

TRACE THE RELATIONSHIP BETWEEN DIGITAL TECHNOLOGIES AND FEMALE LABOUR FORCE PARTICIPATION IN INDIA

Parwinder Kaur, CT University

Rashmi Gujrati, CT University

Hayri Uygun, Recep Tayyip Erdogan University Rize

ABSTRACT

For emerging economies, information and communication technologies (ICTs) present an opportunity as well as new challenges for females. In contexts of efficient and effective performance, the development of new amenities and professions, and interconnection between many agents, ICT adoption, digitisation, and mechanisation offer tremendous new business opportunities. Female labour force participation and digitalization are frequently cited as one of the major drivers behind any country's protracted growth in the economy. The information comes from the World Development Indicator. The study period lasted from 2001 to 2018. Individual internet usage has an adverse influence on female labour force participation, according to the findings. Fixed Broadband Subscriptions and mobile cellular subscriptions were both negative. The policy implication of this study is that Government must develop and implement policies to increase female labour force participation. Despite its insufficient data, this investigation is interesting and necessary for international policy framework. It emphasizes the necessity of taking any action as well as the key to understanding why digitization is vital and how legislation may prioritize women's equal access to information technology and training as a means of enhancing their capabilities and literacy.

Keywords: Female Labour Force Participation; Individual Internet Usage; Fixed Broadband Subscriptions; Mobile Cellular Subscription.

INTRODUCTION

Female labour force participation and innovation are frequently cited as one of the major drivers behind any country's protracted growth in the economy. The Indian economy is one of the fastest growing economies in this age of globalisation. Economic expansion has always been a goal for humans, societies, and nations. The journey of digital revolution from the wheel to the World Wide Web exemplifies how people thrive on creating innovative goods, services, and production processes Digital India (2021). New platform or process design is critical to a country's long-term growth in the economy and better standard of living. The digital economy is still evolving at a tremendous speed. In the international market, only 100 gigabytes (GB) per day were used in 1992, but 45,000 GB per second were used in 2017 (Digital economy report 2019).

India has experienced strong growth, geographical economic shifts, an increase in female education levels, and rapid urbanization over the previous twenty-five years Dettling (2017). During the same time period, the female labour force participation rate dropped by 23% (Lahoti and Swaminathan, 2013). Education and instantaneous urbanisation in India have still not

stimulated more women to participate in the labour force. In terms of female labour force participation, India was ranked 120th out of 131 countries. Information Technology is a significant resource that female could use to conquer discriminatory practices, accomplish equality, well-being, and involvement in decisions that impact the quality of life for people and the prospective of their societies. The number of the exclusive mobile internet subscribers in developing countries increased from 728 million in 2010 to 1.8 billion in 2014. In 2016, 70% of Indian internet users (distribution) were male, while 30% were female. This was expected to change to 60% male users and 40% female users by 2020. In low- and middle-income countries, 54% of women use mobile internet, and the gender divide is reducing. Women are 20 percentage points less likely than males to use mobile internet, compared to 27% in 2017. The advancement in South Asia, where the gap shortened by 16 percentage points, was mainly responsible for the decrease (The mobile gender gap report, 2020).

Previous report concentrated on the microeconomic level instead of the macroeconomic or cross-national basis. Only a few studies have done cross-national research of this nature. A panel analysis of 48 African nations found that increasing ICT penetration leads to higher female labour force participation (Efobi et al. 2016). Only a few studies have done cross-national research of this nature. This research examines the crucial interconnections between digitization and female labour force participation. It also aims to explain the three components through which digital technology can be employed to accelerate women's labour market empowerment. There are three kinds of digitalizations: fixed broadband subscriptions, mobile broadband subscriptions, and wireless broadband subscriptions. Individuals who use the internet and have cell phone subscriptions. Furthermore, this research raises an essential point: technologies will not address the problem of female labour force participation for policymakers. Regardless of whether technology has a beneficial or negative influence on female labour force participation, governments must ensure that women have the appropriate skills and access to ICTs. As a result, they may be able to reach their full potential and engage in the labour market.

REVIEW OF LITERATURE

There is a large body of literature exploring the drivers of this phenomenon examined women's employment influences household technology adoption Suhaida et al. (2013). We propose a non-monotonic correlation between women's education and household technology adoption, with middle-income families buying appliances and upper-income families hiring domestic help. We reveal that increasing female labour force participation by a standard deviation increases washing machine ownership by 0.413 standard deviations, with the strongest effects in counties with pre-war education levels in the mid-ranges. Ngoa & Song (2021) this explored the impacts of information and communication technology (ICT) on female employment in 48 African countries. Over the period 2001–2017, we stipulate and estimate linear regression and dynamic panel data models using fixed effects (FE) and system-generalized method of moments (SYS-GMM) estimation Olivetti (2014). The three main findings are that ICT use (mobile phones and the internet) appreciably increases female labour force participation in Africa; this effect is boosted by financial development and female education; and ICT's impact on female employment in Africa is greatest in the industrial sector. Falk & Hagsten (2021) investigated the correlation between high fibre broadband access and municipality-level establishment dynamics Goos (2018). In contractual areas, a special emphasis is placed on micro, small, and medium-sized businesses. For the years 2010–2018, the data covers 290 municipalities in Sweden.

The results of the Fixed Effects and Spatial Durbin model estimations show a significant but minor direct effect of lagged high-speed broadband access, which is driven by micro establishments.

When the proportion of establishments with high-speed broadband access is combined with the presence of university-educated employees and researchers in the area, a strident trend emerges.

However, there is a scarcity of research on relationship between digitalization and female labour force participation in India. As a result, the primary goal of this study is to investigate the relationship between digitalization and female labour force participation.

There are five sections to this study. Section II provides a concise review of relevant literature and highlights the article's research needs, questions, and potential contribution. The study's aims are discussed in Section III. The study's hypothesis is represented in Section IV. Methods of data gathering and a variable discuss in Section V. The results and discussion is found in Section VI. The final section concludes and discusses policy implications.

Objectives of Study

1. To study the relationship between female labour force participation and fixed broadband subscription.
2. To see the relationship between female labour force participation and Individual using internet.
3. To investigate the relationship between female labour force participation and Mobile Cellular Subscriptions.

Hypothesis of Study

H₁: *There is positive relationship between Female labour force participation and fixed broadband subscription.*

H₂: *There is a positive association between women's engagement in the labour force and their use of the internet.*

H₃: *There is positive relationship Female labour force participation and mobile cellular subscriptions.*

Data and Methodology

This study's data spans the years 2001 to 2018. Data availability at the time of the study limited the periodicities of the variables. The data was gathered from global development indicator sources. The World Bank World Development Metrics provided the dependent variables, which included female labour force participation and digitalization parameters (individual internet usages, Fixed BroadbandSubscriptionsPer100People, and Mobile Cellular Subscriptions Per100 People). The data was analyzed using descriptive statistics and the correlation approach. Appendix 1 contains definitions and references.

Appendix 1 DEFINITIONS OF VARIABLES		
Variables	Description	Sources
Female Labor Force Participation	Employment to population ratio, 15–64, female (%) (Modeled ILO estimate).	World Development indicator
Internet	Internet individual users (per 100 people).	World Development indicator
Mobile phone	Mobile cellular subscriptions (per 100 people).	World Development indicator
Fixed Broadband subscription	Fixed BroadbandSubscriptionsPer100People	World Development indicator

Result and Analysis

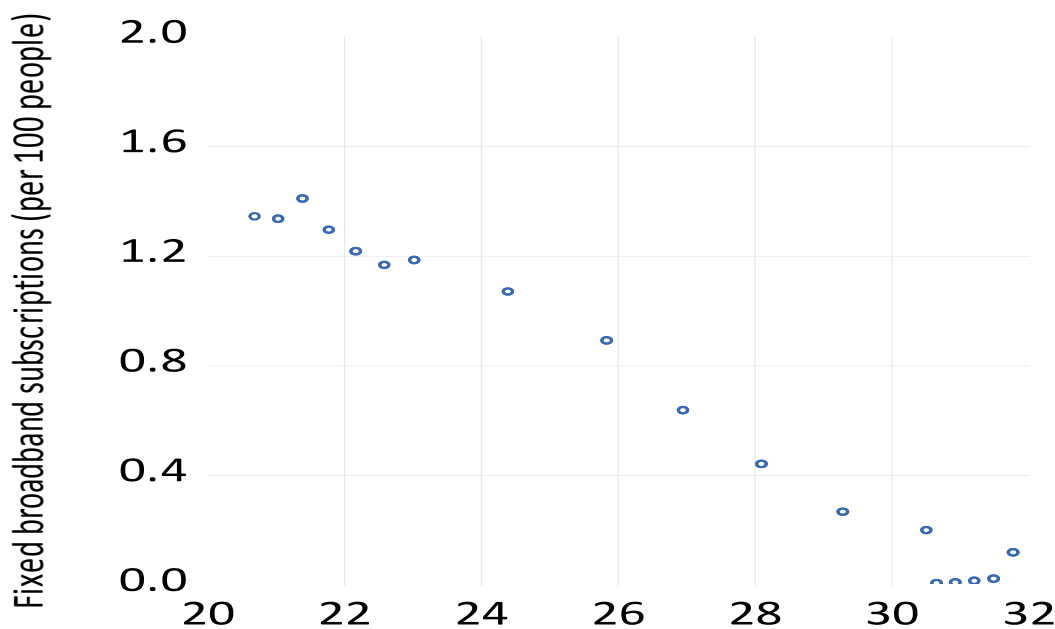
In a time series investigation, preliminary analysis, including visual inspection is required. Appendix 1 contains visual examinations of the variables used in the research. Over the analysed time, the diagrammatical analysis demonstrates increased tendencies in digitalization and a gradual decline in female labour force participation rate. Table 1 shows the basic descriptive statistics; all of the variables observed are positively skewed, with the exception of individuals who use the internet. The no normality hypothesis is supported by the statistics, which indicate a light tail. In comparison to other factors, the summary data show that Mobile Cellular Subscriptions have a high average Table 1 & Figure 1.

Table 1 DESCRIPTIVE STATISTICS				
Statistics	Female labour force participation	Fixed BroadbandSubscriptionsPer100People	Individuals Using The Internet Of Population	Mobile Cellular Subscriptions Per100People
Mean	26.33667	0.700135	10.76419	44.55195
Median	26.41000	0.763238	8.785000	52.03104
Maximum	31.79000	1.408310	32.00000	87.31774
Minimum	20.71000	0.004651	1.537876	0.608372
Std. Dev.	4.205400	0.558751	8.883253	33.88060
Skewness	-0.005117	-0.083594	0.787197	-0.107918
Kurtosis	1.350977	1.290529	2.736380	1.329357
Jarque-Bera	2.039537	2.212682	1.911161	2.128224
Probability	0.360678	0.330767	0.384589	0.345034

Source: Author's calculations.

Variables	Female labour force participation	Fixed BroadbandSubscriptionsPer100People
Female labour force participation	1.000000	
t-Statistic	-----	
Probability	-----	
Fixed BroadbandSubscriptionsPer100People	-0.990634	1.000000
t-Statistic	-29.02086	-----
Probability	0.0000	-----

Source: author’s calculation from data.



Labor force participation rate, female (% of female population aged 15 and over)

FIGURE 1

FIXED BROADBAND SUBSCRIPTIONS PER100 PEOPLE AND LABOR FORCE PARTICIPATION RATE

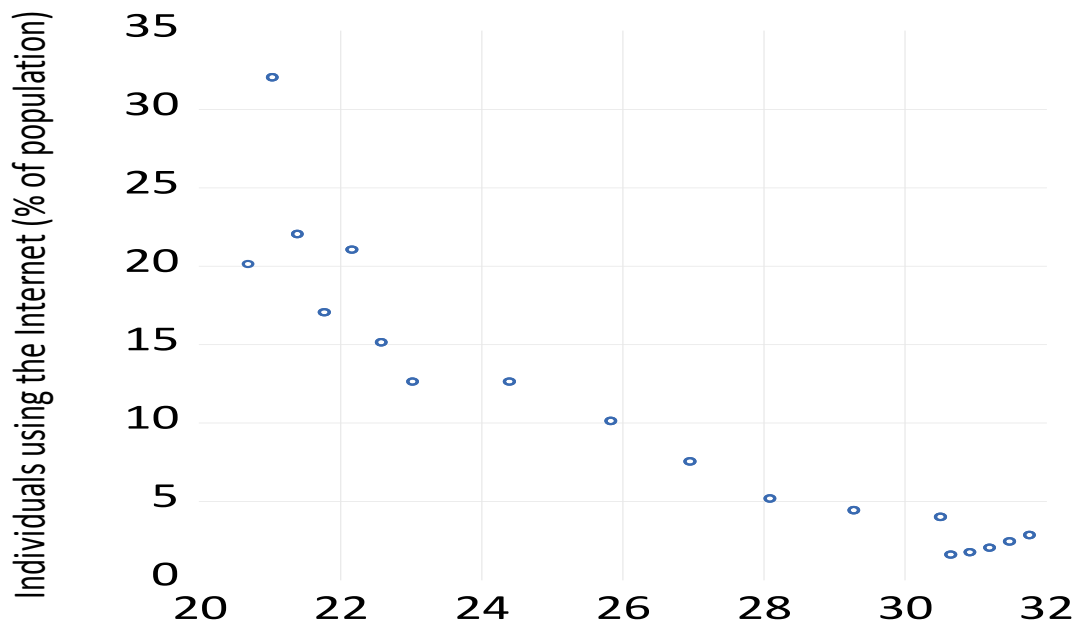
Source: World Bank, 2020.

The hypothesis that elevated Fixed Broadband Subscriptions Per100 People lead to decreased female labour force participation was investigated using correlation analysis, but the association was not considered to be significant, and the relationship was found to be in the reverse direction. As a result, Hypothesis 1 was disproved. The association between Fixed Broadband Subscriptions Per 100People and female labour force participation is not linear, as shown in Table 2. The Correlation coefficient (--29.0) indicates that female labour force participation and Fixed BroadbandSubscriptionsPer100People are inversely related Table 3 Figure 2.

Table 3
RELATIONSHIP BETWEEN FEMALE LABOUR FORCE PARTICIPATION AND INDIVIDUALS USING THE INTERNET OF POPULATION

Variables	Female labour force participation	Individual using internet (%population)
Female labour force participation	1.000000	
Correlation	-----	
t-Statistic	-----	
Individuals Using The Internet Of Population	-0.924495	1.000000
Correlation	-9.701022	-----
t-Statistic	0.0000	-----

Source: author’s calculation from data.



Labor force participation rate, female (% of female population a

FIGURE 2
INDIVIDUALS USING THE INTERNET OF POPULATION AND LABOR FORCE PARTICIPATION RATE

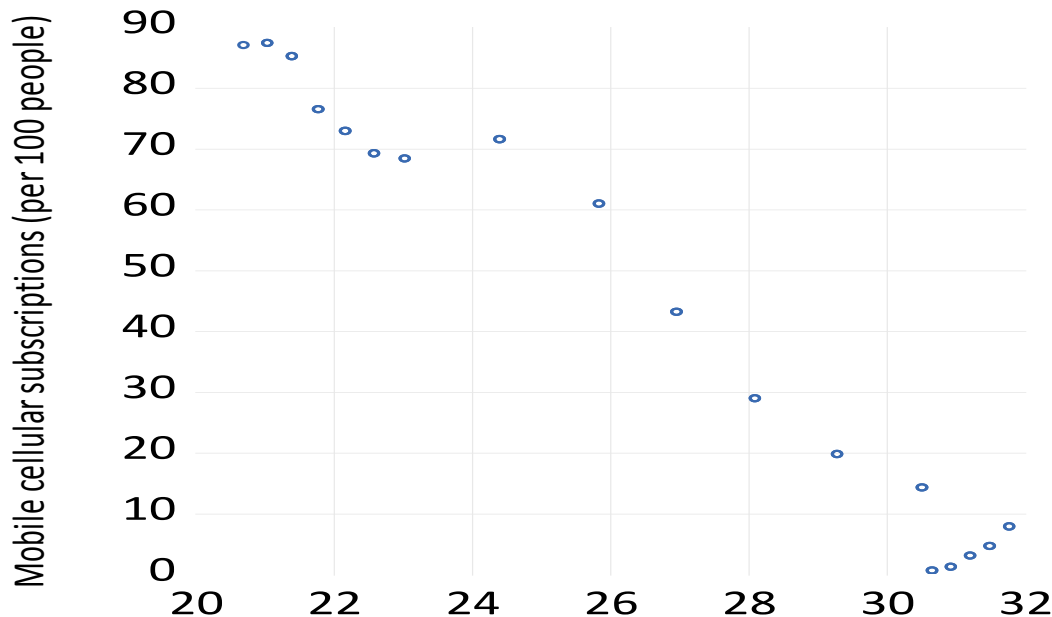
Source: World Bank, 2020.

Table 4
RELATIONSHIP BETWEEN FEMALE LABOUR FORCE PARTICIPATION AND MOBILE CELLULAR SUBSCRIPTIONS PER100PEOPLE

Variables	Female labour force participation	Mobile Cellular Subscriptions Per100People
Female labour force participation	1.000000	
Correlation	-----	

t-Statistic	-----	
Mobile Cellular Subscriptions Per100People	-0.984851	1.000000
Correlation	-22.71839	-----
t-Statistic	0.0000	-----

Source: author’s calculation from data



Labor force participation rate, female (% of female population a
FIGURE 3
MOBILE CELLULAR SUBSCRIPTIONS PER100PEOPLE AND LABOR FORCE PARTICIPATION RATE

Source: World Bank, 2021.

In addition, we looked at the association between those who use the internet and female labour force participation in the analysis. It can be seen in the scatter plots in Figure 2 that individuals utilising the internet have a negative correlation to the population. There is a negative correlation coefficient (-9.701022) between those who use the internet and female labour force participation. As a result, the second hypothesis is similarly unfounded. The inverse link between Mobile Cellular Subscriptions and female labour force participation is depicted in Table 4. The larger the proportion of mobile cellular subscriptions, the lesser the participation of women in the labour force. The value of correlation was (22.71839) Figure 3.

Conclusion and Policy Implications

This study is the first to use correlation coefficient to investigate the relationship between digitalization and female labour force participation from 2001 to 2018. According to the findings of this study, there is a negative association between digital technology and female labour force participation, which supports the role incompatibility hypothesis. According to the data, individual internet usage has a negative impact on female labour force participation. Both fixed broadband subscriptions and mobile cellular subscriptions were down.

Our results demonstrate that strategies promoting the use of new technologies in developing countries should take into account the benefits of increasing female participation in the labour market. To popularise the digital technologies and services required to develop firms and female entrepreneurship, the government should strengthen digital inclusion associated with financial inclusion.

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