable economy, and long-term growth that benefits society and the environment (Al-Qahtani et al., 2022). Female entrepreneurship provides economic freedom and creates more jobs for women. However, access to opportunities and barriers to women's full participation vary globally (Burga et al., 2021).

Women in low-income countries think starting a business is the best method to improve their lives. Women in high-income and emerging nations have a better chance of success than women in lower-income countries. These differences show that women in the developing world need economic empowerment, development, and equality to reach their full business potential (Elam et al., 2021). Female entrepreneurs have been “chanced,” “forced,” and “created” in the Asian economy, argues Tambunan (2019). In addition, Noor et al. (2022) provided proven ways for female entrepreneurs in Asian developing nations to succeed in small and medium-sized firms. Women entrepreneurs in these nations face a matrix of issues. Most examined models for women entrepreneurs in SMEs prioritize human attributes, cultural factors, and material means. This shows that low-income Asian countries value family support for women's careers.

2. METHODOLOGY AND DATA

This study looks at data from 10 ASEAN countries from 1991 to 2021 (excluding Timor-Leste due to limited data). Socioeconomic considerations make modeling the influence of female entrepreneurship on economic growth difficult. The model has seven independent variables of interest representing female entrepreneurship. Seven other independent variables were also used as controls. According to economic theory and solid empirical studies, these are the most important explanatory variables for economic growth. By including control variables, econometric models can help establish causal relationships between variables of interest as opposed to simply correlating them. Furthermore, control variables can increase the explanatory power of the model by capturing more of the variance in the dependent variable, which can lead to more accurate predictions and better policy recommendations. Among other variables, the GDP per employed person is a preferred dependent variable, since it reflects the efficiency of the productivity of the workforce. By doing this, we can find out how much businesses run by women make the economy as a whole more productive. Thus, employing GDP per employed person as the dependent variable and integrating some female entrepreneurship factors as independent variables can unlock a deeper understanding of the intricate relationship between female entrepreneurship and economic growth. In line with findings from a number of studies, including

(Minniti, 2010; Lock & Smith, 2016; Waseem, 2018; Sallah & Caesar, 2020; Mekhzoumi & Gharbi, 2021; Noor et al., 2022; Al-Qahtani et al., 2022), in our empirical study, we use the following model:

$$GDPppe_{it} = \beta_0 + \beta_1 FEPI_{it} + \beta_2 GII_{it} + \beta_3 GDI_{it} + \beta_4 FPYI_{it} + \beta_5 FWPI_{it} + \beta_6 FPHI_{it} + \beta_7 FMRI_{it} + \beta_8 HCE_{it} + \beta_9 HDI_{it} + \beta_{10} FDI_{it} + \beta_{12} GFCF_{it} + \beta_{11} GVFCE_{it} + \beta_{13} GI_{it} + \beta_{14} TRD_{it} + \varepsilon_{it}. \quad (1)$$

Table 1. Description of Variables

| Variable | Meaning | Source |
|------------------------------|--|--------------------------|
| Dependent Variable | | |
| GDPppe | GDP per person employed | World Bank Group |
| Independent variables | | |
| FEPI | Female Entrepreneurship Indicator | Gender Data Portal |
| FPYI | Female Pay Indicator | |
| FWPI | Female Workplace Indicator | |
| FPHI | Female Parenthood Indicator | |
| FMRI | Female Marriage Indicator | |
| GII | Gender Inequality Index | UN Development Programme |
| GDI | Gender Development Index | |
| HDI | Human Development Index | |
| FDI | Foreign direct investment | World Bank Group |
| TRD | Trade: Exports and imports of goods and services | |
| GVFCE | Government final consumption expenditure | UNCTAD |
| GFCF | Gross fixed capital formation | |
| HCE | Household consumption expenditure | |
| GI | Globalization Index | KOF |

OLS regression may exaggerate the impact of variables on growth and may not consider heterogeneous distributions. The panel quantile approach is preferred over OLS, as it provides more accurate estimates when errors do not follow a normal distribution (Baltagi, 2013). Quantile regression provides a better understanding of the effect of female entrepreneurship on economic growth compared to traditional OLS regression, as it provides a comprehensive description of a conditional distribution and is an advancement of existing regression techniques (Agung, 2021). Quantile regression is a flexible method that requires fewer restrictions compared to conventional regression. It offers a comprehensive explanation of the regression coefficient by regressing the independent variables based on the dependent variable's conditional quantile (Davino et al., 2014). Quantile regressions are more resilient to outliers. It is particularly useful when the conditional means of two variables are nonexistent or weak (Ike et al., 2020). The study of panel quantile regression has made significant progress, with a major contribution made by Koenker (2004) in estimating quantiles through linear regression of longitudinal data. To deal with the problem of incidental parameters, he investigates a model in

which individual effects only generate parallel (location) changes to the distribution of the response variable.

The impact of female entrepreneurship on economic growth in a panel of 10 ASEAN countries is investigated using the latest and most innovative Method of Moments Quantile Regression (MM-QR) approach for panel fixed effects proposed by Machado & Santos Silva (2019). To estimate the distribution of conditional economic growth, we employ the MM-QR approach, which allows us to account for the likelihood of heterogeneity. We create a location-scale model of the conditional quantiles using data from a set of n countries ($i = 1, 2, \dots, n$) over T periods ($t = 1, 2, \dots, T$). The model is written out as follows:

$$GDPppe_{it} = \alpha_i + X'_{it}\beta + (\delta_i + Z'_{it}\gamma)U_{it}, \quad (2)$$

where $P\{\delta_i + Z'_{it}\gamma > 0\} = 1$. Individual i fixed effects are denoted by α_i , δ_i , $i = 1, 2, \dots, n$, and Z is a k -vector of transformations of the elements of X with probability 1 that are known to be differentiable. Model (2) may be expanded in the following ways:

$$Q_{GDPppe}(\tau|X_{it}) = (\alpha_i + \delta_i q(\tau)) + Z'_{it}\gamma q(\tau). \quad (3)$$

Independent variables are denoted by X_{it} . The quantile distribution of the response variable $GDPppe$ is denoted by $Q_{GDPppe}(\tau|X_{it})$, which is conditional on the location of explanatory variables. We define the τ -th quantile ($0 < \tau < 1$) of the conditional distribution of the dependent variable given as a set of independent variables X_{it} . The quantile- τ fixed effect for individual i or distributional effect at τ is denoted by the scalar coefficient i . Unlike the habitual fixed effect, the distributional impact does not involve a change in location. Thus, the distributional effect stands in for the influence of time-invariant individual qualities that, like other variables, might have varying effects on various parts of the conditional distribution of $GDPppe$. The τ -th sample quantile estimate indicated by $q(\tau)$, is found by minimizing the following optimization:

$$\min_q \sum_i \sum_t \rho_\tau(\hat{R}_{it} - (\hat{\delta}_i + Z'_{it}\hat{\gamma})q), \quad (4)$$

where $\rho_\tau(A) = (\tau - 1)AI\{A \leq 0\} + \tau AI\{A > 0\}$ indicates the check-function. There were five quantiles utilized in the study's regression analysis, with values of (0.10, 0.30, 0.50, 0.70, 0.90).

3. RESULTS

In the quantile regression based on Eq. (3), five quantiles of 0.10, 0.30, 0.50, 0.70, and 0.9 were chosen to estimate the coefficients of the dependent variables.

The impact of the FEPI on the dependent variable is statistically positive and significant for all quantiles. At all quantiles both GII and GDI have a negative and significant impact on ASEAN countries' economic growth. Across all quantiles the FPYI and FMRI have a significant and negative impact on economic growth. All quantiles, except the highest one, have statistically significant negative coefficients for the FPHI. The FWPI has significant positive coefficients only for the three highest quantiles. All quantiles show that the HCE, HDI, and TRD variables have

a statistically significant positive effect on the dependent variable. However, all quantiles of GVFCE, GFCF, and GI variables have a statistically significant negative effect on economic growth in economies of ASEAN countries.

Table 2. Results of Panel Quantile Regression with Fixed Effects (MMQR)

| | OLS | | Quantile of GDPppe | | | | |
|-------|---------------------------|-------------------------|---------------------------|---------------------------|---------------------------|----------------------------|---------------------------|
| | Location | Scale | 10th quantile | 30th quantile | 50th quantile | 70th quantile | 90th quantile |
| FEPI | 252.4*** (61.91) | -7.834 (35.708) | 264.43*** (69.823) | 258.14*** (59.847) | 252.7*** (61.561) | 247.56*** (71.53) | 238.631** (100.085) |
| GII | -40462.9*** (7438.62) | 1673.397 (4165.50) | -43029.5*** (10591.15) | -41685.9*** (8497.701) | -40525.2*** (7467.084) | -39426.1*** (7452.53) | -37518.7*** (9508.14) |
| GDI | -99958.5*** (23499.98) | -7632.194 (13290.95) | -88252.3*** (27568.32) | -94380.3*** (23441.82) | -99674.3*** (23407.11) | -104687.3*** (26529.74) | -113386.9*** (36548.3) |
| FPYI | -88.85*** (19.773) | 10.127 (11.29) | -104.38*** (30.38) | -96.25*** (23.85) | -89.232*** (19.94) | -82.58*** (18.691) | -71.035*** (22.781) |
| FWPI | 37.64** (17.763) | 10.93 (10.528) | 20.87 (22.918) | 29.65 (18.64) | 37.23** (17.716) | 44.42** (19.51) | 56.88** (26.884) |
| FPHI | -40.269** (19.453) | 4.391 (13.047) | -47.004* (27.909) | -43.478** (21.677) | -40.432** (19.476) | -37.548* (21.083) | -32.542 (30.063) |
| FMRI | -172.486*** (43.141) | -11.891 (26.317) | -154.248*** (45.102) | -163.795*** (39.267) | -172.043*** (42.759) | -179.854*** (52.128) | -193.408** (75.445) |
| HCE | 0.104*** (0.016) | 0.0096 (0.0098) | 0.089*** (0.02) | 0.0971*** (0.0163) | 0.103*** (0.015) | 0.1101*** (0.0181) | 0.121*** (0.025) |
| HDI | 203434.7*** (18579.22) | -9353.07 (9700.15) | 217780.4*** (23258.39) | 210270.7*** (19544.04) | 203782.9*** (18573.38) | 197639.7*** (19841.95) | 186978.5*** (25862.84) |
| FDI | 0.0093*** (0.0032) | -0.00033 (0.0019) | 0.0098*** (0.0027) | 0.0095*** (0.0026) | 0.0093*** (0.0031) | 0.0091** (0.004) | 0.0087 (0.0058) |
| GVFCE | -0.287*** (0.069) | -0.0074 (0.0419) | -0.2761*** (0.072) | -0.282*** (0.063) | -0.287*** (0.069) | -0.292*** (0.084) | -0.3004** (0.121) |
| GFCF | -0.116*** (0.022) | -0.004 (0.0139) | -0.1098*** (0.022) | -0.113*** (0.0194) | -0.115*** (0.021) | -0.118*** (0.027) | -0.123*** (0.039) |
| GI | -1375.1*** (126.969) | 7.203 (65.006) | -1386.1*** (141.994) | -1380.3*** (124.772) | -1375.3*** (126.44) | -1370.6*** (141.88) | -1362.4*** (189.64) |
| TRD | 0.0779*** (0.0083) | -0.00014 (0.0043) | 0.0781*** (0.0113) | 0.078*** (0.0092) | 0.0779*** (.0083) | 0.0778*** (.0085) | 0.0777*** (0.0107) |
| cons | 81394.2*** (16973.24) | 14659.69 (9788.5) | 58909.2*** (20225.85) | 70679.8*** (17090.07) | 80848.4*** (16935.02) | 90477.1*** (19199.19) | 107187.1*** (26576.36) |

Notes: within parentheses are represent the robust standard errors of the coefficient values: ***statistical significance at 0.01 level; **statistical significance at 0.05 level; *statistical significance at 0.10 level.

In Fig. 1, we see a graphical presentation of the results of the panel quantile regression. All quantile regression estimates are associated with 95 % confidence intervals, which are shown by the shaded regions. The elasticities of the independent variables are shown along the vertical axis. Normal (95 %) confidence intervals for the OLS coefficients are shown as horizontal lines.

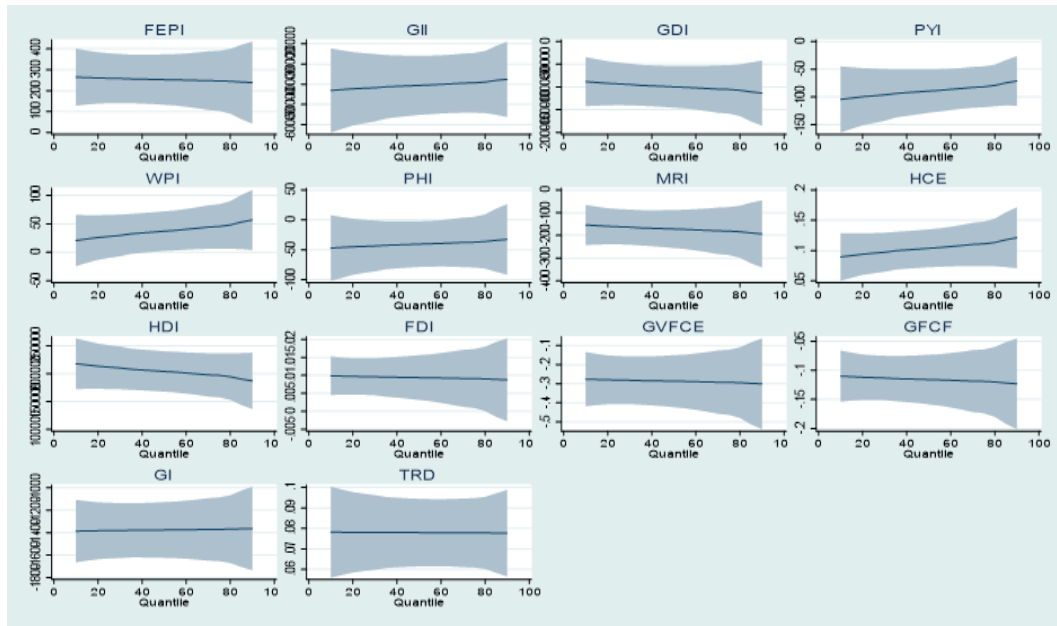


Fig. 1. Quantile estimation: The shaded regions are the (95 %) intervals of certainty for the quantile regression estimates.

After the model has been estimated, it must be tested for robustness. This study utilizes robustness testing, such as tests for varying effects, to confirm the correctness of its results. We formally check whether the coefficients predicted for the different quantiles are statistically different.

Table 3. Wald Tests for the Coefficient Homogeneity

| | 0.10 | | | | 0.30 | | | 0.50 | | 0.70 |
|-------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | 0.30 | 0.50 | 0.70 | 0.90 | 0.50 | 0.70 | 0.90 | 0.70 | 0.90 | 0.90 |
| FEPI | 0.05 (0.826) | 0.05 (0.826) | 0.05 (0.826) | 0.05 (0.826) | 0.05 (0.826) | 0.05 (0.826) | 0.05 (0.826) | 0.05 (0.826) | 0.05 (0.826) | 0.05 (0.826) |
| GII | 0.16 (0.688) | 0.16 (0.688) | 0.16 (0.687) | 0.16 (0.687) | 0.16 (0.688) | 0.16 (0.687) | 0.16 (0.687) | 0.16 (0.687) | 0.16 (0.687) | 0.16 (0.687) |
| GDI | 0.33 (0.564) | 0.33 (0.564) | 0.33 (0.565) | 0.33 (0.565) | 0.33 (0.566) | 0.33 (0.566) | 0.33 (0.566) | 0.33 (0.566) | 0.33 (0.567) | 0.33 (0.567) |
| FPYI | 0.80 (0.371) | 0.80 (0.371) | 0.80 (0.370) | 0.81 (0.369) | 0.79 (0.374) | 0.79 (0.372) | 0.80 (0.369) | 0.79 (0.373) | 0.81 (0.368) | 0.81 (0.368) |
| FWPI | 1.05 (0.305) | 1.07 (0.301) | 1.07 (0.300) | 1.08 (0.299) | 1.07 (0.301) | 1.07 (0.299) | 1.08 (0.299) | 1.07 (0.302) | 1.08 (0.299) | 1.07 (0.301) |
| FPHI | 0.11 (0.737) | 0.11 (0.736) | 0.11 (0.736) | 0.11 (0.736) | 0.11 (0.736) | 0.11 (0.736) | 0.11 (0.736) | 0.11 (0.736) | 0.11 (0.736) | 0.11 (0.736) |
| FMRI | 0.20 (0.650) | 0.21 (0.650) | 0.20 (0.651) | 0.20 (0.651) | 0.20 (0.651) | 0.20 (0.652) | 0.20 (0.652) | 0.20 (0.653) | 0.20 (0.652) | 0.20 (0.652) |
| HCE | 0.94 (0.332) | 0.95 (0.329) | 0.96 (0.328) | 0.95 (0.329) | 0.95 (0.330) | 0.95 (0.328) | 0.95 (0.329) | 0.95 (0.330) | 0.95 (0.331) | 0.94 (0.333) |

| | | | | | | | | | | |
|--------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| HDI | 0.89 (0.346) | 0.91 (0.341) | 0.92 (0.338) | 0.93 (0.335) | 0.91 (0.339) | 0.92 (0.336) | 0.94 (0.333) | 0.92 (0.336) | 0.94 (0.332) | 0.94 (0.332) |
| FDI | 0.03 (0.859) | 0.03 (0.859) | 0.03 (0.859) | 0.03 (0.859) | 0.03 (0.859) | 0.03 (0.859) | 0.03 (0.859) | 0.03 (0.859) | 0.03 (0.859) | 0.03 (0.859) |
| GVFCE | 0.03 (0.859) | 0.03 (0.859) | 0.03 (0.859) | 0.03 (0.859) | 0.03 (0.859) | 0.03 (0.859) | 0.03 (0.859) | 0.03 (0.859) | 0.03 (0.859) | 0.03 (0.859) |
| GFCF | 0.08 (0.774) | 0.08 (0.773) | 0.08 (0.773) | 0.08 (0.774) | 0.08 (0.773) | 0.08 (0.773) | 0.08 (0.774) | 0.08 (0.774) | 0.08 (0.774) | 0.08 (0.774) |
| GI | 0.01 (0.911) | 0.01 (0.911) | 0.01 (0.911) | 0.01 (0.911) | 0.01 (0.911) | 0.01 (0.911) | 0.01 (0.911) | 0.01 (0.911) | 0.01 (0.911) | 0.01 (0.911) |
| TRD | 0.001 (0.974) | 0.001 (0.974) | 0.001 (0.974) | 0.001 (0.974) | 0.001 (0.974) | 0.001 (0.974) | 0.001 (0.974) | 0.001 (0.974) | 0.001 (0.974) | 0.001 (0.974) |

Notes: The numbers in parentheses are p-values.

The Wald test results show that for all the independent variables, one cannot reject the null hypothesis of equality at the 5 % level of significance, implying that dependence structures do not differ across quantile levels.

4. DISCUSSION

FEPI boosts ASEAN country economies in various ways. First, more women in entrepreneurship can improve their labour force participation, businesses and industries have more workers to choose from, which can boost economic growth (World Bank Group, 2020). Second, more female entrepreneurs can help the economy diversify and innovate. New products, services, and industries can boost economic growth (International Labour Organization, 2015). Third, female entrepreneurs are more creative, collaborative, and strategic, which can boost production and efficiency. Fourth, more women in decision-making and leadership roles, especially female entrepreneurs, promote inclusive and sustainable economic growth. Global attempts to accelerate more equitable economic growth have focused on increasing women's labour force, education, and company ownership. Even if economic growth and stronger social policies have closed the gender gap in the region's literacy rates, there are still big inequalities in how many women work, how well they do, and how much money they make (OECD & ASEAN, 2017).

GII has a negative impact on *GDP* in the ASEAN region, implying that gender inequality stifles growth in a variety of ways. First, gender inequality may discourage women from working. This may slow economic growth due to fewer workers in many areas. Second, job discrimination and prejudice may prohibit able-bodied women from working to their full potential. This may lower productivity and waste resources, limiting economic progress. Third, gender inequality may prevent women from getting the education and training they need for the workforce. Thus, a less-trained workforce may reduce output, slowing economic growth. Fourth, gender disparity may make it harder for women to start and grow businesses. This may shrink the private sector, slowing economic growth. Fifth, gender imbalance causes poverty, crime, and social unrest, which divert money and attention from economic growth.

The GDI suggests that gender inequality may slow economic growth by limiting women's labour market participation. The GDI illustrates that restricting women's economic opportunities hinders economic growth. When education, health care, and economic opportunity are limited for women, business ownership is less likely. A less dynamic economy with fewer chances for new enterprises may limit economic progress. Gender disparity puts women in risky, low-paying jobs, which may lower productivity. This may also slow economic growth. Gender inequality reduces women's authority, which slows economic progress. Women's viewpoints on decision-making and problem-solving are underrepresented in leadership posts.

Increasing the FPYI slows economic growth of ASEAN countries. Women still face gender discrimination in most ASEAN countries, notwithstanding their labour regulations. Low-income ASEAN nations' coping methods diminish gender equity in the workforce. Agriculture and low-productivity sectors offer women the lowest-paying, most insecure jobs. Southeast Asian women care for their families despite working. This restricts full-time employment and career goals. Due to family demands, women may pick less competitive and flexible occupations. Thus, the gender pay gap in ASEAN countries exists because men and women share paid and unpaid labour unequally, since fewer women work full-time. They clean, buy, and care for youngsters and elderly relatives due to gender roles.

FWPI has a positive impact on economic growth of ASEAN countries. Southeast Asian women struggle with employment. Insensitive parental leave regulations, difficult working conditions, and sexual harassment drove many women to quit. Women do not use public transportation because it can be dangerous, especially in cities. Low-income women face sexual harassment. If men expect women to care, fewer will volunteer. Businesses are wary of hiring women due to parental leave. Women are employed later and receive fewer benefits. Wealthier nations suffer more workplace harassment when men have more power.

Since ASEAN countries' economic growth is negatively correlated with PHI, biased legislation impacting women's employment before, during, and after childbirth will encourage them to become entrepreneurs, boosting economic growth. If they can return to their jobs after 14 weeks of paid maternity leave, women are more likely to stay in paid work than start a business. OECD (2021) finds that workplace sex discrimination against women in Southeast Asia persists despite modest advances. Some laws make it hard for women to work in some industries or be paid equally in others, and there are not enough workplace protections or maternity and paternity leave programs. Paternity leave is rare and only available to full-time workers. 50 % of Southeast Asian countries need paid paternity leave. Myanmar and Singapore have two-week paternity leaves, while Indonesia has two days. These inequities reinforce gender inequality in parenting and unpaid child care. Paternity leave depends on social security eligibility.

Since FMRI is inversely related to economic growth, ASEAN laws restricting marriage, divorce, remarriage, and domestic violence promote women to start their own businesses, which boosts the economy. Similarly, Franzke et al. (2022) analyse the fact that women in emerging Asian economies are discouraged from starting their own businesses owing to restricted educational and career prospects resulting from forced or early marriages. According to Ojediran & Anderson (2020), cultural

traditions, religious views, and family values impact Southeast Asian women's employment choices. Institutional patriarchal cultures promote authority, surveillance, obedience, compliance, and inequity. Women-owned enterprises remain uneven despite local policy talks on female entrepreneurship and growth. Again, social and societal characteristics and religion of these nations strengthen. Successful female entrepreneurs must choose between family and business.

CONCLUSIONS

The empirical research conducted in this paper, which analysed yearly statistics, concentrated on the economies of ten Southeast Asian countries. To determine the impact of female entrepreneurship on GDP per employed person, we used a panel data model with the following dependent variables: FEPI, GII, GDI, FPYI, FWPI, FPHI, FMRI, HCE, HDI, FDI, GVFCE, GFCF, GI, and TRD. This analysis is developed using the MM-QR approach for panel fixed effects proposed by Machado & Santos Silva (2019) for the period from 1991 to 2021.

Women entrepreneurs may boost developing nations' economies by producing jobs, revenue, and community. Governments promote female businesses to boost revenue and development. If more women of ASEAN countries could develop profitable enterprises, they would be able to support their families and advance in their careers. Owning a business gives women a different perspective on social issues and the freedom to creatively alter their communities. Families and communities benefit from women's increased workforce and social participation.

If ASEAN countries want sustained and fair economic growth that helps women balance work and family, they should pass family responsibility laws. Reliable, affordable child care enables women to work. This level must emphasize the need to remedy the unequal allocation of domestic work by adjusting labour limitations for male workers and valuing women's housekeeping, such as by paying them allowances based on their number of children. State and commercial companies should replace maternity leave with family leave. Private enterprises change; therefore, workers must follow the same norms. Equally important are gender-sensitive public services, infrastructure, and social protection. Women should get all social security benefits, including retirement, unemployment, disability, sickness, old age, loss of working capacity, and paid leave. Pension plans should be revised to minimize maternity leave reductions. As an inducement, specific credits for mothers would be intriguing.

Women of ASEAN countries need education, economic resources, decision-making skills, and technology. Women entrepreneurs need education, retraining, and growth. Removing bias and exploitation can help women flourish in the workplace. ASEAN countries should carefully implement equal pay for equal effort to encourage women to work by clearly mandating a particular number of women in professional, political, and cultural circles, offering women temporary tax benefits, etc.

ASEAN countries must promote specific programs to help women adjust to economic crises like the COVID-19 pandemic. Information and communication technology, digital media, and global interconnectivity would enable their

development. This will inspire women to start businesses that benefit everyone and introduce them to digital tools. Several companies allow employees to work from home due to health issues. The recession has hurt women's jobs, especially in the informal economy. Creating a real social safety net and addressing these gaps will benefit women and the economy.

The family, civic society, training and higher education, businesses, the media, international organizations, government and non-government organizations, and others must work together to empower women economically and maximize women's entrepreneurship in the region. Whether there is a “feminine problem” depends on whether regulations that affect women take reproductive, educational, and professional tasks into account. Investing in a nation's youth is one of the best ways to ensure its success, riches, and safety. Economic growth and social prosperity will result.

REFERENCES

- Agung, I. G. (2021). *Quantile regression: Applications on experimental and cross section data using EViews*. Chichester: John Wiley & Sons, Ltd. <https://doi.org/10.1002/9781119714958>
- Al-Qahtani, M., Zguir, M., Ari, I., & Koç, M. (2022). Female entrepreneurship for sustainable economy and development – challenges, drivers, and suggested policies for resource-rich countries. *Sustainability*, 14(20), Article 13412. <https://doi.org/10.3390/su142013412>
- An, H., Razzaq, A., Haseeb, M., & Mihardjo, L. W. W. (2021). The role of technology innovation and people's connectivity in testing environmental Kuznets curve and pollution heaven hypotheses across the Belt and Road host countries: new evidence from Method of Moments Quantile Regression. *Environmental Science and Pollution Research*, 28, 5254–5270. <https://doi.org/10.1007/s11356-020-10775-3>
- Baltagi, B. H. (2013). *Econometric analysis of panel data* (Vol. 5). Chichester, UK: Wiley.
- Burga, L., Gimelli, N., Muradyan, S., Robakowski, A., Miller, M., Rawlins, M., & Snyder, G. (2021). *Using digital solutions to address barriers to female entrepreneurship: A toolkit*. Washington: The World Bank. <https://doi.org/10.1596/35993>
- Chatterjee, N., Das, N., & Srivastava, N. K. (2019). A structural model assessing key factors affecting women's entrepreneurial success: Evidence from India. *Journal of Entrepreneurship in Emerging Economies*, 11(1), 122–151. <https://doi.org/10.1108/JEEE-08-2016-0030>
- Davino, C., Furno, M., & Vistocco, D. (2014). *Quantile regression: Theory and applications*. John Wiley & Sons, Ltd. <https://doi.org/10.1002/9781118752685>
- Deepa, B., Sunita Rani, Y., & Radhika, P. (2022). Role of women entrepreneurs in economic development of a country. *Journal of Positive School Psychology*, 6(3), 9831–9835. <https://journalppw.com/index.php/jpsp/article/view/5509>
- Elam, A., Hughes, K. D., Guerrero, M., Hill, S., Nawangpalupi, C., Fuentes, M., González, J. P. D., Laviada, A. F., Martinez, C. N., Banon, A. C., Chabrak, N., Brush, C., Baumer, B., & Heavlow, R. (2021). *Women's entrepreneurship 2020/21: Thriving through crisis*. London: Global Entrepreneurship Research Association. <chrome-extension://efaidnbmnnnibpcajpcgclefindmkaj/https://www.gemconsortium.org/file/open?fileId=50841>
- Franzke, S., Wu, J., Froese, F. J., & Chan, Z. X. (2022). Female entrepreneurship in Asia: A critical review and future directions. *Asian Business & Management*, 21(3), 343–372. <https://doi.org/10.1057/s41291-022-00186-2>
- Ike, G. N., Usman, O., & Asumadu-Sarkodie, S. (2020). Testing the role of oil production in the environmental Kuznets curve of oil producing countries: New insights from Method of Moments Quantile Regression. *Science of the Total Environment*, 711, Article 135208. <https://doi.org/10.1016/j.scitotenv.2019.135208>

- International Labour Organization. (2015). *Women in business and management: gaining momentum*. Geneva: International Labour Office. https://www.ilo.org/beirut/publications/WCMS_492721/lang--en/index.htm
- Koenker, R. (2004). Quantile regression for longitudinal data. *Journal of Multivariate Analysis*, 91(1), 74–89. <https://doi.org/10.1016/j.jmva.2004.05.006>
- Lock, R., & Smith, H. (2016). The impact of female entrepreneurship on economic growth in Kenya. *International Journal of Gender and Entrepreneurship*, 8(1), 90–96. <https://doi.org/10.1108/IJGE-11-2015-0040>
- Lowrey, Y. (2003). *The entrepreneur and entrepreneurship: A neoclassical approach*. U.S. Small Business Administration Economic Research Working Paper. Office of Advocacy. <https://doi.org/10.2139/ssrn.744785>
- Machado, J., & Santos Silva, J. (2019). Quantiles via moments. *Journal of Econometrics*, 213(1), 145–173. <https://doi.org/10.1016/j.jeconom.2019.04.009>
- Marsan, G. A., & Sey, A. (2021). *Women's participation in the digital economy: Improving access to skills, entrepreneurship, and leadership across ASEAN*. Senayan: Economic Research Institute for ASEAN and East Asia. <https://www.eria.org/publications/womens-participation-in-the-digital-economy-improving-access-to-skills-entrepreneurship-and-leadership-across-asean/>
- Mekhezoumi, L., & Gharbi, H. (2021). The impact of entrepreneurship on economic growth in industrialized countries covering 2001–2019. *EL-Manhel Economique*, 4(1), 595–612. <https://www.asjp.cerist.dz/en/article/158043>
- Minniti, M. (2010). Female entrepreneurship and economic activity. *European Journal of Development Research*, 22, 294–312. <https://doi.org/10.1057/ejdr.2010.18>
- Mustapha, M., & Subramaniam, P. (2016). Challenges and success factors of female entrepreneurs: Evidence from a developing country. *International Review of Management and Marketing*, 6(4S), 224–231. <https://www.econjournals.com/index.php/irmm/article/view/2492>
- Noor, S., Isa, F. M., & Shafiq, A. (2022). Women's entrepreneurial success models: A review of the literature. *World Journal of Entrepreneurship, Management and Sustainable Development*, 18(1), 137–162. <https://doi.org/10.47556/J.WJEMSD.18.1.2022.7>
- OECD, & ASEAN. (2017). *Strengthening women's entrepreneurship in ASEAN: Towards increasing women's participation in economic activity*. OECD. www.oecd.org/southeast-asia/
- OECD. (2021). *SIGI 2021 regional report for Southeast Asia. Social institutions and gender index*. Paris: OECD Publishing. <https://doi.org/10.1787/236f41d0-en>
- Ojediran, F. O., & Anderson, A. (2020). Women's entrepreneurship in the global South: Empowering and emancipating? *Administrative Sciences*, 10(4), Article 87. <https://doi.org/10.3390/admsci10040087>
- Ramadani, V., Fayolle, A., & Gërguri-Rashiti, S. (2015). Female entrepreneurship in transition economies as a significant but understudied field. In V. Ramadani, S. Gërguri-Rashiti, & A. Fayolle (Eds.), *Female entrepreneurship in transition economies : trends and challenges* (pp. 1–8). New York: Palgrave Macmillan. <https://doi.org/10.1057/9781137444516>
- Roche, N., Anderson, D. S., Balmaceda, M., & Nakornthap-Yomnak, V. (2020). *Advancing women social entrepreneurs in ASEAN*. Singapore: Ashoka. <https://diwa.ashoka.org/report>
- Sajjad, M., Kaleem, N., Chani, M., & Ahmed, M. (2020). Worldwide role of women worldwide role of women economic development. *Asia Pacific Journal of Innovation and Entrepreneurship*, 14(2), 151–160. <https://doi.org/10.1108/APJIE-06-2019-0041>
- Sallah, C. A., & Caesar, L. D. (2020). Intangible resources and the growth of women businesses: Empirical evidence from an emerging market economy. *Journal of Entrepreneurship in Emerging Economies*, 12(3), 329–355. <https://doi.org/10.1108/JEEE-05-2019-0070>
- Schumpeter, J. A. (1931). *The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle*. Harvard University Press.
- SPF. (2022, November 23). *Gender investment and innovation program*. Sasakawa Peace Foundation. https://www.spf.org/en/gender/women_entrepreneurs/
- Tambunan, T. (2019). Women entrepreneurship in Asian developing countries: Their development and main constraints. *African Journal of Gender and Women Studies*, 4(5), 1–14. [chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.internationalscholarsjournals.com/](https://www.internationalscholarsjournals.com/)

articles/women-entrepreneurship-in-asian-developing-countries-their-development-and-main-constraints.pdf

UN Women. (2022). *Women's leadership in the ASEAN region*. United Nations Entity for Gender Equality and the Empowerment of Women (UN Women). <https://asiapacific.unwomen.org/en/digital-library/publications/2022/10/womens-leadership-in-the-asean-region>

UNFPA. (2013). *Realizing the potential*. UNFPA Annual Report 2013, New York: United Nations Population Fund. <https://www.unfpa.org/publications/unfpa-annual-report-2013>

Waseem, A. (2018). Female entrepreneurship and economic growth: An institutional theory analysis. *Pakistan Journal of Gender Studies*, 16(1), 15–36. <https://doi.org/10.46568/pjgs.v16i1.113>

Weber, C., Fasse, A., & Haugh, H. M. (2022). Varieties of necessity entrepreneurship – New insights from Sub Saharan Africa. *Entrepreneurship Theory and Practice*, 0(0), 1–34. <https://doi.org/10.1177/10422587221111737>

World Bank Group. (2020). *Women, business and the law 2020*. Washington: International Bank for Reconstruction and Development. <https://openknowledge.worldbank.org/handle/10986/32639>

AUTHORS' SHORT BIOGRAPHY



Sabrina Chikh-Annache obtained a university habilitation diploma in economics in 2018, after that obtaining a PhD in economics in 2015 and a Master degree in spatial, regional, and urban economics in 2005 from the University of Tizi-Ouzou-Algeria. She has been an Associate Professor with the Department of Economics at the University of Tizi-Ouzou-Algeria since 2005. She is the director of the business incubator at the University of Tizi-Ouzou. Her main areas of interest are microeconomics, macroeconomics, and innovative entrepreneurship.

E-mail: sabrina.chikh@yahoo.com

ORCID iD: <https://orcid.org/0000-0002-1319-599X>



Lotfi Mekhzoumi earned a PhD in economics from the University of Medea-Algeria in 2016 after graduating as an engineer in statistics from the Higher National School of Statistics and Applied Economics and a Magister degree in economic analysis from the University of Algiers 3. He has been a Professor with the Department of Economics at the University of El Oued-Algeria since 2012. He is the Editor-in-Chief of the *Roa Iktissadia Review* and heads the PRFU research project “The Impact of the Knowledge Economy and Entrepreneurship on Industrial Upgrading and Commercial Performance in Middle-Income Countries”. He has experience in econometrics and applied economics and is skilled in using computer software such as SPSS, Minitab, Eviews, Stata, Microfit, and Gretl.

E-mail: lotfimekhzoumi39@gmail.com

ORCID iD: <https://orcid.org/0000-0002-3752-7178>