PAKAR Pendidikan

The Impact of Women's Education and ICT on Female Labor Force Participation in OIC Member Countries

Pengaruh Pendidikan Perempuan dan ICT terhadap Partisipasi Angkatan Kerja Perempuan di Negara Anggota OKI

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Abstract

In recent decades, OIC member countries have faced low female labor force participation rates, influenced by various factors, such as education, fertility, income, norms, and culture. One strategy to increase this participation is to improve the quality and quantity of women's education and the utilization of ICT, particularly the Internet. Information and Communication Technology (ICT) is the fusion of various sectors, especially in services and manufacturing, involving sending, retrieving, or delivering information and data electronically. This study aims to identify the effect of education moderated by ICT utilization, especially the Internet, on female labor force participation in high- and low-income OIC member countries, utilizing secondary data from 2008 to 2021. This research method uses a panel data approach with fixed effect model estimation. The results show that ICT positively affects female labor force participation driven by women's education and sound financial development in high-income OIC member countries. In low-income OIC countries, education has not been able to encourage the role of ICT to increase female labor force participation. In low-income OIC member countries, ICT, with good financial development, can increase women's labor force participation. OIC member countries need to increase investment in ICT access and infrastructure, especially in low-income countries, and improve the quality of education and financial development to support the utilization of ICT in encouraging women's labor force participation.

Keywords: Female labor force participation, female education, ICT, OIC countries, fixed effect.

Abstrak

Negara anggota OKI dihadapkan oleh tingkat partisipasi angkatan kerja perempuan yang rendah beberapa dekade terakhir, yang dipengaruhi oleh berbagai faktor, seperti pendidikan, fertilitas, pendapatan, norma, dan budaya. Salah satu strategi untuk meningkatkan partisipasi ini adalah melalui peningkatan kualitas dan kuantitas pendidikan perempuan serta pemanfaatan ICT, khususnya internet. Teknologi Informasi dan Komunikasi (ICT) didefinisikan sebagai perpaduan berbagai sektor, terutama dalam bidang jasa dan manufaktur, yang kegiatannya melibatkan pengiriman, pengambilan, atau penyampaian informasi dan data secara elektronik. Penelitian ini bertujuan untuk mengidentifikasi pengaruh pendidikan yang dimoderasi oleh pemanfaatan ICT, khususnya internet terhadap partisipasi angkatan kerja perempuan di negara anggota OKI yang berpendapatan tinggi dan rendah, dengan memanfaatkan data sekunder dari tahun 2008 sampai dengan 2021. Metode penelitian ini menggunakan pendekatan panel data dengan estimasi *fixed effect model*. Hasil penelitian menunjukkan bahwasanya ICT berpengaruh positif terhadap peningkatan partisipasi angkatan kerja perempuan yang didorong oleh pendidikan perempuan dan *financial development* yang bagus di negara anggota OKI berpendapatan tinggi. Sementara di negara OKI berpendapatan rendah, pendidikan belum mampu mendorong peranan ICT untuk meningkatkan partisipasi angkatan kerja perempuan. Di negara anggota OKI berpendapatan rendah ICT dengan dorongan *financial development* yang bagus mampu meningkatkan partisipasi angkatan kerja perempuan. Negara anggota OKI perlu meningkatkan investasi pada akses dan infrastruktur ICT, terutama di negara berpendapatan rendah, serta memperbaiki kualitas pendidikan dan pengembangan keuangan untuk mendukung pemanfaatan ICT dalam mendorong partisipasi angkatan kerja perempuan.

Kata Kunci: Partisipasi angkatan kerja perempuan, pendidikan, ICT, negara OKI, *fixed effect*.

1. Introduction

The participation of women in the work force is a significant factor in employment. While there are significant differences in women's labor force participation rates across OIC countries, there is limited research that thoroughly identifies the factors that influence such participation, particularly about the application of information and communication technologies (ICTs). Therefore, examining how ICT can serve as a supportive element to increase women's labor force participation in OIC countries is essential. This research fills the knowledge gap on the role of technology in overcoming existing social and structural barriers. It provides new perspectives on the potential of ICTs in promoting women's labor market inclusion in these developing countries. Given that 17 of the 20 nations with the lowest rates of labor force participation in the world are OIC members, the labor force participation rate in OIC countries is comparatively low (OIC-SESRIC, 2023b). A closer look reveals that the labor force participation rate of women in OIC member nations is noticeably below average. While the global average reached 47.3 percent in 2022, the female labor force participation rate in OIC countries was just 38.2 percent (OIC-SESRIC, 2023b). Comparing OIC nations to developed and non-OIC developing countries, Figure 1. demonstrates that the average female labor force participation rate is the lowest in OIC countries.
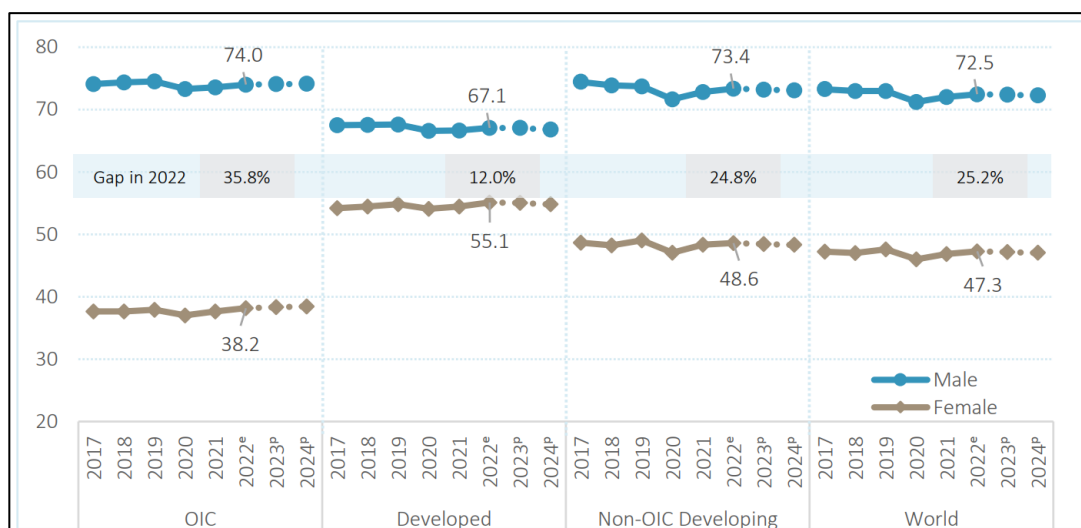

Figure.1. Labor Force Participation by Gender (SESRIC, 2022)

The participation of women in the labor force is influenced by a variety of factors worldwide. Female labor force participation is influenced by a number of factors, including and level of education, political situations, religion, age and fertility (Psacharopoulos & Tzannatos, 1989). The significant role of education in labor force participation has been extensively documented across various countries, both developed and developing (Anyanwu, 2016). Increasing investment in education for women enhances opportunities for diverse employment. Higher education levels promote minimum wage increases that attract women to the workforce (Schultz, 1994). Education levels in OIC member countries still need to be improved, particularly for women. Women's average years of education in OIC member nations continue to be lower than the world average. In 2021, the global average years of schooling for women reached 8.36 years, while the average years for women in OIC member countries stood at 6.93 years. The data reflects the education gap between women in OIC countries and the global average, suggesting that women in OIC countries have more limited access to education. Social, cultural, and

economic factors can influence it. This gap has the potential to hinder women's participation in the labor force as well as economic empowerment, thus requiring attention to improve access to education in these countries.

The condition of women's education in OIC member countries varies significantly. Low-income countries in OIC had an average of only 2.92 years of schooling for women in 2021. Meanwhile, the overall average years of schooling for women in OIC countries reached 6.92 years in the same year. Moreover, in high-income OIC countries, women's average years of schooling reached 10.47 years. These differences in average years of schooling are likely to have varying impacts on female participation in the labor market. Women's education in OIC countries must be optimized, requiring investment to enhance education quality to meet skill demands in the digital era. The majority of OIC nations do not invest enough in research, development, learning resources, and education (OIC-SESRIC, 2023a).

Low levels of female education in OIC member states, while potentially influenced by a lack of ICT access, cannot be seen as the sole cause. While ICTs can be essential in improving access to education, especially in providing distance learning opportunities and technology-based skills training, other factors, such as cultural norms and gender inequality, have a significant impact. In many OIC countries, cultural norms that limit women's role in society often hinder their access to education on par with men. In some countries, women may be considered less suitable to pursue higher education or work in specific sectors. It is exacerbated by existing gender inequalities in social and economic policies, where women often have limited access to the same resources and opportunities as men. In addition, inequalities in the division of domestic duties usually reduce women's time and opportunity to access formal education or skills training.

In addition to social and cultural factors, inequalities in access to ICT also contribute to women's low education. Limited technological infrastructure in many OIC countries, especially in rural or less developed areas, prevents women from utilizing digital technologies that could enhance their education. The lack of digital skills and ICT-based training further exacerbates this gap, especially for women living in areas with limited access to modern education facilities. However, while lack of ICT access is one factor contributing to women's low education in OIC countries, the deeper roots of the problem often lie in the social, cultural, and policy factors that govern women's opportunities and access to education. Therefore, to address this gap, there needs to be a holistic approach that focuses on developing ICT infrastructure and changing policies and social norms that limit women's empowerment.

The strategy to improve women's education quality is to enhance ICT access, especially the Internet. Improving education quality through ICT utilization can impact female labor force participation by providing access to information, knowledge, and learning resources (Ngoa & Song, 2021). With ICT, people can take full advantage of internet developments to improve their skills and prepare for entering the workforce. The OIC Labour Market Strategy 2025 Roadmap includes a debate on how to use ICT to raise educational standards and promote female labor market participation. The OIC Labor Market Strategy 2025 explains that improving the quality of education can be achieved through the use of digital media, especially the internet. Individuals, especially women, can learn and work from anywhere and anytime with internet access. This condition allows mothers to continue working while raising their children, at least by working part-time waktu (Berniell et al., 2021; Billari et al., 2019).

This study has several contributions and is different from other studies. First, this research focuses on OIC member countries. Prior studies have not examined the impact of ICT-moderated education on female labor force participation rates in OIC member nations. This

research is vital because OIC countries have diversity and relevance to global issues, making the results of this study also relevant to these global issues. Thirdly, this study closes a vacuum in the literature that is still uncommon when it comes to research on the effects of ICT and education on the labor force participation of women in a particular region, especially the OIC. As a result, pertinent policies can be developed to strengthen the contribution of women's education and ICT to raising female labor force participation.

2. Literature Review

2.1. Education and Female Labor Force Participation (FLFP)

Female educational attainment significantly influences women's labor force participation (FLFP). Studies in Bangladesh show that better education increases the likelihood of women marrying more educated husbands and raises household income (Tanaka et al., 2021). Female labor force participation and education are strongly and favorably correlated in sub-Saharan Africa, especially in the non-primary sector (Backhaus & Loichinger, 2022). Positive correlations between education and high-productivity employment are suggested by the fact that education enhances the availability of female labor and moves women from stigmatized to non-stigmatized jobs (Pradhan et al., 2015). The detrimental effects of fertility on female labor force participation can be lessened by investments in health and education, with female secondary school attendance increasing the labor supply independent of educational attainment (Law & Wye, 2023). Women's labor force participation rates can be impacted by policies that address gender ideas, families, economic conditions, and education, especially for those in the 25–55 age range (Besamusca et al., 2015).

2.2. Education and Economic Development

The potential for economic growth of a country is stronger when female labor force participation and education levels are higher. Education has an impact on how women participate in the labor force by influencing their decision to enter the job market and how long to work. Participation in the labor force or the choice to work is positively impacted by education (Psacharopoulos & Tzannatos, 1989). Education also tackles the possibility of a drop in female participation as a result of higher incomes and initiatives to support women's education (Lincove, 2008). Labor supply results in two decisions: whether an individual joins the labor market and how much time an individual allocates to work (Ehrenberg & Smith, 2018; Borjas, 2020). Within labor supply, there are theories on work decisions and household production.

Goldin (1994) explains that when a country's income is meager and dominated by the agricultural sector, women's education levels are low, and they are classified as paid workers but more often as unpaid family workers (especially in family farming). Critically, Goldin's (1994) description of women's low levels of education in low-income countries and the dominance of the agricultural sector illustrates conditions relevant to many OIC countries, which often face similar challenges regarding educational inequality and agriculture-based economies. Many OIC countries still rely on family farming, where women are frequently engaged as unpaid laborers, doing household chores or working in the undervalued informal sector. However, while ICTs have great potential to improve access to education and skills training, the challenges lie not only in the availability of the technology itself but also in structural factors that hinder its adoption and utilization, such as limited infrastructure, low digital literacy, and social norms that limit women's role in the formal sector and digital economy. Without supportive policies and

significant social transformation, ICT alone will not be enough to drive change in women's labor force participation in OIC countries. There is a risk that technology may exacerbate gender disparities if women do not have equal access or if they are marginalized in the broader application of technology.Therefore, the relevance of ICTs in increasing women's labor force participation in OICs requires a more holistic approach, which not only introduces technology but also involves improvements in education policies, economic empowerment, and changes in social and cultural norms that limit women's potential.

2.3. ICT and Female Labor Force Participation

The development of ICT, particularly the Internet, has had a broad impact, especially on the labor market. ICT, particularly the Internet, can help users search for job information and be effective for women already working (Nguyen-Phung et al., 2024; Ngoa & Song, 2021; Raja et al., 2013). Studies by Dettling (2017) indicate that while single women are unaffected, married women who utilize high-speed Internet are more likely to participate in the labor force. Female labor force participation is positively impacted by Internet and mobile phone adoption in developing nations (Omotoso & Obembe, 2016). Similar results were found by Watson et al. (2022) in the Indo-Pacific region. The development of ICT not only empowers women but also provides transparency and comprehensive information about the labor market, thereby increasing female labor force participation (Roztocki et al., 2019; Chun & Tang, 2018).

2.4. Regional Differences in ICT's Impact

The effect of ICT on female labour force participation may vary across countries. ICT developments also give women a more flexible workplace by enabling them to work remotely from home or another location, which reduces costs and saves time (Suhaida et al., 2013). ICT has a favourable impact on women's labour force participation in 48 African countries (Efobi et al., 2018; Asongu & Odhiambo, 2019; Ngoa & Song, 2021). Research on the influence of ICT on the labor force participation of women in Saudi Arabia also demonstrates favorable outcomes. Samargandi et al., (2019) In Turkey, on the other hand, no correlation was observed between ICT and female labor force participation. These different research findings have led to the debate that the influence of ICT and education in a country or region may have different effects.

Research showing different results on the effect of ICTs on women's labor force participation across countries, such as that found by Samargandi et al., (2019), opens a critical discussion on the factors that influence the impact of these technologies. In Saudi Arabia, ICTs were shown to increase women's participation in the labor force, while in Turkey, no significant relationship was found between the two. Several contextual factors, such as the level of economic development, cultural norms, gender policies, and educational aspects, likely influence this difference. In Saudi Arabia, with education policies that support women's empowerment and better access to technology-based skills training, women are more likely to utilize ICT for remote work. In contrast, in Turkey, despite more equitable education of women and more progressive gender policies, the influence of ICTs may be more limited due to inequality in access to technology and relevant training, especially in less developed regions. In addition, cultural norms also play an important role; in Saudi Arabia, ICTs provide opportunities for women to work without leaving home, which is more culturally acceptable, while in Turkey, although social norms are more supportive of women's involvement in the labor market, infrastructure barriers and lack of ICT-based training may limit their impact. These differences in results suggest that understanding the impact of ICTs requires in-depth analysis that consider the interaction of economic, cultural, gender policy, and educational factors in each country.

Several research gaps need to be further explored based on the existing literature. Firstly, the different research results on the impact of ICTs on women's participation in countries such as Saudi Arabia and Turkey indicate the importance of contextual factors, such as economics, gender policies, cultural norms, and education, which need to be analyzed more deeply. Second, although education is associated with increased women's participation, there is still a need for research on how ICT-based education and training can further optimize its impact, especially in developing countries. Third, infrastructure barriers and unequal access are significant obstacles to ICT adoption, so research on policies and infrastructure improvements to increase women's access is urgently needed.

3. Methods

This research looks at how education, in the context of ICT, influences women's involvement in the labor force in OIC member nations. Although there are 57 OIC members, only 53 are covered in this study because of data restrictions. The four countries not included in this study do not significantly impact the results, given the similar economic, social, and political characteristics of the OIC member countries as a whole. These countries are identical to those in the sample in terms of women's education levels, labor force participation, and access to technology. Secondary data from UNDP, the World Development Indicator, and SESRIC are used in this study. The 2008–2021 timeframe is covered by the data. This study uses data from 2008 to 2021 because ICT, especially internet use in OIC member countries, began to be significantly used from 2008. The adoption of ICT, especially the internet, began to be substantially utilized in 2008 in various lives in many OIC countries, including in education and employment. In addition, using data in this range is relevant to transforming the digital economy in many countries, including OIC member countries. Two categories—high-income and low-income OIC countries—are used in the calculation to examine the impact of ICT on female labor force participation in OIC member nations. Upper-middle-income and high-income OIC countries are included in the category of high-income countries. OIC nations that fall within the lower-middle-income and low-income categories are considered low-income nations. This classification is based on the income classification system used by the World Bank.

The study's dependent variable is the participation rate of women in the labor force. The three independent variables are education, financial development, and ICT. The association between women's educational attainment and ICT as well as the relationship ICT and financial development in OIC nations are the study's interaction variables. Examining the influence of women's education in OIC countries is intriguing because it is suspected that there are differences in the treatment of women with good education and those with less education. Women with less education are more likely to have restricted access to official financial services and to find it difficult, if not impossible, to receive information. Additionally, women with low education also have limited economic opportunities (Okoyeuzu, 2020).

Table.1. Operational Definitions of Variables

Variable	Definition	Unit	Sources
Female Labor Force Participation (FLFP)	FLFP is the ratio of economically active females aged 15 to 64 to all females aged 15 to 64 in each member nation of the Organization of Islamic Cooperation (OIC).	Percentage	(OIC-SESRIC, 2024)

ICT	ICT in people's use of the Internet throughout the previous three months. Computers, mobile phones, digital TVs, and other gadgets can all access the Internet.	Percentage	WDI
Femaleeduc	ear of schooling is the Average time female individuals spend in OIC member countries on formal schooling.	Years	UNDP
Financial Development	refers to the financial resources that banking institutions and other deposit-taking organizations lend to the private sector. These resources can be obtained through loans, trade credits, equity securities purchases, and other receivables that create obligations to repay. These claims include credit to governmental enterprises for some countries.	Percentage	WDI
Fertility	Fertility rate per woman.	Percentage	WDI
Manufacturing sector	represents the manufacturing sector's value addition, which is the manufacturing sector's net output after all outputs have been added and intermediate inputs have been subtracted. The value added is computed without accounting for the deterioration and depletion of natural resources or the depreciation of manufactured assets. Value added origins are ascertained using the International Standard Industrial Classification (ISIC). ISIC divisions 15–37 include the manufacturing industry. The value added is computed as a GDP percentage.	Percentage	WDI
Service sector	The value added to government and transportation, wholesale and retail commerce (including hotels and restaurants), financial, professional, and personal services including real estate, healthcare, and education, are all included in the value added to the services sector. Imputed bank service fees and customs duties are also included.	Percentage	WDI
Trade Openness	GDP is calculated by dividing total exports and imports of goods and services.	Percentage	WDI
Rule of Law	The degree of public trust, adherence to contracts, the authority of courts and police, and the public's perception of violence and crime all contribute to the rule of law.	The value ranges from -2.5 to 2.5	WGI
Political Stability	It gauges opinions about possible political unrest and violence with political motivations, such as terrorism.	The value ranges from -2.5 to 2.5	WGI

In order to examine the association between ICT and female labor force participation in OIC member nations, panel data regression analysis is used in this study. By integrating cross-

sectional and time series data, panel data improves sample size and boosts data variability. More significant variability in an independent variable leads to lower standard errors in its coefficient estimates (Ibrahim & Arundina, 2022). Baltagi (2013) points out that panel data models offer advantages such as controlling for individual diversity, reducing collinearity effects among variables, and increasing degrees of freedom. Moreover, panel data models are more efficient in identifying and measuring effects than other models. However, panel data analysis presents challenges such as autocorrelation and heteroskedasticity issues.

To address these challenges, choosing the best model among Random Effects (RE), Pooled Least Squares (PLS), and Fixed Effects (FE) Models is essential. Each model has unique characteristics. For example, PLS does not explicitly account for unobserved heterogeneity, whereas FE and RE models do (Gujarati & Porter, 2009). The treatment of β_i differs among these models: Fixed Effects consider β_i as parameters in regression or intercepts, while Random Effects treat β_i as random error components. Consequently, if β_i and control variables are correlated, the Random Effects model may yield inconsistent estimation results (Hsiao, 2005). The estimation model for this study is as follows:

$$
\begin{aligned}
FLFP_{i,t} = \ & \beta_0 + \beta_2 ICT_{i,t} + \beta_3 femaleeduc_{i,t} + \beta_4 Findev_{i,t} + \beta_5\big(ICT_{i,t} \times femaleeduc_{i,t}\big) + \\
& \beta_6\big(ICT_{i,t} \times Findev_{i,t}\big) + \beta_7 fertility_{i,t} + \beta_8 Manufacturing\ sector_{i,t} + \\
& \beta_8 Service\ sector_{i,t} + \beta_9 Trade_{i,t} + \beta_{10} Political\ Stability_{i,t} + \\
& \beta_{11} Control\ of\ Corruption_{i,t} + \varepsilon_{i,t}
\end{aligned}
\tag{1}
$$

4. Result and Discussion

4.1. Descriptive Analysis

Base on Table 2. between 2008 and 2021, the percentage of women in the OIC work force varies between 5.16 and 82.42 percent, with an average of 42.48 percent. In OIC countries, the standard deviation of female labor force participation is 18.23. Columns (4) and (5) display the standard deviation of female labor force participation, which indicates that the variation within and between countries is larger.

Table.2. Summary Statistics

Variable	Obs	Mean	Std. Dev.			Min	Max
			Between	Within	Overall		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Flfp (%)	742	42.48	18.21	2.60	18.23	5.16	82.42
ICT (%)	742	35.62	24.81	15.21	28.92	0.25	100
Financial development (%)	742	31.32	25.01	8.27	26.13	0	138.42
Female education (Years)	742	6.08	3.32	0.63	3.35	0.37	12.53
Fertilitas (%)	742	3.65	1.49	0.26	1.49	1.33	7.54
Manufacturing sector (%)	742	11.51	5.82	1.97	6.09	0.77	48.95
Trade openness (%)	742	73.88	32.16	11.53	33.90	14.88	191.87
Service Sector (%)	742	3.740	2.015	5.29	5.66	-31.7	43.36
Rule of law	742	-0.58	0.62	0.16	0.63	-2.1	0.98
Political stability	742	-7.76	0.89	0.34	0.95	-3.0	1.39

In addition, it is known that the average years of schooling for women in OIC member countries is six years. On the other hand, the between standard deviation of the average years of schooling is higher than the within standard deviation. This condition means that the disparity in

the average years of schooling for women between OIC member countries is more significant than that within a single OIC member country from 2008 to 2021. Meanwhile, the percentage of ICT in OIC member countries ranges from 0.25 percent to 100 percent. This condition indicates a very diverse level of internet usage in each OIC member country from year to year. This condition is supported by a high standard deviation of 28.92 percent. From this average, it can be interpreted that internet usage in OIC member countries is still low. In addition, the between standard deviation of internet usage in OIC countries is higher than the within standard deviation. This condition means that the disparity in internet usage between OIC member countries is higher than in internet usage within a single country from 2008 to 2021.

4.2. Inferencial Analysis

In panel data estimation, several alternatives can be used, such as Pooled Least Squares, Fixed Effects, and Random Effects. Each option has different characteristics. Several steps are needed to select the best estimation from these choices. First, the Chow test must be used to select the optimal model between Pooled Least Squares and Fixed Effects. The following are the Chow test results:

Table.3. Chow Test and Hausman Test Results

Model	P-value	
	Chow Test	**Hausman Test**
High-Income Countries	0.000	0.0003
Low Income Countries	0.000	0.0018

The null hypothesis H_0 is rejected since the p-value is less than 0.05, as shown by the above Chow test results. Stated differently, the Fixed Effect model outperforms the Pooled Least Squares approach. The Hausman test must be performed in order to determine which model—Fixed Effect or Random Effect—is better (Gujarati & Porter, 2009). Table 3 demonstrates that the p-value is smaller than alpha (0.05), resulting in the rejection of H_0 and the recommendation of the Fixed Effect model. Estimates for high-income and low-income OIC member nations are separated into two categories in Table 4 of the modeling. Among the OIC's member nations, there are 20 high-income and 33 low-income nations.

4.3. Discussion

The estimated effect of ICT on female labor force participation rates in high- and low-income OIC member countries is shown in Table 4. The presence of an interaction factor in the model precludes a direct interpretation of the ICT coefficient. More computations are needed to determine the interaction variable's partial effect in order to determine how it influences female labor force participation. The average sample value is a regularly used measure to determine the net influence of the interaction variable (Wooldridge, 2013). Based on Table 4 Column 1, which represents the estimation for high-income OIC nations, the estimation results can be computed as follows, with reference to the net effect calculations by Kartiasih (2022) and (Asongu & Odhiambo, 2020):

$$\frac{\partial\left(FLFP_{i,t}\right)}{\partial\left(ICT_{i,t}\right)} = \beta_1 + \left(\beta_4 \times \overline{femaleeduc_{i,t}}\right) + \left(\beta_5 \times \overline{findev_{i,t}}\right)$$
$$= -3.9026 + (1.3792 \times 8.92) + (0.8062 \times 45.47) = 41.16 \qquad (2)$$

$$\frac{\partial\left(FLFP_{i,t}\right)}{\partial\left(Femaleeduc_{i,t}\right)} = \beta_2 + \left(\beta_4 \times \overline{ICT_{i,t}}\right)$$

$$= 0.726 + (1.3792 \times 57.96) = 80.67 \tag{3}$$

$$\frac{\partial\left(FLFP_{i,t}\right)}{\partial\left(Findev_{i,t}\right)} = \beta_3 + \left(\beta_5 \times \overline{ICT_{i,t}}\right)$$

$$= -0.0905 + (0.8062 \times 57.96) = 46.64 \tag{4}$$

According to the computation above, the average length of education for women in high-income OIC nations is 8.92 years, and their average level of financial development is 45.47 percent.

Table.4. Result of Fixed Effect of ICT's Effect on Female Labor Force Participation in OIC Countries

Variabel	(1) High Income	(2) Low Income
ICT	-3.90255***	-1.25916
	(0.88483)	(1.28347)
Femaleeduc	0.72600	-3.70879
	(1.92946)	(3.10736)
Femaleeduc × ICT	1.37920*	-0.84459
	(0.75446)	(0.86482)
Findev × ICT	0.80622**	1.90063***
	(0.35784)	(0.63323)
financial development	-0.09055	0.75325
	(0.84141)	(1.31166)
Femaleeduc	0.72600	-3.70879
	(1.92946)	(3.10736)
Fertility	-5.45249*	1.45124
	(3.13665)	(3.36473)
Manufacturing	-0.07192	-0.13486
	(0.12299)	(0.10430)
Service	0.04901*	0.01488
	(0.02706)	(0.03113)
Trade	0.02004	-0.03695
	(0.02043)	(0.02509)
Rule of law	2.17443**	0.30316
	(0.98654)	(1.21163)
Political stability	-0.28863	0.71603
	(0.53799)	(0.89170)
Cons	34.75333***	42.24341***
	(3.84564)	(3.60215)
Observations	280	462
Groups	20	33
Prob>F	0.0003	0.0000
R-Square	0.6499	0.2246

Information: * $p < .10$, ** $p < .05$, *** $p < .01$, ( ) standard error. This estimation uses robustness, controls for changes in time with year dummies.

Source: Data processing results

In high-income OIC nations, the average ICT usage rate is 57.96%. These calculations demonstrate that, in high-income OIC nations, there is a positive correlation between ICT and women's education and between ICT and financial development. The ICT, female education, and financial development variables provide positive coefficients from the conditional marginal effect. Accordingly, in high-income OIC member nations, the relationship between ICT and women's education as well as the relationship between ICT and financial growth, may enhance the participation of women in the labor force. If women's education improves and each of the high-income OIC countries is well-positioned for financial development, then more women will participate in the labor force.

The aforementioned findings suggest that education improves women's capacity to use ICT, particularly the internet, for beneficial goals like job hunting, training, and education, or full- or part-time work from home. However, it is also possible to understand this as meaning that in high-income OIC member nations, the quality of education can limit the use of ICT, particularly the internet, in order to boost labor force participation. The results of Ngoa & Song (2021) are in line with the favorable impact of the interaction variable between ICT and education on female labor force participation in this study.

In the meantime, the estimates for low-income OIC member nations are shown in Table 4, Column 2. The estimation findings show that there is no substantial interaction between ICT and women's education in low-income OIC countries, hence this interaction was not calculated. In low-income OIC nations, education has not yet been able to propel the use of ICT to enhance female labor force participation, indicating that conditions for education are still subpar. Furthermore, the ICT infrastructure of OIC member nations with low incomes is subpar. According to Psacharopoulos & Tzannatos (1989), a nation's economic standing affects how much education a woman has and how much she chooses to work. Psacharopoulos & Tzannatos (1989) further clarify that social and cultural factors, as well as demographic variables like urbanization, have an impact on the causal association between education and female labor force participation.

5. Conclusion

Employment issues in OIC member countries include low and stagnant female labor force participation rates. Many factors influence female labor force participation rates, particularly in OIC member countries. Psacharopoulos & Tzannatos (1989) explain that education, age and fertility, religion, culture, and political conditions influence female labor force participation. Increasing investment in women's education enhances opportunities to secure diverse employment. Higher education levels drive increases in minimum wages, making it more attractive for women to join the workforce (Schultz, 1994). The educational conditions for women in OIC member countries vary significantly. The diversity in educational levels in OIC countries can be described based on their income groups. Optimizing women's education in OIC countries requires investment to improve educational quality to meet skill demands in the digital era.

The study's findings demonstrate that ICT significantly increases female labor force participation in high-income OIC nations, a trend that is fueled by highly developed financial systems and high levels of women's education. The study also shows that, when combined with strong financial development, ICT significantly increases female labor force participation in OIC low-income countries. Education hasn't been able to stop the rise in female labor force participation in OIC low-income nations, though.

6. References

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