COST-BENEFIT ANALYSIS OF SKILL

DEVELOPMENT INTERVENTIONS IN GHANA

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Cost-Benefit Analysis of Skill Development Interventions in Ghana

Ghana Priorities

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Academic Abstract

The paper uses earnings data from the Ghana Living Standard Survey (GLSS 7) (2016/17), the Gender and Enterprise Development Survey (GEDS) conducted by the Institute of Statistical, Social and Economic Research (ISSER) in 2014, government-specific reports, and other existing studies to conduct a cost-benefit analysis of two skill improvement interventions—Vocational Training and Apprenticeship—and reviews the scope of government support to SMEs in Ghana. At a social discount rate of 8%, the benefit-cost ratio of vocational training and apprenticeship is 1.3 and 2.4, respectively. The results are based on a series of critical assumptions regarding the costs and benefits of providing skill improvement projects in Ghana. Support for SMEs is important for job creation and required monitoring and evaluation.

Key Words: Apprenticeship, Cost-Benefit Analysis, Technical Vocational Education and Training (TVET), Support to Small and Medium Scale Enterprises.

Policy Abstract

Integration of the youth (15- to 34-year-olds) in Ghana, who represents 35 percent of the population, into full and productive employment can be an important driver for growth and sustained development. The inability to improve labor productivity in the country continues to limit the performance of firms and enterprises across different economic sectors.

The lower level of productivity has been attributed to low levels of skill resulting from inadequate and low-quality training. Skills development for the labor force and the youth, in particular, has, therefore, become a critical agenda for the country's development. In addition to the problem of low levels of skill development, Ghana also faces a high youth unemployment rate. A large proportion of the youthful population enters the labor market looking for employment but is unable to find some. Thus, with the teeming youthful population and high unemployment problems, improving the level of their skills and providing them with productive work is critical to taking advantage of the demographic dividend.

The government, over the last decade, has initiated policies aimed at providing skills necessary for productivity growth and sustained development. Central to these initiatives are technical and vocational education and training, apprenticeship programs for the youth and business support. A good starting point is the introduction of free secondary education including technical and vocational education. There are indications that technical and vocational education outside the Ministry of education will also be free. The introduction of Competency-Based Training (CBT) in TVET education, especially at the Polytechnic level, aims to improve the quality and relevance of TVET with the ultimate aim of helping to meet the needs of the industry. The Council for Technical and Vocational Education Training (COTVET) has also recently developed a draft National Apprenticeship Policy, which aims among other things, to ensure that an apprenticeship is a compulsory requirement for all students, especially those within the Technical and Vocational Education Training (TVET) schools. Programmes such as National Entrepreneurship Innovation Programme (NEIP) have been initiated to boost the private sector and entrepreneurship development, particularly MSMEs in Ghana. The program has provided training to about 12,000 startups and small businesses to build their capacity to enable them to compete locally and globally.

However, more needs to be done to provide adequate skills for Ghana to position itself well in order to take advantage of its youthful population. There is a commitment from the government to reform technical and vocation education in Ghana that provides an important role for the private sector. It is important for the private sector to participate in designing and delivering TVET that will respond to the skills shortage in Ghana's priority sectors (World Bank, 2018).

Intervention 1: Vocational Training

Vocational training involves the practical acquisition of skills and knowledge specific to a particular trade, industry or sector. On the job training forms an integral part of vocational training.

In Ghana, the Council of Technical and Vocational Education Training (COTVET) promotes, coordinates, and oversees all aspects of technical vocational education and training. The council promotes skill developments concerning technical and vocational education across the broad spectrum of pre-tertiary and tertiary education, formal, informal and non-formal sectors. One of the principal objectives of COTVET is to coordinate the work of sector ministries and their agencies, which are legally mandated to make and implement policies regarding the TVET system, especially that of the Ministry of Education and the Ministry of Manpower, Youth and Employment in the delivery of TVET in Ghana (Ministry of Education, 2009). An improved TVET system is expected to promote manufacturing, construction technology, agro-based industry, and commerce.

The benefit of vocational training is measured by the present value of lifetime earnings of vocational training graduates. After accounting for the expected income growth and unemployment, this study estimates the benefit of vocational education of typical graduates to be GH¢44,009 discounted at an 8% rate across the life cycle (17–59-year-old).

The costs of vocational training include the costs to all parties in delivering vocational training—the cost to the individual in accessing the training and the cost to the government of providing vocational training. The opportunity cost of accessing vocational training (forgone income) is also included as a cost. This study estimates the cost of vocational training to be GH¢34,199. Thus, the benefit-cost ratio of 1.3 is estimated for providing vocational training to the youth.

Intervention 2: Apprenticeship

Apprenticeships combine vocational education with work-based learning for an intermediate occupational skill. An apprenticeship can take place in both formal and informal settings.

The National Vocational Training Institute (NVTI), under the Ministry of Manpower, Youth and Employment, usually provides the formal apprenticeship in Ghana. The Council for Technical and Vocational Education and Training (COTVET) regulates both formal and informal apprenticeship programs. COTVET, which co-ordinates and oversees all aspects of technical and vocational education and training in Ghana, has introduced the National Apprenticeship Program (NAP) intended to train workers to feed various industries. The NAP promotes apprenticeship training to harness the knowledge and experience of firms and entrepreneurs to deliver market-relevant skills to youth in a scalable and potentially cost-effective manner. COTVET, in collaboration with the British Council, has recently developed a draft of the National Apprenticeship Policy that will ensure that apprenticeship is a compulsory requirement for all students, especially those within the Technical and Vocational Education Training (TVET) schools in Ghana.

Apprenticeship programs provide benefits to both the individuals and employers through returns to wages and productive workforce (and hence a higher contribution to revenue and profit), respectively. Across the working ages 17-59, the lifetime apprenticeships provide a benefit equal to GH¢ 13,000 for beneficiaries after adjusting for expected income growth and using an 8% discount rate. The benefit to the employer during the period of apprenticeship is estimated as GH¢1700 in 2018 prices. Thus, the total benefit of each apprenticeship is, therefore, GH¢ 14,700 using an 8% discount rate.

The total cost of providing a typical apprenticeship program for 3 years in Ghana is estimated to be GHC 6,200 using an 8% discount rate. The benefit-cost ratio associated with the apprenticeship program in Ghana is estimated as 2.4 using an 8% discount rate.

Intervention 3: Business Support to MSMEs

One important means to create employment for the teeming youth is to develop business and start-up incubators that can guide early-stage firms through to larger firms. By helping the private sector and individuals start their own companies to employ themselves and others, business and start-up incubators can help reduce the burden of youth employment in Ghana.

Understanding benefit-cost analysis start-up incubators is critical in generating enormous support for more businesses to benefit. However, there is a lack of reliable evidence and data to make a robust cost-benefit analysis of business start-ups and incubators. In particular, because businesses that are chosen by (private sector) incubators are highly unlikely to be representative of the wider universe of startups, using anything but carefully considered experiments or quasi-experiments is likely to lead to biased findings on the impact of this intervention. As of writing, no such studies exist and for reasons outlined in Daziel (2018) there are real constraints to conducting RCTs in this space.

Among government-sponsored programs to support businesses in Ghana are the National Entrepreneurship Innovation Programme (NEIP), the National Board for Small Scale Industries (NBSSI), Microfinance & Small Loans Centre (MASLOC) and the "Presidential Pitch", which aims to help entrepreneurs to translate business ideas into to real businesses opportunities to fast track business development, create employment and improve growth of the economy.

Introduction

Ghana is currently facing a number of pressing barriers to the increase in labor productivity that continues to limit the performance of firms and enterprises across economic sectors. Ghana's productivity was lower than other African countries with a similar economic standing, and over 86 percent of employment is in the low productive informal sector (GSS, 2012). Low levels of skill resulting from inadequate and low-quality training have become one of the major challenges limiting productivity improvement. The importance of skill development in the Ghanaian labor market and the economy has been emphasized in both academic and policy-making circles (Hardy, Mbiti and McCasland, 2016; Honorati and Johansson, 2016).

Moreover, the problem of low levels of skill development has coincided with high youth unemployment across the country. A large proportion of the youthful population enters the labor market looking for employment but is unable to find some. This has resulted in high and rising levels of youth unemployment rates that far exceed those of adults. According to Ghana Statistical Service (2014), youths between the ages of 15 and 24 are much less likely to get a job offer compared to adults[1]. Figure 1 indicates that the youth unemployment situation in Ghana has worsened over the last decade, increasing from 9.5% in 2008 to 13.7% in 2018, despite concurrent impressive economic performance.[2] Meanwhile, about 33.5 percent of the current Ghanaian population is between the ages of 15 and 35, reflecting the precarious nature of the youth unemployment challenge and its effect on the entire economy. Employment growth, particularly youth employment, has not been able to keep pace with the strong GDP growth.

At the same time, industries claim to be experiencing a lack of labor market-relevant skills resulting from inadequate and low-quality training. This 'skill mismatch' or 'skill shortage' problem is not unique to Ghana, with industry leaders across the continent consistently noting a lack of skills as a key constraint to doing business (African Development Bank, 2017).

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[1]Even though the lower employment rates among the young people are partly explained by schooling, the growing share of young people who are neither in school nor at work has become a problem for both policy makers and researchers (Hardy et al, 2019).

[2] Ghana has recorded an average annual GDP growth rate of 8.1 per cent over the period 2007-2013.

Figure 1: Youth unemployment rate in Ghana from 1998 to 2018
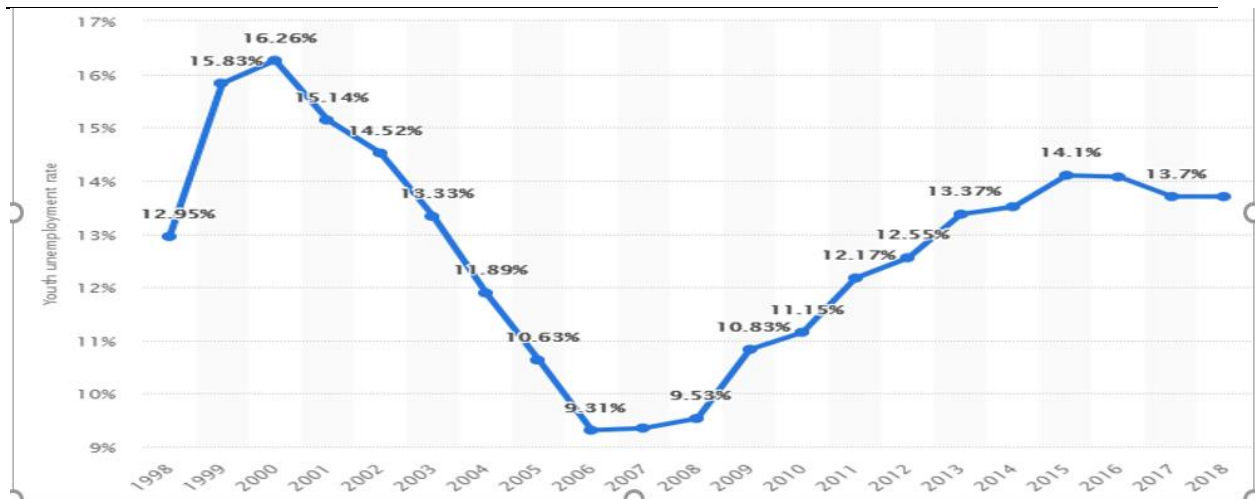
The government, over the last decade, has initiated policies aimed at providing skills necessary for productivity growth and sustained development. Central to these initiatives are technical and vocational education and training for youth. The introduction of free secondary education including technical and vocational education is an important step in improving access to these training and skill acquisition although the need for quality education from primary and basic levels cannot be overemphasized. However, more needs to be done to provide adequate skills for the youth who have completed the basic for Ghana to position itself well in order to take advantage of its youthful population.

In this regard, many interventions for increasing skills development and youth employment are being proposed. Skill development and employment creation have become critical issues requiring urgent attention. With limited resources, however, Ghana is faced with many competing policy options regarding employment creation and skill development. Thus, promoting efficiency in the use of limited resources should be a key objective for policymakers in Ghana. Identifying interventions that yield the greatest value for money is critical in deciding the interventions to improve skills development and employment creation.

The study aims to focus on three different interventions relating to skills and manpower development and employment generation in Ghana. Specifically, we analyze the relative

[3] https://www.statista.com/statistics/812039/youth-unemployment-rate-in-ghana/

effectiveness of each intervention using cost-benefit analysis. The three interventions of the paper include:

- Vocational training
- Apprenticeship
- Business and start-up incubators

These interventions were chosen by the Ghana Priorities advisory council, and represent some of the key levers used by both by the Ghanaian government, and governments worldwide to deal with the issue of skills development and youth unemployment. In conducting cost-benefit analyses of these, we draw upon survey data gathered by the Ghana Statistical Service and ISSER, namely the Ghana Living Standards Survey 7 (GLSS 7) and the GEDS survey respectively. We supplement the research using academic literature.

Our results suggest that vocational education attracts a significant wage premium of 47%, relative to junior high school. This delivers benefits to individuals equivalent to GH¢ 44,000 over the lifetime, using an 8% discount rate. While this is substantial, the costs to the individual and society to obtain that premium are almost equally as large. We estimate that three years of TVET would cost GH¢ 34,000, with half borne by the government in direct costs and the other half borne by the student in terms of direct costs and opportunity costs. Overall, the BCR is 1.3, at an 8% discount rate. In additional analyses comparing vocational education to senior high school, the BCR is higher at 2.4 but still relatively modest overall.

Regarding apprenticeships, using GEDS data we identify a large lifetime wage premium of 65% relative to similar individuals with no apprenticeship training. While the premium as a % is very large, the low wages of individuals in the survey, (those who would be targeted by a potential intervention) means that the absolute value of the wage premium is relatively modest at GH¢ 13,000. Including additional benefits to the firm from hiring the apprentice results in total benefits equal to GH¢14,700. The costs of the intervention are estimated at 6,200 cedis, 70% of which are direct costs and are borne by the government to incentivize enterprises to take on apprentices, and the remainder in opportunity costs for the individual. The BCR is therefore 2.4.

Concerning the final intervention, our review of the literature indicates that there is a dearth of reliable evidence to make a robust cost-benefit analysis of business start-ups and incubators. In particular, because businesses that are chosen by (private sector) incubators are highly unlikely

to be representative of the wider universe of startups, using anything but carefully considered experiments or quasi-experiments is likely to lead to biased findings on the impact of this intervention. As of writing, no such studies exist and for reasons outlined in Daziel (2018) there are real constraints to conducting RCTs in this space. To inform the debate, we make a qualitative discussion on the potential of incubators to support employment creation in Ghana.

Our results indicate that both vocational education and apprenticeships have similar BCRs, with central estimates of 1.3 and 2.4 respectively. Given these figures, apprenticeships may have an advantage in terms of value-for-money, however, the available evidence is not sufficient to assert this finding with high confidence. Vocational education delivers much higher absolute benefits but is also more costly. Broadly speaking, our findings of relatively low BCR interventions for skill development interventions echo previous results on the returns to vocational education, including those conducted by the Copenhagen Consensus Center in other country projects (Psacharopolous 2017; Aurora, Chakrabarti and Prakash, 2018).

Vocational Training

Description of Vocational Training in Ghana

Technical and Vocational Education refers to "those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences, and the acquisition of practical skills, attitudes, understanding, and knowledge relating to occupations in various sectors of economic and social life" (UNESCO & ILO, 2002). In general, TVET is used as a comprehensive term to cover institution-based formal and non-formal education and training programs in the Technical and Vocational institutes (JICA, 2001).

In Ghana, the Council of Technical and Vocational Education Training (COTVET) promotes, coordinates, and oversees all aspects of technical vocational education and training. The council promotes skill developments concerning technical and vocational education across the broad spectrum of pre-tertiary and tertiary education, formal, informal and non-formal sectors. JICA (2001) found inefficiencies in the management of the TVET system largely due to a lack of effective coordination between different ministries offering TVET courses with different certification standards. In this regard, one of the principal objectives of COTVET is to coordinate the work of sector ministries and their agencies, which are legally mandated to make

and implement policies regarding the TVET system, especially that of the Ministry of Education and the Ministry of Manpower, Youth and Employment in the delivery of TVET in Ghana (Ministry of Education, 2009).

The Government of Ghana recognizes TVET as a means of developing the technical and skilled human resource base as a key strategy for rapid economic growth. An improved TVET system is expected to promote manufacturing, construction technology, agro-based industry, and commerce. The recent introduction of Competency-Based Training (CBT) in TVET education, especially at the Polytechnic level, aims to improve the quality and relevance of TVET with the ultimate aim of helping to meet the needs of the industry. Main agents and institutions responsible for the delivery of TVET in Ghana include Ministry of Education, Youth and Sports: Technical Universities and Polytechnics, Technical Institutes, Vocational and Technical High Schools; Ministry of Manpower and Employment: National Vocational Training Institute (NVTI), Integrated Community Centres for Employable Skills (ICCES), Opportunities Industrializations Centre (OIC), Youth Training Centres, and Technical and Vocational Institutes.

Literature Review

Vocational training provides a form of training that emphasizes the skills and knowledge required for a particular trade, craft or job function (in contrast to the general education). Courses in technical vocational education and training (TVET) provide jobs specific technical training, with hands-on instructions.

Despite the increasing demand for workers with vocational and technical skills, the supply of this invaluable human resource has been unable to catch up with the demand in many developing countries. This problem has been partly attributed to the fact that it is more costly to provide vocational and technical education compared to general education as well as low returns to vocational education (Hoeckel, 2008). However, returns to academic qualifications are found to be significantly higher than the returns to vocational qualifications in at least in the United Kingdom (Blundell, et al., 2005). Other studies in different countries also find similar results of lower relative returns to vocational education as compared to academic qualification (see Arora et al., 2018 for a review of the literature from other countries).

In spite of the apparent superiority of general education in terms of costs and returns, Lewin (1997) provides compelling reasons for governments to focus and invest in technical and

vocational education and training (TVET). First, through the impartation of skills and knowledge necessary for making the individual a productive member of society, TVET increases the relevance of schooling. In addition, TVET helps to reduce unemployment because of the provision of employable skills, especially to youth and those who cannot succeed under the general academic system. By improving the quality and skill level of the working population, TVET helps to increase economic development, increase the general standard of living and reduce poverty by giving the individuals who participate in access to higher-income occupations.

In Ghana, technical and vocational education and training (TVET)[4] is currently facing a number of problems including a limited number of technical and vocational institutes, lack of facilities and materials for training students, inadequate technical and vocational teachers or facilitators. Other challenges are a limited number of training institutions for technical teachers, difficulty in career progression and negative public attitudes and perceptions towards technical and vocational education and training (Amedorme & Fiagbe, 2013).

Calculation of Costs and Benefits

In this study, costs, and benefits incurred by and accrued to government, individuals, and organizations are used to provide an ex-ante evaluation of the proposed intervention of providing vocational education. Providing vocational education may provide externalities, which are not measured in this paper. In addition, general equilibrium and possible distribution issues are not considered.

It is important to state that the scope of estimating costs and benefits in this paper is primarily a secondary one, focusing on extant studies rather than undertaking original research. The study does not try to comprehensively estimate secondary costs and benefits associated with the policy intervention on vocational and technical education and training. In fact, we specifically considered limited views of costs and benefits associated with the intervention especially those that can be easily quantified. While this is less than optimal, attribution of other benefits remains difficult and this conservative approach is standard within the education economics literature.

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[4] TVET provides opportunity to individuals to acquire practical knowledge and requisite skill training needed in the job market or for immediate self-employment

The study employed dataset from government institutions to estimate some important variables needed for the evaluation as well as information from the extant research and publicly available information from both the government institutions and private agencies.

Benefits

For the calculation of benefits, we used the estimates of Turkson, Twumasi Baffour and Wong (2020a) based on individual-level data of the seventh round of the Ghana Living Standard Survey (GLSS 7) (2016/7). The GLSS is a nation-wide household survey conducted by the Ghana Statistical Service. The GLSS 7 provides important information on the various labor force related parameters such as labor force participation rate, unemployment rate, youth employment, and unemployment rates, etc. Using the appropriate level of educational qualification, they estimated the private returns to education for people with different levels of educational qualification. We use their estimated returns to education for vocational training and those without vocational education (JHS graduates). For the purpose of this study, we do not distinguish vocational and technical education, as GLSS does not provide such distinction. They estimate private marginal returns to vocational and junior high schools of 0.65 and 0.13 percent, respectively relative to no education. The estimate of marginal wage premium of vocational education are used to compute benefits to vocational education and that of junior high school is used as a proxy of opportunity costs of acquiring the vocational qualifications. We also adjust for the annual growth rate in income to arrive at the benefit of vocational training to derive the life cycle costs and benefit of vocational education.

The graph below depicts the predicted age earning profiles of a 17-year-old in Ghana with vocational education and without vocational education. The graph shows that for a given three-year program, the individual earns no wage until age 20, but upon graduation earns a higher wage than the equivalent JHS graduate which is sustained over time. This wage premium is 47% based on Turkson, Twumasi-Baffour and Wong (2020a). Across the lifecycle we estimate this benefit to be GH ¢44,000 discounted at an 8% rate. It should be noted that the results provided by Turkson, Twumasi-Baffour and Wong (2020a) include an adjustment for biased selection, and should in theory account for average unemployment effects.

Figure 2: Wage Profiles of Vocational and JHS Graduates
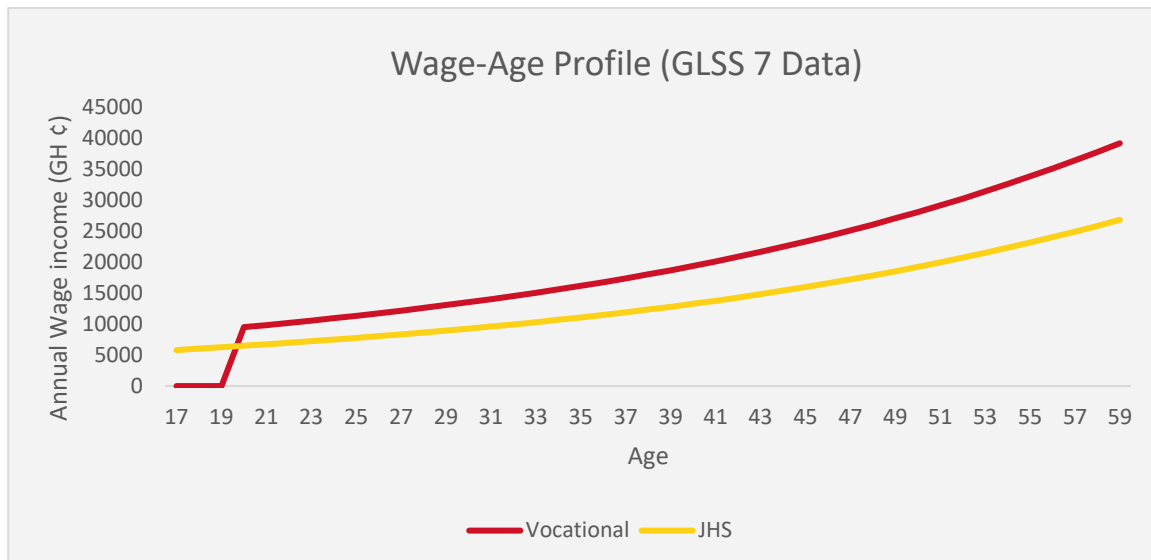
Costs

The costs of vocational training include the costs to all parties in delivering vocational training. This implies the cost to the individual as well as the cost to the government of providing vocational training. Since vocational training comes under technical and vocational education, the per capita expenditure incurred by the government in the sub-sector in the year 2015/16 is used as the per capita cost to the government of providing vocational training. MOE (2018) provides the unit cost of public TVET in Ghana as GH ¢5,240 in 2015. The cost includes government and donor funding but excludes internally generated funds, which predominantly comprise fees and fundraising efforts of the institutions. We estimate this equals GH¢ 6270 in 2018 figures. As is standard with TVET, this is incurred every year for three years.

The cost to the individual has two components- direct cost and indirect cost. The direct cost to the individual consists of the training cost, for which we have used the tuition/training fees charged by the government vocational training institutes and is estimated to equal GH¢ 980 in the first year and GH ¢285 for years two and three. The indirect cost is the opportunity cost of availing oneself for the vocational training and is the income foregone, estimated to be the wage from junior high school (roughly GH ¢6000 per year).

In total, we calculate the full social costs of a three-year program of TVET to equal GH ¢34,200, of which approximately half is borne by the government. Note that these costs focus

on the supply of vocational education, and do not include any costs for demand generation such as promotion, conditional cash transfers or employment placement schemes (see discussion below for potential policies to boost demand). In this respect, the costs presented here are an underestimate of the true costs of a program designed to boost vocational education. As such, the reported BCRs should be considered towards the upper end of the potential range of results.

Summary

Table 1 presents the estimated costs, benefits and benefit-cost ratios using different discount rates. The results suggest that at different discount factors, benefits exceed costs but only marginally. The central estimate is a BCR of 1.3. At a higher discount rate of 14%, vocational education does not pass a benefit-cost test from a societal perspective, and only barely passes a benefit-cost test from a private perspective. This may partially explain the low demand for vocational education in Ghana.

Table 1: BCR FOR DIFFERENT DISCOUNT RATES

Discount	Benefit per Student (GHC)	Cost per student (GHC)	BCR
5%	77,394	36,132	2.1
8%	44,009	34,199	1.3
14%	19,032	30,819	0.6

Source: Authors' Own Computation (see Spreadsheet accompanying this paper)

Sensitivity Analysis – SHS as the counterfactual

During meetings with the Ministry of Education in January 2020, where preliminary results of this analysis were presented, an official made the point that the relevant counterfactual should not be entering the workforce after JHS but going on to further studies in senior high school. The rationale for this viewpoint was that the free SHS policy has compelled more students to continue high school, and students would perceive SHS as the appropriate alternative pathway to vocational education, rather than entering the workforce after JHS.

Here we sketch out the results of this alternate cost-benefit analysis. In this set up there are no opportunity costs for the student since the counterfactual requires them to be out of the workforce anyway. The costs instead are the difference in the direct costs of TVET vs the direct costs of SHS. We follow another paper in the *Ghana Priorities* series and estimate a marginal cost of SHS at GH¢ 650 (Turkson, Twumasi-Baffour and Wong, 2020b). This means the cost of the intervention is GH¢ 7055 in the first year, then GH¢ 6362 in years 2 and 3. The discounted costs are ~ GH¢17,000 using an 8% discount rate.

For benefits, we adopt the income differential between vocational education and SHS, using Turkson, Twumasi Baffour and Wong (2020a). The income differential is large, at 40% of SHS wages almost the same as the premium between vocational education and JHS. Note there is little difference between wages from students who complete JHS vs SHS. In total, the wage benefits over the lifetime are GH¢ 40,000 (compared to GH¢ 44,000 when JHS was the counterfactual). The BCR is 2.4.

Discussion

Under the Free SHS policy, vocational and technical education institutions under the ministry of education provide free access to vocational and technical education. However, the other vocational and technical institutes under different ministries charge fees to provide training. Thus, it is important to provide free vocational and technical education in all institutions irrespective of the umbrella or supervisory ministry. The free access will likely increase demand for vocational and technical education for the youth. This is very important given that vocational education provides skills to graduates that make them ready to enter the labor market in contrast with general secondary education, which mostly serves as a conduit for tertiary education in Ghana. Indeed, the finding of Turkson, Twumasi-Baffour and Wong (2020a)— that there are muted wage returns to senior high school education (relative to JHS) compared with the additional 47 percentage points for vocational education suggests that more effort should be put in providing vocational and technical training to the youth.

Over the years, the neglect of vocational and technical education has led a number of problems in the sub-sectors including a limited number of technical institutes, lack of facilities and materials for training students, inadequate technical teachers or facilitators, and a limited number of training institutions for technical teachers. The government should ensure that there is availability for vocational and technical institutes for students who intend to pursue vocational and technical training at the second cycle level. The government should, therefore, build more technical institutes in the country, convert and upgrade some of the existing SHS (especially community SHSs), which are being underutilized. The preceding cost-benefit analysis embeds these types of actions. Our results indicate BCRs around 1.3 at the 8% discount rate.

As stated, additional measures might also be required to incentivize demand for TVET. These are not formally considered in the cost-benefit analysis – primarily due to lack of data.

However, here we sketch out a number of channels that the government can consider once well-equipped institutes with all the required facilities and personnel are present. First, the government should create awareness about the importance of vocational and technical education through media. Media promotion of the role of TVET in wealth creation, the provision of awareness weeks, exhibitions and open days by TVET institutions can help to counter the problem of negative public attitudes and perceptions regarding technical and vocational education and training in the country (Atchoarena and Delluc, 2001).

Second, the government should provide explicit direct linkages between vocational and technical education and employment. In this regard, the government should promote private-public partnership companies that will absorb graduates of vocational and technical training for them to provide electrical, plumbing, gas services, wielding, electronics and other services to households and firms. Households will subscribe and pay fees directly to companies, which have employed these workers. Thus, formalizing the employment of vocational graduates and with guarantee job opportunities, the gains to vocational education will be more visible at the time the students are deciding to enroll in either general secondary education or vocational education. In addition, a clear career path for graduates with vocational and technical education should be developed to provide options for TVET graduates who intend to pursue higher education in their chosen careers.

Third, the government can remove any remaining costs that are born by households before accessing secondary education in Ghana for ***students of vocational and technical training institutes only***. Though the free SHS policy provides access to all qualified students without paying any school fees, households spend some resources including clothing and other important items needed for a good academic environment and learning. This continues to serve as obstacles to the very poor households to enroll their children in secondary schools. By providing these resources to students with no cost to incur by students and parents, vocational and technical education could become a preferred option to some students who might opt out of secondary due to the existing costs.

Apprenticeship

Description of Apprenticeship

Until recently, apprenticeships in Ghana were essentially informal and widespread (Monk, Sandefur and Teal, 2008). Training usually covered trades and crafts, agriculture, business, and catering. About 80 to 90% of the overall technical and vocational education and training (TVET) provided in the informal sector is executed by the traditional training of apprentices. The sheer size of informal sector in employment in Ghana—approximately 85% of the economically active population and the rise in the importance of the informal sector in providing job opportunities in urban areas (Kingdon, Sandefur, & Teal, 2006)—suggests the important role that traditional apprenticeship training has been playing for the workforce and the economy.

However, formal training of apprenticeship also exists in Ghana usually provided by the National Vocational Training Institute (NVTI), under the Ministry of Manpower, Youth and Employment. The Council for Technical and Vocational Education and Training (COTVET) regulates both formal and informal apprenticeship programs. COTVET co-ordinates and oversees all aspects of technical and vocational education and training in Ghana. Its major objective is to formulate policies for skills development across the broad spectrum of pre-tertiary and tertiary education, formal, informal and non-formal sectors. It has introduced the National Apprenticeship Program (NAP), which has been supported by both development partners and private sectors, to train workers to feed various industries. The NAP promotes apprenticeship training to harness the knowledge and experience of firms and entrepreneurs to deliver market-relevant skills to youth in a scalable and potentially cost-effective manner. COTVET, in collaboration with the British Council, has recently developed a draft of the National Apprenticeship Policy that will ensure that apprenticeship is a compulsory requirement for all students, especially those within the Technical and Vocational Education Training (TVET) schools in Ghana. The policy aims to provide an integrated and standardized approach for undertaking apprenticeships at all levels and sectors; provide a mechanism for aligning skills/ knowledge acquired through an apprenticeship with requirements in the world of work, and improving the coordination mechanisms as well as regulatory and institutional frameworks required for effective apprenticeship practice in Ghana.

Literature Review

Steedman (2012) defines 'Apprenticeship' as at-workplace training programs that combine vocational education with work-based learning for an intermediate occupational skill (i.e., more than routinized job training), and that are subject to externally imposed training standards, particularly for their workplace component. Relative to more formal vocational training, apprenticeships are much more flexible. Apprentices also have more relevant skills because they do hands-on work and learn by observation and doing as opposed to classroom training. Upon completion of apprenticeship training, apprentices either become employees or set up their own businesses. The primary desire of a majority of apprentices is to set their own business or become self-employed viewed as the most rewarding outcome for the apprentices. However, the need for a substantial start-up capital requirement limits the ability of many apprentices to set their own business.

Although there are a plethora of studies that provide evidence on the costs and benefits of apprenticeship training, few explicitly estimate benefit-cost ratios. Arora et al. (2018) conducted a cost-benefit analysis of kill-related interventions including apprenticeship in Rajasthan, India. At a 5% social discount rate, the study estimated the benefit-cost ratio of apprenticeship to be around 5 suggesting for every rupee spends on an average apprentice in the state, the economy reaps 5 rupees as benefits of the investment. More, importantly the study found apprenticeship to be more beneficial compared with vocational training which recorded a benefit-cost ratio of 4 using the same 5% social discount rate. Rothboeck (2014) also estimated the net benefit of apprenticeship training with enterprise data from five case studies in various industries including light and heavy manufacturing, the retail and hotel industries. The study found a positive net benefit of apprenticeship training and that investments (costs of providing apprenticeship training) are often recovered during the apprenticeship period or latest during the first year of retaining apprentices as workers.

There also variants of studies on cost-benefit analysis in developed countries. Nechvoglod (2009) examined the apprenticeship costs of undertaking training in the plumbing and electrical industries for both employers and apprentices in Austrialia. Using data from six case studies of actual electrical and plumbing apprentices, the study found that the main cost to employer is the cost of supervision. For an apprentice, the main cost is the loss of potential earning (opportunity cost) which is very sensitive to the available alternative wage. The study also

found that apprenticeships programs are less attractive to old people relative to young people due to higher opportunity costs borne by old people in participating in apprenticeship programs.

In the United Kingdom, McIntosh (2004) used the labor Force Survey between 1996 and 2002 estimate, empirically the actual wage returns to an apprenticeship. The results of the study indicated that, after completion of an apprenticeship, wages of men increased by about 5-7% while for women, there was no change in the wage return, suggesting gendered differential impacts of apprenticeship. Dearden et al. (2002), however, found a very small and statistically insignificant effect of apprenticeship on wages in a study that estimated returns to apprenticeship and other vocational qualifications. In Germany, Cooke (2003) analyzed the impact of apprenticeship on starting wage rates and wage growth over a period. The study which utilized data from 1984-1995 found an insignificant effect of apprenticeship on initial wage rate but positive significant effect on wage growth for workers with previous training through an apprenticeship.

In Ghana, Monk *et al*. (2008) find that apprenticeship is the main institution through which people with junior high school or lower levels of education are provided with training that enhances their skills to earn more in the labor market. They find that returns to apprenticeship vary significantly depending on the level of education: among currently employed, earnings of those with no formal education but had previous training through apprenticeship increased by 50 percent with the decline in benefits as the levels of education rise. In a field experiment, which randomly gave firms access to worker recruitment services, Hardy (2019) showed that small firms in Ghana accepted offered apprentices provided through the program compared to the large firms. The program reduced the high labor market search costs and in particular the time and monetary costs of screening over ability faced by small firms. The study, which is a short term of effects of apprenticeship training, showed that apprenticeship is beneficial to firms as access to apprentices had a large positive effect on firms' revenues and profits. The results, however, indicated lower returns to apprenticeship relative to a control group — with average total monthly earnings of apprenticeship trainees about 13 percent lower.. The reduction in returns to apprenticeship was attributed to differences between wage work (for many in the control group) and less-lucrative self-employment (for those in the treatment group) and the fact that some of the trainees were still in the apprenticeship training at the time of follow up, with associated lower wage profile. The results of the study also indicated gendered differential effects of returns to apprenticeship—improvement in earnings of women who participated in the apprenticeship was higher than that of men, as they (women) had

already transitioned from apprenticeship to self-employment relative to men who take longer time to complete the apprenticeship. This finding hints at the possibility that the costs of apprenticeships, particularly the component of foregone wages, may be highly variable.

Calculation of Costs and Benefits

The stakeholders who are usually involved in apprenticeship training programs include government, employer, and individual trainees. Thus, the overall cost and benefits of providing apprenticeship include the measurable costs and benefits to the individual, employer, and government.

Costs

Table 2 lists the cost to different stakeholders and mentions the sources used for the analysis.

Table 2: Costs of Apprenticeship Training Programme

Stakeholder	Cost	Data Source
Individual	Opportunity cost (foregone earnings of an unskilled worker)	Average earnings of non-apprentice wage employees and self-employed estimated from Gender and Enterprise Development Survey (2014)
Employer	Apprentice salaries	Using an existing study conducted and a similar program in Ghana, we estimated the cost to the employer (Hardy et al., 2016)
Government/ Sponsor	Reimbursing the employers, marketing and promotioncosts, supervision, and training costs, administrative costs	Total costs of a sponsored apprenticeship program were used to evaluate the cost to the Government/sponsor (Avura and Ulzen-Appiah, 2016)

The costs of apprenticeship include the costs to all parties involves in delivering apprenticeship training. These costs include the cost to the individual, the employer or the firm and the government or sponsor of the apprenticeship-training program. Using a typical apprenticeship program in Ghana sponsored by the GIZ, we estimated the cost to the employer and the government by taking the average cost of that particular apprenticeship program. By dividing the total expenditure of the apprenticeship program by the number of apprentices to be trained, the per capita cost to the government/sponsor agency is derived in 2018 prices as GHC 979 per year for the three years with a total of GHC 2,936 during the three-year period of the apprenticeship program. We are assuming the average apprenticeship training lasts for three years as as simplifying assumption, though note that in reality there is probably large variance around this parameter (Hardy et al., 2019).

The cost of apprenticeship to the individual apprentice is the opportunity of the period spent on the training. The cost (opportunity) to the individual for undergoing apprenticeship is the income forgone of a non-apprenticed worker for three years. The estimated average wage of individuals with no apprenticeship experience over the age of 15-17 is used as a proxy of the opportunity cost. We deduct the stipend he/she gets in that three-year period from the income foregone to arrive at the final cost to the individual (Apprentices receive an average of GH¢252 per year as stipends, Hardy et al., 2016). The total opportunity cost of forgone income incurred by an average apprentice during the three-year program is estimated to be GH 2,042. It is important to note that we do not explicitly include direct costs incurred by the apprentices such as fees or any other out-of-pocket cost as these are usually embedded in sponsored programs in order not to dampen incentives to participate in the program.

The direct cost of apprenticeship to the sponsor or the government including management and administrative costs of the program is sourced from the apprenticeship program sponsored by GIZ. With GHC 4403,288 as the total cost of the program for 1500 trainees (Avura and Ulzen-Appiah, 2016), the per capita cost for the program is estimated as GHC 2,935.5. Apprenticeship is less costly compared to off-the-job training in vocational and technical schools.

The full social costs of a three-year apprenticeship program is therefore estimated to be GH¢ 6,202.

Benefits
Apprenticeship programmes provide benefits to both the individuals and employers. The table presented below provide a list of the benefits to different stakeholders and the sources of data used for the study.

Table 3: Benefits to Various Stakeholders (with source)

Stakeholder	Benefit	Data Source
Individual	Returns to wages	Estimate the average earnings of non-apprentice wage employees and self-employed estimated from Gender and Enterprise Development Survey (2014)
Employer	Productive workforce, contribution to revenue and profit	Using an existing study conducted in Ghana, we estimated the benefit to the employer (Hardy et al., 2016)

In estimating the lifetime benefits and opportunity costs of having apprenticeship training, the study employs the Gender and Enterprise Development Survey (GEDS) conducted by the

Institute of Statistical, Social and Economic Research in 2014. The GEDS surveyed about 1,095 entrepreneurs in Greater Accra. Respondents with no education to the completion of junior high/middle school constitute about 89 percent of all the respondents. Thus, only 11 percent had high school or tertiary education levels of education. Since apprenticeship (especially the informal) in Ghana are usually targeted to individuals with no secondary or high school education, the analytical sample is restricted to people with no high school education. The survey has information about respondents' participation in apprenticeship programs (formal and informal) in the past and current income status whether as wage employees or self-employed. Out of the total number of individuals in the analytical sample, 39.4 percent had been previously involved in apprenticeship training. The average income for respondents with previous apprenticeship training and those with no apprenticeship experience across age groups are used to proxy for lifetime benefits and opportunity costs of being having apprenticeship experience, respectively. Figure 1 presents the income-age profile for apprenticed and non-apprenticed groups at age 17, adjusting to 2018 prices and accounting for real economic growth in the future. In other words, the future benefits incorporate both the wage premium that comes with an increase in skills and also the fact that the absolute gap increases with economic growth. We estimate that over the lifetime apprenticeships provide a benefit equal to ~GH¢ 13,000 for beneficiaries, using an 8% discount rate.

Figure 3: Earnings Profiles for Apprentice and Non-apprentice
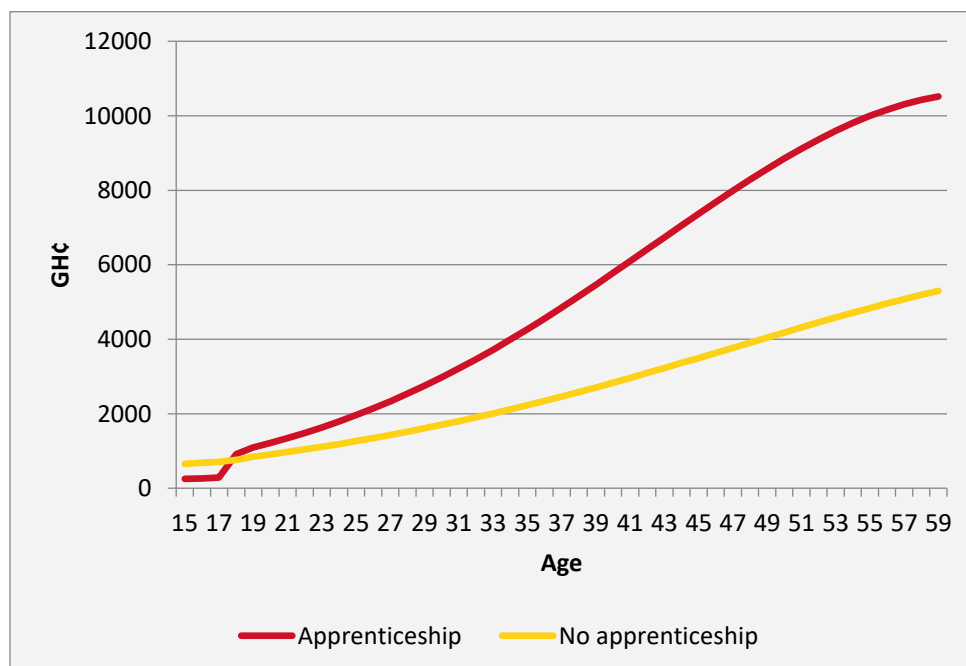
Source: Authors' computations from Gender and Enterprise Development Survey data

Apprenticeship programs also provide a (cheap) source of labor to employers. The marginal productivity of an apprentice would, therefore, lead to an increase in income or profit of the employer or the firm. Hardy et al (2016) estimate an extra profit of GH¢457.7 per annum for small firms with apprentices undergoing training in 2014. Using inflation adjustments this equals GH¢670 in 2018 prices. This contributes to GH¢ 1,700 to the benefits. Note that this figure nets out any management costs associated with having the apprentice.

Summary

The results of the cost-benefit analysis are presented in the table below at different discount rates. The central estimate is 2.4. This suggests it will be net beneficial for the government of Ghana to partner with firms to provide apprenticeship to individuals with a low level of education before they enter into the labor force.

Table 4: BCR FOR DIFFERENT DISCOUNT RATES

Discount	Benefit per Trainee (GHC)	Cost per Trainee (GHC)	BCR
5%	28,613	6,536	4.4
8%	14,679	6,202	2.4
14%	5,653	5,615	1.0

Source: Authors' calculations

It is important to note that apprenticeship programs may provide socio-economic externalities such as improved health for beneficiary households or increased productivity of non-beneficiaries. We do not estimate these benefits, due to lack of data, an indication that the results may under-estimate the BCR associated with an apprenticeship program.

Business Support to MSMEs

Description of Incubators and Support to MSMEs in Ghana

Increasing youth unemployment in Ghana has created an urgent need to create a large number of sustainable jobs. The private sector, in particular, small and medium enterprises (SME) have usually been the source of massive employment creation in both advanced and developing economies. Globally, SMEs are very important in terms of job creation—they account for more than 50 percent of global formal employment (IFC, 2013).

The contribution of SMEs in employment creation is significant in Ghana. In 2013, out of a total of 3,102,917 persons engaged by businesses and establishments in Ghana, MSM size

enterprise has about 83.4 percent (2,587,765) persons engaged. Also, with some total employees of 1,823,070 by all establishments in Ghana, 1,355,150 (74.3 percent) were employed by MSMEs. Proportions of employees in micro-sized, small-sized and medium-sized firms were 18.2 percent, 38.7 percent, and 17.4 percent, respectively. Thus, improving the productivity of the existing MSMEs would enhance their potential to engage more workers. More importantly, start-ups firms, which usually begin as MSMEs, require more attention and support to grow and increase their ability to increase employment, in the face of constraints to doing business in Ghana.

One important means to create employment for the teeming youth is to develop business and start-up incubators that can guide early-stage firms through to larger firms. By helping the private sector and individuals start their own companies to employ themselves and others, business and start-up incubators can help reduce the burden of youth employment in Ghana.

The important role of incubators in improving productivity and increasing job creation is indisputable. However, establishing the causal relationship between benefits and incubator firms is difficult. Without identifying the causal benefits of incubation, any cost-benefit analysis for incubators will be spurious. The main problem is the non-random selection of firms into incubators— that is, firms chosen by incubators are not representative of all start-ups in the economy (Dalziel, 2018). Thus, neither the 'before-after' comparisons of incubator-engaged enterprises nor differences between incubating firms and the non-incubating firms can properly measure the beneficial effects of start-up incubation.

One way to address this identification challenge would be to conduct randomized control trials of incubation. Unfortunately, the nature of incubation and intensive business support means that RCT experiments have been generally resisted in this field. Dalziel (2018) outlines the key challenges with conducting RCTs for incubation. First, incubators by their nature of being private profit-maximizing agents, tend to select the most promising candidate enterprises. Incubators resist random allocation as it does not reflect their actual business practice, and might lead to incorrect inferences about the nature of their service. Second, RCTs require homogeneity in treatment, whereas incubation support is highly bespoke. Third, the incubation/venture capital business model is predicated on a 'hits-based' approach where a small selection of outliers delivers all profits, with the vast majority of supported businesses failing. The small probability of getting an outlier requires a large sample size to detect in a traditional experimental setup. This is likely to be prohibitively costly, infeasible or both.

Lastly, RCTs are most useful when results can be reasonably applied to other circumstances to predict outcomes (external validity). However, the success factors of a business are highly contextual.

Given these challenges, we do not attempt a cost-benefit analysis of incubators. Instead, we provide a qualitative discussion of start-up incubation in Ghana and their promising role in employment creation.

There are many programs that are intended to boost the private sector and entrepreneurship development, particularly MSMEs in Ghana. National Entrepreneurship Innovation Programme (NEIP), which has been recently embarked upon, aims to improve the development of Ghana's entrepreneurial culture and provide additional avenues to Self-employment opportunities for Ghanaian youth and support to MSME's. The program has provided training to about 12,000 startups and small businesses to build their capacity to enable them to compete locally and globally. In addition to the training, funding has been provided to 3,000 of these firms to help them to expand their businesses in order to create jobs. The government expects to support an additional 4,000 businesses in 2020 and expect that the NEIP to create about 30,500 jobs.

The "Presidential Pitch" is also another intervention that aims to help entrepreneurs to translate business ideas into real business opportunities to fast track business development, create employment and improve the growth of the economy. Under the program, 20 applications received were selected in 2019 and were provided with financial support to develop their entrepreneurial ideas into businesses. The government intends to support another set of innovative businesses and startups with enhanced financial support in 2020. Presidential Empowerment for Women Entrepreneurs with Disability (PEWED) is another initiative of the government help marginalized entrepreneurs—disable women—with the aim of accelerating inclusive growth. The program provides funding to scale-up businesses of women entrepreneurs with disabilities. The government plans to provide training and funding to scale-up their businesses to a total of 1000 women entrepreneurs with disabilities in 2020.

Apart from the NEIP and other temporary presidential initiatives, the National Board for Small Scale Industries (NBSSI) and Microfinance & Small Loans Centre (MASLOC) are also initiatives to support new and existing small and medium-scale enterprises (SMEs) in diverse industries. The NBSSI, which was set in 1981 under Ghana's Ministry of Trade and Industry, is mandated to promote the growth and development of Micro and Small Enterprises (MSEs).

The NBSSI provides business development services for micro and small enterprises to boost the growth of MSEs, which are considered as the bone of Ghana's economic development. The NBSSI provides both financial and non-financial services to clients through Business Advisory Centres (BAC). MASLOC was also established with the goal of providing reliable access to microcredit and loans to small enterprises in Ghana through three major credit scheme—group loans, individual loans and wholesale lending to rural banks and Ministries, Departments and Agencies (MDAs) for on-lending to small scale enterprises.

Despite the significant support to the private sector start-ups to grow, there is lack of monitoring and evaluation—an integral to any program or initiative—to understand what work, which sector and how to (and not to) support businesses to reap the highest level of returns for the entire country. In this regard, the government should make evaluations to be part of all the must skill development programs in the country. The evaluation will help in identifying the impacts of different support programs and assess other strategies that can improve the efficiency of government investment in start-ups in order to increase productivity and job creation with the private sector as the engine of growth and job creation.

Conclusion

The importance of skill development to the Ghanaian labor market has been emphasized in both academics and policy-making circles. A critical issue requiring urgent attention and appropriate response is inadequate and low-quality training, that has resulted in a lack of labor market-relevant skills. The skill improvement must be provided with speed, quality and sustainability with innovative job creation for inclusive growth to avert the problem of the low level of skill development that has coincided with high youth unemployment. The government, over the last decade, has initiated policies aimed to provide skills necessary for the sustained development of the country. The central to these initiatives are the technical and vocational education and training for the teaming youth. However, more needs to be done to provide adequate skills for the youth if Ghana can position itself well in order to take advantage of the demographic structure of its population. In this regard, many interventions for increasing youth employment and skills development are being proposed.

This paper provides an evaluation of two important skill development schemes available to the government of Ghana—vocational training and apprenticeship—through cost-benefit analysis. At an 8% discount rate, the benefit-cost ratio of vocational training and apprenticeship is 1.3

and 2.4, respectively. These results should be construed as the returns of increasing the supply of vocational education. These returns are higher than 1, indicating that the interventions are not value-destroying from a social perspective.

It is important to interpret the results from the analysis in this paper with caution since the general equilibrium impacts of the proposed policy interventions have not been considered. The analysis implicitly assumes a given market wage rate for graduates of both apprenticeship and technical and vocational education training. However, increasing the supply of workers with technical and vocational training in the labor market can have a significant impact on the wage rate and therefore the impact on benefit-cost ratios used for the evaluation. On the other hand, productivity gains from better-skilled workers can boost the aggregate productivity effect in the overall economy with a second-round income effect. Therefore the overall benefit-cost ratios and the rankings of various interventions might be higher than presented.

Relative to other interventions in the *Ghana Priorities* series, there are likely superior returns to be found in other human capital interventions focusing on primary school and early childhood (Wong, Turkson and Twumasi-Baffour, 2020; Aryeetey, Nkegbe, Issahaku and Wong, 2020). The challenging task for policymakers in Ghana is that the beneficiaries of these more effective interventions will only hit the workforce in 10-15 years, while the challenge of unemployed and unskilled youth is current and pressing. Unfortunately, there are no easy policy levers to address this issue. Nevertheless, the government should be cognizant of the fact that investing in effective human capital interventions at the primary and early childhood level will ameliorate the future challenge of unemployed and unskilled youth. Given the current state of knowledge, they appear to be the most effective use of marginal funds to address this wicked issue.

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