Educate, Connect, Employ: Closing Gender Gaps in the Global South

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Abstract: Digital technologies are broadly claimed as inclusive technologies enabling the eradication of various social and economic gaps. Our study builds on the hypothesis that growing cross-and within-country digitalization gradually mitigates multidimensional gender gaps of different backgrounds. According to worldwide statistics (WDI, 2025), developing countries severely suffer from gender inequalities (digital, educational and labor), which negatively affect developing economies` development due to keeping women as "overlooked resource" and being ignored as unpaid domestic labor. This work contributes providing evidence on gender gaps in educational and labor market dimensions; but also, by estimating cross-country inequalities in this regard. By estimating the size of gender gaps, we verify if growing digitalization contributes to gender gaps eradication at the country`s individual level in the group of low-income and lower-middle-income countries. We assess whether cross-country divides in terms of gender gaps are growing or diminishing. Using the World Bank (2025) data, we use the sample of 24 low-income and 46 lower-middle-income countries, in the period from 2000 to 2023. We use a panel dataset encompassing 9 variables – extracted from the World Development Indicators 2025, approximating women's and men's access to digital technologies, education and labor market, including composite indicators delivered by the United Nations Development Programme, approximating gender socio-economic discrimination.

Keywords: Gender gaps, Digitalization, Labor market, Developing countries

1. Introduction

Women in the Global South face structural problems regarding education, finding work and getting basic resources. This continues despite decades of efforts to achieve gender equality, such as the Beijing Platform for Action, the Maputo Protocol, and the African Women's Decade (Alozie & Obong, 2017). The spread of digital technologies gives hope that digitalisation helps to break down barriers and enable women to reach economic potential. It is becoming lear that women need access to the internet, cell phones, and digital services. It allows them gain skills, expand social network, get involved in school, work, and public life (Alozie & Obong, 2017). Empirical evidence shows that women in low- and lower-middle-income countries continue to face difficulties in accessing and utilising digital technologies, and these disparities reflects pre-existing social and economic inequalities (Mariscal et al., 2019). Prior research from Raihan et al. (2025) recognises women as a susceptible group facing digital exclusion, grappling with structural barriers including financial constraints, reduced digital literacy, insecure online environments and culturally unsuitable content. David and Phillips (2022) emphasise the systems theory that suggests that small changes in women's digital inclusion are challenging to sustain. This problem happens because different types of exclusion, like digital, social, and economic, work together in feedback loops to make low-inclusion traps. Furthermore, the literature associates the gender digital gap with persistent disparities in education and employment (Rashid, 2016; Alozie & Obong, 2017; Mariscal et al., 2019). Research from Africa, Latin America and South Asia indicates that reduced educational attainment, diminished labour market engagement and domestic responsibilities restrict women's access to and utilisation of ICT. Digital exclusion even makes it harder for them to get better jobs and make more money (Galperin & Arcidiacono, 2021). Even though a lot of research has been done on this topic, there are still three important gaps. First, much of the empirical work is either cross-sectional or examines only one country or region. This restriction impedes our understanding of the concurrent evolution of digitalisation and gender disparities across low- and lower-middle-income economies. Second, most studies examine digital access, education, and job-market outcomes separately. Nevertheless, policy frameworks are increasingly emphasising the connections among these things.

This paper contributes by examining digitalisation and gender inequality across 70 low- and lower-middle-income countries from 2000 to 2023. First, we show changes in gender gaps have using a panel of indicators on internet use, education, and labour-market participation for both genders and indices of gender inequality. Next, we examine whether greater digitalisation is associated with lower inequality in education and job outcomes. We also use Gini indices to monitor how gender gaps across countries are changing over time. This paper also aims to understand if digital convergence between countries has made gender outcomes more equal and add to ongoing theoretical debates about whether digitalisation in the Global South is mainly a way to include more people or to make gender inequalities worse or better.

2. Background

2.1 Digitalisation, Gender and Development in the Global South

Digital technologies play an increasing role in the development strategies of the Global South. They are expected to improve access to education, healthcare, finance and markets. In low- and middle-income countries, mobile broadband emerges as means of accessing the internet enabling use of online services without needing fixed infrastructure (Mariscal et al., 2019). Nonetheless, these opportunities for accessing digital services are not equitably distributed showing that women are 10% less likely than men to own mobile phones, use mobile internet, or possess the requisite skills to benefit from these services (Mariscal et al., 2019). In some low-income settings, traditional gender norms worsen women's limited access. Often, male household members own and control mobile phones and other devices, requiring women to obtain permission to use them (Rashid, 2016). This restricted utilisation of ICTs by women is associated with their lower educational attainment and socioeconomic status or greater domestic obligations (Alozie & Obong, 2017). Digital inequality also shows that women, along with other groups like low-income people, older adults, ethnic minorities, migrants, and people with disabilities are likely to be left out of the digital world (Raihan et al., 2025). Raihan (2025) further finds that the main obstacles to digital access are low income, the high cost of devices and internet connections, insufficient computers, and insufficient digital skills. Language, cultural relevance and worries about online safety make these problems even worse (Raihan et al., 2025). Consequently, the theory of the digital divide has evolved from a narrow focus on infrastructure to a broader understanding of digital (in)equity as a complex issue shaped by structural inequalities and intersectional identities (Raihan et al., 2025). The digital gender gap is more seen as a sign of and a cause of gendered development outcomes. When women are not allowed to use digital spaces, they have fewer opportunities to participate in the growing digital economy, access online public services, or use digital technologies for business and learning (Mariscal et al., 2019).

2.2 From Digital Divide to Digital Inequality, Systems and Feedback Loops

The initial generation of research on the digital divide concentrated on a dichotomous classification between individuals with access to networks and hardware and those without (Mariscal, 2005). Subsequent research broadened this viewpoint to encompass digital inclusion. David and Phillips (2022) call this bigger picture the 4A/5A frameworks. This includes not only connectivity but also awareness, affordability, skills, literacy and agency. This change has been significant for studying gender gaps because women may have formal access to technology but lack the skills and permission to use. Recent research indicates that an expanded view of digital gender disparities may still be inadequate to explain the worsening of these inequalities despite investments aimed at improving digital access and skills. David and Phillips (2022) contextualise women's digital inclusion within a complex system characterised by feedback loops and conditions of reduced inclusion. Their research indicates that digital, social, economic and political exclusions mutually reinforce each other. As a result, minor improvements in one area can quickly disappear unless actions are taken to address different types of inequality simultaneously. Additionally, recent literature on digital inequality have introduced the concept of adverse digital incorporation, referring to situations in which more privileged people derive greater value from less privileged people through digital systems (Heeks, 2022). Although most people in low- and middle-income countries are now part of some digital system, this has sometimes made inequalities worse (Heeks, 2022). The correlation between digitalisation and gender equality is not simplistic. Digitalisation can help women gain power, especially when it is part of larger efforts to improve education, decent work, and rights. In situations where deep-seated structural inequalities exist, the growth of digital technology may reinforce or worsen the hierarchies that already exist.

2.3 Gender Digital Gaps, Education and Labour Markets

Real-world studies show that differences between men and women in how they access and use digital technologies are linked to patterns of social inequality. Rashid's (2016) analysis of public access ICT venues in Bangladesh, Brazil, Chile, Ghana and the Philippines reveals that women's digital inclusion is impacted by their educational attainment and the accessibility of ICTs within the home environment. Women with tertiary education and home access to ICTs are more likely to be digitally included (Rashid, 2016). Disparities in education contribute to labour market inequalities that are shaped by digital technologies. Mariscal et al. (2019) argue that as more aspects of daily life and essential services move online, women lacking digital literacy are excluded from better-paying jobs. They also have trouble finding jobs online, which widens gender pay gap (Mariscal et al., 2019). The authors also stress that digital financial services can only help women become more financially included if they are connected to the internet and can build data capital through digital transactions (Mariscal et al., 2019). Additionally, the link between having a job and using the internet has been looked at more closely in Latin America. Galperin and Arcidiacono (2021) show that the gender gap in internet use in Ecuador, Guatemala, Mexico and Peru is primarily due to more men working. They say that if women worked as much as men did, the digital gender gap in these countries would be much smaller. They also find signs that being employed has a more substantial effect on women's chances of being online than on men's. This could be because women work in more digital technology-intensive fields. This finding is connected to our "Employ" dimension examining how digital access, sectoral employment patterns and gender gaps in the labour market are related. Also, evidence from Africa, Asia, and Latin America shows that women face social and cultural barriers when using digital technologies. Research indicates that patriarchal norms, domestic responsibilities and safety concerns constrain women's capacity to optimise digital tools. For instance, women often have little free time to use digital resources and may be explicitly told not to use their phones (Rashid, 2016; Mariscal et al., 2019). These cultural norms impact both educational and employment opportunities, which highlights the need to analyse gender inequalities across various areas rather than depending exclusively on digital metrics.

3. Materials and Empirical Settings

3.1 Data

Our research defines the empirical sample covering 70 low-, and lower-middle income countries (24 low income and 46 lower-middle income economies) from 2000 to 2023 using World Bank country classification (2026). Our panel encompasses 9 variables. First we use Internet Users ($IU_{c,y}$) to approximate the level of digital technologies adoption. Next, we use 8 variables showing the magnitude of labor market–related and education gender gaps: School enrollment, primary and secondary (gross) – gender parity index ($GPI_{c,y}$), gender equality rating[1] - CPIA ($CPIA_{c,y}$), Gender Development Index ($GDI_{c,y}$), Gender Inequality Index ($GII_{c,y}$), labor force participation rate, female/male (% of female/male population ages 15-64) ($LF_{c,y,F/M}$), vulnerable employment, female/male (% of female/male employment) ($VL_{c,y,F/M}$), wage and salaried workers, female/male (% of female/male employment) ($WG_{c,y,F/M}$) and contributing family workers, female/male (% of female/male employment) ($FM_{c,y,F/M}$). Our first indicator is Internet Users. In the perspective of gender-related analysis, the limited access to technological innovations is mirrored by women`s discrimination in access to education, restricted participation in e.g. labor market or public life. The Gender Parity Index for captures gender gaps in primary and secondary school enrollment reflecting early-stage inequalities that in further life translates into unequal opportunities on labor market. The, CPIA gender equality rating measures institutional commitment to ensuring gender equality**.** Next, Gender Development Index and Gender Inequality Index, they encompasses gender development disparities **i**n education, health, and income. Lastly, we use labor market indicators**:** labor force participation, vulnerable employment**,** wage and salaried workers and contributing family workers (each indicators used separately for women and man thus demonstrate economic gender inequalities). Our data are extracted from World Development Indicators 2025, International Telecommunication Union 2025, United Nations Educational, Scientific and Cultural Organization 2025 and United Nations Development Programme 2025.

3.2 Empirical Settings

Our empirical techniques combine descriptive statistics, absolute gender gaps calculations, nonparametric graphical approximations to visualize statistical relationship between variables and inequality measure – Gini index.

The absolute gender gap is defined as a difference between given variable for man ($X_{c,y,M}$) and women ($X_{c,y,F}$) in a given year (y). Hence the gender gap follows as:

$$GG_{c,y,X}=X_{c,y,M} - X_{c,y,F} \ , \qquad [1]$$

where $X_{c,y,M}$ is the X-variable value for men in $X - country$ and $X - year$, and $X_{c,y,F}$ – for women with analogous notations. The value of $GG_{c,y,X}$ shows the *„distance"* between men and women in given area thus the magnitude of gender gap (disparity). Put differently it demonstrates how much women need to catch-up to be equal to men in given field, in a given country and year.

If we hypothesize that *women perform worse than men* in given area, we expect the gender gaps to be as follows:

- $GG_{c,y,LF} > 0$, when women – compared to men, less actively participate in labor force;
- $GG_{c,y,VL} < 0$, when woman – compared to man, are more exposed to vulnerable employment;

[1] 1=low to 6=high

- $GG_{c,y,WG} > 0$, when woman – compared to man, are less probable to hold "paid employment jobs;
- $GG_{c,y,FM} < 0$, when woman, compared to man, are more exposed to be considered as "contributing family workers".

For analytical purposes we also express change in gender gap ($GG_{c,y,X}$) between two years y_{n+1} and y_n as:

$$\Delta GG_{c,y,X} = \Delta GG_{c,y_{n+1},X,M} - \Delta GG_{c,y_n,X,F} \,. \quad [2]$$

Next, we use locally weighted polynomial smoother is a nonparametric method used to graphically fit the curve displaying relationship between two variables, and thus we approximate the function having a general form:

$$f(.), \quad [3]$$

under assumption that all errors e_i generated by the model are identically zero. Having defined x_i as one of the covariates we can estimates the $f(.)$ by using the multivariate polynomial form where respective x_i is chosen to extrapolate:

$$y_i = f(x_i^*), \quad [4]$$

if $i = 1, \dots \dots k$, in the k-nearest neighborhood of x^*, with underlying assumption that f is the locally a smooth function.

Lastly, we adopt the classical Gini coefficient, where for given population attributed to values y_i, i=1…n, and if ($y_i \leq y_{i+1}$), the general formula for Gini coefficient is defined as:

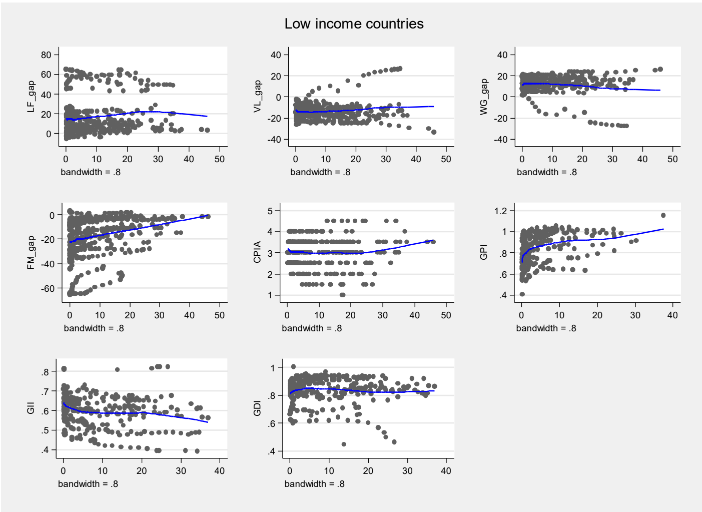
$$Gini = \frac{1}{n}\left(n + 1 - 2\,\frac{\sum_{i=1}^{n}(n+1-i)y_i}{\sum_{i=1}^{n} y_i}\right). \quad [5]$$

4. Results

Here below we discuss the results both for low-, and lower-middle income countries between 2000 and 2023. First, we note that descriptive statistics[2] show differences across low income and lower-middle income panels in terms of reported gender gaps, but also regarding digitalization (7.4% and 20.1% on average for low and lower-middle income group accordingly). The labor market-related gender disparities are also striking. On average, in low-income group the $LF_{c,y}$ gap is reported as 16.9%pp and almost 21% for lower-middle income group. Next for $WG_{c,y}$ the gap reaches 12%pp and 8%pp for low and lower-middle income panels accordingly. The most significant differences between low and lower-middle income countries are unveiled in for $FM_{c,y}$ as reported (-18.2%pp) for low, and (-11%pp) for lower-middle income group. The gender differences appear less striking in case of educational indicators showing that in this sphere women *versus* men inequalities are being gradually eradicated. Next, we examine three elements. First, we verify the relationship between growing digitalization *versus* gender gaps. Second, we calculate changes in absolute gender gaps for all variables. Third, we verify cross country differences in gender gaps and report if between 2000 and 2023 growing cross-country growing homogeneity or heterogeneity is unveiled. We expect, that increasing digitalization should be reflected in diminishing gender gaps. More specifically we expect that increasing deployment of digital technologies should be associated with declines of gaps regarding labor force participation, vulnerable employment, wage and salaried work and also contributing family workers. The above improvements are expected as higher digitalization enhances overall inclusion, shifts women`s ability to access labor market information, transit from informal and risk-exposed labors to formal and better secured jobs. Analogously, we expect that digitalization shifts help to close gender educational gaps through broadly implemented schooling opportunities. Figure 1 shows the statistical relationship between digitalization and gender gaps in 24 low-income countries between 2000 and 2024. We observe that the overall digitalization level remains relatively low, and no strong relationship between ICT shifts and gender gaps are observed. Relatively the strongest positive relationship is visible between $IU_{c,y}$ and $FM_{c,y}$ with calculated correlation (0.25) however it suggests that digitalization shifts enhanced even more $FM_{c,y}$ gaps. As for the remaining indicators the statistical relationship is scatter and rather unclear. It appear that the educational and economic gender gaps vary massively regardless of the digitalization level. Respective graphs on Figure 1 unveil that e.g. very similar gender gaps (see for instance for $VL_{c,y}$ or $WG_{c,y}$) are reported to highly differentiated digitalization levels (between close to 0% and above 40%). When we turn to educational indices the picture revealed is similar. More detailed and meaningful insights into the relationship between digitalization and gender gaps can be derived from Table 1 (see appendix) reporting absolute changes in

[2] Full table available on request.

digitalization level and labor market related gender gaps between 2000 and 2023 for each country. The first striking conclusion is that all countries in scope experienced shifts in digitalization with only some exceptions like Somalia, South Sudan or Central African Rep. Still, most of low-income counties made progress in Internet use, with the best examples of Gambia, Togo, Rwanda or Mali. In 12 out of 24 considered countries in the low-income panel experienced declines in gender gaps regarding labor force participation. For wage and salaried workers in only 9 countries the dropping gaps are observed. For vulnerable employment gaps the drops are reported for 11 countries (Niger and Gambia the most significant), and only 3 when contributing family workers are considered. Since vulnerable employment and contributing family work are considered as *destimuli* for socio-economic development in our case the $VL_{c,y}$ and $FM_{c,y}$ as well as their changes ($\Delta GG_{c,y,VL}$) and ($\Delta GG_{c,y,FM}$) must be interpreted reversely to $LF_{c,y}$ and $WG_{c,y}$. If $\Delta GG_{c,y,VL/FM} > 0$ gender gaps are dropping (positive change), and while $\Delta GG_{c,y,VL/FM} < 0$ gender gaps are growing (negative change). Considering the above Table 1 reports 15 economies where $\Delta GG_{c,y,VL} > 0$, and 21 economies where $\Delta GG_{c,y,FM} > 0$. These results show that the period between 2000 and 2023 resulted in decreasing gender gaps when vulnerable employment and contributing family workers indicators are considered. As for $FM_{c,y}$ the leader is Mozambique that noted $\Delta GG_{c,y,FM}$=33.02, and for $VL_{c,y}$ it is Syria where $\Delta GG_{c,y,VL}$=38.32. However, still, Gambia or Niger despite their relatively good progress in digitalization, the gender gap for vulnerable employment has risen.

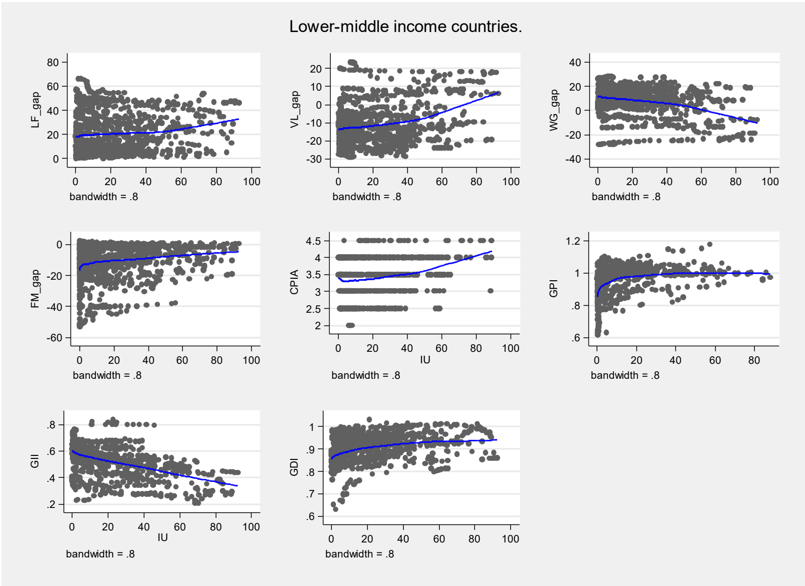


Source: Authors` elaboration. Note: on X-axis values of Internet Users (total).

Figure 1: Digital technologies adoption *versus* gender inequalities. Low income countries

Next, Figure 2 and Table 2 (see appendix) summarize the results for lower-middle income economies. Also in this case the overall relationship between deployments of digital technologies are not rigidly unveiled. Relatively the strongest negative statistical association is demonstrated between $IU_{c,y}$ and $GII_{c,y}$, with the correlation coefficient at (-0.49), showing that shifts in ICT are negatively associated with overall gender inequalities. Next, the correlation between $IU_{c,y}$ and $GDI_{c,y}$ and $IU_{c,y}$ and $WG_{c,y}$ are (0.35) and (-0.32) supporting the hypothesis that increases in digitalization goes along with increasing gender development and dropping gender gaps regarding wage and salaried workers. Slightly more moderate relationship we observe for $IU_{c,y}$ versus $VL_{c,y}$ as the r^2=0.31 indicating that ICT shifts diminish gender gaps in terms of vulnerable employment. Apparently, the demonstrated statistical associations are stronger compared to what was reported for the low-income panel, however – if we take a closer look at individual graphs on Figure 2, it is hard to delineate a clear pattern of relationships between digitalization and gender gaps. High gender gaps remain persistent even on the occasion of rapid digitalization. Analogously to Table 1 for low-income panel, Table 2 (see appendix) summarizes results regarding absolute changes in overall digitalization and labor market related gender gaps. First observation is that during the period 2000-2023 lower-income countries experienced shift in digitalization, even up to 80-90%pp of absolute growth in Internet usage. Such dynamic increases potentially brings better environment and "open windows of opportunities" for women in educational and economic empowerment. In case of $\Delta GG_{c,y,LF}$ and $\Delta GG_{c,y,WG}$ for which we expect the difference to be negative in value suggesting gender gaps diminishing regarding labor market participation and being engaged in wage and salaried jobs, we report promising changes in 29 out of 46 countries for $LF_{c,y}$ and in 23 for $WG_{c,y}$. As for the labor force participation gap the most significant drops are reported for: Bangladesh (-23.77), Nicaragua (-20.40), Eswatini (-15.42), and Cote d`Ivoire (-15.31).

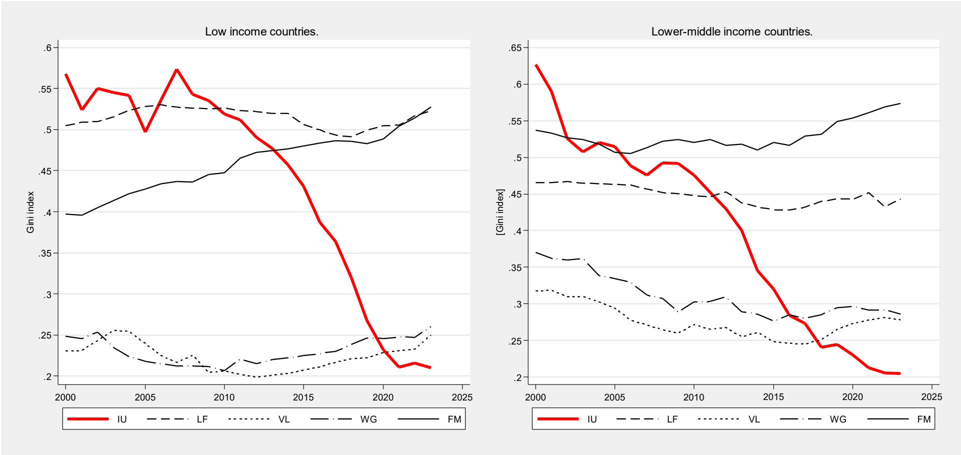
Unfortunately in the same group of countries in the remaining economies the $LF_{c,y}$ have worsened with the highest shift in Guine (+20.02). As women participate more actively in formal labor market activities that results in gender gaps diminishing the $WG_{c,y}$ also should drop as a consequence. In the panel of lower-middle income countries the decreasing gender gap ($\Delta GG_{c,y,WG} < 0$) is reported for 23 economies, with the highest drops in Morocco (-14.56). Unfortunately, if still $\Delta GG_{c,y,WG}$ is considered in Pakistan and Bhutan the gender gap has massively worsened resulting in $\Delta GG_{c,y,WG}$=(+18.49) and $\Delta GG_{c,y,WG}$=(11.53). Lastly, in case of vulnerable employment and contributing family workers gender gaps, as previously explained we expect $\Delta GG_{c,y,VL} > 0$ and $\Delta GG_{c,y,FM} > 0$. The best progress is observable for $FM_{c,y}$ gender gaps as in 31 out of 46 the $\Delta GG_{c,y,FM} > 0$. The countries fording ahead the most are Myanmar – (+39.08), Bangladesh – (+28.0) and Cambodia – (+26.47). As for the vulnerable employment the $\Delta GG_{c,y,VL} > 0$ is traced for 21 economies with the best progress achieved in Egypt – (+14.95), Morocco – (+14.45) and Myanmar – (+11.32).



Source: Authors` elaboration. Note: on X-axis values of Internet Users (total).

Figure 2: Digital technologies adoption *versus* gender inequalities. Lower-middle income countries

Figure 3 displays time trends in cross-country inequalities approximate by Gini index, both for low-, and lower-middle income countries, for: $IU_{c,y}$, $LF_{c,y}$, $VL_{c,y}$, $WG_{c,y}$ and $FM_{c,y}$.. This evidence extends the previous analyses offering a dynamic and distributional perspective on how cross-country digital inequalities and labor market related gender inequalities related over the period 2000-2023. Moreover, by tracking the Gini index for Internet users variable and other 4 gender gap related variables, we track how these inequalities evolve in two examined country income groups. The first observation is that the strongest downward trend is reported for the $UI_{c,y}$ Gini index for both country groups, which coincides with the evidence provided in Tables 1 and 2 on strong increases of ICT deployment. The evidence in Figure 3 adds to the previous that this shifts resulted in drops in cross-country digital inequalities and led to growing cross-country homogeneity in terms of digital technologies deployment. Drops in digital inequalities are reported for the same time interval (2005-2010) in low-, and lower-middle income countries, were drops from the level of Gini index c.a. 0.5-0.6 to 0.2. The Figure 3 also unveils overtime dynamics Gini indices for labor-market related gender gaps, and in this time these dynamics differ not only between variables but also the picture is different for low income and for lower-middle income countries. In the lower-middle income group the decrease of cross-country inequalities regarding gender gaps for vulnerable employment and wage and salaried workers is relatively stable over time, with – however, slight upswing after year 2020. As for the labor force gender gap cross-country inequalities barely moved between 2000 and 2023 (from 0.44 to 0.46), and for contributing family workers the light upward trend is visible (from 0.53 in 2000 to 0.57 in 2023). The picture for low income group is even less promising. In terms of digital technologies adoption enormous cross-country inequalities drops are reported (Gini index fell from 0.56 to 0.21), thus the low income group became relatively homogenous. For gender gaps in vulnerable employment, wage and salaried workers and labor force participation the cross-country inequalities have slightly risen. If we consider the gender gaps in regard to contributing family workers the picture is the worst since the Gini increased from 0.39 in 2000 to 0.52 in 2023, picturing growing cross-country disparities.



Source: Authors` elaboration.

Figure 3: Digitalization and gender gaps inequalities (Gini) low-, and lower-middle income countries. 2000-2023

The overall analysis may suggest the existence of the reinforcing mechanism that great digital deployment and inclusion coincides with dropping cross-country inequalities regarding gender gaps on labor market. However this mechanism, although do not necessarily implying causalities, seems to be unveiled only for the lower-middle income countries. It appears, that in the lower-middle income group digital technologies translate into inclusive opportunities for women, and as countries converge in terms of digital technologies use the analogous happens for gender gaps. In low income economies the digital shifts across countries contribute to this country group homogeneity, but the distributional effect on labor market related gender gaps is uneven and barely detectable, which is determined by structural and institutional conditions that may strengthen – or reversely, weaken this effects.

5. Conclusions

Our evidence shows that despite progress in digitalization between 2000 and 2023, its impact on gender gaps in low-income countries remains weak, whereas in lower-middle-income economies the relationship is clearer, especially for wage employment and overall gender development. Still, in both income groups we see improvements in vulnerable employment and contributing family work gaps. We also documented sharp drops in cross-country digital inequalities, yet labor-market gender disparities remain as far more persistent. Our findings suggest that digitalization alone is insufficient to reduce gender inequalities and that its impact depends heavily on broader structural and institutional conditions. Policy-wise, digital strategies should be integrated with labor market reforms and targeted measures facilitating women's transition from informal to formal employment. Governments should also strengthen inclusive institutions and expand gender-sensitive educational and skills programs to ensure that digital progress translates into meaningful reductions in gender disparities.

Ethics Declaration: as for this research the ethical clearance was not required

AI Declaration: this paper was prepared without using any AI-based tools

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Appendix 1: Tables 1 & 2

Table 1: Absolute changes in levels of ICT adoption and magnitude of gender gaps [in %pp]. Low income countries. Change between 2000 and 2023

Country	$\Delta IU_{c,y}$	$\Delta GG_{c,y,LF}$	$\Delta GG_{c,y,WG}$	$\Delta GG_{c,y,FM}$	$\Delta GG_{c,y,VL}$
Afghanistan	17.70	-0.64	4.32	14.09	-4.90
Burkina Faso	16.84	-5.07	1.30	7.12	-1.45
Burundi	10.99	-1.39	-7.14	23.25	6.88
Central African Rep.	7.46	3.67	-0.63	11.17	1.27
Chad	13.15	5.77	0.93	7.20	-1.87
Congo. Dem. Rep.	30.49	3.81	-2.73	28.68	3.54
Eritrea	19.84	-3.23	1.67	11.68	-0.10
Gambia	44.56	-0.91	9.21	4.35	-15.03
Guinea-Bissau	32.20	-4.60	-0.09	10.90	0.36
Liberia	23.47	-1.25	4.19	11.27	-3.17
Madagascar	20.18	0.37	-3.48	-6.11	1.59
Malawi	17.84	1.69	0.06	3.78	0.35
Mali	34.91	2.90	0.10	2.69	0.26
Mozambique	19.64	6.87	6.25	33.02	-3.34
Niger	23.10	4.87	8.09	-5.97	-13.16
Rwanda	33.96	-8.70	-4.62	5.16	4.30
Sierra Leone	20.44	6.22	1.81	-0.31	-1.73
Somalia	-0.08	-0.32	1.44	8.05	2.23
South Sudan	7.07	-1.83	-3.93	9.96	6.01
Sudan	26.37	1.36	4.09	11.61	-6.88
Syrian Arab Rep.	34.52	-10.29	-30.69	31.06	38.32
Togo	36.10	-2.78	0.16	11.78	-0.05
Uganda	15.06	2.42	3.67	4.35	-7.77
Yemen	13.72	6.28	-7.61	5.13	8.50

Source: Authors` calculations.

Table 2: Absolute changes in levels of ICT adoption and magnitude of gender gaps [in %pp]. Lower-middle income countries. Change between 2000 and 2023

Country	$\Delta IU_{c,y}$	$\Delta GG_{c,y,LF}$	$\Delta GG_{c,y,WG}$	$\Delta GG_{c,y,FM}$	$\Delta GG_{c,y,VL}$
Angola	44.70	1.20	2.15	-0.13	-1.50
Bangladesh	44.43	-23.77	-1.67	28.00	-2.85
Benin	31.98	-14.72	-1.65	0.92	1.86
Bhutan	88.00	-5.05	11.53	-10.17	-11.58
Bolivia	68.76	-10.49	-3.90	10.06	2.79
Cambodia	60.65	4.75	3.19	26.47	-3.97
Cameroon	41.65	9.73	-4.73	12.56	4.85
Comoros	35.43	-2.20	-3.94	9.99	5.54

Country	$\Delta IU_{c,y}$	$\Delta GG_{c,y,LF}$	$\Delta GG_{c,y,WG}$	$\Delta GG_{c,y,FM}$	$\Delta GG_{c,y,VL}$
Congo. Rep.	38.37	-0.33	1.39	-0.79	-1.31
Cote d'Ivoire	40.47	-15.31	-0.38	-3.65	-0.06
Djibouti	64.81	-9.39	-1.59	1.67	1.80
Egypt	72.06	3.75	-1.32	4.14	14.95
Eswatini	56.67	-15.42	1.15	0.66	-1.15
Ghana	69.75	-1.64	8.87	-4.61	-8.93
Guinea	26.40	20.02	4.20	3.36	-3.63
Haiti	39.07	-1.83	2.34	3.40	-2.11
Honduras	57.10	-7.16	9.67	-2.52	-4.27
India	55.37	-6.22	-2.85	-4.19	-0.30
Jordan	89.88	-4.96	5.89	0.08	-2.95
Kenya	34.68	5.44	-9.63	13.87	8.83
Kyrgyztan	87.46	7.06	-2.48	-0.80	2.13
Lebanon	75.55	-13.96	7.85	0.68	-11.40
Lesotho	47.79	6.22	-5.72	2.90	5.22
Mauritania	37.21	-5.10	2.46	1.52	-5.40
Morocco	90.31	-4.80	-14.56	11.95	14.45
Myanmar	58.50	7.13	-6.92	39.08	11.32
Namibia	62.76	-6.74	-7.36	6.15	6.33
Nepal	55.60	-14.91	3.16	1.53	-3.82
Nicaragua	57.22	-20.40	2.78	0.93	-3.11
Nigeria	39.14	-7.63	1.70	0.30	-3.09
Pakistan	27.40	-11.52	18.49	-9.68	-19.47
Papua New Guinea	23.27	0.68	-0.79	-4.58	0.48
Philippines	81.82	-7.15	8.74	1.96	-6.31
Sao Tome and Principe	56.86	-2.65	-2.50	-0.70	1.80
Senegal	60.20	-9.25	-0.11	10.74	-0.49
Solomon Islands	42.02	0.60	9.09	-17.90	-9.82
Sri Lanka	50.55	-2.18	-4.67	8.76	4.14
Tajikistan	56.75	-8.55	2.43	1.76	0.28
Tanzania	28.98	3.22	0.42	-10.40	-0.38
Timor-Leste	34.00	0.43	10.05	-15.88	-9.77
Tunisia	69.65	-11.87	-4.59	1.46	2.96
Uzbekistan	88.52	5.47	4.66	0.92	-2.04
Vanuatu	43.59	2.41	-5.93	-1.65	5.08
Viet Nam	77.85	1.64	1.62	24.30	-3.09
Zambia	32.81	-7.16	-0.52	10.35	-1.49
Zimbabwe	38.00	1.23	-3.59	0.96	2.17

Source: Authors` calculations.