

SKILLS, GENDER AND PRODUCTIVE ENTREPRENEURSHIPS IN AFRICA

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August 2014

Abstract

Theoretical studies on the gender gaps in productive entrepreneurship that could inform policymaking in Africa have been scarce. This paper contributes to closing this gap with a model linking entrepreneurship to skills, productivity, and formality. The model shows that differences in skills, including ICT skills, together with greater opportunity cost for women, can lead to gender gaps in entrepreneurial outcomes. The results are consistent with the findings from the World Bank Enterprise Surveys for African countries. The model also helps explain why narrow business training programs for women have had a limited success. Training for women entrepreneurs that encompasses business skills, technical skills, networking, and confidence building, together with lifting women's time constraints, may be more effective.

¹ The authors thank Wenli Li and Song Yueping for helpful comments and discussions. An earlier version of the paper was presented at the 2014 ASSA Meetings (Philadelphia) and at the 1st Africa Search and Matching Workshop (Marrakech, May 2014). The views expressed are those of the authors and not necessarily those of their institutions of affiliation. Corresponding e-mail address: z.brixiova@afdb.org.

‘Across the world, there is a strong case for greater gender equality in the economy. Greater economic opportunities for women can contribute to stronger, better and fairer growth by raising the overall level of human capital and labour productivity... Helping more people to realise their work and family aspirations, more men and women will share the benefits of growth.’

Report on the Gender Initiative: Gender Equality in Education, Employment and Entrepreneurship, OECD 2011 (page 12)

1. Introduction

Productive women’s employment and entrepreneurship have been increasingly recognized as a potential source of inclusive growth and societal well-being (World Bank, 2012 and 2014; Hallward-Driemier, 2013). Concomitant with this recognition has been the rapid rise in the number of studies on women entrepreneurship. Various reasons may explain this surge but the main ones include the focus on both male and female productive entrepreneurship as an engine of growth (Minniti and Naudé, 2010; Forbes, 2011; WEF, 2012; Brixiova, 2010 and 2013; Vossenbergh, 2013). The persistent gender gaps in the levels of entrepreneurship as well as differences in occupations and performance between men and women entrepreneurs have also been noted (Mead and Liedholm, 1998; Goedhuys and Sleuwaegen, 2000; Minniti, 2010;).

Using 2005 firm level data for countries in Central and Eastern Europe, Sabarwal and Terrell (2008) found performance gaps between male and female businesses, while controlling for industry and location. Female entrepreneurs had smaller scales of operation (in terms of sales revenues) and were less efficient in terms of total factor productivity. In contrast, utilizing the World Bank Enterprise Surveys 2002 – 2007, Bardasi et al. (2007) found that in Africa female entrepreneurs were as productive as their male counterparts in terms of value added per worker and total factor productivity. However, the bulk of the empirical evidence points to a persistent gender gap in entrepreneurial performance in Africa, with female entrepreneurship more concentrated in the low-value added and low-productivity activities in the informal sector.

This paper examines gender differences in entrepreneurship through a theoretical model that links entrepreneurship to skills, productivity, and formality. The paper complements the literature that has adopted the contextual approach to gender gaps in entrepreneurial outcomes with an individualistic explanation. The model shows that raising entrepreneurs’ skills and lowering time constraint can facilitate development of productive women’s entrepreneurship. When potential entrepreneurs have skills required in high productivity sectors (banking, real estate) or skills that raise the overall productivity (ICT), they are more likely to open and run highly productive firms. This is in contrast to general skills needed for starting up businesses, which make this process more efficient regardless of the chosen sector. Further, when the value of a potential business opportunity (e.g., the expected discounted net profit) is high, the skilled entrepreneur will raise search intensity while being also more enticed to search for opportunities in the first place.

We introduce the gender aspect of entrepreneurship into the model through several channels. First, women, especially in Africa, face greater challenges than men in finding business

opportunities in productive sectors and turning them into firms because of their lack of business skills, lower participation in professional networks, and often having less confidence than men (Hallward-Driemier, 2013; UN Swaziland, 2013; Babson College et al., 2012). Second, as women are underrepresented in studying technical subjects (e.g., math, engineering) they are less equipped to open firms requiring technical skills. Women often lag men in skills that would raise overall productivity of their firms, such as skills in information and communication technology (ICT). Third, with bearing a disproportionate share of family responsibilities, women face higher time constraints. Such constraints, together with cultural barriers, discourage women from productive entrepreneurship. Reflecting these facts, the model shows that in equilibrium a higher share of men than women will be engaged in high productivity formal firms.

Our model is consistent with several stylized facts about female entrepreneurship in Africa. We discuss, in particular, gender differences in firm informality and utilization of ICT observed in recent (country level) World Bank Enterprise Survey aggregated data for a group of African countries. We also provide a policy discussion and recommendations, including those that could encourage women to enter non-traditional, but more productive, industries and sectors.

The remainder of the paper is organized as follows. Section 2 provides a brief review of the literature on gender differences in entrepreneurship and skills, with focus on ICT. Section 3 develops the theoretical model and presents the main results. Section 4 confronts these results with existing data from a group of African countries covered in World Bank Enterprise Surveys. Policy discussion and conclusions are in the final section.

2. Gender differences in entrepreneurship: An overview of the literature

The economic literature on gender gaps in entrepreneurship is by and large empirical. A number of empirical studies have identified characteristics of female entrepreneurship in developing countries that distinguish it from male entrepreneurship, underscoring gender segmentation. For example, analyzing the micro data from sub-Saharan Africa, Hallward-Driemier (2013) found that women are concentrated in micro and small scale enterprises as well as in basic services and other low-value added sectors while men are in larger firms and in manufacturing and other activities that tend to generate higher value added. Amin (2010) finds that female-owned firms in the unregistered sector are smaller than male-owned firms in Burkina Faso, Cameroon, Cape Verde, Ivory Coast, Madagascar and Mauritius. These imbalances have implications for income, job security, and social protection (International Organization of Employers, 2008).

Based on a literature survey, Kabeer (2012) suggests that ‘gender stratifies entrepreneurial activity along all points of the continuum, including survival and accumulation ends’. While the necessity entrepreneurship prevails in Africa and the opportunity one is scarce, even larger portions of women than men are ‘necessity entrepreneurs’ involved in survivalist activities.

The empirical literature reports that women engage more often in informal activities and are less likely to register their firms (Ellis et al., 2007; Leino, 2009; Wanjala and Were, 2009; Hallward-Driemier, 2011; Grimm et al., 2012). For example, Leino (2009) provides evidence that women

entrepreneurs are ‘more likely to operate in the informal sector, with 38 percent of informal but only a quarter of formal businesses owned by women’. Grimm et al. (2012) examine data on informal entrepreneurs in seven West African countries and find that women account for 65% of the firm managers in the bottom quartile of use of physical capital, but only for 30% in the top quartile. Further, men lead only 13% of survivalist firms.

While credit constraint is a barrier for both male and female entrepreneurs in Africa, it is more binding for women, in part because lower ownership of assets that can be used as collateral. In turn, credit constraint lowers firm productivity (Goedhuys et al., 2008) and may help explain the high level of informality. Aterido et al. (2013) point out an ‘unconditional’ gender gap in Africa in access to credit and note that ‘the lower use of formal financial services by women can be explained by gender gaps in other dimensions related to the use of financial services, including lower level education and asset ownership. Indeed, access to credit and low skills seem to be the most binding constraints to female entrepreneurship and business development in Africa.

Finally, some studies have documented that women enterprises may have lower productivity (Hallward-Driemier, 2011; OECD, 2011; Rijkers and Costa, 2012). However, studies have also shown that, once we control for the size of the firm, level of education, and the sector of activity, there appears to be much smaller differences in male-female productivity and these differences completely may disappear when focusing on formal enterprises (Hallward-Driemier, 2011).

In another stream of literature, separate from the entrepreneurship issues, the persistent digital gender divide has started to be systematically documented in various reports and empirical literature, correcting the initial lack of data in this area (Farrell and Isaacs, 2007; Hafkin and Huyer, 2008; UNESCO, 2013; Intel, 2013). This literature has shown that (i) women use ICT less than men due to both lower skills and access and (ii) when they use, they do so often for different (mostly social) purposes than men. As a result, in many countries, more men than women possess technological knowledge and skills needed to develop new techniques and start innovative economic activities needed for productive entrepreneurship (ILO, 2009).

In summary, the existing literature comprises mostly separate streams of empirical research, including surveys, while contributions of economic theory to the underlying causes of the gender gaps in entrepreneurship have been limited. Our paper contributes to closing this gap with a model linking the observed gender differences in entrepreneurial outcomes with women’s lower skills (in a broad sense, including networking and self-perception as productive entrepreneurs), greater time constraints, and other obstacles (cultural barriers) that potential women entrepreneurs may encounter. Below, we develop a theoretical model along these lines.²

² A major barrier for entrepreneurs in Africa and elsewhere is access to credit. The implications of this constraints have been covered in the theoretical literature. See, for example, Li (1998) for advanced economies; Brixiova and Kiyotaki (1997) for transition economies; Balamoune-Lutz, Brixiova and Ndikumana (2011) for Africa.

3. The Model

3.1 Economic environment

Agents

Consider a continuous time economy, where the population is normalized to one and consists of infinitely lived entrepreneurs and workers, with population sizes μ and $1 - \mu$, respectively. All entrepreneurs and workers are endowed with one unit of time at every t , and have the same risk neutral preferences, $U_0 = E_0 \int_{t=0}^{\infty} e^{-rt} c_t dt$, where c_t is consumption of a single good at t , and E_0 denotes expectations at $t=0$. Workers are either employed in a private firm or working in the subsistence, informal sector. Wages in the private sector, w are equal to workers' alternative source of income, namely from the subsistence informal sector, b .

Entrepreneurs are either in the subsistence sector (earning income b) and searching for a business opportunity or running a firm in the formal private sector. The business opportunity is of high productivity, z^h , when internet and mobile technology is used and of low productivity, z^l , otherwise, where $z^h > z^l > 0$. A portion p of entrepreneurs have high skills to use internet and communication technology and portion $1 - p$ of entrepreneurs have low ICT skills.

Firms are created through entrepreneurs' search effort x_i at a flow cost of $d(x_i) = x_i^2 / 2\gamma$ units of consumption good, where $i = s, u$ denotes entrepreneurs with high and low ICT skills.³ Parameter $\gamma > 0$ denotes the efficiency of search. The entrepreneurs of type i choose their effort levels x_i which then determine the arrival rate of a business opportunity, λ_i , according to a Poisson process. For the type i entrepreneur, the arriving business opportunity has high productivity z^h with probability ϕ_i and low productivity z^l with probability $1 - \phi_i$, where $1 > \phi_s > \phi_u > 0$. Differently put, entrepreneurs with high ICT skills are more likely to find a highly productive business opportunity (requiring the usage of ICT or other skills that raise productivity) than entrepreneurs with low ICT and other relevant skills.⁴

A business opportunity of type $z^j, j = h, l$ allows the entrepreneurs to produce output in the formal sector $y^j = z^j n$ employing $n > 0$ workers, described by a constant returns to scale production function. The profit in the formal private firms with productivity j amounts to $\pi^j = z^j n - wn$. Firms (and jobs) are destroyed at rate δ , which again arrives according to the Poisson process.

³ Regarding notation, s stands for 'skilled' (high skilled) and u stands for 'unskilled' (low skilled) entrepreneurs

⁴ The model could be applicable to entrepreneurship of other less skilled groups, such as rural workers.

To characterize the entrepreneurs' optimization problem, the value function approach is utilized. Omitting the time subscripts and denoting J_i and V_i to be the present discounted value of the income stream of an entrepreneur running a private firm, and an entrepreneur searching for a business opportunity, respectively, the corresponding Bellman equations are:

$$rV_i = \max\left[(b - \sigma_i + \max_x \left(-\frac{x_i^2}{2\gamma} + x_i[\phi_i(J_i^h - V_i) + (1 - \phi_i)(J_i^l - V_i)]\right) + \dot{V}_i); b + \dot{V}_i\right] \quad (1)$$

$$rJ_i^j = \pi^j + \delta(V_i - J_i^j) + \dot{J}_i^j \quad i = s, u; j = h, l \quad (2)$$

where r is the discount rate, σ_i , $\sigma_u > \sigma_s > 0$ is the opportunity cost (disutility) of search, with unskilled workers facing greater disutility. This parameter can be also interpreted as start-up cost.

According to (1), each entrepreneur chooses between working in the informal sector and searching for business opportunities or working in the informal sector without searching. If the entrepreneur chooses to search, the return equals the net income from the informal sector combined with the expected return on running a business and the change of the value of searching for opportunities, V_i . Equation (2) states that the return on operating a firm consists of expected profits minus the expected loss due to the firm's possible destruction plus the change of the value of J_i .

Equation (1) shows that the entrepreneur i in the informal sector searches for business opportunities in the formal sector when the net payoff from such search exceeds the extra foregone income in the informal sector: Denoting $\xi_i \in [0, 1]$ as the probability that the entrepreneur i in the informal sector searches for a business opportunity, the decision to search can be described by:

$$\xi_i = \begin{cases} 1 & \text{if } \frac{x_i^2}{2\gamma} \geq \sigma_i \\ 0 & \text{otherwise} \end{cases} \quad i = s, u \quad (3)$$

When the entrepreneur i chooses search effort, x_i , the marginal cost of search equals to the expected marginal payoff:

$$\frac{x_i}{\gamma} = \phi_i(J_i^h - V_i) + (1 - \phi_i)(J_i^l - V_i) = L_i \quad i = s, u; \quad (4)$$

where L_i is the value of a business opportunity to an entrepreneur with skills i . Let m_{ii}^n be the number of searching entrepreneurs with skills i , $i = s, u$ and m_{ii}^j the number of entrepreneurs with skills i running a private firm of productivity j , $j = h, l$. The time paths for skilled

entrepreneurs running high and low productivity firms are described by (5a) and (5b), respectively:

$$\dot{m}_{st}^h = x_{st}\phi_s m_{st}^n - \delta m_{st}^h = x_{st}\phi_s(p\mu - m_{st}) - \delta m_{st}^h \quad (5a)$$

$$\dot{m}_{st}^l = x_{st}(1 - \phi_s)m_{st}^n - \delta m_{st}^l = x_{st}(1 - \phi_s)(p\mu - m_{st}) - \delta m_{st}^l \quad (5b)$$

Similarly, the time paths for unskilled entrepreneurs running high and low productivity firms are described by (5c) and (5d), respectively:

$$\dot{m}_{ut}^h = x_{ut}\phi_u m_{ut}^n - \delta m_{ut}^h = x_{ut}\phi_u[(1 - p)\mu - m_{ut}] - \delta m_{ut}^h \quad (5c)$$

$$\dot{m}_{ut}^l = x_{ut}(1 - \phi_u)m_{ut}^n - \delta m_{ut}^l = x_{ut}(1 - \phi_u)[(1 - p)\mu - m_{ut}] - \delta m_{ut}^l \quad (5d)$$

Combining (5a) with (5b) and (5c) with (5d) yields the following laws of motion for skilled and unskilled entrepreneurs:

$$\dot{m}_{st} = x_{st}m_{st}^n - \delta m_{st} = x_{st}(p\mu - m_{st}) - \delta m_{st} \quad (5e)$$

$$\dot{m}_{ut} = x_{ut}m_{ut}^n - \delta m_{ut} = x_{ut}[(1 - p)\mu - m_{ut}] - \delta m_{ut} \quad (5f)$$

The initial condition, $m_0^n = \mu$, implies that $m_{s0}^h = m_{u0}^h = m_{s0}^l = m_{u0}^l = 0$.

Labor market 'clearing' conditions

Firms and jobs are destroyed through firm-specific, idiosyncratic productivity shocks arriving at rate δ . The entrepreneurs then start searching for a new business opportunity. Denoting m_{it}^n as searching entrepreneurs of type i , $i = s, u$ at $\forall t$, the labor market clearing conditions for skilled and unskilled entrepreneurs, respectively, are described as:

$$p\mu = m_{st}^n + m_{st} = m_{st}^n + m_{st}^h + m_{st}^l \quad (6a)$$

$$(1 - p)\mu = m_{ut}^n + m_{ut} = m_{ut}^n + m_{ut}^h + m_{ut}^l \quad (6b)$$

Equation (6a) describes the clearing condition for regular entrepreneurs and equation (6b) for the disadvantaged ones. Defining $m_t = m_{st} + m_{ut} = m_{st}^h + m_{st}^l + m_{ut}^h + m_{ut}^l$ to be the total number of private firms, m_t , the aggregate entrepreneurial market clearing condition becomes:

$$\mu = m_{st}^n + m_{ut}^n + m_{st} + m_{ut} = m_{st}^n + m_{ut}^n + m_t \quad (6c)$$

Finally, workers either work in formal private firms or are self-employed in the informal sector:

$$(1 - \mu) = N_{ut} + N_t = N_{ut} + m_t n . \quad (7)$$

where N_t is the number of workers in the formal sector, N_{ut} is the number of workers self-employed in the informal sector and n is the number of workers employed in each private firm.

3.2 Equilibrium – definition and characteristics

The *equilibrium* of this economy is the allocation of workers N_{ut} and entrepreneurs with skills i m_{it} such that at every t (i) each entrepreneur i chooses whether to search for opportunities in the formal sector, ξ_{it} , and if so what effort to put into search, x_{it} ; (ii) each worker chooses the allocation of labor, taking wages as given as given; and (iii) labor and product markets clear.

The equilibrium is described by m_{i0}, N_{u0} , and by the sequence $\{L_{it}, \xi_{it}, m_{it}, N_{ut}\}_{t=0}^{\infty}$ such that (7) – (9) and (3) are met. Suppressing the time subscript and letting π_{ui} , $\pi_{ui} = \gamma L_i^2 / 2$ be the average ‘profit’ from search, the value of a business opportunity to an entrepreneur $i = s, u, L_i$, evolves as:

$$\dot{L}_i = (r + \delta)L_i + \pi_{ui} - [\phi_i \pi^h + (1 - \phi_i)\pi^l - (b - \sigma_i)] \quad i = s, u \quad (8)$$

The total number of entrepreneurs changes according to:

$$\dot{m}_i = \gamma L_i (p_i \mu - m_i) - \delta m_i \quad i = s, u \quad (9)$$

where $p_s = p$ and $p_u = 1 - p$.

Steady state equilibrium

In the steady state, variables take on the same values in all time periods, that is $\dot{L}_i = \dot{m}_i = 0$ and $m_{it} = m_i^*, L_{hs} = L_s^*, \xi_{it} = \xi_i^*$, and $N_{ut} = N^*$ for $i = s, u$ and $\forall t \in [0, \infty]$.

Proposition 1: If $\pi_{ui}^* \geq \sigma_i$ $i = s, u$. Then for each $i = s, u$ there exists a unique non-trivial steady state equilibrium $m_i^* > 0$, $L_i^* > 0$, such that

$$m_i^* = \frac{p_i \mu \gamma L_i^*}{\gamma L_i^* + \delta} \quad i = s, u \quad (10)$$

$$L_i^* = \left[-(r + \delta) + \sqrt{(r + \delta)^2 + 2\gamma [\phi_i \pi^h + (1 - \phi_i)\pi^l - (b - \sigma_i)]} \right] / \gamma \quad i = s, u \quad (11)$$

Proof: Equation (11) follows from (8). Since $\phi_i \pi^h + (1 - \phi_i) \pi^l + (b - \sigma_i) > 0$, $L_i^* > 0$ $i = s, u$. Let $H = x_i^* (p_i \mu - m_i) - \delta m_i$. First suppose that $m_i = 0$. Then $H = p_i \mu x_i^* > 0$. Second, when $m_i = p_i \mu$ then $H = -\delta p_i \mu < 0$. Since H is continuous and monotonically decreasing in m_i , \exists unique $m_i^* > 0$ that satisfies (10). ■

Equations (10) and (11) show that the productive private sector is larger with higher expected profits. This is because when the value of a business opportunity L_i is low, entrepreneurs will lower search intensity or may stop searching for business opportunities altogether, i.e. $\xi_i = 0$.

3.3 The market solution and inequality

In this section we show that due to their higher direct search cost and greater opportunity cost associated with search, disadvantaged workers either opt out of searching for business opportunities more easily or put less effort into their search than regular entrepreneurs. In the subsequent parts of the paper, we then discuss mitigating policies.

Proposition 2. The ‘cut-off’ value of a business opportunity at which an entrepreneur $i = s, u$ chooses to search for business opportunities, \hat{L}_i , is higher for low-skilled (unskilled) than for high-skilled (skilled) entrepreneurs, that is $\hat{L}_u > \hat{L}_s > 0$.

Proof. From (4) the ‘cut-off’ value of a business opportunity for an entrepreneur i , \hat{L}_i , becomes $\hat{L}_i = \sqrt{2\sigma_i / \gamma}$. Since $\sigma_u > \sigma_s > 0$, $\hat{L}_u > \hat{L}_s > 0$.⁵ ■

Proposition 2 shows that because of their lower opportunity cost for market activities, high skilled entrepreneurs are more likely to search for business opportunities than low skilled entrepreneurs. As a result, a larger share of unskilled entrepreneurs ends up working as self-employed, in the informal subsistence sector.

Proposition 3. If the difference in expected profits of skilled and unskilled entrepreneurs exceeds the difference in their start-up cost, that is if $(\phi_s - \phi_u) \pi^h - (\phi_s - \phi_u) \pi^l > \sigma_u - \sigma_s$, then high productivity firms run by skilled entrepreneurs account for a larger share of their population than high productivity firms run by unskilled entrepreneurs: $k_s^h = m_s^{h*} / p\mu > m_u^{h*} / ((1 - p)\mu) = k_u^h$.

Proof. Condition $(\phi_s - \phi_u) \pi^h - (\phi_s - \phi_u) \pi^l > \sigma_u - \sigma_s$ together with (11) implies that $L_s^* > L_u^*$. From (4) follows that $x_s^* > x_u^*$, that is skilled entrepreneurs put more effort into their search for business opportunities than unskilled entrepreneurs. From (10) and (5) it follows that $k_i^h = \frac{\phi_i x_i^*}{x_i^* + \delta}$

⁵ Negative values of L_i are not considered since they imply that no search for business opportunities would occur.

is the steady state share of entrepreneurs of type i , $i = s, u$ in their respective populations μp and $p(1 - \mu)$ that run highly productive firms. Since $x_s^* > x_u^*$ and $\phi_s > \phi_u$, then $k_s^h > k_u^h$. ■

Proposition 3 shows that in equilibrium a higher share of skilled entrepreneurs operates high productivity firms (utilizing ICT) than is the case for unskilled entrepreneurs. This result is due to greater aptitude of skilled entrepreneurs to business opportunities requiring ICT skills, raising pay-off to search. In turn, higher pay-off stimulates skilled entrepreneurs to put more effort than their unskilled counterparts into search for business opportunities.

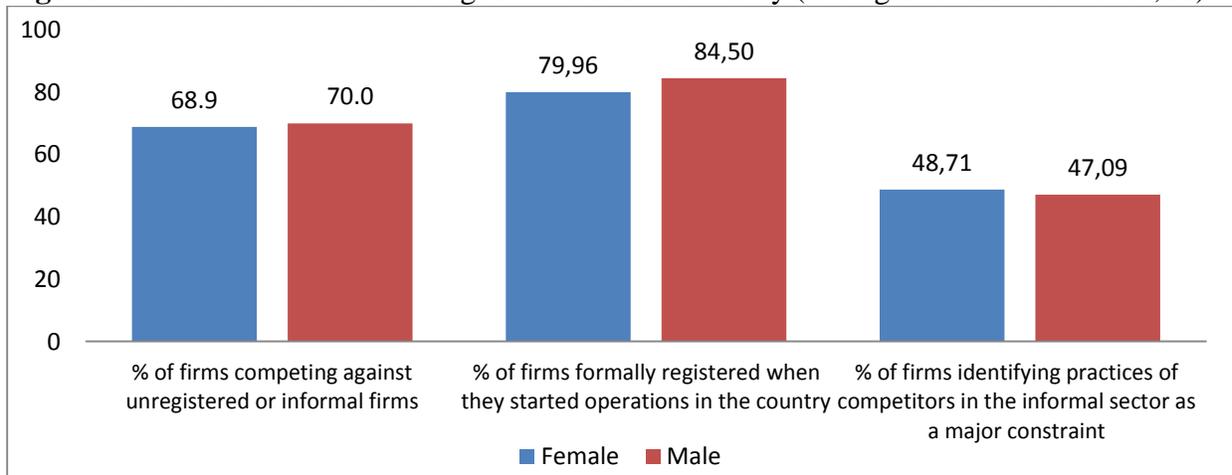
4. Gender differences in entrepreneurship in Africa: bringing the model to data

4.1 Informality

Proposition 2 shows that because of higher expected profits, high skilled entrepreneurs will put more effort into searching for business opportunities than low skilled entrepreneurs. As a result, a larger share of unskilled entrepreneurs will be self-employed in the informal (subsistence) sector. In Africa, this implies that a larger share of women would be in the informal sector as women tend to have lower skills.

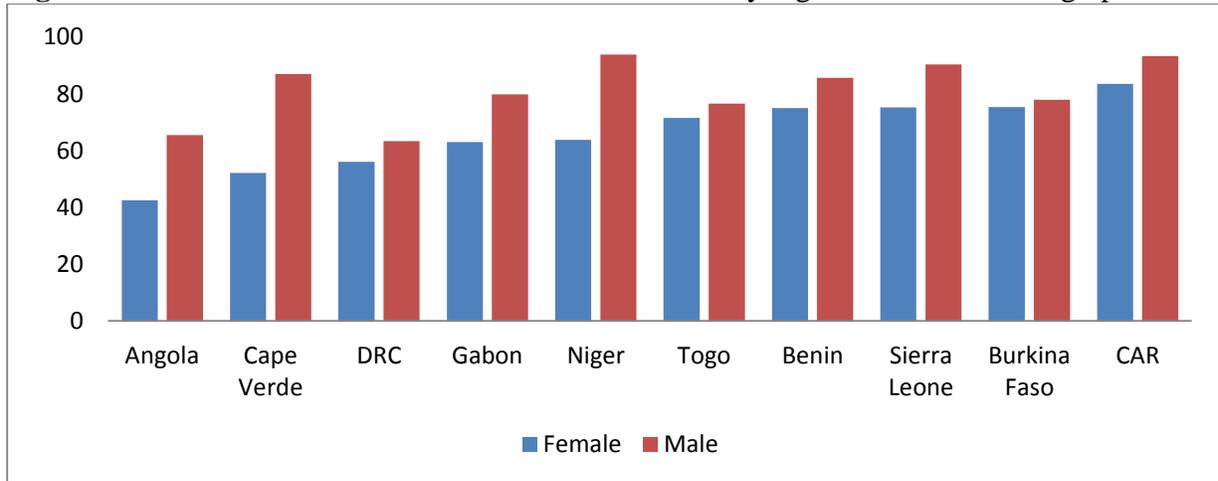
Figure 1a shows that a higher percentage of firms where a female is top manager (relative to male-managed firms) compete against unregistered or informal firms and identify practices of competitors in the informal sector as major constraint. Further, a lower percentage of female relative to male managed firms were formally registered when they started operations. Figure 1b indicates that in the ten African countries featured firms with female top manager are less likely to formally register when they start operations than firms with top male manager, implying that more women than men tend to start their businesses in the informal sector.

Figure 1a. Female- and male-managed firms and informality (averages for SSA countries, %)



Source: Enterprise Surveys online database (World Bank). Note: Countries included are Angola, Benin, Botswana, Burkina Faso, Cameroon, Cape Verde, Central African Rep., Chad, Congo rep., DRC, Ethiopia, Gabon, Lesotho, Liberia, Malawi, Mali, Niger, Rwanda, Sierra Leone, Togo, and Zimbabwe.

Figure 1b. Selected African countries: % of firms formally registered when starting operations



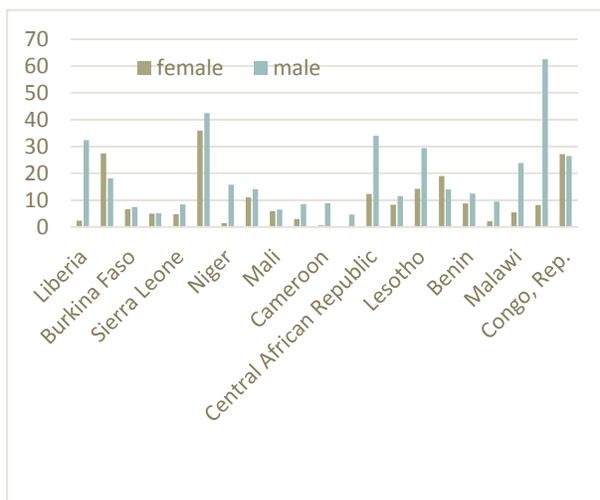
Source: Enterprise Surveys online database (World Bank). Note: Countries included are Angola, Benin, Botswana, Burkina Faso, Cameroon, Cape Verde, Central African Rep., Chad, Congo rep., DRC, Ethiopia, Gabon, Lesotho, Liberia, Malawi, Mali, Niger, Rwanda, Sierra Leone, Togo, and Zimbabwe.

4.2. Foreign technology transfer and use of ICT

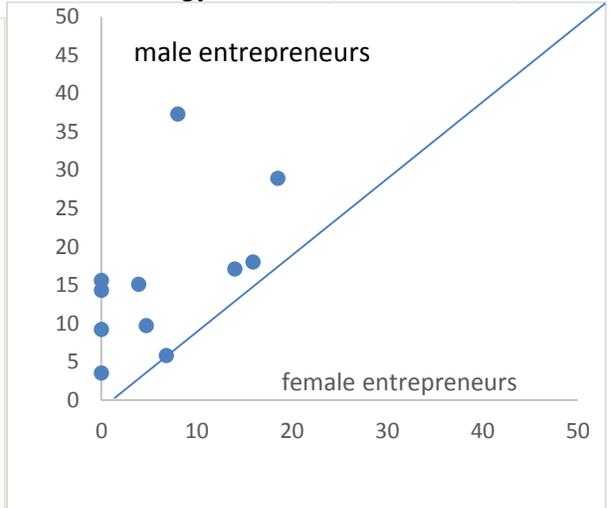
Proposition 3 shows that in equilibrium a higher share of skilled than unskilled entrepreneurs will end up operating high productivity firms (utilizing ICT, for example). In general, in developing countries, and particularly in Africa, women entrepreneurs have lower technical skills. Thus, based on the results of the model we expect a lower share of female-owned firms using ICT than among male-owned enterprises. Women also run firms with lower average share of foreign ownership and technology transfer (Figures 2 and 3).

Figure 2. Foreign Technology Ownership and Technology Transfer, by gender

2a. Foreign Ownership (% of total)

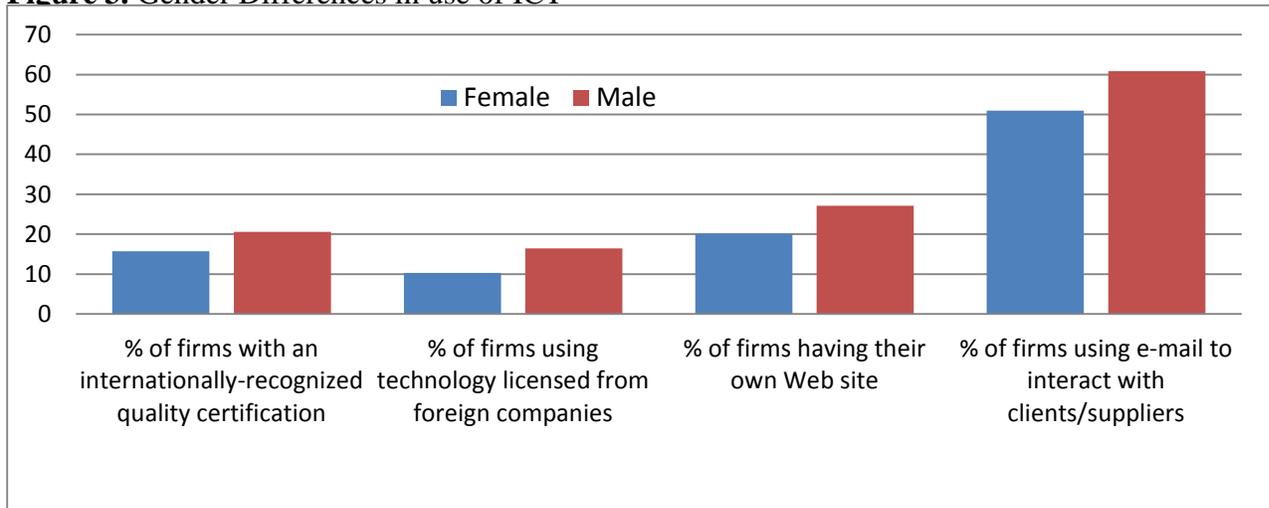


2b. Technology transfer (% of all firms)



Source: World Bank Enterprise Survey.

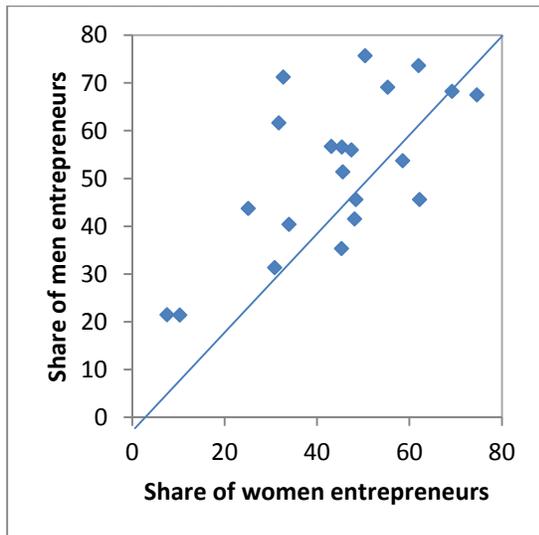
Figure 3. Gender Differences in use of ICT



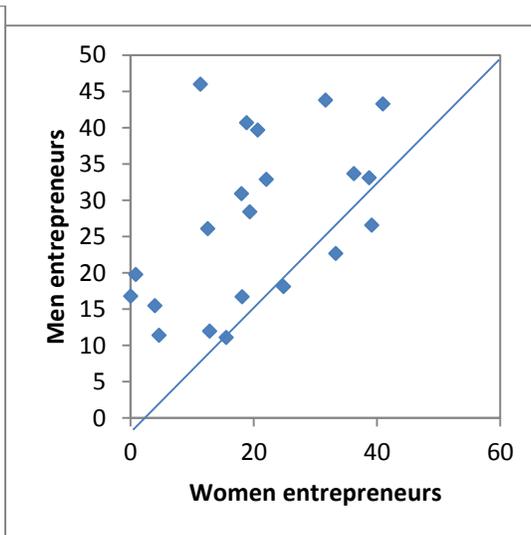
Source: World Bank Enterprise Surveys.

Figure 4. Share of entrepreneurs having external quality audit and using e-mail for work (%)

4a. External audit



4b. E-mail for work



Source: Enterprise Surveys online database (World Bank).

Again, in comparison to male-managed firms, female managed-firms are less likely to have their own website and use emails to interact with clients and suppliers. They are also less likely to have an internationally-recognized quality certification and use technology licensed from foreign companies. These observations point to a possibly significant gender barriers to use ICT including skills. This is of concern since ICT skills, and e-skills in particular, are increasingly becoming part of requirements for today’s productive employment and entrepreneurship.

The aggregate numbers on utilization of ICT can hide substantial differences cross-country differences. Country information reveals that in Africa, in majority of countries fewer women-managed firms than men-managed firms established website and were using e-mails (Figure 4). Moreover, the gender gaps are asymmetric – positive gender gaps tend to be smaller than negative ones. These factors are likely to lower productivity (Masurel, 2004).

5. Policy discussion and conclusions

The model we develop in this paper suggests that differences in education and skills, including ICT skills together with greater opportunity cost for women, may help account for gender differences in entrepreneurial outcomes. In particular, they may also help explain why, relative to men, women are less likely to operate high-productivity enterprises. The model also shows that women entrepreneurs are more likely to end up mostly in the informal subsistence sector. Data from the World Bank Enterprise Survey data for a group of African countries seem consistent with these predictions.

The two key differences that have been identified, women's low skills and the higher informality of female entrepreneurship, require serious attention from policy makers. In the following sections we make some policy recommendations.

First, skills, in particular ICT skills, have been identified as a key factor in productive entrepreneurship as noted in the following statement:

‘With an estimated 500 million people entering the global workforce over the next decade, coming to grips with the technological challenge is crucial. Without being “plugged in”, millions of women and men risk being left behind. Since women represent a significant majority of those who do not have access, there is a clear gender dimension to the technological divide... In addition, there is a gender gap across and within most countries: almost everywhere women lag behind men either in access to training or in the application of technology’.

Skills and Entrepreneurship: Bridging the Technology and Gender Divide,
ILO 2008

Second, policymakers should identify the factors that may account for high share of female entrepreneurship in the informal sector, since informality has traditionally been associated with lower productivity and lower value added activities. This is in part due to lower access to credit and business information and networks when operating in the informal sector. Since women's lower skills are a major contributor to informal, rather than formal, entrepreneurial activity, promoting female education and skills development would help move female entrepreneurship more towards the formal sector. At the same time, and as our model shows, skill training alone may not be sufficient – the higher opportunity cost that women face when leaving household activities may also need to be addressed to put female entrepreneurship on more equal footing.

In terms of education policies for women in Africa, policymakers should identify: (i) why women in general have lower educational attainments in some countries (although this has been improving in recent years): and (ii) why women are persistently under-represented in science and technology fields in secondary and tertiary education and in technical and vocational schools. In some cases, the technical schools (and laboratories) may be located in areas that are difficult for girls to travel to, in which case policymakers should identify ways to improve access, which may include investing in specific infrastructure. Often, the gender gap is a result of socio-cultural factors that could be mitigated through policy and the right type of incentives. Some of these factors are the same as the ones affecting women's access to good jobs in the labor market, in spite of increases in women's share of the labor force in developing countries (Luci et al., 2012). Addressing traditions, laws and social norms that discourage women should be the focus of policies that aim at facilitating women's access to productive entrepreneurship.

Since women's entrepreneurial activities tend to interact with their housework, female entrepreneurship may have unique characteristics; and what works for male entrepreneurship may not necessarily work for female entrepreneurship. As our model and Ahl (2006) and Kilkooma (2012) suggest, the approaches that have been trying to incentivize women in the same way as men may be inadequate for stimulating women's entrepreneurship.⁶ In fact, policies and policy reforms aimed at promoting entrepreneurship can sometimes have unexpected adverse effects (Iyigun and Rodrik, 2005; Balamoune-Lutz, 2011). Some authors have asked whether policy support should be designed differently for women entrepreneurs. For example, Drine and Grach (2012) examined data from a survey of 50 men and 50 women entrepreneurs in three Tunisian regions and found that the support services that were in place were inadequate for promoting women's entrepreneurial activity. These and related issues could be also subject of further research for Africa and other developing countries.

⁶ Same financial incentives for men and women to participate in the entrepreneurial training may not be adequate for women to undertake it, given the higher opportunity cost associated with housework.

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