

# Enterprise Skills and Firm Performance in Zambia



## Evidence from Structural Equation Modeling of a Skills Demand Model

The issue of skills is front and center in policy discussions in Zambia: what kinds of skills are needed for the growth and modernization of the economy? are the right kinds of skills being supplied by education and training institutions? are there skill gaps in supply relative to what is demanded by enterprises? why do so few Zambian employers provide in-service training to upgrade skills of their workforce? do skill deficits constrain firm performance, and what can the private sector and policy makers do to remedy this, to improve labor productivity and wages?

Some of these issues are explored in a recent study of skills development and firm performance in the formal sector of Zambia.<sup>1</sup> The study used data from a 2016 survey of 350 formal sector firms in Zambia fielded by the World Bank Enterprise Survey Group. The Zambia Enterprise Skills Survey (ZESS) randomly sampled firms in four regions—Lusaka, Kitwe, Ndola, and Livingstone—stratified by firm size and sector. ZESS elicited detailed data on key firm attributes: educational composition of its workforce; the firm's main sources of skills supply; employer's qualitative assessments of worker skill deficiencies; workforce strategies; and information on labor productivity and annual wages.

This wealth of data was used to formulate and estimate a multiequation skills demand model, to measure three

latent constructs:<sup>2</sup> (1) *organizational capital* or the firms' stock of intangible knowledge, (2) *skill gaps* as measured by employer assessments of the adequacy of current workforce skills and how skill deficiencies affect different operations, and (3) *skill strategies* or measures that employers might use to respond to skills gaps and changing skills demand. These latent variables, and the relationships between them and firm-level productivity and wage outcomes, were estimated as a system of equations using Structural Equation Modeling (SEM) methods. The findings are consistent with predictions of the new productivity literature, research on education and training, and skill-biased technological change.

First, ostensibly similar firms of the same size within the same sector can have very different skill needs and skill strategies that affect firm performance and the distribution of productivity and wage outcomes. The firm's organizational capital drives skills demand which, in the short term, is manifested in skill gaps and in firm strategies to mitigate skill deficits. High-skills demand firms<sup>3</sup> face greater deficiencies in workers' cognitive and noncognitive skills, and especially in the operational constraints that skill deficits pose for use of technology, innovation, quality, and production.

<sup>1</sup> Tan, Hong. 2018. "Enterprise Skills and Firm Performance in Zambia: Evidence from Structural Equation Modeling of a Skills Demand Model." Global Education Practice, World Bank.

<sup>2</sup> A latent variable is one that, while not directly observable, may be measured indirectly by different indicators. For example, an individual's 'ability' is not observable but it is often associated with higher IQ or other test scores; similarly,

'hospital quality' is often associated with measurable indicators such as the ratio of doctors to patients, access to specialized medical care, intensity of nursing services, and responses on patient care satisfaction surveys.

<sup>3</sup> Firms are categorized as being 'high skills demand' if they are exporters and/or recently introduced new products or services, and as 'low-skills demand' if they are neither exporters nor innovators

Some firms respond with skill strategies that include filling job vacancies, providing in-service training, hiring skilled foreign labor, and outsourcing professional services. They also employ a more skilled workforce with a higher share of tertiary educated and Technical Education and Vocational Education and Training (TEVET) credentialed workers and workers in management, professional, and technician occupations.

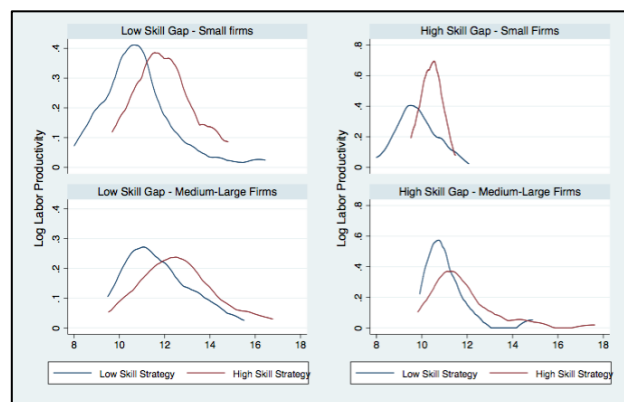
Second, observationally similar firms can have very different skill gaps and skill strategies depending upon their skills demand and location. On average, high skills demand firms have larger skill gaps but more responsive skill strategies than their low skills demand counterparts, differences that hold for each firm size. Large firms with high skills demand have fewer skill gaps, suggesting that they are better able to mitigate skill deficiencies than their smaller counterparts. Location in the capital Lusaka, with its agglomeration of universities, TEVET institutions, and in-service training providers also appears to confer a skills supply advantage to firms relative to location in other regions. Larger firms in Lusaka have fewer skill deficits and more responsive skill strategies than their counterparts in other regions. This implies that the skill needs of many larger firms located outside Lusaka are not being met.

Third, skill deficits have a negative impact on labor productivity while responsive skill strategies improve productivity outcomes. These effects are estimated from production functions that account for capital intensity and the education, TEVET, and occupational composition of the firms' workforce. Organization capital itself has no statistically significant impact on productivity; its productivity impact arises primarily through increasing the gap between desired and available skills and eliciting skill strategies from some firms but not others to address these skill gaps. This endogenous choice to deploy skill strategies was addressed using an instrumental variable (IV) approach relating skills strategy choices to a measure of proximity to different sources of skills supply. The IV estimates suggest that skill strategies have large causal impacts on improving labor productivity.

To highlight this result, the following figure compares the distribution of labor productivity for four groups

of firms, by firm size. ZESS firms are categorized by whether they have low or high skill gaps and low or high skill strategies<sup>4</sup> to address the question: given a level of skill gaps, are more vigorous strategies to mitigate skill deficits associated with higher labor productivity? The x-axis measures the logarithm of labor productivity, while the y-axis measures the kernel density distribution of labor productivity in each group of firms. The left panel focuses on the sample of firms with low skill gaps, the right panel on the sample with high skill gaps. Controlling for firm size, it is clear—for firms with both low and high skill gaps—that high skill strategies are associated with improvements in labor productivity. For each group of firms, a high skill strategy shifts the mode and skew of the labor productivity distributions to the right of the distributions for the comparison group with low skill strategies, that is, to higher levels of labor productivity.

#### Distribution of Labor Productivity by Firms' Skill Gaps and Skill Strategies



Finally, like the productivity results, more responsive skill strategies improve wage outcomes. Improvements in productivity are also associated with higher annual wages, suggesting that employers share two-thirds of labor productivity gains with their workers in the form of higher wages. Firms with high skills demand and those investing in the skills of their workforce pay wage premiums to attract, reward, and retain their most skilled workers. Wages are lower in manufacturing compared to information technology (IT) and the service sectors and in firms located outside Lusaka which face greater skill shortages.

<sup>4</sup> We define skill gaps and skill strategies as being 'low' if their factor scores (which are normalized to have mean 0)

are less than 0 and 'high' if factor scores are equal to or greater than 0.

Thus, policy concerns about the quality and limited supply of high-level skills, and the constraints they pose for development and productivity growth, appear well founded. State support for the development of high-level pre-employment skills is distributed unevenly across regions and is focused on large public sector tertiary and TEVET institutions. In-service training for upgrading current workforce skills has received less attention, and the low incidence of employer-sponsored training in Zambia—which lags behind other Sub-Saharan Africa countries and developing countries globally—needs to be addressed.

The government has a critical role to play in facilitating firms' responses to these two skill challenges, especially in determining how to: (i) increase the supply and market relevance of pre-employment higher-level educational and TEVET skills, across regions and from both local and foreign sources, and (ii) promote and finance expanded in-service training and upgrading of workforce skills that are so important for innovation and productivity growth.

### **Increasing Higher-Level Skills Supply**

Given fiscal constraints, it is clear that the solution to the first challenge cannot be further expanding the number of public universities and training institutions throughout the country.

#### *Involve the Private Sector*

The state can facilitate the private sector, both university and training institutions as well as industry, to play a greater role in the development of higher-level skills:

- The government should consider making state institutional support available, on a competitive basis, to public and private sector tertiary institutions that can work collaboratively with industry to deliver market-relevant education and training.
- The state should consider co-financing delivery of skills in short supply at the regional level with qualified private sector partners, using public-private partnership arrangements.

#### *Expand the Budget Allocation to TEVET*

The allocation of the education budget to TEVET is currently relatively small and the country could benefit

from an expansion of the TEVET sector. There are economic and equity justifications for doing so.

- TEVET offers growing numbers of secondary school graduates an alternative route to post-secondary education. The returns to TEVET are high, and TEVET graduates perform well in career progression and in the labor market.
- Economic development calls for a more diverse set of professional and technical skills, many in short supply not only at the pre-employment level but also while employed within firms.

#### *Facilitate Access to Foreign Sources of Skills*

Many Zambian employers employ high-skilled expatriate managers, professionals, and technicians because of limited local supply. They also outsource essential high-skill legal, accounting, engineering, and architectural services to professional services firms. Both strategies are limited by a lack of recognition of foreign-obtained academic and professional qualifications.

- The government should work with South African Development Community (SADC) regional partners to facilitate Zambian employers' access to high-skilled foreign labor and critical services provided by professional services firms. Progress in this area will require greater coordination between the education ministries and Zambian government agencies responsible for immigration, trade, and industry.

#### *Develop Regional Centers of Excellence*

Like other SADC countries, different skill gaps and skill mismatches exist in many sectors, and it is neither feasible nor desirable for individual countries to invest scarce resources in all skill deficit areas. Rather, a case can be made for a regional approach to collaboratively identify skill gaps and national capabilities and invest in a network of regional centers of excellence to exploit economies of scale and specialization.

- Zambia should consider participating in the SADC regional strategy to develop new sources of supply for critical skills. Ideally, centers of excellence would work with the private sector to develop curricula, pedagogical methods, and new skills relevant to industry.

## Promoting In-Service Training

A second broad challenge is to promote in-service training and incentivize employers to sponsor in-service training programs for their current employees.

### *Develop Cost-Effective Training Programs*

The in-service training modalities most likely to be effective are those that address the operational problems that skill deficiencies pose. Some training needs are firm specific, but most are likely to be either general to all firms, sectoral based, or related to the use of specific technologies such as information and communication technology (ICT). The high cost of training tailored to the specific skill needs of individual firms may not be justified for the vast majority of firms. Demand-driven training may be delivered cost-effectively to clusters of small and medium enterprises (SMEs) operating in the same sector and geographic region.

- Their common skill needs would first be identified by working with firms and local industry associations and chambers of commerce; programs targeting these skill needs would then be developed using local providers or, as needed, expertise from Lusaka or abroad.
- Such programs would be group based to reduce unit costs and costs shared by firm beneficiaries and the state.

### *TEVETA Support for In-Service Training*

The TEVET Fund administered by TEVET Authority (TEVETA) focuses most resources on financing pre-employment training and TEVET infrastructure improvements. More resources should be targeted at developing and promoting in-service training, especially for SMEs and sectoral clusters of firms.

- Given limited experience with in-service training, TEVETA's initial focus should be on piloting and evaluating alternative training and delivery modalities, before going to scale once the value of training and associated extensions services is demonstrated. Such training would be financed through cost sharing with firms.



- This will require extensive consultation and collaboration with industry partners, public and private sector providers, and other government bodies such as the Zambia Development Agency, which has overlapping responsibilities for SME business development and industrial extension services.

### *Financing In-Service Training with Payroll Levies*

Zambia should revisit the introduction of a payroll levy system to provide sustainable financing for in-service training. The original proposal for such a training levy was never adopted over employer concerns and because matching government funding did not materialize.

- Policy makers might look to the lessons of other countries with successful models of payroll levy systems. These have been responsive to employers' needs for continuous skills upgrading, given them greater control over how levy resources are used, and promoted the development of robust training markets.

*(This brief was extracted from the study report cited in the footnote #1 on page 1. The study was financed by the World Bank and carried out by Hong Tan who consults for the Education Global Practice at the World Bank.)*