Assessing Economic Development: The Role of Women in the Economy

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Introduction

Amidst the fast changes in the global economy, it is crucial to comprehend the elements that contribute to a nation's growth. The participation of women in the economy is a critical factor in driving economic growth and development. Access to education, health services, and employment opportunities allow women to become active economic participants as laborers and consumers. Women's inclusion in the workforce expands the pool of talent and skills, diversifying the range of perspectives. This reduces poverty levels and income inequality while empowering women and future generations to be active citizens.

This study aims to investigate the correlation between women's involvement in the economy and the degree of development in a given nation. It specifically examines the contributions of women's entrepreneurship and labor force participation. We use the Women Entrepreneurship Index (WEI) to numerically measure the scope of entrepreneurship in a given nation and the Female Labor Force Participation Rate (FLFPR) to measure the level of employment of the female population. The research seeks to reveal the possible correlation between gender-specific economic indicators and more expansive developmental results via regression analysis. Using a logistic regression model, the two chosen economic indicators are used for the binary classification of a country as developed or developing. This model is used to answer the question: Can the Women's Entrepreneurship Index and the Female Labor Force Participation Rate effectively predict a country's level of development?

Context and Implications

The scholarly research for this study has revealed significant patterns within the scope of institutional and social frameworks and the level of economic advancements in a region. Two of

our sources focus in on India, the country with the sixth lowest WEI of all ranked nations (NextBigWhat, 2018). This article from a Bangalore newspaper illustrates how a country's WEI score may accurately reflect wider socio-economic processes. For example, there are clear discrepancies in business ownership based on gender in India's metropolitan areas (Sabyasachi, 2023). Men are far more likely to own businesses due to historically established frameworks that make it easier for them to advance in society. Given its low WEI score, it makes sense that India is classified as a developing country. The impact of certain economic and social factors on development is evident globally.

Female involvement in the economy is based on a multitude of factors, including government policies, education systems, financial systems, location, and social norms (Xie et al., 2021). The infinite combinations of these factors produce vastly different economic states in countries all over the world, but patterns in female involvement are clear. Geographical location is a valid predictor of economic involvement (Hanson, 2003). It is far more convenient to start a business in an area where demand is high and resources are abundant. Rural areas commonly drag behind urban areas in terms of technological advancements. In China, another developing country, researchers observed that the presence of time-saving technological advancements, such as washing machines, allow more time to be allocated to participating in the economy as a laborer or consumer (Tewari & Wang, 2021). This is especially true for women because, based on cultural norms, they are tasked with the housework. Turkey is a perfect example of the impact of cultural variables on involvement in the economy. Turkey has been experiencing an increase in FLFPR that can be directly attributed to increased educational opportunities for women, rural to urban migration, and female economic empowerment (Tunali et al., 2021). Education is another important factor in economic development. As cultural norms are starting to shift to

promote female independence, more women in sub-Saharan Africa are seeking higher education. This increase in education has proven to be directly correlated to an increased FLFPR (Backhaus & Loichinger, 2022). Increased involvement in the economy provides a big boost to economic development. This trend of female empowerment is becoming more prominent as many global economies are seeing positive shifts in growth (Blau & Winkler, 2022).

Women are experiencing a transformation of institutional challenges into favorable circumstances (Kristoff & WuDunn, 2021). As women are given more opportunities for economic independence, countries experience increased economic productivity, improved child well-being, and more representative institutions (Revenga & Shetty, 2012). Female empowerment is a catalyst for progress as female participation proves to play an important role in economic development.

This study holds significant implications for a range of stakeholders, including policymakers, development agencies, and women entrepreneurs. Policymakers can leverage these insights to formulate gender-sensitive economic policies conducive to national development. Development agencies, tasked with promoting economic growth and gender equality, can use this information to target their interventions more effectively. Women entrepreneurs stand to gain directly from policy changes and initiatives that acknowledge and address the barriers they face in business and the workforce.

The possible risks associated with this study stem from the improper use of data, which may result in reinforcing stereotypes or the misguidance of policies. Those policies and reinforced stereotypes can strongly influence the overall economy of the country involved as a result of changing global perspectives and relationships between trading countries. On the other hand, the research promises substantial benefits, including the potential to inform policies that

support women's economic empowerment and contribute to more balanced and equitable development. Ensuring the responsible use of data and maintaining objectivity in our analysis are crucial steps in mitigating these risks.

Adopting a consequentialist approach, the ethical merit of this study is evaluated based on its potential outcomes and contributions to society. This framework prioritizes research outcomes that have positive societal impacts, such as enhancing women's roles in the economy and fostering societal progress through gender-inclusive development. The objective is to ensure that the study's conclusions lead to meaningful actions and policy formulations that not only uplift women's economic status but also contribute to the broader goal of equitable and sustainable development.

Measurement

The primary objective of this research is to quantify the degree to which the Women's Entrepreneurship Index (WEI) and the Female Labor Force Participation Rate (FLFPR) might serve as indicators for a nation's level of development. Our investigation aims to determine the reliability of these gender-specific economic variables as predictors of a country's development status. This study examines the correlation between women's economic engagement and the overall economic progress of their nations. The objective is to determine if increased participation of women in the economy is associated with measures of a country's economic advancement. To measure this correlation, we use logistic regression analysis, a statistical technique particularly suitable for solving binary classification issues.

The key terms to conceptualize for this study are the Level of Development, Women Entrepreneurship Index (WEI), and Female Labor Force Participation Rate (FLFPR). The development of a country is a description of how economically advanced it is, based on

economic growth and security (Majaski, 2022). The level of development is operationalized by the gross domestic product (GDP), human development index (HDI), and average income per capita. For example, in 2022 Germany boasted a GDP of about $4,174 billion (top 5 GDP in the world), 0.942 HDI (9th highest in the world), and an average income of about $49,061 (O'Neill, 2023; United Nations, 2022; McEvoy, 2023). Germany's high numbers and rankings classify it as a developed country. India, which is a developing country according to our data, in 2022 had a GDP of about $3,385 billion which is comparable to Germany's (MacroTrends, 2023). However, India had an HDI of 0.6 and an average income of $1,789, which are significantly lower and would classify India as developing (United Nations, 2022; Rathore, 2023).

The WEI is an overall assessment of the quality and scale of a nation's female entrepreneurial systems. It is operationalized by an algorithm that collects data on the quality of the entrepreneurial environment and the women's entrepreneurial aspirations (Terjesen, 2015). The FLFPR simply refers to the amount of women working or actively looking for employment in the labor market. It is measured as a proportion of this value and the total female population eligible for employment in a given nation (World Bank, 2022). For example, according to our data, Germany has a WEI of 63.61 and a FLFPR of 69.9%. As opposed to India, which has a WEI of 25.3 and a FLFPR of 61.1%.
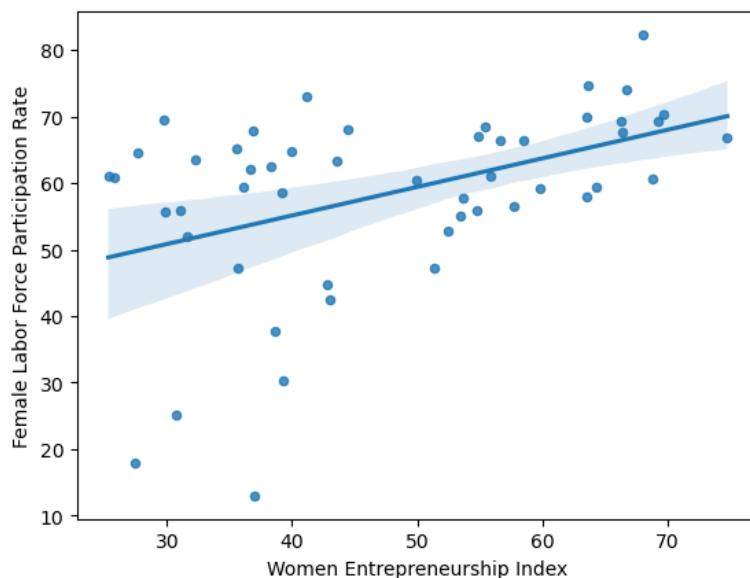
Data

The Women Entrepreneurship dataset is a comprehensive analysis of fifty countries, including their development level, European Union membership, currency, women's and overall entrepreneurship indices, inflation rate, and female labor force participation rate.

To assess the impact of the WEI on various countries, we utilized the level of development as an economic indicator. The figure below shows that the WEI is significantly

higher in developed countries than in developing countries. Next, we created a logistic regression model to predict the level of development using the WEI data. However, the accuracy score for this model came out low at 0.55, suggesting that the WEI alone is insufficient for predicting the level of development.
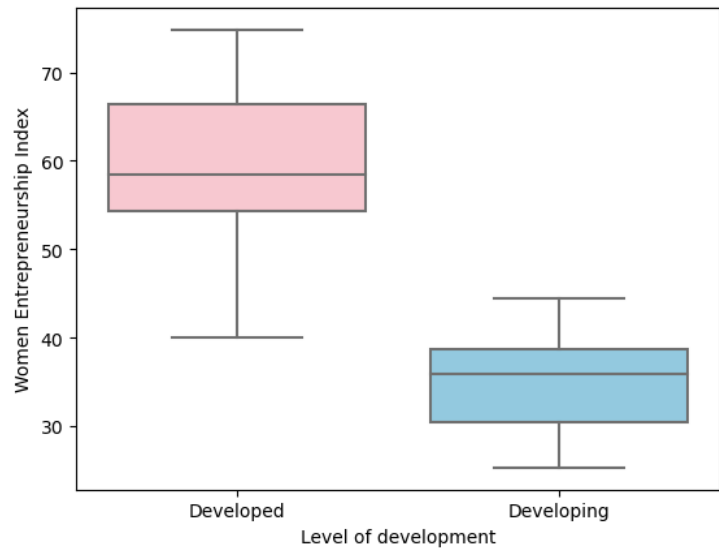

Therefore, we needed to explore other variables that could provide meaningful insights. In particular, we chose to focus on the Female Labor Force Participation Rate (FLFPR) because employment goes hand in hand with entrepreneurship. By visualizing the relationship between the WEI and FLFPR, we observed that while the correlation may not be the most pronounced, there is a noticeable trend. High WEI values tend to align with high FLFPR, while low WEI values exhibit a slightly scattered relationship with FLFPR. This suggests that WEI is linearly related to FLFPR, and further exploration using logistic regression might uncover valuable patterns in the data.

Additionally, we visualized the relationship between FLFPR and the level of development. The difference is not as pronounced as in the first figure, but there is a clear relationship between the two variables, demonstrating a higher FLFPR in developed countries. From here, we created an improved logistic regression model with WEI and FLFPR as our two predictors.
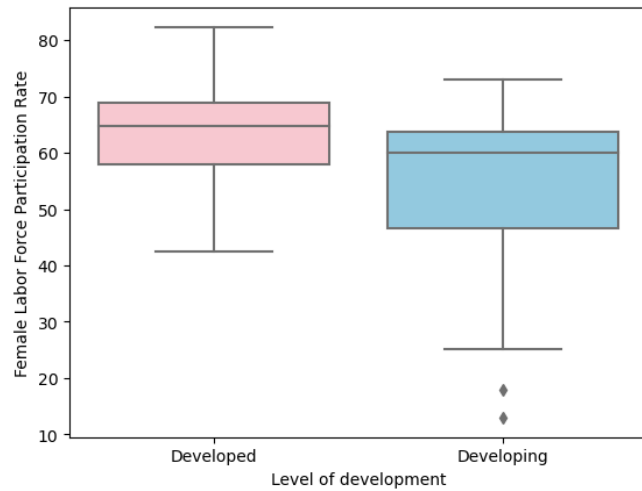
The new logistic regression model returned an accuracy score of 0.91. From the confusion matrix, we can observe that the model is highly precise and specific. In linear
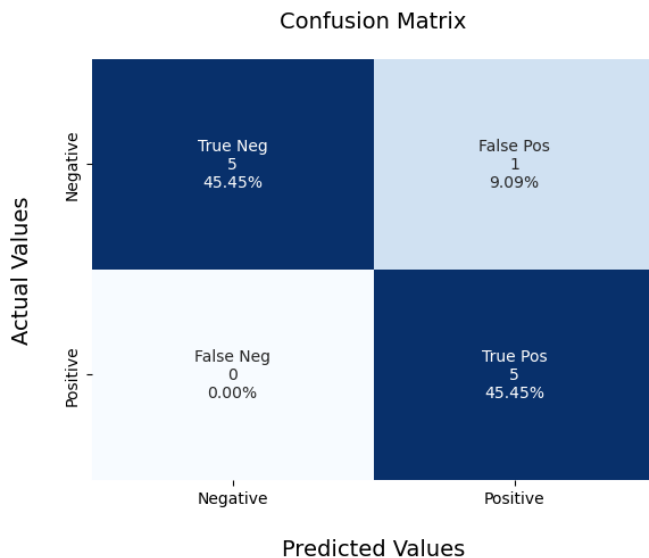
regression, the R-squared (or coefficient of determination) expresses how well the data fits the regression model as a proportion of the variance in the dependent variable explained by the model. There is no R-squared equivalent for a logistic regression. Instead there is a pseudo R-squared, which serves to compare different models for the same data or assess the relative improvement in fit when adding variables to the model. The first model returned a pseudo R-squared of 0.06348. After the FLFPR data was added, the pseudo R-squared became 0.2944, proving that the second model is better. Additionally, the WEI and FLFPR had p-values of 0.001 and 0.003 respectively. P-values less than 0.05 at a 95% confidence level are

regarded as statistically significant to the model. The model resulted in a WEI coefficient equivalent to -0.1126 and a FLFPR coefficient equivalent to 0.0859.

Conclusion

This research aimed to analyze the relationship between women's participation in the economy and the degree of economic development in different countries. Our objective was to assess the predictive capacity of the Women Entrepreneurship Index (WEI) and the Female Labor Force Participation Rate (FLFPR) in determining whether a nation is classified as developed or developing. Our research indicates that while there is a correlation between the WEI and the developmental state of nations, this indicator alone is not enough to accurately predict outcomes. The inclusion of the FLFPR enhanced the model, suggesting that a comprehensive approach is required to understand the intricacies of economic growth. The logistic regression model improved its ability to categorize a country's developmental level by including both indices. Nevertheless, the research had a few drawbacks. The use of secondary data limits the conclusions due to the limitations in the quality and extent of the current databases. Furthermore, the categorization of nations into binary classifications based on only two variables may oversimplify the intricate range of progress. To enhance the scope of future studies, it is advisable to include supplementary factors, such as educational and healthcare accessibility, in order to provide a more thorough analysis of women's economic involvement and its influence on development. To summarize, this study highlights the significance of women's economic participation as an indicator of a country's advancement. As the global economy progresses, the increased participation and influence of women in the employment and entrepreneurial sectors are expected to play a crucial role in promoting sustainable development.

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