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**Skills and youth entrepreneurship in Africa:
Analysis with evidence from Swaziland**

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Abstract

The shortages of entrepreneurial skills have lowered search effectiveness of potential young entrepreneurs and the rate of youth start-ups. Our paper contributes to closing a gap in the entrepreneurship and development literature with a model of costly firm creation and skill differences between young and adult entrepreneurs. The model shows that for young entrepreneurs facing high costs of searching for business opportunities, support for training is more effective in stimulating productive start-ups than subsidies. The case for interventions targeted at youth rises in societies with high costs of youth unemployment. We test the role of skills and training for productive youth entrepreneurship on data from a recent survey of entrepreneurs in Swaziland.

JEL classification: J11, J08, L26, O11

Key words: youth entrepreneurship, model of skills and structural transformation, policies, Africa

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1. Introduction

For the past decade, Swaziland, as most of the other middle income countries in Southern Africa (e.g., Botswana, Lesotho, Namibia, South Africa) has been among the slow growing economies on the continent. With high unemployment and youth unemployment, inclusive growth in the region has remained elusive (Jauch, 2011; Ncube et al., 2014). Despite the oversized public sectors, the overall employment has been low, reflecting limited private sector job creation and entrepreneurship, both in the formal and informal sector. The countries were also negatively impacted by the global financial crisis, either through trade with Europe – directly (South Africa), via South Africa (Lesotho and Swaziland) – or through fall in commodity export proceeds (Botswana, Namibia).

In Southern Africa middle income countries, with low job creation and demographic pressures, youth unemployment is a major challenge. In Swaziland, the share of youth in the working age population (15 – 64) in 2010 reached 43%, above the regional peers. Currently, youth unemployment rate exceeds 50% of the youth labor force and is among the highest in Africa. Further, a substantial portion of youth has been discouraged from participating in the labor markets. The labor markets were a key channel in transmitting the 2011-2012 fiscal crisis to households. Since many of the factors that could unlock the employment potential of the youth are also on the demand side of the labor market, private sector development, including youth entrepreneurship, can be part of the solution (Brixiová and Kangoye, 2014).²

Besides macroeconomic environment, the literature on causes of high youth unemployment identifies the following main factors: (i) demographic changes (Korenman and Neumark, 2000); (ii) individual human capital (O’Higgins, 2001); (iii) family background and networks, i.e. social capital (Coleman, 1988); (iv) structural changes and characteristics of specific economies (Peterson and Vroman, 1992); and (v) skill and geographical mismatches (Elhorst, 2003). While poor macroeconomic performance and shocks to aggregate demand are often considered a key in the developed economies, long-standing structural bottlenecks, especially to private sector development and productive entrepreneurship, are often emphasized in developing countries.

The importance of productive entrepreneurship for development and differences in type of entrepreneurship across countries were already underscored in Baumol (1968 and 1990).³ Since then, the literature on entrepreneurship has grown markedly (please see Acs and Audertsch, 2003; Parker, 2009 for overview). In the context of Africa, Rogerson (2001) showed that low productivity entrepreneurship has been highly prevalent in the region, but productive (opportunity) entrepreneurship has been mostly missing. At the same time, theoretical analysis of factors impacting entrepreneurship in developing countries and in particular Africa has been relatively scarce. The literature in this area includes Leff (1979); Gelb et al., (2008); Naude (2008 and 2010); Baumol (2010); and Brixiova (2010 and 2013) among others.

² A nationally representative survey carried out in Swaziland in November 2011 found that 7.3 % of households had at least one member who lost job during 2011 fiscal crisis (UN Swaziland, 2012).

³ In this paper we define entrepreneurship as in Naudé (2010) to be ‘...the resource and process whereby individuals utilize opportunities in the market through the creation of new business firms.’

In this paper, we examine barriers to youth entrepreneurship in an extended framework of Brixiová et al. (2009) of costly firm creation and skill acquisition by workers, which accounts for differences in skills among entrepreneurs. We particularly focus on the lack of skills among young entrepreneurs that prevents them turning a perceived business opportunity into a firm.⁴ Specifically, we develop a model of costly entrepreneurial start-ups, where youth are less skilled than adults. We then consider policy options for removing impediments to youth entrepreneurship and show how targeted support to entrepreneurial training or start-up subsidies can narrow the gap in productive entrepreneurship between youth and adults. The results are supported by empirical analysis of data from the 2013 UN survey of entrepreneurs in Swaziland.

Our research takes place at the time of heightened interest among African researchers and policymakers to unlock the employment potential of youth. With tight fiscal conditions in the aftermath of the global financial crisis, new jobs in the region are unlikely to be generated by the public sector. Entrepreneurship is then viewed as an option for generating sustainable livelihoods. In fact, with their ability to adapt to changes and innovate, young people have the potential to drive tech-entrepreneurship and growth (Lisk and Dixon-Fyle, 2013).

In Swaziland, as elsewhere, potential young entrepreneurs are constrained the most by the lack of entrepreneurial skills and the limited access to finance/start-up capital. The few existing entrepreneurship programs are not always well-tailored to their needs. The Government has taken steps to address these constraints, but such initiatives would need to be scaled up and linked with better incentives to help reduce youth unemployment.

The paper is organized as follows. Section 2 outlines some of the key constraints to entrepreneurship in developing countries and to youth entrepreneurship in Swaziland. Section 3 develops model of entrepreneurship and structural change, with focus on shortages of entrepreneurial skills and start-up capital. Options to address the youth disadvantages in business start-ups such as government support for training and start-up capital are then analysed. Section 4 tests the results of the model with new data from Swaziland. Section 5 concludes.

2. Stylized facts on constraints to youth entrepreneurship

2.1 Constraints to entrepreneurship in developing countries

Numerous factors constrain entrepreneurship across developing countries. Besides well-studied access to credit for the established SMEs, key for start-ups appears to be the regulatory framework and the business environment, the initial capital, and entrepreneurial skills (Figure 1). For example, according to the World Bank (2013), in Southern Africa the existing SMEs viewed access to finance as the top constraint (29.1 percent of respondents), followed by crime and

⁴ As the Global Entrepreneurship Monitor and the IDRC report states: ‘The ability of an entrepreneur to go from an idea to the commercialization of a business based on this idea requires particular competencies (knowledge, experience and skills). These may be developed through formal education in grade school or university courses, informal methods like books or websites, or training programs offered by private or government sources. Such education is critical to the initial success and sustainability of any enterprise (Herrington and Kelley, 2012; page 46).

Figure 1. Factors of entrepreneurship in developing countries

Figure 1a. New firm entry and quality of regulations, 2004 - 2011

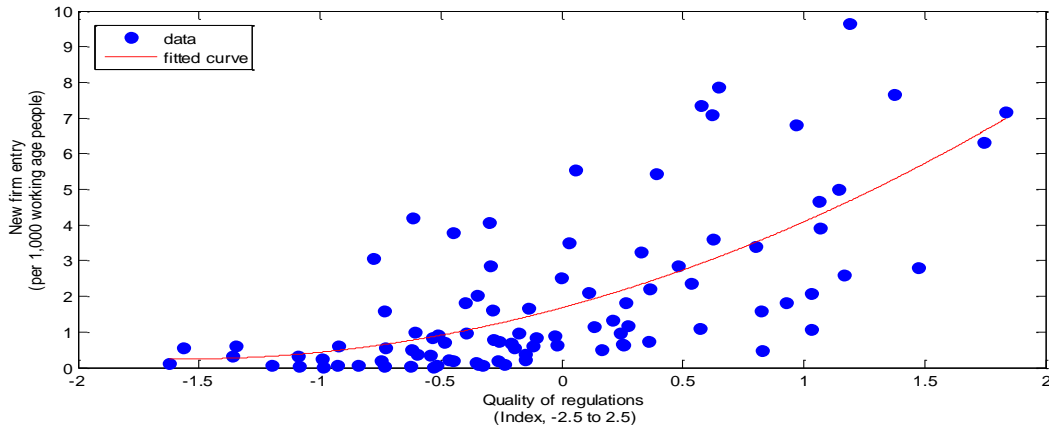


Figure 1b. New firm entry and cost of start-ups, 2004 - 2011

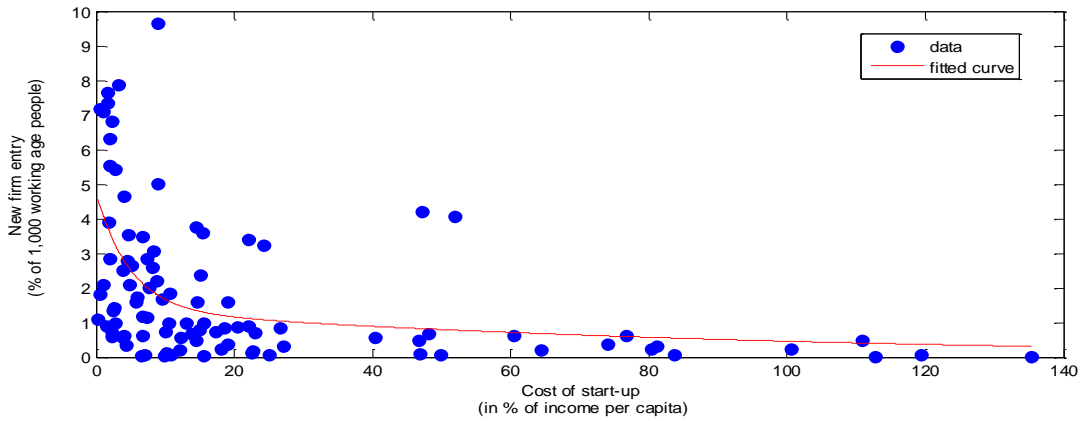
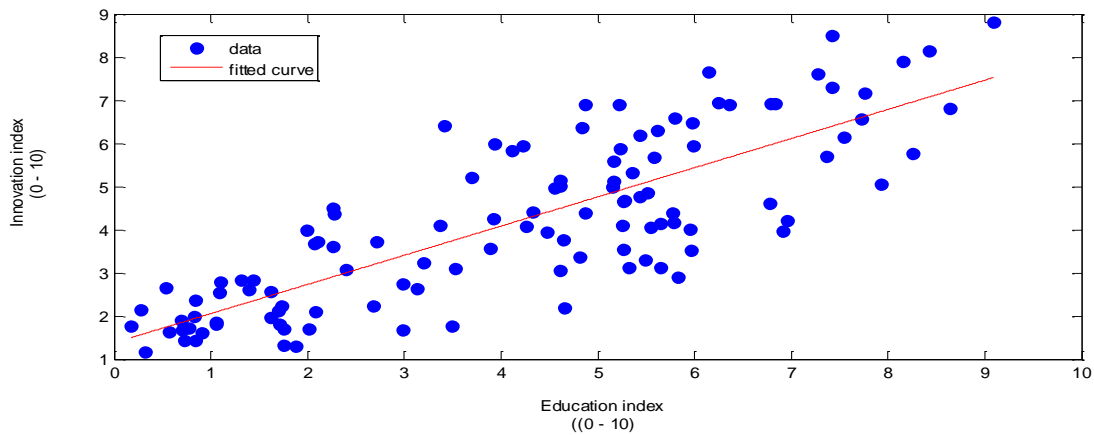


Figure 1c. Innovation and education index, 2012



Source: Authors' calculations based on the World Bank Doing Business (2013), KAM, Entrepreneurship and Governance databases.

corruption. Workforce skills were also viewed as important, constituting a major constraint for more than 16 percent of SME respondents.⁵

Among various constraints, access to credit has been well studied (Li, 1998; Aghion et al., 2007). The lack of skills on the side of workers in developing countries has been also recognized and covered (Brixiova et al., 2009). In this paper, we thus focus on skill shortages of entrepreneurs.

2.2 Constraints of young entrepreneurs in Africa

With relatively weak growth prospects of the middle income countries in Southern Africa and especially in Swaziland, solutions to youth labor market challenge relying only on the supply side will not be effective. While entrepreneurship alone cannot tackle youth employment challenge, it can be an important part of the response. We now highlight some key constraints faced by young entrepreneurs in Africa, as covered in the literature.

Schoof (2006) examined a range of key constraints that impede young people in different countries, mostly in Sub-Saharan Africa, from starting a successful business, while also identifying incentives and measures to tackle these barriers. The study confirmed the need to differentiate between youth and adult entrepreneurship, stemming from unique constraints and greater barriers that young people face as a result of their limited resources and experiences. Entrepreneurial education, access to start-up capital and business provider services were found among the key factors impeding youth entrepreneurship, alongside societal attitudes and a regulatory framework. The importance of capacity building was underscored in the ILO report by Chigunta et al. (2005), which studied youth entrepreneurship in Eastern and Southern Africa.

2.3 Characteristics and constraints of young Swazi entrepreneurs

Survey of young urban entrepreneurs⁶

In November 2012, the UN Swaziland surveyed over 600 entrepreneurs in urban Swaziland. It relied on the face-to-face interviews in Hhoho and Manzini regions.⁷ The sampling frame was small and medium-sized enterprises (SMEs) listed in the 2011 SME directory of the Ministry of Commerce, Industry and Trade (provided by the SME Unit). Using this frame, all firms listed in the major six cities that provided their full addresses were selected for interviews.⁸

⁵ The Global Entrepreneurship Monitor (2012) outlines the Entrepreneurial Framework Conditions – that is factors that have a significant impact on the entrepreneurship sector. These factors include financial market sophistication, technology, development, higher education and training, and labor market efficiency. Our focus is on skills.

⁶ Constraints for rural entrepreneurs are left to further research. Given Swaziland's small size, the distinction between rural and urban entrepreneurs is blurred as people from rural areas often commute to cities on daily basis.

⁷ The choice of urban areas was informed by the evidence from 2007 and 2010 labor force surveys, which revealed that the ratio of youth to adult unemployment was particularly high (almost triple) in urban areas compared to rural areas. Manzini and Hhoho regions were selected as areas where most entrepreneurial activities have been concentrated and for their potential to generate positive spillovers to the rest of the country.

⁸ This choice implied that new and very small firms as well as those that outgrew the 'SME status' or are not listed in the directory and operating more informally may be systematically underrepresented. To partly correct for this bias, a large number of enterprises were interviewed (relative to the population in selected areas).

The survey covered young and adult entrepreneurs to understand differences between these groups in terms of personal characteristics, skills, social networks, values and views on the constraints they face.⁹ Among the 640 entrepreneurs interviewed, 255 were classified as young (i.e. ages 18 – 35) and 385 as adult (above 35 years of age). Young and adult entrepreneurs with similar demographic and social characteristics (gender, sector of operation) were chosen to learn about the differences age introduced to the entrepreneurial experience in Swaziland'. Among sectors, services, especially trade, were the main area of entrepreneurs' activities.

The interviews aimed to obtain information about the entrepreneurs' background, objectives of the firms they run and the constraints they encounter most frequently. The survey also collected data on the main characteristics of the enterprise (years of operations, sector, employment and turnover). The questionnaire concluded with a section on entrepreneurs' recommendations for policymakers and financial institutions.

Table 1. Differences between young and adult entrepreneurs in Swaziland, 2012

	All entrepreneurs			Young entrepreneurs		
	Young 15 - 35	Adult 36 and above	SE and stat. sign.	15 - 29	30 - 35	SE and stat. sign.
(in % of total entrepreneurs unless otherwise indicated)						
<i>Education and experience</i>						
						0.25
Age of entrepreneur (years)	30.3	47.1	0.57 ***	26.7	32.8	***
Age of business (years)	4.1	7.2	0.57 ***	3.7	4.5	0.4 *
Higher education	35.3	48.3	3.97 ***	33.0	36.8	6.12
Received formal business training	18.4	26.5	3.40 **	12.6	22.4	4.93 **
Prior work experience	37.8	57.8	4.01 ***	32.0	41.6	6.26
<i>Resolve/Commitment</i>						
Hours of work (per week)	39.3	42.3	1.70 *	39.5	39.2	2.78
Operating at full capacity (months)	9.5	10.4	0.14 ***	9.1	9.8	0.5
Involved in job search	26.1	9.2	2.9 ***	35.6	19.6	5.6 ***
Would accept job offer	35.3	17.9	3.4 ***	38.8	32.9	6.1
If fails would start another firm	52.2	55.1	4.02	46.6	55.9	6.37
<i>Outcomes</i>						
Firm stable or growing	60.0	69.9	3.81 ***	56.3	62.5	6.26
Sales (monthly, E thousand) 1/	71.2	110.1	76.2	13.1	110.9	75.6
Sales same or higher than last year	34.5	37.7	3.89	37.8	32.2	6.08
Turnover (monthly, E thousand) 1/	138.7	354.7	79.7 ***	85.9	174.1	61.7
Employment (av. 2012)	1.8	2.4	0.38	1.3	2.1	0.38 **

Source: Authors' calculations based on 2013 UN Swaziland survey. 1/ E stands for emalangeni (local currency). *, **, and *** denote 10%, 5% and 1% significance levels.

⁹ The survey adopted approach of Djankov et al. (2005) and incorporated questions from three perspectives on factors impacting entrepreneurship: (i) institutions; (ii) social networks and (iii) personal traits of entrepreneurs.

Table 1 reports some findings from the survey, focusing on personal traits of entrepreneurs and entrepreneurial outcomes. We first cover differences in means between young (15 – 35) and adult (36 +) entrepreneurs. The mean age of young entrepreneurs was 30.3 years, while that of adult entrepreneurs 47.1 years. Regarding experience in the same firm, the businesses of young entrepreneurs were 4.1 years old on average, relative to 7.2 years of those of adults. While only one third of young entrepreneurs had higher education, but almost half of adult the adults did. Similarly, less than 1 out of 5 young entrepreneurs received business training, while more than 1 out of 4 adults was trained. Only 38 percent of young entrepreneurs had prior work experience, relative to 58 percent of adults. All these indicators thus point to skill disadvantage of youth.

The indicators of effort/commitment – hours of work, operating at full capacity, involvement in search for another job, etc. – portrait adult entrepreneurs as putting in more effort into their businesses than youth. Finally, adults outperform youth on all indicators of outcomes – sales, turnover, employment and prospects.

Focus group discussions with young entrepreneurs

To gain better understanding of constrains perceived by young – actual and potential (including students) – entrepreneurs in Swaziland, UNDP Swaziland undertook focus group discussions (FGDs) with young Swazi entrepreneurs during September—December 2012. The participants were also asked to provide solutions to challenges they identified. Opinions on how to create enabling entrepreneurship framework conditions, especially for youth, were sought. While the results of the FGDs are only indicative, they provide the following useful insights.

- Young Swazi entrepreneurs viewed the lack of skills (including work experience) and finance as top barriers to start ups. University students thought that the entrepreneurship classes overemphasize concepts, while not equipping them with the ‘know-how’ to start and run a business. In their view, training programs should go beyond business plan preparation and foster linkages to business service providers and networks.
- Young people were also concerned about not having a say in policies ‘promoting’ their economic interests, including entrepreneurship, partly due to traditional decision-making structures. Development programs for youth thus often fail to meet young people’s needs.
- A weak business environment also impedes young Swazi entrepreneurs. Such barriers impact youth disproportionately because of their lack of experience in overcoming them and the limited links to professional networks. Further on the business environment, the limited access to finance for start-up capital, which reflects young people’s limited assets for collateral and the absence of financial history, is an important constraint.
- Youth viewed professional networks as critical to enter sectors other than those with ‘low barriers/high competition.’ Access to information on business opportunities was also a priority and so was supportive infrastructure such as incubators for youth business ideas.

Overall, the findings of the FGDs confirmed the gap in entrepreneurial skills and training programs to be an important hindrance for youth business start-ups, alongside the lack of the initial capital.¹⁰

2.4 Measures to stimulate youth entrepreneurship

While entrepreneurship as an academic field is relatively new, the link between human capital and productive entrepreneurship has been long posited in the theoretical and empirical literature (Jovanovic, 1982; Evans and Leighton 1989; McPherson 1996; and Chigunta et al., 2005). Recognizing the importance of human capital and skills in self-employment and entrepreneurship, governments in Africa and elsewhere have increasingly turned to ‘entrepreneurship programs’. The programs vary in objectives, types of interventions, and implementation arrangements, reflecting constraints to entrepreneurship they tend to address.

Results of the entrepreneurship programs also vary widely, with similar programs yield different outcomes in different places and for different groups (McKezie and Woodruff, 2014). Among recent research, Klinger and Schündeln (2014) found that in Central America, business training significantly increases the probability that a participant starts a new business or expands an existing one. Utilizing a randomized experiment, Mano et al. (2012) found that basic-level management training improves business practices and performance in Ghana. Gindling and Newhouse (2014) documented that in low income countries, effective targeting of training programs to the self-employed with higher growth potential is important. It is noteworthy though that the positive impacts on both labor market and business outcomes were found to be significantly higher for youth than for adults (Cho and Honorati, 2014).¹¹

In an effort to support youth entrepreneurship, the Government of Swaziland established the Youth Enterprise Fund (YEF) in 2009, to provide training and start-up capital for emerging young entrepreneurs. However, the program ran into difficulties in 2011 and 2012, due to fiscal constraints on new funding and low repayment rates on the existing loans. While in principle this initiative is a step in a right direction, substantial scaling up and better repayment other incentives would be needed to achieve meaningful reduction in youth unemployment.¹²

TechnoServe Swaziland, NGOs supporting entrepreneurship, provides youth with training, networks and seed capital.¹³ As TechnoServe, Junior Achievement Swaziland (JASD) focuses on

¹⁰ The FGDs were a qualitative exercise, carried out with active and potential young entrepreneurs (students). Interviews with key stakeholders in the public sector (e.g., Ministry of Economic Development; Ministry of Commerce, Trade and Industry, Youth Enterprise Fund), the private sector (e.g., NedBank, FINCORP) and NGOs (e.g., TechnoServe, JASD) were carried out to triangulate the dialogue (UNDP Swaziland, 2012).

¹¹ Evaluations of Latin America’s programs targeted to vulnerable youth pointed out effectiveness of vocational and life skills training combined with internships in private firms (Attanasio et al., 2011; Card et al., 2011).

¹² The 2011 fiscal crisis has further undermined the YEF financing with low repayment rates and inadequate support from the government. The low repayment rates were mostly a result of disbursed funds not being adequately monitored and of weaknesses in the YEF’s business proposal assessment process (UN Swaziland, 2013). The Youth Enterprise Development Fund in Kenya has also experienced massive loan defaults, with many youth enterprises performing well below their potential (Rori et al., 2011). Oseifuah (2010) posits that training in the financial literacy and entrepreneurship skills has a positive impact on growth of youth SMEs in South Africa.

¹³ Since access to credit is a key obstacle for young entrepreneurs who lack collateral and are considered ‘high risk’ because of their limited business experience, TechnoServe also launched a loan guarantee facility that was taken up

capacity development of potential entrepreneurs. The JASD conducts courses for high school students on entrepreneurship and financial literacy, drawing on partners from the private sector, education institutions and the Government. While such initiatives can play a catalytic role, fragmentation limits their effectiveness. Swaziland still needs to develop a comprehensive youth employment and entrepreneurship strategy for integrating young people into the labor market.

International experiences show that youth entrepreneurship training programs can form successful government interventions, provided that necessary preconditions (e.g. time limit, targeting) are in place. In the next section, we develop a model reflecting these facts, conduct policy analysis and test the results on new data from Swaziland.

3. The model

Reflecting the above facts, we develop a model of entrepreneurial start-ups in an economy with limited entrepreneurial skills, costly search for business opportunities and costly start up (i.e. requiring initial capital). This is a model of structural transformation, where both young and adult entrepreneurs face skill shortages, but the shortages are more pronounced among youth.¹⁴

With their lack of work and entrepreneurial experience, weak links to professional networks, and limited start-up capital and access to credit, young entrepreneurs face higher cost than adults when searching for opportunities and turning them into businesses. For young entrepreneurs the skill shortages can be explained by the lack of experience while in the case of adults they reflect the need to move to a new productive sector.¹⁵ The model is applied to analyze policies to stimulate start-ups by subsidizing entrepreneurial training/search or start up. The efficiency–equity trade-offs involved in promoting youth vs. overall entrepreneurship are also examined.

Consider a one-period economy with the population size normalized to one. There are two types of agents, entrepreneurs and workers, with population shares μ and $1-\mu$, respectively. Furthermore, a portion $1-p$ of both entrepreneurs and workers are adults and portion p are young people. All agents receive \bar{w} amount of consumption good, c , from their domestic or informal sector production. They have risk neutral preferences in consumption $E(c)$ where E denotes the expectations agents form at the beginning of the period about the income they will receive from their activities. Young entrepreneurs are ‘less skilled’ than their adult counterparts and thus face more challenges to find viable business opportunities/ turn them into firms.¹⁶

At the beginning of the period, entrepreneurs search for opportunities to open firms and incur cost equal to $d(x_i) = x_i^2 / 2\gamma_i$, where $i = A, Y$ for adults and youth, respectively and γ is a search efficiency parameter that takes on two values: γ_Y for the young entrepreneurs (that is with

by Standard Bank and Nedbank Swaziland. More recently, the Nedbank extended credit under the Central Bank of Swaziland guarantee scheme, conditional on training from the Swazi Small Enterprise Development Company.

¹⁵ In the Southern Africa context, due to the adjustment of the size of the public sector, the former public sector employees would need to gain new skills either to be employed or run their own firm in the private sector.

¹⁶ This assumption also reflects the mismatch that exists between the skills supplied by the current educational system and those demanded in the private sector, putting premium on work experience.

probability p) and γ_A with probability $1-p$, where $\gamma_A > \gamma_Y > 0$. The difference in search efficiency reflects the differences between young and adult entrepreneurs in their initial skill levels, with youth being less able to search for opportunities and turn them into firms than adults.¹⁷ The search results in probability x_i , $i = A, Y$ of opening a business, which – after paying start-up cost k , then produces output y using n amount of labor as follows:

$$y = \frac{1}{1-\alpha} z^\alpha n^{1-\alpha} \quad (1)$$

where z is the business capital and α , $0 < \alpha < 1$, is the share of capital in the output. With entrepreneurs paying workers a market-determined (competitive) wage w , each entrepreneur running a firm earns profit amounting to $\pi = \frac{1}{1-\alpha} z^\alpha n^{1-\alpha} - wn = \frac{\alpha}{1-\alpha} z^\alpha n^{1-\alpha}$. The market clearing condition for entrepreneurs is $\mu = m + m_u$ where m is aggregate the number of entrepreneurs who run a business and m_u are entrepreneurs who did not find a business opportunity to open a business become self-employed in the informal sector and earn income b .

At the beginning of the period, workers acquire skills for the private sector at a cost of $k(q) = q^2 / 2\theta$, with $\theta > 0$. Workers' learning efforts result in probability q , of obtaining skills and job in the private sector at wage w , which reflects their marginal product of labor.¹⁸ Denoting N as the total labor working in the private sector (e.g., $N = nm$), the market clearing condition is $1 - \mu = N + N_u$, where N_u are the unemployed.

3.1 Agents' problem and the equilibrium

The entrepreneur of type $i = Y, A$, where Y denotes young and A denotes adult, solves:

$$\begin{aligned} \max E(c_i) \\ \text{s.t. } c_i \leq \bar{w} + x_i \pi + (1 - x_i) b - \frac{x_i^2}{2\gamma_i} \end{aligned} \quad (2)$$

Similarly, the representative worker solves:

$$\begin{aligned} \max E(c) \\ \text{s.t. } c_i \leq \bar{w} + qw - \frac{q^2}{2\theta} \end{aligned} \quad (3)$$

¹⁷ The model could be applied to other groups with skill shortages (e.g. people in rural areas).

¹⁸ Unlike entrepreneurs, young and adult workers face the same cost of acquiring skills. The case of differences among workers is elaborated in Brixiová et al. (2009).

The equilibrium is a wage rate and an allocation of workers and entrepreneurs such that (i) entrepreneurs and workers maximize their utilities and (ii) labor and output markets clear so that $m = \mu\bar{x} = \mu[p\bar{x}_Y + (1-p)\bar{x}_A]$ holds for entrepreneurs and $N = (1-\mu)q$ for workers.¹⁹

3.2 Decentralized solution

Solving the utility maximization problems of entrepreneurs and workers and substituting from the labor market clearing condition $N = nm$ yields:²⁰

$$\frac{x_i}{\gamma_i} = \frac{\bar{x}}{\bar{\gamma}} = \pi - b = \frac{\alpha}{1-\alpha} z \left[\frac{(1-\mu)q}{\mu\bar{x}z} \right]^{1-\alpha} - b \quad ; \quad i = Y, A \quad (4)$$

$$\frac{q}{\theta} = w = \left[\frac{\mu\bar{x}z}{(1-\mu)q} \right]^\alpha \quad (5)$$

where $\bar{x} = p\bar{x}_Y + (1-p)\bar{x}_A$ is the average search effort and $\bar{\gamma} = p\bar{\gamma}_Y + (1-p)\bar{\gamma}_A$ is the average search cost of young and adults. From (4), the entrepreneurs' search effort for a business opportunity, x_i , is positively related to net profits, $\pi - b$, and search efficiency: γ_i , $i = Y, A$. For a given level of profits young entrepreneurs who face high search cost due to their skill shortages are less likely to search and more likely to work in the informal sector than their adult counterparts. Conversely, when search for opening businesses is less costly (or subsidized, as discussed below), entrepreneurs will increase their search effort (x rises with γ).

Equations (4) and (5) also show interdependency between (i) the number of firms and workers' effort to acquire skills and (ii) the availability of skilled workers and entrepreneurs' search effort. Specifically, a lower number of searching entrepreneurs reduces the expected wage and discourages workers to acquire skills needed in the private sector. Conversely, shortages of skilled workers discourage entrepreneurs from searching for productive business opportunities where such workers are needed.

3.3 Standard optimal solution

The standard approach to derive the optimal solution is to maximize utility derived from consumption (in this case from maximizing output) by solving the social planner's problem:²¹

¹⁹ Based on the parameters, the model either has (i) a unique trivial equilibrium where workers and entrepreneurs exert zero effort or (ii) one trivial and one unique equilibrium with positive effort by workers and entrepreneurs. We focus on the unique equilibrium with positive workers' and entrepreneurs' efforts.

²⁰ Disaggregating by age, $m = m_Y + m_A$ and $m_u = m_{uY} + m_{uA}$, where $m_Y = p\mu\bar{x}_Y$ and $m_A = (1-p)\mu\bar{x}_A$.

From $N = nm$ follows that $n = \frac{q(1-\mu)}{\bar{x}\mu}$.

²¹ In the past, in practice the focus on welfare maximization through raising consumption/output has often manifested itself by policymakers' focus on high growth. This approach, which does not take into account inequality and hence inclusiveness or sustainability, can be problematic, as discussed below.

$$\text{Max} \left(m_Y \left[\frac{z^\alpha}{1-\alpha} \right] n^{1-\alpha} + m_A \left[\frac{z^\alpha}{1-\alpha} \right] n^{1-\alpha} - \mu p \frac{x_Y^2}{2\gamma_Y} - \mu(1-p) \frac{x_A^2}{\gamma_A} - (1-\mu) \frac{q^2}{2\theta} \right) \quad (6)$$

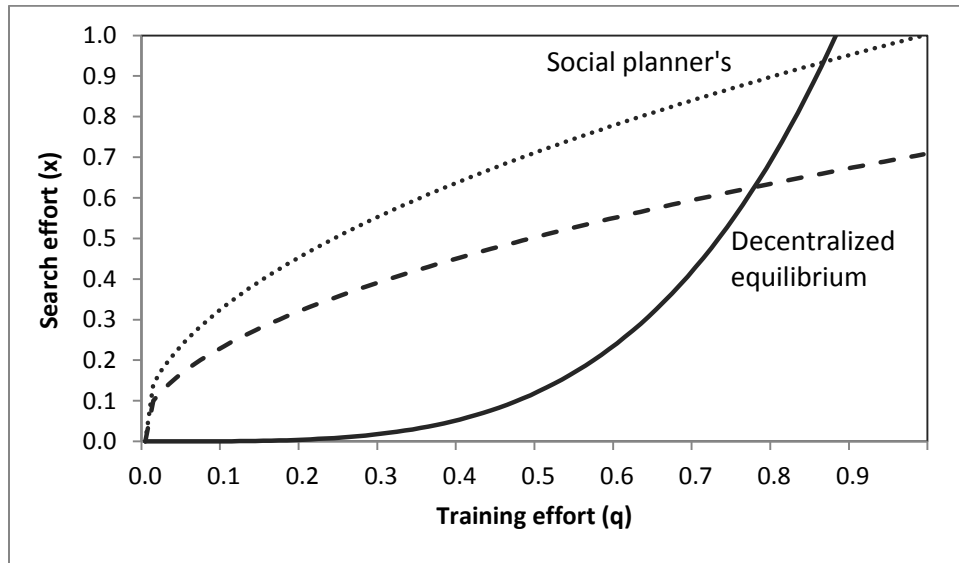
$$\text{s.t. } m_Y = \mu p x_Y; m_A = \mu(1-p)x_A; n = \frac{(1-\mu)q}{\mu \bar{x}}; 0 < x_Y, x_A, q < 1$$

In solution to (6), the condition for optimal effort by workers to acquire skills remains identical to (5), but (4) now changes to:

$$\frac{x_i}{\gamma_i} = \frac{\bar{x}}{\bar{\gamma}} = \pi = \frac{\alpha}{1-\alpha} z \left[\frac{(1-\mu)q}{\mu \bar{x} z} \right]^{1-\alpha}; i = Y, A \quad (7)$$

From (4) and (7), the solution to the social planner's problem and in the decentralized economy would be identical if $b = 0$.²² However, with a positive level of income from the informal sector $b > 0$ as in the benchmark decentralized case, incentives for entrepreneurs to search for business opportunities are reduced. This also lowers the equilibrium private sector employment relative to the outcome in the social planner's problem (Figure 2).

Figure 2. Decentralized and social planner's solution



Source: Authors' calculations.

3.4 Policies to stimulate entrepreneurship

Subsidies to start up

²² In fact, if the social planner would include output in the informal sector, b , in the objective function, the decentralized and the optimal solutions would be identical. Not including b in the objective function is consistent with the goal to promote 'good' – high productive, secure and well-paid – jobs.

We now discuss how can policies such as subsidizing the entrepreneurial start-ups through encouraging search efforts offset the disincentives created by the informal sector income. Specifically, we assume that subsidy per entrepreneur takes form $x_i s$. The entrepreneur of type i solves (8a) with solution described by (8b) and (5):

$$\max_{0 < x_i < 1} \left(\bar{w} + x_i \pi + (1 - x_i) b - \frac{x_i^2}{2\gamma_i} + s x_i \right); i = Y, A \quad (8a)$$

$$\frac{\bar{x}}{\bar{\gamma}} = (\pi - b + s) = \left\{ \frac{\alpha}{1 - \alpha} z \left[\frac{(1 - \mu)q}{\mu \bar{x} z} \right]^{1 - \alpha} - (b - s) \right\} \quad (8b)$$

Equation (8b) shows that under the above forms of financing, the subsidy per worker could exactly offset the expected disincentive effect from the income in the informal sector, that is $s = b$. It is straightforward to show that financing the subsidy from profit taxation would be much less effective than for example consumption taxation, since higher profit tax rate would work in the opposite direction of the subsidy, offsetting its impact. In economies with severe shortages of productive entrepreneurship, such as Swaziland, tax base should be broadened and taxation should shift, where possible, to other sources away from firm profits.

Support to entrepreneurship training programs

The government can support entrepreneurship with training. Participation in such programs lowers entrepreneurs' income from the informal sector by a fraction ξ and also reduces the rate of search cost (or raises search efficiency) by a fraction $\sigma \in (0,1)$. With this type of support, the problem of an entrepreneur i is described by (9a), while the solution is characterized by (9b) and again (5):

$$\max_{0 < x_i < 1} \left((\bar{w} - \xi + x_i \pi + (1 - x_i) b - \frac{(1 - \sigma)x_i^2}{2\gamma_i} \right); i = Y, A \quad (9a)$$

$$\frac{(1 - \sigma)\bar{x}}{\bar{\gamma}} = (\pi - b) = \left\{ \frac{\alpha}{1 - \alpha} z \left[\frac{(1 - \mu)q}{\mu \bar{x} z} \right]^{1 - \alpha} - b \right\} \quad (9b)$$

Based on (9b), the increase in search efficiency resulting from entrepreneur's participation in retraining programs amounting to $\sigma = \bar{\gamma}b/\bar{x}$ would offset the disincentives arising from the informal sector income. Effectiveness of this measure will depend on how the entrepreneurship training programs – if sponsored by the government – are being financed. Again, cuts in non-priority expenditures or increases in rates of less distortionary taxes (lump-sum, consumption) would be a preferred option to profit or income taxation.

Comparing the cost of reaching optimal solution under the two subsidy schemes shows that when efficiency of search is relatively low (search effort high), it is preferable to support training programs reducing entrepreneurial search cost rather than simply subsidize existing search. Given the relatively low search efficiency of youth, this points to the importance of their training.

3.5 *Considering equity between young and adult entrepreneurs*

While the solution to the social planner's problem maximizes the aggregate output and consumption, it does not take into account inequalities between young and adult entrepreneurs that may arise. These inequalities can constitute another reason for public interventions.

As already mentioned, young people in most sectors (with the possible exception high-tech sectors) are disadvantaged relative to adults when looking for entrepreneurial opportunities. To reflect this observation in our model, young people incur higher search cost for business opportunities than adults, that is $0 < \gamma_Y < \gamma_A$. Subsequently, the solution to the decentralized problem characterized by (4) and (5) will result in a larger share – relative to the relevant labor force – of potential young entrepreneurs failing to find a suitable business opportunity than is the case for adult entrepreneurs ($m_Y < m_A$).

When 'optimal' government policies target only output and thus output-maximizing solutions are adopted, the government would provide identical subsidy $s=b$ to young and adult entrepreneurs or reduce their search cost by the same fraction σ through training. Under such measures, inequalities between the two groups would not be eliminated or even narrowed.

What subsidies to entrepreneurial search could then government provide so as to put search effort of youth on equal footing with that of adult entrepreneurs? Conditions (4) and (5) show that when the government subsidizes search of adult entrepreneurs by the amount b , the equal search effort of young entrepreneurs would be achieved through subsidy to young entrepreneurs that exceeds b , $s_Y > b$, amounting to:

$$s_Y = b + \frac{\gamma_A - \gamma_Y}{\gamma_Y} b \tag{10}$$

where $s_Y > s_A = b > 0$ since $\gamma_A > \gamma_Y$.

To ensure that the government-sponsored entrepreneurial training programs equalize search efforts of young and adult entrepreneurs, youth should be prioritized for the training, so that its efficiency of search converges to that of adults. The following condition needs to hold:

$$\frac{\gamma_Y}{\gamma_A} = \frac{1 - \sigma_Y}{1 - \sigma_A} \tag{11}$$

It follows from (11) that since $\gamma_A > \gamma_Y$, the government needs to sponsor training for young entrepreneurs so that their search effectiveness rises more than that of adults: $\sigma_Y > \sigma_A$.²³

3.6 Optimal solution with social costs of (youth) unemployment

Besides the standard social planner's problem described by (6), the optimal solution also depends on the objectives that the society sets for itself. When only output (or utility) maximizing solutions are adopted, other priorities such as income distribution, low unemployment and inclusiveness can be compromised. However, high growth with widespread unemployment point to exclusive development path, which is typically not sustainable.

Protracted unemployment or idleness can lead to 'scarring', that is the impairment of their employment and income prospects through low wages; underemployment, and; low-pay-no-pay cycles, and the loss of human capital. Negative consequences of youth underutilization extend well-beyond economic well-being. For example, social exclusion is an important negative consequence of youth unemployment and idleness. The young people miss out on critical life-skill building experiences such as applying their knowledge, developing a sense of own abilities autonomy as well as contributing meaningfully to society (Khumalo, 2011).

We now modify the objective function (6) to show a situation where the society assigns social cost to unemployment. The social planner's objective function then changes to:

$$\max \left(m \left[\frac{z^\alpha}{1-\alpha} \right] n^{1-\alpha} - \mu \frac{\bar{x}^2}{2\bar{\gamma}} - (1-\mu) \frac{q^2}{2\theta} - A(\mu-m) \right) \quad (12)$$

$$\text{s.t. } m = \mu\bar{x}; n = \frac{(1-\mu)q}{\mu\bar{x}}; 0 < \bar{x}, q < 1$$

where $A(\mu-m) = A(\mu-\mu\bar{x})$ is cost of unemployment; with $\mu-m$ denoting entrepreneurs who did not open a productive business firm and are unemployed/in the informal sector. Solution to (12) is characterized again by (5), but (7) now changes to:

$$\frac{\alpha}{1-\alpha} z \left[\frac{(1-\mu)q}{\mu\bar{x}z} \right]^{1-\alpha} = \frac{\bar{x}}{\bar{\gamma}} - A \quad (13)$$

Hence introducing social costs raises the entrepreneurial effort needed to reach optimal (social planner's) solution. For example, start-up subsidy would now need to offset also social cost of unemployment, $s = b + A$.

Since we are interested in youth entrepreneurship, we now look into the case where the society assigns social costs to youth unemployment only. In this situation, problem (12) becomes:

²³ Where possible, these government interventions should be financed through lump sum-like taxation (e.g., real estate) or with taxes on consumption (e.g., VAT).

$$\max \left((m_Y + m_A) \left[\frac{z^\alpha}{1-\alpha} \right] n^{1-\alpha} - \mu p \frac{x_Y^2}{2\gamma_Y} - \mu(1-p) \frac{x_A^2}{2\gamma_A} - (1-\mu) \frac{q^2}{2\theta} - A(\mu p - m_Y) \right) \quad (14)$$

$$\text{s.t. } m_Y = p\mu x_Y; m_A = (1-p)\mu x_A; n = \frac{(1-\mu)q}{\mu \bar{x}}; 0 < \bar{x}, q < 1; \text{ and } m = m_Y + m_A$$

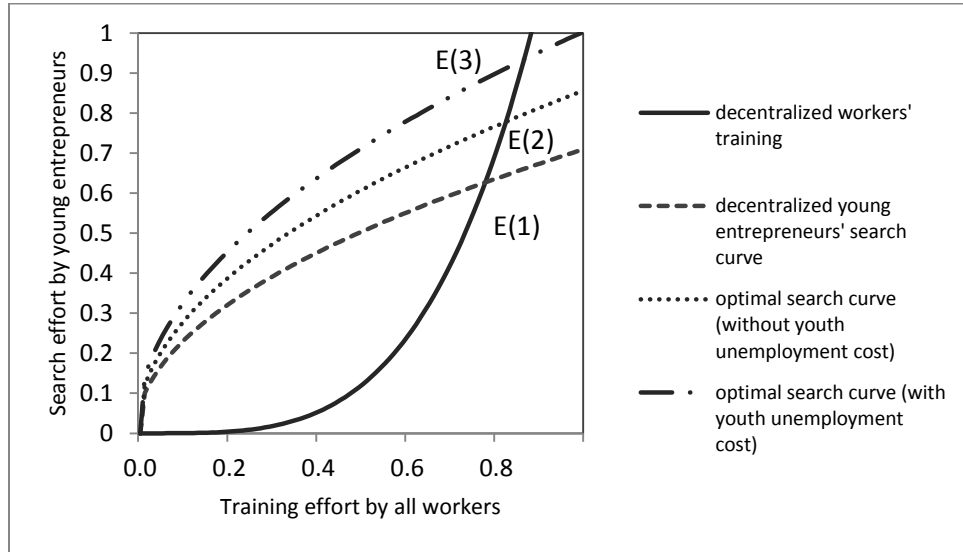
where $A(\mu p - m_Y) = A(\mu p - \mu p x_Y)$ is social cost of youth unemployment; with $\mu p - m_Y$ denoting young entrepreneurs /working in the informal sector. First order conditions replacing (7) are:

$$\frac{\alpha}{1-\alpha} z \left[\frac{(1-\mu)q}{\mu \bar{x} z} \right]^{1-\alpha} = \frac{x_Y}{\gamma_Y} - A = \frac{x_A}{\gamma_A} = \frac{\bar{x}}{\bar{\gamma}} - \frac{Ap\gamma_Y}{\bar{\gamma}} \quad (15)$$

(15a)

Conditions (15) with (13) show that the optimal entrepreneurial effort rises when the society assigns social costs to all unemployed entrepreneurs. At the same time, higher social costs related to youth unemployment give justification to interventions that are targeted at this age group (Figure 3). For example, when social costs A are assigned to the unemployed young entrepreneurs, their optimal start up subsidy would rise to $s = b + A$ for youth but remain $s = b$ for the adults.²⁴

Figure 3. Optimal search with and without youth unemployment cost



Note: E(1) is the decentralized equilibrium, E(2) is the social planner's solution when social cost of youth unemployment are not taken into account and E(3) is the optimal solution with youth unemployment cost.

²⁴ In contrast, when social costs are related to all unemployed entrepreneurs, the optimal solution would be reached with uniform subsidy $s = b + A$ to all entrepreneurs.

4 Empirical Evidence from Swaziland

4.1 Kernel density estimate of entrepreneurial sales

In this section, we compare some of the results of our model with data from a recent (2013) survey of Swazi entrepreneurs. In particular, examine if skills and training for young entrepreneurs impact positively their performance, measured by sales. Figure 4 illustrates the sales distribution of adult and young entrepreneurs. Both distributions are nearly uni-modal, with adult entrepreneurs outperforming the youth except for the relatively very high sales range. We then ask if training would improve the sales performance of youth. Figure 4b shows that relative to the 'no-training' case almost entire probability density function would move to right if all youth were trained.

Figure 4. Kernel density estimate of probability density function of sales

Figure 4a. Kernel density of entrepreneurial performance: youth vs. adults

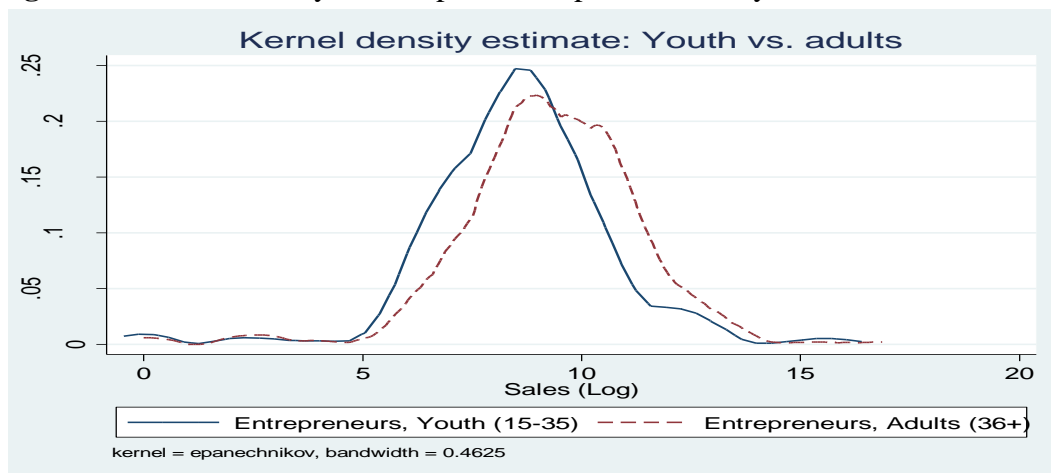
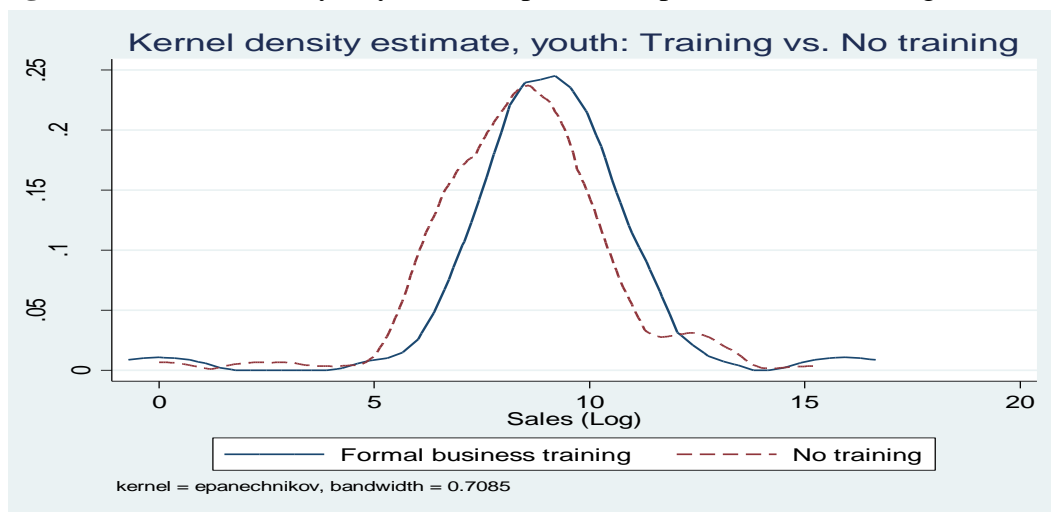


Figure 4b: Kernel density of youth entrepreneurial performance: training vs. no training



Source: Authors' calculations based on UNDP Survey of Young Entrepreneurs. **Note:** Sales in a regular month.

4.2 Results of probit estimations

Finally, we test which of the characteristics of young entrepreneurs impact their sales performance in a multivariate probit regression. We find that firms where young entrepreneurs received more business training performed better than those with less training. Male entrepreneurs and Swazi citizens also recorded better sales performance during the past two years than their counterparts. At the same time, the impact of formal education, while positive, is not significant suggesting that formal education may not provide skills needed for productive entrepreneurship (Table 2).

Our model and empirical results suggest that targeted government interventions can help youth overcome numerous obstacles for productive entrepreneurship. The results underscore the need for policy interventions to go beyond improving the business environment to more pro-active measures. In particular the governments could consider assistance to young entrepreneurs through business training and other interventions for start-ups to even their chances of entrepreneurial success with those of adults.

Table 2. Firm sales performance and skills: probit estimations

Dependent var.: sales are flourishing (=0 if decreasing or stagnating; =1 if flourishing - 2 years ago -)	(1)	(2)
Received business training	0.194** (0.0905)	0.199** (0.0923)
Age of business (log)	0.00515 (0.0621)	0.00346 (0.0628)
Age	-0.0248* (0.0146)	-0.0281* (0.0150)
Informal source of initial capital	0.0767 (0.0925)	0.0422 (0.0962)
Applied for formal credit 2/	0.0649 (0.114)	0.0505 (0.119)
Number of employees (log)	0.0482 (0.0673)	0.0144 (0.0688)
Secondary	0.0714 (0.113)	0.0480 (0.113)
University	0.0356 (0.147)	0.00346 (0.144)
First business handled	0.162 (0.119)	0.180* (0.0946)
gender		-0.170* (0.0888)
married		0.0332 (0.0923)
nationality		0.215*** (0.0756)
Observations	102	102
R-square	0.0599	0.1025

Source: Authors' calculations based on the UNDP Swaziland (2013) survey of entrepreneurs. **Note:** Probit model and variables are specified in Annex I. 2/ Many applications for formal credit are turned down. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

5. Conclusions

In this paper, we developed a model of costly firm start up, where young entrepreneurs experience greater shortages of entrepreneurial skills than adults. They thus face more challenges turning their ideas into businesses. To derive policy recommendations we utilized the model for analysis of the impact of the government support to entrepreneurial training and subsidies to start up, while taking into account equity considerations. The model shows that targeted support to entrepreneurial training can lead to more efficient outcome than the decentralized solution and reduce the gap in productive entrepreneurship between the two cohorts. In particular when search efficiency is relatively low (and search effort high), it is preferable to support training programs to reduce entrepreneurial search cost rather than simply subsidize their existing efforts. The importance of skills and training is confirmed by our empirical analysis of a new survey of Swazi entrepreneurs.

Findings of our model and the evidence from Swaziland need to be put into context with experiences of other countries and regions with programs supporting youth entrepreneurship. Among various types of support, entrepreneurial education and training have becoming more prevalent. While results of these training programs vary, targeting high potential youth and providing packages of reforms (for example, supplementing access to credit with training) seems to have yielded better results than widely spread support containing a single measure (credit). The design of interventions should be adjusted to country-specific conditions and further researched.

By focusing on training and start up subsidies we have left other constraints to youth entrepreneurship such as youth low participation in professional networks or the lack of supportive infrastructure (incubators) for further research. More broadly, the area of effective government policies fostering productive youth entrepreneurship in Africa is relatively understudied. Further research in this area could also explore the role of African youth in technology adoption and innovation as well as different policies that the African governments could adopt towards high potential and vulnerable youth groups.

Annex I. Probit Estimations –Model and Variables

Table 1, Annex I. Variables used in probit estimations

<i>Dependent variable</i>	Definition	Comment
Sales performance	Dummy variable indicating whether total current sales have been decreasing or stagnating (=0), or have been flourishing as compared with sales 2 years ago	Proxy of performance
<i>Controls</i>		
First business handled	Dummy variable indicating whether the business is the first one to be handled by the interviewee entrepreneur	Proxy of the experience in business management
Age of business (log)	Log of the age of business in age	Proxy of the experience in business management (this assumes a stable ownership)
Highest education: secondary/high school	Dummy variable indicating whether the highest education level attained in the secondary/high school level	Proxy of education
Highest education: university	Dummy variable indicating whether the highest education level attained in the university level	Proxy of education
Received business training	Dummy variable indicating whether the entrepreneurs has ever received a formal, informal, advanced business training or has simply been introduced to business or nor.	Proxy of business skills
Age	Age in years	Entrepreneurs' socio-economic characteristics
Gender (=1 if female)	Dummy variable taking the value of 1 for female entrepreneurs and 0 for male entrepreneurs	Entrepreneurs' socio-economic characteristics
Married	Dummy variable indicating whether the entrepreneur is married or not.	Entrepreneurs' socio-economic characteristics
Nationality	Dummy variable indicating whether the entrepreneur has the Swazi citizenship or not.	Entrepreneurs' socio-economic characteristics
Number of employees (log)	Log of the total current number of employees	Business characteristics

The following probit model has been used:

$$Sales_i = \alpha + \beta[Experience]_i + \gamma[Education]_i + \delta[Skills]_i + \lambda[Business\ characteristics]_i + \nu[Socio-economic\ characteristics]_i + \eta_i$$

where i stands for individual entrepreneurs. The dependent variable ($Sales$) takes on value 1 when the total sales have increased or 0 when they stagnated/decreased relative to sales two years ago. $Experience$ is proxied by the age of business and whether this is the first business managed; $Education$ is proxied by the highest level of education attained; $Skills$ are proxied by the business training received; $Business\ characteristics$ is proxied by the number of employees; $Socio-economic\ characteristics$, used as controls, are proxied by age, gender, marital status and nationality.

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