Skills and Earnings in Formal and Informal Urban Employment in Ghana

Courtney Monk, Justin Sandefur and Francis Teal

Centre for the Study of African Economies
Department of Economics
University of Oxford

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Abstract

The value of the skills in an economy depends in part on the quality and quantity of the supply and in part on the demand for skills. In Ghana the pattern of job creation over the last decade has been one where non-farm self-employment and jobs in small firms have exploded in importance relative to jobs in the formal sector. While there has been extensive research on the returns to education, there has been much less on the returns to skills training. In Ghana there is a highly developed apprenticeship system where young men and women undertake sector specific training which is paid for usually by those responsible for the apprentice and which yields skills used primarily in the informal sector. In this paper we use a recent urban based household survey with detailed questions on the background, training and earnings of workers in both wage and self-employment to ask how apprenticeship compares with other forms of training in terms of pay and employment outcomes. We show that apprenticeship is by far the most important institution providing training and is undertaken primarily by those with junior secondary school or lower levels of education. In comparing those with some form of training to those with none, training to be a nurse or teacher gives by far the highest return, a three fold increase in earnings. In contrast those who have done an apprenticeship earn significantly less than those with no training. Once an allowance is made for the level at which the apprentice enters the system there is evidence that for those with the lowest level of education apprenticeship does lead to a substantial increase in earnings, some 41 per cent. For those with higher levels of education it does not lead to any increase at all. In fact the point estimates imply a decrease. We argue that the reasons for undertaking an apprenticeship can be found, in part, in the powerful effect undertaking an apprenticeship has in increasing the probability of informal employment relative to having no job. In contrast to these outcomes for apprentices we show that training to be a nurse or teacher not only pays off in earnings but substantially shifts the probability of being in formal relative to informal employment. In summary these forms of training, one undertaken in the private sector and the other in the public sector, are associated with radically different outcomes for those receiving the training.

1   Introduction

Skills training in Ghana occurs in both the private and public sectors. By far the most important institution which provides such training in the private sector is the apprenticeship system. Apprentices are young men and women who undertake highly sector specific training. Some of these apprentices then go on to form their own businesses, others go on to work in the firm in which they were apprentices as masters, some move to other firms or occupations. It matters where apprentices go as incomes differ substantially across these different outcomes, Sandefur, Serneels and Teal (2007). While much is known about the institution in terms of its structures and forms we know much less about how well apprenticeship pays relative to other forms of training and relative to more academic education. Frazer (2006) explores the institution of apprenticeship in Ghana and argues that it is a form of skill acquisition which pays off in self-employment if the apprentice acquires sufficient capital to start their own buisness. Thus to establish the effect of apprenticeship it is essential to be able to observe individuals in both the wage and self-employment sectors. In the next section we document how important has been the expansion of the self-employment in urban Ghana over the last decade.

Over the period 2004 to 2006 the CSAE in conjunction with the Ghana Statistical Office has carried out an urban based labour market survey which in its most recent round had very detailed questions concerning the skills and training that the individuals had received. The survey also sought to measure the incomes of the self-employed with as much accuracy as possible in a manner that would allow incomes to be compared across the formal and informal sectors. This survey is a follow-up to two earlier surveys carried out in 2004 and 2005. In this note the data on apprentices from the 2006 round of this survey is used to address a range of questions about the background of apprentices and the outcomes of their training. We leave to later work linking this data to the earlier rounds of the survey. The questions we address are:

1. How important is apprenticeship as a form of training?
2. What is the educational background and occupational outcomes of the apprentices?
3. Does being an apprentice pay?
4. Do the occupational outcomes from apprenticeship differ from that of other forms of training?

While we address questions specific to Ghanaian apprenticeship the analysis links to the long history in Ghana, and elsewhere, of the relative value of academic relative to vocational education, Foster (1965a,b) and to the policy debate as to how public provision compares with the private provision of training, Middleton, Ziderman, and van Adams (1993). In the next section we document the rise in the importance of the informal sector in providing job opportunities in the

urban sector. Sections 3 to 6 address the four questions posed above. A final section draws policy conclusions as to the links between skill training and job creation.

2   Formal and Informal Job Creation in Ghana

In this section we provide a background to our data on training by documenting what types of jobs have been created in Ghana over the period 19877/88 to 1998/99, a period for which we have comparable LSMS household based surveys. Table 1 is taken from Kingdon, Sandefur and Teal (2006). In Table 2 we use the same source to show how the job composition of Ghana's workforce has changed over the period from 1987/88 to 1998/99.

Table 1   Wage and Non-Wage Employment in Ghana

	1987/88		1988/89		1991/92		1998/99	
	%	000s	%	000s	%	000s	%	000s
Wage Employees	17.3	1,121	18.1	1,215	15.4	1,143	13.2	1,166
Government	8	518	7.9	530	7.8	579	5.9	521
State Enterprise	1.9	123	2.3	154	1.2	89	0.6	53
Private	7.4	480	7.9	530	6.4	475	6.7	592
Self-employment	19.5	1,264	24.2	1,624	23.5	1,744	27.3	2,411
Unpaid Family	2.2	143	1.1	74	1.3	96	0.3	26
Agriculture	58.7	3,804	54.6	3,664	56.7	4,207	55.7	4,918
Unemployed	2.2	143	1.9	127	3.2	237	3.5	309
Total Labor Force	100	6,480	100	6,710	100	7,420	100	8,830

Source: GLSS Surveys and author calculations. The sample is confined to those aged over 18.

Table 1 shows that over the period from 1987/88 to 1998/99 the labor force in Ghana increased from 6.5 million to 8.8 million, an increase of more than 2 million while the number of wage employees scarcely changed at all. The numbers classified as unemployed by the household surveys only increased by 200,000 so where did the labor force participants go? The answer is that about half the jobs were created in the rural sector and about half went into non-farm self-employment. Incomes are much higher in households headed by one with an urban self-employed job than a farmer so this growth in employment has important implications for policy towards poverty, Ghana Statistical Service (GSO) (1995, 2000).

In Table 2 we provide a breakdown by sector. There has been a sectoral shift in employment towards manufacturing and services and away from agriculture. Such a shift would be anticipated in a growing economy. However this shift is not, as already noted, one into wage

Table 2   Jobs by Sector

GLSS Round 1: 1987/88

	Farmer	Wage Job		Non-farm	All
		Not private	Private	Self-employed	
Sector					
Agriculture	61.4	1.3	1.3	0.8	64.8
Manufacturing	0.0	0.4	1.3	6.0	7.7
Mining	0.0	0.5	0.1	0.1	0.7
Services	0.0	8.2	5.0	13.6	26.8
Total	61.4	10.4	7.8	20.4	100.0

GLSS Round 4: 1998/99					
	Farmer	Wage Job		Non-farm	All
		Not private	Private	Self-employed	
Sector					
Agriculture	57.0	0.4	0.8	0.7	59.0
Manufacturing	0.0	0.2	1.3	8.6	10.1
Mining	0.0	0.2	0.3	0.1	0.6
Services	0.0	6.3	3.9	20.1	30.3
Total	57.0	7.1	6.4	29.5	100.0

Source: Author calculations from GLSS Surveys.
The Table shows the percentages of jobs by sector and by whether they are wage or self-employment. The non-private sector includes international organisations as well as the domestic public sector. The Figures differ slightly from those in Table 1 as we have confined the sample to those individuals for which we have sectoral as well as occupational information. The sample is still restricted to those aged over 18.

employment, but for both manufacturing and services the rise has been in self-employment. This increase has been particularly large for the service sector where jobs in the self-employed sector have increased from 14 to 20 per cent over the decade. The data is these first two Tables show the importance of the rise of informal relative to formal employment. While there is no agreed definition of how formality and informality are to be identified it is clear that informality describes well jobs in the self-employed service sector and it is this sector where almost all of the urban jobs have been created.

It would appear from Tables 1 and 2 that the informal sector has done a remarkable job in absorbing the rapid growth in the labour force. In contrast to some other countries in Sub-Saharan Africa, in particular Ethiopia and South Africa, unemployment appears to be very low, see Kingdon, Sandefur and Teal (2006) for the comparative data. The figure in Table 1 for 1998/99 is that only 3.5 per cent of those in the labour market are unemployed. However how many of the population are in the labour force and, of central importance for our study, how high is unemployment in the urban sector among the young? As the GLSS3 and GLSS4 questionnaires were very similar, and in respect of how employment and unemployment can be identified virtually identical, we use them to ask: how many individuals living in urban areas, have jobs

which generate payment of some form? In Table 3 we answer that question for two groups of individuals those aged between 15 and 65 (Columns [1] and [2]), and those aged between 15 and 24 (Columns [3] and [4]). The sample is confined to those who are not at school.

Table 3 The Number with Jobs in 1991/92 and 1998/99 (Percentages of the Population)

	1991/92	*1998/99*	*1991/92*	*1998/99*
	Aged 15-65		Aged 15-24	
	[1]	[2]	[3]	[4]
Wage Employees	29.6	23.1	12.4	8.1
Self-employment	41.2	45.8	22.7	20.3
Unpaid Family	2.3	3.2	5.0	7.8
Unemployed	8.2	7.9	12.8	11.6
Labor Force	81.5	80.0	52.9	47.7
No Jobs	29.1	31.1	64.9	71.7

Source: GLSS surveys. The sample is confined to those classified as being in an urban area, whose principal activity was not farming and who are not identified as being at school. A job is defined as being either a wage employee or in self-employment. The later is identified as answering yes to the question, "during the last twelve months have you made money including payment in kind through self-employment (for example trading)?"

The data in Table 3 present a very different picture to that in Tables 1 and 2, some 30 per cent of the population aged 15 to 65 do not have a job, while among the young workforce, those aged 15 to 24, in 1999 over 70 per cent did not have a job. The differences are primarily due to the proportion of the population in the labour force being very low. Is this due to differences across gender? In table 4 we take the data for 1998/99 and divide it up by gender for the same age groups as for Table 3. The low participation rate in the labour force is not due to a difference across genders.

Table 4 The Number with Jobs in 1998/99 by Gender (Percentages of the Population)

	Men		*Women*	
	Aged 15-65	Aged 15-24	Aged 15-65	Aged 15-24
Wage Employees	39.7	12.2	10.8	5.4
Self-employment	30.6	13.2	57.1	25.0
Unpaid Family	1.2	3.6	4.6	10.5
Unemployed	8.9	12.0	7.2	11.3
Labor Force	80.5	41.0	79.6	52.1
No Jobs	29.6	74.6	32.2	69.8

The sample is the same as that detailed in the notes to Table 3.

For the complete age range, from 15 to 65, the labour force participation rate is some 80 per cent for both men and women, among the younger age group it is much higher from women than men. The data in Table 4 show that among the young, who are those for whom training is most important, 75 per cent of men and 70 per cent of women do not have a job defined as an income

sourced from wages or self-employment. That does not imply they do not carry out activities of economic value to their households, it does mean that policy in Ghana has not been successful at creating either wage or self-employment jobs for the young. We turn now to the training undergone by these young people.

3   How important is apprenticeship as a form of training?

We begin by asking how important is any form of training among the urban population based on our new data. As Table 5 shows within our sample of people aged from 15 to 65, including those both in and outside the labour force, 33 per cent have done some form of training either as an apprentice or attending some vocational or technical school.

Table 5: Training in Ghana in 2006

	Number of observations	% of total
No formal training	1099	67
Any apprentice/vocational/technical training, past or current	544	33
Total individuals, excluding children and the elderly	1643	

Source: Ghana Urban Panel Household Survey, CSAE/GSO 2006.

In the analysis that follows we are going to identify four kinds of training which occur outside the main academic educational stream. These are firstly attending a vocational or technical school, secondly undertaking an apprenticeship, thirdly being trained on-the-job and finally being trained as a teacher or nurse. The reason for separately identifying training as a teacher or nurse will be apparent from the results that we present below. Many individuals do more than one form of training so in Table 6 we present the number of training events in the data, ie one of the training activities identified in the survey.

In Table 6 we identify both current and past training. It is clear that apprenticeship is by far the most common form of training, 16 per cent of the training events in the survey are current apprenticeship while 41 per cent are past apprenticeships. The second most important form of training in that classified as on-the-job, followed by vocation training, excluding that for teachers and nurses, who constitute 3 per cent of the training events.

Table 6: Types of Training

	Number	% of total
Current apprentice	122	15

Past apprentice	317	40
Current vocational trainee	16	2
Past vocational trainee	112	14
Current on-the-job trainee	40	5
Past on-the-job trainee	158	20
Trained teacher/nurse	25	3
Total number of training events	790	100

Source: Ghana Urban Panel Household Survey, CSAE/GSO 2006.

4   Educational background and occupational outcomes of the apprentices?

In Table 7 we present the education background of the individuals in the sample and for apprentices in order to asses how their educational patterns differ. Table 8 presents a similar breakdown for occupational outcomes.

Table 7   Educational Background

Complete sample	Number	% of total
No education (years<6)	226	14
Primary (years between 6 and 9)	218	13
Middle (9 or 10 years -- jss or middle)	896	55
Secondary	283	17
Post secondary (strictly academic)	13	1
Polytechnic	7	0
Total	1643	

Individuals who did an apprenticeship in the past	Number	% of group
No education (years<6)	29	9
Primary (years between 6 and 9)	32	10
Middle (9 or 10 years -- jss or middle)	233	74
Secondary	23	7
Post secondary (strictly academic)	0	0
Polytechnic	0	0
Total	317	

Source: Ghana Urban Panel Household Survey, CSAE/GSO 2006.

It is clear from Table 7 that by far the most common pattern for apprentices is to enter it after the end of junior high school, which under the old education system was the end of middle school. Of those individuals in the sample who had done an apprenticeship in the past 74 per cent entered at the junior high school level. However it will prove to be of importance for the results which will be shown below to note that while this pattern is by far the most common there are different paths. Some 9 per cent had done an apprenticeship with no education. A comparison of the

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educational background of those who did an apprenticeship with the whole sample shows that it is those with junior secondary or below who are more likely to be apprentices than those with higher levels of education. Indeed there is nobody in the sample who undertook an apprenticeship who completed a post secondary qualification.

Table 8   Occupational Outcomes in 2006

Complete sample	Number	% of total
Self-employed	549	33
Small firm	248	15
Large firm	169	10
Public sector	64	4
No earned income	613	37
Total	1643	

Individuals who did an apprenticeship in the past	Number	% of total
Self-employed	181	57
Small firm	52	16
Large firm	30	9
Public sector	8	3
No earned income	46	15
Total	317	

Note: this includes those who also did, in addition, other types of training.
Source: Ghana Urban Panel Household Survey, CSAE/GSO 2006.

It is clear from Table 8 that the most common pattern for apprentices is to be self-employed. However it will prove to be of importance for the results which will be shown below to note that some 15 per cent of the sample, who had done an apprenticeship, currently had no income. A comparison of the educational background of those who did an apprenticeship with the whole sample shows that it is those with junior secondary or below who are more likely to be apprentices than those with higher levels of education.

5   Does being an apprentice pay?

In order to answer the question does apprenticeship pay it is clearly crucial to be able to measure self-employment income. Our data is taken from a longitudinal labor market survey conducted by the Centre for the Study of African Economies (CSAE) at Oxford University, under the direction of the authors and in collaboration with the Ghana Statistical Office (GSO). The urban panel survey (UPS) collects information on incomes, education and labor market experience, household

characteristics and various other modules for labor force participants (ages 15 to 60) in urban areas. For Ghana these areas span the four largest urban centers in the country: Accra (and neighboring Tema), Kumasi, Takoradi and Cape Coast. The samples were based on a stratified random sample of urban households from the 2000 census in Ghana.[1] While the initial sample was household based, interviews were conducted on an individual basis, and the unit of analysis in what follows will be at the individual level. A total of 830 were interviewed in the first round of the survey in Ghana, which was conducted between October 2003 and June 2004.

Collecting income data on the self-employed in low-income countries is a controversial endeavor. Field guides for the World Bank's Living Standards Measurement Surveys (LSMS), which serve as the international standard for household surveys in development economics, recommend survey managers not collect this information. The stated rationale is that self-employed business people in the informal sector rarely keep written accounts and their self-reported income data may be too noisy to be of use. For household based enterprizes, the distinction between business and personal expenditures may be completely alien to respondents. We acknowledge the validity of these concerns.

However, because the non-agricultural self-employed constitute a majority of the urban working population in Ghana, we feel measuring such incomes are essential to our current objective of understanding the impact of apprenticeship on welfare. Our income measure for the self-employed is based on self-reported profits. Profits are net of routine operating expenses and gross of fixed capital expenditure, if any. The concepts of ``revenue'', ``business costs'', and ``profits'' are explained to respondents by enumerators with experience in conducting firm and household surveys. As the surveys are entered directly onto handheld computers, a simple mechanical check forces enumerators to go over the numbers again if revenue, cost and profit figures are inconsistent. Enumerators have reported few conceptual difficulties with this portion of the questionnaire.

In Table 9 we report the descriptive statistics on which our analysis will be based where we make a distinction between those who earn some income and those who report none. A breakdown by wage employees and the self-employed is reported in an Appendix. Using the data summarised in Table 9 we carry out a series of tests to ask of the data the following question: which of the four forms of training we have identified - vocational, apprenticeship, on-the-job and teaching and nurse training - pays the most? The answer to that question will clearly depend

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[1] We should note that the analysis in this paper does *not* incorporate data from the Ghana Manufacturing Enterprise Survey (GMES). The UPS and the GMES are conducted in parallel with a common survey instrument. However, we restrict ourselves in this paper to the population based sample of the UPS, excluding the firm-based sample of manufacturing employees interviewed through the GMES.

on how much we control for in any equation. In Table 10 we control for gender, age, as a measure of general work experience, education measured in year and a raven's test which is intended as an indicator of reasoning ability similar to that originally used in Knight and Sabot (1990). We will also investigate how controls for occupation influence our measures of the returns to training. We identify four occupation classes - the self-employed, those working in a small firm, defined as one with less than 10 employees, those working in large firms, defined as those with more than ten employees and those working in the public sector. Workers employed in pubic sector firms are not separately identified, they will be included in the large firm category so in our analysis the public sector is essentially civil servants.

In Table 11 we extend the set of controls in two dimensions. Firstly, instead of controlling for education by a continuous measure we use dummies for the highest level completed. Secondly, we allow the return from forms of training to differ depending on where the student enters the training system. Such a distinction has been found to be important in understanding the returns to training in Tanzania, Kahyarara and Teal (2006).

We begin by asking the simplest descriptive question: how do the earnings of those who received at least one of these four forms of training compare with those who received none? This question is answered in Table 10 column [1]. Our data imply that the returns from different forms of training differ radically. Those who undertake training to be either a nurse or teacher receive incomes some three times higher than those with no training. In contrast those with some on-the-job training receive only 27 per cent more income those with no training [obtained by exp(0.24)-1]. In even greater contrast those who have undertaken an apprenticeship receive incomes 17 per cent *lower* than those with no training. It is important to recognise that his does not imply that undertaking an apprenticeship lowers earnings. It implies that simply as a descriptive fact apprenticeship is associated with a range of circumstances which lead to lower levels of income on average than those with no training. What those circumstances might be we now investigate by including controls in the equation.

Table 9   Summary Statistics

Sample (excluding students, including people with no earned income):

N = 1356	Mean	Standard Deviation
Male (=1 if male)	0.43	0.50
Age (years)	36.62	11.59
Raven's Score (out of 20)	4.68	4.75
Education (years)	8.34	3.81
Past apprentice (=1 if past apprentice)	0.23	0.42
Past vocational (=1 if past vocational trainee, excluding teachers and nurses)	0.08	0.27
Past on-the-job training (=1 if past on-the-job trainee)	0.11	0.31
Teacher/nursing training (=1 if past teacher or nursing trainee)	0.01	0.12
Monthly earnings in cedis	108,589	109,679
Monthly earnings in dollars	88.48	89.37
Log of monthly earnings in dollars	n/a	n/a

Sample with earned income (excludes students):

N = 932	Mean	Standard Deviation
Male (=1 if male)	0.44	0.50
Age (years)	35.38	10.59
Raven's Score (out of 20)	4.52	4.81
Education (years)	8.21	3.99
Past apprentice (=1 if past apprentice)	0.29	0.45
Past vocational (=1 if past vocational trainee, excluding teachers and nurses)	0.09	0.29
Past on-the-job training (=1 if past on-the-job trainee)	0.14	0.34
Teacher/nursing training (=1 if past teacher or nursing trainee)	0.02	0.13
Monthly earnings in cedis	111,627	110,379
Monthly earnings in dollars	90.95	89.94
Log of monthly earnings in dollars	4.11	0.95

Source: Ghana Urban Panel Household Survey, CSAE/GSO 2006.

In Table 10 Columns [2] and [3] we present two basic earning functions to establish a basis for how the effects of training and occupation may impact on earnings. In Column [2] we only control for gender, age and education, in Column [3] we include our control for reasoning ability, the Raven score. While this measure of ability decreases the return to education a little the impact is not large. This is consistent with a very wide range of evidence that any positive upwards bias on the OLS estimates of the return to education through any correlation between ability and education are small, see Card (2001) for a review.

Our first test as to whether training is linked to increases in income, once we control for human capital, is in Table 10 Column [4] where we include the training measures as well as our controls for gender and human capital. The effect of these controls is to remove any significant effect of training on earnings for all except those going to teacher or nursing school. It remains

Table 10

Earnings Equations with Years of Schooling

	(1)	(2)	(3)	(4)	(5)
Male		.435 (.057)***	.392 (.058)***	.404 (.058)***	.341 (.059)***
Age		.063 (.019)***	.064 (.019)***	.064 (.019)***	.064 (.019)***
Age^2		-.064 (.025)**	-.064 (.025)**	-.065 (.025)***	-.065 (.025)***
Education (years)		-.078 (.022)***	-.084 (.022)***	-.078 (.024)***	-.065 (.024)***
Education^2 (years^2/100)		.913 (.152)***	.863 (.153)***	.785 (.167)***	.621 (.169)***
Raven score			.028 (.006)***	.026 (.006)***	.023 (.006)***
Past vocational/technical school	.069 (.100)			.104 (.092)	.085 (.088)
Past apprentice	-.159 (.072)**			-.061 (.069)	-.024 (.068)
Past on-the-job training	.240 (.093)**			.094 (.081)	.108 (.078)
Teacher/nursing school	1.069 (.172)***			.719 (.241)***	.458 (.231)**
empl. small firm					-.161 (.070)**
empl. big firm					.314 (.076)***
empl. public					.420 (.119)***
Obs.	932	932	932	932	932
R^2	.032	.167	.184	.194	.22

All standard errors are robust. Regressions include controls for city of residence.

Table 11

Earnings Equations with Schooling Dummies

	(1)	(2)	(3)	(4)	(5)
Male	.449 (.057)***	.409 (.058)***	.410 (.058)***	.347 (.059)***	.345 (.060)***
Age	.068 (.019)***	.068 (.019)***	.068 (.019)***	.066 (.019)***	.066 (.019)***
Age^2	-.069 (.025)***	-.067 (.025)***	-.068 (.025)***	-.067 (.025)***	-.066 (.025)***
Primary	-.013 (.112)	-.074 (.113)	-.079 (.114)	-.080 (.114)	-.002 (.131)
JSS/Middle	.152 (.093)	.057 (.095)	.057 (.097)	.025 (.098)	.084 (.111)
Secondary	.393 (.113)***	.249 (.117)**	.245 (.117)**	.145 (.116)	.225 (.127)*
University/Masters/Polytechnic	1.542 (.251)***	1.302 (.263)***	1.297 (.264)***	1.044 (.273)***	1.107 (.277)***
Teacher/nursing school	.941 (.219)***	.887 (.227)***	.896 (.224)***	.619 (.229)***	.609 (.231)***
Raven score		.027 (.006)***	.025 (.006)***	.022 (.006)***	.022 (.006)***
Past apprentice			-.078 (.070)	-.041 (.069)	.348 (.206)*
Past vocational/technical school			.097 (.093)	.079 (.089)	-.478 (.396)
Past on-the-job training			.088 (.082)	.103 (.079)	.122 (.080)
App x Primary					-.435 (.265)
App x JSS/Middle					-.430 (.220)*
App x Secondary					-.473 (.310)
Voc x Primary					.477 (.435)
Voc x JSS/Middle					.629 (.407)
Voc x Secondary					.390 (.517)
empl. small firm				-.176 (.070)**	-.180 (.070)**
empl. big firm				.315 (.076)***	.303 (.076)***
empl. public				.401 (.120)***	.389 (.120)***
Obs.	932	932	932	932	932
R^2	.177	.192	.194	.221	.226

All standard errors are robust. Regressions include controls for city of residence.

true that, accepting the point estimates in the equation, that this last form of training is by far the highest doubling incomes. It is also true that the point estimate on apprenticeship remains negative but, as already noted, it is no longer significantly different from zero. In the final Column of Table 10 we include in addition controls for occupational outcomes. The effect here is to roughly half the point estimate on the teacher and nursing parameter, suggesting that about half of the return to this type of training occurs through access to the public sector. The occupational dummies suggest a hierarchy of earnings by which those in the public sector earn about 80 per cent more than those in the small firm sector, with those in self-employment earnings 17 per cent more than those in small firms and those in large firms earning 37 per cent more than those in self-employment. It is important to remember these sectoral differences control for human capital so do not reflect the full extent of differences across sectors. Further as there are clearly many factors which induce sorting across sectors that we do not observe these sectoral cannot be given any causal interpretation. There is however a common finding across all the regressions that apprenticeship never has a positive effect on earnings. Which raises an obvious question: why do so many do it? As we have already shown it is by far the most common form of training in Ghana.

In Table 11 we begin to address that question by asking if the effects of apprenticeship on earnings depend on when on the education path the apprenticeship is undertaken. In order to do that we move from measuring education by the number of years and instead use a series of dummy variables for the highest level of education reached. For completeness we repeat in Table 11 Columns [1] - [4] the same comparisons as we have already reported in Table 10. It is clear that changing this way of modeling education does not alter our result so far, to be found in Table 11 Columns [3] and [4], that undertaking an apprenticeship has no positive impact on earnings. In the final column of Table 11 we interact the apprenticeship and vocational training variables with the educational background. So (App x Primary) in the Table means that the apprenticeship was undertaken after primary education was completed and a similar definition holds for the other interaction terms. Although the result is only significantly different from zero at the 10 per cent level we now find a substantial positive impact on earnings for those who undertook an apprenticeship but have less than primary completed education, this includes those who did not start and those who did not complete primary. The point estimate in Table 11 Column [5] implies that those with the lowest levels of education achievement have a 42 per cent higher income from undertaking an apprenticeship than those, with these low levels of education, who do not do one. The point estimates imply that for those with any higher level of education the effect is negative. Indeed we know from Table 7 above that nearly three quarters of those doing an apprenticeship

undertake it as the end of junior secondary school. For those the point estimates in Table 11 Column [5] imply that their incomes are 8 per cent lower as a result of undertaking the apprenticeship and at the ten per cent significance level this is different from zero. Our big puzzle remains. There is no evidence for the vast majority who do an apprenticeship that it pays. Is it possible doing an apprenticeship operates on access to employment? To that question we now turn.
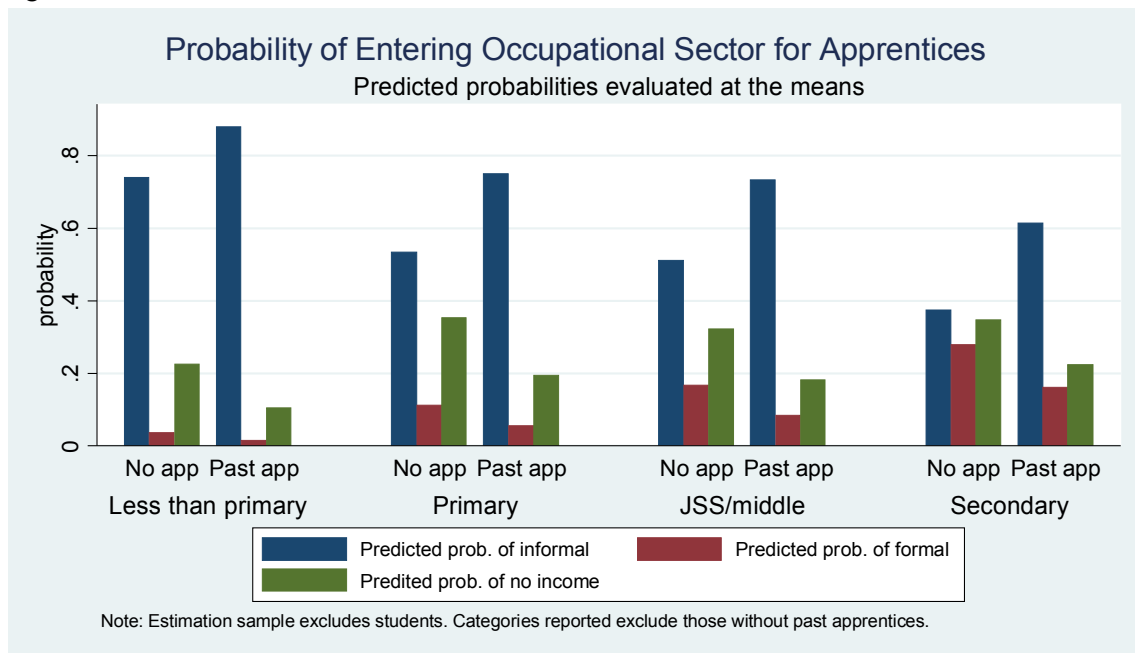
6   Do the occupational outcomes from apprenticeship differ from that of other forms of training?

In section 4 above we set out how the educational background and occupational outcomes for apprentices differ from those for our whole sample. In this section we address more formally the question as to how far undertaking an apprenticeship compares with other forms of training in affecting the probability of different occupational outcomes. In Table 10 and 11 we have identified four occupational outcomes - self-employment, employment in small and large firms and the public sector. These outcomes are conditional on have a job so we are faced with seeking to model five possible occupational outcomes, those used in Table 10 and 11 and the no income category. Such a model would be complex to interpret and our sample is too small to obtain other than very imprecise estimates. So in this section we reduce the possible options to three- no income (which includes those outside the labour force and those in the labour force without a job), informal employment (which includes both the self-employed and those in small firms) and the formal sector (which includes both those in large firms and those in the public sector). We report in the appendix a multinomial logit which can be given an interpretation as modeling the determinants of occupational choice as a function of education and training. As the coefficients on such models are hard to interpret we concentrate on using the predicted probabilities from the model to ask two questions. Firstly, how is the probability of working in either the formal or informal sector affected by having an apprenticeship? Secondly, how does the effect of having an apprenticeship compare with that from training to be a teacher or nurse which the previous section showed to be by far the training with the highest return.

We answer the first of these question in Figure 1 below which shows how the probability of moving between having no income and the two types of employment we identify, informal and formal, as a result of doing an apprenticeship varies across the education background of the apprentice (the data which underlies the Figure is given in the appendix). The same pattern is apparent for all education backgrounds. The effect of having an apprenticeship is to substantially

increase the probability of having an informal sector job. For middle/junior school completers the effect of apprenticeship is to increase the probability of an informal sector job by 22 percentage points from 51 to 73 per cent. Most of the shift to informal employment comes from the no income category where for middle/junior school completers the probability of having no income falls from 32 to 18 per cent. The major effect of undertaking an apprenticeship is a shift from no-income to informal employment, the shift within employment from formal to informal is much less important.

Figure 1

Probability of Entering Occupational Sector for Apprentices
Predicted probabilities evaluated at the means

Note: Estimation sample excludes students. Categories reported exclude those without past apprentices.
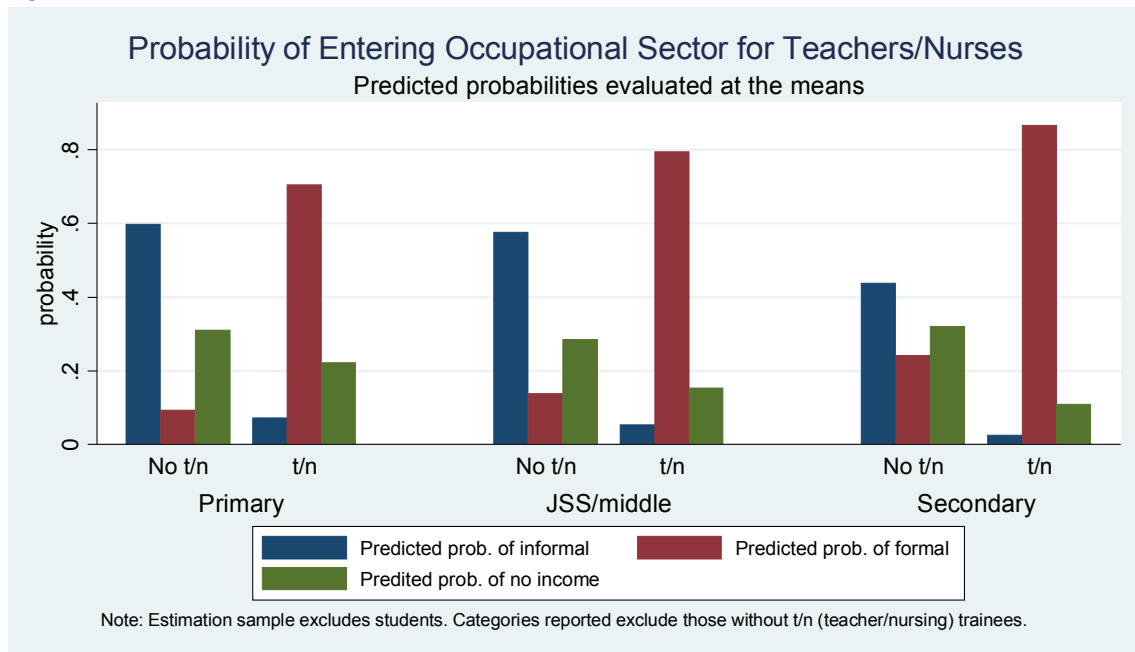
As can be seen from the multinomial logit in the appendix the effect of apprenticeship on increasing the probability of informal employment is highly significant. Why do we observe such a highly significant effect for the occupational outcomes but such weak evidence of any positive earnings effect once in employment? We outline here two possible elements of an answer to that question. The first is that the role of apprenticeship is to enhance the skills of the worker to a point where their earnings exceed their reservation wage. Thus apprenticeship makes possible employment in the informal sector in the sense that the costs of working are now lower than the benefits. The second part of a possible answer is that apprenticeship is undertaken by those with relative low ability and is an option forced on them by their exclusion from undertaking further formal education. If this is the case the negative point estimate on the apprenticeship dummy reflects not the lack of a positive impact but the failure of the regression to control fully for such unobserved low ability. That this may well be part of the explanation is suggested by the control

for ability we do have in the equation, the raven score, which if dropped causes the point estimate on the apprentice dummy to become more negative and more significant (results not reported).

We turn now to our second question: how does the effect of having an apprenticeship compare with that from training to be a teacher or nurse? We answer that in Figure 2 which presents a similar breakdown to that of Figure 1 and show the probability of being in one of the occupational categories as a result of undertaking this form of training. The contrast with the effects of undertaking an apprenticeship is striking. With this form of training there is a very substantial shift from informal to formal employment. For the secondary completers the probability of a formal sector job increases from 24 to 87 per cent and reduces the probability of an informal sector job from 44 to 3 per cent. In other works while apprenticeship acts to shift the probability of employment between informal and none, this form of training acts to shift workers between the informal and formal sectors.

Figure 2

Probability of Entering Occupational Sector for Teachers/Nurses
Predicted probabilities evaluated at the means

Note: Estimation sample excludes students. Categories reported exclude those without t/n (teacher/nursing) trainees.

7   Summary and Conclusion

What does our data imply for the links between skill training and job creation? The incentive to acquire skills depends on their value. It is normally assumed that the acquisition of skills increases earnings. Our analysis points to its potential importance in creating incentives to have a job. We have shown that the numbers with no jobs is far higher than the low unemployment rates

reported in the GLSS surveys would seem to imply. While informal jobs have risen markedly as a proportion of those in the labour force the participation rate is so low that average unemployment rates in 1998/99 of 3.5 per cent are consistent with 30 per cent of individuals, aged 15- 65, not having a job, defined as an income source from wages or self-employment. Among the young, those aged from 15 to 24, some 70 per cent have no jobs so defined. Such low employment rates have an ambiguous effect on the incentives to train. Employment opportunities that pay well are clearly scarce so the incentives to acquire skills are reduced. However employment among the young is so scarce that the cost of undergoing any training in terms of reduced incomes from employment is clearly very low, thus increasing the incentive to train. The apprenticeship system in Ghana is of interest, in part, as it is a private market in skill creation, which will be responsive to these costs and benefits.

Apprenticeship is, on the basis of our survey, by far the most important form of training in urban Ghana. Of the training events our survey identified over half were either current or past apprenticeships. The vast majority of apprenticeships are undertaken by those with junior secondary school or less. While nearly 60 per cent of those who did an apprenticeship in the past are self-employed some 9 per cent work in small firms and some 15 per cent have no job. Our earnings data suggest that those who undertook an apprenticeship earn significantly less than those with no training. Once an allowance is made for the level at which the apprentice enters the system there is evidence that, for those with the lowest level of education, apprenticeship does lead to a substantial increase in earnings, some 41 per cent. For those with higher levels of education it does not lead to any increase at all. In fact the point estimates continue to imply a decrease. We have argued that part of the explanation for this may be due to our limited controls for ability. Apprenticeship is an outcome forced on many individuals who cannot proceed further through the academic educational system. We have also shown that apprenticeship has a powerful effect in increasing the probability of being in informal employment relative to having no job. So one possible role for apprenticeship is to increase the supply of skills so that the benefits of working exceed the costs.

In contrast to these outcomes for undertaking apprenticeships are the very high earning increase that accrue from being trained as a nurse or teacher. Their earnings are twice those of apprentices who enter after junior secondary school, with a full set of controls for education and occupation. Further such training substantially shifts the likelihood of obtaining a formal relative to informal sector job. In summary these forms of training, one undertaken in the private sector and the other in the public sector, are associated with radically different outcomes for those receiving the training.

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Appendix Table: Summary Statistics by Self-employed and Wage Earners

Self-employed (positive income earners):

N = 541	Mean	Standard Deviation
Male (=1 if male)	0.28	0.45
Age (years)	36.97	10.45
Raven's Score (out of 20)	3.32	4.16
Education (years)	7.05	4.23
Past apprentice (=1 if past apprentice)	0.33	0.47
Past vocational (=1 if past vocational trainee, excluding teachers and nurses)	0.09	0.28
Past on-the-job training (=1 if past on-the-job trainee)	0.11	0.32
Teacher/nursing training (=1 if past teacher or nursing trainee)	0.002	0.04
Monthly earnings in cedis	99,064	88,335
Monthly earnings in dollars	80.72	71.97
Log of monthly earnings in dollars	3.96	1.01

Wage employees (positive income earners in SMEs, large firms, and the public sector):

N = 391	Mean	Standard Deviation
Male (=1 if male)	0.66	0.47
Age (years)	33.16	10.40
Raven's Score (out of 20)	6.19	5.14
Education (years)	9.80	2.96
Past apprentice (=1 if past apprentice)	0.22	0.42
Past vocational (=1 if past vocational trainee, excluding teachers and nurses)	0.10	0.30
Past on-the-job training (=1 if past on-the-job trainee)	0.16	0.37
Teacher/nursing training (=1 if past teacher or nursing trainee)	0.04	0.19
Monthly earnings in cedis	129,011	133,259
Monthly earnings in dollars	105.12	108.58
Log of monthly earnings in dollars	4.30	0.83

Appendix Table

Multinomial Logit

	Informal	Formal
Male	-.187 (.154)	1.315 (.205)***
Age	.465 (.040)***	.455 (.055)***
Age^2	-.553 (.054)***	-.535 (.074)***
Raven score	-.007 (.017)	.049 (.021)**
Primary	-.777 (.292)***	.676 (.592)
JSS/Middle	-.727 (.236)***	1.166 (.520)**
Secondary	-1.117 (.287)***	1.603 (.544)***
University/Masters/Polytechnic	-2.459 (1.228)**	2.295 (.933)**
Teacher/nurse training	-1.772 (1.196)	2.361 (.732)***
Past apprenticeship	.935 (.212)***	-.107 (.292)
Past vocational training	.041 (.288)	.375 (.345)
Past on-the-job training	.271 (.302)	.479 (.355)
Obs.	1356	
Pseudo R^2	.244	

The base, or reference, category is comprised of people with no earned income, excluding students and current trainees. The informal sector refers to self-employment and small firms (those with fewer than 10 employees); the formal sector refers to large firms (those with more than 10 employees) and the public sector. Regressions include controls for city of residence.

Education	No Apprenticeship	Apprenticeship
Less than primary	Informal: 0.739 Formal: 0.036 No income: 0.225	Informal: 0.879 Formal: 0.015 No income: 0.105
Primary	Informal: 0.534 Formal: 0.112 No income: 0.354	Informal: 0.750 Formal: 0.055 No income: 0.194
JSS/Middle	Informal: 0.511 Formal: 0.167 No income: 0.322	Informal: 0.734 Formal: 0.084 No income: 0.182
Secondary	Informal: 0.374 Formal: 0.278 No income: 0.348	Informal: 0.614 Formal: 0.161 No income: 0.224

Education	No t/n	t/n
Primary	Informal: 0.597 Formal: 0.093 No income: 0.310	Informal: 0.073 Formal: 0.705 No income: 0.223
JSS/Middle	Informal: 0.576 Formal: 0.139 No income: 0.285	Informal: 0.053 Formal: 0.794 No income: 0.154
Secondary	Informal: 0.438 Formal: 0.242 No income: 0.320	Informal: 0.025 Formal: 0.866 No income: 0.108