

An Econometric Study Using Panel Data Model of Factors Affecting Women's Economic Empowerment for Some Countries During the Period (2000-2023)

دراسة قياسية باستخدام نموذج Panel Data للعوامل المؤثرة في التمكين الاقتصادي للمرأة لبعض الدول خلال المدة (2023-2000)

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Abstract:

Objectives: The study aimed to use the analytical and standard method in analyzing the results of the study based on the analysis of factors affecting the economic empowerment of women in some countries during the period (2000-2023).

Methods: To investigate the relationships between variables, the Panel Data model has been described to express the relationship between the female employment rate as a dependent variable and women's empowerment indicators as independent variables. The study sample consisted of five countries, including Saudi Arabia, Sudan, Egypt, India and South Africa. The data were estimated using three models: the aggregate regression model, the static effects, and the random effects model.

Results: The results showed that the fixed effects model is the most appropriate model for this study. Using the statistical program E-views12.

Conclusion: The study found the following: It is expected to have an inverse relationship between the female unemployment rate and the female employment rate (FE) - as a dependent variable - and a positive relationship between the female labor force rate and FE. Contrary to expectations, it was found that there is a positive relationship between the female mortality rate and the dependent variable, in addition to the dependent variable not affected by the age dependency ratio of males.

Keywords: Labour Force; Workforce; Dependency Rate; Women's Economic Empowerment.

الملخص:

الأهداف: هدفت الدراسة إلى استخدام الأسلوب التحليلي والقياسي في تحليل نتائج الدراسة القائمة على تحليل العوامل المؤثرة على التمكين الاقتصادي للمرأة في بعض الدول، خلال الفترة (2000-2023).

المنهجية: لتحري العلاقات بين المتغيرات، فقد تم توصيف نموذج Panel Data، للتعبير عن العلاقة بين نسبة تشغيل الإناث كمتغير تابع، ومؤشرات تمكين المرأة كمتغيرات مستقلة. وتمثلت عينة الدراسة في خمسة دول، تضمنت كلاً من: المملكة العربية السعودية، السودان، جمهورية مصر العربية، الهند، وجنوب إفريقيا. وقد تم تقدير البيانات باستخدام ثلاث نماذج، وهي: نموذج الانحدار التجميعي، والتأثيرات الثابتة، ونموذج التأثيرات العشوائية. النتائج: أظهرت النتائج أن نموذج التأثيرات الثابتة هو النموذج الأنسب لهذه الدراسة، وباستخدام البرنامج الإحصائي E-views12.

الخلاصة: توصلت الدراسة إلى ما يلي: متوقع إلى وجود علاقة عكسية بين معدل بطالة الإناث ونسبة تشغيل الإناث (FE) - كمتغير تابع، وعلاقة طردية بين معدل القوى العاملة للإناث وFE. وبالعكس المتوقع توصلت إلى وجود علاقة طردية بين معدل وفيات الإناث والمتغير التابع، بالإضافة إلى عدم تأثر المتغير التابع بنسبة الإعالة العمرية للذكور.

الكلمات المفتاحية: القوى العاملة؛ قوة العمل؛ معدل الإعالة؛ التمكين الاقتصادي للمرأة.

1 Introduction

For social and human development and stability, women's empowerment is a crucial component. Aiming to achieve an individual's stability and development as well as his well-being in a way that is in line with his needs and his abilities - socially, intellectually, and economically - it is a continuous process of development, which can be undertaken fully or in part. Empowerment¹, sustainability², productivity³, and equality⁴ are some of the key components of development as an approach that are necessary in different societies. Given these factors pertaining to both genders—men and women—aspects of gender inequality in the labor market nonetheless emerge in spite of the efforts undertaken to elevate the status of women in that sector, given that they account for over half of the global population by population size. There appears to be a persistent decrease in the economic contribution of women, which could be attributed to discrimination based on gender in the labor market. Both paid and unpaid wages⁵, formal and informal sectors, positions (like management and decision-making roles), and job stability vary amongst them; these distinctions are primarily in favor of men. Women are disproportionately affected by this, as their options for employment are diminished, leaving them with fewer options overall.

As opposed to the aforementioned, empowerment refers to women challenging cultural norms and standards in order to elevate their status and end the cycle of social marginalization (Helmy, 2003). Women should be empowered in a variety of fields, including politics, economics, law, health, education, and decision-making processes, among many others (Swain and Walentin, 2008). In this regard, the Human Development Report (1995) stressed the significance of empowering people, particularly women⁶, as empowerment is thought to be a surefire way to connect development and growth. People who are able to exercise all of their political, social, and economic choices are also more likely to see strong, sustained, and participatory democratic growth (United Nations Development Programme, 1995).

When it comes to women's economic empowerment, it refers to their role as active participants in development processes because they have all the necessary components of economic, social, political, and cognitive power (Al-Daraghmeh, 2014). This enables them to take advantage of a variety of opportunities, accumulate wealth, and influence social changes (Ayoub, 2010). In addition to earned income, women's economic empowerment aims to equalize the relative distribution of men and women in various jobs, including administrative, organizational, and professional roles, as well as wage rates (United Nations, 2011). As a result, women cannot achieve economic empowerment unless they have a private, regular source of income (Malhotra, 2011). In conclusion, it can be stated that women's effective participation in the economic sphere is still hampered by a number of issues. Their employment rates are still low, and their working conditions are getting worse, particularly in the unorganized private sector. Furthermore, women continue to have a higher unemployment rate than men (International Labor Organization, 2015).

Based on data from the International Labor Organization, the language of numbers indicates that, out of 865 million women, 812 million are able to contribute effectively to the various economies of the world; therefore, investing in them will hasten the processes of sustainable development (ILO, 2015). Data from the World Bank also show that women's labor market contributions are declining globally, to the point where they are not higher than 65 percent in East Asian countries and 59 percent in ECA countries. The contribution of Arab women to the labor market is at its lowest points, at 23 percent, or less than half of the global average. As a result, the World Bank estimated that it might take 150 years for Arab women to catch up to their Western counterparts, as their participation has only increased at a rate of less than 1% over the previous 30 years (World Bank, 2015).

The aforementioned indicates that, even with recent advancements in a number of women's empowerment areas, particularly in the health and education sectors, there is still a need to close the gender

¹ This is accomplished by giving all societal members—male and female—equal opportunities.

² In order to attain maximum utilization of those resources' capabilities, investment rates in human resource development should be increased.

³ which prioritizes the needs of the present generation without undervaluing the work of providing for future generations.

⁴ In other words, empowering people to attain the stage of personal growth that offers them the most choices.

⁵ such as care and housekeeping.

⁶ Taking away her contractual protections and perks, for example.

gap in many areas and to broaden the framework for women's empowerment in other development sectors. countries—developing nations especially. According to Malhorta and Schuler (2002), this calls for expanding women's access to suitable economic opportunities and flexible work environments that facilitate their ability to balance work and family obligations. With women serving as productive contributors to community development in both Arab (the Kingdom of Saudi Arabia, Sudan, and Egypt) and non-Arab (India, South Africa) nations, this study intends to examine the variables influencing women's economic empowerment in these contexts (2000–2023). E-views12, a statistical program, was utilized to apply the time series methodology for cross-sectional Panel Data.

1.1 Significance of the research

Women's role in economic growth and development is still limited, and they are still underrepresented in senior positions and entrepreneurship, despite efforts to support this. Therefore, by highlighting the key elements influencing women's economic empowerment—such as their contributions to the development movement in the countries under study—the study's significance arises from the significance of women's economic empowerment.

1.2 Objective of the study

Acknowledging the significance of women's empowerment research as a fundamental component and a vital link in the development process, the researcher aims to clarify the reality of the empowerment element in the countries under study - Saudi Arabia, Sudan, Egypt, India, and South Africa - as well as the key factors influencing it in those nations. Consequently, the primary goal of this research is to investigate and evaluate the key variables influencing the process of economic empowerment in a group of countries over the period of 2000–2023 using the Panel Data model, as a standard study methodology.

1.3 Study problem

Since women's roles have historically been neglected, half of society's energies have been disrupted, the status of women in any given society is a measure of its development and growth. According to Salem and Nassara (1999), society cannot progress if women's roles and contributions are not recognized. The reality of women's empowerment in diverse societies calls for further research on a range of topics, including the focus of this study, which centers on the key variables influencing women's economic empowerment in select nations between 2000 and 2023. In light of this, the research problem can be expressed as the following query:

In certain countries, what are the primary factors influencing women's economic empowerment?

1.4 Study hypotheses

In order to ascertain the significance of the key elements influencing women's economic empowerment in the countries being examined between 2000 and 2023, the researcher in this study aims to verify the veracity of the following conjectures:

- Male to female employment ratios and age dependency ratios have a positive significant correlation.
- The female employment rate and the unemployment rate have an inverse significant relationship.
- The rate of female employment and mortality have a significant inverse relationship.
- The female employment rate and the female labor force participation rate have a positive significant relationship.

1.5 Study terminology

Labor force is the total number of people who are employed or seeking employment for pay, ranging in age from 15 to 65 (Ibrahim, 2005).

Workforce is restricted to all persons who are employed (ILO, 1982).

Dependency rate is defined by the World Bank as the total number of dependent people ⁷per 100 people in the working-age population ⁸(Ibrahim, 2005).

⁷ Those who are either younger than 15 or older than 64.

⁸ ranging in age from 15 to 64.

Women's empowerment is the process of enhancing their capacity for self-organization and independence, which validates their autonomy and freedom from subjugation in decision-making, management, and leadership roles (Varghese, 2011).

Women's economic empowerment refers to all the activities that women engage in, both inside and outside the home, that have a quantifiable, measurable economic benefit for the family or society (Bengali, 2014).

1.6 Study limitations

First, the study's objective limits are explained. In some countries, the female employment rate was used as a proxy for women's economic empowerment, and this study examined the key factors influencing this empowerment.

Second: Temporal constraints: The study's scope is from 2000 to 2023.

Third: Spatial boundaries: Researching women's economic empowerment and their role in the development movement of the countries under study—Saudi Arabia, Sudan, Egypt, India, and South Africa—determines the spatial dimension.

1.7 Study methodology

Referencing prior literature found in scientific books, research, and periodicals pertaining to the research topic, this study employed the descriptive analytical approach as a theoretical foundation. Moreover, a standard model of the key elements influencing women's economic empowerment and the degree of their contribution to the development movement in the countries under study is constructed using the Econometric Analysis tool. This is accomplished by gathering the official statistics required in order to employ cross-sectional time series data, testing the viability of the hypotheses that support the objectives of the research, and formulating the most significant findings and suggestions.

1.8 Specifications of cross-sectional time series data Panel Data

Since cross-sectional time series data account for both the variation across cross-sectional units and the time component, most studies have recently shown a great deal of interest in using them. Because it yields results and estimates with high confidence and is free of bias, estimating this kind of data is crucial (Hasio, 1986; Nasrulddin, 2020).

There are three primary models of Panel Data that can be distinguished (Hill, et al. 2011; Vijayamohan, 2016; Greene, 2012).

Initially, the Pooled Regression Model (PRM) is utilized, which disregards the influence of time in the model and presumes the stability of coefficients (β_0). The functional formula below can be used to express it:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \varepsilon_{it}$$

The second approach is the Fixed Effects Model (FEM), which maintains the same time component as the aggregate regression model and examines the behavior of each set of cross-sectional data independently β_{0i} . The following functional form can be used to express it:

$$Y_{it} = \beta_{0i} + \beta_1 X_{it} + \varepsilon_{it}$$

Third: Random Effects Model (REM), in which the random effect is found in both the cross-sectional factor and the time factor, so that the error term consists of two parts¹¹, as the following functions show:

$$Y_{it} = \bar{\beta}_0 + \beta_1 X_{it} + v_{it} \quad \text{Where} \quad v_{it} = u_i + \varepsilon_{it}$$

Finally, these models were compared to determine which model was best suited to the study data. To compare the PRM and (REM) models, the Lagrange Multiplier Tests for Random Effects were used, and the REM and (FEM) models were compared using the Hausman Tests.

⁹ Description and analysis of real-life events, without the intervention of the researcher.

¹⁰ Quantitative analysis of relationships between variables, according to economic theory.

¹¹ Therefore, it is called the Error Components Model.

2 Previous studies and literature

Human resources development is one of the most important indicators of achieving sustainable development, so it is necessary to take full advantage of these resources so as not to waste or destroy social productivity, of which women constitute a large part. Although women constitute more than half of the world's population, their economic contribution remains far below required levels, and their participation rate in the labor market is lower than that of men, which leads to high unemployment rates among women. In addition, the quality of women's working conditions is declining, both in the public and private sectors, as they face a large pay gap with men, and even do most of the unpaid work, representing higher levels of salaries. Their contribution to the informal sector (ESCWA, 2012).¹² Therefore, most countries strive to achieve sustainable human development, which requires the participation of all members of society, men and women, in this process. Which means the necessity of women's participation in the development process, by increasing their economic empowerment and reducing the obstacles that reduce their effective participation in various aspects of life.

In order to achieve women's empowerment, it is necessary to: First, increase the rate of their economic participation, by reducing the severity of the various restrictions - social, cultural, environmental, ... - imposed on their participation in the labor market. In addition to providing all health, educational, and material resources and means for them. Secondly, reducing the gender gap by eliminating gender discrimination¹³. Which leads to enhancing women's capabilities, improving their productivity, and increasing their participation in the field of entrepreneurship, senior positions, and decision-making processes (Un Women, 2012).

In general, previous studies approached the issue of women's empowerment differently. Some addressed women's economic empowerment as a standalone issue, while others addressed it in terms of gender equality or women's rights to quality education and training. Some of these studies are discussed in greater detail below:

2.1 Educational level and women's empowerment

Education is an essential foundation for investment and human capital development, as many scholars have emphasised since the 18th century, including Adam Smith, the founder of classical economics and the father of modern economics. Since then, a group of economists has published numerous relevant studies emphasising that the rate of returns to education outweighs the rate of money spent on it, as returns to education increase with educational level (Silles, 2007). In addition, education has a much higher rate of return on investment than any other sector (Mincer, 1958).

With regard to women, the study by Ibn Shalhoub (2017), based on the comprehensive social survey approach and the questionnaire tool, indicated many results, the most prominent of which was the extent of the importance of qualifying, educating, and training women. Women's education is considered one of the determinants that has a positive impact on their economic empowerment (Bushra & Wajiha, 2015), as their higher educational level will increase the likelihood of their participation in the labor market (Duflo, 2012). Accordingly, there is a positive impact of both women's education and economic participation on women's cumulative empowerment, and this is what was found in the Sultana & Hossen (2013) study entitled "The Role of Employment in Women's Empowerment" in the city of Kuluna, Bangladesh, using the Cumulative Empowerment Index¹⁴ on a sample. Randomly, it included 120 women.

Women's education also has positive effects on many economic variables. This is what was concluded by the study of Mishal and Al-Sarouji (2006) entitled "The Economic Returns of Education in the Hashemite Kingdom of Jordan: A Benchmark Study" in Jordan, where the level of women's education had a positive impact on: the husband's income level and then on the family's consumption pattern and how the family

¹² An infinite number of very small economic projects carried out by the poor in cities/slum areas in developing countries, such as street vendors, shoe repair workers, and so on (Issa, 2010).

¹³ That is, the differences/differences between women and men in all areas, such as access to resources, rights, power and influence, wages, benefits, ..., etc. (International Labor Organization, 2022).

¹⁴ An indicator of decision-making, in which the scores obtained from various responses to a set of questions about the family decision-making process are added.

spends vacations¹⁵. Women's economic activity, their saving pattern, and their type of job¹⁶. To reach these results, the study used primary data collected by distributing the questionnaire in various governorates of Jordan. In general, women's increased educational level and greater participation in paid work will increase their ability to make financial decisions (Malhotra & Mather, 1997).

In contrast to the above, the element of education may have a minimal impact on the process of empowering women, and this is what was found in the study by Swain & Walentin (2008) entitled "The Economic and Non-Economic Factors that Empower Women." The study showed that the most important factors in the process of empowering women are: economic, administrative, control, and behavioral changes. Using Robust Maximum Likelihood (RML) methodology, on 100 households in India. There is also much evidence indicating that there is no linear relationship between a woman's educational level and her rate of participation in the labor force, as this relationship may take the shape of the letter U. ¹⁷Therefore, it is necessary to focus on the process of linking education outcomes with the needs and requirements of the development process, so that investment in education achieves the desired goals of supporting the national economy. The educational process must also be compatible with a number of socioeconomic indicators, such as the Women's Empowerment Index (Mishaal and Al-Sarouji, 2006). So that the level of women's education increases the value of their time at work, which is reflected positively in increasing their average wage and thus the family's income. Accordingly, women become an effective element at the level of the family and society as a whole, giving them added economic value.

2.2 The gender gap and women's empowerment

From the above, although there is a direct relationship between the rate of economic return to education and the average per capita income, this return increases for males (5.5%), at a higher rate than its increase for females (5.24%). This is what the study of Shteivi and Al-Assaf (2014) concluded in studying the economic return to education in Jordan, during the period (1999-2012). Accordingly, we find that there are some studies that focused on the extent to which women's empowerment is affected by demographic factors, such as the Williams study (2006), which developed a new concept for studying the gender gap and its relationship to women's empowerment. Using demographic analysis, the study found that there was a gender gap that had a negative impact on women's empowerment. This is based on quantitative analysis of data using Confirmatory Factor Analysis (CFA).¹⁸

The nature of the economic structure in society also affects women's participation in the labor force, as there is a relationship between population growth and the increase in the proportion of women in the demographic composition on the one hand, and the percentage of women's participation in the labor market on the other hand (World Bank, 2012). Although high rates of population growth may constitute an obstacle to development ¹⁹in developing countries, linking the economy and development to the population component has alleviated the severity of this obstacle. Accordingly, it has become necessary to analyze the economic extent of demographic dimensions (Adinat, 1996).

In this context, the World Bank report (2023) emphasises the importance of gender equality as a fundamental human right. This is accomplished by removing barriers for women and providing equal opportunities for men and women in a variety of fields, thereby increasing economic efficiency and improving development outcomes. Closing gender gaps in job opportunities will, in the long run, increase per capita GDP by about 20%. As a result, the World Bank launched the Accelerate Equality Initiative in 2022, with the goal of closing the gender gap by promoting and empowering women.

¹⁵ So the probability of the family eating meals in restaurants increases, and the probability of spending vacations in tourism inside or outside the country increases.

¹⁶ So, the likelihood of her saving in banks increases, and the likelihood of her choosing to work in the private sector increases.

¹⁷ Although the rate of women's participation in economic activities such as agriculture is high - especially in poor countries - this rate will decrease as the rate of economic growth improves, so that the focus shifts from agricultural to industrial activities that are not appropriate to the nature of women (Pampel & Tanaka, 1986). Despite the above, this rate will rise again, as a further rise in the rate of development will require many more women in the labor market (Goldin, 1995).

¹⁸ A statistical method that uses indicators to test the suitability of a complete theoretical model.

¹⁹ Such as a decrease in real national income per capita, increased pressure on infrastructure projects, and a decrease in savings rates.

In contrast to the above, the gender wage gap in favor of men not only leads to weak economic participation of women, but also leads to their reluctance to work (Dababneh, 2016; Kabeer, 2005). Therefore, women must have a prominent role in social and economic development, by providing various types of support to establish projects that empower women economically. This is what actually happened in Ronda, whose society is characterized by the dominance of men in various areas of life - social, economic and political - where, as a result of this support, women were able to increase their incomes and improve their social and economic conditions. In addition, empowering women economically will lead to achieving family security, by helping the husband with expenses, thus increasing the family's income and improving her social status. This is what Al-Hogail's study (2019) concluded, entitled "Women's Economic Empowerment and its Relationship to Achieving Family Security," using the descriptive analytical approach for both questionnaires that were distributed to 466 people, and interviews that were conducted on a sample of 15 women with leadership positions.

2.3 Obstacles to women's empowerment

Despite the importance of the phenomenon of empowerment that came with the development of the concept of development into sustainable development in recent times, achieving it requires the availability of many modern mechanisms, especially with regard to empowering Arab women, who face many difficulties in participating in the development of society. This may be due to the heterogeneity of the situation of Arab women at work, as a result of the differences in various influences across Arab countries ²⁰(Zayed, 2015). In general, apart from participation in family work or informal work, the rate of economic participation of women in Arab countries is low, when compared to men at the local level, or to developing countries ²¹at the international level (Abu Nahla, 2005).

This was confirmed by the study of Al-Aqrabawi and Talafha (2012) entitled "Study of Social Protection for Women in Jordan," which showed the growth of the economic participation rate of Jordanian women from 12.3% in 2002 to 14.9% in 2011, equivalent to 2.6%, compared to 50%. % at the global level and 25.2% at the level of Middle Eastern countries. The study attributed this to the early exit of women from the labor market, due to the decrease in the number of years of service accepted for retirement. In addition to some social factors, such as marriage and childbirth, the ability to continue working under family circumstances is considered one of the most important challenges facing women's economic participation (Dababneh, 2016). Some societal legacies are also considered an obstacle to Saudi women's participation in development, such as the lack of training courses necessary to raise the efficiency of working women, and women's weak economic awareness (Omar, 2020).

In this context, many studies have indicated the negative impact of fertility rates on women's participation in the labor market, especially in developing countries, such as the study by Adinat (1996). With the increase in the number of children, women prefer to leave work to care for their children, especially with the absence of suitable alternatives for maternal care in these countries. Although an increase in the age of marriage as a result of women's enrollment in education will lead to a reduction in the fertility rate, which increases the rate of women's economic participation (Tsani, 2012), Adinat (1996) pointed out many other factors that have a strong impact on economic participation. For women, such as age, especially over the age of forty, as there is a significant decline in women's participation in work after that age. Al-Aqrabawi and Talafha (2012) also pointed out the phenomenon of 'horizontal occupational segregation' in Jordan, whereby women's work is concentrated in the education, health and social work sectors, in addition to their preference for working in the government sector²², which means ineffective investment in human capital, due to weak economic participation. For women.

Life's obstacles and the balance between women's roles are considered the main obstacle to the economic empowerment of working women. Women often work for their families, as their access to economic resources is demonstrated through their contribution to the family budget. Therefore, empowering women has an important role in confronting the phenomenon of poverty, and this is what was concluded by Soliman's study

²⁰ Cultural, religious, social, economic, political, and legal.

²¹ Whether those that preceded it in terms of level of development, or those that are at the same level.

²² It provides job security and social status.

(2013) entitled "The Role of Women's Economic Empowerment in Confronting the Problem of Poverty: A Field Study on a Sample of Women in the Village of Harraniya, Giza Governorate." Women also have a fundamental role in influencing the labor market and thus stimulating development. Therefore, women must be given the opportunity to develop their potential and participate in economic life to a greater extent, by removing distortions in the labor market and creating equal conditions for both sexes (Vojtic, 2013).

To achieve this, it is necessary to cooperate with the government sector to reform current laws/policies to make them more flexible, by innovating new methods or updating the methods used²³, and harnessing all the necessary technologies for that (Abu Hamdan, 2014). Women's empowerment and economic participation are negatively affected by some legal and legislative frameworks, such as family law, and this is what was found in a study by the Organization for Economic Cooperation and Development on 6 Arab countries: Algeria, Egypt, Libya, Jordan, Morocco, and Tunisia (OECD, 2018). Finally, it is necessary to develop the necessary indicators to identify the most important areas of women's empowerment, and know how to use these indicators to design a global measure aimed at revealing the reality of women's empowerment in various areas of life (Malhotra & Schuler, 2002).

2.4 International efforts made in the field of women's empowerment

Since 1983, Achary & Bennet have found that women's entry into the market as a participant actually increases their economic empowerment, increasing their decision-making capabilities within the family, and their access to independent income. This was emphasized by Ackerly in 1995, when he pointed out that women's entry into the labor market will increase their economic empowerment, in addition to increasing their level of knowledge. In addition, the representation of women in senior management positions in companies can improve the performance level of those companies (Dezso & Ross, 2012). Therefore, it has become necessary to make more efforts to support women's empowerment in various societies. Indeed, the United Nations' support for women's rights began in Article 1 of its Charter, with the need to "promote and encourage respect for human rights and fundamental freedoms for all without distinction as to sex, language or religion and without distinction between men and women" (United Nations, 1945: 2). Although the United Nations has prioritized the legal and civil rights of women around the world, over time, these rights are no longer sufficient to guarantee gender equality (United Nations, 2000). Therefore, it was necessary to start taking more effective measures aimed at achieving gender equality.

Indeed, the United Nations has held four global conferences in several stages, aiming to develop the necessary strategies and action plans for the advancement of women. This is with regard to women's development needs, their prominent contributions to the development process, their empowerment and the strengthening of their role as participants in various aspects of humanitarian activities (World Bank, 2006). However, despite this, gender differences still exist in various economic and political fields, as women still receive a lower percentage (only 24%) than men in the labor market, at the level of countries around the world. For example, the number of women national parliamentarians increased only slightly from 1995 to 2015, estimated at about 10.7%. As another attempt to promote gender equality, The Commission on the Status of Women was established, with the aim of promoting women's rights, modeling global standards for women's empowerment and achieving gender equality.

This is in addition to International Women's Day (March 8), which is celebrated for the purpose of recognizing women's achievements, regardless of various divisions²⁴. On this day in 1975, the famous phrase "Women's rights are human rights" was stated by Hillary Clinton²⁵, aiming to achieve gender justice and equality by 2030 (United Nations, 2015). United Nations Secretary-General António Guterres also noted the need to "advance gender equality, improve maternal health, and empower women to make their own reproductive choices," in order to achieve the Sustainable Development Goals (United Nations, 2023).

Finally, interest in women has increased globally in recent times, due to changing concepts of development, which require a continued focus on empowering women and achieving gender equality, as a necessity to achieve comprehensive sustainable development (Qahtani, 2016). Women's progress and their

²³ Such as working remotely/from home, part-time work.

²⁴ National, linguistic, cultural, economic, and political.

²⁵ Former US Secretary of State, and wife of former US President Bill Clinton.

ability to participate in social and economic development have become a measure of the extent of society's development and growth, as investing in developing women's capabilities is the best way to achieve economic development (Vojtic, 2013 & Shalabi, 2021).

2.5 Theories related to the subject of the study

The phenomenon of gender equality began as an organized activity in the latter half of the 19th century (Al-Khalid, 1996), and it was divided into three stages. The first: concerned with equal property rights between the sexes, and granting political power to women, especially with regard to their role in voting. The second: It focused on demanding civil rights for women, from the early sixties to the late eighties. Third: It emerged at the beginning of the twentieth century, to focus on addressing various forms of economic and racial imbalance, in addition to women's issues (Scott & Marshall, 2011; Adajaro & Sedguk, 2014). The following is a summary of some theories related to the subject of the study, as follows:

First: The theory of gender equality, which is based on the gender disparity in the division of labor, such that men work in the fishing craft due to its difficulty, while women work in harvesting crops due to its ease. This places control in the hands of the man, away from the woman who resides relatively at home, as she is responsible for taking care of the children. Which means that women are not treated like men, so that society's affairs are organized and its priorities are determined according to men's concerns and interests. From the above, this theory called for achieving equality between men and women in all economic, political and social fields, through the establishment of some social and political movements that demand the achievement of this equality, such as 'Women's Liberation, the Feminist Movement, and the Women's Promotion Movement' (Bahri, 2014 & Al-Sukkari, 2000). As an extension of this theory, the following theory has emerged.

Second: Feminist Theory in Development, which is also concerned with the phenomenon of inequality between the sexes with regard to development issues, such as unequal opportunities for work between the sexes, and the lack of subordination of women to men. This theory also acknowledges that the absence of women in development policies or decision-making groups is an indicator of this dependency. Feminist theory of development also focused on three trends, including liberalism, Marxism, and socialism. The liberal trend focused on the person, whether male or female, having reason/rational decision (Awad, 2010). This was also confirmed by the Marxist trend, which focused on the necessity of shifting from the capitalist system to the socialist trend, with the aim of reducing the exploitation of women (Wanis, 2002 & Abdel Wahab, 1985).

Third: Gender approach theory. In contrast to the term sex, which expresses the biological differences between males and females in statistical analyses, the term gender is used to analyze the responsibilities/roles of each of them in society (Gender Issues, 2016). From the standpoint of social justice, this concept has become one of the most important and pivotal concepts in achieving sustainable development, through gender equality in various fields (Al-Sayed and Mansour, 2010). So that there is a possibility of change in gender roles, which enables closing the gap of discrimination between women and men in terms of social status and the development process as a whole (Abu Bakr & Shukri, 2002). This theory also focuses on analyzing the structural, cultural, political, and economic reasons that led to gender discrimination, in addition to analyzing the reasons that led to its continuation. Then work to achieve equality between women and men in various decisions, plans and policies (Al-Addan and Bani Salama, 2016).

2.6 The female workforce in the countries under study

2.6.1 The female workforce in the Kingdom of Saudi Arabia:

In general, the 1990s witnessed radical changes represented by an increase in the rates of women's entry into the labor market in some Gulf countries, but this was limited to certain sectors, such as health and education (Al-Yahia, 2017). Specifically in the Kingdom of Saudi Arabia, successive five-year development plans achieved tangible progress in developing human resources, leading to the Ninth Development Plan (2010-

²⁶ Which assumed that the rise in demand for various products, in addition to the change in market forces, has encouraged increased integration of women into the productive sector.

²⁷ Which is based on private property and profit maximization. Women suffer from job opportunities and lower wages, in addition to exhausting unpaid domestic work.

2015), the objectives of which clearly stated the need to support women's contribution to economic activity and provide what is necessary to enable them effectively in it. However, despite the high rate of Saudi women's participation in the education sector, women's empowerment indicators were low. According to those indicators, the Kingdom ranked 134 (United Nations, 2015).

In 2017, the situation quickly changed as a royal order was issued to solve the problems of women's rights and services provided to them, and even to empower them without the approval of the guardian. Finally, the Kingdom's Vision 2030 came, in which Saudi women occupied the largest share, as its most important goals stated: liberalizing women's restrictions imposed on their participation in working life²⁸, the necessity of raising the rate of women's participation in the labor market - from (22%) to (30%) -while generating various opportunities for it in that market (Saudi Vision, 2030). In this context, a study (Mohammed, 2020) found that women's employment rates in the private sector in Saudi Arabia increased to 10% in 2016. This led the researcher to expect, through the analytical approach, a decrease in unemployment rates - from (12.3%). 9% -), in 2023. Accordingly, the study recommended more attention to women's employment and empowerment. The following (Figure 1), shows a summary of the most important general indicators of women's economic empowerment in light of the sustainable development goals, as follows:

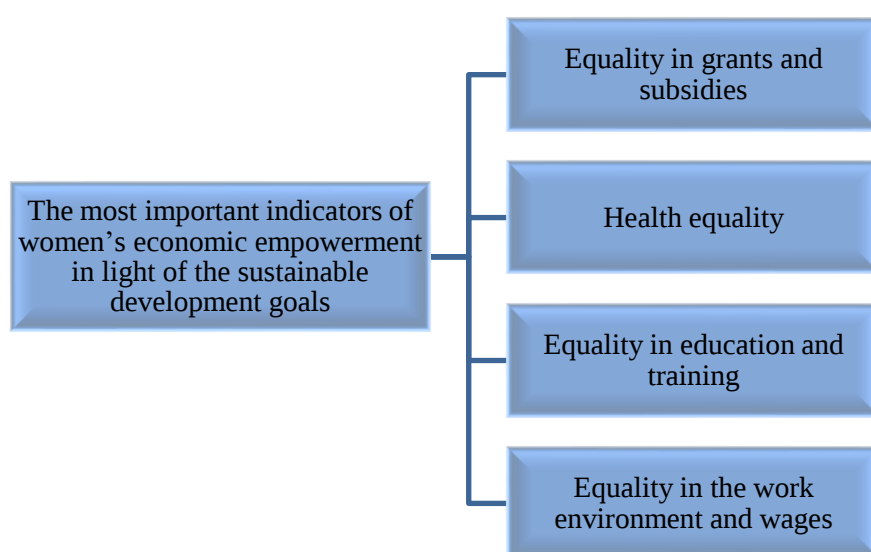


Figure 1: Indicators of women's economic empowerment under the sustainable development goals

Source: Prepared by the researcher, based on the Kingdom's Vision 2030

(Figure 2) also shows the upward trend in female labor force rates in the Kingdom, during the study period (2000-2023), until it reached a maximum of (19.46%) during the year 2020. This may be attributed to the social freedoms that Saudi women obtained under the guidance of the Crown Prince, such as women driving cars, for example (Al Arabiya, 2023). It is certain that the improvement in these rates has been linked to an increase in women's educational level ²⁹(Mishaal and Al-Sarouji, 2006), especially with the expansion of female scholarships abroad - for the master's level -, which exceeded their counterparts for male scholarships (Arab Women Development Report, 2015). These positive results come in conjunction with the Saudi economy achieving the highest growth in domestic product at 8.7%, the highest growth rates among the G20 countries (General Authority for Statistics, 2022).

²⁸ Such as allowing women to drive cars

²⁹ That is, there is a positive effect of women's education on their economic participation, such that education positively affects women's choice of work and type of job, and also affects their saving pattern.

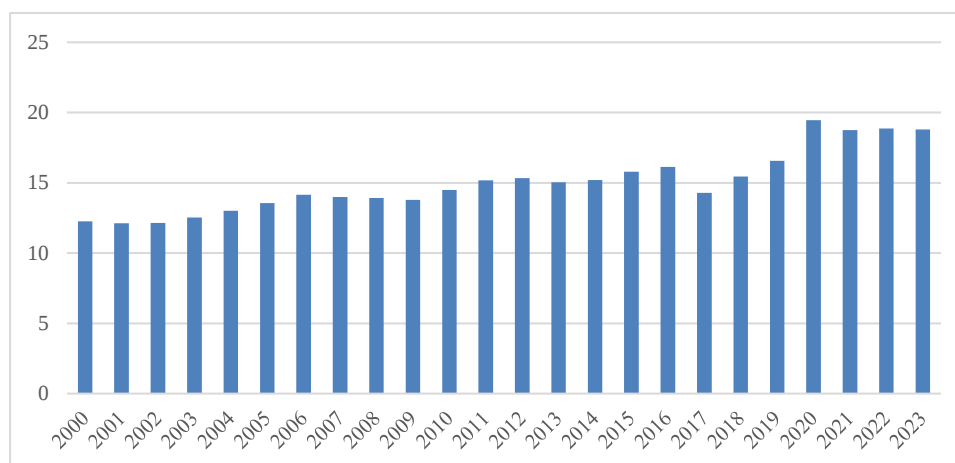


Figure 2: Female labor force rates in the Kingdom during the period (2000-2023)

Source: Prepared by the researcher, based on World Bank data (2023)

Finally, according to the Kingdom's Vision 2030, many notable achievements have been achieved from the beginning of the vision, even in the field of women's economic empowerment in the labor market. Women's economic participation rates increased from (17%) in 2017, to (33.5%) in 2020, and then to (35.6%) in 2022, exceeding the percentage targeted to be achieved in 2025, which is (31.4%) (Empowering Women, 2030 & Kingdom Budget, 2023).

2.6.2 The female workforce in Sudan

Sudanese women are at the forefront of Arab women who have obtained their rights, such as the right to vote in elections in addition to participating in them, and the rate of women in the Sudanese National Parliament (24.1%) exceeds that of most Western countries (United Nations Women, 2020). In addition to the role of Sudanese women in the family and social field, they participated in various aspects of national construction, such as education, health, and combating illiteracy. However, despite this, men still advance at higher rates in many areas, especially within political parties, where women are often underrepresented (Arab Gate, 2016).

Regarding the principle of gender equality, as Sudan is one of the countries facing major challenges, we find that it is one of the few countries that have not signed the Convention on the Elimination of All Forms of Discrimination against Women (United Nations Women, 2020). In the context of inequality, discrimination between males and females in the field of education appears as one of its most important and clearest forms (United Nations MDG Indicators, 2016). The following (Figure 3) shows the female labor force rates in Sudan during the study period (2000-2023).

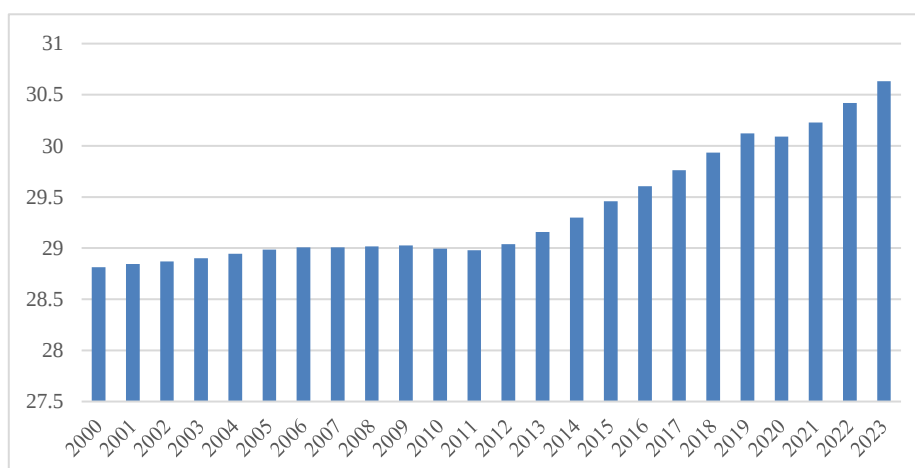


Figure 3: Female labor force rates in Sudan during the period (2000-2023)

Source: Prepared by the researcher, based on World Bank data (2022)

In general, the previous (Figure 3) shows the extent of improvement in the rate of women's participation in the labor force in Sudan during the period (2000-2023), until it reached a maximum of (30.63%) in 2023. This may be an extension of the effects of the COVID-19 pandemic, the most important of which was the shift to remote work, which encouraged many women to join the labor market or increase working hours. On the other hand, this increase may lead to expanding the circle of economic activity in cases of economic crises (Al-Arab Newspaper, 2022).

2.6.3 The female workforce in Egypt

Although the Egyptian government has implemented many huge investments in an attempt to narrow the gender gap, especially in the health and education sectors, the participation rate of women in the labor force still does not exceed 15.4%, compared to 67.1% for men. Accordingly, the National Council for Women has authorized a community dialogue to develop the national strategy to empower Egyptian women and qualify them for an active role in the development of the country, as the following (Figure 4) shows (World Bank, 2023; National Strategy to Empower Egyptian Women, 2017):

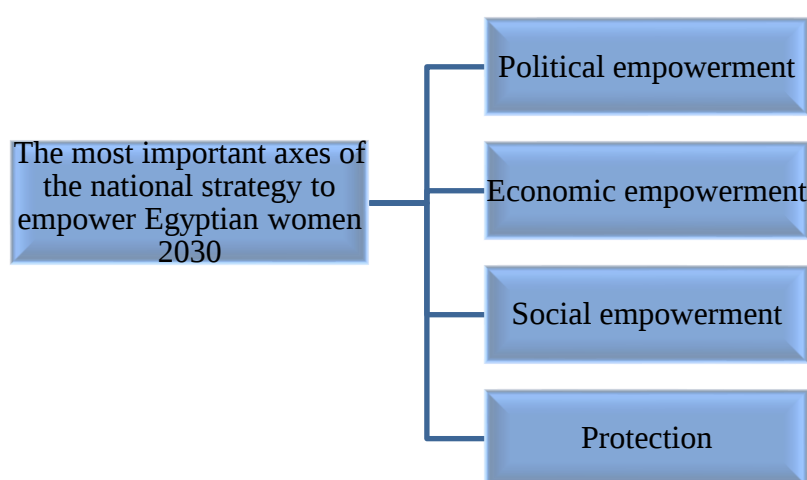


Figure 4: Indicators of women's economic empowerment under the sustainable development strategy in Egypt

Due to the increase in activities/programs/plans targeting women's empowerment in Egypt, the following (Figure 5) shows, in general, the upward trend in female labor force rates, until it reached a maximum of (24.52) in 2016. However, since 2018, these rates have been declining until they reached their lowest levels (17.34) in 2020, and this may be attributed to the economic repercussions of the COVID-19 pandemic (Dabas, 2021 & Adel, 2023).

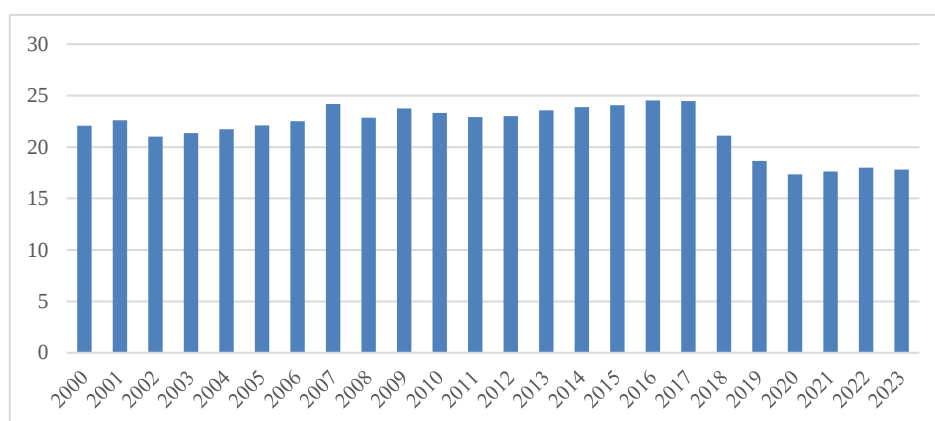


Figure 5: Female labor force rates in Egypt during the period (2000-2023)

Source: Prepared by the researcher, based on World Bank data (2022)

2.6.4 The female workforce in India

India is one of the countries that has made great strides in both the field of women's participation in the development process and the field of reducing the gender inequality gap. However, despite this, we find that

the Indian government still faces great difficulties in terms of increasing women's employment rates. Especially with expectations of population increase, to more than one billion people of working age, compared to 400 million female workers, in 2030, according to statistics from the McKinsey Global report (Farouk, 2022). Accordingly, the Indian government is working hard to pursue many policies that work to increase career opportunities available to women, and thus to increase their participation at the government level and in decision-making processes. The following (Figure 6) shows the most important of these policies, as follows (Varandini, 1994; Government of India, 2016):

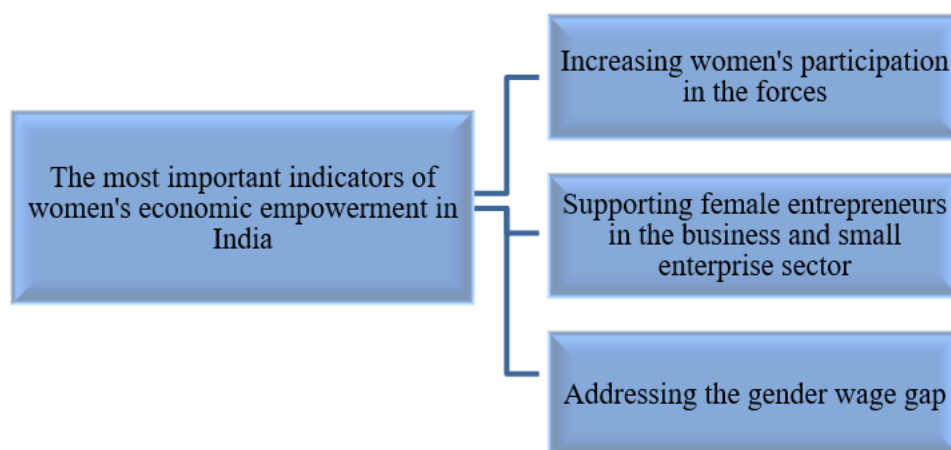


Figure 6: Indicators of women's economic empowerment under the sustainable development goals

Source: Prepared by the researcher, based on the United Nations Millennium Development Goals

In general, the following (Figure 7) shows the downward trend in female labor force rates since the beginning of the study period, reaching its lowest value (20.98%) in 2018. This may be due to the early age of marriage for females in India, with complete reliance on men in financial matters (Qareh, 2018). Although there are not enough job opportunities for the population of India (Al-Eqtisadiyah, 2023), female labor force rates have begun to improve since 2019. This may be due to the recent increase in awareness of the extent of the negative effects of gender discrimination and the exclusion of females from the labor market, which has led to lower productivity rates (Duta, 2023).

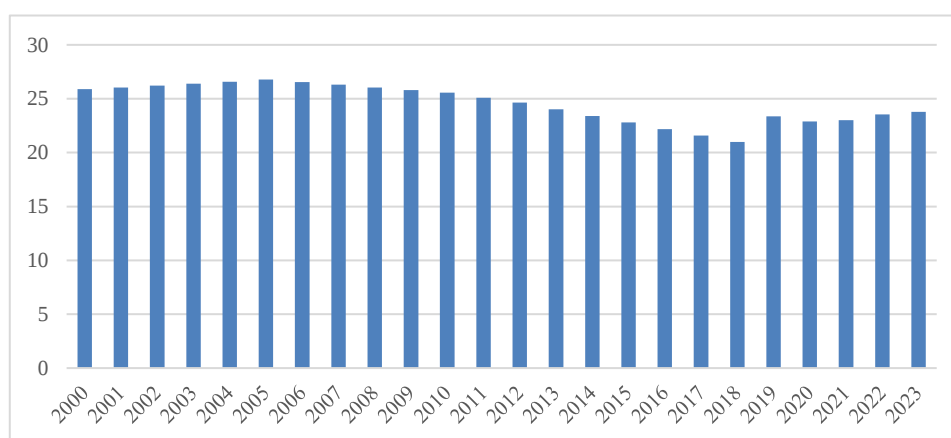


Figure (7): Female labor force rates in India during the period (2000-2023)

Source: Prepared by the researcher, based on World Bank data (2022)

2.6.5 The female workforce in South Africa

Despite the high rates of women's economic participation in agricultural business in South Africa, as these rates reached approximately 70% in 2012, 66% of them are informal workers (OECD, 2011), which leads us to low indicators of women's empowerment. Africa, especially with regard to participation in the formal economy, education levels, as well as wage levels (UNDP, 2016). For example, the average years of schooling

for females reached 4.7 compared to 6.5 for males, in 2018. Also, women's share of the gross national income reached (2763) compared to (4034 for men), in the same year (African Development Bank Group, 2023).

As for the political aspect, it is noted that the percentage of seats held by women in national parliaments has increased from 30% in 2000 to only 47% in 2022 (World Bank, 2022). Likewise, human development indicators data indicate health empowerment ³⁰through life expectancy at birth, and indicate that it is higher for females (62.4) than for men (59), which means higher health indicators for women compared to men. However, these indicators must be taken into consideration, as they may ignore health indicators specific to women, such as the number of births and the maternal mortality rate (Human Development Data and Indicators, 2018). The following (Figure 8) shows the extent of fluctuation - ups and downs - in female labor force rates during the study period (2000-2023).

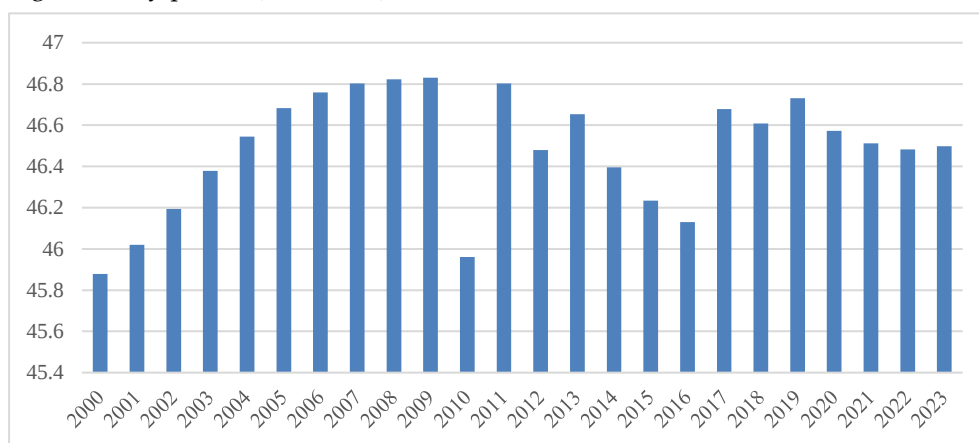


Figure 8: Female labor force rates in South Africa during the period (2000-2023)

Source: Prepared by the researcher, based on World Bank data (2022)

The female labor force rates in Africa have been increasing until they reached a maximum (46.83) in 2009. The reason for this may be due to the high rates of women working in the informal sector³¹, as women constitute 50% of the labor force in the agricultural sector (State Information Service, 2018). Immediately after that year (2010), these rates dropped to their lowest levels (45.9), and this may be due to the lack of flexibility in working hours, which hinders women's ability to reconcile their family work with paid work. This is in addition to the discrimination between women and men in terms of available job opportunities (United Nations Development Fund for Women, 2009). Then these rates began to fluctuate until the end of the period.

3 The standard model and its analyses

This part of the current study was devoted to the applied aspect, as it relied on longitudinal ³²panel data models to express the relationship between the female employment rate as a dependent variable³³, and the independent variables related to women's economic empowerment shown in the following function. Data for the study variables were obtained from official statistics of the World Bank (World Bank, 2023). To identify the general trend of the variables and estimate the relationship under study, descriptive tests were conducted using the statistical program E-views12.

3.1 Description of the study model

The current study followed the quantitative method in analyzing the impact of independent variables associated with women's economic empowerment on the female labor force. The study model takes the general functional form, as follows:

³⁰ Women's health empowerment is essential for women's access to other types of empowerment, as a result of them enjoying a productive life (Jabeen, 2015).

³¹ The proportion of women in the formal workforce paid by the state decreases, meaning that women's efforts are not compensated with high wages.

³² This is based on previous literature, in addition to its suitability to the data of the current study.

³³ Which were chosen based on previous studies and the efforts of researchers.

$$FE_{it} = \beta_0 + \beta_1 ADM_{it} + \beta_2 FU_{it} + \beta_3 MR_{it} + \beta_4 FW_{it} + \varepsilon_{it}$$

β_i is also indicated for the parameters mentioned in the functional formula, and the dependent variable represents the female employment rate (FE), while the independent variables are represented by: the age dependency ratio for males (ADM), female unemployment rate (FU), female mortality rate (MR), and female labor force rate (FW). ε expresses the random error term in the model.

As we mentioned previously, the current study assumes the following:

- There is a positive significant relationship between the age dependency ratio for males and the employment ratio for females.
- There is an inverse significant relationship between the female unemployment rate and the female employment rate.
- There is an inverse significant relationship between the female mortality rate and the female employment rate.
- There is a positive significant relationship between the female labor force rate and the female employment rate.

3.2 Model variables

After defining the model variables, we will review below the description and general trend of all study variables, as follows:

First: The dependent variable: Female Employment Rate (FE). It is expressed in the current study by the percentage of participation of females over 15 years of age in the labor force as employees to the total number of employed populations ³⁴(Female employment to employed population%). In general, the following (Figure 9) shows the extent of the low female employment rate in Africa. This may be due to the unemployment rate among females rising to 9.1% following the recent economic recession, compared to 3.1% for males compared to the rest of the countries under study.

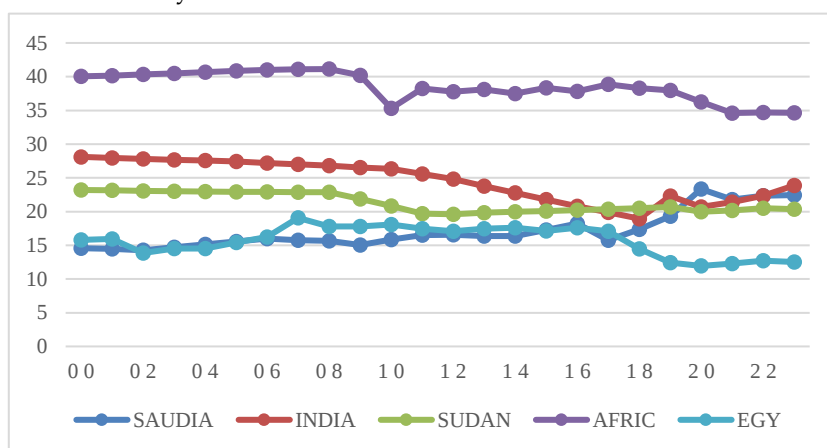


Figure 9: Female employment rate for the countries under study during the period (2000-2023)

Second: Independent variables, which include all of the following:

1. Age dependency for males (ADM), which refers to the ratio of dependent people ³⁵to the working-age population³⁶. Data in this study are presented as the ratio of dependents per 100 people of the working-age population. We notice from the following (Figure 10) a decreasing trend in this variable for all the countries under study, with an increase in the country of Africa. This is because unemployment in low-income countries has fallen below pre-pandemic levels. The rate will reach 5.3 percent - equivalent to 191 million people, which will lead to improved growth rates and a slower pace of poverty reduction and job growth in Africa compared to the rest of the countries under study.

³⁴ The age group of 15 years and above represents the young population.

³⁵ Who are younger than 15 or older than 64 years.

³⁶ In the age group 15-64 years.

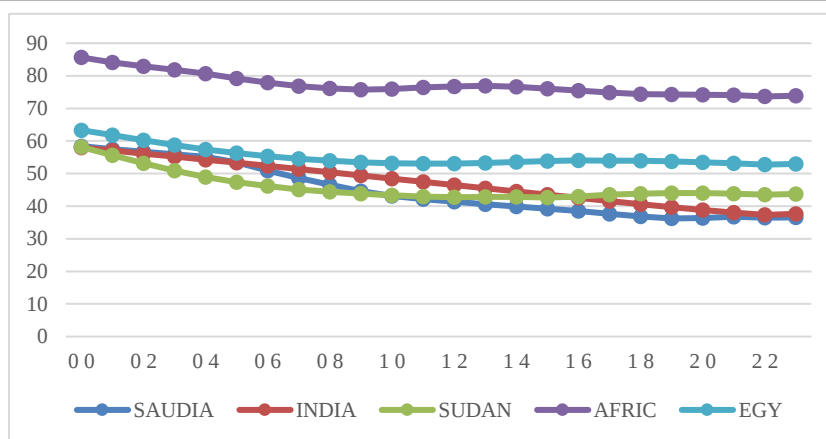


Figure 10: Age dependency ratio for males for the countries under study during the period (2000-2023)

2. Female Unemployment Rate (FU): The definition of unemployment varies from one country to another, but it generally refers to identifying the number and percentage of unemployed individuals who do not contribute to the production process due to the lack of creating new job opportunities. This variable is expressed in this study as the percentage of unemployed women per 100 people of the population. In general, the following (Figure 11) shows the extent of fluctuation in this variable for all countries under study. With a decrease in India due to the provision of job opportunities for millions of young people entering the labor market compared to the rest of the countries under study.

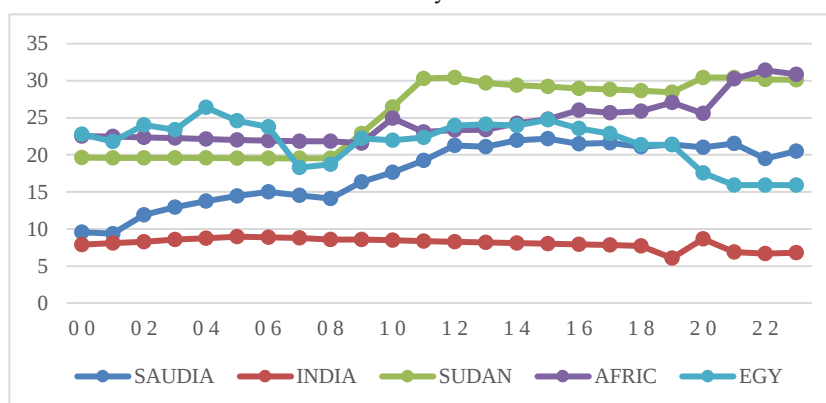


Figure 11: Female unemployment rate in the countries under study during the period (2000-2023)

3. Female Mortality Rate (MR): It is expressed in this study as the mortality rate for female adults per 1000 female adults³⁷. In general, we notice from the following (Figure 12) the extent of variation in this variable between the countries under study, with its increase in the State of Sudan and its decrease in the Kingdom. This is the reason for the spread of immunodeficiency diseases during that period, compared to the rest of the countries under study.

³⁷ The adult mortality rate refers to the probability that a 15-year-old will die before reaching the age of 60, taking into account current age-specific death rates between these two ages.

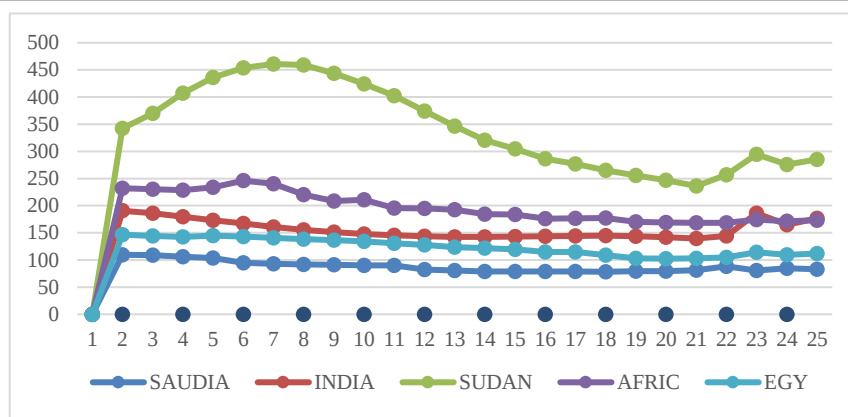


Figure 12: Female mortality rate for the countries under study during the period (2000-2023)

4. Female Workforce Rate (FW)³⁸ to indicate the extent to which women can be active in the labor force, that is, to express the participation of females of working age over 15 years in the labor force as employed or unemployed. It is expressed as a percentage of the total labor force (% of total labor force). In general, we notice from the following (Figure 13) the extent of relative stability in this variable for all the countries under study, with an increase in the country of Africa. This is due to the return of financial conditions to normal in the country compared to other countries.

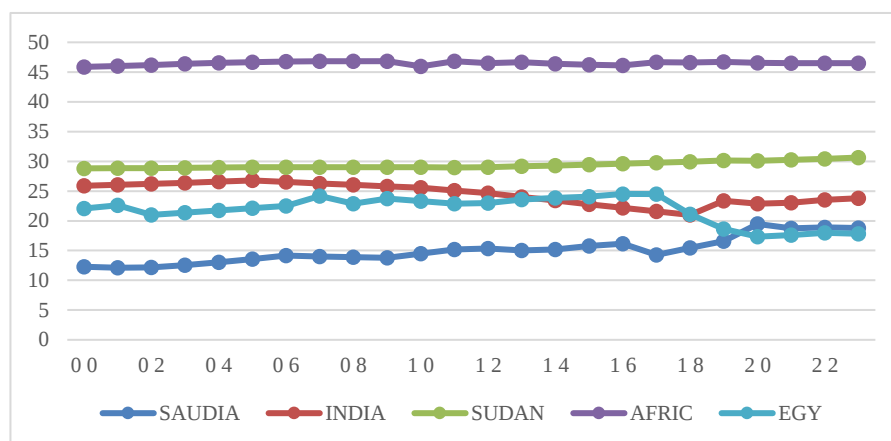


Figure 13: Women's labor force for the countries under study during the period (2000-2023)

3.3 Descriptive statistics for study variables and linear correlation between independent variables

Firstly, to give a clear picture of the status of the study sample during the time period (2000-2023), the descriptive statistical characteristics of the study variables have been specified in Appendix No. (1).³⁹Therefore, a linear correlation analysis was conducted between the independent variables in the following Table 1, as the use of multiple regression requires that this problem does not exist:

Table 1: Correlation coefficient matrix between independent variables

Correlation	ADM	FU	MR	FW
ADM	1			
FU	0.255254	1		
MR	0.061214	0.284282	1	
FW	0.775222	0.426040	0.416391	1

Prepared by the researcher based on the program E-views12

³⁸ The female labor force includes those aged 15 years and over, which is included in the International Labor Organization's definition of the economically active population.

³⁹ Its results indicate the average values, the arithmetic median, the highest and lowest value, for various variables. It also shows the lower standard deviation values for all variables, which means less dispersion of the data from its arithmetic mean.

It is clear from the previous (Table 1) that the condition that the independent variables are not related to each other has been met, as all correlation values do not exceed 70% soon (Hayawi, 2010), while there is a strong and direct correlation of 77.5% between the variables FW and ADM.

3.4 Estimating the regression model

To estimate the regression model and arrive at the results and analyze them, the three previously mentioned regression models were estimated for the longitudinal data model, namely: (PRM), (FEM), and (REM), ⁴⁰as the following (Table 2) shows:

Table 2: Estimation results of regression models

Dependent Variable: FE				
Total panel (balanced) observations: 120				
	Variable	PRM	FEM	REM
coefficient	C	9.315523***	-13.12628***	9.315523***
T-Stat		8.102625	-7.647662	22.02799
Std.Error		1.149692	1.716378	0.422895
coefficient	ADM	-0.032292	0.014562	-0.032292***
T-Stat		-1.142139	0.851377	-3.105046
Std.Error		0.028274	0.017104	0.010400
coefficient	FU	-0.345885***	-0.296415***	-0.345885***
T-Stat		-10.50598	-7.775635	-28.56180
Std.Error		0.032923	0.038121	0.012110
coefficient	MR	-0.011537***	0.008437***	-0.011537***
T-Stat		-4.222114	3.021316	-11.47834
Std.Error		0.002732	0.002792	0.001005
coefficient	FW	0.899438***	1.457292***	0.899438***
T-Stat		22.49784	24.68799	61.16316
Std.Error		0.039979	0.059028	0.014706
R-squared		0.928773	0.990698	0.928773
Adjusted R-squared		0.926296	0.990028	0.926296
F-statistic		374.8891***	1477.757***	374.8891***

*10%, **5%, ***1%

Prepared by the researcher based on the program E-views12

Although the male dependency ratio (ADM) is not significant in the multiple regression model ⁴¹(Appendix No. 2), by estimating the previous regression equation in its linear form, the results of the previous (Table 2) have shown the significance of all variables in the REM model. While the results of the PRM and FE models matched it, as shown in the previous (Table 2), which shows the significance of all variables except the male dependency ratio (ADM). Which means it has no effect on the dependent variable (FE). The results show that the three models are significant, as indicated by the F test. The adjusted coefficient of determination in all models also shows the high extent of the ability of the independent variables to explain the changes occurring in the dependent variable, especially in the FEM model, as it reached almost 100%.

To ensure that the model is free of measurement problems that may affect the accuracy of the estimation results, the Jarque-Bera test was conducted, which showed that random errors follow a normal distribution⁴², in all models (Appendix No. 5, 4, 3).

3.5 Model comparison tests

First: Comparison between the pooled model (PRM) and the random effects model (REM) using the Lagrange Multiplier Tests for Random Effects, as the following (Table 3) shows:

⁴⁰ So, the (RE) model was estimated only by the generalized least squares method, while both (PR) and (FE) were estimated by the ordinary least squares method.

⁴¹ Using Ordinary Least Squares (OLS).

⁴² The probability value is < 5%, which indicates that the random errors follow a normal distribution.

Table 3: LM Breusch-Pagan

Test Hypothesis			
	Cross-section	Time	Both
Breusch-Pagan	470.9050	4.807707	475.7127
Prob.	(0.0000)	(0.0283)	0.0000

Prepared by the researcher based on the program E-views12

As shown in the previous (Table 3), Probability > 5%, which means rejecting the null hypothesis ⁴³and accepting the alternative hypothesis⁴⁴, that is, the random effect model (REM) is the best to estimate the relationship.

Second: Comparison between the random effects model (REM) and the fixed effects model (FEM) using Husman Tests, as the following (Table 4) shows:

Table 4: Husman Tests

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	738.955600	4	0.0000

Prepared by the researcher based on the program E-views12

As shown in the previous (Table 4), Probability > 5%, which means rejecting the null hypothesis ⁴⁵and accepting the alternative hypothesis⁴⁶. That is, the fixed effects model (FEM) is the most appropriate. Accordingly, the study's questions were answered through it, as the following (Table 5) shows:

Table 5: Analysis of the results of the fixed effects model (FEM)

Independent variables	Significance and congruence	Interpretation
ADM	Not significant, consistent with expectations (0.014562)	It is expected that an increase in the male dependency ratio will lead to an increase in the female employment rate, as the increase in the number of dependent people may be a burden on the head of the family - in terms of providing housing, food, and education - which may lead to the wife working to help bear the responsibility of that burden (Al-Ruwaiashed, 2020). Especially if she is educated, as the woman's level of education positively affects the husband's income level and thus the family's consumption pattern (Mishaal and Al-Sarouji, 2006). However, it was found in this study that this variable does not affect the female employment rate, which may be due to the lack of education or experience necessary for work among females in some countries such as Africa (UNDP, 2016) and Sudan (United Nations MDG Indicators, 2016). Or to the negative impact of fertility rates on women's participation in the labor market, such that women prefer to leave work to care for their children, especially in the absence of suitable alternatives for maternal care (Adinat, 1996). This may also be due to the high percentage of families headed mainly by women (Challenges Facing Women, 2022).
FU	Significance conforms to expectations (-0.296415)	As expected, there is an inverse relationship between the unemployment rate for females and their employment rate, as a decrease in female unemployment rates may mean - at the same time - an increase in their employment rate. Which in turn may be due to the high levels of education - in general and higher education in particular - among females in some countries. Hence, their entry rates into the labor market increase. This is in addition to increasing awareness of the importance of women's education in various societies (Al-Salem, 2023), as the returns to education increase with the

⁴³ H0: Pooled least squares model is the best fit.

⁴⁴ H1: The random effect model is the best fit.

⁴⁵ H0: The random effects model is the best fit.

⁴⁶ H1: The fixed effects model is the best fit.

		increase in educational level (Silles, 2007). In addition, returns on investment in education are higher than returns on investment in other sectors (Mincer, 1958).
MR	Significance does not match expectations (0.008437)	It is expected that an increase in female mortality rates will lead to a decrease in their employment rate, but in this current study it was found that there is a positive relationship between them. Which may indicate that the largest proportion of these deaths were outside the labor force among females - those under the age of 15 or over 64 years old - or those who were about to retire. This increases the number of employment opportunities available. The age factor affects the economic participation of women, especially those over the age of forty. As there is a significant decline in women's participation in work after that age (Adinat, 1996). This may also be due to the higher percentage of females in the population than the percentage of males (Hassan, 2022).
FW	Significance conforms to expectations (1.457292)	As expected, the current study found that there is a direct relationship between the female labor force rate and their employment rate. As it is expected that increasing female participation in the labor force in general - as employed or unemployed - will lead to an actual increase in the percentage of their participation as employed people in the labor force (Qazzaz & Mrar, 2005). Especially with the spread of the phenomenon of increasing the age of marriage as a result of women's enrollment in education, which has led to a reduction in the fertility rate, which increases the rate of women's economic participation (Tsani, 2012).

4 Conclusion and recommendations

Changing laws and breaking barriers in order to achieve economic empowerment for women in a group of countries - Saudi Arabia, Sudan, Egypt, India, and South Africa - during the time period (2000-2023). A group of previous studies that demonstrated the connection were discussed, in addition to the most important theories related to women's labor force and their economic empowerment. Methods for measuring this effect were also explained, by laying the theoretical foundation for choosing the study variables and formulating the standard model. Previous studies have shown how important women's economic empowerment is in influencing the rate of women's participation in the labor force in various countries of the world. It also explained the extent of the impact of the educational level on the empowerment of women, especially higher education, as it has been shown that higher education positively affects the employment rate of women in the workforce.

To determine the extent to which economic empowerment indicators influence the factors affecting their economic empowerment process, four hypotheses were tested, centered on the negative impact of: the female unemployment rate (FU) and the female mortality rate (MR) on the female employment rate (FE). In addition to assuming the positive effect of: the male age dependency ratio (ADM) and the female labor force ratio (FW) on the female employment ratio (FE).

The study found, as expected, that there is an inverse relationship between the female unemployment rate (FU) and the female employment rate (FE), which reflects that increasing FU by 1% leads to a decrease in FE by approximately 30%. The study also found, as expected, a positive relationship between FW and FE. Contrary to expectations, I found a positive relationship between MR and the dependent variable. The study also found, contrary to what was expected, that ADM had no effect on FE. This reflects the presence of gender gaps in the participation rates of men and women in the labor market in developing and developed countries, while they are still widening in emerging countries. However, it is a reflection of the increase in the number of females enrolled in education in those countries, which delays their entry into the labor market.

In general, it was noted that despite the efforts of the governments of the countries under study to support and increase female employment rates, they are still below the required level. Therefore, in light of the results reached, and to enhance women's economic participation, which contributes to increasing their economic empowerment, the researcher recommended all of the following:

- The need to provide a suitable environment for women to work in employment places, in addition to ensuring that appropriate wages are provided to them. To show that she has new creative energies, and thus strives better for the growth of the institution in which she works, and its development while ensuring the implementation of the provisions contained in the Labor Law that facilitate women's access to appropriate job opportunities, such as part-time work and access to paid maternity leave.
- Adopting a comprehensive, multi-sectoral approach to facilitate women's entry into the labor market and their retention in it, which includes creating an enabling legislative environment, developing supportive policies, and investing in education and skills that take into account the needs of the labor market.
- Increasing the awareness and culture of various societies about the importance of women's participation in the labor market, while imposing the necessary laws/legislation for that. Which means the necessity of trying to get rid of the faulty genes that stand as an obstacle to women's participation in economic activity.
- Efforts to increase educational and training workshops on economic planning for women, which may help increase women's economic empowerment.
- In light of the growing interest in scientific studies related to women's economic empowerment, the researcher recommends the need to provide a platform for official data/statistics related to women. This helps researchers conduct further studies on other factors that may lead to a decline in women's employment rates in the labor market, which were not addressed in this article. Among these factors, we mention the following:
 1. A standard study on the impact of fertility rate on demographic and social variables to empower women.
 2. Study the impact of the phenomenon of early marriage on women's entry into the labor market.

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Appendices

Appendix (1): Descriptive statistics for study variables

	FE	ADM	FU	MR	FW
Mean	23.44131	53.98053	19.47151	181.7234	27.46191
Median	20.75500	53.09092	21.43250	147.2230	24.87319
Maximum	41.12900	85.62762	31.42600	460.9820	46.83097
Minimum	11.93800	36.23104	6.066000	78.39400	12.11516
Std. Dev.	8.516052	13.37416	7.200474	96.13357	10.74962
Skewness	0.881134	0.779813	-0.393898	1.356410	0.732136
Kurtosis	2.554375	2.528680	2.090411	4.223199	2.459316
Jarque-Bera	16.52084	13.27288	7.239870	44.27802	12.18215
Probability	0.000259	0.001312	0.026784	0.000000	0.002263
Sum	2812.957	6477.664	2336.581	21806.81	3295.430
Sum Sq. Dev.	8630.254	21285.32	6169.773	1099758.	13750.97
عدد المشاهدات	120	120	120	120	120
Cross sections	5	5	5	5	5

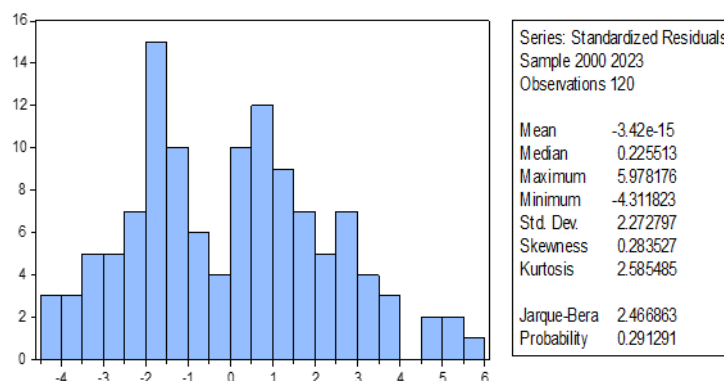
Source: Prepared by the researcher based on the outputs of the E-views 12 program

Appendix (2): Results of the multiple regression model

Dependent Variable: FE Included observations: 120				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.315523	1.149692	8.102625	0.0000
ADM	-0.032292	0.028274	-1.142139	0.2558
FU	-0.345885	0.032923	-10.50598	0.0000
MR	-0.011537	0.002732	-4.222114	0.0000
FW	0.899438	0.039979	22.49784	0.0000
R ²	0.928773	Mean dependent var		23.44131
$\bar{R}^2$	0.926296	S.D dependent var		8.516052
S.E of reg.	2.311986	Akaike info criterion		4.554864
Sum squared resid	614.7071	Schwarz criterion		4.671010
Log likelihood	-268.2919	Hannan-Quinn criter.		4.602032
F-statistic	374.8891	Durbin-Watson stat		0.059853
Prob (F-statistic)	0.000000			

Source: Prepared by the researcher based on the outputs of the E-views 12 program

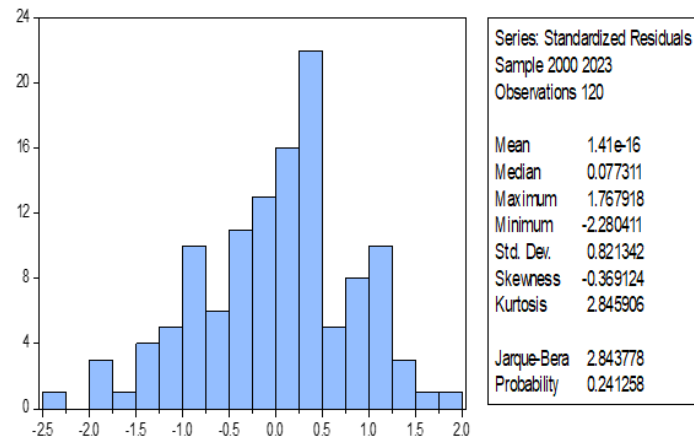
Appendix (3): Results of estimating the pooled regression model



Dependent Variable: FE Included observations: 120				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.315523	1.149692	8.102625	0.0000
ADM	-0.032292	0.028274	-1.142139	0.2558
FU	-0.345885	0.032923	-10.50598	0.0000
MR	-0.011537	0.002732	-4.222114	0.0000
FW	0.899438	0.039979	22.49784	0.0000
R ²	0.928773	Mean dependent var		23.44131
$\overline{R^2}$	0.926296	S.D dependent var		8.516052
S.E of reg.	2.311986	Akaike info criterion		4.554864
Sum squared resid	614.7071	Schwarz criterion		4.671010
Log likelihood	-268.2919	Hannan-Quinn criter.		4.602032
F-statistic	374.8891	Durbin-Watson stat		0.059853
Prob (F-statistic)	0.000000			

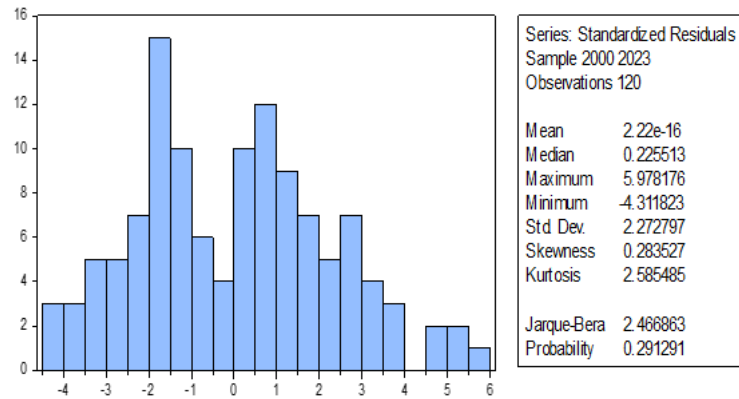
Source: Prepared by the researcher based on the outputs of the E-views 12 program

Appendix (4): Estimation results of the fixed effects regression model



Dependent Variable: FE Included observations: 120				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-13.12628	1.716378	-7.647662	0.0000
ADM	0.014562	0.017104	0.851377	0.3964
FU	-0.296415	0.038121	-7.775635	0.0000
MR	0.008437	0.002792	3.021316	0.0031
FW	1.457292	0.059028	24.68799	0.0000
R ²	0.990698	Mean dependent var		23.44131
$\overline{R^2}$	0.990028	S.D dependent var		8.516052
S.E of reg.	0.850425	Akaike info criterion		2.585877
Sum squared resid	80.27770	Schwarz criterion		2.794939
Log likelihood	-146.1526	Hannan-Quinn criter.		2.670778
F-statistic	1477.757	Durbin-Watson stat		0.419152
Prob (F-statistic)	0.000000			

Source: Prepared by the researcher based on the outputs of the E-views 12 program

Appendix (5): Estimation results of the random effects regression model

Dependent Variable: FE Included observations: 120				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.315523	0.422895	22.02799	0.0000
ADM	-0.032292	0.010400	-3.105046	0.0024
FU	-0.345885	0.012110	-28.56180	0.0000
MR	-0.011537	0.001005	-11.47834	0.0000
FW	0.899438	0.014706	61.16316	0.0000
R ²	0.928773	Mean dependent var		23.44131
$\overline{R^2}$	0.926296	S.D dependent var		8.516052
S.E of reg.	2.311986	Durbin-Watson stat		0.059853
Sum squared resid	614.7071	Prob (F-statistic)		0.000000
F-statistic	374.8891			

Source: Prepared by the researcher based on the outputs of the E-views 12 program