

On determinants of SME start ups in Ethiopia:

A theoretical exploration

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Abstract

Since coming to power in 1991, the Ethiopian government has strived to create an environment that supports entrepreneurship. Almost 20 years later, however, the highly productive small and medium-sized enterprise (SME) sector remains limited. This paper develops a simple theoretical model of SME start ups with frictions in the business climate and the labor market that characterize the Ethiopian institutional landscape. It finds that subsidizing entrepreneurs' search may encourage start-ups, but it needs to be accompanied by improvements to the business environment and functioning of the labor market. Wage subsidies would be less effective in stimulating SMEs, but they could encourage firms to move from the informal to the formal sector. Since unclear property rights constitute potentially the most severe form of taxation, reforming them is key.

Key words: Equilibrium model of start ups, active policies labor market, informal sector

JEL classification: O1, J24, J48, H26

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1. Introduction

Low-income countries in Sub-Saharan Africa (SSA) are well aware of the positive role that small and medium-sized enterprises (SMEs) can play in their development. SMEs can innovate, adopt new technology and know-how, create jobs, broaden the tax base, and diversify risk. Benefits of SMEs can extend to the external sector, through their launching of new products. The role of the private sector, including SMEs, as engine of growth was illustrated by the postwar recovery in Austria and Germany and by the diverging paths of Central and East European and Baltic countries. In the transition economies, the productivity gains, employment, and the convergence towards the income levels of the EU-15 countries have depended on a dynamic private sector, and especially new firms. SMEs now also receive increased interest due to the global financial crisis, as SSA countries have searched for ways to rebalance their sources of growth from a heavy reliance on exports and FDI towards domestic private enterprises and demand.

When the current Ethiopian government came to power in 1991, it inherited a centrally planned economy and faced some challenges similar to transition economies, including private sector development. So far, however, hopes that the economy would transition from being dominated by low-productive jobs in the state sector to more productive ones in the private sector remain unfulfilled.² This lack of good (productive and well-paid) jobs discourages workers from acquiring skills, out of fear that such asset would not be utilized. In turn, the lack of skilled workers constrains firms in their activities. Notwithstanding the recent rapid growth driven mostly by public infrastructure investment, the country seems to be stuck in a vicious circle of low productivity, low-paid jobs and poverty. Designing and implementing policies that would help develop the private non-agricultural, and especially the industrial sector presents a key policy challenge.

This paper develops a simple theoretical model of SME start-ups with frictions in the urban labor market and the business environment. It modifies the framework of Brixiova, Li, and Yousef (2009) by considering imperfect information in the skilled workers' labor market and allowing firms to operate in the informal sector. The idea that imperfect information and ensuing negative externalities lead to suboptimal labor market outcomes was emphasized by Snower (1996) in the context of developed economies. This paper posits that the concept is even more suitable for low-income countries such as Ethiopia where exchanges in the labor market for skilled workers are sparse. In such economies, the large informal sector blurs information about available skilled workers and highly-productive jobs. The related underinvestment in training and scarcity of skilled workers could discourage entrepreneurs to search for business opportunities.

The model focuses on start-ups of highly-productive private firms, as their absence is a key constraint to productivity growth and job creation in the formal sector in Ethiopia. The emphasis on start-ups and the inclusion of the informal sector, which are important

² Bajona and Locay (2009) develop a model of entrepreneurship under central planning that accounts for the long-run underperformance of planned economies relative to market-oriented ones.

in low-income countries, distinguishes this framework from that of Snower (1996) who examined the number of vacancies in existing firms in the formal sector in advanced economies. The framework differs from that of Gelb et al. (2008) as it considers how differences in regulations, including unclear property rights, and other elements of the business environment (tax rates, monitoring) influence firms' choices between formality and informality. The model matches several stylized facts of the Ethiopian urban labor market, and is used to analyze the effect of incentives to develop the SME sector.

The paper is organized as follows. Section 2 provides stylized facts on the private sector, SMEs and the urban labor market in Ethiopia, including the informal sector. Section 3 presents the benchmark model. It shows that the benchmark equilibrium is suboptimal compared to the one with improved business environment. Section 4 extends the basic model to allow the firm to choose to operate in the informal sector and conducts further policy analysis. In particular, it examines the impact of subsidies to entrepreneurs' search with those for employing skilled workers in SME start ups and their decision to work in the formal sector. It also discusses factors that may drive firms into the informal sector, with a special attention to weak property rights. Section 5 concludes.

2. Stylized facts on SMEs and the urban labor market³

Since Ethiopia's departure from the centrally planned system, its economy has had a unique mixture of features. Its slowly declining share of the state sector in industrial output, low private job creation, and high unemployment make it akin to an early-stage transition economy. At the same time, Ethiopia is one of the poorest countries in the world, with: (i) a large and dualistic informal sector; (ii) high and almost constant share of agriculture in output; (iii) labor market frictions, including imperfect information; (iv) business environment with heavy regulations; and (v) slow adoption of new technologies. The sections below highlight main stylized facts about SMEs and the urban labor market.

2.1 Limited formal private sector⁴

The role of the private sector in the Ethiopian economy has evolved through several stages. Between the 1950s and early 1970s, the Imperial government pursued market-based policies. When the Derg regime came to power in 1974, its economic policy was guided mostly by principles of central planning. Private property was suppressed through nationalization and private sector industrial activities, consisting mainly of SMEs, were discouraged through policies that prevented firms to access credit and import inputs. When taking over in 1991, the current government aimed to reduce bureaucratic procedures while encouraging private sector development. (Geda and Degefe, 2002).

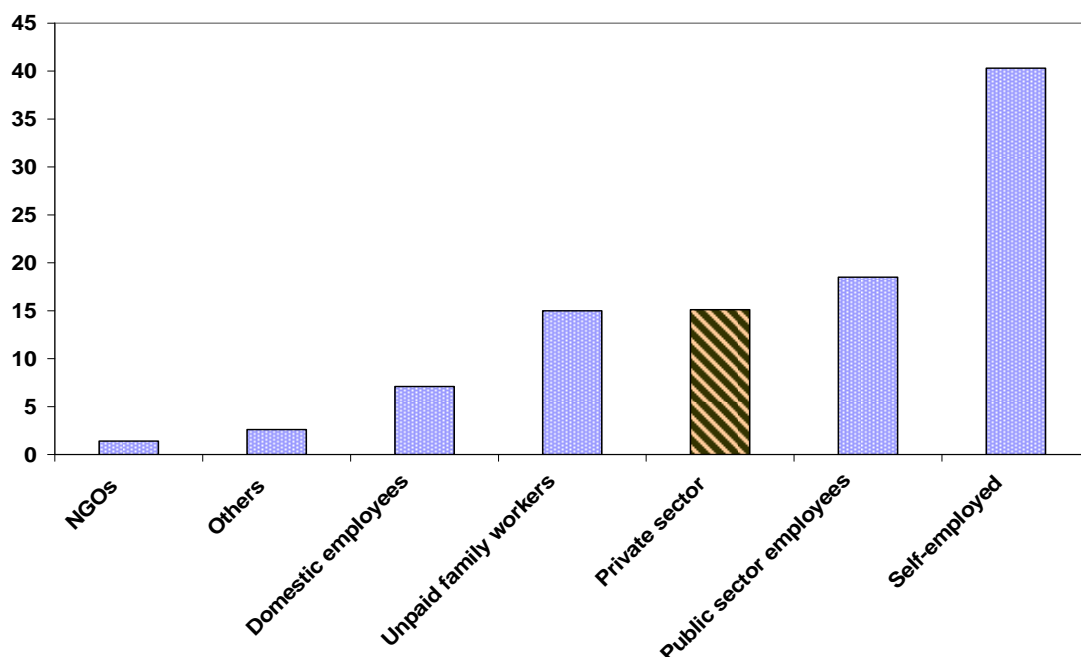
³ This section draws especially on World Bank (2007a and 2007b), the Ethiopian Labor Force Survey (2005), the Urban Labor Force Survey (2006) and the National Informal Sector Survey (2003) of the Ethiopian Central Statistical Authority. The paper focuses on urban labor markets, but rural development is equally important as agriculture accounts for 80 percent of employment and 50 percent of GDP.

⁴ The private sector includes all agents in the economy not formally classified as in the public sector, that is agents involved in the government, state-owned enterprises or parastatals, and independent public agencies.

Almost twenty years later, however, the role of the private sector in the Ethiopian economy remains limited. As in the transition economies of Eastern Europe and the CIS, privatization of SMEs proceeded swiftly. However, the medium-large-scale privatization progressed slowly in 2000s, and the share of the state sector in industrial output has been around 50 percent since 2000, after a decline from 80 percent in the mid-1990s. In manufacturing, it amounts to only 40 percent (World Bank, 2007b). While the majority of SMEs are now private, very small firms predominate. Success stories in specific sectors notwithstanding, the formal private sector in urban areas is underdeveloped. Possibly only about 30 percent of total urban employed population was in the formal sector in mid-2000, and only half of those in the private sector (Figure 1).⁵ The private sector is concentrated mostly in Addis Ababa and the surrounding regions (UNCTAD, 2002).

To put the pace of private sector growth into perspective, a comparison with other countries is useful. Until now, Ethiopia's privatization program has not progressed much beyond the SME stage. In contrast, in Tanzania, where the private sector has been the main driver of growth, including in industry and social services, it currently accounts for about 70 percent of GDP (World Bank, 2002). In most transition countries, which also started changing from plan to market in early 1990s, the private sector accounted for most of output, including in industry, already by the mid-2000.

Figure 1. Ethiopia: Distribution of employed population in urban areas, 2005 (% of total)



Source: Central Statistical Authority, Labor Force Survey, 2005.

⁵ Other surveys found that the informal sector accounts for 45-50 percent of employment in all urban areas and about 30 percent in urban centers, but studies on urban centers exclude domestic employees. World Bank (2009) states that informal sector represents 71 percent of urban employment.

2.2 High unemployment, insufficient private job creation

The urban labor market has been characterized by persistently high unemployment, with regional rates ranging from 18 to 35 percent of the labor force. Unemployment has disproportionately affected young people (Figure 2).⁶

Figure 2a. Employment rate and youth unemployment rate by urban centers, 2005

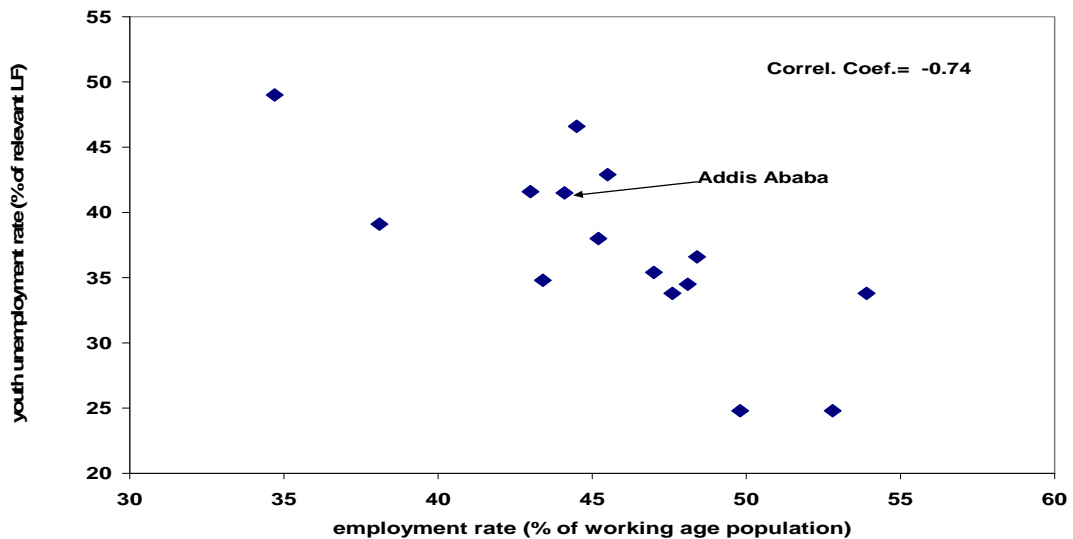
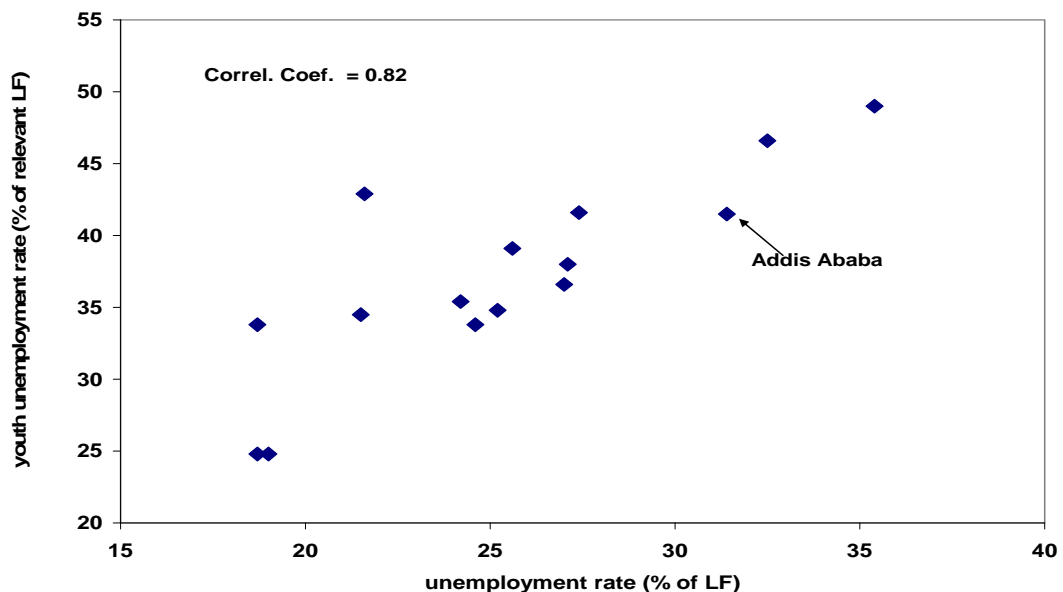


Figure 2b. Total and youth unemployment rates by urban centers, 2005



Source: Central statistical office and author's calculations. 1/ Urban centers have above 2000 inhabitants.

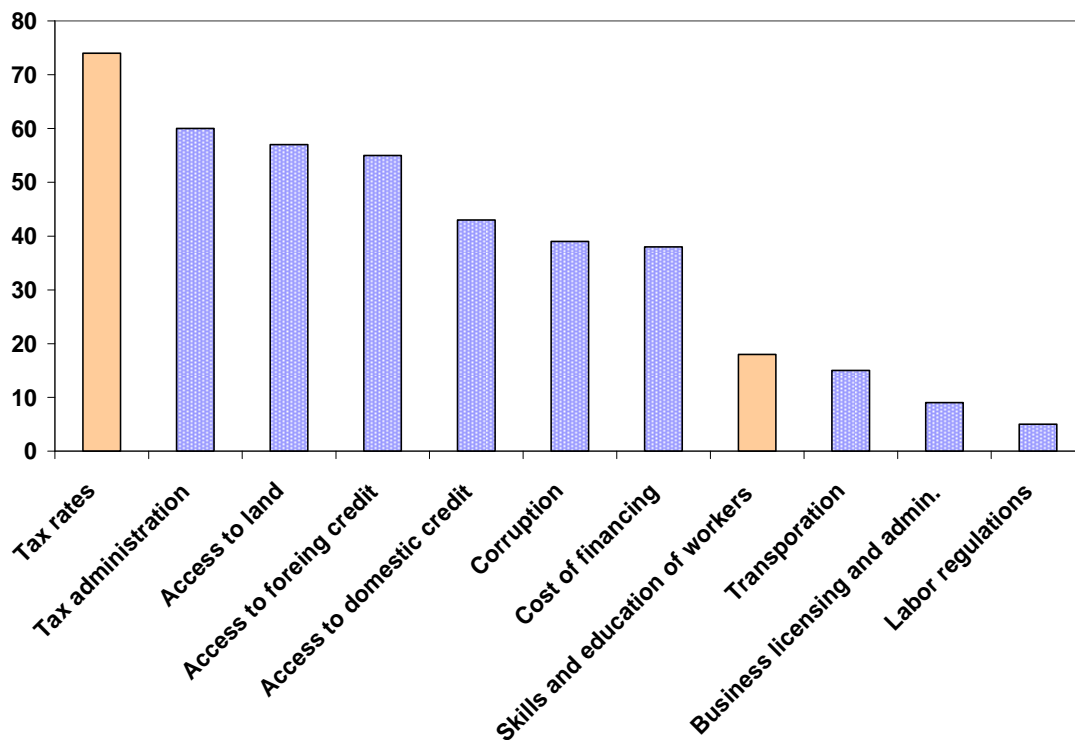
⁶ Bigsten, Mengistae, and Shimeles (2007) studied the Ethiopian urban labor markets during 1994 – 2004 and found that while the unemployment rate declined during this period, it stayed well in the double-digits.

Both supply and demand factors have contributed to the persistent labor market imbalances. On the supply side, the urban population more than doubled between 1990 and 2007, from about 6 million in 1990 to 13 in 2007. On the demand side, with declining public sector jobs, the private sector needs to drive job creation. Yet slow urban job creation impeded the shift from rural to urban activities as well as the transition from plan to market. The inadequate private job creation in urban areas is also evident in low exit rates from unemployment into the formal private sector.⁷

2.3 Obstacles to SMEs and private sector development

As mentioned above, the Ethiopian private sector is mostly small-scale, informal and service-oriented. What then are the factors that have been impeding faster job creation in the formal private sector? According to the World Bank's first Assessment of the Investment Climate in 2001/02, high tax rates were the most common complaint of entrepreneurs. Besides high rates, an inefficient and unpredictable tax administration was another frequent complaint. Predictably, the credit constraint was viewed as important. The lack of skilled workers affected 20 percent of entrepreneurs (Figure 3).

Figure 3. Most cited constraints to SMEs (in % of total respondents), 2001



Source: World Bank (2007a).

⁷ 30 percent of the unemployed in 1994 were unemployed in 2004; another 22 percent left the labor force. Of those who found jobs 70 percent went to the informal sector, and 17 percent to the formal private sector

To ease the tax burden and increase predictability, all Ethiopian businesses with annual turnover of less than US\$50,000 were included under a “presumptive tax”, where their income is estimated by the tax authority. Their marginal profit tax rates range from 10 percent to 35 percent vs. 30 percent corporate tax rate for other businesses. However, the progressive tax system could still discourage the creation of highly profitable firms, as the income from additional effort would fall under the higher taxable income bracket.

In comparative perspective, Ethiopia’s structural reform efforts have weakened after the “second generation” market reforms undertaken during 2002 – 04; this was reflected, for instance, in sliding on the “Doing Business” ranking. According to the 2009 African Competitiveness Report (World Economic Forum, World Bank and African Development Bank, 2009), inefficient government bureaucracy and corruption have become major obstacles to entrepreneurship in Ethiopia, with the tax system and skill shortages being perceived as important but somewhat less constraining. Entrepreneurs continued to raise the lack of access to credit as a concern⁸

2.4 Large and dualistic informal sector⁹

Most SMEs in Ethiopia operate in the informal sector (Denu et al., 2005). The informal sector consists mostly of low-productive firms concentrated in manufacturing and trade (Figure 4). Several sectors seem exclusively informal. This lower-tier informal sector consists of competitive and largely undifferentiated firms. But some successful small businesses also operate in the shadow economy, including small-scale manufacturing firms. This more dynamic upper-tier employs more educated workers. While precise figures are unclear, some estimates suggest that the upper tier constitutes around 20 percent of the informal sector firms.¹⁰ The Ethiopian informal sector is thus dualistic, consisting of both survival firms and the productive ones. Nevertheless, it is more stagnant than in, for example, Mexico (World Bank, 2007a).¹¹

Equally concerning as the predominance of the informal sector is its low productivity, which also leads to low wages, especially for unskilled workers. Urban labor markets in Ethiopia are thus characterized by a substantial wage gap between the formal and informal sectors (about 1/3 in 2004). Women and uneducated population tend to be

⁸ Another frequently mentioned constraint to SMEs in this survey was their lack of access to credit, consistently with findings of the African Development Bank and OECD (2005).

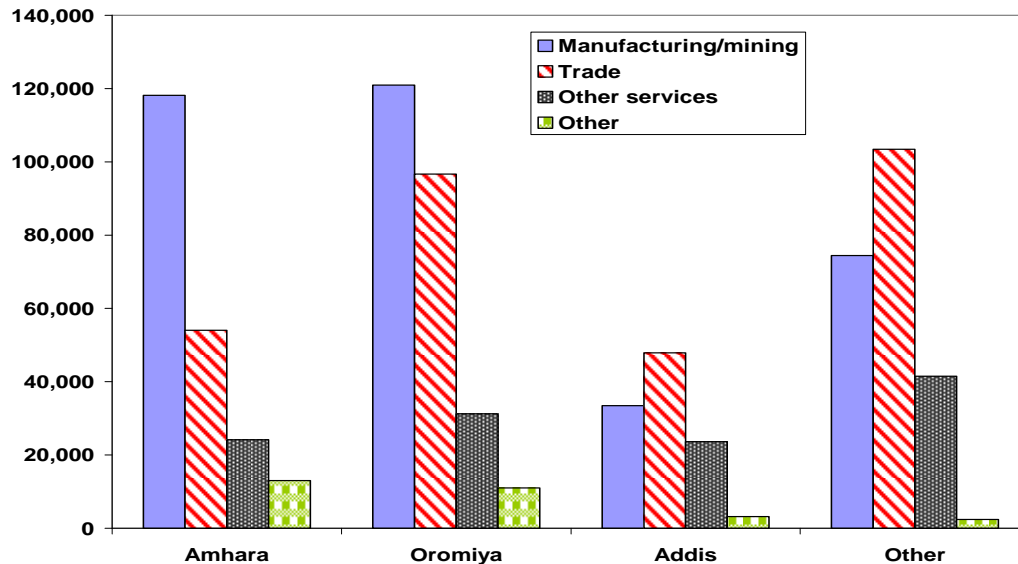
⁹ The urban labor market consists of three segments: (i) the public sector where jobs in most fields pay above the private sector; (ii) the underdeveloped formal private sector; and (iii) the large informal economy. Firms are informal if they have no book of accounts; no license; and fewer than 10 employees.

¹⁰ Some firms go underground to avoid regulations or taxation; they typically limit the size and scope of their operations. OECD (2009) discusses the duality of the informal sector in developing countries in detail.

¹¹ The Survey confirmed the dual nature of the informal sector, as it contained both private establishments (mostly as sole proprietors) and employees. OECD (2009) discusses the duality of the informal sector in developing countries. As in other developing countries some firms choose to operate go underground to avoid regulations or taxation; in such situations they typically limit the size and scope of their operations.

disproportionately represented in the informal economy (Denu et al, 2005). Survey evidence does not support views that for some workers the informal sector may be a transition to formal jobs. When workers leave the informal sector, they typically exit to unemployment, with only very few leaving for formal sector jobs.

Figure 4. Informal sector establishments, by region and industry (2003)



Source: Central Statistical Authority, The National Informal Sector Survey 2003.

2.5 Frictions in the urban labor market

The skill shortages have been demonstrated through relatively high returns to education. Specifically, when illiterate workers are taken as the reference group, education raises wages by 26 percent for those with grade 1-4 and by 130 percent for the highest skilled. Unemployment has affected the highly-skilled workers less, with the notably lower rate for workers with tertiary education (9 percent vs. 23 percent total rate in 2004). At the same time, unemployment rates of young people with high school and some higher education have been on the rise, pointing to a possible mismatch between skills supplied by the educational system and requirements of the private sector (Denu et al, 2005).

The lack of labor market information makes matching between firms seeking workers and job seekers challenging. While the employment exchanges are formally charged with responsibility to register job openings and share the information with the unemployed, their services are used only sporadically. For example, in 1999, only 6 per cent of the job seekers registered with the employment exchange offices. Others preferred to search through relatives, stop by at work sites, or establish their own enterprise. In part, the low and declining vacancy-to-unemployment ratios posted by agencies may reflect the reduced trust in their services, in addition to scarcity of jobs (Denu et al, 2005).¹²

¹² According to the World Bank (2007a), 21 percent of vacancies between 1997/98 and 2001/02 remained unfilled, due to a lack of qualified workers or their unwillingness to relocate from urban to rural areas.

3. The model

To reflect constraints faced by SMEs in Ethiopia, the model developed below incorporates the following features: (i) imperfections in the business climate (including government bureaucracy/regulations); (ii) high tax rates; (iii) shortages of skilled workers; and (iv) limited information in the labor market for skilled workers. The model is consistent with several stylized facts on the Ethiopian economy, namely (i) limited formal private sector employment, (ii) the informal sector dominated by self-employment and small enterprises, and (iii) the wage and productivity gap between the formal and informal sectors. The impact of several government interventions, including subsidies to searching entrepreneurs and to firms that employ skilled workers is then examined, with focus on firm creation and firms' decision to work in the formal sector.

3.1 The environment

The population size is normalized to one. There are two types of agents, entrepreneurs and workers, with population shares μ and $1-\mu$, respectively.¹³ Agents live for one period, are endowed with one unit of time and \bar{w} amount of consumption good, and have risk neutral preferences, $E(c)$, where c is consumption of a single good, and E denotes the expectations agents form at the beginning of the period about income they will receive either from working or running a firm.

At the beginning of the period, entrepreneurs search for opportunities to open private firms. This effort, x , costs them $d(x) = x^2 / 2\gamma$, $\gamma > 0$, units of consumption good, and results in the probability x of finding a highly-productive business opportunity. In order to run a firm, each entrepreneur needs to find \bar{n}_s skilled workers.¹⁴ Specifically, denoting V_s to be the aggregate skilled vacancies, N_s total number of skilled workers searching for jobs, and h number of skilled-job matches, the matching function is described as

$$h = \min[N_s, V_s] \quad (1)$$

Entrepreneurs with high-productivity business opportunity thus find skilled workers with probability $\rho = \min[\frac{N_s}{V_s}, 1]$. If entrepreneurs find both a business opportunity and skilled

¹³ Thus supply of entrepreneurs is not endogenous. Entrepreneurs tend to be individuals with specific background. For example, Djankov et al (2006) found that family characteristics had a strong influence on becoming an entrepreneur in China. Similar assumption is used in Gelb et al. (2008) for Africa.

¹⁴ This assumption is consistent with the long-acknowledged fact that productive firms form relationships mainly with productive workers. Fafchamps et al., 2006, who examined employee-employer matched data for 11 African countries, confirmed this empirically also for Ethiopia.

workers, they produce output according to $y_s = \beta z_s \bar{n}_s$ ¹⁵. The output is influenced by the productivity of the opportunity, z_s , and by the quality of the business climate, which enters as an efficiency component of the production function β , $0 \leq \beta \leq 1$.¹⁶ Each entrepreneur running a highly productive firm earns profit $\pi_s = (\beta z_s \bar{n}_s - w_s \bar{n}_s)$, where w_s is the wage of skilled workers, determined through bargaining.

If entrepreneurs do not find a business opportunity and/or skilled labor, they will open a low-productivity firm in the informal sector, employing unskilled workers, \bar{n}_u . Their profit then amounts to $\pi_u = z_u \bar{n}_u - w_u \bar{n}_u$, where w_u is the wage in the low-productivity firm, which equals the income of self-employed, b , also working in the informal sector. The output is produced by one of the two technologies, which differ in the labor input required per unit of output, where $z_s > z_u > b > 0$ are productivity levels in high-productivity firms, low-productivity firms, and of self-employed workers, respectively.¹⁷

Workers acquire skills demanded in the private sector, and incur cost $k(q) = q^2 / 2\theta$, where $\theta > 0$. Their learning effort results in probability q of obtaining skills.¹⁸ Skilled workers then find employment in a high-productivity firm in the formal sector with probability $\xi = \min[\frac{V_s}{N_s}, 1]$. Workers who either do not obtain skills or do not find skilled

job become go into the informal sector, either as self-employed or as employees of low-productivity private firm. In each case they earn income amounting to $b < w_s$, where b is the income from being self-employed. While the market for unskilled workers is perfectly competitive, the skilled worker's wage is set through decentralized Nash bargaining between the highly-productive private firm and the skilled workers it employs. If bargaining does not lead to an agreement, the worker would exercise its fall-back option, which is the income when self-employed in the informal sector or wage in the low-productivity firm, b . Since the outcome depends on the relative strength of the skilled worker vs. the firm, α , $0 < \alpha < 1$, the resulting wage is:

¹⁵ In the standard dynamic search model of Mortensen and Pissarides (2000), the matching function takes Cobb-Douglas form and is described by $h = AV^\alpha U^{1-\alpha}$, where is the efficiency of matching. Since this is a static model, the matching function Snower (1996) is more suitable.

¹⁶ More generally, β reflects quality of institutions. Amoros (2009) shows empirically that differences in institutional quality help explain differences in entrepreneurship across developed and developing countries. In Parente and Prescott (2000), this component reflects country-specific policies and institutions

¹⁷ The assumption that more productive firms operating in the formal sector employ more workers is consistent with the observation that growth and development are accompanied by increase in average size of the enterprise, with self-employment and small firms accounting for most of production and employment in poorest countries. Gollin (2008) shows in a calibrated model that these differences in firm size and employment structure across countries can be largely explained by differences in productivity.

¹⁸ x (and q) are restricted to be between 0 and 1. This assumes that despite their efforts, workers (entrepreneurs) occasionally fail to acquire skills (find highly-productive business opportunities).

$$w_s = \alpha\beta.z_s + (1 - \alpha)b \quad (2)$$

The wage gap between the skilled and unskilled jobs amounts to $\alpha(\beta z_s - b)$.¹⁹

The characterization of the environment is completed by market clearing conditions. Denoting $n_s = m_s \bar{n}_s$ to be the total number of skilled labor employed in the high-productivity private sector, $n_u = m_u \bar{n}_u$ total labor employed in the low-productivity private sector, and n_i total number of self-employed, the market clearing condition for workers is $1 - \mu = n_s + n_u + n_i$. The market clearing condition for the entrepreneurs can be written as $\mu = m_s + m_u$, where m_s are entrepreneurs who run highly productive firms, while m_u denotes those who run low-productivity firms.

3.2 *Entrepreneurs' and workers' problems and solution*

At the beginning of the period, firms and workers decide how much effort to put into search for business opportunities and training, respectively. The entrepreneurs' decision to search for a business opportunity and open a firm is:

$$\begin{aligned} & \max_{c, x > 0} E(c) \\ \text{s.t. } & c + \frac{x^2}{2\gamma} \leq \bar{w} + x\rho\pi_s + x(1 - \rho)\pi_u \end{aligned} \quad (3)$$

The worker's decision to obtain training can be described by:

$$\begin{aligned} & \max_{c, x > 0} E(c) \\ \text{s.t. } & c + \frac{q^2}{2\theta} \leq \bar{w} + q\xi w_s + q(1 - \xi)b + (1 - q)b \end{aligned} \quad (4)$$

Solving the utility maximization problems of workers and entrepreneurs and substituting from the labor market clearing condition yields:

$$\frac{x}{\gamma} = \rho(\pi_s - \pi_u) = \min \left[\frac{(1 - \mu)q}{\mu x \bar{n}_s}; 1 \right] (\pi_s - \pi_u) \quad (5)$$

$$\frac{q}{\theta} = \xi(w_s - w_u) - b = \min \left[\frac{\mu x \bar{n}_s}{(1 - \mu)q}; 1 \right] (w_s - b) - b \quad (6)$$

¹⁹ When analyzing data on manufacturing firms in Ethiopia Mengistae (2001) found that both skills and job-matching influence wage growth. These empirical findings support assumptions of skill acquisition and matching before production in the high-productivity private sector takes place.

Equation (5) states that in equilibrium, the marginal cost of entrepreneur's search for a business opportunity, x/γ , is equal to the profit from search. According to (6) the workers' marginal cost of acquiring skills equals the net marginal benefit from working, which amounts to the skilled and unskilled wage over the income from self-employment. In (5) and (6), number of vacancies amounts to $V_s = \mu x \bar{n}_s$, where μx is the number of entrepreneurs who found highly productive business opportunity. Similarly, the number of skilled workers searching for a skilled job is $(1 - \mu)q$.²⁰

3.3 Policy discussion – improving the business environment

Suppose that in equilibrium (E_1), $(1 - \mu)q > \mu x \bar{n}$, the number of skilled workers looking for jobs exceeds the number of skilled vacancies. Then with improvements to the business climate, β , entrepreneurs would intensify their search in response to firms' profitability. The resulting increased number of skilled vacancies encourages workers' to acquire skills. Thus in the new equilibrium E_2 , both entrepreneurs' and workers' efforts would be higher due to the improved business environment (higher γ and β) (Figure 5). When the lack of skilled vacancies is the key constraint to job creation, improving the business environment should be a priority.²¹ Improving efficiency of entrepreneurs' search would also have a positive impact. While policies reducing training costs would encourage workers to acquiring more skills, they would not be effective in raising skilled employment. Given the scarcity of skilled job openings the skilled employment outcome would not change, only additional skilled workers would end up in low-skilled jobs. This example shows how policies need to be well-targeted to address binding constraints.

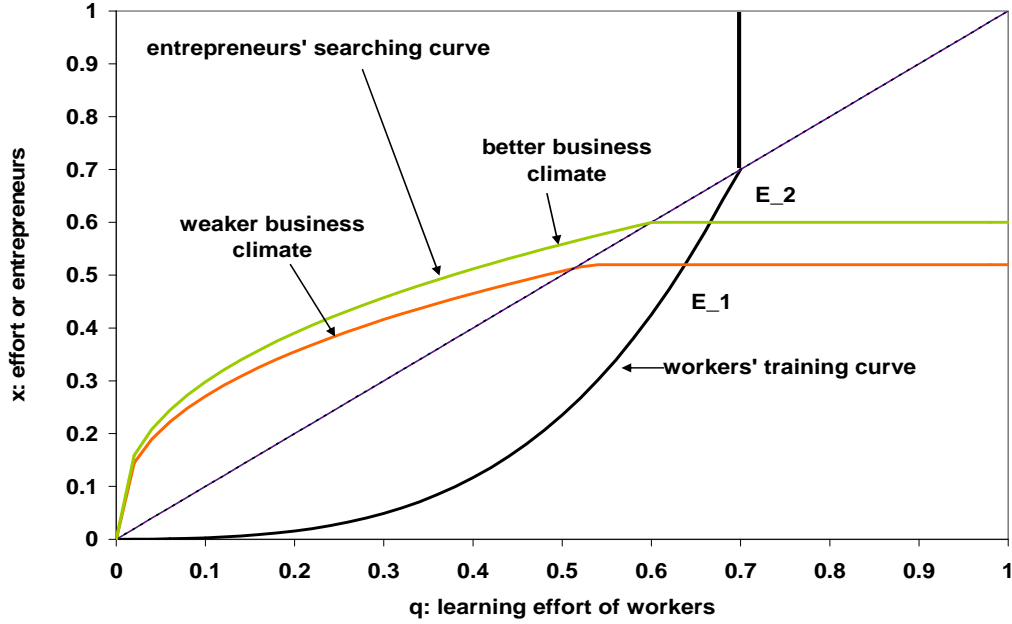
4. What drives firms into the informal sector?

This section extends the basic model to examine the factors that influence firms' decisions whether to operate in the formal or the informal sector. In addition, the sections below explore whether policies subsidizing entrepreneurs' search or wages of skilled workers would be effective for encouraging entrepreneurship and in what sector.

²⁰ The equilibrium is defined as wage rates and an allocation of workers and entrepreneurs such that (i) agents maximize their utilities; and (ii) labor and product markets clear. Depending on the parameters, the model either has (i) a unique trivial equilibrium where workers and entrepreneurs exert zero effort, or (ii) a trivial equilibrium and a unique one with positive effort by workers and entrepreneurs. We focus on the unique equilibrium with positive workers' and entrepreneurs' efforts.

²¹ The positive impact of higher search effort entrepreneurs on workers applies only if the search curve intersects the training curve in the concave part of the latter Figure 2. Figure 2 assumes that $\mu \bar{n}_s = 1 - \mu$.

Figure 5. The impact of improved business environment on equilibrium outcomes



With profit taxes and the option for the highly productive firms to go underground, entrepreneurs' profit from running a highly-productive firm changes to $\pi_s = \max[\pi_s^F, \pi_s^I]$, where π_s^F is the after-tax profit in the formal sector and π_s^I is profit in the informal sector. Entrepreneurs will operate in the formal sector with probability p_s . If they do not find a highly productive business opportunity and/or skilled labor, they will run a low-productivity firm with unskilled workers, \bar{n}_u in the informal sector. The business climate enters the production function as an efficiency component β^h , $h = f, i$ where f stands for formal and i for informal sector. It is better in the formal than in the informal sector, i.e. $\beta^f > \beta^i$. Hence the output of a highly productive firm is produced according to $y_s^h = \beta^h z_s \bar{n}_s$. The wage of skilled workers now also depends on the sector: $w_s^h = \alpha \beta^h z_s + (1 - \alpha) w_u$, $h = f, i$. Since the productivity of firms decreases when they go underground, wages of skilled workers also fall.

The government imposes tax rate τ on profit of highly productive firms and monitors their payments. When doing so, it incurs K monitoring expenditures and detects tax evading firms with probability $\phi > 0$. Assuming that the government confiscates the firm's entire profit if it detects tax evasion, its net revenues amount to: $p_s \tau (E^F z_s \bar{n}_s - w_s^F \bar{n}_s) m_s^F + (1 - p_s) \phi (E^I z_s \bar{n}_s - w_s^I \bar{n}_s) m_s^I - K$, where ϕ is the probability that the firm in the informal sector is caught by the tax authorities.

With the possibility to go underground, the entrepreneur's profit from running a highly-productive firm now becomes $\pi_s = p_s(1 - \tau)\pi_s^F + (1 - p_s)(1 - \phi)\pi_s^I$; the entrepreneur takes the tax rate and the probability of being monitored as given. The firm will choose to be in the informal sector, i.e. $p_s = 0$, if the after-tax profit in the formal sector is less than the expected profit in the informal sector:²²

$$(1 - \tau)\pi_s^F < (1 - \phi)\pi_s^I. \quad (6)$$

Table 2 shows how different factors influence the probability that the entrepreneur will operate in the formal sector, p_s . Reduced profit tax rates would entice firms to move to the formal sector, provided they are sufficiently large. Improving tax monitoring would also help, but cost-benefits of this measure in particular need to be considered relative to reforms of the business environment, especially given the underdeveloped private sector in Ethiopia. While better tax monitoring would encourage firms to move to the formal sector, it could reduce entrepreneurship due to lower expected profits in the informal sector. In contrast, improvements in the business climate would raise profits in the formal sector and encourage entrepreneurs to move to the formal sector, thus have unambiguously positive effect on both entrepreneurs' search and formality.

Table 2. Comparative statics

Effect of increase in	On probability to work in the formal sector
Tax rate τ	-
Monitoring ϕ	+
Better business climate E^F	+
Improved functioning in the informal sector E^I	-
Workers' bargaining power α	-

4.1 Subsidies of entrepreneurs' search vs. subsidies to skilled employment

This section focuses on stimulating entrepreneurs' search effort to create firms and jobs, a key constraint for private sector development in the Ethiopian economy. In response to low firm and job creation, active support to entrepreneurs has become common in low-income economies, including Ethiopia. This section analyzes the impact of partial government financing of the entrepreneurs' search for business opportunities and compares it with wage subsidies to skilled workers.²³

²² This is the well-known "Sandmo" condition (Sandmo, 2005).

²³ In both cases, the subsidy is financed by the same amount of lump-sum tax \bar{T} . Brixiova et al. (2009) discuss the impact of subsidy financing in detail.

4.1.1 Subsidizing entrepreneurs' search

In case of *subsidy to searching entrepreneurs*, sx , the entrepreneur's budget constraint changes to: $c + \frac{x^2}{2\gamma} - sx \leq \bar{w} + x\rho\pi_s + x(1-\rho)\pi_u$. Profits of an entrepreneur running a high productive businesses (and employing skilled labor) amount again to $\pi_s = p_s(1-\tau)\pi_s^F + (1-p_s)(1-\phi)\pi_s^I$, where $\pi_s^F = (1-\tau)(\beta^F z_s \bar{n}_s - w_s^F \bar{n}_s)$ is after-tax profit of a firm in the formal sector and $\pi_s^I = (\beta^I z_s \bar{n}_s - w_s^I \bar{n}_s)$. (3) now changes to:

$$\frac{x}{\gamma} = \rho(\pi_s - \pi_u) = \min \left[\frac{(1-\mu)q}{\mu x \bar{n}_s}; 1 \right] (\pi_s - \pi_u) + s \quad (7)$$

The workers' training curve, summarizing their decision to obtain training, is as in (4). From (6) and (7) it is clear that while subsidizing entrepreneurs' search will raise their efforts, it will not impact their decision whether to operate in the formal sector or not. Such decision, as shown above, would depend on changes in profit tax rate, τ , and/or in the business environment relative to conditions in the informal sector, β^F / β^I .

4.1.2 Subsidizing employment of skilled workers²⁴

In case of the wage subsidy per skilled worker amounting to ω , entrepreneur's budget constraint changes to $c + \frac{x^2}{2\gamma} - sx \leq \bar{w} + x\rho\pi_s(\omega) + x(1-\rho)\pi_u$; where profit of an entrepreneur who works in the formal sector and receives wage ω subsidy per skilled worker hired is: $\pi_s^F(\omega) = (1-\tau)[\beta^F z_s \bar{n}_s - (w_s^F(\omega) - \omega)\bar{n}_s]$. Profit of the entrepreneur working in the informal sector is unchanged, that is $\pi_s^I = \beta^I z_s \bar{n}_s - w_s^I \bar{n}_s$.

Workers capture part of the subsidy in proportion to their bargaining power, α . The wage of skilled workers working for a firm in the formal sector then increases to: $w_s^F(\omega) = \alpha(\beta^F z_s + \omega) + (1-\alpha)w_u$, while the wage of a skilled worker working for a firm in the informal sector is unchanged, $w_s^I = \alpha\beta^I z_s + (1-\alpha)w_u$, and $w_s(\omega) = p_s w_s^F(\omega) + (1-p_s)w_s^I$. With higher expected wage of skilled workers due to the subsidy, the worker's training effort increases according to:

$$\frac{q}{\theta} = \xi[w_s(\omega) - w_u] - b = \min \left[\frac{\mu x \bar{n}_s}{(1-\mu)q}; 1 \right] [w_s(\omega) - w_u] - b \quad (8)$$

²⁴ This concept of subsidies differs from that of Rijkers, Ladarchi and Teals (2008) who examined whether the subsidized SMEs adopted more labor-intensive technology and hence increased employment.

Entrepreneurs' profit in the formal sector also increases as they receive part of the subsidy. Equation (3) thus changes to:

$$\frac{x}{\gamma} = \rho[\pi_s(\omega) - \pi_u] = \min\left[\frac{(1-\mu)q}{\mu x \bar{n}_s}; 1\right][\pi_s(\omega) - \pi_u(\omega)] \quad (9)$$

The impact of wage subsidy on entrepreneurs' search is more nuanced in this case than under the search subsidy. First, if in the absence of subsidy the firm would opt for the informal sector and if the subsidy is not large enough to entice it to move to the formal sector, the entrepreneurs' search effort would not change. So the wage subsidy can raise entrepreneurs' search effort only if the firms end up working in the formal sector. Second, in addition to stimulating entrepreneurs' search, by changing net profit the wage subsidy can also influence in which sector – formal or informal – the entrepreneurs operate. Third, when $s = \omega \bar{n}_s$, that is when amounts paid to firms are equal under both subsidies, the wage subsidies will have lower impact on entrepreneurs' search. This is because entrepreneurs capture only $(1-\alpha)\omega \bar{n}_s$ of the subsidy; the rest accrues to workers. Correspondingly, workers also raise their effort in response to higher wages (Figure 7).

The conditionality on the sector in which the firm ends up operating constitutes a key difference in how subsidies impact the entrepreneurs' efforts. Search subsidies, which are paid before entrepreneurs find their business opportunities, impact only their search effort decision, but not whether to operate in the formal or the informal sector. With wage subsidies, forward-looking entrepreneurs increase their effort only when they work in the formal sector upon finding a business opportunity and skilled workers.

Finally, when deciding between these two instruments, policymakers need to consider the binding conditions that the economy faces. If the initial equilibrium is low because of the lack of skilled job openings (as is the case in Ethiopia), in the new equilibrium number of firms searching for skilled workers would rise more in response to search than wage subsidies. In contrast, the number of skilled workers seeking employment in highly-productive firms is higher under wage subsidies. But, as Figure 7 shows, since the key constraint to the private job expansion is the lack of job openings and not skilled workers, wage subsidies would lead to a larger share of skilled workers the informal sector than under the search subsidy. As this example illustrates, for policies to be effective, they need to address the binding constraints and not to fall on unintended recipients.

4.2 Unclear property rights

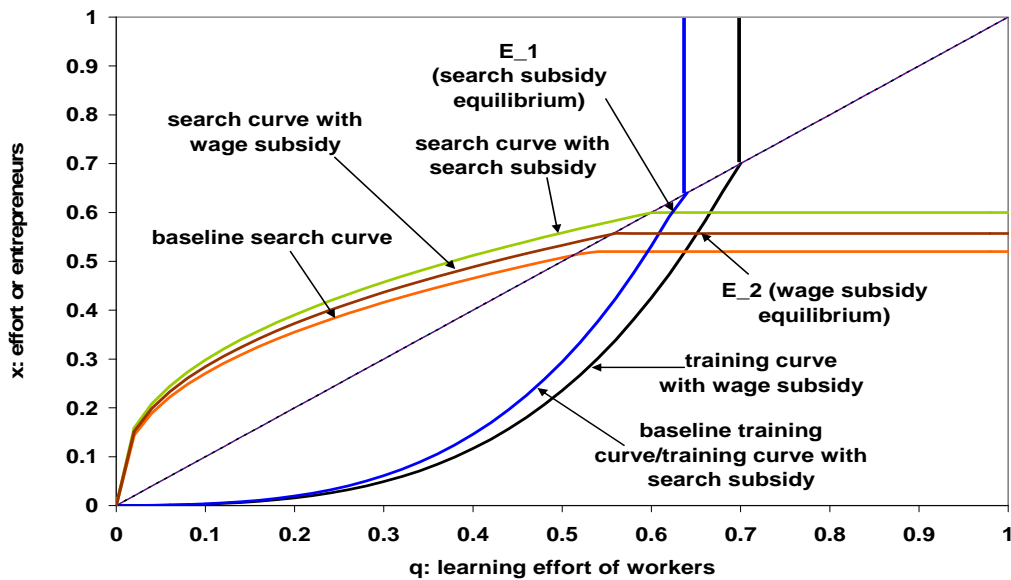
This section discusses the business environment and in particular the impact of unclear property rights that also characterize the Ethiopian economy. In general, unclear property rights present a possibility of expropriation and thus an extreme form of taxation on business capital. In such a situation, the efficiency coefficient becomes 0, $\beta^F = 0$. Denoting probability of expropriation as ψ , the entrepreneurs' efficiency coefficient in

the production function in the formal economy changes to $\bar{E}_s^F = (1 - \psi)E^F + \psi 0_s$. The entrepreneurs will now be more likely to opt for the informal sector, since

$$p_s = 0 \Leftrightarrow (1 - \tau)(\bar{E}_s^F z_s \bar{n} - \bar{w}^F \bar{n}) < (1 - \phi)\pi_s^I \quad (10),$$

and the expected profit in the formal sector is reduced by the possibility of expropriation. Even if they do not opt for the informal sector, the entrepreneurs will lower their search effort. The reverse is also true – if improvements to property rights are sufficiently large, entrepreneurs who would otherwise opt for the informal sector will increase their search effort and opt for the formal sector. In that sense, improving business environment seems to resemble providing wage subsidies and tax incentives.

Figure 7. Comparison of the impact of wage and search subsidies



However, it needs to be emphasized that wage subsidies are inferior to improvements in the business environment, and especially to strengthening the property rights, as a way to encourage entrepreneurs to move to the formal sector. In addition to encouraging entrepreneurs to search and operate in the formal sector, strengthened property rights raise firms' productivity and wages of skilled workers. Wage subsidies or tax incentives should thus be used cautiously, and only when improvements to the business climate are particularly costly.²⁵

²⁵ At the same time, when policymakers consider incentives that would move firms to the formal sector, wage subsidies (or tax incentives in the form of lower rates) may be preferable to extra expenditures on tax monitoring. Unless the revenues from enhanced tax monitoring are spent in a way that benefits entrepreneurs, the profitability of running a firm may decrease, discouraging entrepreneurship.

5. Conclusions

Are subsidies the best way to support SME start ups and skilled employment in low-income countries with a largely underdeveloped private sector such as Ethiopia? Our analysis shows that subsidies may help, but the government's choice of the type of subsidy must address the main constraints that the private sector faces. In countries such as Ethiopia, where entrepreneurship is limited and productivity is low, the key objective should be to help entrepreneurs open high-productivity firms and employ skilled workers, regardless of the sector. In such a situation, the search (or start-up) subsidy may be suitable, as it would encourage entrepreneurs to search for business opportunities. In contrast, tax incentives or wage subsidies would be much less effective to encourage start ups as they do not affect firms in the informal sector, where most SMEs in Ethiopia operate. And wage subsidies would be less effective than search subsidies even for firms in the formal sector, as it would partly accrue to workers.²⁶ On the positive side though, tax cuts may facilitate SME formalization and a broadening of the tax base.

To accelerate start ups of highly productive SMEs and encourage skilled employment, the underlying inefficiencies in the factor markets would also need to be addressed. Hence both types of subsidies should be accompanied by further reforms of the business climate and functioning of the labor market. The key among them is a strengthening of property rights. In addition to encouraging entrepreneurship -- through higher firm creation and increased rate of formalization -- clearer property rights raise firms' productivity and thus wages of skilled workers. This, in turn, would encourage workers to acquire skills without creating an excessive supply of educated labor. The gaps in the functioning of the urban labor market, such as the lack of information about skilled jobs and workers, could be also tackled by building up the employment exchange offices.

Taking a broader view, the global financial and economic crisis has underscored the importance of the diversified private sector, including SMEs. For policymakers, the crisis has thus triggered a rethinking of their growth strategies. Before the crisis, many SSA small open economies relied almost exclusively on FDI and exports as the main drivers of growth. However, in light of the crisis, countries are trying to achieve a more broad-based growth by shifting some of their resources to domestic private enterprises and demand.²⁷ In this context, enhanced efficiency of the financial sector would help channel savings to their most productive use. In addition, in resource-poor landlocked countries such as Ethiopia, domestic resources would likely need to be supplemented by external financing to ease credit constraints and shortages of foreign exchange. Magnitudes of such constraints and a design of mitigating interventions as well as application of this framework to other countries in SSA could be subject of further research.

²⁶ This conclusion is consistent with Ayele (2005), who found investment incentives (i.e. import and income tax exemptions) to be relatively weak policy instruments of indigenous SMEs in Ethiopia. Enterprise start ups were more supported by better infrastructure and overall environment.

²⁷ Even before the crisis, some economists pointed out that an outward orientation in general, and export-oriented manufacturing in particular, may not be suitable development path for sub-Saharan Africa because of a strong competition from China and India on the global markets (Kaplinsky and Morris, 2007).

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