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Education and Employment in Zambia

Evidence from a Scoping Exercise

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Education and Employment in Zambia: Evidence from a Scoping Exercise[1]

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Abstract

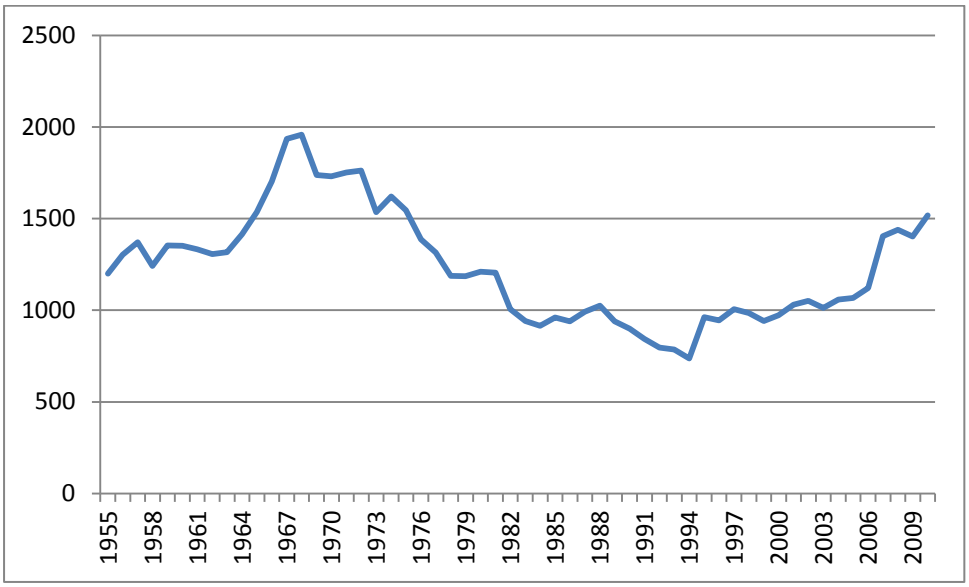
Over the past twenty years the Zambian economy has been growing and its structure changing. However, most of the jobs which have been created recently have not been in the sectors where growth has been largest, such as mining and construction, but rather in various types of services. In parallel to these changes in labour demand there has been a large increase in school enrolment, particularly at secondary school level, and with this a fall in the proportion of the labour force with only primary education and a relative increase in those with post-secondary education. Despite the increase in the numbers of those with more education there exists the perception that the education system is not meeting the needs of the changing economy. This paper investigates this issue using quantitative data drawn from labour market and firm surveys, as well as a series of interviews undertaken with business managers, industry representatives and government officials. The quality of the Zambian school system is poor compared to other countries within the region but despite this, on average, businesses in Zambia are unlikely to report that skills are a constraint for them and are unlikely to engage in their own training. Skills training requirements are heterogeneous across sectors and the returns to education differ significantly between sectors. Education beyond secondary school is associated with substantial premiums in the public sector and in private sectors such as mining and manufacturing. In the long-term any attempt to improve skills within the Zambian labour market will need to tackle the quality of primary and secondary school education. In the shorter-term, the post-secondary education system needs to better fit the students which are emerging from the school system and public training institutions need to collaborate more with the private sector to meet their specific needs.

[1] This work has been funded by the International Growth Centre. The views expressed in the paper are those of the authors and does not necessarily reflect the views of the funders. We thank Robert Liebenthal, Alan Hirsch and Shahid Yusuf for very valuable comments, and the owners and managers of firms, representatives of employer organisations and government officials who we interviewed during the course of this research.

1. Economic growth and labour demand in Zambia

Over the past twenty years real per capita incomes in Zambia have been steadily rising. Much of this high growth performance is attributed to the expansion in the mining sector. The privatisation of the mines in the late 1990s led to a large inflow of foreign capital investment and coupled with a favourable international price for copper, production and exports increased. This meant that between 2000 and 2010, the mining's share of GDP grew dramatically to almost 10 percent of GDP. However, this is not the only sector in Zambia where the share of GDP has grown dramatically over the period – construction's share more than doubled to 12.9 percent in 2012 and the transport, storage and communications sector's share grew by approximately two-thirds. These two sectors, as well as manufacturing and agriculture, forestry and fishing, now each individually contribute more to GDP than mining. The structure of Zambia's economy is changing with the contribution of the mining, construction and transport, storage and communications sectors growing and a reduction in the contribution of agriculture.

Figure 1. Zambian real per capita GDP, PPP converted 2005 prices



Source: Heston, Summers and Aten, Penn World Table Version 7.1 (2012)

Table 1. Sectoral Percentage Share of GDP (1994 Constant Prices), 2000-2014

% Share of GDP at Constant Prices	Year												
Sector	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Agriculture, Forestry and Fishing	17.2	16.0	15.2	15.2	15.0	14.2	13.7	12.9	12.5	12.6	12.5	12.6	12.6
Mining and Quarrying	6.4	7.0	7.9	7.7	8.4	8.6	8.7	8.5	8.2	9.3	9.9	8.8	7.1
Manufacturing	10.5	10.4	10.7	10.9	10.9	10.6	10.6	10.2	9.9	9.5	9.2	9.3	9.6
Electricity, Gas and Water	2.9	3.1	2.9	2.7	2.6	2.6	2.7	2.5	2.4	2.4	2.4	2.4	2.3
Construction	4.9	5.3	6.0	6.9	7.9	9.1	9.8	11.1	11.4	11.7	11.8	12.0	12.9
Wholesale and Retail trade	18.3	18.4	18.7	18.9	18.8	18.3	17.5	16.9	16.4	15.8	15.3	15.4	15.5
Restaurants, Bars and Hotels	1.9	2.3	2.3	2.4	2.4	2.5	2.8	2.9	2.8	2.3	2.4	2.4	2.3
Transport, Storage and Communications	6.3	6.2	6.1	6.1	6.1	6.5	7.4	8.3	9.1	9.2	9.9	10.5	10.9
Financial Institutions and Insurance	8.2	7.8	7.9	7.7	7.6	7.4	7.3	7.1	7.3	7.3	7.1	7.0	7.3
Real Estate and Business services	9.5	9.4	9.5	9.4	9.3	9.1	8.8	8.6	8.4	8.1	7.7	7.4	7.1
Community, Social and Personal Services	7.7	7.8	7.7	7.4	7.1	7.5	7.7	8.1	8.6	8.8	8.6	8.7	8.8
Public Administration & Defence	4.4	4.2	4.0	3.9	3.7	3.7	3.2	3.4	3.3	3.1	2.8	2.9	3.0
Education	2.0	2.2	2.3	2.2	2.1	2.4	3.1	3.3	3.8	4.1	4.2	4.3	4.3
Health	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.6
Recreation, Religious, Culture	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.6
Personal Services	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4
Less: FISIM	-4.9	-4.8	-4.7	-4.6	-4.5	-4.4	-4.2	-4.1	-4.0	-3.8	-3.6	-3.5	-3.3
TOTAL GROSS VALUE ADDED	**89.2**	**88.9**	**90.0**	**90.8**	**91.5**	**91.9**	**92.6**	**93.1**	**93.1**	**93.1**	**93.1**	**93.1**	**93.1**
Taxes less subsidies on Products	10.8	11.1	10.0	9.2	8.5	8.1	7.4	6.9	6.9	6.9	6.9	6.9	6.9
TOTAL G.D.P. AT MARKET PRICES	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Source: Central Statistical Office, 2012

The change in the structure of the economy has been accompanied by changes in labour demand. Between 2006 and 2010 the economy added 309,000 jobs (Central Statistical Office, 2012), more than a third of which were in the community, social and personal services sector, another 31 percent in international organisations and a quarter in wholesale and retail trade. Together, these three sectors accounted for over 90 percent of net job creation. A number of sectors shed jobs during this period. Jobs were lost in both the manufacturing and finance, insurance and real estate sectors and mining also shed a small number of jobs despite the sector's growth in output. The change in the Zambian economy has thus been towards more capital intensive sectors, such as mining, more capital intensive production, as illustrated by manufacturing, and towards services, with job creation happening mainly in the services sectors. This change has generated higher demand for those with more education and technical skills but little demand for those with low levels of education who comprise the bulk of the workforce.

Table 2. Jobs by sector (000s)

Sector	2006	2010	Change
Agriculture, forestry and fisheries	3 006	3 029	23
Mining and quarrying	69	66	-3
Manufacturing	163	132	-31
Electricity, gas & water	15	17	2
Construction	53	80	27
Trade wholesale and retail distribution	389	468	79
Hotels and restaurants	35	44	9
Transport and communication	84	117	33
Finance, insurance and real estate	85	25	-60
Community, social and personal services	279	388	109
Private household services	54	80	26
International organisations	2	99	97
Total	4 235	4 544	309

Source: Central Statistical Office, 2010

The relatively high economic growth rates together with the existence of relatively high levels of unemployment suggest that the skills of the currently unemployed do not match the requirements of firms, or market wage rates are out of line with the wages that firms are willing to pay to those with the characteristics of the unemployed. Thus, for Zambia to reduce unemployment, the skills profile of the unemployed needs to change, or wages for those with the characteristics of the unemployed need to fall. The mismatch between the skills of the workforce, even if they have come through further training institutions, and the demands of both the private and public sector is a

common complaint heard often from firms. This is especially the case in sectors such as mining, engineering and construction.

The Zambian government is attempting to address the challenges that young people face when entering the labour force, implementing policies to encourage entrepreneurship and improving technical skills (for example the Zambia National Service has been reorganised into the Zambian Youth Training Service with a mandate to strengthen youth skills training) and has increased the share of spending allocated to education and training. However, school quality remains poor and the cost of labour is relatively high which encourages firms to consider immigrants and to move away from lower-skilled labour and towards part-time or casual labour to reduce the risks and financial burdens associated with full-time hiring.

For the Zambian government to effectively target policies to address the skills constraints which firms report, it needs information on where these constraints are the most acute. This paper contributes to providing this information by focusing on the relationship between employment opportunities, characteristics, labour returns and education with the key objective of identifying the potential shortages in human capital that industry demands. It does this in two ways. First it examines the micro-data on the Zambian labour force to establish education trends, and education constraints. This broad quantitative view is complemented by qualitative interviews with industry representatives and firms in the manufacturing, mining, construction and the SME sectors in order to better understand their skills needs and how they cope with the existing skills in the current workforce. The focus of this paper is on the post-secondary education sector, where much of the skills training in the Zambian economy happens. However, the challenges which Zambia faces in terms of skills are much broader than this sector and policies need to tackle two key areas. First, the poor educational system and poor outcomes which begin in primary school and persist. Second, the incentives, including the regulatory environment, which discourage firms from hiring the relatively low skilled and increase demand for relatively skilled people. Should the current trends continue, Zambia will face the duel challenges of training the relatively skilled workers the economy currently demands, and rising numbers of the relatively unskilled unemployed.

2. The structure and performance of the Zambian education system

School education

Formal education in Zambia consists of academic learning based on a three-tier structure: primary education consisting of seven years, junior secondary education consisting of two years, and senior secondary school consisting of three years. Upon successful completion of secondary school, pupils may choose to further their education by attending tertiary education either at a university, college, vocational or technical institute. The government is the main provider of education at all levels but there has been a substantial rise in private sector participation for at least the last 15 years.

Zambia has three main national examinations: grade seven exams which determine entry into junior secondary school; grade nine exams which determine entry into senior high school and grade twelve exams which mark the end of formal secondary education and determine entry into college and university. Before the current increase in the number of secondary schools, there used to be a high dropout rate at grade seven and nine when pupils failed to make it to secondary school. This changed with the introduction of basic schools which offered more places.

The table below shows the basic and secondary schools disaggregated by provider from 2000 to 2009. This table illustrates two key things. First, enrolment has been increasing during this period, particularly in secondary schools. There are thus more young people now entering the labour market with some or completed secondary school education. Second, growth rates in enrolment have been highest in private, including church, and community schools. This suggests that these schools are filling a need which government is not meeting

Table 3. Basic and secondary enrolment in Zambia by provider, 2000-2009

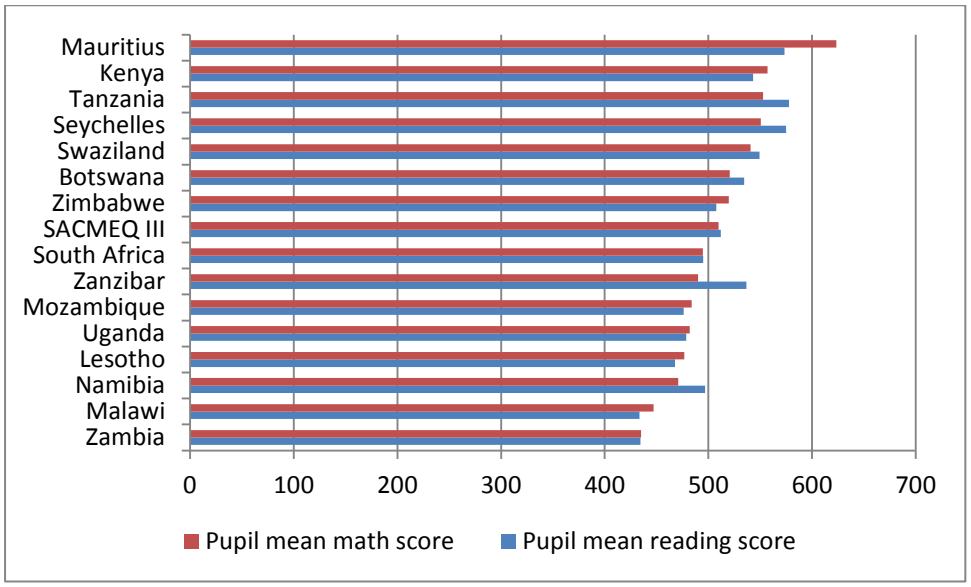
Year		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Annual Growth Rate
Secondary Total		271	271	308	318	319	396	544	586	599	672	9.5%
Basic Total		5324	5777	5902	5773	6728	8467	7639	8013	8195	8111	4.3%
Year totals by provider												
Government/GA*	Secondary	244	244	253	244	251	310	447	459	464	531	8.1%
	Basic	4310	4310	4360	4400	4962	4927	4709	4918	4790	4983	1.5%
Private/Church	Secondary	27	27	55	74	68	86	97	124	135	141	18%
	Basic	131	131	205	287	395	540	354	387	411	381	11.3%
Community	Basic	883	1336	1337	1086	1371	3000	2576	2708	2994	2747	12%

**Grant Aided*

Source: Ministry of Education, 2009

Since independence in 1964, the Zambian government has made considerable progress towards its goal of universal basic education. By the 1990s the substantial government investment in education from independence till the early eighties had resulted in increases in school enrolment and completion. The percentage of the labour force with no schooling dropped from 24 percent in 1986 to 16 percent in 1993, while the percentage with secondary education rose from 18 to 24 percent (Fluitman & Alberts, 2000). However, over the period 1980-2000 there was a gradual decline in the education budget as a result of the deterioration in economic conditions since the mid-seventies and also the government's commitment to fiscal restraint in the early nineties. In 1975 public spending on education represented 6 percent of GDP, which shrunk to 4 to 5 percent in the first half of the eighties, then declined to 3 to 4 percent in the second half of the eighties and finally to 2 percent in the early nineties (Burger et. al, 2005). These low levels of spending on education have resulted in a poor and deteriorating education system.

Figure 2. Average performance of grade 6 pupils in maths and reading in Southern and Eastern Africa



Source: Southern and Eastern Africa Consortium for Monitoring Educational Quality, various reports

The Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) has been monitoring educational performance at the primary school level throughout the region since 1995. These tests are standardised so learning outcomes can be compared across countries. In the latest round of SACMEQ tests, undertaken in 2007, Zambian grade 6 pupils performed, on average, the

worst in both maths and reading among the 15 countries. Distressingly, the reading test which is comparable over time indicates that schooling has become worse - between 1995 and 2007 average reading scores in Zambian schools fell from 477.5 to 434.4.

Recently though, the Zambian government has made spending on education a priority. The 2013 national budget has 17.5 percent of the total budget allocated to the education sector (now the combined Ministry of Education and Science and Technology). However, improvements in education take time and require more than just increases in budget. Furthermore, the young people completing education now and entering the labour market all came through the education system when these SACMEQ tests indicated that it was the worst in the region. It is thus unlikely that these young people have a strong enough academic grounding to participate in sophisticated post-secondary training. The academic ability of those exiting secondary education is unlikely to change rapidly given the slow nature of school reform and it is not even clear currently whether increased government spending on education has resulted in better outcomes.

Post-secondary education

There are two broad types of post-secondary education available to high school graduates: Technical Education, Vocational and Entrepreneurship Training (TEVET); and University. TEVET covers a broad range of training services and providers, ranging from small, relatively informal programs (such as computer classes offered in ad hoc settings), to multi-year diploma programs in technical subjects. Some are registered with the Technical Education, Vocational and Entrepreneurship Training Authority (TEVETA); others are not. They also range from privately-owned training providers, where fees presumably reflect the full cost of service delivery to State-Owned Institutions (SOI), where services are highly subsidized. Some training programs and institutions focus primarily (or exclusively) on the specific internal needs of line ministries (such as police, military, prisons, teacher training, wildlife authority, etc.).

The Technical Education, Vocational and Entrepreneurship Training Authority (TEVETA) under the Ministry of Education, Science, Technical and Early Childhood Education is responsible for registering private training colleges and monitoring training standards and certification and, since early 2002, has been implementing a Technical Education, Vocational and Entrepreneurship Training (TEVET)

Development Program (TDP), aimed at improving the quality, sustainability, demand-responsiveness, and equity of TEVET in Zambia. However, there has been very slow progress made in achieving the objectives of the programme (World Bank, 2010).

Enrolment in TEVET institutions grew slightly between 2005 and 2009 from 30,511 to 33,399. Males are almost 60 percent of TEVET enrolment. To increase access to skills training more TEVET institutions in rural areas have been established and existing institutions revamped.

Until recently, the country only had two main universities: The University of Zambia and the Copperbelt University, both public. However, in order to increase access to tertiary education, the government has encouraged the establishment of private universities. This has led to the establishment of 14 private universities and an ambitious plan for additional public universities. Until the recent introduction of private universities and the conversion of some private colleges into universities, competition for entry into the two public universities was extremely high resulting in very few high school students entering university. This meant that the number of University graduates had remained fairly low in most disciplines. Enrolment rates are growing though – in the period from 2005 till 2009 total enrolment in public universities increased by almost 50 percent, from 12,774 in 2005 to 19,086 in 2009 (GRZ, SNDP, 2011). Total enrolment in universities and TEVET institutions was 52,485 in 2009 and universities have increased their share in post-secondary enrolment from 30 percent to 36 percent, indicating a movement from vocational to more academic training. The subjects offered by public and private universities also differ. The provision of science and technology education remains predominantly provided for by the government through these two Universities and TEVET institutions, while the private sector focuses on more commercially orientated courses.

3. Education and employment in Zambia: Quantitative analysis

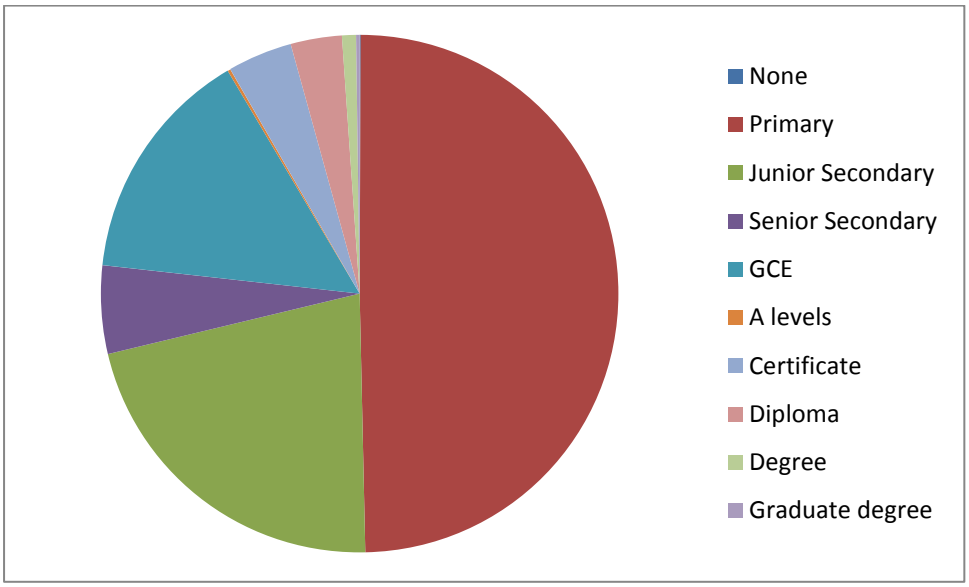
Broad trends in education and employment

To better understand the relationship between education and employment in Zambia, and with it the demand for certain types of education, we use data on individuals collected as part of the Living Conditions Monitoring Survey (LCMS) of 2010. Where possible, we also use data from the 2004 survey to assess trends. We are not able to match all variables between the two years since questions had changed and we did not have access to all the variables collected in the survey. The results we present are weighted by the official weights supplied by the Zambian Central Statistics Office (CSO).

Figure 3 shows that distribution of educational attainment in 2010. Much of the labour force in Zambia have less than secondary education. In 2010, the highest level of education for almost half of those who were labour force participants was primary school education. Junior secondary school was the next most common category (21 percent). The proportion of those with primary school fell by ten percentage points (59 percent to 49 percent) between 2004 and 2010. The bulk of this fall has been balanced by an increase in junior secondary education (by seven percentage points).

Education beyond the General Certificate of Education (GCE) is fairly uncommon – less than ten percent of the labour force had A-levels or further education qualifications. Among post-secondary education qualifications, certificates are most common (4 percent of the labour force) followed by diplomas (3 percent). Those with university degrees (both undergraduate and graduate) make up approximately one percent of the labour force. The proportion of those in the labour force with post-secondary education increased dramatically between 2004 and 2010. In 2004, approximately five percent of those working or wanting work had post-secondary education. By 2010 this proportion had increased by more than 60 percent to 8.33. This is indicative of the demand for these qualifications by both individuals and companies, and is in line with the increased enrolment in tertiary institutions, particularly universities, identified earlier.

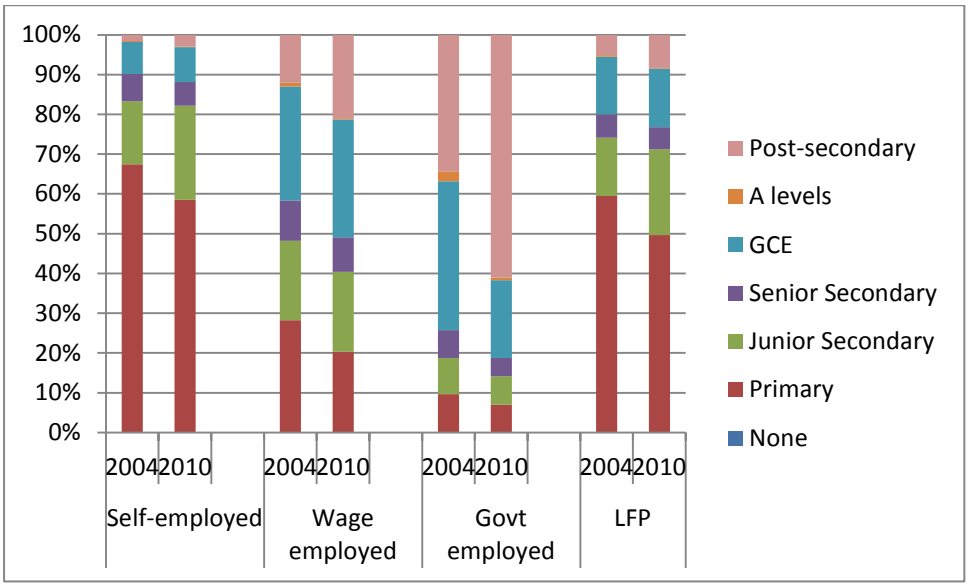
Figure 3. Highest education level, Zambian labour force, 2010



Source: Own calculations based on Central Statistical Office data

Education profiles differ by the sector in which a person works. The self employed are dominated by relatively low education levels – most workers in this sector have junior secondary education or less. Although the proportion of those with just primary education has fallen between 2004 and 2010 this has been almost exactly balanced by the increase in the proportion of those with junior secondary education. The education profile among the wage employed is more diverse. In 2010 those with a GCE were the most common (30 percent of workers), followed by those with primary, junior secondary and post-secondary education (with each of these categories contributing approximately 20 percent of the workforce). Although the proportion in most of these categories has remained fairly constant over the six years between 2004 and 2010, the proportion with primary education has contracted by eight percentage points and the proportion with post-secondary education has increased by a similar amount. This is in line with the broader trend of increased demand for post-secondary education.

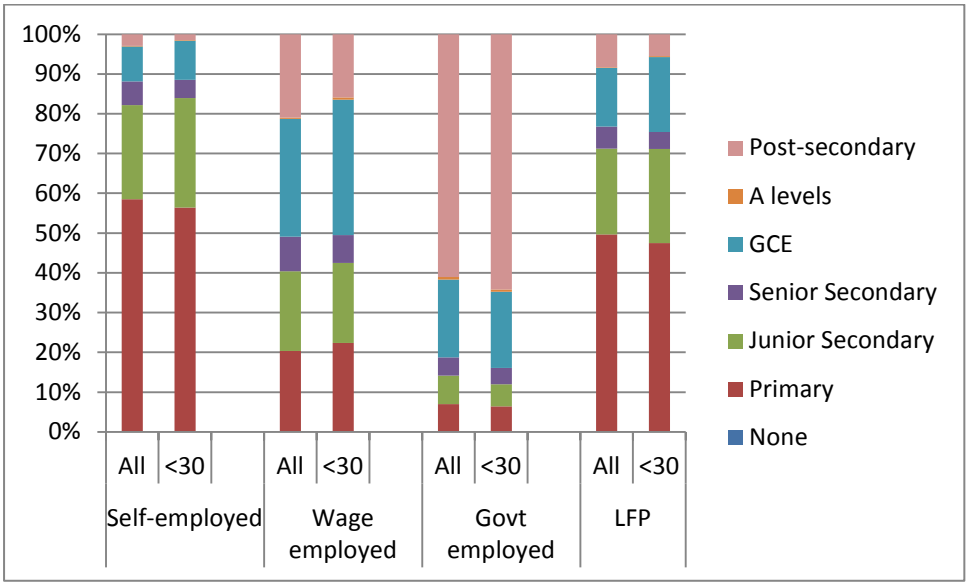
Figure 4. Proportion of workers by education and sector including all labour force participants (LFP), 2004 and 2010



Source: Own calculations based on Central Statistical Office data

Among those working for government the proportion with post-secondary education has almost doubled between 2004 and 2010 to 61 percent. This has now overtaken the GCE to become the most common educational level among government employees. The current importance of a post-secondary qualification for a government job is further emphasised if those who are younger than 30 are considered – a higher proportion of young people working in the public sector have post-secondary education than the broader pool of those working for government. This is not the case for those in wage employment where fewer young people have post-secondary education than the broader pool. There are at least three specific explanations for this. It may be that those who will enter wage employment, who are currently young, are still busy in further education. Wage employment may require the types of further education which takes longer than required by government jobs. Second, young people with post-secondary education may be waiting for government jobs because they are better paying and may only consider wage employment if they fail to find a government job. Thirdly, young people with post-secondary education may initially obtain work experience in the public sector and then transition into private wage employment as they get older.

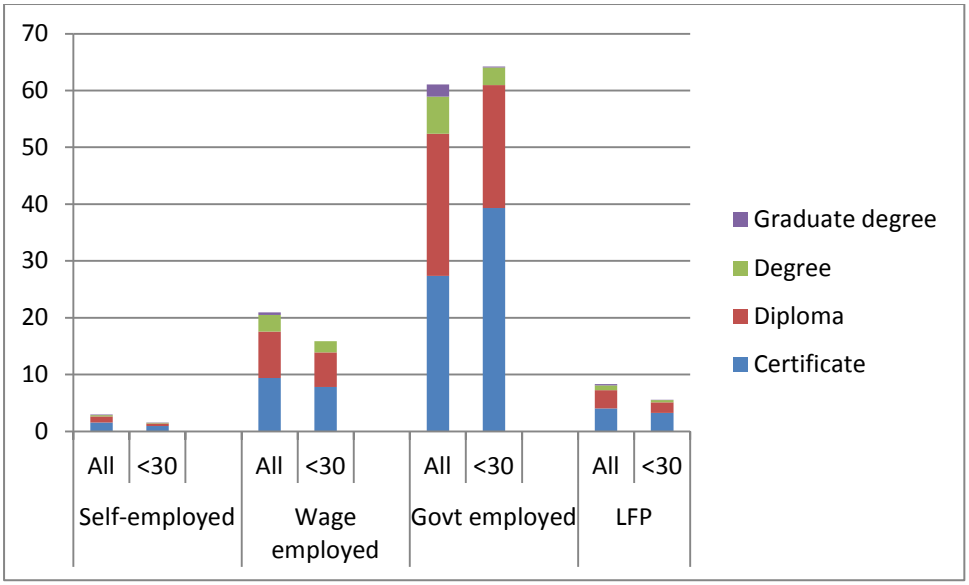
Figure 5. Proportion of workers by education and sector including all labour force participants (LFP), those less than 30 compared to all ages



Source: Own calculations based on Central Statistical Office data

Certificates are the most common form of post-secondary education in both public and private wage employment. Relative to other types of post-secondary qualification these are the most important for young employees in government. This relates to both their duration and the requirements of government jobs. Certificate training takes the shortest time in training ranging from 3 months to 12 months and most government employees who joined with secondary school level qualifications have in-house training at certificate level in fields specific to their work.

Figure 6. Proportion of workers by type of post-secondary education by sector including all labour force participants (LFP), those less than 30 compared to all ages



Source: Own calculations based on Central Statistical Office data

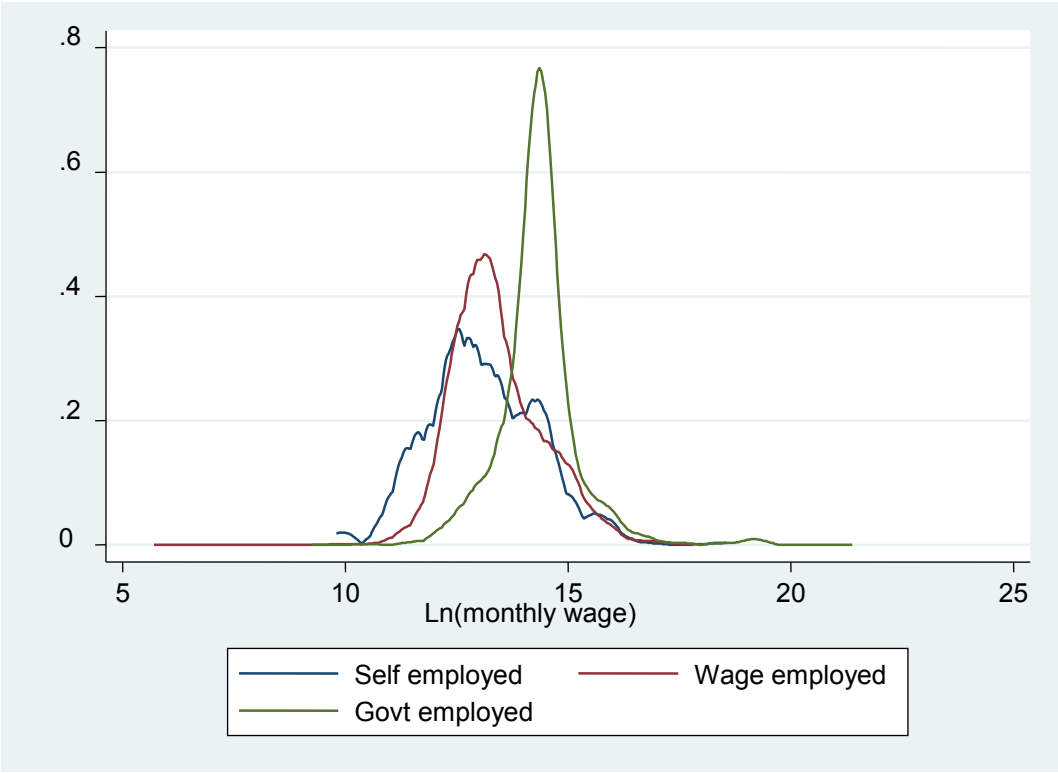
Education and wages in Zambia

Wages provide a good indication of the premium placed on skills – rare skills which are in demand will attract a higher wage than more commonplace skills or those which fewer companies require. Figure 7 shows the distribution of monthly wages for the self, wage and government employed. Two aspects of this figure stand out. The first is that there is a relatively large overlap in the distribution of wages, particularly between self and wage employment. Although those in self-employment earn less on average than the wage employed there is a substantial proportion of the self-employed who earn incomes which are comparable to the wage employed.[2] Self-employment can thus be relatively lucrative, presumably if an individual has access to capital either of the physical kind or human capital such as skills. The second thing which is noticeable is that government employment pays on average much more than employment in the other two sectors and that earnings in government employment are much less dispersed than in the other two sectors. Higher earnings in government jobs means that young people may 'queue' for these jobs - remaining unemployed whilst applying for these types of jobs. This may explain the relatively small proportion of young people in wage

[2] The proportion of the self-employed earnings similar levels of wages to the wage employed is large – close to 60 percent of the self-employed earn monthly wages which are higher than the bottom quartile of the wage employed and 42 percent earn wages which are higher than the median for wage employed.

employment with post-secondary education and may not be an irrational strategy, particularly among those who have a relatively good probability of getting a well paying public sector job. Young people with post-secondary education who do not find a public sector job may ultimately give up and transition into wage employment.

Figure 7. The distribution of wages by sector, 2010

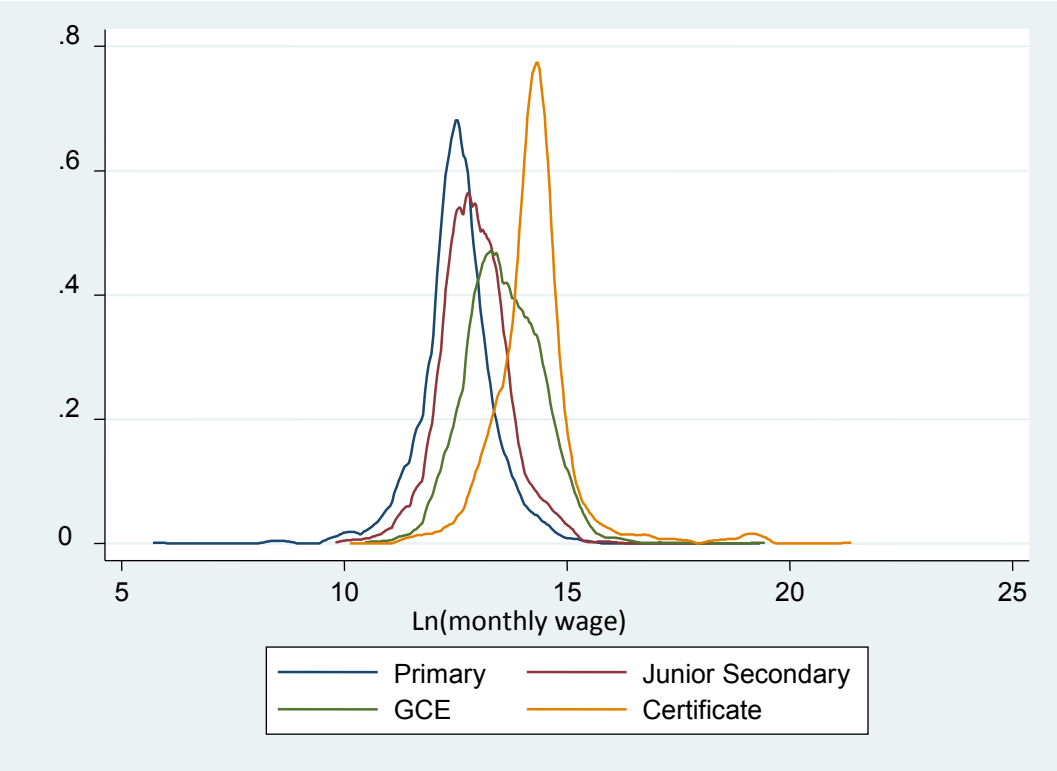


Note: Wages are measured as ln(monthly wages).

Source: Own calculations based on Central Statistical Office data

Educational levels provide a much clearer hierarchy in wage levels than sectors. There is a strong positive correlation between the level of education and wages. Wages for those with primary or junior secondary education are relatively tightly distributed but the distribution of wages for those with a GCE is broader, overlapping both those with lower levels of education and those with certificates.

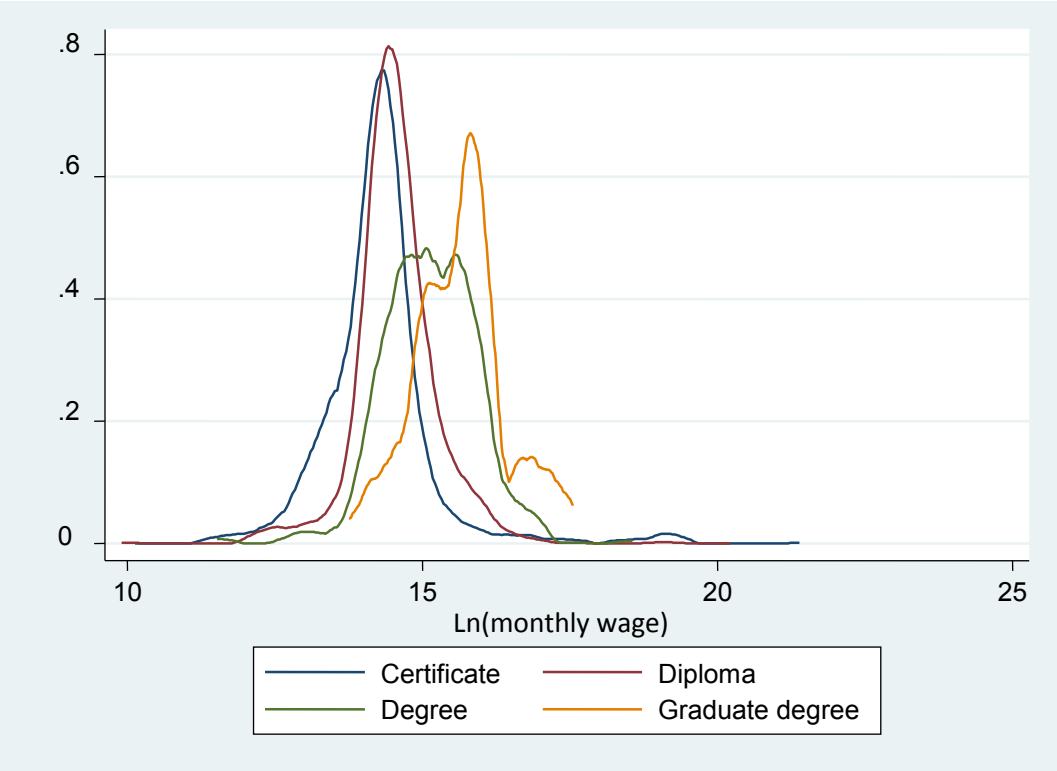
Figure 8. The distribution of wages by education level, lower education levels, 2010



Source: Own calculations based on Central Statistical Office data

There is also a hierarchy in wages for those with post-secondary education – on average those with university degrees earn more than those with certificates or diplomas, and those with graduate degrees earn more than those with undergraduate degrees.

Figure 9. The distribution of wages by education level, higher education levels, 2010



Source: Own calculations based on Central Statistical Office data

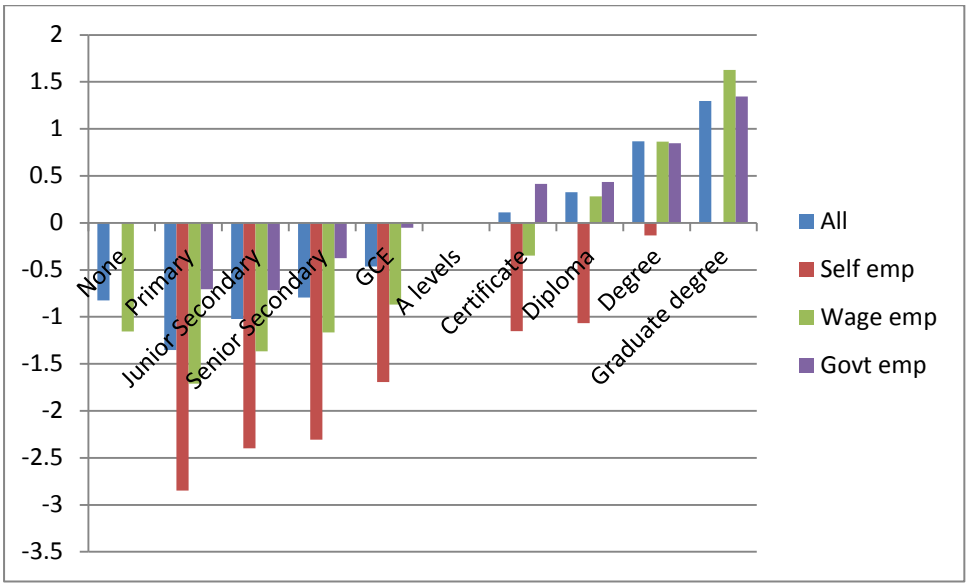
In order to control for the fact that certain education levels may be correlated with other factors we run earnings equations which control for individual characteristics such as gender and age. These are estimated using an ordinary least squares regression (OLS) which controls for age and gender.

Figure 10 shows the education premiums, relative to A-levels, for all workers and then by the sector of employment. The hierarchy in wages by education qualification is clearly evident in the figure – on average those with lower levels of education earn significantly less than those with higher education levels.

In terms of specific post-secondary qualifications, certificates do not seem to elicit a wage premium for the wage employed – a diploma seems much more useful in this sector. For government employment the returns to either a certificate or diploma is equivalent. In these sectors there are large returns to those with a university degree. Interestingly, although there is an increase in wages

with education for those in self-employment this relationship levels out with the completion of secondary school. There is also very little difference in the returns to a certificate compared to a diploma for the self-employed.

Figure 10. Education premiums (compared to A-levels) in monthly wages, self, wage and government employment, 2010

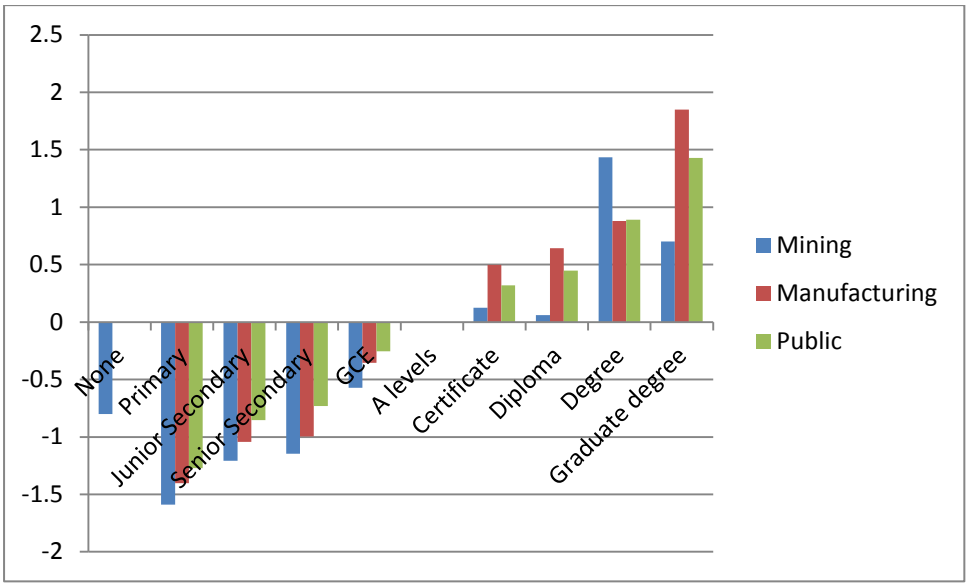


Notes: These are derived from the coefficient estimates of an earnings equation.

Source: Own calculations based on Central Statistical Office data

These results, together with those above, suggest that certificates are of particular importance for those in the public sector but that there is, on average, no shortage of certificate holders in the private sector. This is supported by the relatively large number of young people with certificates in the public sector. One factor explaining this is that many government employees may receive training which results in a certificate whilst working in a public sector job. For the wage employed, certificates make no difference to earnings compared to A-levels. Rather, the premium in the private sector is for those with diplomas, or university degrees.

Figure 11. Education premiums (compared to A-levels) in monthly wages, mining, manufacturing, and public, education and health sectors, 2010

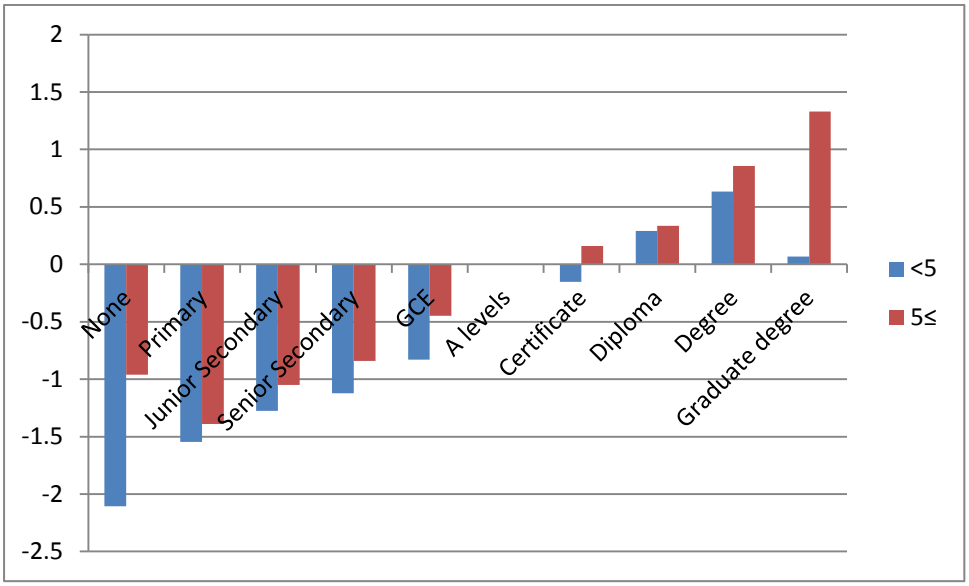


Notes: These are derived from the coefficient estimates of an earnings equation.

Source: Own calculations based on Central Statistical Office data

The mining and manufacturing sectors also display a hierarchy in wages which is based on education level. For the mining sector, the largest premium comes from an undergraduate university degree, indicating that this is a constraint in this sector. Hamukoma (2011) provides a detailed review of the challenges facing the Zambian mining industry in terms of skilled workers. He argues that there is a skills mismatch between the type of employees wanted by the mining industry and the type available, and that this is likely to become larger in future. He estimates that in 2012 there was a shortage of 540 skilled workers, with largest numbers for craft certificate holders – mining (209), technicians – mining (120), and graduates – mining (47). In the manufacturing sector, like public services, there are premiums to certificates, diplomas, degrees and a large premium to graduate degrees.

Figure 12. Education premiums (compared to A-levels) in monthly wages, by firm size, 2010



Notes: These are derived from the coefficient estimates of an earnings equation.

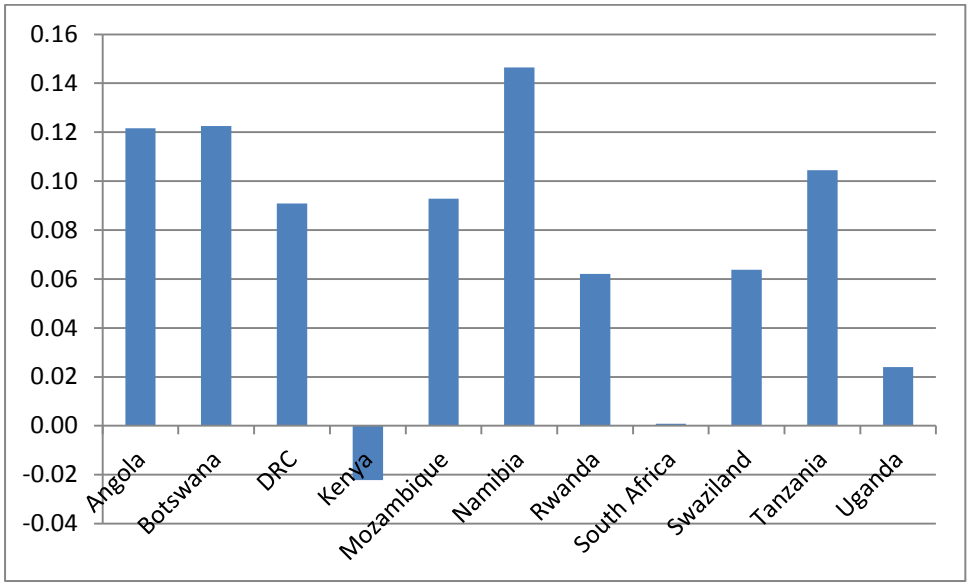
Source: Own calculations based on Central Statistical Office data

The size of the firm, earnings and the returns to education are also related. Returns to education are steeper for those in smaller firms (with less than five employees) below A-levels than for larger firms but this reverses at higher levels of education – bigger firms are more likely to pay relatively more to those with post-secondary education compared to small firms. This suggests that the skills associated with post-secondary education are in particular demand for larger firms.

Firms, training and wages

As the Zambian economy shifts away from agriculture towards sectors which require more skilled labour, the availability of skills may become a constraint. The World Bank's Investment Climate Surveys (ICS) ask managers of firms to identify whether certain things, such as infrastructure, labour regulations and the education of their workforce, are constraints to their current observations. Figure 13 shows the relative probabilities of a firm reporting that inadequate education of their workforce was a major or very severe constraint to their operations for a number of different countries in the region. These control for firm size and are relative to Zambia. What they show is that, on average, managers in Zambian firms are unlikely (or were unlikely in 2008 when the survey was undertaken) to think of education as a constraint when compared to managers in other countries.

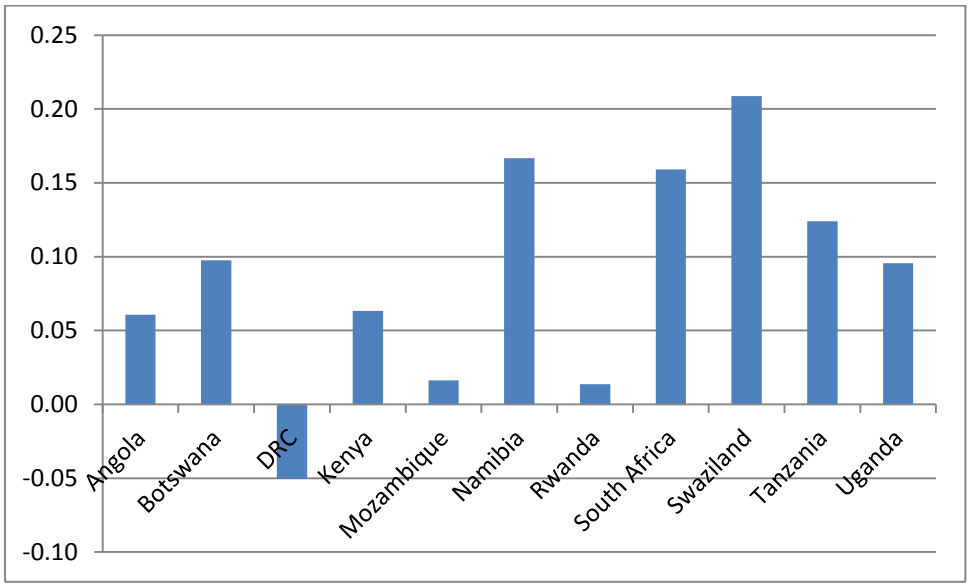
Figure 13. Probability of reporting inadequate education of the workforce as a major or very severe obstacle for firm operations, relative to Zambia and controlling for firm size



Source: Own calculations based on the World Bank's Investment Climate Surveys data

Figure 14 shows the relative probability of whether a firm undertakes training once firm size is controlled for. On average, across all countries considered except the Democratic Republic of Congo, Zambian firms are the least likely to run formal training programmes for its permanent employees. These results from the firms indicate that, in general, Zambian firms do not consider education a constraint and do not engage in training to improve the skills of their workforce.

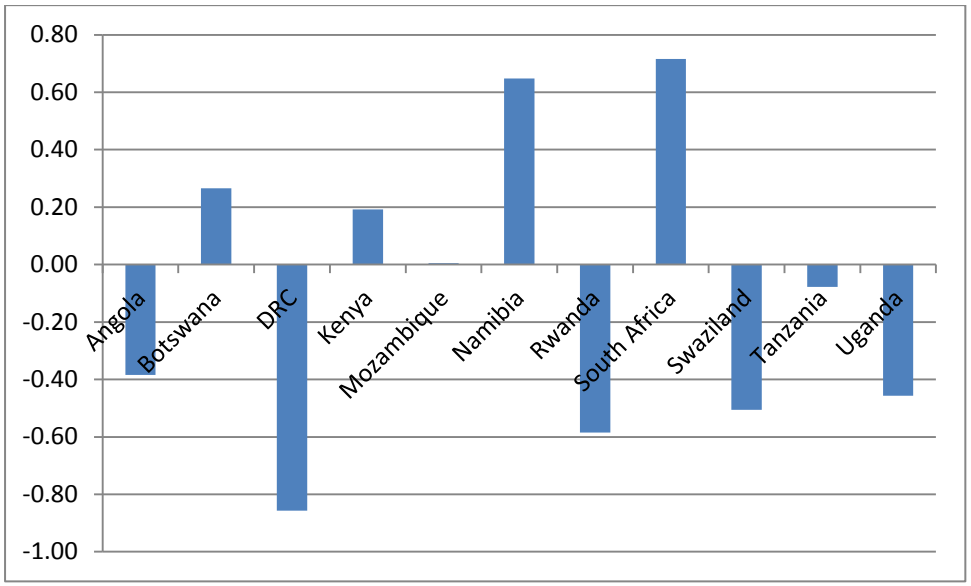
Figure 14. Probability of undertaking training, relative to Zambia and controlling for firm size



Source: Own calculations based on the World Bank's Investment Climate Surveys data

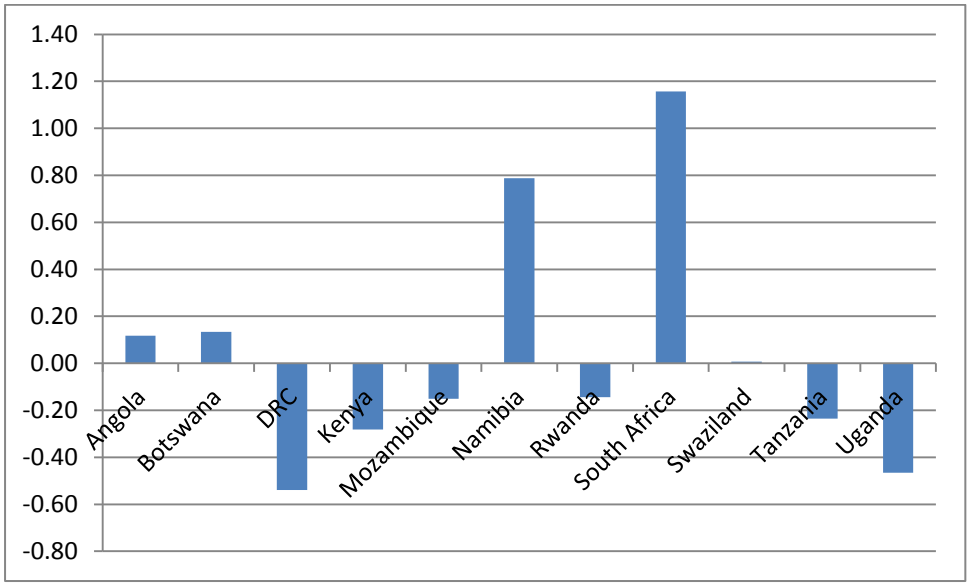
Zambian firms are also, on average, relatively capital intensive compared to other countries within the region. On average, Zambian firms use more capital per worker than firms than those in Angola, Rwanda, Swaziland, Tanzania and Uganda. These relatively high capital-labour ratios may be why relative wages are high compared to other countries in the region (as shown in Figure 16). However, government policies which raise the cost of labour may also contribute (World Bank, 2010).

Figure 15. Relative capital-labour ratios, relative to Zambia and controlling for firm size



Source: Own calculations based on the World Bank's Investment Climate Surveys data

Figure 16. Relative compensation levels for production workers, relative to Zambia and controlling for firm size



Source: Own calculations based on the World Bank's Investment Climate Surveys data

Discussion

Zambia has experienced a large increase in the proportion of the labour force with post-secondary education since 2004. The increase in education levels has happened across sectors but is particularly apparent among government workers where the proportion with post-secondary education almost doubled between 2004 and 2010. The largest area of demand in the government sector is for those with post-secondary certificates and these certificates are associated with a wage premium which is similar to the premium attached to those with diplomas. Private sector wage employment does not, on average, pay a premium to those with certificates, suggesting that these are not the type of qualifications which the private sector values. However, among some sub-sectors within the private sector, such as manufacturing, these types of qualifications do earn a premium. Manufacturing and the public sector pay both premiums for university degrees but the mining sector, in particular, pays a larger premium to those with undergraduate university degrees compared to other post-secondary qualifications. This suggests that there is a shortage of these types of individuals in these sectors.

These results highlight the heterogeneous nature of the skills composition of workers across sectors and that education shortages are associated with specific sectors. Broad surveys such as the World Bank's ICS actually indicate that, on average, firms do not perceive inadequate education as a constraint to current operations and are less likely to engage in formal training at the firm level than firms in other countries in the region. Furthermore, they pay higher wages than firms in the region and are more capital-intensive.

Any type of post-secondary education is associated with wage premiums for government employment; private wage employment requires diplomas or university degrees; and the mining sector pays a large premium for undergraduate university degrees. This indicates that policy initiatives to address the skills shortages within the Zambian economy need to be aligned with the specific requirements of sectors. Furthermore, this analysis does not indicate whether education levels cause these levels of earnings since the observed education level may proxy for other unobserved characteristics, such as motivation, which firms may value. This means that increasing education levels may not necessarily lead to the creation of more jobs or an increase in economic growth.

5. Education and employment in Zambia: What does industry want?

The quantitative analysis hints at heterogeneous skills needs across sectors. To understand this further we undertook a number of interviews to better understand the types of skills industry requires. These included a series of interviews with firms and industry representatives of the key growth sectors among them: The Zambia Association of Manufacturers, the Zambia Chambers of Commerce and Industry, Zambian Association of Building and Civil Engineering Contractors, the Zambia Chamber of Small and Medium Business Associations (ZCSMBA) and the Government (Public Service Commission, the Human Resources wing of government). The focus of this section is thus on the skills needs of the private sector. However, in a separate appendix (Appendix 2) we briefly discuss government skills needs.

Overall, industry feedback is centred on the lack of modern relevant skills among higher education graduates. This confirms the perception that there is a lack of linkages between industry and education sector providers. Since 1974 when the government took the training of technicians away

from industry, there has been a consistent mismatch of skills provided by the education system and what industry demands. Industry experts confirm that most higher education graduates have the theoretical knowledge but lack the hands on skills that the industry requires. The search for properly qualified graduates with the relevant skills is usually daunting, and when found, usually costly. Apprenticeships are a way to bridge the gap between theoretical knowledge and experience, combining both.

The series of interviews undertaken confirmed that there are specific qualities other than academic/theoretical knowledge that are sought after which are not discernible in official labour demand and supply statistics. This section draws out the key issues raised in these interviews.

'The big problem is sourcing and retaining skilled and experienced labour'

Skilled labour shortages are seen to represent a serious constraint in the construction, manufacturing and mining sectors in both the Lusaka and Copper Belt regions of Zambia. The quantity of post-secondary school graduates with relevant skills in technical areas is limited, and when available, expensive to recruit and retain. Sourcing relevant domestic labour especially for the big mining firms has been daunting, with most relying on foreign expatriates. This confirms the high premiums paid by firms to those with high levels of education identified in the quantitative section.

The small pool of people with the requisite skills makes it difficult for sectors and firms which cannot afford to pay high wages to attract these types of people.

For the construction industry, which seems to prefer to have full time permanent staff, the mobility of labour to higher paying mining jobs makes it difficult to get contracts. Recruiting fresh graduates with high wage expectations but little experience is risky in that the firm will have to invest in retraining these graduates at a high cost and risk losing them to higher paying sectors such as mining. Construction firms complain that this makes competition with international firms difficult.

The reduced ability to 'train and retain' staff and high churn rates has meant that many firms spoken to have had to offer higher wages to induce employees to stay. This increases costs and makes them less competitive. Industry feedback suggests that this problem is growing and has already led to

some businesses reducing their product offerings, and in some instances ceasing to operate. However, the inability (or unwillingness) of some firms to pay market wages for skilled individuals may indicate that they are less productive than other firms, or are in industries where they cannot pass on the increases in input prices. This would suggest that policy interventions should focus on increasing productivity.

'Foreign labour is more productive than local labour'

Among the interviewees there was a general perception that foreign labour was more productive than local labour and required less supervision. The Zambian Association of Building and Civil Engineering Contractors reported that Zambian TEVET institutions have drastically reduced enrolment, with some institutions going for years without any registered students in programmes such as carpentry, bricklaying and mechanical fitting. Further, for those that are available, firms report that on average, a Zimbabwean bricklayer would do twice the job of a Zambian bricklayer at half the cost with least supervision. The low levels of productivity are in part ascribed to the lack of apprenticeships during training and also mobile labour which shifts jobs/industries in search of a higher wages. However, the quantitative data revealed that, at least among production workers, Zambian workers earn, on average, higher wages than those in other countries in the region. Zambian education, certainly at the early levels, is also inferior to that of other countries. This would thus create an incentive for workers to migrate to Zambia and for employers to hire foreigners – at the same wage rate foreigners provide better value than local workers.

The mining industry firms interviewed were concerned with the quality of graduates produced by Zambian training institutions. Most firms lament the mismatch between the skills they require and the skills of those emerging from training institutions. The lack of skilled candidates at affordable wage rates leads to mining firms employing foreign expatriates. Representatives of the mining industry make the point that locally trained labour is less productive in part because the needs of industry and the training being undertaken are not aligned.

'The overall costs of skilled permanent labour in Zambia is high relative to foreign options and semi-skilled part-time labour'

For most multi-national mining firms in Zambia, high productivity is the most important characteristic they consider when hiring labour, whether foreigner or locals. In general these firms see Zambian labour laws as highly prohibitive in hiring labour that firms can train for their needs. They complain that aspects of the labour laws such as the minimum wage make it impossible to hire labour to train for future full-time engagement. In addition to paying Pay As you Earn Taxes (PAYE) which the employer has to cover indirectly, firms have to contribute towards the national pension scheme and medical expenses for the employees. These costs, together with the wages of workers, mean that they consider the combined labour cost as high, and relatively low productivity makes these relative costs even higher still. In order to overcome this, some firms hire foreign expatriate labour, which though may be expensive in relation to local labour, is argued to be more productive. Relatively high labour costs also make it more attractive for these types of firms to become more capital intensive. This corroborates the quantitative data which reveals relatively high wage rates and capital-intensity among Zambian firms compared to other firms in the region.

'Education providers are not proactive in engaging industry on relevance of their training'

A common response across those interviewed was that education providers do not seem to be aware of the relevance of certain skills that graduates are expected by industry to have. Changes in science and technology which have happened within industries, and even more broadly, are not reflected in the current education curriculum. While fundamental principles may be covered, more advanced knowledge, including recent developments, are not. This means that firms have to provide expensive in-house training in order to get new employees to the required level. This creates a further incentive for firms to hire foreign skilled labour.

Industry specific qualifications are also lacking. In an interview with a pharmaceutical drug manufacturing company, the respondent lamented that there are no locally trained industrial pharmacists despite repeated attempts to engage with the relevant education providers to encourage this type of training. These education providers face little incentive to put these types of courses in place but this has profound effects on the industry. The interviewed firm claimed that one of the notable pharmacology firms had to shut down in part owing to the non-availability of local skills. Currently, the industry employs mostly expatriates from India to manufacture drugs. The local

pharmacy graduates have to be retrained at the industry/firm's costs but owing to high minimum wages set for pharmacists, such industrial training is very costly. Growth in this sector has been this slow and as has employment growth. Incentives to encourage firm apprenticeships would be one way to create the types of skills required in this industry and a mechanism for the industry and education providers to collaborate. At present industry is very often not consulted about the contents of the curriculum.

Across the interviews the key messages from industry were in four broad areas:

I. Encourage workplace experience learning for students in TEVET and other higher education learning institutions;

II. Collaborate with end users. Both industry and education providers need to effectively collaborate;

III. Develop a mutually beneficial working relationship between TEVET providers and industry. This is extremely valuable for skills transfer to students as well as signalling the relevant training to education providers. It also provides a recruitment pool from which industry could recruit and allows firms to establish relationships with students before deciding whether to recruit them permanently.

IV. Adequate funding for TEVET education providers to meet the needs of industry skills training. The lack of adequately trained skilled lecturers and equipment in TEVET institutions is an often mentioned constraint to this.

'There is no active labour market information system'

Currently very limited labour market information exists in an easily accessible form in Zambia. This means that firms do not know the types of skills coming out of the higher education system, and that people enrolling in post-secondary education are unaware of which skills are in demand and what they may be able to earn when they get a job. In addition to this education providers are also unaware of changes in demand for certain skills and thus are slow to respond to industry's needs. Industry feedback suggests the urgent need for the establishment of an active labour market information system, especially for the industrial sectors, which could be managed by the Ministry of Labour. This would reduce information asymmetry and also signal what skills are available and

provided for by which education provider. This would allow industries to engage with specific providers for further collaboration on skills training. Currently labour offices, especially in provincial centres, operates as hosts for unskilled labourers who are mostly hired on a 'casual' basis but this does not provide any labour market intelligence about more skilled labour to industry. Suggestions from industry are for the Ministry of Labour and Ministry of Education, Science, Technology and Vocational Training to collaborate on the provision and management of an active labour management information system that will provide useful labour data.

'There is a negative perception of certain relevant skills provided by the TEVET Education System'

Industry feedback suggests that many high school graduates who do enter TEVET institutions seem to avoid certain types of training, such as bricklaying, which are in heavy demand by industry. The low perceptions of certain types of training seem to be mostly based on low expected wages/incomes from such professions. Responses from industry response suggest this is not the case. Construction firms seem to be able and willing to pay competitive wages to these professions if certified by the relevant TEVET education providers. This indicates a need to effectively communicate the needs of industry to high school graduates who may not have access to University education and to counter the perceptions that certain types of jobs are low-paid.

6. Policy Suggestions and Directions for Further Research

Over the past twenty year the Zambian economy has been growing and its structure changing. However, most of the jobs which have been created recently have not been in the sectors where growth has been largest, such as mining and construction, but rather in various types of services. In parallel to these changes in labour demand there has been a large increase in school enrolment, particularly at secondary school level, and with this a fall in the proportion of the labour force with only primary education and a relative increase in those with post-secondary education.

The observed increase in school enrolment has not corresponded with an increase in education quality however. Comparable tests indicate that Zambian primary schools produce the lowest scores in mathematics and reading across the region and that education quality, at least by these measures, has dropped since the 1990s. Even if current higher spending levels on education improve school

quality this is likely to take time and there is a current cohort of young people who have been through this poor education system and are in, or about to enter, the labour market.

Despite poor school education, Zambian firms are less likely to engage in formal training than firms in other countries in the region. They also, on average, do not consider these poor education levels a constraint to their current operations and seem to pay higher wages. Higher levels of capital intensity explain this, as do the types of sectors, such as mining, in which many firms participate and which are relatively capital intensive but require low levels of skills. It is thus no surprise that employers often find foreign labour more productive, since these types of individuals are likely to have been through better education systems and be prepared to work for lower wages. Even though most firms currently do not consider education as a constraint, poor education levels may be constraining the emergence of more productive firms and the growth of non-traditional sectors.

This research also indicates significant heterogeneity in education qualifications and the skills required across sectors and types of jobs. The proportion of tertiary educated employees in government jobs has increased substantially since 2004. Public sector jobs are also, on average, the best paid. This may indicate that people may be pursuing further education in order to be part of the pool from which government draws applicants, or it may just indicate a better educated and more productive government sector. The skills gap in the mining sector is most acute for technicians, those with craft certificates and graduates, and those with university degrees are paid large premiums. In manufacturing the premium paid to those with post-secondary education does not differ as much across qualification. This heterogeneity suggests that training programmes which aim to increase the pool of potential skilled employees will need to differ across industries. This is probably best done through close collaboration with industry bodies.

Should the trends in both labour demand and supply in Zambia persist, it seems likely that Zambia will face the twin problems of a skills constraint at the top end of the labour market and a large number of unemployed who have low levels of skills and poor quality education. At the same time, the proportion of labour force participants with some, or complete, secondary education will be increasing. These individuals are likely to have expectations of better job prospects which they assume come from higher education. These types of people can become a volatile political constituency if these expectations are not met.

There are at least three ways to overcome these challenges in the labour market. The first would be higher rates of economic growth which would lead businesses to consider workers further down the skills distribution. Policies to improve economic growth will thus have positive implications for the labour market. The second would be labour market reform to allow wages to be more flexible and create incentives to hire more low-skilled people. Certainly the structure of the Zambian economy in part determines the relatively high capital intensity of Zambian firms but regulations and non-wages costs also add to the overall cost of Zambian labour. The third approach would be to change the skills composition of the workforce so as to reflect the demands of the sectors where labour demand growth is likely to be highest. These three approaches are not mutually exclusive and are likely to be complementary.

In the long-term any attempt to improve skills within the Zambian labour market will need to tackle the quality of primary and secondary school education. Given the trends present in the Zambian labour market, the types of jobs which will be created in the future are likely to be in services, including retail. These jobs will require basic numeracy and literacy. Furthermore, any post-secondary education, whether vocational or academic, relies heavily on the skills and techniques taught at school. The rapid increase in enrolment in non-government schools since 2000 may actually be a market response to the poor quality of Zambian education. If these schools are actually better at teaching then the government sector needs to learn from them and they need to be allowed to play a bigger role in education. It would be useful to have more research to establish whether this is in fact the case.

In the shorter-term, the post-secondary education system needs to better fit the students which are emerging from the school system. Within Zambia tertiary education there are two main streams – TEVET and university. Enrolment in both is growing although university enrolment, which is currently lower than TEVET enrolment, is increasing at a much higher rate. Currently, TEVET education in Zambia, like in many countries, is often viewed as inferior with students opting into it only when they have 'failed' to get to University. One reason for this is that the TEVET system is not well resourced and does not receive strong financial support. Apprenticeships are not widely available and this has in part led to low quality graduates being produced. There is thus scope for reform in this sector in order to improve the efficiency of training and the employability of higher education

graduates. This will require collaboration between employers, or industry bodies and training institutions in order to design programmes which better suit the needs of firms.

The Zambian labour market may also function better if more information is available to job seekers, those entering post-secondary education and employers. One way to do this may be to create some sort of active labour market information system (as outlined in Appendix 1). Better information on school outcomes can also help to track improvements in education outcomes.

Directions for future research

This scoping study has discussed some of the issues related to education and employment in Zambia. Given the broad nature of this topic there are a number of areas which can benefit from future research that have not been dealt with sufficiently in this research. These include:

1) The role of private education providers. Enrolment in non-government schools has increased dramatically which may be a response to poor education quality in government schools. Research is needed in order to determine whether this is the case, whether these private schools add value efficiently and the role these schools can play in the education system.
2) The link between schooling outcomes and the labour market. Many of those who complete secondary education will not engage in any further education. However, some of the skills which they will have learnt at school will be beneficial in the labour market. Further research on which skills which can be imparted at school, matter for successful outcomes in the Zambian labour market can provide guidance for school curricula.
3) A better understanding of how the distribution of wages is related to educational qualifications and skills. There is a clear hierarchy in earnings depending on the level of education but it is not clear whether it is education or something else which determines this. Further research could unpack this.
4) How educational qualifications are associated with the sector which people work in, including the informal sector. Within wage and self-employment there is a large dispersion, but also a large degree of overlap, in the distribution of earnings. Government jobs pay more but the dispersion of earnings is lower. An interesting research question which can inform policies which aim to improve the quality of jobs is what role education plays in determining between and within sector variation in relation to other factors.

5) The relative importance of firm-specific, sector-specific and more general skills and how these relate to education. Skills requirements are heterogeneous across sectors and are likely to be heterogeneous across firms. The relative importance of firm compared to sector heterogeneity is important for designing interventions to improve skills. If most of the heterogeneity is at the firm-level then sector specific training will have little impact. Matched employer-employee data over time would be one way to examine this issue.
6) Do the most productive firms engage in training, what type of training is this and can this be replicated in other Zambian firms? Although it seems that relatively few firms engage in formal training in Zambia, further research can determine whether these firms are more productive and able to compete both domestically and internationally. It may be that successful firms are able to use individuals as is, which would suggest that government money could be used more productively in other areas, or they may engage in specific types of training for their needs. They may also engage in training which could be undertaken at lower cost through educational institutions, or training which can be replicated in other firms.
7) There are also a number of lessons which can be learned about education reform and the structure of further education by examining the experiences of other countries. At a primary and secondary school level, what are countries in the region such as Kenya, Tanzania, Swaziland and Zimbabwe doing which leads to learning outcomes which are so much better than in Zambia? Research on other countries research can also explain what successful vocational training programmes actually look like and how industries and universities can collaborate in order to train graduates which have the specific skills required in these industries.

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Appendix 1: Potential importance of an active labour market information system (LMIS)

Importance of LMIS to the government

- Provides information about active labour market policies concerned with providing employment and closing the skills gap.
- Evaluates the results of labour related policies and programmes (e.g., the effects of minimum wages on employment).
- Provides key indicators on demand and supply labour in Zambia.

Importance of LMIS to the employees or job seekers

- Provides information to make decisions about future career development by providing information on the needs of the labour market.
- Identifies potential current and future job market opportunities.
- Provides information on education providers, skills development training and active labour market programmes which they can participate in.

Importance of LMIS to education providers

- Helps education providers align course provision with labour market needs through the analysis of labour market trends.
- Helps identify industries that they could partner with to enhance practical skills training to increase employability of students.

Importance of LMIS to employers

- Provides information to facilitate decisions about upgrading their employees' skills.
- Provides information on skills available in the labour market and their trends.
- Provides information on labour policies and labour costs.

Appendix 2: Education and Employment in the Zambia Public Sector

This appendix provides an overview of the public sector's treatment of labour and focuses on recruitment needs and laws. As would be expected, the public service's response to its labour needs takes a different approach from that of the private sector as government can play a dual role of supplier of skills through the public education system and end user demand for these skills.

The Public Service Management Division and the Public Service Commission, which fall under the Cabinet Office under the Office of the President, are responsible for the recruitment, training, placement and promotion of civil servants in the Zambian Civil service. Recruitment of personnel in the Public Service is now supposed to be done on merit, with emphasis placed on post-secondary level education. The demand for personnel in the civil service is varied, and the government remains the largest employer in the country.

A public service training policy is in place. A number of management development training institutions exist in the country, offering various pre and in-service training programmes to civil servants of various categories. The institutions include the National Institute of Public Administration (NIPA) and the Chalimbana Training Institute. For officials in local government, there is a mandatory requirement for one to have attained a diploma in local government administration in addition to any qualification held.

Unlike the private sector, the public sector has relaxed entry requirements in terms of experience for junior level government officials who aim at a career in government. Fresh graduates are recruited and re-oriented to the needs of the public service. In-house training plays a crucial role in government.

Wages and conditions of service in the public sector are regulated through the process of collective bargaining under the Industrial Relations Act for employees of the Government, district councils, and employees in domestic service. For general workers, cleaners, watchmen, drivers, clerks, copy

typists, receptionists and telephonists who belong to the lowest categories the Minimum Wages and Conditions of Employment Order applies.

While wages in similar private sector jobs may be high, there is high demand for government jobs by the population leaving college and university. The potential job security and further education opportunities in the public sector and the lack of alternative jobs makes the public service a highly attractive employer.

Most public sector jobs aside the police and army are in government administration, and as such, there is usually a high demand for social science (non-technical) related disciplines to join the civil service.

Appendix 3: List of Interviewed Firms

Id	Name	Sector	Location
1	Crossways Investments ltd	Construction	Lusaka
2	Chamb Investments	Construction	Lusaka
3	Lewis Construction	Construction	Lusaka
4	Premier Electrical	Construction	Lusaka
5	Dian Construction	Construction	Kitwe
6	Jonfel Construction	Construction	Kitwe
7	Marike Engineering	Construction	Kitwe
8	Daven Works Construction	Construction	Kitwe
9	Pharmanova	Manufacturing	Lusaka
10	Foam King Industries	Manufacturing	Lusaka
11	Gourock Industries	Manufacturing	Ndola
12	Foam King Industries	Manufacturing	Ndola
13	Taurium Mining	Mining	Lusaka
14	Collum Coal Mine	Mining	Lusaka
15	Certrap Zambia	Mining	Ndola
16	Non-Ferous Metals Zambia	Mining	Ndola
17	Quantun Mining	Mining	Ndola
18	Makole Enterprises	Sector Representative	Lusaka
19	Zambia Association of Manufacturers	Sector Representative	Lusaka
20	Zambia Associatison of Chambers of Commerce and Industry	Sector Representative	Lusaka
21	Association of Civil Engineering and Building Contractors	Sector Representative	Lusaka

The International Growth Centre (IGC) aims to promote sustainable growth in developing countries by providing demand-led policy advice based on frontier research.

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