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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 the 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.

Keywords: youth entrepreneurship, model of skills and structural transformation, policies, Africa
JEL classification: J08, J11, L26, O11

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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, overall employment has been low, reflecting limited private sector job creation and entrepreneurship, both in the formal and informal sectors. The countries were also negatively impacted by the global financial crisis, through trade with Europe either directly (South Africa), via South Africa (Lesotho and Swaziland) or through a fall in commodity export proceeds (Botswana, Namibia).

In southern Africa's 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 years) in 2010 reached 43 per cent above its regional peers. Currently, youth unemployment rate exceeds 50 of the young labour force and is among the highest in Africa. Further, a substantial portion of youth has been discouraged from participating in the labour market. The labour markets were the key channel in transmitting the 2011-12 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 labour market, private sector development, including youth entrepreneurship, could be part of the solution (Brixiová and Kangoye 2014).¹

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 major disadvantages in the developed economies, long-standing structural bottlenecks, especially to private sector development and productive entrepreneurship, are often emphasized in the developing countries.

The importance of productive entrepreneurship for development and differences in type of entrepreneurship across countries are already underscored in Baumol (1968, 1990).² Since then, the literature on entrepreneurship has grown markedly.³ In the context of Africa, Rogerson (2001) shows 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 on entrepreneurship in developing countries and in Africa in particular has been relatively scarce. The literature in this area includes Leff (1979); Gelb et al. (2009); Naudé (2008, 2010); Baumol (2010); and Brixiová (2010, 2013) among others.

In this paper, we examine barriers to youth entrepreneurship in an extended framework of Brixiová et al. (2009) on costly firm creation and skill acquisition of workers that accounts for differences in skills among entrepreneurs. We focus particularly on the lack of skills among young

¹ A nationally representative survey carried out in Swaziland in November 2011 found that at least one member had lost his job during 2011 fiscal crisis in 7.3 per cent of households (UN Swaziland 2012).

² 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'.

³ See Acs and Audretsch (2003) for an overview.

entrepreneurs that prevents them from converting 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 an 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 in unlocking the employment potential of the youth. With tight fiscal conditions prevalent in the aftermath of the global financial crisis, new jobs in the region are unlikely to be generated by the public sector. Thus, entrepreneurship is viewed as an option for generating sustainable livelihoods. In fact, with their ability to adapt to change and to 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 mostly constrained by the lack of entrepreneurial skills and the limited access to finance/start-up capital. The few existing entrepreneurship programmes are not always well-tailored to their needs. The government has taken steps to address these constraints, but these 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 in particular to youth entrepreneurship in Swaziland. Section 3 develops a model of entrepreneurship and structural change, with a focus on the shortage 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

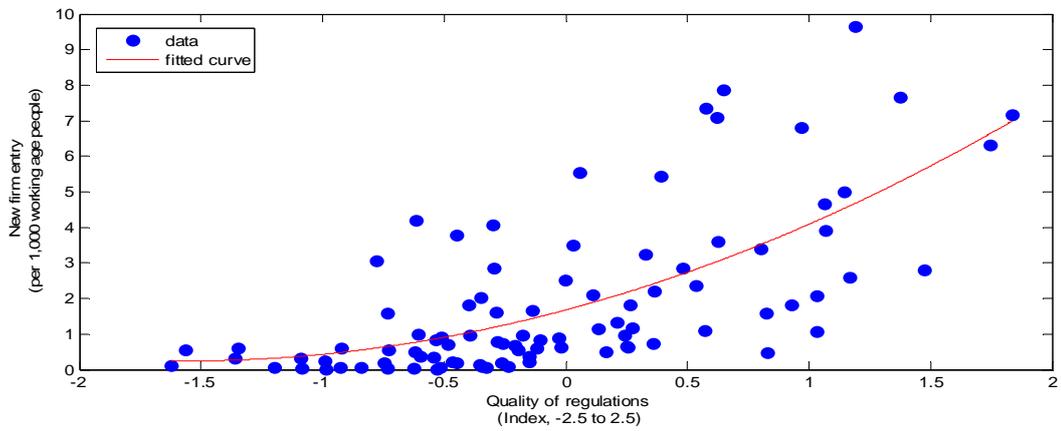
Numerous factors constrain entrepreneurship across developing countries. In addition to well-studied access to credit for established small- and medium-sized enterprises (SMEs), key factors for start-ups appear to be the regulatory framework and the business environment, initial capital, and entrepreneurial skills (Figure 1). For example, according to the World Bank (2013), in southern Africa, 29.1 per cent of the existing SMEs perceived limited access to finance as a top constraint, followed by crime and corruption. Workforce skills were also viewed as important, constituting a major constraint for more than 16 per cent of SME respondents.⁵

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 programmes offered by private or government sources. Such education is critical to the initial success and sustainability of any enterprise (Herrington and Kelley 2012: 46).

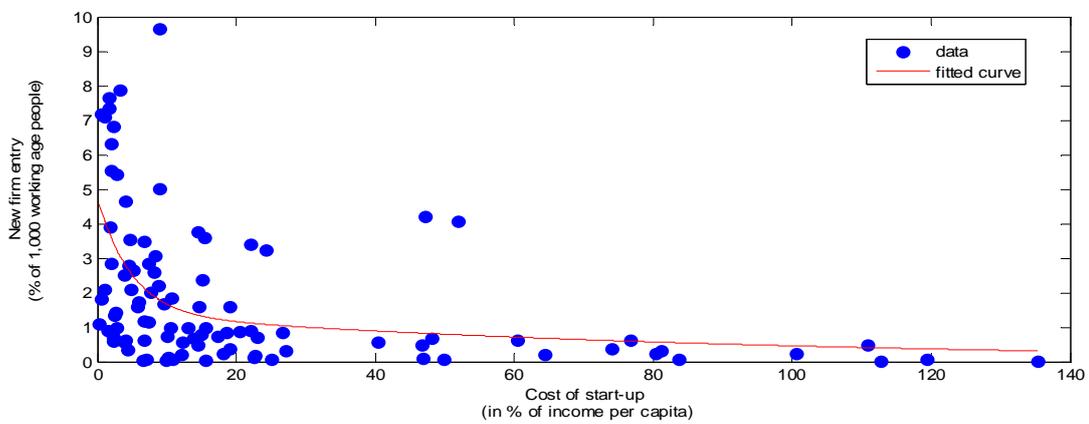
⁵ The Global Entrepreneurship Monitor (Herrington and Kelley 2012) outlines the Entrepreneurial Framework Conditions, that is, factors that have a significant impact on the entrepreneurship sector. These include financial market sophistication, technology, development, higher education and training, and labour market efficiency. Our focus is on skills. See Ncube (2005) on the importance of the business environment.

Figure 1: Factors of entrepreneurship in developing countries

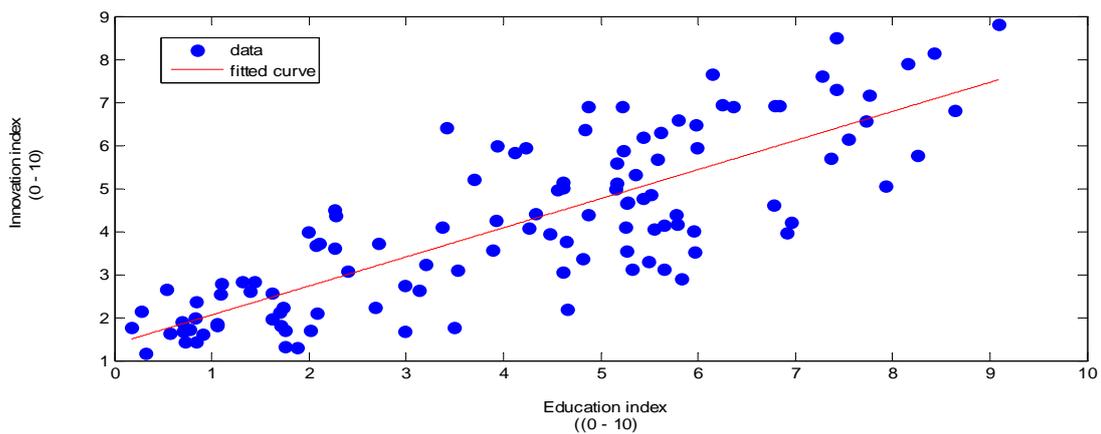
Panel 1A: New firm entry and quality of regulations, 2004-11



Panel 1B: New firm entry and cost of start-ups, 2004-11



Panel 1C: Innovation and education index, 2012



Source: Authors' calculations based on the entrepreneurship database (World Bank 2013) and the governance database (Kaufmann et al. 2013).

Among the 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 examined (Brixiová et al. 2009). In this paper, we thus focus on the 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, especially in Swaziland, solutions to youth labour market challenge that rely only on the supply side will not be effective. While entrepreneurship alone cannot tackle the challenge of youth employment, 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) examines 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 confirms the need to differentiate between youth and adult entrepreneurship, stemming from the special 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 are among the key factors impeding youth entrepreneurship, in addition to societal attitudes and a regulatory framework. The importance of capacity building is underscored in the ILO report by Chigunta et al. (2005), which examines 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 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 contacted for interviews.⁸

The survey covered young and adult entrepreneurs in order to understand the 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., aged 18–35) and 385 as adult (aged above 35 years). Young and adult entrepreneurs with similar demographic and social characteristics (gender, sector of operation) were chosen to learn about the differences that age introduced to the entrepreneurial experience in Swaziland. The services sector, especially trade, was the main area of entrepreneurial activity.

The interviews aimed to obtain information on the background of the entrepreneurs, objectives of the firms they ran and the constraints they most frequently encountered. The survey also collected data on the main characteristics of the enterprise (years of operations, sector,

⁶ Constraints for rural entrepreneurs are deferred to future 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 a daily basis.

⁷ The choice of urban areas was informed by the evidence from 2007 and 2010 labour 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 have outgrown the 'SME status' or are not listed in the directory but operate 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).

⁹ The survey adopted the 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.

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 yrs	Adult 36 plus	SE and stat. sign.	15-29 yrs	30-35 yrs	SE and stat. sign.
(in % of total entrepreneurs unless otherwise indicated)						
Education and experience						
Age of entrepreneur (yrs)	30.3	47.1	0.57 ***	26.7	32.8	0.25 ***
Age of business (yrs)	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
Resolve/commitment						
Hours of work (per week)	39.3	42.3	1.70 *	39.5	39.2	2.78
Operating at full capacity (mos)	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
Outcomes						
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 **

Note: ¹ E stands for emalangeni (local currency). *, **, and *** denote 10%, 5% and 1% significance levels.

Source: Authors' calculations based on the UN Swaziland (2013) survey.

Table 1 reports some findings from the survey, focusing on the personal traits of the entrepreneurs and entrepreneurial outcomes. We first examine the differences in the mean between the young (aged 15-35) and adult (36 +) entrepreneurs. The mean age of young entrepreneurs was 30.3 years, while that of adult entrepreneurs 47.1 years. With regard to 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 the adults did. Similarly, less than 1 out of 5 young entrepreneurs had received business training, while more than 1 out of 4 adults were trained. Only 38 per cent of young entrepreneurs had prior work experience, relative to 58 per cent of the 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 more effort into their businesses than the youth. Finally, adults outperform youth on all outcome indicators—sales, turnover, employment and prospects.

Focus group discussions with young entrepreneurs

To gain a better understanding of the constraints as perceived by the actual and potential (including students) young entrepreneurs, UNDP Swaziland undertook focus group discussions (FGDs) with young Swazi entrepreneurs during September—December 2012. The participants were also asked to suggest solutions to the 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 the top barriers to firm start-ups. University students felt that entrepreneurship classes overemphasized concepts, without equipping them with the ‘knowhow’ to start and run a business. In their view, training programmes 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 that would ‘promote’ their economic interests, including entrepreneurship, partly due to traditional decision-making structures. Thus, development programmes for youth often failed to meet young people’s needs.
- A weak business environment also impeded young Swazi entrepreneurs. Such barriers impacted disproportionately on the youth because of their lack of experience in overcoming these obstacles and the limited links to professional networks. Later, the business environment, limited access to finance for start-up capital, reflecting young people’s limited assets to collateral and the absence of financial history, are important constraints.
- Youth viewed professional networks as critical for entering 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 that the gap in entrepreneurial skills and training programmes was an important hindrance for youth business start-ups, alongside the lack of the initial capital¹⁰

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; 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 programmes’. These vary with regard to their objectives, types of interventions, and implementation arrangements, reflecting the constraints to entrepreneurship they tend to address.

Results of the entrepreneurship programmes also vary widely, with similar programmes yielding different outcomes in different places and for different groups (McKenzie and Woodruff 2014). Among recent research, Klinger and Schündeln (2011) note 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) find that in Ghana basic-level management training improved business practices and performance. Gindling and Newhouse (2014) document that in low-income countries, effective targeting of training programmes to the self-employed with higher growth potential is important. It is, however, noteworthy that the

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).

positive impacts on both labour market and business outcomes are 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 young emerging entrepreneurs. However, the programme ran into difficulties in 2011 and 2012, due to fiscal constraints on new funding and low repayment rates on existing loans. While this initiative is a step in the right direction in principle, substantial scaling-up and better repayment of other incentives would be needed to achieve meaningful reduction in youth unemployment.¹²

TechnoServe Swaziland, an NGO supporting entrepreneurship, provides youth with training, networks and seed capital.¹³ As TechnoServe, Junior Achievement Swaziland (JASD) focuses on capacity development of potential entrepreneurs by conducting 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 labour market.

International experiences show that youth entrepreneurship training programmes 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., requirements of 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 the youth.

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 costs than adults when searching for opportunities and turning them into businesses. For young entrepreneurs, the shortage of skills shortage 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.¹⁴ The model is applied to the analysis of

¹¹ Evaluations of Latin America's programmes 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 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 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.

¹⁴ In the southern Africa context, due to an adjustment in the size of the public sector, the former public sector employees would need to gain new skills either to be employed or to run their own firm in the private sector.

policies to stimulate start-ups by subsidizing entrepreneurial training/search or start-up. The efficiency–equity trade-offs involved in promoting the youth as compared to 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 in finding viable business opportunities/turning these into firms.¹⁵

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 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.¹⁶ 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 labour 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 a job in the private sector at wage w , which reflects their marginal product of labour.¹⁷ Denoting N as the total labour 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.

¹⁵ 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.

¹⁶ The model could be applied to other groups with skill shortages (e.g., people in rural areas).

¹⁷ 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).

3.1 Agents' problem and the equilibrium

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

$$\max E(c_i)$$

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

Similarly, the representative worker solves:

$$\max E(c)$$

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

The *equilibrium* is a wage rate and an allocation of workers and entrepreneurs such that (i) entrepreneurs and workers maximize their utilities and (ii) labour and output markets clear so that $m = \mu \bar{x} = \mu [px_Y + (1-p)x_A]$ holds for entrepreneurs and $N = (1-\mu)q$ for workers.¹⁸

3.2 Decentralized solution

Solving the utility maximization problems of entrepreneurs and workers and substituting from the labour market clearing condition $N = mn$ yields:¹⁹

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

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

where $\bar{x} = px_Y + (1-p)x_A$ is the average search effort and $\bar{\gamma} = p\gamma_Y + (1-p)\gamma_A$ is the average search cost of the young and adults. From Equation (4), the entrepreneur's 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 costs 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 the 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 efforts. Specifically, a lower number of searching entrepreneurs reduces the expected wage and discourages workers to acquire skills needed in the private sector. Conversely, the shortage of skilled workers

¹⁸ 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.

¹⁹ Disaggregating by age, $m = m_Y + m_A$ and $m_u = m_{uY} + m_{uA}$, where $m_Y = p\mu x_Y$ and $m_A = (1-p)\mu x_A$. From $N = nm$ follows that $n = \frac{q(1-\mu)}{\bar{x}\mu}$.

discourages 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:²⁰

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

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

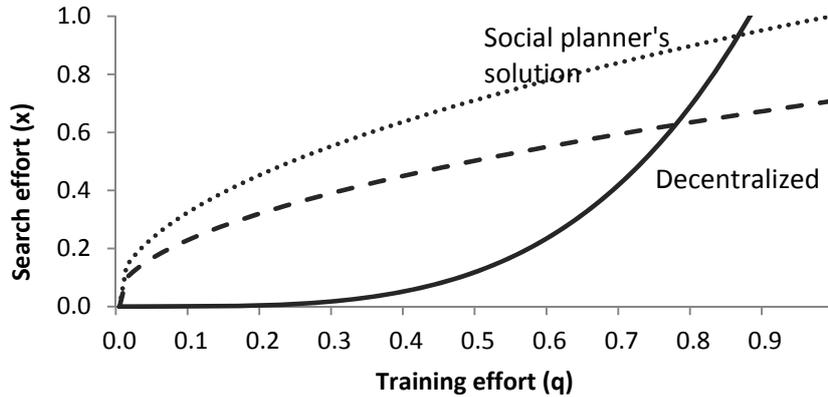
In solution to Equation (6), the condition for optimal effort by workers to acquire skills remains identical to Equations (5), but (4) now changes to:

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

From Equations (4) and (7), the solution to the social planner's problem and in the decentralized economy would be identical if $b = 0$.²¹ 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.

²⁰ In the past, the focus on welfare maximization through raising consumption/output has in practice often manifested itself as the policymakers' focus on high growth. This approach, which does not take inequality into account and hence inclusiveness or sustainability, can be problematic, as discussed below.

²¹ 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.

3.4 Policies to stimulate entrepreneurship

Subsidies to start-up

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 Equation (8a) with solution described by Equations (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, the taxbase should be broadened and taxation should shift, where possible, to other sources away from firm profits.

Support to entrepreneurship training programmes

The government can support entrepreneurship with training. Participation in such programmes 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 Equation (9a), while the solution is characterized by Equations (9b) and again Equation (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 Equation (9b), the increase in search efficiency resulting from entrepreneur's participation in retraining programmes 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 programmes—if sponsored by the government—are being financed. Again, cuts in non-priority expenditures or increases in the 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 the efficiency of search is relatively low (search effort high), it is preferable to support training programmes 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 the 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 of 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 costs for business opportunities than adults, that is $0 < \gamma_Y < \gamma_A$. Subsequently, the solution to the decentralized problem characterized by Equations (4) and (5) will result in a larger share—relative to the relevant labour force—of potential young entrepreneurs failing to find suitable business opportunities 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 the government then provide so as to put search efforts of young entrepreneurs on equal footing with those of adults? Equations (4) and (5) show that when the government subsidizes the search of adult entrepreneurs by the amount b , an equal search effort of young entrepreneurs would be achieved through a subsidy to young entrepreneurs that exceeds b , $s_Y > b$, amounting to:

$$s_Y = b + \frac{\gamma_A - \gamma_Y}{\gamma_Y} \quad (10)$$

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

To ensure that the government-sponsored entrepreneurial training programmes equalize the 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 equation needs to hold:

$$\frac{\gamma_Y}{\gamma_A} = \frac{1 - \sigma_Y}{1 - \sigma_A} \quad (11)$$

It follows from Equation (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: $\sigma_Y > \sigma_A$.²²

3.6 Optimal solution with social costs of (youth) unemployment

Besides the standard social planner's problem described by Equation (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

²² 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).

inclusiveness can be compromised. However, high growth with widespread unemployment points 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 Equation (6) to show a situation where the society assigns social cost to unemployment. The social planner’s objective equation then changes to:

$$\begin{aligned} \max & \left(m \left[\frac{z^\alpha}{1-\alpha} \right] n^{1-\alpha} - \mu \frac{\bar{x}^2}{2\bar{\gamma}} - (1-\mu) \frac{q^2}{2\theta} - A(\mu - m) \right) \\ \text{s.t. } & m = \mu\bar{x}; n = \frac{(1-\mu)q}{\mu\bar{x}}; 0 < \bar{x}, q < 1 \end{aligned} \quad (12)$$

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

$$\begin{aligned} \max & \left((m_Y + m_A) \left[\frac{z^\alpha}{1-\alpha} \right] n^{1-\alpha} - \mu p \frac{x_Y^2}{2\gamma_Y} - \mu(1-p) \frac{x_A^2}{2\gamma_A} - (1-\mu) \frac{q^2}{2\theta} - A(\mu p - m_Y) \right) \\ \text{s.t. } & m_Y = p\mu x_Y; m_A = (1-p)\mu x_A; n = \frac{(1-\mu)q}{\mu\bar{x}}; 0 < \bar{x}, q < 1; \text{ and } m = m_Y + m_A \end{aligned} \quad (14)$$

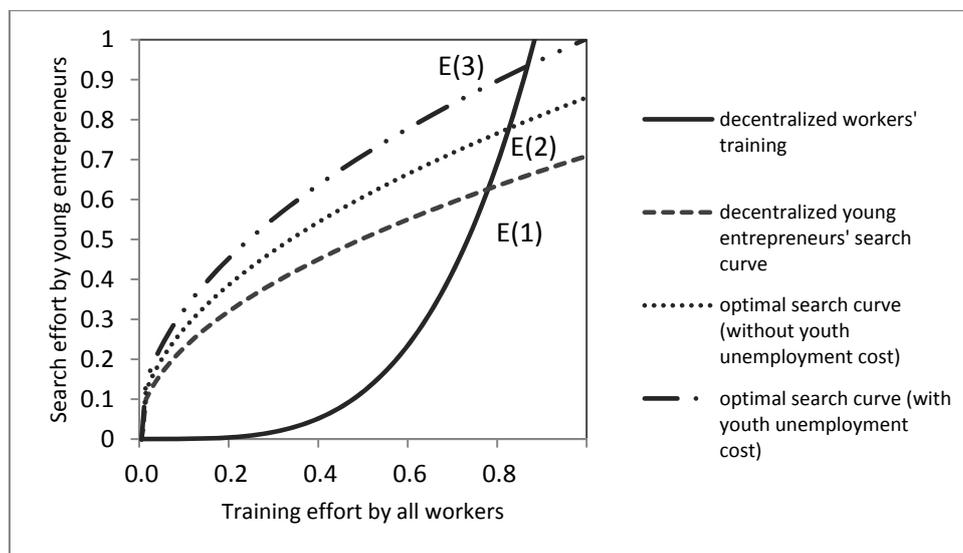
where $A(\mu p - m_Y) = A(\mu p - \mu p x_Y)$ is social cost of youth unemployment; with $\mu p - m_Y$ denoting young entrepreneurs/working in the informal sector. First order conditions replacing Equation (7) are:

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

Equations (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.²³

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 costs of youth unemployment are not taken into account and E(3) is the optimal solution with youth unemployment cost.

Source: Authors calculations.

4 Empirical evidence from Swaziland

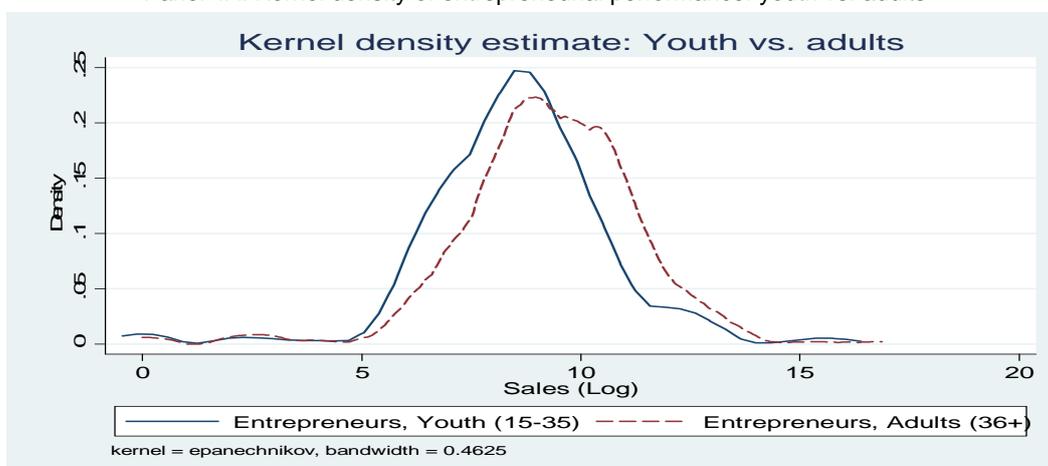
4.1 Kernel density estimate of entrepreneurial sales

In this section, we compare some of the results of our model with data from a recent (2013) survey of Swazi entrepreneurs. In particular, we examine if skills and training for young entrepreneurs impact positively on 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 analyse if training would improve the sales performance of youth. Figure 4/Panel 4B shows that relative to the 'no-training' case, almost entire probability density function would move to right if all youth were trained.

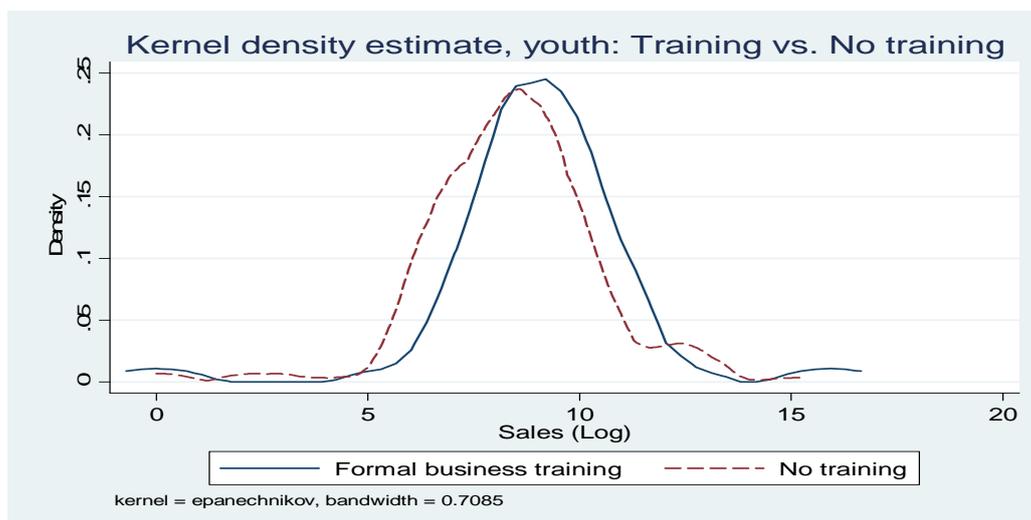
²³ In contrast, when social costs are related to all unemployed entrepreneurs, the optimal solution would be reached with uniform subsidy $s = b+A$ to all entrepreneurs.

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

Panel 4A: Kernel density of entrepreneurial performance: youth vs. adults



Panel 4B: Kernel density of youth entrepreneurial performance: training vs. no training



Note: Sales in a regular month.

Source: Authors' calculations based on UNDP Swaziland (2012).

4.2 Results of probit estimations

Finally, we test which of the characteristics of young entrepreneurs influence 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 the skills needed for productive entrepreneurship (Table 2).

Our model and empirical results suggest that targeted government interventions can help youth overcome numerous obstacles to productive entrepreneurship. The results underscore the need for policy interventions that go beyond improving the business environment to more pro-active measures. In particular the government 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

Note: Probit model and variables are specified in Appendix I. ² Many applications for formal credit are turned down. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations based on the UNDP Swaziland (2012).

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. Thus they face more challenges in turning their ideas into businesses. To derive policy recommendations we utilized the model to analyse the impact of 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 a 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 programmes to reduce entrepreneurial search costs rather than simply subsidize existing efforts. The importance of skills and training is confirmed by our empirical analysis of a new survey of Swazi entrepreneurs.

The findings of our model and the evidence from Swaziland need to be put into context with the experiences of other countries and regions with programmes supporting youth entrepreneurship. Among the various types of support, entrepreneurial education and training have been becoming

more prevalent. While results of these training programmes vary, targeting high potential youth and providing packages of reforms (for example, supplementing access to credit with training) seem to have yielded better results than widely spread support containing a single measure (credit). The specific design of interventions needs to be adjusted to country conditions and further researched.

By focusing on training and start-up subsidies, we deferred the other constraints to youth entrepreneurship—such as youth low participation in professional networks or the lack of supportive infrastructure (incubators)—for future 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 to support high potential and vulnerable youth groups.

Appendix Table A1: 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 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 interviewed entrepreneur	Proxy of 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 not	Proxy of business skills
Age	Age in years	Entrepreneurs' socioeconomic characteristics
Gender (=1 if female)	Dummy variable taking the value of 1 for female entrepreneurs and 0 for male entrepreneurs	Entrepreneurs' socioeconomic characteristics
Married	Dummy variable indicating whether the entrepreneur is married or not	Entrepreneurs' socioeconomic characteristics
Nationality	Dummy variable indicating whether the entrepreneur has the Swazi citizenship or not	Entrepreneurs' socioeconomic characteristics
Number of employees (log)	Log of the total current number of employees	Business characteristics

Source: Authors compilation.

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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