

Chapter 5: Digital Equity for Women's Economic Agency: A Key Pathway to Sustainable Development

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1 Abstract

The COVID-19 pandemic has underscored the critical need to prioritize women's economic empowerment (WEE) and bridge the gender digital gap (GDD) for sustainable development. This chapter explores how addressing the GDD can amplify the impact of WEE programs and tackle the gender digital divide. Globally, women face significant challenges in accessing online platforms, resulting in 195 million fewer women online compared to men. The pandemic has exacerbated this situation further marginalizing women. However, empowering 600 million women and girls with digital connectivity has the potential to boost global GDP by up to \$18 Billion. Closing the GDD presents a unique opportunity to enhance women's economic agency, address the digital skills gap, and foster sustainable development. This chapter reviews current actions by the United States, the European Union, and the G20 Group of Nations on WEE and the GDD as interconnected priorities. The United States has established the White House Gender Policy Council and the Women's Global Development and Prosperity (W-GDP) Initiative. The European Union focuses on digital inclusion for women and women's digital entrepreneurship, while the G20 emphasizes bridging the digital gender divide and increasing women's participation in the digital economy.

Key Terms: Digital inclusion policy, G20, gender digital divide, gender equality

2 Introduction

We want women to be adapting technologies that are enablers for their business [and] we want them to be driving the future of technology... We really need to focus on it and do more in this space because clearly, that is what is going to be needed to get us out of this crisis.

Wendy Teleki, head of The World Bank's Women Entrepreneurs Finance Initiative, February 16, 2022

In February 2022, Wendy Teleki, head of The World Bank's Women Entrepreneurs Finance Initiative, ushered in a new period of development policy by making an explicit link between women-led entrepreneurship and the enabling capacity of technology as two joint, interrelated, and critical

priorities for economic recovery. This approach has long had its advocates, but the COVID pandemic—its disproportionate impact on women, and their response to it—has highlighted the importance of prioritizing women's economic empowerment (WEE) and bridging the gender digital divide (GDD) as key drivers of sustainable development.

The accelerated adoption of digital technologies during the pandemic has underscored the pervasive nature of the gender digital divide and the opportunities to be gained from effectively tackling it. Promoting women's rights and gender equality have been an implicit objective of development policies and actions for many years, and equal rights for genders is now its own Sustainable Development Goal (SDG), Number 5 on "Gender Equality" (United Nations, n.d.). In this context, actions that specifically support WEE have also received growing attention for their ability to contribute to women's economic agency and to wider economic resilience.

As a phenomenon, the gender digital divide (GDD), also called the "digital gender divide," has existed since the dawn of the information age. It possesses characteristics distinct from but also linked to the wider digital divide which is generally observed as the economic and social impact of lagging uptake of digital technologies by nations and regions. The gender digital divide is a phenomenon observed in geographies where differences between the genders exist in terms of access to, (appetite for) use of and skills in digital technologies, and where men and boys enjoy disproportionately greater participation across all variables. A correlation exists between the gender digital divide and the digital divide such that actions to bridge the GDD also impact the digital divide and deliver a corresponding economic impact.

Due to social, economic, and cultural factors, the relationship between closing the digital divide and bridging the GDD gender digital divide is not one-to-one in the opposite direction, however. Programs to deploy telecommunications infrastructure, increase access to and use of (affordable) internet, and digital skills programs contribute to digital inclusion, closing the digital divide, and economic development, generally speaking. Unless programs specifically target the GDD—i.e. through digital skills, tech-driven entrepreneurship, future workforce readiness, and/or other programs specifically targeting girls and women—such programs will not expressly decrease the GDD, although they may have this as an outcome.

Programs that promote WEE are positively correlated with economic development, to a greater or lesser degree, when successful in their explicit mission. GDD programs can support WEE by adding to women's economic agency and the ability of women to contribute to the wider economy, e.g., through promoting digital and financial literacy, digital skills for the workplace, and tech-driven entrepreneurship by women.

WEE policies can tackle GDD, and the digital divide more broadly, through programs that promote advanced digital skills, technology-driven entrepreneurship, and future workforce readiness for women, for example. A positive feedback loop is also created when women themselves become founders of tech-driven enterprises and then hire skilled women into similar work. This phenomenon addresses GDD and the digital divide and contributes to women increased economic agency and ability to engage in the economy more broadly.

The real opportunity for economic development is thus linked to a butterfly effect derived from leveraging GDD for WEE programs, and vice-versa.

- **GDD for WEE Programs:** Tackling the gender digital divide can magnify women's economic empowerment programs and increase their intended impact on the economy, while directly impacting the economy by closing the digital divide; and
- **WEE for GDD Programs:** Women's economic empowerment programs can magnify impacts on tackling the gender digital divide and wider digital divide, while directly impacting the economy in their intended way.

The greatest single driver of economic resilience and sustainable development is actively supporting digital equity for women's economic agency, at the intersection of closing the gender digital divide (GDD) and promoting women's economic empowerment (WEE), with women as entrepreneurs, equal actors in the workforce, and leaders across the board. On this basis, the case is made to explicitly prioritize, budget and program development actions pursuing digital equity for women's economic agency at the nexus of WEE and GDD.

To support this position, the following questions are considered:

- What is the economic impact of the gender digital divide and the opportunity presented by closing it?
- What is the state of play regarding development action that focuses on tackling the gender digital divide and promoting women's economic empowerment?
- What indicators and best practices may be employed to support digital equity for women's economic agency as a pathway to economic resilience and sustainable development?

There are exponential advantages to be derived from prioritizing development actions that optimize the synergies between WEE and GDD, in the name of digital equity for women's economic agencies, in order to promote economic resilience and sustainable development. It is time for international policy priority-setting that leverages this opportunity

3 The Opportunity

A vast 'connectivity chasm' remains in the [Lesser Developed Countries], where almost three-quarters of people have never connected to the Internet. Women in LDCs are particularly marginalized, with roughly four out of every five still offline

Doreen Bogdan-Martin, Director of ITU's Telecommunication Development Bureau, November 30, 2021.

A key characteristic of the digital disruption which cuts across geographic locations and socio-economic conditions is that no matter where they are in the world, women are less likely to be online than men. Of the Earth's nearly 7.9 billion human population, men make up thirty percent and women twenty-five percent of people who are online, reflecting 195 million fewer women online overall (ITU, 2013). Despite a surge in online participation during the COVID pandemic, the rate at which women go online fell behind and continues to lag. This ubiquitous and persistent trend represents the digital divide compounded by the gender gap which, without focused effort to address it, risks widening.

In countries where digitalization has a firmer hold, women are still less likely to have digital skills, take up formal computer science and other STEM studies, or hold technical and leadership roles in IT organizations. Globally, the founder of a digitally driven enterprise is five times more likely to be a man than a woman, and in many places, the ratio is closer to ten-to-one (Startup Genome, 2023).

Anywhere in the world today, therefore, a woman is:

- Less likely to be online;
- More likely to have low or no digital skills;
- Less likely to be an IT professional; and
- Far less likely to launch a tech-driven enterprise.

As a result, women are at greater risk of being excluded by the digital disruption, often framed as a type of environmental turbulence induced by digital innovation that leads to the erosion of boundaries and approaches that previously served as foundations for organizing the production and capture of value (Karimi & Walter, 2015, Rauch et al., 2016, Weill & Woerner, 2015), a phenomenon exacerbated by the COVID pandemic.

In addition to the yawning social divide this reality reflects, it also represents a loss for the global economy and for women themselves who are unable to fully realize their potential as economic actors in an increasingly digital society. In 2013, the UN reported that bringing 600 million women and girls online could boost global GDP by up to \$18B (Broadband Commission, 2013). A European

study in 2018 suggests that greater participation of women in the ICT sector would contribute as much as \$16B annually to the European economy alone. Especially as a response to the COVID-induced 'She-cession,' action to tackle the gender digital divide presents an opportunity to improve women's economic agency, address the digital skills and job gap, and promote a pathway toward sustainable development.

3.1 Regional Differences

Often cited as a response to "job scarcity," the Women's Entrepreneurship Report of 2021 underscores that over half of women in developing countries see entrepreneurship as a path to a better future, compared to twenty-five percent in high-income countries (Gem, 2021). In the global North, fully eighty percent of women are marginalized by traditional career paths (McKinsey), and taken broadly, a loss of \$160T in wealth is the result of the global earnings gap between men and women (World Bank Group, 2018). This, the "glass ceiling" phenomenon, long pre-dates the recent recession and is further exacerbated by it.

The gender digital divide is not entirely comparable between the Global North and South, and the distinction is two-fold: First, broadband penetration is higher in the North, where a digital divide exists but at a fraction of that witnessed in the rest of the world. In addition, women and men experience relatively similar access to the Internet and digital technologies in the US, Europe, and East Asia, where the Internet Use Gap is in the low single digits. For the rest of the world, women are between nine and 137 percent less likely than men to use the Internet, these statistics reflecting the situation in MENA and South Asia, respectively (ITU).

Before COVID, urban centres around the world faced persistent double-digit unemployment, despite an ongoing under-supply of talent for tech jobs which is expected to reach 1.5 million unfilled jobs in Europe alone by 2025 (EC). Foreshadowing a global trend, the uptake of IT jobs in Europe over the past decade has grown nine times that of the rest of the job market, while the number of female IT professionals has decreased in relative terms and flat-lined in absolute numbers. The Digital Scorecard for Europe shows a decades-long lag in digital skill levels for European women, which represents a persistent four percent difference between genders, or nine million fewer women than men in Europe who have digital skills.

3.2 Global Similarities

Despite the differences, similarities remain: No matter where she is in the world, a woman is less likely to have access to digital tools, including the internet, and to possess digital skills, including at

an expert level. She is also far less likely to become an entrepreneur who is enabled by or innovating with technology.

As a potential path out of economic adversity, women everywhere turn to entrepreneurship, making women-led enterprise one of the most dynamic variables in the global economy, although it is not consistently treated as a policy priority. GEM research in 2019 suggests that \$5T would be added to the global economy if women participated in entrepreneurship at the same rate as men (Unnikrishnan & Blair, 2022). The COVID pandemic has disproportionately impacted women, forcing millions out of the workplace, many permanently. In response, entrepreneurship is and will continue to be a key factor in sustaining economic independence for women and in igniting the global economy. In the digital society, such participation is increasingly linked to skills supporting both digitally enabled and digitally-driven entrepreneurship.

Regardless of geography, closing the gender digital divide presents a critical factor in ensuring women's economic agency to promote economic development. This focus has the advantages of limiting the risk of further marginalization of women as a result of digital disruption, addressing the global IT skills gap, filling tech jobs that otherwise go unfilled, and supporting a woman's pathway to economic agency in the workforce and as a digital entrepreneur.

3.3 Toward Digital Equity for Women's Economic Agency

From a development perspective, as a response to economic uncertainty and as a pathway toward sustainable development more broadly, inclusive digital transformation must be an explicit focus of policy action, and of priority- and budgeting-setting going forward, particularly as it pertains to girls and women. As the critical path toward the joint missions of promoting women's economic empowerment and tackling the gender digital divide, the notions of digital inclusion, and particularly digital equity must be prioritized. Digital inclusion demands "intentional strategies and investments to reduce and eliminate historical, institutional, and structural barriers to access and use technology" (NDIA, 2021), and activities in this direction must evolve as technology does. "Digital equity is a condition in which all individuals and communities have the information technology capacity needed for full participation in our society, democracy, and economy" (NDIA, 2021).

Achieving the condition in which women can fully participate in the economy as independent, sovereign agents, therefore, requires a focus on digital equity, specifically in its connection with women's economic empowerment. Since "empowerment" is a means to the purported end of women's economic agency, the term "agency" is employed as a measurable target for economic development policy. In this direction, the present chapter argues for promoting digital equity for women's economic agencies as its own policy priority for sustainable development.

4 Development action: State of play

Gender equality is a core principle of the European Union, but it is not yet a reality. In business, politics, and society as a whole, we can only reach our full potential if we use all of our talent and diversity. Using only half of the population, half of the ideas or half of the energy is not good enough. With the Gender Equality Strategy, we are pushing for more and faster progress to promote equality between men and women.

Ursula Von der Leyen, President of the European Commission, (EC, 2020, March 5).

In order to understand the opportunities for promoting digital equity for women's economic agency, the present section provides a review of current development approaches by the European Union and G20 Group of Nations on women's economic empowerment and tackling the gender digital divide as synergistic development priorities. The focus is policies that explicitly promote WEE and GDD independently or as part of broader ICT, Digital for Development, Digital Inclusion, Gender Equality, and Women's Economic Empowerment initiatives.

4.1 The European Union

On March 5, 2020, Ursula Von der Leyen, the first woman President of the European Commission, launched the EU Gender Equality Strategy 2020-2025 (EC, 2020, March 5), whose key objectives are the following: Ending gender-based violence, challenging gender stereotypes, closing gender gaps in the labor market, achieving equal participation across different sectors of the economy, addressing the gender pay and pension gaps, closing the gender care gap, and achieving gender balance in decision-making and in politics.

4.1.1 The EU Action Plan on Gender Equality and Women's Empowerment in External Action 2021-2025 (GAP III)

Consistent with the EU Gender Equality Strategy, in November 2020, the European Union launched the Action Plan on Gender Equality and Women's Empowerment in External Action 2021–2025, GAP III (EC, 2020, November 5), which promotes gender equality and women's empowerment through all external action of the European Union, and has the mission of "putting women and girls' rights at the heart of the global recovery for a gender-equal world."

With the rationale that no country in the world is on track to achieve gender equality by 2030, and because the health and socio-economic consequences of the COVID crisis are disproportionately affecting women and girls, GAP III aims to accelerate progress on empowering women and girls and

safeguard gains made since the adoption of the 1987 Beijing Declaration and Platform for Action.

GAP III aims to accomplish its objectives through five pillars:

- **85% of all new actions** throughout external relations will contribute to gender equality and women's empowerment by 2025;
- **Sharing a strategic vision** and close cooperation with EU Member States and partners at multilateral, regional, and country levels;
- **Accelerating progress**, focusing on the key thematic areas of engagement;
- **Leading by example**; and
- **Measuring results**.

Although no specific targets for gender digital inclusion are set forth in GAP III, a description of Pillar Three refers to "bringing the gender perspective to new policy areas, including the green transition and the digital transformation."

4.1.2 European Union Digital for Development Hub

The digital economy will be a key driver of inclusive sustainable development in Africa only if we bridge the digital divide, including the gender divide. The launch of the AU-EU Digital4Development Hub is a milestone in our partnership with the African Union to work towards this goal.

Jutta Urpilainen, European Commissioner for International Partnerships. (EC, 2020, December 8).

Digital for Development Hub (D4D Hub)

The Digital for Development Hub (D4D Hub) was launched in December 2020 by the President of the European Commission, Ursula von der Leyen, European Heads of State, and D4D Hub partners. The D4D Hub serves as a strategic multi-stakeholder platform that fosters digital cooperation between "Team Europe" and its partners across twelve regional clusters around the world with the aim of promoting global partnerships to ensure that digital technologies improve lives worldwide.

D4D - Rural Women Entrepreneurs

Various programs have been carried out under the auspices of the D4D Hub, including those with a focus on inclusive digital transformation and women's economic empowerment, though not necessarily jointly. One program of interest in this direction is the Rural Women Entrepreneurs project in Bangladesh which received €20M in its first phase in order "to improve healthcare access in rural communities with the help of digital technologies, and by mobilizing and developing the

capacity of 58 women's business centres (WBC) across its target geography" (EC, 2020, January 12).

Other results for Phase One of the Rural Woman Entrepreneurs project include the following:

- 18,000 patients treated through facilitated telemedicine;
- 10 apps developed to facilitate access to teleconsultations, nutrition monitoring, and referral of malnutrition cases to government health facilities, e.g. local hospitals and community clinics;
- A virtual learning platform and skills development platform for Women Business Center entrepreneurs created; and
- 40,000 individual households registered within the project's digital ecosystem

4.2 European Union Member States

I stand for a feminist development policy. For this, we are developing an action plan with the participation of civil society. The fight against poverty and hunger is also more successful if you focus on real equality.

Svenja Schulze, German Minister for Economic Cooperation and Development, (Schulze, S. (2022, February 17).

European Union member states each have their respective development programs, many of which are represented among the European Association of Development Agencies. They also fund regional and international development banks, like the European Bank for Reconstruction and Development (EBRD) and the World Bank, and participate in economic development organizations like the OECD, G7, and G20.

The "BMZ 2030" program of the German Federal Ministry for Economic Cooperation and Development (BMZ) is highlighted here for its specific focus on digitalization and, linked to that, programs that target GDD and WEE. In the "BMZ 2030" reform concept, digitization has a special priority in German development cooperation projects. The BMZ Digital Strategy drives digital transformation through dedicated flagship projects within its five pillars which are the following: Work, Local Innovations, Equal Opportunities, Good Governance, and Human Rights, and Data for Development.

4.3 European Bank for Reconstruction and Development (EBRD)

I am delighted that the EBRD is launching its first digital approach. It puts technology at the service of transition in the economies where we invest. Digital development can accelerate the recovery and help to build back better, more sustainable economies and more inclusive

societies. We are hugely encouraged by our shareholders' strong support and ready to implement our plan.

Odile Renaud-Basso, EBRD President, November 10, 2021 (Reiserer, 2021).

In 2020, the European Bank for Reconstruction and Development (EBRD) invested eleven billion euros (\$13.4B) across emerging economies (EBRD, 2021). Echoing the priorities of the European Union, in 2021 the EBRD promoted equality of opportunity and economic empowerment of women with its Strategy for the Promotion of Gender Equality (SPGE) and Strategy for Equality of Opportunity (SEO) 2021-2025. These strategies are reinforced in the EBRD's 2021 Transition Report, Digital Approach to Advancing Transition, and in its 2021-2025 Strategic and Capital Framework (SCF).

4.3.1 Strategy for the Promotion of Gender Equality 2021-2025 (SPGE)

The EBRD's Strategy for the Promotion of Gender Equality 2021-2025 (SPGE) aims to mainstream gender considerations in the EBRD's projects and policy priorities, and strengthen a "gender-responsive investment culture" by underpinning bank strategies and policies in three focus areas:

- **The Access to Finance and Entrepreneurship priority** has the overall goal of building inclusive and gender-responsive financial systems and business environments.
- **The Access to Skills, Employment, and Livelihoods focus area** has the overall goal to support investments to better promote skills, employment, and sustainable livelihoods.
- **The Access to Services and Public Goods priority** has the overall goal to create inclusive and gender-responsive services and public goods.

The SPGE addresses ways to enable women to benefit from opportunities brought about by digital transformation, including access to skills and employment, in the following ways:

- Integrating digital skills into all relevant business-led sector skills councils, sectoral and national skills development strategies, and other institutional and strategic documents supported by the Bank;
- Mainstreaming digital skills into all relevant TVET (technical, vocational education, and training) and higher education programs supported by the EBRD, and undertaking advisory projects on skills development issues, including by enhancing clients' capacity to forecast needs;
- Creating pathways to access STEM education and careers for women and other under-represented groups, including through mentoring and training.

4.3.2 Strategy for Equality of Opportunity 2021-2025 (SEO)

The EBRD Strategy for Equality of Opportunity 2021-2025 (SEO) is focused on building inclusive and gender-responsive financial systems and business environments, and creating inclusive and gender-responsive services and public goods. This includes supporting people and communities to safeguard their livelihoods through reskilling and access to green or digital jobs and entrepreneurship opportunities. The SEO specifically tackles the intersection of digital transformation and skills development by focusing on demand-led approaches, while embracing life-long learning and work-based skills development opportunities.

4.3.3 Strategic and Capital Framework 2021-2025 (SCF)

The EBRD's gender engagement is further supported by four thematic lenses outlined in the Strategic and Capital Framework 2021-2025 (SCF):

- **The transition to the green economy** requires joint action from governments, intergovernmental organizations, and the private sector, as well as widespread transformation across all societies. Persistent gender inequalities hinder the capacity of women, communities, and economies to adapt to and mitigate climate change.
- **The incorporation of digital technology** across all areas of life is generating a digital economy built around online economic activities. Ensuring that women benefit from the digital economy can improve their economic and social outcomes while guaranteeing their participation in STEM subjects is key for sustainable development.
- **The care economy** refers to all forms of paid and unpaid care provided within a society, including childcare, early childhood education, disability and long-term care, elderly care, and other types of care. In a broader sense, it also captures the domestic provisioning of food, clothing, and shelter.
- **Gender equality** requires that institutions, laws, policies, and social norms allow women to access and benefit from opportunities on the same footing as men. Across economies and sectors, women continue to face constraints related to high levels of gender-based violence, biased laws, and norms that prevent them from owning property, working, and making decisions about their lives.

4.3.4 Transition Report 2021

The 2021-22 EBRD Transition Report highlights that seventy-three percent of individuals in the EBRD regions use the internet, compared with ninety percent in advanced economies. It suggests that the affordability of fixed and mobile internet is a barrier to development and that only fifty-six percent of consumers in the EBRD regions report using digital payment methods, while in advanced

economies, the number stands at ninety-six percent. It also underscores that a gap in digital uptake exists between urban and rural areas.

Digital Approach to Advancing Transition

Addressing the challenges reported in the Transition Report, in a 2021 Digital Approach to Advancing Transition, its first-ever digitalization strategy, the EBRD sets priorities on the following:

- Establishing the **foundations** for digital transformation: The EBRD will develop enabling legal, regulatory, and institutional frameworks, as well as implementation capacity. This includes promoting innovation, supporting healthy competition in digital markets, promoting cyber security, safeguarding energy and financial stability, and ensuring appropriate data protection.
- Promoting **adaptation** among enterprises and governments: The EBRD will support investments enabling technology and knowledge transfer, the digitalization of products and processes in local companies, and the digitalization of financial institutions through technical assistance and financing.
- Supporting **innovation** and new market entrants: The EBRD's support could include regulatory sandboxes for start-ups and accompanying digital government services, an increase in Star Venture Programmes, and bespoke advisory services for high-potential start-ups, accelerators, and incubators over a wider geographical area. Venture Capital and Equity Funds will also be stepped up.

4.3.5 Women Entrepreneurs Finance Initiative (We-Fi) - Stepping Up for Women

As part of the Women Entrepreneurs Finance Initiative (We-Fi), the EBRD's "Stepping Up for Women" programme aims to help women entrepreneurs to weather the challenges deepened by the COVID pandemic by providing them with enhanced digital skills.

4.4 The G20 Group of Nations

The G20 Group of Nations is a strategic multilateral platform connecting the world's major developed and emerging economies. The G20 holds a strategic role in securing future global economic growth and prosperity. Together, the G20 members represent more than eighty percent of world GDP, seventy-five percent of international trade, and sixty percent of the world population.

4.4.1 G20 Germany 2017

Leaders Declaration

The 2017 G20 Leaders Declaration shaping an interconnected world affirms that digitalization and access to ICT serve as powerful catalysts for the economic empowerment and inclusion of women and girls, noting explicitly that “access to STEM-related training and occupations is key” (G20 Research Group, 2017) to establishing an enabling environment for women’s empowerment.

Women Entrepreneurs Finance Initiative (We-Fi)

The Women Entrepreneurs Finance Initiative (We-Fi) was agreed at the German G20 presidency in 2017 and is now an initiative coordinated by the World Bank.

eSkills4Girls Program

The initiative "eSkills4Girls" was launched under the German G20 presidency in 2017 with the aim of tackling the gender digital divide, by increasing women’s and girls’ access to and participation in the digital world and boosting education and employment opportunities in emerging and developing countries.

4.4.2 G20 Italy 2021

Consistent with the message of the 2021 Italy Women20 Communiqué, a series of commitments to promoting women’s economic empowerment and tackling the gender digital divide are included in the 2021 G20 Rome Leadership Declaration (European Council of the European Union, 2021) which are excerpted below:

- Article 20. Cities and Circular Economy. “[... and E]enabling more equitable access to digital innovations.”
- Article 33. Gender Equality and Women’s Empowerment. ““... We reaffirm our commitment to gender equality and emphasize the pivotal role of women’s and girls’ empowerment and leadership at all levels for inclusive and sustainable development. [...] We will work on key factors such as equal access to education and opportunities, including in STEM sectors, the promotion of women’s entrepreneurship and leadership, the elimination of gender-based violence, the enhancement of social, health, care and educational services, the overcoming of gender stereotypes, and the uneven distribution of unpaid care and domestic work”.
- Article 35. Employment and Social Protection. “We will work to ensure decent working conditions for remote and platform workers and strive to adapt our regulatory frameworks to new forms of work, ensuring that these are fair and inclusive, leaving no one behind while paying special attention to addressing the digital gender divide and intergenerational inequalities”

- Article 36. Education. “Access to education is a human right and a pivotal tool for inclusive and sustainable economic recovery. We commit to ensuring access to quality education for all, with particular attention to women and girls and vulnerable students. We will increase our efforts to make education systems inclusive, adaptable, and resilient, and will enhance the coordination between education, employment, and social policies to improve the transition from education to quality employment, also through lifelong learning.”
- Article 37. [sic] “We recognize the critical role of education for sustainable development, including environmental stewardship, in empowering younger generations with the necessary skills and mindset to address global challenges. We commit to enhance cooperation and to foster stronger, effective measures to this end.”
- Article 46. Digital Economy, Higher Education, and Research. “We recognize the role of technology and innovation as key enablers for the global recovery and sustainable development. [...] We recognize the growing role that Information and Communication Technologies play in our societies. In this context, we emphasize the need to address the increased security challenges in the digital environment, including ransomware and other forms of cybercrime. With this in mind, we will work to strengthen bilateral and multilateral cooperation to secure our ICT, address shared vulnerabilities and threats, and combat cybercrime.”
- Article 51. Data Gaps. “[...and will P]provide digital public services that are human-centric, proactive, easy to work and accessible to all.”

Ministerial Declaration - G20 Roadmap Towards and Beyond the Brisbane Target a.k.a. “The Rome Roadmap”

The 2021 Italy G20 Research Group’s Labour and Employment Ministerial Declaration on “Fostering an Inclusive, Sustainable, and Resilient Recovery of Labour Markets and Societies,” includes language connected to the G20 Policy Recommendations to Reduce Gender Gaps in Labour Force Participation and Pay by Improving Women’s Job Quality and building on the so-called “25 by 25” or “Brisbane Targets,” which aim to increase labour force participation by women by twenty-five percent by 2025. The language specifically addressing women’s economic empowerment and closing the digital gender divide is captured in Annex 1: G20 Roadmap Towards and Beyond the Brisbane Target: more, better and equally paid jobs for women, and excerpted below:

- “Ensure equal opportunities to access lifelong learning, reskilling and upskilling, and workplace training, especially for low-skilled female workers that are more likely to suffer the impact of employment changes; provide enabling environments for women to take

control of their lives in a world of rapid and economic and technological change, giving opportunities to enter, maintain and progress in employment; Increase the provision of digital skills training for all women, especially young women and those returning to work after a prolonged break, and other relevant measures to bridge the gender digital divide.”

- “Promote equal opportunities in educational and vocational pathways and increase the participation of women in high-wage, high-growth fields, including by strengthening educational, vocational, labor market, and career guidance. Encourage evidence-based practices to promote the hiring of women in those sectors where women are under-represented, notably in Science Technology Engineering, Mathematics, and ICT.”
- “Promote measures to increase the participation and representation of women in decision-making bodies and workers’ and employer’s organizations.”
- “Promote policy measures aimed at achieving fair and transparent career progression processes, including the selection criteria for managers and other key positions such as regular and voluntary communication by companies on gender gaps in promotion, recruitment, and managerial positions.”

4.4.3 Women20

The pandemic has hastened digital transformation, dramatically deepening gender inequalities. It is imperative to halt the digital marginalization of girls and women impacted by this disruption, and urgently take action to ensure a just digital transformation where girls and women are fairly, meaningfully and equally engaged as digital citizens.

Women20 Communiqué, (Women20, 2021).

At the 2015 G20 meetings in Turkey, the G20 officially recognized the Women20 (W20) stakeholder engagement group of the G20, tasked with representing the interests of girls and women to G20 leadership. During subsequent G20 presidencies in China, Germany, Argentina, Japan, Saudi Arabia, Italy, Indonesia and India, the annual Women20 Communiqué has consistently addressed topics of digital inclusion, digital equity, and women’s economic empowerment, linked with labour force participation and entrepreneurship, as priorities impacting the wellbeing of girls and women in the world, and of greater society.

Digital Empowerment

The 2021 Women20 Communiqué of the G20 Italy Presidency captured the following priorities for Digital Empowerment, which both echo the timeline for the Generation Equality targets and include specific reference to entrepreneurship, labour force inclusion, financial inclusion, and “women's economic development” (W20):

- **Ensure safe access to and use of digital technologies for all women and girls in G20 economies by 2026** by: a) removing barriers such as prohibitive costs, insufficient infrastructure, unsafe online environments, and harmful gender stereotypes; b) facilitating the use of the internet, mobile telephony and other digital tools by women and girls for health, education, financial, employment and other purposes; c) developing gender-sensitive ethical guidelines on artificial intelligence (AI) and other digital technologies;
- **Guarantee foundational digital skills for all women and girls of G20 members, with pathways to future work and expertise in disruptive technologies by 2026** by a) upskilling and reskilling women to address the skills shortage in digital and STEAM jobs; b) providing funding and incentives to public and private sectors to provide training and career development in digital fields to women and girls; c) implementing skills programmes that promote women's financial inclusion and entrepreneurship, focused on and enabled by digital technologies to support women's economic development;
- **Ensure that women hold equal leadership roles in digital fields in G20 economies by 2030**, including technology organizations, start-ups, policy-making, and academia, by: a) ensuring women are equally represented in fields of technology research and development; b) creating more visibility of women in high-level positions in the ICT sector; c) providing fiscal and other incentives to achieve gender-balanced leadership in the technology sector, including academia and research institutions;
- **Adopt and implement comprehensive and coordinated policies encompassing all relevant measures to identify, prevent and prosecute cyber violence and threats of violence** by: a) promoting awareness-raising programmes throughout society on how to prevent harmful online gender-based violence; b) legislating for prevention and punishment of online violence.

Women's Entrepreneurship and Finance

The communiqué further addresses the critical link between WEE and GDD in its recommendation on Women's Entrepreneurship and Finance with the following statement: "Facilitate access to finance, and capacity building for all, in particular for solopreneurs and microenterprises by [...] supporting access to digital banking, mobile money accounts, mobile commerce, and blockchain-enabled assets and technologies." (Women20, 2021).

5 Indicators and best practices

The initiatives captured in this chapter reflect a groundswell of activities that, explicitly or otherwise, increasingly centre digital equity for women's economic agency as an effective, holistic, and sustainable international development strategy. Moving forward, a view of key performance indicators (KPIs) at the intersection of promoting women's economic empowerment and closing the gender digital divide, will be useful for capturing, reporting on, and managing the impact of this growing body of work.

5.1 Key Performance Indicators

In order to assess and manage progress towards digital equity for women's economic agency, key performance indicators that support creating and nurturing an ecosystem at the intersection of promoting women's economic empowerment and closing the gender digital divide are considered here. With a view to promoting full workforce participation as well as digitally enabled and digitally-driven entrepreneurship by women, such KPIs might include the following:

- Digital skills levels among girls and women
- Number of women ICT specialists
- Percentage of women-led, technology-driven enterprises.

Because STEM- and specifically technology-driven entrepreneurship by women is arguably the critical path promoting economic resilience and sustainable development, this last KPI deserves special attention. As a policy priority, it might be characterized as a digital equity in entrepreneurship and is a key aspect of digital equity for women's economic agency. A rationale is outlined below for refining and delivering on indicators linked to these priorities.

5.2 Women-led Digital Entrepreneurship

When addressing the under-representation of women as entrepreneurs in the context of digital disruption, it is critical to consider several variables that impact their engagement from a digital equity perspective. In addition to lack of access, the relatively low participation of women in digital entrepreneurship, and in entrepreneurship generally, may also reflect a lack of the minimum digital skills required to participate as entrepreneurs in the digital economy, as well as a shortage of women in digital/STEM sectors overall. At both extremes, a persistent lack of digital skills among women—sometimes reinforced by stereotypes that entrepreneurship and ICT are “man-bastions”—creates double indemnity for women-led, digitally-driven as well as digitally-enabled startups, the latter of which is arguably almost any kind of enterprise today.

5.2.1 Digitally enabled Entrepreneurship

Technology-enabled entrepreneurship relies on digital tools and skills to launch, maintain, and often scale an enterprise today. Such tools can be as “simple” as a website, smartphone app, administrative and productivity tools for finance/accounting, marketing/CRM, etc. Or they can be as complicated as logistics, supply chain, and ERP systems. “E-commerce” represents the bundling of such tools and platforms, as well as payment systems, outbound and inbound marketing, etc. For this reason, enabling an enterprise for e-commerce can create a critical lifeline for startups, scale-ups, and steady-state businesses in sectors that are customer-facing, business-to-business, and beyond.

“Digitally enabled” can also refer to digital tools that provide access to enterprise funding, e.g. crowdfunding platforms, fin-tech, like blockchain, online procurement Project applications and administration tools, etc. A lack of skills to digitally “enable” an enterprise with these kinds of tools can therefore create barriers to entry and scale for women across the board, and also in far-flung, rural areas. Conversely, the digital skilling of women, including in rural areas and in typically “non-digital” sectors like agriculture, could create entrepreneurship opportunities for women that they may not encounter otherwise. In some sectors, like banking and finance, “technology-enabled” may understate the reliance of an enterprise on technology, and the line separating enterprises that are “tech-enabled” and “tech-driven” blurs, although the distinction may still be useful.

5.2.2 Tech- and Digitally-driven Entrepreneurship

The global dearth of women in STEM studies, and in Computer Science in particular, results in especially low percentages of women-led entrepreneurship in STEM—“STEMpreneurship,” or “ESTEAM” (Entrepreneurship and Arts powered by STEM). In Europe, it is estimated that ten percent of tech starters are women, though actual numbers may be even lower.

Underrepresentation of women in formal Computer Science education and in entrepreneurship means that technology-driven startups by women is a KPI worth tracking for its “canary in the coal mine” quality, and its signalling of a worrisome lack of engagement of women entrepreneurs in the digital economy. This figure can help track progress in building a strong, supportive entrepreneurship ecosystem for women, including access to funding, skills, mentorship, etc.; and success at growing a cohort of women researchers, developers, and innovators in STEM. STEM, and specifically technology-driven entrepreneurship by women, maybe the critical path for sustainable development in the digital age, and therefore a valuable indicator of the health and vitality of the global digital economy.

In this connection, it may also be useful to mention the technology bias in funding, where a majority of VC spend, for example, goes to technology-intensive entrepreneurship and again, presents women entrepreneurs with an additional barrier to entry. It is also worthwhile to note the increasing technology intensity of STEM studies and research, which may also result in an obstacle for women to enter these areas, and itself creates a Catch-22 scenario. Digital skills are needed to study STEM and the lack of women studying STEM results in less digital innovation by women.

Ultimately, one may argue that low or no digital skills among women—plus stereotypes, policies, and funding patterns that reinforce these norms—create unwelcome barriers to entry, and possibly to scaling and growth, for women-led entrepreneurship across all sectors and geographies, and in STEM especially. Policies that seek to eliminate these barriers would also have to address participation in STEM studies by girls and women, STEM-driven entrepreneurship by women, and equity in entrepreneurship overall. This reality also underscores the rationale for explicitly tackling digital equity for entrepreneurship and for digital equity for women's economic agency writ large.

5.3 Digital Equity Maturity

Increasing access to digital technologies by women, also for women-led, digitally-enabled, and digitally-driven entrepreneurship, is a primary consideration in designing policies to address digital equity for women's economic agency. In the era of digital disruption by innovations in mobile communications and high-speed computing in the cloud accelerated by the COVID pandemic, access to digital technologies alone, though necessary, may not be sufficient to ensure full participation of women as entrepreneurs in the digital economy, including as a path to sustainable development. To this end, it may be useful to articulate a digital equity “maturity curve” for defining key performance indicators that measure the increasing engagement of women over time, initially via access to digital technologies, and ultimately through assuming equal leadership with men in the digital society.

5.3.1 Access to Digital Technology

By definition, giving girls and women equal access to digital technology means ensuring they have as much opportunity to take advantage of digital media and tools, including the Internet, telecoms, online platforms, etc., as enjoyed in society by boys and men. Factors influencing access often go beyond technical infrastructure to include social norms, stereotypes, and traditions regarding capital ownership of all kinds.

5.3.2 Utilization of Digital Technology

Beyond access to digital technology, a minimum level of digital literacy is desirable to ensure that, once they have access to it, women can utilize digital technology and undertake the kind of digitally-

enabled entrepreneurship described above, including for the most geographically dispersed and financially vulnerable groups of women. In this connection, it is also useful to reference the inclination of women to use digital technologies, which can also be influenced by societal and cultural norms, including when questions of access and minimum digital skills are tackled.

5.3.3 Creation of Digital Technology

Ensuring that girls and women become digitally skilled at an intermediate or even expert level supports their ability to contribute as creative actors in the digital economy, including as researchers, developers, innovators, and leaders in technology-driven entrepreneurship.

5.3.4 Leadership in Digital Sectors

Policies that promote digital equity in entrepreneurship should ultimately have as their objective increasing leadership by women and girls across the board—in politics, the economy, and society—in the digital age. To this end, policies to increase participation of women in decision-making should take into account the added dimension of digital equity, and therefore include specific KPIs related to leadership in digital sectors and in digital entrepreneurship.

5.4 The Leaky Pipeline

The so-called "leaks" in the digital talent pipeline are well documented (Blickenstaff, 2005). Anywhere in the world, when young women enjoy formal education at all, they are seriously underrepresented in STEM studies, especially ICT, at the secondary and post-secondary levels. It is challenging for adult women with STEM educations to remain in and advance to leadership roles in these sectors long-term, again especially in ICT. There is also a global dearth of women of all ages as leaders in STEM in academia, industry and policy. As noted, these factors influence the participation of women in STEM-driven entrepreneurship and as entrepreneurs around the world. Robust effort to stimulate digital equity for women's economic agency must therefore also include action on the following fronts:

- Formal education for girls across the board with a focus on increasing their participation in STEM, especially Technology, studies;
- Digital skills education for girls and women of all ages, promoting them as IT experts, entrepreneurs and leaders; and
- Policies to promote women in leadership roles across the board, including in enterprise, and especially in digital sectors.

5.5 The Digital Disruption

The rate of economic and social transformation brought about by the digital disruption and accelerated by the COVID pandemic means that a response to digital inequity—including, and perhaps most importantly, for women-led entrepreneurship in its contribution to women’s economic agency—must be comprehensive and forthcoming in short-order. The advent of machine learning and artificial intelligence poses an immeasurable risk for increasing the gender digital divide and gender inequity globally, along with associated implications for women’s economic agency. Addressing these risks requires targeted and sustained investment in programs that take advantage of best practices and that should themselves be acknowledged as key performance indicators contributing to digital equity for women’s economic agency, including:

- **ESTEAM skills initiatives that are specifically girl- and women-focused**
 - Community and ecosystem development, including to support women in digital entrepreneurship and promoting digital “excellence” for girls and women
 - Programs that promote female role models in digital sectors by recognizing and
 - rewarding outstanding girls and women in digital sectors, including entrepreneurship
 - Programs targeted at increasing the number of women IT experts, including through
 - Informal education and professional certification programs, in strategic digital fields like cloud computing, cybersecurity, data science, machine learning, artificial intelligence, software development, etc.
 - Digital skills apprenticeship programs targeting mature, adult women with mentorship and financial and other long-term support on their path toward digital entrepreneurship.

5.6 Leveraging the State of the Art

There are many initiatives worth building upon in the interest of increasing digital equity for women’s economic agency. Some that reflect the state of the art are highlighted below.

5.6.1 Ending Violence Against Girls and Women

Digital equity safeguards that promote women’s economic agency should also address both the threat of and actual physical and psychological violence suffered by girls and women, including online. To date, the Istanbul Convention (Council of Europe, 2023) promotes the most comprehensive global standard protecting and defending the right of individuals to be free from (threat of) violence online and otherwise. The accession, signing and ratification of the Istanbul Convention may therefore be valuable KPIs for capturing global progress on eradicating gender-based abuse, violence and harassment, including online.

5.6.2 “Women Digital” Role Models

The digital disruption has transformed media and the concept of what a "role model" is, but the impact of role models on the notion of what, for example, girls and women can accomplish as equal actors in society, cannot be understated. As Geena Davis famously said, “if she can see it, she can be it” (Geena Davis Institute on Gender in Media, 2023). In pursuit of digital equity in entrepreneurship, the role model “effect” for challenging negative stereotypes is critically important. The work of both the Geena Davis Institute on Gender and Media and the Global Alliance on Gender in Media, to leverage media of all kinds for achieving gender equality, has been invaluable in this direction and deserves attention.

5.6.3 “Women in Digital” Scoreboard

Under leadership of Ms. Mariya Gabriel, European Commissioner, the European Commission developed a Women in Digital Scoreboard that rates performance of individual European countries in terms of women’s participation in the digital economy, based on seven criteria. The scoreboard currently does not address women-led technology-driven entrepreneurship, but does include an indicator for “women ICT specialists,” as well as details on digital skills levels among women by age.

5.6.4 Gender Equality Indices

The European Institute on Gender Equality Gender Equality Index (EIGE, n.d.) is a composite index, representing thirty-one indicators in eight domains, for monitoring a country’s progress toward achieving gender equality. In "Work" and “Education” domains, these indicators also capture trends in STEM education and careers, for example, that impact the present discussion and may therefore provide a valuable starting point for key performance indicators on digital equity in entrepreneurship, especially as relates to women’s economic agency.

6 Conclusion

Digital equity for women’s economic agency, a policy priority at the nexus of women’s economic empowerment and closing the gender digital divide, is clearly gaining momentum as a focal point for international development action. Building upon the programs and practices included here, while monitoring and reporting on the suggested indicators, will help solidify an explicit focus on digital equity for women’s economic agency as the surest path to promote economic resilience and sustainable development.

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