



Women's economic empowerment and poverty: Specification empirics examining global data

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ABSTRACT

Two measures of women's economic empowerment (1) number of female business owners and (2) the number of female sole proprietors are used as women's entrepreneurial surrogates to determine the impact of women's economic empowerment on poverty globally. Using a Fixed-effect model (FEM) and dominance analysis (DA) as an estimation technique, this study sampled carefully ninety-five (95) countries for which data is available for the years 2002 to 2021. These countries are further subdivided into regions for further examinations. Based on the global dataset, the study concludes that the number of female business owners across the study sample significantly contribute to poverty reduction. It is pertinent to emphasize that policy measures that aim to increase the share of female business owners on a worldwide scale should incorporate the poverty threshold. In terms of regional blocks classifications, varied results are produced for both number of female business owners and number of female sole proprietors. This study is anticipated to be valuable in terms of originality since it provides a precise and coherent understanding of the genuine measure on women's economic empowerment that must be placed, from the perspective of global dataset and regional blocks, to reduce global poverty more effectively.

1. Introduction

Poverty is not only concerned with financial constraints that an individual faces, but it impacts the well-being of the individual, creates economic instability, impacts the socio-economic development of a nation, has environmental impacts and impacts the future generations of a country [1–3]. Poverty has existed with humanity since ancient civilizations and has impacted every aspect of individual life, society, and the global world [4,5]. The worldwide poverty rate has seen a significant increase from 2020 despite the historical decline between 2015 and 2018 as displayed in Figs. 1 and 2. It is claimed that the effects of COVID-19, increasing living expenses, and the wider effects of the conflict in Ukraine have severely hampered the issues of poverty. In 2019, an additional 8 million workers will be pushed into poverty, according to the World Bank's estimates. Increasing food costs and the effects of the Ukraine crisis could increase that number by >50 % by 2030, as per the sustainable development goals progress report, in 2020. Hence poverty alleviation is a major concern for humanity both at the individual, national and at global levels.

The alleviation of poverty brings about global economic

development which covers the areas of economic benefits by increased productivity and economic growth, improving the standard of living of citizens, helping to reduce income and poverty gaps, helping increase access to credit and financial services, creating jobs and encourages entrepreneurship [1,2,6–8]. Social benefits of improving living conditions, improved health conditions, providing access to education and promoting skills development, helping to reduce crimes and providing other benefits [1,2]. These benefits highlight the need for poverty alleviation for individuals, communities, and societies. Considering the enormous benefits of poverty alleviation for individuals, communities, and societies. Various measures have been proposed to help in the alleviation of property not limited to infrastructure development, Economic Empowerment, Education and Skills Development, provision of Health and Well-being, environmental development and not excluding Women's economic empowerment and gender equality initiatives issues [1,2,6–9].

In the global struggle against poverty, strategies have predominantly targeted men, which has expanded the lacuna in income amongst men and women and exacerbated gender bias. Although these policies are somewhat effective, little has been achieved. Since the adoption of the

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Beijing Declaration and Platform for Action at the Fourth United Nations World Conference on Women in Beijing in 1995, it has been acknowledged that women's empowerment is essential for attaining sustainable development. It is the framework of the 2030 Agenda of the United Nations. According to 2018 World Bank data, for every 100 males, 104 females were living in poverty, and it has been demonstrated that girls and women of reproductive age are far more likely to reside in impoverished households than boys and men [10]. Women are more susceptible to poverty than males because of traditional beliefs, the gendered distribution of resources, and the politics amongst men and women [11]. In addition, accumulating data suggests that women's earnings add more value to the standard of living than men's [12], as women's advancement brings about social sustainability [6]. To reach the ultimate impact on lowering poverty, a greater focus must be made on equality concerns and the elimination of impediments affecting women.

Women Empowerment is considered as means by which women acquire competence, problem-solve, and get assistance across the way [13]. Other studies consider Women's Economic empowerment as a mechanism of poverty alleviation which helps to achieve women's economic advancement, and access to opportunities, services, and resources, which includes decision-making ability in households and markets, manageable paid and unpaid workloads, and promoting the well-being of women in the face of equitable policies, laws, institutional practices, and social norms [2,3,7,8,14–17]. The empowerment of women not only has the benefit of benefitting women but has a global economic development impacting families, communities, and societies as a whole. Some of the benefits associated with women's economic empowerment in helping to reduce poverty are: improved education, minimise vulnerability to violence, Improved household income and living standards, help reduced income inequality and poverty gaps and globally help to achieving Sustainable Development Goals [2,8,14] Antonijević et al., [18] argue that the empowerment of women is crucial because, despite their significant potential, women often have limited access to financial and banking services worldwide and contribute less to financial inclusion, which can be considered as a key mechanism for poverty alleviation.

In research, although recent and other prior studies have shown that women's economic empowerment does help in poverty alleviation [2,3,7,8,14–17], little is known as to how women economic empowerment do help in poverty alleviation, considering global analysis of data and focusing on women economic empowerment measurement of number of female business owners and number of female sole proprietors as a measure of women economic empowerment. Considering the identified research gap the study aims to explore or examine how women's

economic empowerment may impact poverty alleviation considering global data and using the number of female business owners and number of female sole proprietors—as surrogates for women's entrepreneurial activity in the empowerment of women. In Nigeria, Ogundana et al., [8] explore how women entrepreneurs perceive business growth. They found that women entrepreneurs associate growth with a percentage change in their clientele, regardless of how small the change is. This perspective brings to bear the need to understand the context-specific challenges and opportunities faced by women entrepreneurs to alleviate poverty focusing on global data and using female business owners and sole proprietors as a proxy measure of women empowerment would help to better understand the impact of women empowerment on poverty alleviation.

The empowerment of women in helping to reduce poverty, the study using the number of female business owners and number of female sole proprietors is justified for the reason being that: Women in businesses make decisions which have economic impacts, and the business can also provide income to the women helping to reduce their dependence and promote economic independence [2]. Also, their business would bring about job creation and economic growth which can also help in poverty alleviation, as Bouguerra, [15] argues that businesses in the form of entrepreneurship bring about economic growth and employment opportunities for the well-being of society in the alleviation of poverty. Furthermore, through their business, they can support themselves, their families, and the community they operate in through their social responsibility activities. Therefore, using the number of female business owners and female sole proprietors, as a measure of women's economic empowerment would help to gain insights into the impact of women's economic empowerment as a mechanism for poverty alleviation.

The article makes numerous additions to the body of knowledge: This article sheds additional light on women and the widening gender gap. The concentration of poverty reduction initiatives on men has exacerbated the disparity in productivity and income between men and women and promoted gender inequality. Conventional poverty evaluation, planning, and monitoring methods have not adequately considered gender inequity which has had a profound effect on the efficacy of income equality. Consequently, it is essential to examine and solve the difficulties of poverty through a gender lens. Second, this article analyzes the disparities in the utilization of various empowerment methods. There are inconclusive findings in the existing literature on the impact of microfinance on women's empowerment. Some studies revealed that microcredit schemes had good benefits, while others discovered that they had no impact or negative ones. One potential reason for the mixed findings is the utilization of distinct measures for empowerment [19,

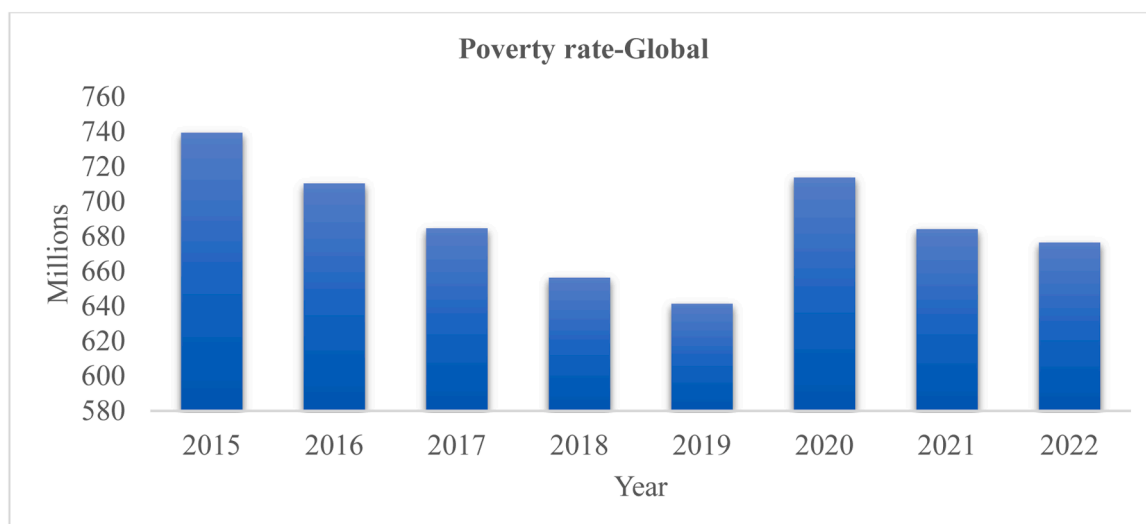


Fig. 1. Global poverty rate.

20]. Third, this paper evaluates the effects of women’s economic empowerment on poverty across regional block classifications. The study gives special attention to East Asia & Pacific, Europe & Central Asia, Latin America & Caribbean, Middle East & North Africa, South Asia, and Sub-Saharan Africa. These regional blocks apart from World Bank data that show the ethnic diversity of poverty headcount patterns appear to have similar historical poverty rates. Dataset decomposition is necessary because natural resources, and social, and economic developments are not the same across countries and regions. Hence, a need to proffer policy advice in line with the regional characteristics. Establishing this relationship and its classifications is crucial because it has diverse implications for development policy [21]. Fourth, the relative importance of the individual parameter estimates (PEs) in the statistical model of poverty is investigated. Finally, another significant contribution to the body of knowledge is the consideration of a panel threshold analysis. Consequently, the quadratic model is specified to examine the non-linear effect of women’s economic empowerment on poverty.

Whereas the following section discusses the summary of the research and formulation of hypotheses, Section 3 discusses the study methods and estimation techniques. The findings from the research are discussed in Section 4, while the results are discussed in Section 5.

2. Literature review and theoretical framework

2.1. Women empowerment: history and relevance

Women’s empowerment traces back to the years of the feminist movement globally. Four different waves of feminist movement have been recorded in the past. The first wave of the drive for women’s suffrage occurred in Europe and the United States in the early twentieth century centuries [22]. The second wave examined the hierarchical nature of society and identified gender-based dominance and marginalization. The 1990s marked the beginning of the third wave, which refers to a continuity and response to the second wave. The fourth wave tries to achieve equality by emphasizing gender-related conventions and women’s marginalization [23].

2.2. Theoretical framework

A unitary model of empowerment and Household bargaining models. The empowerment of women is a complex subject extensively examined within the theoretical framework of major disciplines [24]. For a comprehensive review of the literature on household decisions, the unitary model or common preference models of the household serve as the basis [25]. The unitary model regards households as distinct individuals with specific inclinations. Thus, every member of the household has an identical value measure, or conversely, all domestic issues are based on the choice of a single person. Therefore, household decisions are not influenced by who controls the household’s money or wealth. Such a conceptual viewpoint relates to the unitary model in which one individual (or a couple) controls all domestic decision-making. In this model, individuals combine their earnings or assets and operate as consumption or production units. Bargaining theory asserts that the allocation of home resources depends on the relative bargaining strength of each household member. Members of the household can negotiate with one another while making decisions, allowing differences between spouses to influence household decision-making. The theoretical underpinnings of the unitary method have been contested by scholars and practitioners [26].

Overall, these models offer a basis for evaluating how women’s employment and career choices influence the outcomes of household decision-making and their power to make those choices. Understanding the nuances of how attitudes, behaviours, and inclinations affect the judgements and decisions men and women make is crucial given the intricacy of power dynamics among men and women.

2.3. Some relevant key studies on women empowerment and poverty alleviation

In research, indeed recent and other prior studies have shown that women economic empowerment do help in poverty alleviation for instance, recently in Iran, Salamzadeh et al. [27] observed that women entrepreneurs through digital tools can be empowered for sustainable

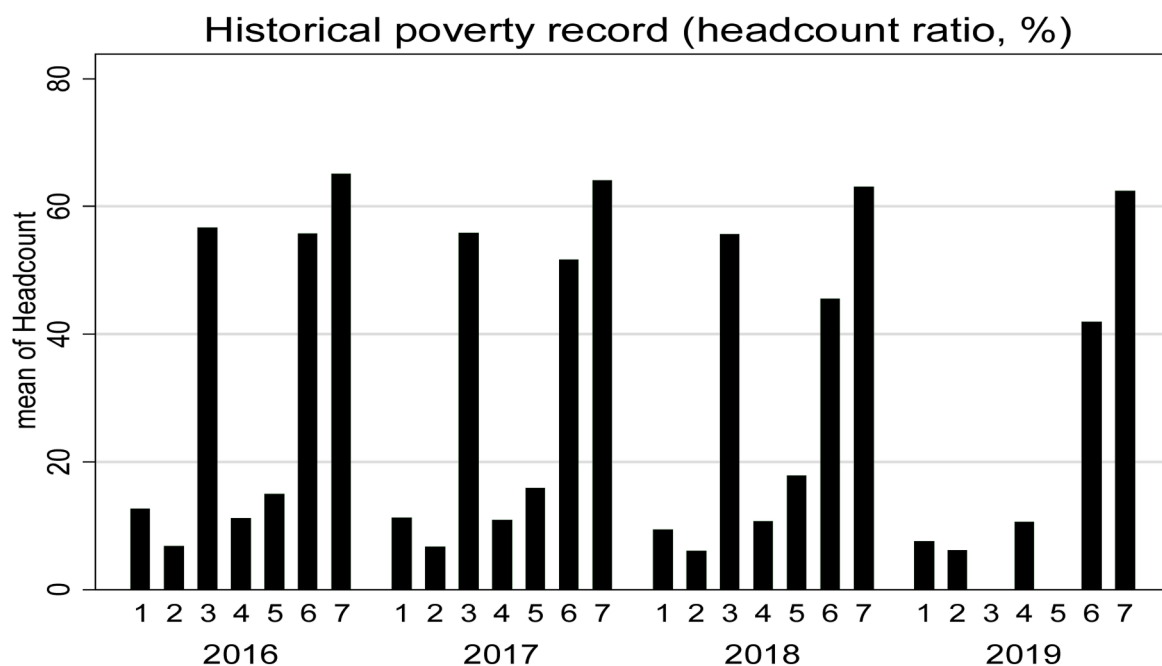


Fig. 2. Poverty rate by regional block classifications. Note: (1) East Asia & Pacific, (2) Europe & Central Asia, (3) Fragile and conflict affected situations, (4) Latin America & Caribbean, (5) Middle East & North Africa, (6) South Asia, (7) Sub-Saharan Africa. Source: Author’s compilation (2024).

business growth, helping to achieve a more equitable and environmentally conscious future, which would aid in poverty alleviation. Similarly, Nziku et al. [7] considered a broad view of the entrepreneurial ecosystem and women entrepreneurship in the Middle East, stressing on the importance of developing a strategy to achieve women's economic empowerment which is critical for the attainment of sustainable development goals, and fostering good-quality entrepreneurial activity. These goals contribute to the alleviation of poverty. In addition, Agu et al. [14] stressed on women entrepreneurship helping to reduce poverty during the covid 19 pandemic. Furthermore, even in developed countries in examining 51 studies for the period 1990 to 2020, Douaihy et al., [2] found a link between poverty and entrepreneurship. This suggests that women entrepreneurship as a mechanism for women economic empowerment do help to reduce poverty in developed countries, as has been the case for developing countries. For developing countries In Nigeria, Sajuyigbe and Fadeyibi, [28] observed that the involvement of women in businesses positively help in the achievement of sustainable economic developmental goals. They also observed that majority of women in Nigeria have been empowered by having access to education, voting in elections, and having been benefitting from empowerment training programs. These reasonably confirm that women empowerment do help in poverty alleviation. In Sri Lanka, De Silva et al., [16] considered that the ownership of beauty salon do empowerment women and help in poverty alleviation although they face challenges. Bouguerra, [15] posit that women play a major role in economic development in their businesses and this not only benefit a nation but help in creation of employment, increase production and consumption and help in achieving gender equality, cultural and social reforms in the effort of poverty alleviation.

2.4. Potential factors of poverty reduction and hypothesis development

Several studies have examined the factors discovered to influence poverty [1,2]. Women's economic empowerment proxies such as the number of female business owners, the number of females of sole proprietorship, and other factors namely gross domestic product growth and Gini index or ratio (income inequality) are just a few used by this study.

Since the UN Millennium Development Goals were launched in the year 2000, discussions regarding women's empowerment and poverty have been never-ending, and the results are inconclusive. The empowerment of women's resources has been proven to link favourably with alleviating poverty [29]. Obayelu and Chime [30] assert that multidimensional women's empowerment is an effective strategy for combating poverty. Nadim and Nurlukman [31] indicate that women's empowerment is viewed as a unique strategy for eliminating poverty, particularly in emerging nations. Awumbila, [32] examines the gender dimensions of poverty in Ghana in its entirety. If poverty reduction programs are to be sustainable, it is necessary to acknowledge the unequal gender relations and power structures that women face at all levels in Ghana, and how these increase women's vulnerability to poverty. Dayal et al. [33] demonstrate that there is substantial indication that initiatives targeted at significantly decreasing poverty will not be productive until the understanding of poverty is rethought from a gendered perspective, over and above statistics. According to Chant [34], the targeting of programs solely at women to reduce poverty tends to place gender in the "poverty trap," where gender inequity is reduced to a function of poverty. In Ghana and Uganda, research has shown that women's empowerment improves nutrient availability and monetary food shortfall. In Ghana, Tsiboe et al. [92,018] results indicate that female-led households are significantly more likely to be self-sufficient in food production than male-dominated households. In Cameroon, Ntenkeh et al. [35] suggested that for food security to be enhanced, all programs that empower women must be supported and institutionalized.

For other factors, the growth rate of Gross Domestic Product (GDP) used in this study has been widely studied in literature to influence

poverty. According to Adams [36], growth is a crucial tool for alleviating poverty in developing countries. When the growth rate of GDP is evaluated by survey-mean income (consumption), there is a statistically significant relationship involving economic development and poverty alleviation. Despite the disparity, according to Škare and Družeta [37], as economic progress happens, poverty decreases. This is particularly true for China and India, the two largest countries in the world by population. Fosu [38] examines new worldwide data about the connection between economic growth and poverty alleviation in emerging economies, with an emphasis on the influence of income disparity. The study reveals that there are significant disparities in countries' capacities to convert economic expansion into poverty reduction. Understanding such country-specific profiles is vital for formulating successful and worldwide poverty reduction initiatives. Sukiyono et al., [9] observed that women play a significant role in smallholder plantations and large oil palm plantations, which provides jobs, income to many families in helping in poverty reduction. Bergstrom [39] demonstrates that, on average, the inequality elasticity of fighting poverty is greater than the (absolute) growth elasticity. This study presents the Gini index, which measures how far an economy's income or consumption distribution deviates from being evenly distributed. Research by Karagiannaki [40] reveals a positive correlation between income disparity and poverty, utilizing several inequality and poverty indicators.

Conclusions about the linkage between women's economic empowerment and poverty vary across time, geography, and writers. Additionally, it is crucial to stress that how poverty is assessed or quantified influences the conclusions made on the interrelationship of occurrences and the ideas supporting anti-poverty efforts

Our testable hypotheses are outlined below:

H₁: Women economic empowerment significantly affect poverty.

H₂: Poverty is affected differently at various levels of economic empowerment of women

H₃: Women economic empowerment affects poverty differently along regional blocks.

H₄: The parameter estimate of women's empowerment is relatively significant for poverty amid many other variables.

3. Methodology

3.1. Data and information references

This investigation sampled carefully ninety-five (95) countries for which data is available for the years 2002 to 2021. These nations are further subdivided into regional characteristics for further examination. The unique characteristic of these selected nations justifies their inclusion in the study. These selected nations have demonstrated continuous economic growth. Table 1 lists the descriptions and sources of information for all covariates. Appendix A1 also lists the sampled nations.

3.2. Selection variables and justification

3.2.1. Dependent indicator

3.2.1.1. Poverty headcount ratio measurements. Although poverty is a popular topic in academic circles, there has yet to be a consensus regarding its definition. Many advocates for monetary characteristics, such as a lack of money or consumption. Others advocate a non-financial strategy that focuses on shortcomings in several categories. This study analyzes poverty from an economic standpoint. Since the beginning of poverty research during the nineteenth century, this has characterized the theoretical approach to measuring poverty [41].

The poverty headcount ratio is the simplest and most well-known indicator of poverty. It quantifies the percentage of those who survive on less than \$3.65 per day. The headcount remains an extremely good

Table 1
Variable definitions.

Variable	Proxies	Symbols	Expected Hypothesis	Source
Dependent variables				
Poverty Headcount Ratio	Monetary Poverty	phcr	?	World Development Indicators
Independent variables				
Number of female business ownership	Women empowerment	nfbow	+	As Above
Number of female sole proprietorship	Women empowerment	nfsp	-	As Above
Control variables				
Gross domestic product growth		gdp	-/+	As Above
Gini Index		giniindex	+	As Above
Source: Author's compilation (2024)				

measurement. It is, not surprisingly, the measure of poverty most frequently estimated. This measure allows scholars and practitioners to examine the most pressing aspect of the human dimensions of poverty. by counting the number of people living in poverty. To make the poverty headcount ratio more useful and to improve its poor ability to allocate resources, it is necessary to compute the population for sub-poverty lines with lower levels than the poverty line as a whole. It is in this direction that the authors have further decamped the dataset into regional block classifications. This indicator of poverty can be written in the following form:

$$H_t = \phi \left(\frac{\log \left(\frac{z}{y_t} \right)}{\sigma_t} + \frac{1}{2} \sigma_t \right) \tag{1}$$

where $\phi(\cdot)$ is the incremental value of the regular static probability, represented by $\phi(\cdot)$. σ_t represents the standard deviation of the natural log of earnings.

3.2.2. Independent variables

3.2.2.1. Women's economic empowerment. This study regards economic empowerment as the ability of women or mothers to exercise control over economic resources directly. The bargaining literature maintains a strong link between the economic condition of women and the well-being of their families [42]. For instance, increased control of household resources implies an increase in food resources, improved caregiving practices and a hygienic household environment. Also, a study by Smith et al., [43] links women's empowerment (including resource control) to improved child nutrition. It follows from conventional thinking that when women own land(s), are employed, and can save and access credit, they can make efficient and timely contributions towards their health and that of their children.

Among the most important surrogates for women's economic empowerment, the number of female business owners and the number of female sole proprietors are utilized as entrepreneurial surrogates in this study. The number of female business owners represents the number of women who own at least one share of a newly registered limited liability company. Due to a lack of standardized and country-comparable statistics, gender inequalities in entrepreneurship are difficult to diagnose. High levels of female entrepreneurial engagement make economies more resistant to financial crises and less susceptible to economic slowdowns. Number of female sole proprietors is the proportion of

recently registered female-owned sole proprietorships in each period. The owner and manager of a sole proprietorship are distinct from the business and personally accountable. The Entrepreneurship Database of the World Bank Group collects data on the number of sole proprietors like that of the number of female business owners.

Apart from the key two variables discussed, two variables considered to be relevant are employed in this study namely GDP growth and Gini index. GDP growth has been widely studied in literature to influence poverty. The growth rate of GDP is measured as:

$$GDPgrowthrate = \left[\left(\frac{GDP_{pv}}{GDP_{init}} \right)^{\frac{1}{n}} - 1 \right] \tag{2}$$

where GDP_{pv} is the present value of GDP, GDP_{init} is the initial value of GDP and n is the number of period or years. Gini index which assesses the variation from a completely equal level of wealth (or, in certain cases, consumer expenditure) across households and individuals in an economy. is calculated as Gini in period t denoted by G_t is given by

$$G_t = 2\phi \left(\frac{\sigma_t}{\sqrt{2}} \right) - 1 \tag{3}$$

3.3. Research model

The study adopts and estimates models utilizing estimators for static panel data. Fixed-Effect Model (FEM) technique is used for the analysis. The following principles form the basis for the decomposition of the dataset into regional blocks: First, each item contains distinctive characteristics that may or may not influence the explanatory variables. Furthermore, we consider that the qualities of the individual may affect the determinant or outcome variables, and we must control for this. To analyze the overall effect of the determinants on the dependent variables, it is necessary to exclude time-invariant traits. Finally, since they are individual-specific and should not be associated with other aspects of that person, those time-invariant traits should not be considered. In summary, FEM is a method for accounting for missing variables in panel data when the missing variables vary among entities (states) but do not fluctuate over time. The dependent variable (phcr) and vector of independent variables (nfbow and nfs) are denoted as Y_{it} and X_{it} , respectively. Then our model

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 Z_i + u_{it} \tag{4}$$

where Z_i is an unseen factor that differs from one state to another and does not fluctuate. For instance, the Z_i could represents the cultural attitude, technological changes, managerial expertise etc. We want to estimate β_1 , the effect on Y of X holding constant the unobserved state characteristic Z . Because Z_i varies from one state to another but is constant over time, then let $\alpha_i = \beta_0 + \beta_2 Z_i$, the Equation becomes

$$Y_{it} = \beta_1 X_{it} + Z_i + u_{it} \tag{5}$$

An extended expression for the connection to be evaluated is shown as:

$$\log phcr_{it} = \beta_1 \log nfbow_{it} + \beta_2 \log nfs_{it} + \eta_1 \log gdp_{it} + \eta_3 \log giniindex_{it} + Z_i + \varepsilon_{it} \tag{6}$$

where $phcr_{it}$ is the dependent variable, $nfbow_{it}$ and nfs_{it} are the independent variables. gdp_{it} and $giniindex_{it}$ are employment variables used as control variables in the second model. The firm-specific impact or specific variability is represented as Z_i . Z_{it} identifies a large number of unobservable corporate variables that affect poverty, which include access to digital, management skills, the level of work environment, and political, social, and business ties. ε_{it} is the residual factor that contains any additional market defects and regulatory measures that may influence response variable but are not accounted for in our approach.

Estimating the third hypothesis employs dominance analysis.

Dominance analysis computes general dominance weights by averaging incremental validity of a given predictor across all potential sub models using that predictor [44]. To determine the relative significance of the factors of major relevance to monetary poverty, dominance analysis was utilized. In a sub model, the cumulative relevance of determinant i is described as follows:

$$\Delta R_{in}^2 = r_{y.xixh}^2 - r_{y.xh}^2 \tag{7}$$

where x and y independent and dependent factors, respectively, are represented by and in the equation, while xh denotes one distinct subgroup of k indicators within the sub model, and x_i denotes the $(k+1)$ the new variables to the sub model. The mean cumulative relevance for determinant xi in all sub models of size k is given below:

$$p - 1$$

$$C_{xi}^k = \sum_{k=1}^k \Delta R_{ih/k}^2 / p - 1 \tag{8}$$

where ΔR_{ih}^2 is as described in Eq. (11), h is one distinct subset of k predictors and $\binom{p-1}{k}$ the combination function equal to $\frac{p!}{k!(p-1-k)!}$ which is the count of subsets of size k that can be formed from $(p-1)$ predictors.

$$p - 1$$

$$C_{xi}^k = \sum_{k=1}^k C_{xi}^{(h)} / (p - 1) \tag{9}$$

Basic dominance weights possess two primary attractive characteristics.: Firstly, each universal dominance weight is the average value of a determinant to a criterion, both independently and when accounting for all other variables within the model. Secondly, the total of the general dominance values of all determinants always equals the aggregate model R^2 [44].

The study investigates the quadratic term of the variable’s nonlinearity as captured in hypothesis 4. Alternately, the defining moment of the relationship. The square of the independent variables of interest captured in the dominance analysis is introduced in the model to show the curvature in the relationship. Implementing a nonlinear quadratic model will help explain more variance, tighter fit the observation around the regression line, reduce model error, absence of curvilinear shape in the residual and naturally lead to better confidence and prediction intervals. In sum, the justification or relevance of this quadratic model are as follows: (1) examine if the relationship between dependent and independent variables are nonlinear, (2) existence of monotonic (increasing or decreasing) relationship, (3) a relationship is parabolic and (4) does dependent variable respond differently as independent variable increases?

The quadratic function is any expression with the form:

$$\alpha x^2 + b x + c = 0 \tag{10}$$

where x signifies an unidentified and a , b and c symbolize observable numerical values so that a is not equal to 0. If $a = 0$, therefore the expression is linear rather than quadratic. a , b and c consist of the quadratic coefficient, linear coefficient, and the constant or free term, respectively. An extended expression for the connection to be evaluated is shown as:

$$\log phcr_{it} = \beta_1 \log nfbow_{it} + \beta_2 \log nfsp_{it} + \beta_3 \log nfsp_{it} \wedge 2 + \eta_1 \log gdpg_{it} + \eta_3 \log giniindex_{it} + Z_i + \varepsilon_{it} \tag{11}$$

4. Results

4.1. Summary statistics

Table 2 reports the summary statistics, dataset structure, and the correlation matrix. The poverty headcount ratio shows that roughly 1.3 % of the world population are in poverty, notwithstanding, the ratio ranges from -2.3 % to 4.5 %. Intriguingly, the result did not show any wide deviation for the variables used in the study. Table 2 further reports the correlation matrix, which analyses the correlation among the variables used in the study.

4.2. Empirical results

4.2.1. Fixed effects (FE) estimates

In Table 3, the study explores global outcomes on women’s economic empowerment and poverty. While Model 1 reports fixed effects (FE) results for the variable of interest only, Model 2 reports regression results for the variable of interest and the control variables only. Model 3 shows the fixed effects (FE) results for the entire variables. The Model 3 is used for the results discussions.

Discussing the global dataset result as shown in Model 3, the result revealed an inverted U-relationship between women’s economic empowerment proxied by the number of female business owners and poverty headcount ratio. Specifically, at both 1 % significance levels, the number of female business owners yields -0.5460 and 0.0347 at levels and squared terms respectively. This suggests that per the study sample employed, the number of female business owners itself has a negative effect on poverty but the coefficient of the quadratic term being positive suggests that the effect of the number of female business owners increases (gets less negative) as the number of female business owners increases. We calculated further the point of inflection or the turning point after which the relationship turns. As the number of female business owners increases to 73.7 million, the relationship between the number of female business owners and poverty changes or the effect changes. Alternatively, the sign change happens only at an extreme value of 73.7 million female business owners. Specifically, 73.7 million represents the threshold of female business owners at which poverty is exacerbated. This result could suggest that when the number of female business owners reaches this threshold, family life may become distorted. Consequently, a rise in poverty levels. This study noted that growth in GDP and income inequalities exhibit a positive relationship with the poverty headcount ratio globally.

4.2.2. Fixed effect estimates for regional block classifications

In Table 4, the study segments the datasets into regional block

Table 2
Description statistics and Pearson Correlation.

Variables	phcr	nfbow	nfsp	gdpg	giniindex
Description statistics					
Mean	1.3230	7.9580	9.0070	3.7690	3.5790
Standard deviation (SD)	2.1610	1.9470	1.9100	0.0990	0.2170
Minimum	-2.3030	2.6390	5.0430	3.0940	3.1440
Maximum	4.5330	12.0950	13.3260	4.1770	4.1700
Observation	1881	140	151	1864	1192
Expected sign	?	+	-	-/+	+
Pearson Correlation					
nfbow		1			
nfsp		0.4150*	1		
gdpg		-0.4370*	-0.2240*	1	
giniindex		-0.1960*	-0.0710	0.0540	1

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: Author’s computations (2024).

Table 3
Women's economic empowerment and poverty headcount ratio: Regression results.

Variables	Model 1	Model 2	Model 3
nfbow	-0.0079 (0.0318)	0.0032 (0.0315)	-0.5460*** (0.1892)
Nfbow ²			0.0347*** (0.0118)
nfsp	-0.0297 (0.0260)	-0.0332 (0.0258)	-0.2317 (0.2582)
Nfsp ²			0.0101 (0.0137)
GDPG		0.1655*** (0.0330)	0.1695*** (0.0330)
Gini index		1.0137*** (0.2926)	0.9963*** (0.2922)
Constant	1.6432*** (0.2845)	-2.2678** (1.0850)	0.7391 (1.8484)
Observations	1868	1868	1868
R-squared	0.1010	0.3722	0.4570
Number of countries	94	94	94

Note: Model 1 reports regression results for the variable of interest only, Model 2 reports regression results for the variable of interest and the control variables only and Model 3 shows the regression results for the entire variables. The Model 3 is used for the results discussions.

Standard errors in parentheses
***p < 0.01, **p < 0.05, * p < 0.1.

Table 4
Fixed Effect estimates for regional block classifications.

Variables	Model 4	Model 5	Model 6	Model 7
nfbow	-14.8076 (53.0938)	-2.4128 (3.1351)	-2.3517*** (0.3910)	-0.0575 (0.1360)
Nfbow ²	0.7743 (2.8013)	0.1707 (0.2311)	0.1472*** (0.0238)	0.0010 (0.0085)
nfsp	0.1166 (4.0739)	13.2784 (14.3647)	0.4543 (0.3172)	0.3312*** (0.1248)
Nfsp ²	-0.0145 (0.2085)	-0.9278 (0.9766)	-0.0212 (0.0163)	-0.0179*** (0.0084)
GDPG	0.5100*** (0.1275)	0.1088*** (0.0303)	0.1165*** (0.0421)	0.0655*** (0.0187)
Gini index	-0.7780 (0.8496)	2.9386*** (0.2590)	-0.3124 (0.4490)	1.1555*** (0.1369)
Constant	70.0424 (216.8129)	-46.4576 (43.2017)	7.5595*** (2.9214)	-2.1401*** (0.8115)
Observations	179	300	908	1165
R-squared	0.3009	0.4229	0.5480	0.8430
Number of countries	9	15	46	69

Note: n Model 4 reports FE results for East Asia & Pacific, Model 5 reports FE results for Latin America & Caribbean, Model 6 reports FE results for Europe & Central Asia and Model 7 reports FE results for Middle East & Sub-Saharan Standard errors in parentheses ***p < 0.01, **p < 0.05, *p < 0.1.

classifications namely East Asia & Pacific, Latin America & Caribbean, Europe & Central Asia and Middle East & Sub-Saharan. These segmentations are considered for the analysis because of the unique characteristics in terms of poverty across these regions. As shown in Model 4 and 5 of Table 4, the insignificant results recorded for the variables of interest, suggest that in East Asia & Pacific and Latin America & Caribbean, the number of numbers of female business owners' activities and number of female sole proprietors appear not to be a good development strategy in reducing poverty in these regions. The result in Model 6 demonstrates an inverted U-relationship. Particularly, the number of female business owners yields -2.3517 and 0.1472 for levels and squared terms at a 1 percent significance level respectively. This suggests that Europe & Central Asia block, the number of female business owners itself has a negative effect on poverty but the coefficient of the quadratic term is positive suggesting that the effect of the number of female business owners increases (gets less negative) as the number of female business owners increases. Beyond 30.1 million, the link between

the number of women-owned businesses and poverty shifts, or the effect shifts. Thus, the sign change only occurs when the number of female business owners reaches 30.1 million. Notably, 30.1 million is the number of female business owners at which poverty worsens. When the number of female business owners exceeds this threshold, family life may become disrupted, according to this result. As a result, the increase in poverty levels. This study also reveals that growth in GDP exhibits a positive relationship with the poverty headcount ratio. Results for the Middle East and North Africa and Sub-Saharan African regional blocks are presented in Model 7 of Table 4. A concave-up curve relationship is shown. The number of female sole proprietors yields 0.3312 and -0.0179 at levels and squared terms at 1 and 5 percent significance levels respectively. This indicates that, for the Middle East and North Africa and Sub-Saharan African regional blocks, the number of female sole proprietors has a positive effect on poverty. However, the negative coefficient of the quadratic term suggests that the effect of the number of female sole proprietors dropped rapidly as female sole proprietors increased. Hence, a hump shape function. Thus, for Middle East and North Africa and Sub-Saharan African regional blocks, an attempt to increase the number of female sole proprietors could potentially increase poverty levels. A reversal of this direction could be possible only when the proportion of female sole proprietors reaches a threshold of about 754 million. The result further demonstrates that poverty has a direct correlation with the growth of the GDP and income disparities.

4.2.3. Dominance analysis results

Fig. 3 presents the dominance analysis results. Two dimensions of women's economic empowerment i.e., the number of female business owners and the number of female sole proprietors are used as women's entrepreneurial surrogates to determine the impact of women's economic empowerment on poverty globally. The application of the dominance analysis is to determine which type of women's economic empowerment used in this study is relatively relevant and dominant to other indicators. In terms of the variables of interest to the poverty reduction, the result suggests that the number of female business owners is relatively relevant and dominant in reducing poverty for regions such as East Asia & Pacific and Latin America & Caribbean. The number of female sole proprietors remains an important policy aim for the Middle East & North Africa, Sub-Saharan Africa, and Europe & Central Asia, and this result warrants the most concern from policymakers for rapid economic and social expansion.

5. Summary, conclusion, and recommendation

This study sampled carefully ninety-five (95) countries for which data is available for the years 2002 to 2021. These countries are further subdivided into regional characteristics for further examination. The article sheds light on how women's economic empowerment could assist in improving poverty globally. In sum, four hypotheses are tested: (1) women's economic empowerment significantly affects poverty, (2) poverty is affected differently at various levels of economic empowerment of women, (3) women's economic empowerment affects poverty differently along regional blocks and (4) the parameter estimate of women's empowerment is relatively significant for poverty amid many other variables. Fixed-effect model (FEM) is employed as an estimation technique. The comparative significance of the women's empowerment variables to the poverty headcount ratio was explored by the use of dominance. Finally, the quadratic term is introduced to investigate the relationship's turning point.

Results are presented and discussed based on global dataset, regional block classifications, and dominance analysis. First, the study concludes, based on the global information, that the number of female business owners across the study sample significantly contributes to poverty reduction. Notwithstanding, the coefficient of the quadratic term being positive suggests that the effect of the number of female business owners increases (gets less negative) as the number of female business owners

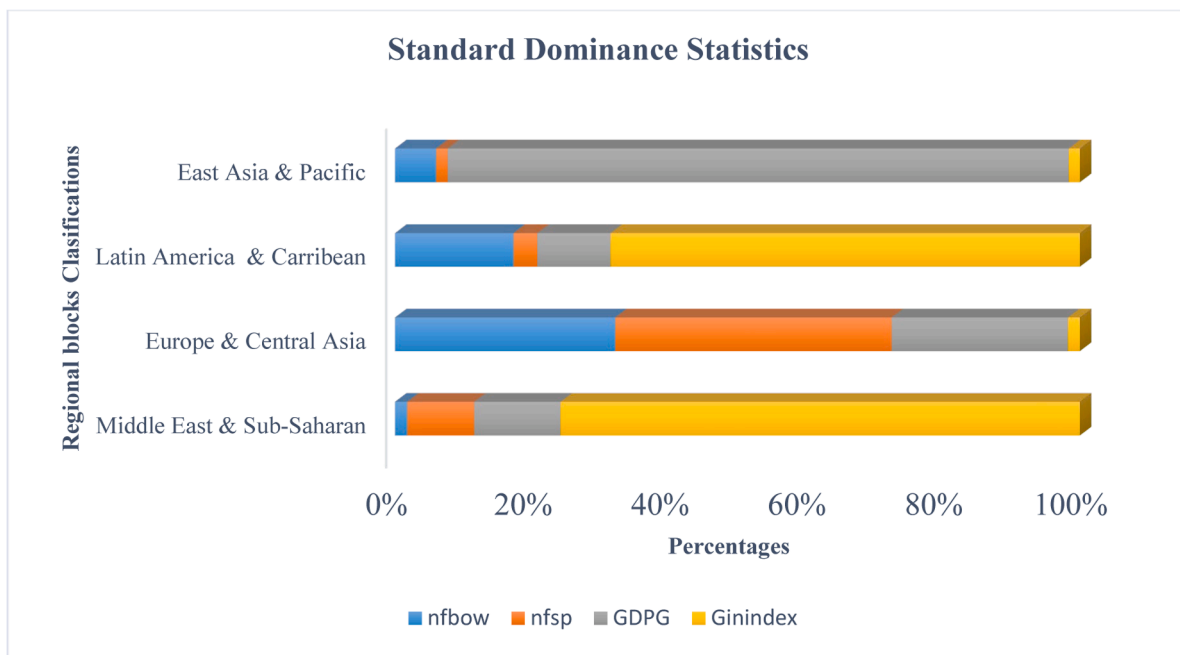


Fig. 3. Dominance analysis.

increases. This study found a significant correlation between the global poverty headcount ratio and the increase in GDP and income inequality. This result proffers a policy direction for policymakers. While this result validates the household bargaining theory, the result is similar to extant related findings [31,45–48]. These authors demonstrate that beyond statistics, policies targeting poverty alleviation cannot be complete without considering gender dimensions, particularly women's economic empowerment. On the contrary, this result invalidates the empirical findings of Tsiboe et al. [45]. Tsiboe et al. [45] assert that women's empowerment negatively influences monetary poverty. It is pertinent to emphasize that policy measures that aim to increase the share of female business owners on a worldwide scale should incorporate the poverty threshold.

Second, in terms of regional block classifications, while the number of female business owners continues to remain an effective development strategy for reducing poverty in Europe & Central Asia, the number of females and, number of female sole proprietors increases poverty in the Middle East & North Africa and Sub-Saharan Africa. Nevertheless, policy directives must not disregard their respective threshold levels. This finding finds support in the empirical work of Fosu [38]. Fosu [38] discusses poverty reduction in emerging economies, with a focus on the effect of income inequality and reveals that there are significant disparities in countries' capacities to convert economic expansion into poverty reduction. Understanding such country-specific profiles is vital for formulating successful and worldwide poverty reduction initiatives. *Finally*, for policy purposes, the dominance analysis concludes that the number of female business owners is relatively relevant and dominant in reducing poverty for regions such as East Asia & Pacific Latin America & Caribbean. For Europe & Central Asia, the Middle East & North Africa, and Sub-Saharan Africa, and number of female sole proprietors is found to be relatively relevant in the reduction of poverty in terms of priorities. The number of female sole proprietors remains an important policy aim for Europe & Central Asia, Middle East & North Africa, and Sub-Saharan Africa, and this result warrants the most concern from policymakers for rapid economic and social expansion.

Although the study findings show that women's empowerment through their business can help reduce poverty the study also acknowledges the fact that women's businesses do encounter challenges relating to: First, Financial issues, for example, women have limited

access to financial services and credit, they having low financial literacy and business management skills, they are faced with inequitable distribution of wealth, they operate in a business environment of high interest rates and other economic issues. Second, they must resolve social and other cultural barriers during their business. A case in point is, the need for them to balance family and business responsibilities, brace themselves concerning stereotypes about women's businesses. Also, some cultural norms and values in some countries may not encourage women's entrepreneurship. Third, women's business also faces regulatory and policy issues as a challenge, for instance, business registration in some countries is complex and challenging and there are inadequate laws and policies supporting women's entrepreneurship. Fourth, women businesses also face technology and infrastructure barriers in the sustainability of their business, for instance, cybersecurity threats, poor internet connectivity to support business, and poor infrastructure including electricity, transportation and energy supply. Finally, personal barriers and other factors hinder the development of women's businesses. The study acknowledges that these barriers vary across different contexts and regions and may intersect with other forms of discrimination which may hinder the progressiveness of women's entrepreneurship we believe that addressing these issues and barriers can be crucial in promoting women's entrepreneurship and economic empowerment for poverty alleviation.

The findings of this study have theoretical, methodological and practical implications which are elaborated on as follows: For theoretical implications the findings that women empowerment measured by the number of women business owners and sole proprietorships helping to reduce poverty gives support to the unitary model of empowerment and Household bargaining model theories as women's employment and career choices influence the outcomes of household decision-making and their power to make those choices of operating businesses in helping to alleviate poverty. Furthermore, the findings contribute to the existing literature on women's empowerment and poverty reduction by providing empirical evidence of the positive relationship between women's entrepreneurship and poverty alleviation on the global level. This also supports the theory that women's economic empowerment can have a multiplier effect on the alleviation of poverty, as women are more likely to invest their income in their families and communities.

Concerning methodological Implications, the findings highlight the

importance of using a mixed-methods approach to capture the complex relationships between women's empowerment and poverty alleviation on a global scale. Our findings suggest that quantitative methods can provide valuable insights into the correlations between the variables on a global scale, offering a deeper understanding of the underlying mechanism of how women's empowerment helps in poverty alleviation.

There are several practical implications which can be derived from the study for practitioners, policymakers, development agencies and the business community. First, the finding that women's empowerment using business ownership helps in poverty alleviation highlights the need for women's entrepreneurship to be supported by all and sundry and the need for investment in programs that support or encourage women's entrepreneurship. Second, because women's businesses face barriers or challenges in their development, the positive impact of women's business ownership on poverty highlights the need for policymakers, governments, and business community to address the structural barriers that prevent women from accessing markets, resources and networks in the course of their business promotion. Third, the positive impact of women's empowerment suggests the need for policymakers and practitioners to promote and encourage women's entrepreneurship, for example, thorough tax incentives, easy business registration procedure for women entrepreneurs, offering education programs on promoting women's businesses, providing financial support and other means to support women businesses. Finally considering that women's empowerment and poverty alleviation are complex and multifaceted concepts the study recommends that a more comprehensive and holistic approach is adopted in the promotion of women's empowerment, by addressing the social, economic, and cultural barriers that hinder women from realizing their full potential in businesses. Other recommendations are elaborated on in the next paragraph

The study's recommendations are derived from the results of global datasets, regional block classifications, and dominance analyses. First, campaigns targeted at promoting complete involvement in economic entrepreneurship particularly for women globally and in Europe & Central Asia should be encouraged by various governments and ministries concerns. Nevertheless, these policy directives should be monitored and evaluated closely to ensure thresholds are not exceeded. Second, for Middle East & North Africa, and Sub-Saharan Africa, trade ministries of the countries should remove trade barriers that restrict female sole proprietors. Motivation through sponsorships should be encouraged. Training such as formal and informal should be organized by various governments and ministries concerned to enhance the skills of these women in entrepreneurial activities. Lastly, in terms of priorities and from a dominance and policy perspective, pro-gender policies that aim to increase the number of female business owners remain a good strategy for alleviating poverty in East Asia & the Pacific and Latin America & the Caribbean., the Middle East & North Africa and Sub-Saharan Africa may not benefit from pro-gender measures aiming at raising the proportion of female sole proprietors.

Evidence about the impact of women's economic empowerment on poverty, situating recent poverty reduction progress in a worldwide framework is the key contribution of this study to literature. The article further sheds light on the performance of some regional blocks in translating women's economic empowerment into poverty reduction. Regardless, what are the unique causes of poverty in specific geographical blocs and nations? And why did gender equality decline significantly in some nations while rising significantly in others? Answering these concerns accurately needs country-specific research that is limited to this study. However, the study provides a guideline for investigating such significant nation's unique challenges that warrant future study investigation.

CRediT authorship contribution statement

Isaac Boadi: Methodology, Investigation. **Baba Seidu Adibura:** Data curation. **Joseph Opuni-Frimpong:** Investigation. **Andrews**

Ayiku: Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Supplementary materials

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Data availability

Data will be made available on request.

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