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Women's Entrepreneurship

How to Measure the Gap between New Female and Male Entrepreneurs?

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Abstract

This paper analyzes data on female and male entrepreneurship that were collected by the World Bank Group's Entrepreneurship Database. Recognizing the importance of a differentiated approach to entrepreneurship in terms of legal entities, the data on female and male business owners are collected at the level of limited liability companies and sole proprietorships. Forty-four of the 143 economies that participated in the Entrepreneurship project provided some sex-disaggregated data for 2016. The paper finds that the gender gap in business ownership remains high in many economies around the world. In the majority of the analyzed economies, less than one-third of new limited liability company owners are women. Although sole proprietorships are more frequently used by female entrepreneurs, only three economies have similar or equal number of women business owners relative to men. The gap in female entrepreneurship is especially apparent in low-income economies, where women are much less likely than men to start a new business. The paper also provides new insights into the relationship between female entrepreneurship and various institutional factors, including women's financial inclusion, the gender gap in education, and legal rights disparities. The analysis suggests a need to expand the collection of sex-disaggregated data, to trace the economies' progress in narrowing the existing gender gap in entrepreneurship.

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Women's Entrepreneurship: How to Measure the Gap between New Female and Male Entrepreneurs?

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1. Introduction

Women's economic empowerment is a cornerstone of the 2030 Agenda for Sustainable Development. The 2016 Report of the United Nations Secretary-General's High-Level Panel on Women's Economic Empowerment provides strong evidence that women are lagging behind men in terms of the number of female business owners, the size of women-owned businesses, and their access to economic resources. Specifically, women-owned enterprises are smaller and disadvantaged in their access to credit, resources, and assets (UN Secretary-General's High-Level Panel on Women's Economic Empowerment 2016, 2). With data on the existing gender gap in female entrepreneurship sparse, tracking the progress achieved by women in this area becomes more important.

Cross-country comparisons are essential for in-depth analysis of the development of female entrepreneurship in different institutional, legal and socio-cultural environments. Measuring women's entrepreneurial activity is critically important for a better understanding of how female entrepreneurs contribute to the economy and society. However, there are few data sets related to female entrepreneurship with comparable cross-country data. To address this issue, the 2017 edition of the World Bank Group's Entrepreneurship Database expanded its scope to collect comparable cross-country data on the number of new female and male LLC owners and sole proprietors.

The importance of female entrepreneurship for economic development is widely recognized. Numerous studies demonstrate the positive impact of female entrepreneurs on economic growth and development, as well as sustainable and durable peace (Cuberes and Teignier 2014; Fetsch, Jackson, and Wiens 2015; Lewis et al. 2014; Woetzel et al. 2015). Moreover, economies characterized by high levels of female entrepreneurial activity are more resilient to financial crises and experience economic slowdowns less frequently (Global Entrepreneurship Research Association 2017, 29). Despite different methodologies, these studies find significant socioeconomic benefits of female entrepreneurship. According to Woetzel et al. (2015), a "full-potential" scenario—in which women participate in the economy identically to men—would contribute as much as $28 trillion, or 26 percent, to annual global GDP by 2025. Currently, the potential of female entrepreneurs is not fully realized in many economies. Indeed, an analysis of 15 gender indicators across 95 economies shows that 46 of these economies have very high levels of gender inequality on more than half of the indicators (ibid.). Another cross-country study demonstrates that gender gap-related income losses differ by geographical region (Cuberes and Teignier 2014). Economies in the Middle East and North Africa have the highest income loss associated with lower economic opportunities for women (27 percent); in Europe, this loss is less than 10 percent (ibid., 21).

This study provides further evidence of gender gaps in female business entry and ownership in many economies worldwide. Indeed, less than one-third of LLC owners are women in the vast majority of economies. Although sole proprietorships are more frequently used by female entrepreneurs, only three economies have similar or equal numbers of women business owners relative to men. The study also suggests that the gap in female entrepreneurship is reinforced by other gender inequalities, such as low financial inclusion of women, the gap in education, and legal rights disparities.

Section 2 reviews the coverage and limitations of existing female entrepreneurship data sets. Section 3 presents the methodology and describes the data collection process, with a particular focus on the new gender-specific indicators. Section 4 consists of a comparative analysis of gender gaps in business entry and ownership across economies. Section 5 discusses how institutional factors can influence female entrepreneurship. Specifically, this section analyzes the link between the level of female entrepreneurship and other factors, including legal barriers for women to doing business, their level of education and their ability to access bank accounts and capital.

2. Female Entrepreneurship and Existing Data Sets

The lack of comprehensive sex-disaggregated data on business entry and ownership presents a significant obstacle to the global and diversified analysis of female entrepreneurship. Due to insufficient standardized and country-comparable data, the diagnostics of gender gaps in entrepreneurship are limited. This section offers a brief overview of the existing data sets and indicators commonly used to measure female entrepreneurship and analyzes their limitations.

The Global Entrepreneurship Monitor (GEM) was launched in 1999 and is now carried out by more than 400 experts on entrepreneurship from over 100 research and academic institutions (Global Entrepreneurship Research Association 2017). The GEM considers the broad definition of entrepreneurship as "any attempt at new business or new venture creation, such as self-employment, a new business organization, or the expansion of an existing business, by an individual, a team of individuals, or an established business" (Reynolds, Hay, and Camp 1999, 3). This definition of entrepreneurship is not limited to a specific type of legal entity. Since 2004, the Global Entrepreneurship Research Association has published biannual reports on women's entrepreneurship which provide analysis of female entrepreneurs who intend to start and run businesses. The most recent report, for 2015, covers 83 economies. One of the key indicators used is the Total Early-Stage Entrepreneurship Activity (TEA) female and male rates which measure the percentage of the adult population either in the process of starting a business or who have recently started a business (Global Entrepreneurship Research Association 2015, 17). Methodologically, the GEM reports rely heavily on country-level surveys. For the TEA, the GEM collects data with an Adult Population Survey (APS) of at least 2,000 randomly selected adults in each economy. In addition, a National Expert Survey (NES) collects in-depth opinions from at least 36 national experts about the factors that affect the entrepreneurship environment in each economy.

In 2011, the Organisation for Economic Co-operation and Development (OECD) launched a gender initiative to strengthen gender equality in three areas: education, employment and entrepreneurship. The OECD broadly defines entrepreneurs as "people who own and work in their own business, including un-incorporated businesses and own-account workers" (OECD 2016, 122). The OECD Gender Data Portal provides data on 18 indicators related to female entrepreneurship including the share of female-owned sole-proprietor enterprises, earnings gap in self-employment and attitudes toward entrepreneurial risk. However, geographic coverage is limited to the 35 OECD members and partner economies. Furthermore, some indicators do not have comprehensive country coverage. The 2011–2015 data on the share of sole-proprietor enterprises owned by women, for example, are available for only one country (France).

The United Nations launched the Evidence and Data for Gender Equality (EDGE) project in 2013 to strengthen national systems on gender data collection in critical areas of policy making. As of June 2017, the list of Minimum Set of Gender Indicators contained 52 quantitative indicators and 11 qualitative indicators related to national norms. Two of the indicators measure entrepreneurial activity directly, namely the percentage of women-owned firms (defined by size) and the proportion of workers who are self-employed. Between 2012 and 2015, EDGE focused on the development of guidelines for the collection of gender indicators based on household surveys. The EDGE pilot project was conducted in only seven developing economies—Georgia, Maldives, Mexico, Mongolia, the Philippines, South Africa and Uganda. Similar to the OECD gender initiative, the EDGE project defines entrepreneurs as "persons who have direct control over an enterprise they own alone or with other individuals" (UNSD 2017).

In recent years, several composite indices of female entrepreneurship have been introduced based on the combination of different sources. Launched in 2015, the Global Women Entrepreneur Leaders Scorecard is based on sources such as the World Bank's Global Findex database, the World Bank's *Women, Business and the Law* database, the World Economic Forum, Transparency International, the Global

Entrepreneurship Monitor, and the Global Gender Gap Index, among others. The Global Women Entrepreneur Leaders Scorecard identifies impediments to high-impact female entrepreneurship in 31 economies. High-impact female entrepreneurs are defined as those "who own and operate businesses that are innovative and growth oriented" (Aidis, Weeks, and Anacker 2015). A composite index of 21 indicators, the Scorecard highlights key aspects of an economy's institutional and business environment, gender access issues and individual-level entrepreneurial characteristics.

The Global Entrepreneurship Index (GEI), developed by the Global Entrepreneurship and Development Institute (GEDI) in 2011, is another composite index of entrepreneurial activity. The GEDI launched the Female Entrepreneurship Index (FEI) in 2013. It measures the global development of high-potential female entrepreneurs, who are defined as "women who own and operate businesses that are innovative, market expanding, and export-oriented" (Terjesen and Lloyd 2015, 4). The FEI consists of 23 gender-specific variables that inform three sub-indices: (i) entrepreneurial environment, including equal rights and market size, secondary education, business risk, and access to childcare; (ii) entrepreneurial eco-system, including support and training for small and medium-size businesses and labor force parity; and (iii) entrepreneurial aspirations, including expenditure on research and development and external financing.

A comparative analysis of the existing data sets devoted to global entrepreneurship shows certain limitations. Most existing data sets and indicators are based on data which are largely self-reported by individuals or by domestic entrepreneurship experts. As a result, some of these data are reported sporadically or based on perceptions. Several indicators among the reviewed data sets represent composite indices that aggregate a set of different sources and other data points. A further limitation is the wide range of definitions of female entrepreneurship. These definitions can vary—which can create issues of comparability among data sets. In addition, the various data sets use different input data about factors facilitating or impeding the development of entrepreneurship and output data measuring female entrepreneurial activity. A comparative analysis of the existing data sets, with a focus on their input and output indicators, is presented in Table A1 in the appendix.

The existing data sets related to female entrepreneurship usually apply a general approach that covers various types of business entities. They do not differentiate between sole proprietorships, LLCs or corporate organizations. However, several studies point to the importance of a differentiated approach to female entrepreneurship (Aidis and Weeks 2016; Estrin and Mickiewicz 2011; Terjesen and Lloyd 2015). For example, based on their analysis of the Female Entrepreneurship Index calculated for 77 economies, Terjesen and Lloyd (2015) suggest that "although all forms of female entrepreneurship are important, more sophisticated ventures require additional resources, skills, and aspirations" (2015, 5). A survey of high-tech firms conducted in 2004 by the Kauffman Foundation provides substantial evidence of the existence of discrepancies in organizational form between male and female business owners. Robb and Coleman (2009) conclude that women-owned high-tech firms are more likely to be organized as sole proprietorships or partnerships during their start-up year (38.7 percent versus 24.9 percent for firms owned by men) and are less likely to be organized as either corporations or as LLCs (61.3 percent versus 75.1 percent). Even at the initiation stage, male entrepreneurs tend to develop larger and more sophisticated businesses than women. In this respect, disaggregated data on the organizational form of women-owned businesses could provide new insights into lower levels of participation by women in growth-oriented entrepreneurship.

3. Methodology and Data Collection

The Entrepreneurship Database was launched in 2007 to benchmark formal entrepreneurial activity across economies. An advantage of the Entrepreneurship Database is its reliance on official statistics that come mostly from business registries and national statistical agencies. The Entrepreneurship Database defines an entrepreneur as "any economic unit of the formal sector incorporated as a legal entity and registered in a public registry, which is capable, in its own right, of incurring liabilities and of engaging in economic activities and transactions with other entities" (Ács, Desai, and Klapper 2008, 267). In contrast to many entrepreneurship indices, the Entrepreneurship Database does not include the informal sector, owing primarily to the difficulties associated with quantifying the number of firms that comprise it. Considering that statistical agencies around the world define business entities in various ways, the Entrepreneurship Database takes into account their legal form. The standard unit of measurement provides comparable data on entrepreneurial activity across economies.

The Entrepreneurship Database helps clarify the relationship between new firm registration, the regulatory environment, and economic growth. Research using the Entrepreneurship Database shows a significant relationship between the level of cost, time, and procedures required to start a business and new firm registration (Divanbeigi and Ramalho 2015; Klapper, Lewin, and Quesada Delgado 2009; Klapper and Love 2010). A recent study, for example, shows that an improvement of 10 percentage points in the overall measure of business regulation (Doing Business distance to frontier score) is linked to an increase of around 0.6 new businesses per 1,000 adults (Divanbeigi and Ramalho 2015, 8). The Entrepreneurship Database also helps explain the relationship between entrepreneurship and financial development, including the impact of financial crises on the formation of new businesses in the economy (Klapper and Love 2011; Klapper, Meunier, and Diniz 2014).

The 2017 edition of the Entrepreneurship Database contains annual data for 143 economies on the number of limited liability companies (LLCs) registered (both new and total) between 2006 and 2016. The Entrepreneurship Database was expanded in 2017 to include a gender dimension of business ownership. To do so, it combines comparable cross-country data on new businesses registered in those economies where national statistics include sex-disaggregated data. Furthermore, recognizing the importance of a differentiated approach to entrepreneurship in terms of organizational form, the data on female and male business owners are collected at two levels—LLCs and sole proprietors. This allows for in-depth analysis of gender differences in business entry worldwide. The Entrepreneurship Database facilitates both a greater understanding of the dynamics of new business registration around the world and in-depth analysis of the relationship between gender and entrepreneurship at various organizational levels.

To ensure cross-country comparability, the Entrepreneurship Database employs a consistent unit of measurement that is applicable and available among the diverse sample of participating economies. The Entrepreneurship Database and World Bank Group's Doing Business jointly developed a data collection methodology to measure entrepreneurial activity systematically. The primary sources of information for the Entrepreneurship Database are national business registries. In cases where the business registry is unable to provide the data, alternatives sources—such as statistical agencies, tax and labor agencies, ministries of economy and chambers of commerce—are used. The data collection process involves telephone interviews and email correspondence with business registries.

The gender-specific indicators used in the Entrepreneurship Database include the percentage of new female LLC owners, the percentage of new female sole proprietors and the percentage of new LLCs with female ownership. Table A2 in the appendix presents sources of sex-disaggregated data. The OLS regression analysis presented in this study uses two dependent variables: the percentage of new female LLC owners and the percentage of new female sole proprietors. Using these variables allows for the identification of

particular effects that institutional factors have on female entrepreneurship at different levels. The independent variables include the Women, Business, and the Law measure of legal rights disparities, years of women's education, and account ownership. The control variable used is gross national income per capita. The descriptions and sources for the dependent and independent variables are included in Table A3 in the appendix.

The Entrepreneurship Database uses the World Bank's groupings of economies based on income. All economies are divided into three income groupings: low income, middle income and high income. The indicator used for these groupings is gross national income per capita in U.S. dollars, converted from local currency (World Bank 2017). For geographic units, the Entrepreneurship Database also uses the World Bank's regional groupings. Under this classification, participant economies fall into seven regions: East Asia and the Pacific (EAP), Europe and Central Asia (ECA), Latin America and the Caribbean (LAC), Middle East and North Africa (MENA), OECD high-income economies (OECD), South Asia (SAS) and Sub-Saharan Africa (SSA).

Of the 143 economies participating in the Entrepreneurship Database, 44 economies provided sex-disaggregated data on female and male entrepreneurship. Of these, 15 economies are classified as high income, 24 as middle income, and five as low income. They represent diverse cultural, political, institutional, geographic and socioeconomic environments. Table A4 in the appendix places the 44 economies that provided sex-disaggregated data into 21 groups, determined by their region and gender indicators. Of the 44 economies providing sex-disaggregated data, only 22 provided data on both new female LLC owners and new female sole proprietors. In seven economies, sex-disaggregated data were limited to the number of new female LLC owners and did not include data on sole proprietors. Conversely, 11 economies provided the data on the number of new female sole proprietors but did not provide data on female LLC owners. In one economy, Albania, sex-disaggregated data included the number of LLCs with at least one female business owner, but did not include either the number of new female LLC owners or new female sole proprietors. For 2016, observations related to new female LLC owners include 32 economies, while observations related to new female sole proprietors cover 35 economies.

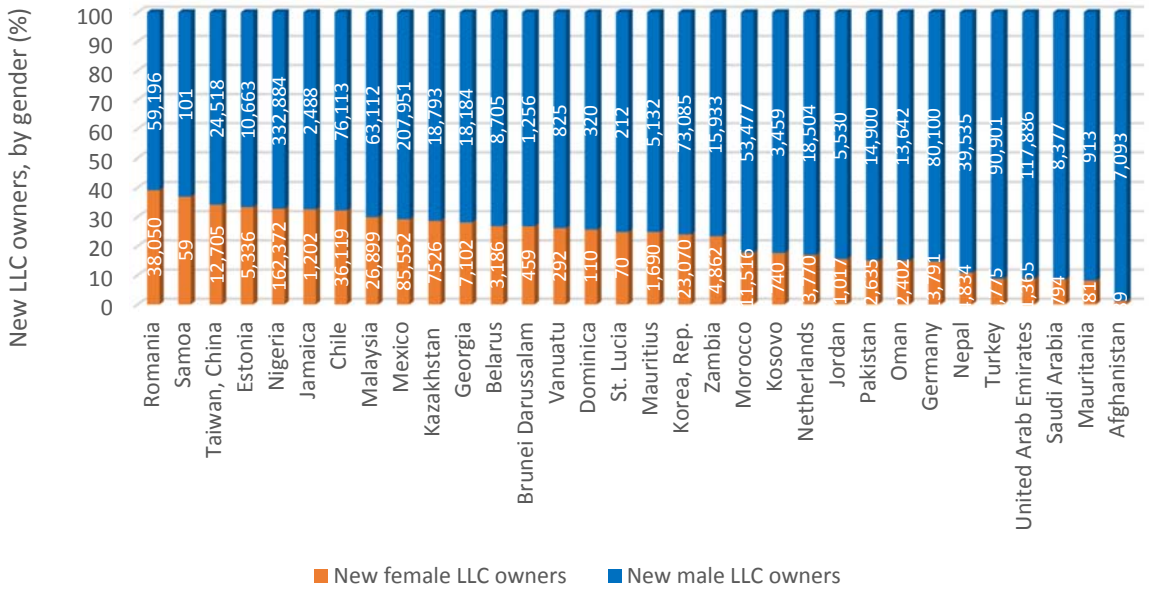
A limited number of economies provided panel data on the number of new female LLC owners and sole proprietors over the last five years. Specifically, 24 economies reported panel data on the number of new female LLC owners between 2012 and 2016, while 28 economies provided the data on female sole proprietors for the same period. The insufficient coverage of sex-disaggregated data limits empirical analysis of female business entry and suggests the need to expand the collection of time-series data on female entrepreneurship over the coming years. The regression analysis is based on indicators calculated for 2016. The descriptive statistics, including the number of observations available for each indicator, are included in Table A5 in the appendix.

4. Comparative Analysis of the Gap between Female and Male Entrepreneurs

The economies examined in this study show substantial variations in the percentage of new female business owners at the level of both LLCs and sole proprietorships. Figure 1 shows the percentage of new female LLC owners calculated for 32 economies where official business registries provided the relevant data. Among these economies, the percentage of new female LLC owners in 2016 ranges from a high of 39.1 percent in Romania to a low of 1.2 percent in Afghanistan. In most economies (87 percent of those included in the sample), less than one-third of new LLC owners were women in 2016.

All 32 economies studied exhibit significant gender gaps in business entry at the level of LLCs. Furthermore, in all but one economy (Estonia), less than 1 percent of the female adult population are new LLC owners. In Estonia, 1.2 percent of the female adult population registered a new LLC in 2016.

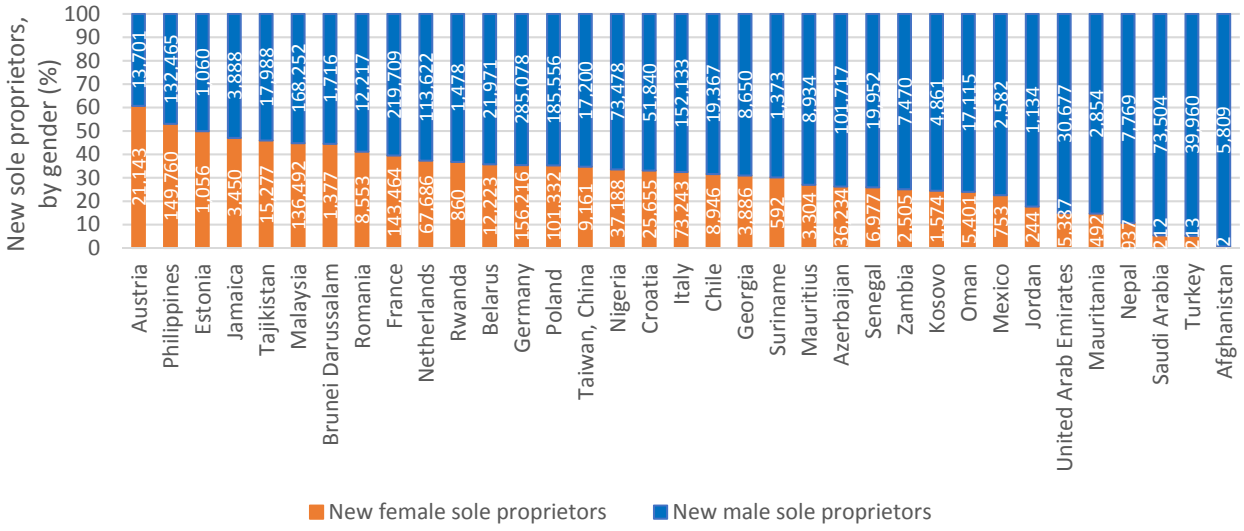
Figure 1: Percentage and number of new female and male LLC owners in 2016



Source: Entrepreneurship Database.
Note: The labels show the absolute numbers of new female LLC owners and new male LLC owners.

Thirty-five economies provided data on female-owned sole proprietorships for 2016. Figure 2 shows the proportion of new female sole proprietors in these economies. The percentage of new female sole proprietors ranges from a high of 60.7 percent in Austria to a low of 0.7 percent in Afghanistan. Only three economies—Austria, the Philippines, and Estonia—recorded a similar or higher number of female-owned sole proprietorships than male-owned sole proprietorships in 2016.

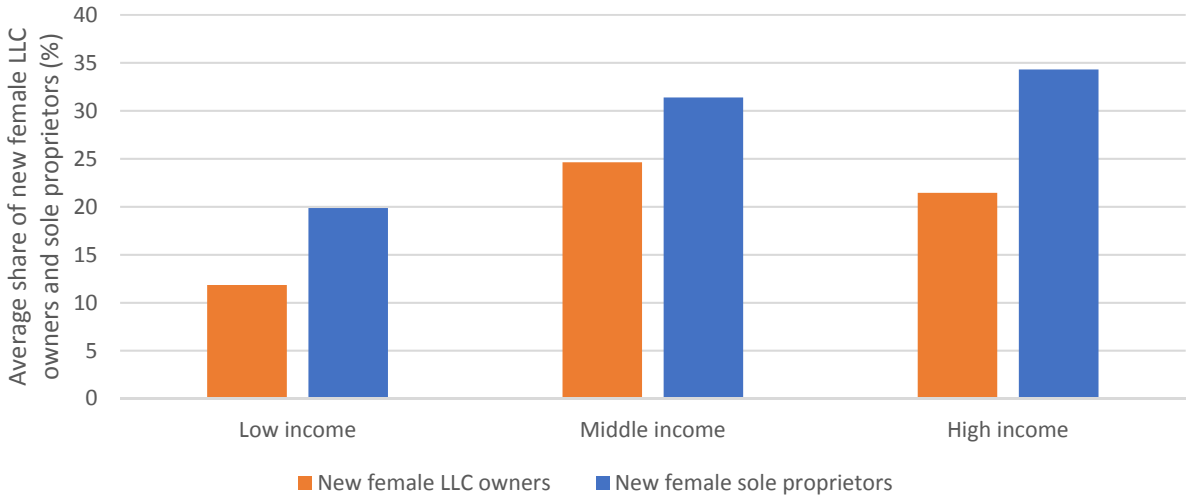
Figure 2: Percentage and number of new female and male sole proprietors in 2016



Source: Entrepreneurship Database.
Note: The labels show the absolute numbers of new female- and male-owned sole proprietorships registered in 2016.

Gender gaps in female business entry and ownership are associated with substantial losses to national income and economic development at both the national and regional levels. While the data show that female entrepreneurs choose to start their firms as sole proprietorships more often than LLCs, there was a significant gender gap between female and male entrepreneurs in 2016. The average proportion of new female LLC owners and sole proprietors in three income groups are shown in figure 3. Low-income economies are characterized by the largest gaps in female business ownership at the level of both LLC owners and sole proprietors.

Figure 3: Average income-group percentages of new female LLC owners and sole proprietors in 2016

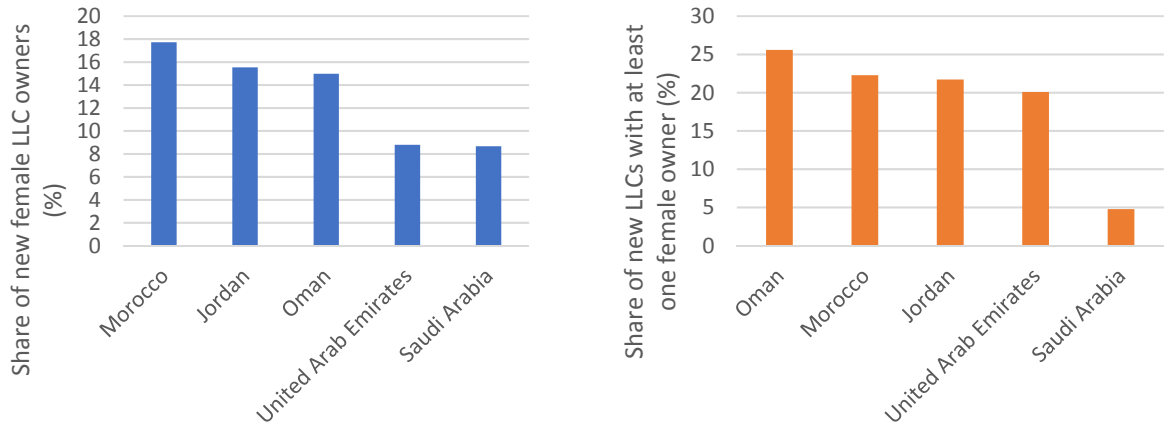


Source: Entrepreneurship Database.

The gender gap in business ownership is observed in every income group. However, women in low-income economies are proportionately less likely to start businesses at the level of either LLCs or sole proprietorships than those in middle- and high-income economies. The significant gender gaps observed in low-income economies suggest that few women are able to start new businesses.

One of the biggest gaps can be observed in the Middle East and North Africa region, where only one out of four women participates in the labor force (Gatti et al. 2013:10). Despite a marginal increase in women's participation in economic activities in recent years, it is estimated that it would take 150 years for the economies of the Middle East and North Africa to reach the current world average for female labor force participation (Gatti et al. 2013, 10). The Entrepreneurship Database provides further evidence of the substantial gender gap in female entrepreneurship in the Middle East and North Africa region. Over the past five years, however, the number of women-owned businesses has risen steadily in some economies, including Morocco, Jordan and the United Arab Emirates. Figure 4 depicts the proportion of new female business owners in 2016 in the five economies in the Middle East and North Africa region included in this study. Morocco had the largest proportion of new female LLC owners (17.7 percent), followed by Jordan (15.5 percent) and Oman (15 percent).

Figure 4: The level of female business ownership in select economies in the Middle East and North Africa in 2016



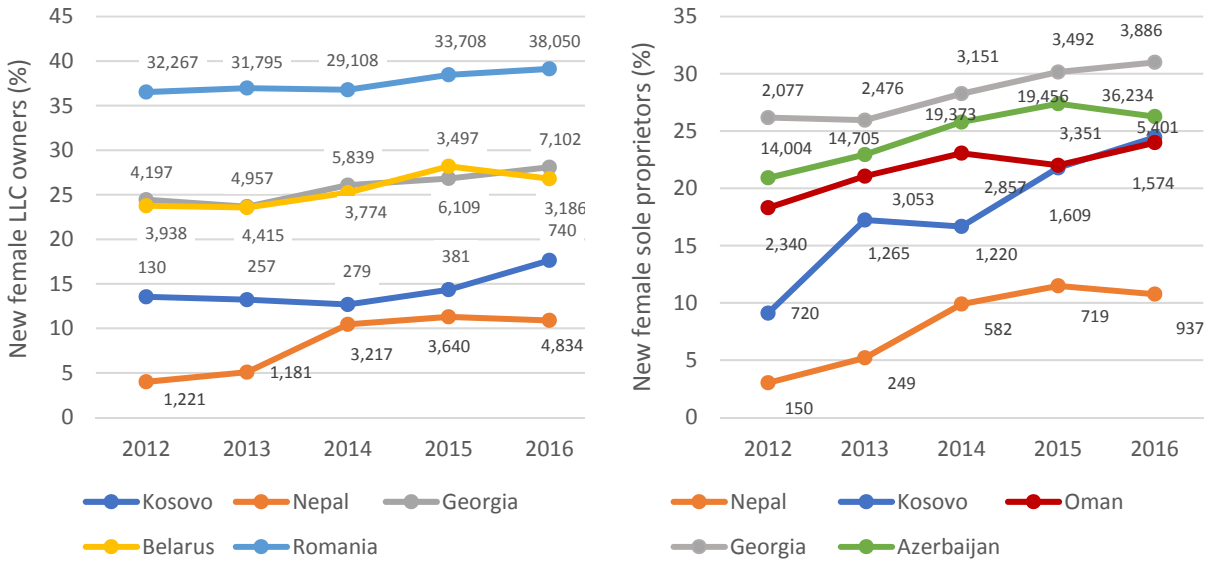
Source: Entrepreneurship Database.

Levels of female business ownership are relatively low in the Middle East and North Africa region compared to those in the OECD high-income group. Women entrepreneurs in the Middle East and North Africa face barriers including financial constraints and a lack of female-friendly entrepreneurship policies. For example, women in the Middle East are half as likely as men to have a formal bank account (Demirgüç-Kunt et al. 2015). Furthermore, women business owners across the region identify similar challenges to doing business, such as accessing financial management skills training, finding and keeping good employees and securing capital (CAWTAR and IFC 2007, 7). Inequalities surrounding legal rights also hamper the participation rate of female entrepreneurs. Gender legal disparities are higher than the estimated world average in the Middle East and North Africa (Iqbal et al. 2016, 11). Of the regional economies included in the Entrepreneurship Database, Morocco has the lowest measure of legal rights disparities; Saudi Arabia has the highest (Iqbal et al. 2016, 13). Indeed, legal rights disparities correspond to differences in female business ownership in these economies.

The gender gap in business ownership precludes the economies of the Middle East and North Africa from benefiting from the gains associated with female entrepreneurship, including job creation and economic development. A "full-potential" scenario—in which women participate in the economy at the same rate as men—would add an estimated $2.7 trillion, or 47 percent, to annual regional GDP by 2025 (Woetzel et al. 2015, 34–35). This underscores the importance of developing policies and programs that support female entrepreneurship.

Of the 44 economies that provided related sex-disaggregated data, 24 provided data on new female LLC owners between 2012 and 2016 and 28 reported the data on new female sole proprietors for the same period. These data show that—in some economies—there was a significant increase in the percentage of new female LLC owners and sole proprietors over this five-year period. Figure 5 shows that the gender gap in business ownership narrowed in Azerbaijan, Belarus, Georgia, Kosovo, Nepal, Oman, and Romania between 2012 and 2016. The largest increase in the proportion of female LLC ownership is reported in Nepal, where new female LLC ownership rose from 4 percent in 2012 to 11 percent in 2016. Conversely, a decreasing number of new female LLC owners is reported in economies including Afghanistan, Saudi Arabia and Turkey. In Saudi Arabia and Turkey, a decrease in the number of new female LLC owners was accompanied by an increase in the number of newly-registered LLCs compared to 2012. An increasing proportion of new female sole proprietors is observed in economies including Azerbaijan, Georgia, Kosovo, Nepal and Oman, where the gender gap narrowed compared to 2012. The largest overall increase is observed in Kosovo where the proportion of new female business owners rose from 9 percent in 2012 to 25 percent in 2016.

Figure 5: Economies with the most significant growth in the proportion of new female business owners



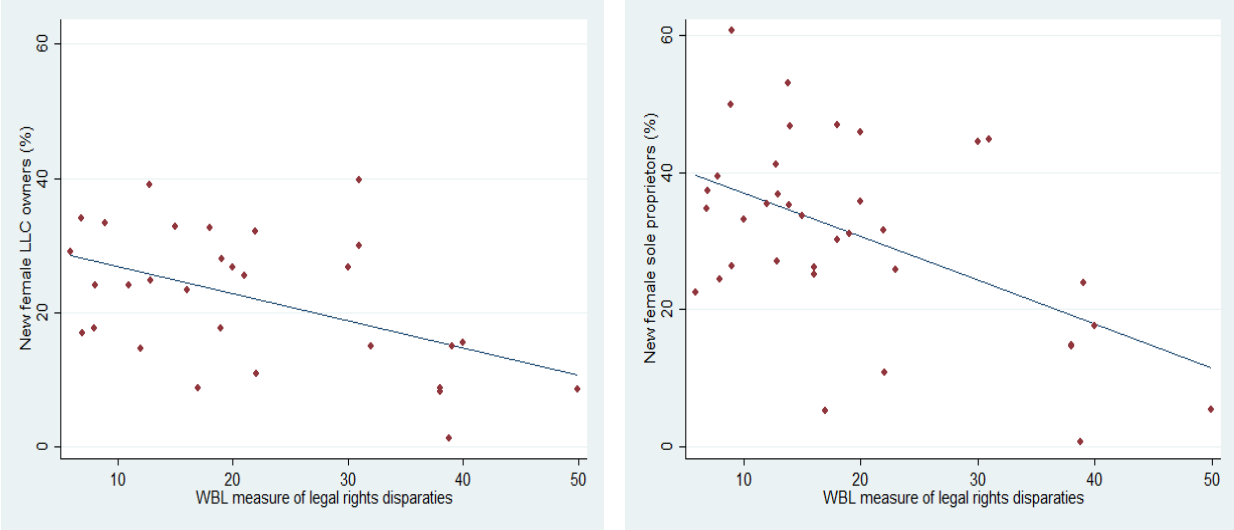
Source: Entrepreneurship Database.
Note: The labels show the absolute numbers of new female LLC owners and sole proprietors.

5. Institutions and Female Entrepreneurship

The new data on the number of female LLC owners and sole proprietors provide a snapshot of business ownership demographics in various economies. This measure of female entrepreneurship can be analyzed with other indicators that can influence female entrepreneurship. The World Bank's *Women, Business, and the Law* (WBL) database and the Global Findex database, for example, provide additional information on institutions that help to contextualize the observed variations in the proportion of new female LLC owners and sole proprietors across economies.

Gender gaps in female business entry reflect disparities in women's legal rights. In particular, they signal other inequalities in access to institutions, use of property, getting a job, providing incentives to work, going to court, building credit and protecting women from violence. Currently, the *Women, Business, and the Law* database captures aspects of gender inequality in 190 economies around the world. Using these data, the *Women, Business, and the Law* database constructs a measure of legal gender disparities. A recent study finds that a high degree of legal gender disparities "is negatively associated with a wide range of outcomes, including years of education of women relative to men, labor force participation rates of women relative to men, proportion of women top managers, proportion of women in parliament, percentage of women that borrowed from a financial institution relative to men and child mortality rates" (Iqbal et al., 21). In addition, the Entrepreneurship Database identifies another important gender outcome of legal disparities across economies. Figure 6 shows that *the Women, Business, and the Law* measure of legal disparities is negatively correlated with the proportion of new female LLC owners and sole proprietors, implying that such disparities constitute a significant barrier for the development of female entrepreneurship.

Figure 6: The WBL measure of legal disparities and the level of female entrepreneurial activity



Sources: Entrepreneurship Database; adapted from Iqbal et al. (2016).
Note: The regression results are presented in tables A6 and A7. The models are based on 30 and 35 observations, respectively. The relationship is significant at the 1 percent level after controlling for income per capita.

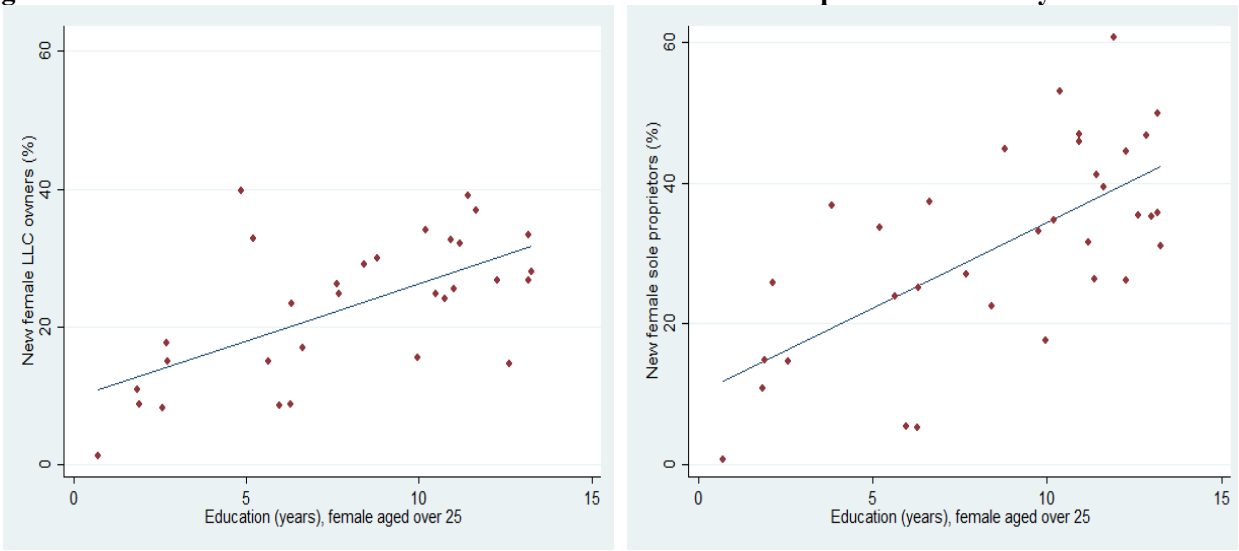
Economies with more gender disparities are also characterized by relatively low numbers of new female entrepreneurs at the level of both LLCs and sole proprietorships. Importantly, the negative effect of legal rights disparities tends to be more burdensome for female sole proprietors. Again, most economies that participated in the study show gender disparities in legal rights that are important for entrepreneurship, such as registering a business, applying for a passport, obtaining a national identification card, traveling outside the home, opening a bank account, legally administering property, and acquiring equal property rights

without male consent. Although these gender disparities in legal rights affect all women, they are even more restrictive for female entrepreneurs who want to start new businesses. Overall, the data show that gender equality in legal rights is critical for fostering female entrepreneurship. Specifically, equal legal rights facilitate access for female business owners to economic resources and finance.

Many studies highlight the benefits of formal schooling to entrepreneurship and business performance (Fayolle and Kyrö 2008; Islam and Amin 2016; Iversen, Malchow-Møller, and Sørensen 2016; Kobeissi 2010; Van Der Sluis, Van Praag and Vijverberg 2008). Importantly, there is evidence that female entrepreneurs benefit more from education than their male counterparts (Van Der Sluis, Van Praag and Vijverberg 2008, 797). Several factors explain the positive relationship between education and entrepreneurship. First, starting and running a successful business requires start-up skills on the part of entrepreneurs. Second, national education systems play a critical role in the creation of high-quality human capital and the formation of positive attitudes toward entrepreneurship. As such, human capital is an important determinant of entrepreneurial development. Educated and experienced entrepreneurs are better prepared to face challenges that arise in rapidly changing and highly-competitive business environments. The entrepreneur's level of education is of particular importance for more sophisticated forms of entrepreneurial activity. Also, high-quality human resources are more likely to create innovative high-growth businesses in the most technologically-advanced industries.

In this respect, Gakidou et al. (2010) show that "the substantial increase in education, especially of women, and the reversal of the gender gap have important implications for the status and roles of women in society." Importantly, more developed economies with higher levels of education are also characterized by higher rates of female participation in the labor force. Formal education can develop the knowledge and skills in women required to run their own businesses. To identify links between formal education and female business ownership, this study relies on the Institute for the Health Metrics and Evaluation (IHME) Database, which contains information about global educational attainment spanning the last 50 years. The database provides estimates of average years of educational attainment per capita by year (1970-2015), gender and age group for 188 economies. The study uses age-standardized and population-weighted estimates for females over 25 years of age (Institute for Health Metrics and Evaluation 2017). Figure 7 demonstrates that a higher mean number of years of education is positively associated with the level of female entrepreneurial activity.

Figure 7: Years of education of women and the level of female entrepreneurial activity



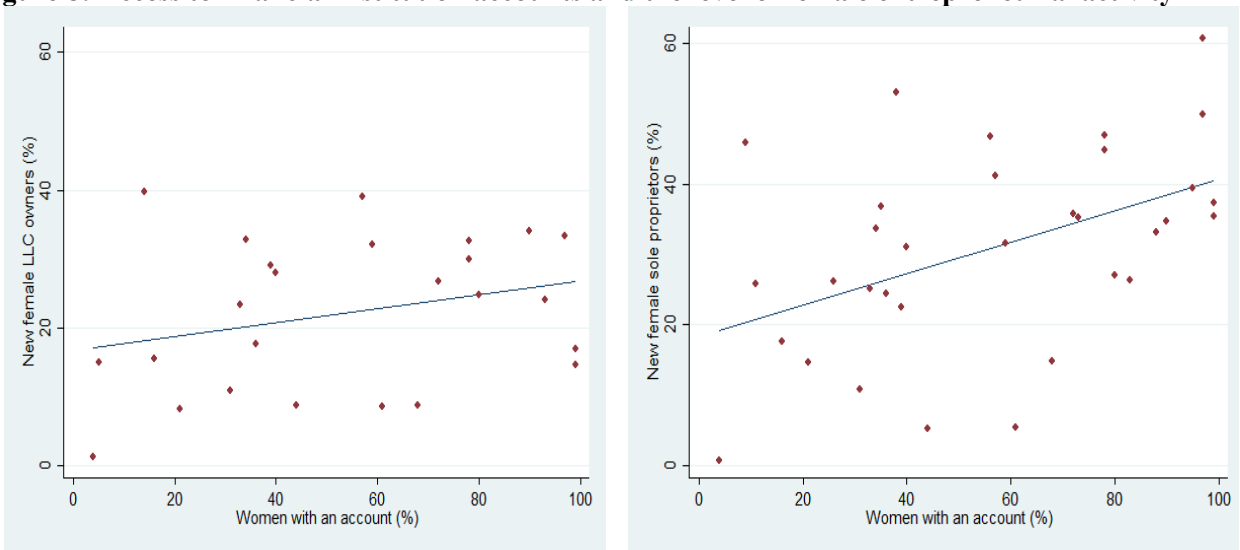
Sources: Entrepreneurship Database; adapted from the Institute for Health Metrics and Evaluation (2017).

Note: The regression results are presented in tables A6 and A7. The models are based on 31 and 33 observations, respectively. The relationship is significant at the 1 percent level after controlling for income per capita.

This analysis suggests that economies where women have a higher number of years of education are also characterized by relatively high numbers of new female entrepreneurs at the level of both LLCs and sole proprietorships. Importantly, the positive effect of education is slightly stronger for female sole proprietors. Overall, the data show that education is critical for fostering female entrepreneurship. The educational attainment variable also captures the *quality* of entrepreneurs; there is a broad consensus that individuals with a higher number of years of schooling are more capable of starting more sophisticated businesses in the most technologically-advanced industries. The positive relationship between educational attainment and business ownership is observed in all regions and income groups, suggesting that equal access to education is critically important for the development of female entrepreneurial activity. In this context, narrowing the gender gap in education also contributes to narrowing the gap between male and female business owners.

The Global Findex database provides evidence that large gender gaps in access to capital, bank accounts and finance persist in many economies despite progress in expanding financial inclusion. Importantly, a significant number of women remain unbanked globally. In 2011, only an estimated 47 percent of women had a bank account compared to 54 percent of men; by 2014, these numbers had risen, to 58 percent and 65 percent, respectively (Demirgüç-Kunt et al. 2015). However, the same 7 percentage point gender gap persisted. Furthermore, large disparities exist in account ownership across economies in different income groups. In developing economies, this gap was estimated at 9 percentage points; in OECD high-income economies it is virtually nonexistent (Demirgüç-Kunt et al. 2015). At the same time, Figure 8 shows that access to bank accounts as savings and payment mechanisms is positively associated with female business ownership.

Figure 8: Access to financial institution accounts and the level of female entrepreneurial activity



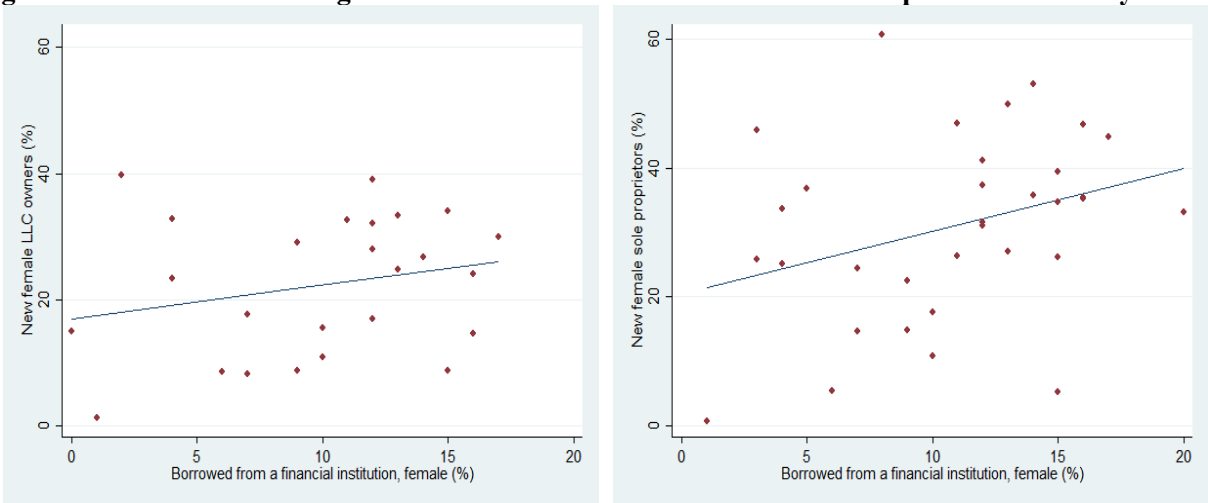
Sources: Entrepreneurship Database; Global Findex Database (http://datatopics.worldbank.org/financialinclusion/), World Bank.
Note: The regression results are presented in tables A6 and A7. The models are based on 25 and 32 observations, respectively. The relationship is significant at the 1 percent level after controlling for income per capita.

This analysis suggests that the removal of barriers to account ownership tends to benefit the development of female entrepreneurial activity at the level of both LLCs and sole proprietorships. Importantly, the positive effect of account ownership is stronger for female sole proprietors. Considering the existing disparities in account ownership across different income groups, it can be argued that women in less-developed economies would have greater entrepreneurial advantages from easier access to bank accounts.

Another obstacle that is particularly restrictive for female entrepreneurial activity is access to the economic resources needed to start a new business, including capital and finance (Estrin and Mickiewicz 2011; Brush and Cooper 2012). Global Findex data show that the problem of insufficient access to formal loans persists in many economies worldwide. In 2014, women in OECD high-income economies were about 20 percent less likely than their male counterparts to report having borrowed from a financial institution in the past 12 months (Demirgüç-Kunt et al. 2015). However, developing economies were characterized by the overall low level of formal credit for both men and women (Demirgüç-Kunt et al. 2015). Policies that enhance financial inclusion are beneficial for the development of entrepreneurship.

Comparing data from the Entrepreneurship Database with that from the relevant Global Findex database indicators allows for the identification of links between women's access to loans from financial institutions and the percentage of new female LLC owners and sole proprietors. Figure 9 demonstrates that there is a positive relationship between an economy's female business ownership and the percentage of women who borrowed from a financial institution within the past 12 months.

Figure 9: Access to borrowing from financial institutions and female entrepreneurial activity



Sources: World Bank Entrepreneurship Database; Global Findex Database.
Note: The regression results are presented in tables A6 and A7. The models are based on 25 and 34 observations, respectively. The relationship for female LLC owners is significant at the 5 percent level after controlling for income per capita.

This analysis suggests that the availability of formal loans to women who start their own businesses can be beneficial for the development of female entrepreneurship at the level of both LLCs and sole proprietorships. Importantly, the positive effect of borrowing from financial institutions is stronger for female sole proprietors. However, a number of economies are characterized by extremely low levels of access to capital for women. In such cases, female entrepreneurs must often rely on informal social networks for resource acquisition; such networks tend to be male-dominated (Aidis et al. 2008; Estrin and Mickiewicz 2011; Krylova 2016). The importance of public policies aimed at expanding women's financial inclusion is underscored by this point.

6. Conclusion

Comparisons of gender-neutral and gender-specific indicators of entrepreneurship highlight the importance of collecting data on female business owners. The systematic and consistent collection of such data is crucial for developing meaningful, evidence-based recommendations and public policies related to women's economic empowerment and their contribution to international development. The lack of sex-disaggregated data in many economies limits the understanding of the issues surrounding female entrepreneurship. As previously stated, a number of national statistics authorities do not compile sex-disaggregated data on entrepreneurial activity.

This study suggests that the gender gap in business ownership remains high in many economies around the world. In the vast majority of the analyzed economies, less than one-third of new LLC owners are women. Although sole proprietorships are more frequently used by female entrepreneurs, only three economies have similar or equal number of women business owners relative to men. The gap in female entrepreneurship is especially apparent in low-income economies where women are much less likely than men to start a new business. This suggests a need to intensify efforts to boost female business ownership. Progress in this area should be tracked closely over the coming years through expanding the collection of standardized and country-comparable sex-disaggregated data on business entry and ownership within the Entrepreneurship Database.

This study also explores interlinked and reinforcing factors that impact female entrepreneurship, including women's financial inclusion, legal rights disparities and the gender gap in education. This analysis shows that national economies should prioritize the expansion of financial inclusion, equal legal rights and access to education for women. The elimination of gender disparities in these spheres also contributes to the narrowing of the gender gap in entrepreneurship. Sustainable Development Goal (SDG) 5, which targets all forms of discrimination against women and girls, provides an opportunity to tackle these issues holistically. The achievement of SDG 5 is critically important. Without boosting women's economic participation and moving towards gender equality, it will be significantly more challenging for economies to achieve other SDGs or the 2030 Agenda for Sustainable Development and, most importantly, to reach their full economic and social potential. In this respect, further research is needed to provide policy-relevant evidence on female entrepreneurship. Such research could measure female directorship in addition to female ownership. The development of solutions to reduce the existing gender gap in business formation would also require in-depth analysis of business demography, characteristics of women-owned businesses, and determinants of their growth.

APPENDIX

Table A1: Data Sets related to female entrepreneurship

Data set and coverage in latest report	Type of data	Definition of female entrepreneurship	Examples of input indicators	Examples of output indicators
GEM Special Report on Women's Entrepreneurship (83 economies in 2015)	Primary data	Any attempt at new business or new venture creation	Surveys covering following issues, by gender: • Fear of failure • Capability perceptions • Opportunity perceptions • Personal connections (knowledge of entrepreneurs)	• Female TEA rates and female/male ratio • Intentions of women to start a business within the next 3 years
OECD Gender Data Portal (35 OECD economies, partner economies in 2016)	Primary data	Women who own and work in their own business, including unincorporated businesses and own-account workers	• Attitudes toward entrepreneurial risk, by gender • Feasibility of self-employment, by gender • Share of the population who report borrowing money to start a business, by gender • Access to training and money to start a business, by gender	• Share of sole-proprietor enterprises owned by women • Earnings gap in self-employment • Share of employed who are employers • Share of women inventors
Evidence and Data for Gender Equality (EDGE) (7 pilot economies in 2015)	Primary data	Women who have direct control over an enterprise they own alone or with other individuals	• Proportion of the population with access to credit, by gender • Proportion of adult population owning land, by gender • Gender gap in wages • Proportion of children under age 3 in formal care • Gender parity index of the enrolment education	• Percentage of firms defined by size owned by women • Proportion of employed who are own-account workers (self-employed)
Global Women Entrepreneur Leaders Scorecard (31 economies in 2015)	Secondary data	High-impact women entrepreneurs who own and operate businesses that are innovative and growth oriented	• Law business regulations • Access to education • Access to banks • Equal legal rights • Access to small and medium-size enterprise training	• Female start-ups ratio • College educated start-ups • Growth-oriented start-ups • Market expanding start-ups
Female Entrepreneurship Index (77 economies in 2015)	Secondary data	Women who own and run businesses that are innovative, market expanding and export-oriented	• Equal rights and market size • Secondary education • Business risk • Access to childcare • SME support and training • Labor force parity • Expenditure on research and development, financing	• Entrepreneurship ratio that measures the ratio of female to male TEA

Table A2: Sources of Sex-Disaggregated Data on Business Ownership

Economy	Data Source
Afghanistan	Afghanistan Central Business Registry and Intellectual Property
Albania	Institute of Statistics (INSTAT)
Austria	Austrian Institute for Small and Medium Enterprises Research
Azerbaijan	Ministry of Taxes
Belarus	Ministry of Justice of Belarus
Brunei Darussalam	Registry of Companies and Business Names Division
Chile	Ministry of Economy, Development, and Tourism
Croatia	Bureau of Statistics of the Ministry of Justice
Dominica	Companies and Intellectual Property Office
Estonia	Centre of Registers and Information Systems
France	National Institute of Statistics and Economic Studies
Georgia	National Statistics Office of Georgia (GEOSTAT)
Germany	Federal Statistical Office
Italy	Italian Union of Chambers of Commerce, Industry, Crafts and Agriculture
Jamaica	Companies Office of Jamaica
Jordan	Companies Control Department
Kazakhstan	Committee on Statistics of the Ministry of National Economy
Korea, Rep.	Ministry of Strategy and Finance
Kosovo	Kosovo Business Registration Agency
Malaysia	Companies Commission of Malaysia
Mauritania	Single Window Unit
Mauritius	Corporate and Business Registration Department
Mexico	Ministry of Economy
Morocco	Moroccan Office of Industrial and Commercial Property
Nepal	Office of the Company Registrar
Netherlands	Netherlands Chamber of Commerce
Nigeria	Corporate Affairs Commission
Oman	National Center for Statistics and Information
Pakistan	Securities and Exchange Commission
Philippines	Securities and Exchange Commission
Poland	Ministry of Economic Development
Romania	National Trade Register Office
Rwanda	Rwanda Development Board
Samoa	Ministry of Commerce Industry and Labour
Saudi Arabia	Ministry of Commerce and Investment
Senegal	National Agency for Statistics and Demography
St. Lucia	Registry of Companies
Suriname	Chamber of Commerce and Industry
Taiwan, China	Department of Commerce of the Ministry of Economic Affairs

Economy	Data Source
Tajikistan	Statistics Agency under the President of the Republic of Tajikistan
Turkey	Directorate of Internal Trade of the Ministry of Customs and Trade
United Arab Emirates	Federal Competitiveness and Statistics Authority
Vanuatu	Asian Development Bank
Zambia	Patents and Companies Registration Agency

Table A3: Variable Description and Source

Internal source		
Name	**Description**	**Source**
Percentage of new female LLC owners	The number of female business owners of new limited liability companies over the total number of business owners of new limited liability companies	Entrepreneurship Database
Percentage of new female sole proprietors	The number of new female sole proprietors over the total number of new sole proprietors	Entrepreneurship Database
Percentage of new LLCs with female ownership	The number of newly registered limited liability companies with at least one female business owner over the total number of newly registered limited liability companies	Entrepreneurship Database
External sources		
Name	**Description**	**Source**
The Women, Business, and the Law (WBL) measure of legal gender disparities	A composite indicator of legal disparities faced by women in seven areas: accessing institutions, using property, getting a job, providing incentives to work, going to court, building credit, and protecting women from violence	The Women, Business, and the Law Database
Years of education of women aged over 25	Mean number of years of education by age and sex estimated based on censuses and nationally representative surveys	The Health Metrics and Evaluation (IHME) Database
Account ownership, by women	The percentage of women aged over 15 with an account	Global Findex Database
Access to formal loans, by women	The percentage of women aged over 15 who borrowed from a financial institution within the past 12 months	Global Findex Database
Gross national income per capita	The U.S. dollar value of a country's final income in a year, divided by its population	World Development Indicators

Table A4: Economies with sex-disaggregated data grouped according to their region and gender-specific indicators in 2016

Regions							
Indicator	**ECA**	**EAP**	**LAC**	**MNA**	**OECD**	**SSA**	**SAS**
Number of new female LLC owners	Belarus; Georgia; Kazakhstan; Kosovo; Romania; Turkey	Brunei Darussalam; Malaysia; Nepal; Samoa; Taiwan, China; Vanuatu	Dominica; Jamaica; Mexico; St. Lucia	Jordan; Morocco; Oman; Saudia Arabia; United Arab Emirates	Chile; Estonia; Germany; Korea, Rep.; Netherlands	Mauritania; Mauritius; Nigeria; Zambia	Afghanistan; Pakistan
Number of new LLCs with at least one female owner	Albania; Azerbaijan; Belarus; Georgia; Kazakhstan; Kosovo; Romania; Tajikistan; Turkey	Brunei Darussalam; Malaysia; Nepal; Taiwan, China; Vanuatu	Jamaica; Mexico	Jordan; Morocco Oman; Saudia Arabia; United Arab Emirates	Chile; Estonia; Italy	Mauritius; Nigeria; Zambia	Afghanistan; Pakistan
Number of new female sole proprietors	Azerbaijan; Belarus; Croatia; Georgia; Kosovo; Romania; Tajikistan; Turkey	Brunei Darussalam; Malaysia; Nepal; Taiwan, China; Philippines	Jamaica; Mexico; Suriname	Jordan; Oman; Saudia Arabia; United Arab Emirates	Austria; Chile; Estonia; France; Germany; Italy; Netherlands; Poland	Mauritania; Mauritius; Nigeria; Rwanda; Senegal; Zambia	Afghanistan

Source: Entrepreneurship Database.

Table A5: Descriptive statistics

Variable	Number of Observations	Mean	Std. Deviation	Min.	Max.
Percentage of new female LLC owners	32	22.4	9.7	1.2	39.1
Percentage of new female sole proprietors	35	30.8	13.8	0.7	60.7
The Women, Business, and the Law (WBL) measure of legal gender disparities	42	19.0	10.9	5.9	49.9
Years of education of women aged over 25	42	8.7	3.8	0.7	13.3
Account ownership, by gender	36	54.9	30.4	4.0	99.0
Access to formal loans, by gender	36	10.6	4.9	0.0	20.0
Gross national income per capita	44	12,981.9	14,045.6	630.0	48,940.0

Table A6: OLS regressions with the percentage of new female LLC owners and institutional factors

	Percentage of new female LLC owners	Number of observations	Adjusted R-squired
The Women, Business, and the Law (WBL) measure of legal gender disparities	-0.467*** (0.124)	30	0.303
Years of education of women aged over 25	1.889*** (0.315)	31	0.541
Account ownership by women	0.354*** (0.076)	25	0.455
Access to formal loans by women	1.184** (0.439)	25	0.190

Standard errors in brackets.
*p < 0.1 **p<0.05 ***p<0.01

Sources: The data were derived from the Entrepreneurship Database, the Women, Business, the Institute for Health Metrics and Evaluation Database, and the Law Database, and Global Findex Database.
Note: ***(**) (*) denotes significance at the 1 (5) (10) percent level. Standard errors reported in parentheses. This table reports results from OLS regressions of new female business owners registered in 2016 to such institutional indicators as women's legal rights disparities, access to education, account ownership, and access to formal loans. The estimations reported control for gross national income per capita.

Table A7: OLS regressions with the percentage of new female sole proprietors and institutional factors

	Percentage of new female sole proprietors	Numbers of observations	Adjusted R-squired
The Women, Business, and the Law (WBL) measure of legal gender disparities	-0.605*** (0.179)	35	0.265
Years of education of women aged over 25	2.340*** (0.511)	33	0.408
Account ownership by women	0.336*** (0.114)	32	0.223
Access to formal loans by women	0.748 (0.553)	32	0.050

Standard errors in brackets.
*p < 0.1 **p<0.05 ***p<0.01

Sources: The data were derived from the Entrepreneurship Database, the Women, Business, the Institute for Health Metrics and Evaluation Database, and the Law Database, and Global Findex Database.
Note: ***(**) (*) denotes significance at the 1 (5) (10) percent level. Standard errors reported in parentheses. This table reports results from OLS regressions of new female business owners registered in 2016 to such institutional indicators as women's legal rights disparities, access to education, account ownership, and access to formal loans. The estimations reported control for gross national income per capita.

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