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Gender Differential Effects of Technical and Vocational Training: Empirical Evidence for Tanzania

by

Cornel Joseph and Vincent Leyaro

Abstract

This paper investigates the gender differential effect of technical and vocational educational and training (TVET) in Tanzania using data from the 2014 Integrated Labour Force Survey (ILFS). The multinomial logit model results for employment mobility show that TVET training significantly improves males as well as females chances of entering into formal employment while at the same reduces their probability of working in informal, agriculture or being unemployed. The effects are much higher for females relatively to males almost for all categories of education and training. The results further show that though the TVET training increases males as well as females earnings significantly, though the returns to TVET are substantially higher and statistically significant for females than males. The decomposed gender earnings gap using Oaxaca and Blinder (1973) decomposition technique reveal there is a significant gender earning gap in Tanzania, where males tends to earn significantly higher income by 58 percent than females. Clearly, two implications come out here: one, as TVET and general education increases the probability of females more than males to be in the formal employment, investing in girls skills training and education will address the problem of rising youth unemployment and formalize the economy. Two, as returns to TVET and general education is substantially high for females than males, investing in girls' skills training and education will address the problem of rising inequality and by extension the higher level of poverty rate in the country.

JEL Classification:

Keywords: gender, employment mobility, returns, TVET, Tanzania

Centre for Research in Economic Development and International Trade, University of Nottingham

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Outline

The Authors

CREDIT External Fellow Vincent Leyaro is a senior lecturer, and Cornel Joseph is a PhD candidate, in the Department of Economics, University of Dar es Salaam.

Corresponding author: vleyaro@yahoo.com

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1. Introduction

Gender differences in labour market outcomes have attracted considerable attention in research and public policy. As the result, various studies have been done and show that across most countries, the gender labour market differential has generally narrowed over time but has not been closed (ILO, 2017). Empirical evidence suggests that gender differences in the labour market outcomes do persist in terms of employment participation (Hakim, 1996; Mandel and Semyonov, 2006), occupational rewards (Mandel, 2012; Twumasi-Baffour and Turkson, 2015) and segregation across occupations (Anker, 1997; Steinmetz, 2012). One of the main explanations for these findings refers to gendered family responsibilities, with women being expected to take over a larger share of the work done at home and men focusing on work outside home (Triventi *et al*., 2015).

Economic theory suggests that there are both demand and supply factors that are explaining labour market outcomes differential between men and women. The demand factors are based on employers' perception that women are on average less qualified than men, while the supply factors lies on human capital model which suggests that normally women anticipate shorter and less continuous careers and are therefore forced to choose occupations that are compatible with their household responsibilities (Mincer and Polachek, 1974; Dolado *et al.,* 2003).

Thus, the main arguments in literature are that women are less productive than men. This is caused by women family responsibilities that force them to invest less in their education and training (Becker, 1981; Rosenfeld and Kalleberg, 1991). The existing studies in developing countries have shown that technical and vocational education and training (TVET) has not proved to be a successful vehicle in enhancing the economic welfare of women. In other countries, which are characterized by a more permissive economic environment, TVET has resulted in improved labour market performance when TVET graduates find employment related to the courses studied. Although, TVET training have been perceived as inferior to general education, the TVET graduates enjoy a faster transition from school to work and are more likely to have a permanent first job (Strawiński *et al.,* 2016).

Empirical evidences have also shown that the private returns to general education was significant larger for women than for men (Fox and Oviedo, 2008; Aslam and Rawal, 2013; Twumasi-Baffour, 2013; Leyaro *et al.,* 2014), however, gender differential returns to TVET are inconclusive. For example, Aslam and Rawal (2013) found that returns to TVET training were higher for men's in self-employment, but lower for women's in wage employment in Pakistan. Also, Roszkowska and Majchrowska (2014) found that wage premium for TVET was much higher among men than for women in Poland. In Brazil, Almeida (2015) found that men who completed a TVET course enjoyed a positive wage premium in relation to males without TVET, while woman who completed a TVET course earn less compared with women without TVET training. To the best of our knowledge, there is no existing study in Tanzania that examined the gender labour market outcomes effect of technical and vocational training.

All these points to the fact that, in most of economies in the Sub Saharan Africa (SSA) where informality is rampant as in some countries is as high as up to 70 percent, with more women in the informal sector than men in the one hand and in countries where there is rising inequality in the other hand; enhancing skills training through technical and vocational training among women will have double effects. One is that, it could easily help women enter into formal employment and therefore reduces informality in the economy; and two, as more women participate in the labour market, their earnings will rise relatively more than men's earnings. This will address both the gender gap and rising income inequality. Consequently, making the use of data from the 2014 Integrated Labour Force Survey (ILFS) and applying appropriate estimation techniques, this paper investigates and examines the gender labour market outcomes differential effect of technical and vocational training in Tanzania.

The remaining part of this paper is organized as follows; section two presents a survey of relevant literature, while section three presents some efforts and initiatives towards reducing gender disparities in Tanzania. Section four presents empirical model and methodology. Section five describes data, while section six presents and discusses the empirical results; and Section seven presents summary and policy implications.

2. Gender Gap and Technical and Vocational Training: Review of Literature

Various theories have been developed to explain gender wage gap. However, theories that have been used extensively in the literature are human capital theory, labour market segmentation (occupational segregation) theory and the theory of labour market discrimination. According to the human capital theory, labour market outcome differential effects results from differences in human capital investments and endowments (Ncube, 2012). The model explains women's lower wages due to gender differences in individual characteristics is associated with productivity, such as level of education, labour market experience, on-the-job training and other aspects that affect earnings (Mincer and Polachek, 1974; Polachek 1995).

The human capital theory links individual expectation of lifetime labour market participation and the incentives to acquire valuable training (Polacheck, 2004). When people expect to have long term uninterrupted labour market participation, they acquire more incentive to invest further on education and training (Ncube, 2012). Women are anticipated to spend less time in the labour market or lead less continuous work lives due to the division of labour within the family unit, especially when it comes to take care of children (Padayachie, 2015). This results in women being less willing to fully be committed to attaining general education and training which too affects their labour market outcomes that affect substantially negatively their earnings potential (Pacheco Medina, 2013). In addition, given the time taken out of the labour market, this has lead to deterioration of their skills and experiences.

The labour market segmentation model argued that occupational sex segregation occurs due to exclusion of women from otherwise male orientated jobs, resulting in women being crowded into traditionally female orientated jobs (Blau and Kahn, 2000; Padayachie, 2015). Since women are more likely to be out of the labor force at different points of the life-cycle, they will choose occupations that have fewer barriers to access (Polachek, 1985). Usually such occupations demand lower skills and have smaller returns to on job-training (Pacheco Medina, 2013). Consequently, women will be in a more competitive labour markets such that wages will be low; and, men will be in less competitive jobs with higher wages. Furthermore, women are willing to work in a

pleasant job environment and are averse to work in certain occupations, while men are not averse to work in risky jobs (Anker, 1997).

Furthermore, a portion of the gender wage gap remains unexplained, even after controlling for human capital and other observable differences (Ncube, 2012). Becker (1964) called this discrimination as taste discrimination, where the discriminators are willing to forgo an extra pay in order to have the group they prefer compared to an equally productive unfavourable group. Becker (1964) identified three distinct forms of discrimination in a competitive framework: employer, employee (or co-worker) and customer. According to Becker (1964), there three channels of labour market discrimination. Through the employer channel, employer pays a premium wage in order to employ the people they prefer (Becker, 1964). The discriminating employer in this case is unwilling to hire workers unless women or minority workers themselves 'compensate' employers by accepting a lower wage (a wage below the wage paid to men) for identical productivity or by being more productive at a given wage (Agrawal, 2013). Thus, since they prefer men over women, they will pay more for men.

Employee discrimination channel exists when employers discriminate in a situation when other employees do not prefer to work with colleague of the opposite sex or minority workers (Agrawal, 2013). Under this channel the male employees may demand higher wages in order to work with people they would not prefer to work with such as women. In the case of the customer discrimination channel, this occurs when consumers are not willing to purchase goods and service from members of a certain group, for example women (Agrawal, 2013). Thus employers discriminate women not because of their own tastes but because of employer's customers' tastes. Consequently, owner of the firms would have to pay the undesired worker less or avoiding employing women in order to capture certain customers.

Institutional theory is another discrimination theory, which is based on interrelation of combining institutional forces such as unions, monopolistic industries, government regulations and community prejudices. The institutional discrimination theory suggests that institutional factors may result into gender wage gap (Ncube, 2012).

There is as well statistical discrimination theory developed by Phelps (1972), Arrow (1973) and Aigner and Cain (1977). Contrary to the previous discrimination theories, it assumes away prejudice by employers (Agrawal, 2013). Women earn lower wages because on average they have lower productivity. Statistical models are based on the assumptions that firms have limited information about the skills of applicants (Agrawal, 2013). Thus, employers make decision on the absence of full information, since it is costly and difficult to acquire full information from job applicants. The theory postulates that if employers believe that women have low productivity and ability levels, they would not employ them or they would be paid low wages (Ncube, 2012). Employers would use sex as a screening device for hiring and paying an individual (Agrawal, 2013). In turn, they pay women a lower wage than men with identical observable skills.

There are several empirical studies that have set to quantify these theories and here we survey some of them. Neuman and Ziderman (2001) compared the returns to general education and those of TVET in Israel. The findings showed that, TVET training graduates do not lead to higher wages as like in general education. By comparing the outcomes for women with those for men, the study found that while men who attended TVET and work in matched occupations enjoy a wage premium of 9.85 percent, women working in matched occupations did not receive any wage advantage. Furthermore, women who studied in TVET institution earn less than their counterparts who attended general education.

Richard (2007) analysed male-female wage determination and gender discrimination in Uganda by using nationally representative household survey of 2002/03. The results from Oaxaca (1973) and Neumark (1988) decomposition technique showed that the gender wage gap was 39 percent and this was largely attributable to discrimination. Pacchiotti (2012) utilized the Integrated Labour Force Survey (ILFS) data of 2006 to examine the determinants of men's and women's wages, and subsequently gender wage gap in Tanzania. Analysis of wage differentials were performed using Neumark (1988) decomposition of gender wage gap. The result showed that the wage gap was about 36.5 percent, and 55.3 percent of the wage gap was explained by differentials in observable characteristics.

Ahmed and Maitra (2010) examined gender wage discrimination in Bangladesh by using individual level unit record data. The analysis of gender wage determination was done using the Oaxaca-Blinder decomposition method. The findings showed that gender wage differentials were considerably larger in urban areas (67 percent compared to 57 percent of rural); and a significant portion of the gender wage gap resulted from discrimination. Aslam and Rawal (2013) examined the labor market outcomes of TVET using data from a unique, purpose-designed survey of more than 1,000 households in Pakistan applying the multinomial logit model estimation strategy. The results indicated that, TVET training significantly improves women's chances of entering self-employment and wage employment, even though, only women in wage employment benefited from improved earnings. On the other hand, men who had attended TVET training benefited through an improved probability of being self-employed and earning higher returns within that occupation.

Roszkowska and Majchrowska (2014) analyzed the differences in wages of men and women with different educational and training levels, and their changes from 2004 to 2010 using the Structure of Wages and Salaries by Occupations Database in Poland. The findings showed that wage premium for TVET was much higher among men than women. Also, the results indicated that males wage premium for TVET was almost the same as the wage premium observed among workers with general secondary education and tertiary education.

Almeida *et al* (2015) examined the economic returns to TVET in Brazil using data from the Brazilian National Household Sample Survey. The findings showed that among women, those who completed a TVET course had, on average, an hourly wage differential that was 2.1 percent less than that of women who worked and never pursued TVET training. For men who completed TVET course had, on average, an hourly wage that was approximately 5.8 percent higher than those who did not attend any TVET training. Thus, overall the empirical findings are not settled as results are mixed differing from one case to another. More empirical studies for as many countries are warranted.

3. Gender Disparity in Tanzania: Efforts and Initiatives

3.1 National and International Initiatives

The government of Tanzania has taken various measures and initiatives to address gender disparity and issues. The constitution of the United Republic of Tanzania endorses gender equality and equity and guarantees full participation of women and men in social, economic and political life. The government amended the 1977 Constitution in 2000 and 2004 among other things, to increase women's participation in the National Parliament and Local Authorities. In addition to all these, the Government is also implementing international commitments as enshrined in the United Nations Charter and on the Human Rights Declaration (1948), the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) (1979), the Convention on the Rights of the Child (CRC) (1989), Beijing Declaration and Platform for Action (1995), AU Solemn Declaration on Gender Equality and the Protocol to the African Charter on Human and Peoples Rights on the Rights of Women (2003), World Summit 2005 Resolution on Gender Equality and Empowerment of Women, SADC Declaration on Gender and Development (1999), Addendum on Prevention and Elimination of Violence Against Women and Children (1998).

In 2000, the government formulated the Women and Gender Development Policy (2000) to put more emphasis on the Women in Development Policy (WID) (1992) in line with the Beijing Platform for Action. The government also established mechanisms for gender policy formulation, coordination, monitoring and evaluation and implementation of gender development policy, gender mainstreaming programmes and plans. The mechanisms include establishment of a Ministry responsible for gender development, setting up Gender Desks in Ministries, Independent Departments, Regional and District Authorities. To ensure effective implementation of the women and gender development policies, a National Strategy for Gender Development (NSGD) that builds on a number of national vision's and other policies and strategy to promote gender equality and equity has been prepared. This strategy covers key areas of gender concerns stipulated in the Women and Gender Development Policy of 2000. Among others, education and training plays a key role for sustainable social, cultural, political and economic development of women. For education and training among women promotes quality of life, good health, access to paid employment, decision making, and productivity in both market and non-

market work and facilitates social and political participation. Thus women as men should experience such benefits in a fair and equitable manner.

Besides all these efforts and initiatives by government, non government organization and international community, gender disparity and discrimination against women have continued unabated. For instance, the existing stereotype attitudes, still favour education and training for boys than girls in most communities. As a result majority of girls tend to concentrate on stereotype fields of study such as home economics, secretarial courses and nursing. Other shortcomings of the education and training system include limited budgetary allocations, gender insensitive school management practices, unfriendly learning environment for girls and people with disabilities, inadequate trained teachers on gender issues, gender biased curriculum, social and cultural values which are resistant to change for girls' education and training. Poverty and work overload for girls and women at household level continue to be the major obstacles which cause drop-out of mainly girls than boys in school and training institutions.

Most technical and vocational training institutions were established to cater for men and boys, as a result, majority of girls and women have been left out of the mainstream of technical and vocational training. Even though, more recently the government have taken efforts and measures to make sure that there are equal access to training for women just as for men through sensitization and encourage girls and women to take up non-traditional or male dominated trades and making more information available on TVET training opportunities for girls and women.

3.2 Gender Differences in TVET Enrolment and Completion in Tanzania

As far back as 1940s, during the colonial era, Tanzania (by then Tanganyika) passed apprenticeship training law that was based on the 1940s ordinance cap.81. This law aimed to fill a real need (i.e. to fill the skills gap) because the country had neither the industrial network nor the skilled workers who could train others on the job. Following this, two trade schools were introduced: Ifunda Technical School in Iringa and Moshi Technical School in Kilimanjaro. It was up until 1969 when the first center to conduct Vocational Education and Training in Tanzania was established at Chang'ombe in Dar es Salaam. The people who were trained were army soldiers and workers from Ministry of

Works. Then slowly candidates who had completed standard seven (primary school leavers) started to join such training. The center started with three trades, namely: motor vehicle mechanics – with 29 candidates, fitter mechanics – with 9 candidates and carpentry and joinery- with 8 candidates. Up until 1970 therefore Tanzania had only three technical and vocational schools, with hardly three trades and around 46 plus students, and hardly there were women (www.veta.go.tz/index.php/en/history).

In 1974 Tanzania enacted its first Vocational Training Act to replace the colonial apprenticeship law that was based on 1940s Ordinance cap.81. The 1974 Act established the National Vocational Training Division (NVTD) in 1975 within the Ministry of Labour and Manpower Development as well as the National Vocational Council (NVC). The NVTD started with ten traders and a total number of 258 candidates. From 1974 to 1994 (during its 20 years of existence), the NVTD established 18 Vocational Training Centers (NTC) in all regions in the country expect for Lindi and Kigoma regions (i.e. in addition to the 3 ones that existed earlier making a total of 21 centers) and one Vocational Teachers Training College (MVTTC) in Morogoro region. A total of 34 trades were offered to equip young men and women with basic employable skills before they joined organizations in various sectors of the national economy. NVTD offered Trade Testing grade III, II and I grade one being the highest. Thus, until 1994 Tanzania had twenty one VTC and one MVTTC, offering around 34 traders and about 300 enrolled students, most of them were men with few women.

Therefore, technical and vocational training (TVET) in Tanzania has historically been viewed and regarded as a male dominant, both in terms of programs and course content, and the enrolment. Previously, Tanzania had few technical schools for boys only and latter accommodated girls but not in equal proportion as boys. The TVET training centers were characterized with having few facilities that could accommodate females. However, TVET training centers have been increasing overtime so is the enrolment of girls, as what is experienced by many other countries. As shown in Table 1 gender disparities in enrolment of TVET institutions in Tanzania from 2011/12 to 2015/16 have been narrowing.

Table 1: Enrolment Trend in TVET in Tanzania by Sex, 2011/12 - 2015/16

	2011/12	2012/13	2013/14	2014/15	2015/16
Vocational Education					
Male	58778	68539	100835	109146	120742
Female	51236	59678	63242	80541	75349
Total	110014	128217	164067	189687	196091
Technical Education					
Male	58558	59847	63624	66983	57895
Female	53889	53233	52536	58021	59172
Total	112447	113080	116160	125004	117067

Source: BEST, 2016

As shown in 2011/12, out of 110,014 students enrolled in vocational education 58,778 were males, which were relatively more than female by 4 percent. Thus, even though the trends of females enrolled in vocational education and training increased over time still males dominated females in all periods as their enrolment also increased. With respect to technical education and training, as shown in Table 1 males were mostly enrolled in same number as females in most years except in 2015/16 where females outweigh the number of males. This could be attributed by adequate information and counseling; and parent changing attitudes which restrain female access to TVET. However, could also be due to increase in males' enrolment in general education.

Table 2 shows further that in 2016, females were more enrolled in business administration, clothing and textiles, laboratory technology and hospitality and tourism fields, while males were dominant in automotives, construction, electrical and mechanical engineering programs. Thus males are dominant in higher paying fields compared to females.

Table 2: Enrollment in Folk and Vocational Education and Training by Field of Study, Programme and Sex, 2015/16

		Programme									
Field of Study	**Sex**	Long Course Above Year 2	Long Course Level 1 Year 1	Long Course Level 1 Year 2	Long Course Level 2	Long Course Level 3	Long Course Year 1	Long Course Year 2	Short Courses	**Grand Total**	**% of females**
Agriculture	M	21	290	142	131	123	146	186	639	1678	42
	F	25	133	71	132	40	144	235	467	1247	
Automotive	M	309	2700	1871	2333	1387	86	10737	30430	49853	10
	F	108	104	212	82	38	0	1666	3344	5554	
Business Administration	M	6	998	144	189	39	0	1525	1924	4825	68
	F	49	2911	790	591	270	17	2326	3398	10352	
Clothing and Textiles	M	2	1270	113	185	15	70	25	41	1721	82
	F	24	2539	1851	1378	233	144	638	924	7731	
Construction	M	101	2479	1770	1926	413	190	437	985	8301	11
	F	16	403	127	198	44	28	27	138	981	
Electrical	M	50	2498	1564	1778	583	160	2880	2826	12339	12
	F	36	369	289	415	82	78	198	253	1720	
General subject	M	0	777	396	56	0	0	3552	6722	11503	46
	F	0	1141	78	61	0	0	3476	5208	9964	
Hospitality and Tourism	M	27	906	103	623	193	12	2440	1751	6055	69
	F	62	2287	335	808	458	66	4595	5064	13675	
ICT	M	161	819	183	312	189	1	7078	11505	20248	52
	F	227	794	362	392	271	9	6915	12805	21775	
Laboratory Technology	M	0	18	5	9	0	68	98	6	204	60
	F	0	8	15	25	0	138	105	10	301	
Mechanical	M	35	689	437	549	225	1	150	324	2410	07
	F	0	39	71	28	6	0	7	22	173	
Mining	M	0	123	52	0	0	0	515	693	1383	54
	F	0	149	19	0	53	0	572	804	1597	
Pedagogy/Trainer of the training	M	0	0	0	0	0	0	0	4	4	33
	F	0	0	0	0	0	0	0	2	2	
Printing	M	0	8	0	97	3	0	49	61	218	56
	F	0	12	0	90	3	0	5	167	277	
Grand Total	M	712	13575	6780	8188	3170	734	29672	57911	120742	38
	F	547	10889	4220	4200	1498	624	20765	32546	75349	
% of female	43.4	44.5	38.4	33.9	32.1	45.9	41.2	35.5	56.2		

Source: BEST, 2016

4. Empirical Model and Methodology

4.1 Gender Differential in Labour Market Mobility

Entry into the labor market is an important factor to be analyzed to determine the impact of technical and vocational training on individuals' wellbeing. To analyze the probability of entering into the labor market, we use a multinomial logistic regression to compare the gender differences in labour market mobility. The model is specified as follows:

$$pr[Y_i = 1|X] = \frac{\exp(x\beta)}{1+\exp(x\beta)} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

where $pr[Y_i = 1|X]$ represents the likelihood of individual *i* working during the reference week (in formal employment, informal employment, agriculture or non-agriculture self-employment), and *X* captures the observable variables including education and technical and vocational training. The model is estimated separately by sex.

4.2 Returns to Education and Training by Gender

Traditional private returns to education were estimated with the standard *Mincerian equation* (Mincer, 1974). The equation regress the log of wages on years of schooling, work experience, and its square as follows:

$$ln\ W = \beta_0 + \beta_1 S + \beta_2 EX + \beta_3 EXSQ + \mu_i \dots\dots\dots\dots\dots\dots\dots\dots (2)$$

where *lnW is* the log of real monthly or hourly earnings, S, EX and *EXSQ* are the years of schooling, labour market experience and experience square respectively. The coefficient of education or training (β_1) in equation (2), though not without estimation biases, is usually interpreted as the percentage increase in wages due to an additional year of education or training (te Velde, 2005).

While the traditional *Mincerian* approach is very popular, it is not without its problems. The empirical evidence suggests that returns are not a linear constant, but may be specific

to different levels of education and training (Psacharopoulos and Patrinos, 2004; Salehi-Isfahani *et al.,* 2009). The *Mincerian* approach is unlikely to yield causal estimates, and differences in ability, school quality and family background can substantially bias estimated returns (Glewwe, 1996; Krafft, 2013). Measurement error in wages or schooling can also affect estimates, usually biasing them downward (Card, 1999; Glewwe, 1996). There is also the issue that many adults are not wage-workers. Individuals select into wage work, and this selection process can bias estimated returns to education (Glewwe, 1996).

Despite of these weaknesses, the standard Mincer estimates have been consistent with higher quality studies that identify causal effects (Card, 1999; Duflo, 2001). Instrumental variables (IV) approaches are also common but are not without limitations, and they require a high-quality instrument to identify schooling decisions (Card, 1999). Common instruments include parents' education, which is a dubious instrument, and institutional factors such as the rules about enrollment and the geographical proximity of schools. As Card (1999) shows, even valid instruments can generate biased estimates in the presence of heterogeneous individuals. Additionally, IV estimates tend to have a larger upward bias due to omitted ability than do OLS estimates (Card, 1999). Given the fact that IV tends to be more biased than OLS or sibling comparisons, and that a good instrument is not available in 2014 ILFS data, consequently, IV methods is not used in this paper. Instead, in this study, the returns to general education and technical and vocational training are estimated as:

$$ln\ W = \beta_0 + \beta^i{}_1 GE_i + \beta^i{}_2 TVET_i + \beta_3 EX + \beta_4 EXSQ + \mu_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

where lnW is natural logarithms of monthly earnings, GE is a vector of dummy variables identifying the person's highest level of general education attained, TVET is dummy variables showing the level of technical and vocational training attained by an individual and μ_i is a residual error term. To control for other important factors, such as differences in wages by locality and sectors of employment, a number of additional variables are incorporated into the model as controls, X_i, , which is the extended version of earnings function as developed by Mincer (1974):

$$ln\ W = \beta_0 + \beta^i{}_1 GE_i + \beta^i{}_2 TVET_i + \beta_3 EX + \beta_4 EXSQ + \alpha' X_i + \mu_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

For this study *GE* is converted into series of dummies for different levels of education and training attained by an individual (primary, secondary and tertiary), and TVET is converted into four TVET dummies (for technical, vocational, on-the-job training and apprenticeship) in order to analyse the way different levels of education and training impart different skills to workers and so are the returns to those skills. The coefficient on years of schooling (β_1) represents the average private rate of return to one additional year of schooling (marginal returns to education), regardless of the level of education, and the coefficient of (β_2) is returns to TVET, while μ_i is a well behaved stochastic error term.

EX is the potential years in the labour force (age –school–6). This is based on the assumption that all individuals start schooling at age of six. However, it is possible that some start school at an age earlier than six years. Also, we assume that individuals get employed immediately after completing school, which is a strong assumption, especially for women and youth who are underrepresented in the labor market. EX^2 is experience square which captures the declining effects of experience as individuals' age increases.

X_i is a vector of control variables, including, sex, sectors of employment dummies (for whether individual work for the public, private, informal sector and agriculture as a reference category), workers effort proxied by log weekly working hours, marital status (taking the value of 1 if the respondent is married and 0 otherwise), institutional aspects proxied by union membership (taking the value of 1 if individual is a member of trade union and 0 otherwise), area of work (three regional dummies indicating whether the respondent works in Dar-es-Salaam, in other urban areas or in rural areas).

The model is examined separately by sex, in order to compare the private returns to education and TVET between males and females. This is mainly motivated by fact that men and women are differentially treated by employers in both labour markets (Carnoy, 1994).

4.3 Gender Wage Decomposition Techniques

The calculation of wage gender gap are based on Blinder (1973) and Oaxaca (1973) decomposition technique. This technique starts from the following baseline *Mincerian* wage function for males and for females:

$$w_i^m = \beta_i^m x_i^m + \varepsilon_i^m \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (5)$$

$$w_i^f = \beta_i^f x_i^f + \varepsilon_i^f \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (6)$$

where w_i^m and w_i^f are the logarithms of monthly earnings for males and females, β_i^m and β_i^f are vectors of parameters for estimation, and the vectors x_i^m and x_i^f for males and females, containing covariates that determine monthly wages, including human capital endowments such as education, training and labour market experience, ε_i^m and ε_i^f are random error terms. Hence, the Oaxaca-Blinder decomposition is estimated as:

$$\bar{w}_m - \bar{w}_f = \hat{\beta}_m(\bar{x}'_m - \bar{x}'_f) + \bar{x}'_f(\hat{\beta}_m - \hat{\beta}_f) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (7)$$

where w_m and w_f are the mean of males and females earnings (in logarithms form); $\bar{x}'_m$ and $\bar{x}'_f$ are vectors containing the respective means of the independent variables for males and females; and $\hat{\beta}_m$ and $\hat{\beta}_f$ are the estimated coefficients. The first term on the right hand side captures the wage differential due to different characteristics of males and females. The second term is the wage gap attributable to different returns to those characteristics or coefficients.

In equation (7), the male wage structure is taken as the non-discriminatory benchmark. It can be argued that, under discrimination, males are paid competitive wages but females are underpaid. If this is the case, the male coefficients should be taken as the non-discriminatory wage structure. Conversely, if employers pay females competitive wages but pay males more (nepotism), then the estimated coefficients for females should be used as the non-discriminatory wage structure. Therefore, the issue is how to determine the wage structure $(\hat{\beta}^*)$ that would prevail in the absence of discrimination. While *a*

priori there is no preferable alternative, the decomposition can be quite sensitive to the selection made;

$$\hat{\beta}^{*} = \omega\hat{\beta}_{m} + (I-\omega)\hat{\beta}_{f} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (8)$$

where ω is a weighting matrix and I is the identity matrix. Then, any assumption regarding β^{*} can be seen as an assumption regarding ω. The literature has proposed different weighting schemes to deal with the underlying index problem: first, Oaxaca (1973) proposes either the current male wage structure, that is $\omega = I$ (equation 1), or the current female wage structure, that is, ω=0 – the null matrix as $\hat{\beta}^{*}$, suggesting that the result would bracket the "true" non-discriminatory wage structure. Reimers (1982) implements a methodology that is equivalent to ω =0.5 I. In other words, identical weights are assigned to both men and women. Cotton (1988) argues that the non-discriminatory structure should approach the structure that holds for the larger group. In the context of sex discrimination such weighting structure implies an $\omega = I_{m}I$ where I_{m} is the fraction of males in the sample. Neumark (1988) proposes a general decomposition of the gender wage differential:

$$\bar{w}_{m} - \bar{w}_{f} = \hat{\beta}^{*}(\bar{x}'_{m} - \bar{x}'_{f}) + \bar{x}'_{m}(\hat{\beta}_{m} - \hat{\beta}^{*}) + \bar{x}_{f}(\hat{\beta}^{*} - \hat{\beta}_{f}) \ldots\ldots\ldots\ldots\ldots\ldots (9)$$

This decomposition can be reduced to Oaxaca's two special cases if it is assumed that there is no discrimination in the male wage structure, that is, $\hat{\beta}^{*} = \hat{\beta}_{m}$, or if it is assumed that $\hat{\beta}^{*} = \hat{\beta}_{f}$. Neumark (1988) shows that $\hat{\beta}^{*}$ can be estimated by using the weighted average of the wage structures for males and females using a pooled sample. The first term is the gender earnings gap attributable to differences in characteristics. The second and the third terms capture the difference between the actual and pooled returns for men and women, respectively.

5. Descriptive Statistics and Analysis

The main data set used in this is the 2014 Integrated Labour Force Survey (ILFS) collected by the Tanzania National Bureau of Statistics (NBS). The key information collected in the survey is twofold: the workers characteristics and the second being employment related information of the individual workers. The sample drown from the NBS data set contains 19,198 observations of which 48.26 percent were females and the remaining 51.74 percent were males. The ILFS contains limited set of variables. Specifically we make use of information on monthly earnings, age, education, technical and vocational training, marital status, employments status, experiences, location, regional dummies and other socio-economic characteristics. Table 3 presents the percentage sample distribution of education and training attainment by sex, while Table 4 shows the sample distribution of employment status by sex.

With an exception of primary level education, men are more than women in all education and training levels. Relatives to females, majority of males have attained secondary education at 55 percent, vocational training at 60 percent, tertiary non-university at 53 percent and university education at 67 percent. Both males and females in the sample have the same proportional of attaining primary education at 50 percent. With respect to status of employment in Table 4, we observe that females are more unemployed at 74 percent compared to men 26 percent and more on informal employment at about 51 while males engaged more on wage employment at about 69 percent and in agriculture at about 51 percent. That is, in Tanzania many women are unemployed and are in the informal sector, suggesting that more of technical and vocational training to women could help to address this problem.

Table 3: Distribution of Total Sample Population with Education Attainment by Sex

	Female		Male		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Primary and below	6,791	50	6,670	50	13,461	100
Secondary	1,579	45	1,908	55	3,487	100
Vocational training	446	40	668	60	1,114	100
Tertiary non-university	242	47	274	53	516	100
University	206	33	414	67	620	100
Total	9,264	48	9,934	52	19,198	100

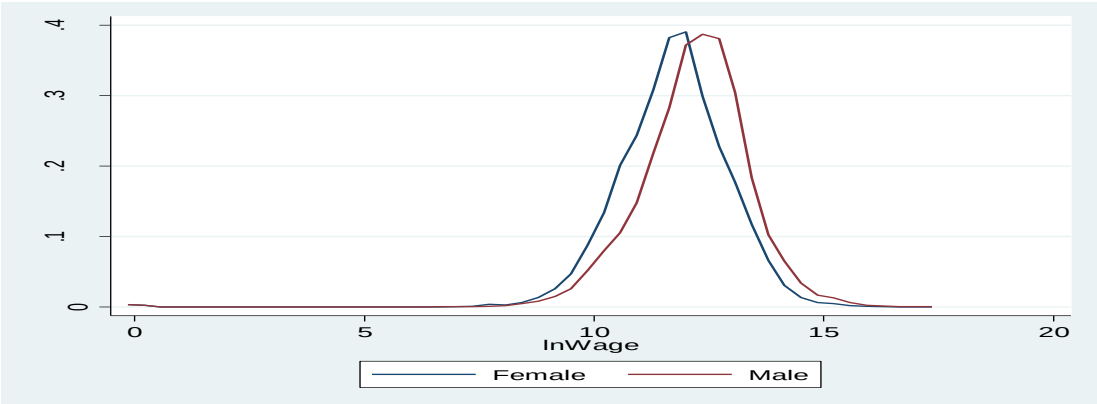
Source: Own Computation based on 2014-ILFS

Table 4: Distribution of Working Age Population Employment Status by Sex

	Female		Male		Total	
Employment Sectors	Number	Percent	Number	Percent	Number	Percent
Unemployed	1,492	74	515	26	2,007	100
Formal	1,329	31	2,958	69	4,287	100
Informal	3,556	51	3,409	49	6,965	100
Agriculture	2,887	49	3,052	51	5,939	100
Total	9,264	48	9,934	52	19,198	100

Source: Own Computation based on 2014-ILFS

Figure 1: K-density Distribution of log Monthly Earnings



Source: Own construction based on ILFS data 2014.

The Kernel Density Plot (KDP) of male and female earning in the Figure 1 gives a clear graphical summary of the shape of data on monthly wages of males and females aged (15-64 years). The gender earning gap is quite visible from the two plotted distributions. The plot of males earning is quite smooth relative to the plot of the females' earnings, which is skewed towards the lower tail. The distributions indicate that the average monthly earnings are higher for males than for females. Figure 1, also shows that females are slightly more represented at lower earnings levels, have a lower peak of the function than males do (fewer female workers earn the mean wage compared to male workers), and are less represented in the earning levels above the mean.

6. Results and Discussion

6.1 Employment Mobility

The results for the estimated Multinomial Logit Model (MLM) for the overall sample and sex based sample are presented in Table 5 and 6. In the literature there is an argument that the MLM should be used if the Independence of Irrelevant Alternatives (IIA) assumption holds and various tests are passed including Hausman McFadden and SUEST tests. Even though, this paper is guided by Long and Freese (2014) arguments that IIA tests are not useful for assessing violations of the IIA assumption; and therefore, the MLM should only be used in the case where the alternatives are dissimilar and not just substitutes for one another.

The likelihood ratio tests of the null hypothesis that there was equality of coefficients between any pair of employment sectors in all models were also conducted. The null hypotheses were rejected at the 1 percent test level of significance. The test results suggest that the labour market is heterogeneous and segmented into formal paid jobs, self-employment, agriculture and not-working is appropriate. In addition, likelihood ratio test was used to test a null hypothesis that all slope coefficients in each model were simultaneously equal to zero. For all estimated models the null hypothesis was rejected at 1 percent of significance statistical test level. In addition, Wald test of whether any of the four employment sectors could be combined were conducted and the test confirms that none of the categories should be combined. Table 5 and 6 presents the marginal effects of multinomial logit model of employment mobility by sex.

Before looking on the results of general education and technical and vocational training, we first focus on basic control variables results. The marginal effects show that age increases the likelihood of being in formal and informal employment, though a negative sign on the square term indicates that much older individuals are less likely to be working either formally or informally. These findings are in line with Dimova *et al*. (2010) and Wambugu (2011). The age coefficients for being unemployed and working on agriculture are negative and statistically significant suggesting that being young is associated with a higher probability of being unemployed compared to adult individuals and working in the

agriculture as the only option remain. For young people this could possibly be due to lack of experience and necessary skills needed in the labour market. The findings further reveal that male and female living in household with large family size had a higher probability of working in agriculture and lower probability of working in formal and informal jobs. On the one hand, this finding could be attributed to the fact that agriculture offer more opportunities for child care since more hours are spent at home. On the other hand, Raihan *et al*. (2016) argues that households with large number of dependants utilize the family members to support their family farm.

Further analysis shows that married males were more likely than unmarried males to be in agriculture, but less likely to be unemployed. Married females, on the other hand, were more likely to be working in agriculture and unemployed, but were less likely to be in formal and informal employments. These finding is consistent with other studies in Kenya by Wamuthenya (2010) and Wambugu (2011). The negative effect of marriage on probability of females being employed in wage employment may reflect employer's prejudice against female employees because of fear that their careers will be interrupted due to family responsibilities (Machio, 2016). Also, married females could be forced to become employed in agriculture sector in order to cope with the need to care for children and domestic work (Twumasi-Buffour, 2013).

The results in Table 6 also suggests that being a household head drove males and females head into formal and informal employments and reduces the probability of working in agriculture or being unemployed. The estimated results are consistent with those obtained by studies on other developing countries, for example Wamuthenya (2010) and Dogrul (2012). The results reveal further that males and females non-resident (migrant) as opposed to the resident in particular location are more likely to be in formal and informal employments and are less likely to be working in agriculture or being unemployed. In addition, the result also show that males and females living in rural and other urban areas apart from Dar es Salaam are more likely to be in agriculture but are less likely to be in formal and informal employments, as well as being unemployed. The results is consistent with the fact that agriculture serves as a buffer of absorbing part of the unemployed and the inactive population in the rural areas and peri-urban areas (Castel *et al*., 2010).

We now turn the results that focus on general education first before turning into technical and vocational training as shown in Tables 5 and 6. The results suggest that tertiary education attainment increases the probability of working in formal wage employment for both males and females while it reduces the likelihood of working in agriculture and informal occupations. The effect of tertiary education on wage employment is even higher for females than males. These findings are in line with previous studies in other countries, where Bridges and Lawson (2008) found that having a university education raises the probability of being in wage employment relative to self-employment for men. Relative to primary education, tertiary education reduces females' probability of being unemployed. This finding could possibly be attributed to a smaller number of females with tertiary education that rendered it easier to access formal employment once they searched for employment.

Coming to technical and vocational training results, as shown in Table 5, we observe that, while TVET training is positively associated with high probability of working in wage employment and it is negatively related to working in agriculture or non-working. This implies that individuals that attended at least one month training were more likely to be working in the formal and self employment sectors and less likely to be in agriculture for both males and females. In the case of informal employment, the results show that males with TVET training were significant less likely to be informal employed a result which is consistent with study by Aslam and Rawal (2013). The TVET category is further decomposed in Table 6.

Table 5: Marginal Effects after Multinomial Logit Model

	Males				Females			
Variables	Unemployed	Formal	Informal	Agriculture	Unemployed	Formal	Informal	Agriculture
Age	-0.007***	0.015***	0.012***	-0.020***	-0.020***	0.019***	0.018***	-0.018***
	(0.001)	(0.004)	(0.004)	(0.003)	(0.003)	(0.002)	(0.004)	(0.003)
Agesq	0.008***	-0.020***	-0.018***	0.030***	0.020***	-0.023***	-0.026***	0.030***
	(0.001)	(0.005)	(0.005)	(0.003)	(0.004)	(0.003)	(0.005)	(0.004)
Primary Education is a reference category								
Secondary	0.017***	0.184***	-0.103***	-0.098***	0.014	0.210***	-0.150***	-0.074***
	(0.004)	(0.014)	(0.013)	(0.010)	(0.010)	(0.015)	(0.015)	(0.012)
TVET	0.002	0.220***	-0.067***	-0.155***	-0.022***	0.131***	0.020	-0.128***

	(0.003)	(0.013)	(0.013)	(0.009)	(0.011)	(0.014)	(0.018)	(0.012)
Tertiary	0.010	0.572***	-0.404***	-0.178***	-0.097***	0.753***	-0.483***	-0.172***
	(0.007)	(0.014)	(0.012)	(0.009)	(0.010)	(0.017)	(0.014)	(0.011)
Dar es Salaam is a reference category								
Other urban	-0.034***	-0.145***	-0.249***	0.428***	-0.195***	-0.032***	-0.272***	0.499***
	(0.003)	(0.012)	(0.012)	(0.016)	(0.008)	(0.007)	(0.014)	(0.015)
Rural	-0.029***	-0.322***	-0.429***	0.780***	-0.197***	-0.100***	-0.522***	0.819***
	(0.003)	(0.009)	(0.010)	(0.010)	(0.007)	(0.006)	(0.010)	(0.010)
Hhead	-0.082***	0.061***	0.044***	-0.024	-0.131***	0.089***	0.065***	-0.023
	(0.010)	(0.020)	(0.021)	(0.018)	(0.011)	(0.016)	(0.020)	(0.015)
Migrant	-0.010***	0.055***	0.057***	-0.102***	-0.022***	0.025***	0.114***	-0.118***
	(0.003)	(0.012)	(0.012)	(0.009)	(0.008)	(0.008)	(0.012)	(0.010)
Hhsize	0.001*	-0.003	-0.012***	0.014***	-0.001	-0.007***	-0.008***	0.016***
	(0.000)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)
Marital(married=1)	-0.015***	-0.003	0.009	0.009	0.077***	-0.019*	-0.121***	0.063***
	(0.005)	(0.017)	(0.018)	(0.014)	(0.010)	(0.010)	(0.015)	(0.012)

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Marginal Effects after Multinomial Logit Model

	Males				Females			
	Unemployed	Formal	Informal	Agriculture	Unemployed	Formal	Informal	Agriculture
age	-0.006***	0.015***	0.011***	-0.020***	-0.020***	0.019***	0.018***	-0.018***
	(0.001)	(0.004)	(0.004)	(0.003)	(0.003)	(0.002)	(0.004)	(0.003)
Agesq	0.008***	-0.021***	-0.018***	0.030***	0.020***	-0.024***	-0.026***	0.030***
	0.001	0.005	0.005	0.003	0.004	0.003	0.005	0.004
Primary Education is a reference category								
Secondary	0.016***	0.172***	-0.090***	-0.099***	0.014	0.195***	-0.137***	-0.072***
	(0.004)	(0.014)	(0.014)	(0.010)	(0.010)	(0.015)	(0.015)	(0.012)
On job tvet	-0.005	0.291***	-0.150****	-0.136***	-0.027	0.307***	-0.132***	-0.147***
	(0.009)	(0.030)	(0.029)	(0.013)	(0.040)	(0.065)	(0.062)	(0.019)
Apprenticeship	-0.004	0.148***	0.006	0.138***	-0.030**	0.008	0.133***	-0.110***
	(0.004)	(0.019)	(0.018)	(0.009)	(0.015)	(0.018)	(0.024)	(0.014)
Vocational	0.019*	0.233***	-0.133***	-0.119***	-0.062*	0.206***	-0.030	-0.113***
	(0.011)	(0.032)	(0.030)	(0.014)	(0.035)	(0.068)	(0.071)	(0.036)
Technical	0.003	0.279***	-0.152***	-0.131***	-0.011	0.202***	-0.066***	-0.125***
	(0.005)	(0.019)	(0.018)	(0.011)	(0.015)	(0.023)	(0.025)	(0.018)
Tertiary	0.009	0.568***	-0.399***	-0.178***	-0.097***	0.748***	-0.479***	-0.172***
	(0.007)	(0.014)	(0.013)	(0.009)	(0.010)	(0.018)	(0.014)	(0.011)
Dar es Salaam is a reference category								
Other urban	-0.034***	-0.144***	-0.252***	0.429***	-0.195***	-0.028***	-0.276***	0.499***
	(0.003)	(0.012)	(0.012)	(0.016)	(0.008)	(0.007)	(0.014)	(0.015)
Rural	-0.029***	-0.323***	-0.428***	0.781***	-0.198***	-0.100***	-0.521***	0.819***
	(0.003)	(0.009)	(0.010)	(0.010)	(0.007)	(0.006)	(0.010)	(0.010)
Hhead	-0.080***	0.061***	0.044***	-0.024	-0.131***	0.089***	0.065***	-0.023
	(0.010)	(0.020)	(0.021)	(0.018)	(0.011)	(0.016)	(0.020)	(0.015)
Migrant	-0.010***	0.055***	0.058***	-0.102***	-0.021***	0.027***	0.112***	-0.118***
	(0.003)	(0.012)	(0.012)	(0.009)	(0.008)	(0.008)	(0.012)	(0.010)
Hhsize	0.001*	-0.003	0.012***	0.014***	-0.001***	-0.007***	-0.008***	0.016***
	(0.000)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)
Marital (married=1)	-0.015***	-0.003	0.010	0.009	0.077***	-0.017*	-0.123***	0.064***
	(0.005)	(0.017)	(0.018)	(0.014)	(0.010)	(0.010)	(0.015)	(0.012)

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

6.2 Gender Differential Returns to General Education and TVET

As it has been the case for preceding sections, we first look on the results of the basic variables as shown both in Tables 7 and 8. As shown in Table 7, the coefficients on experience squared are negatives while that of experience is positive, suggesting existence of a concave relationship between experience and labour earnings, a finding which is consistent with the findings from previous studies, among others, Siphambe (2000) and Okletey (2013). The results show further that being married has a significant positive effect on earnings of married male, but is not significantly in determining female earnings in the labour market. These results are consistent with that of Aslam and Kingdon (2012). The reason may be that after marriage most females give priority to stay home and take care of their children.

Furthermore, hour worked per week on the current job, is significantly positive determinant of labour market earnings and the magnitude of the effect is larger for females than males. Membership to a union raises earnings by 26 percent for males and 45 percent for females, implying that having a membership in union is more important for females than males. The results in Table 7 also show that males and females employed in the other urban areas as well as in rural areas earn significantly less incomes than those in employed in Dar es Salaam. This finding can be attributed to the presence of more labour market opportunities in Dar es Salaam than in those other areas. The estimated results further suggest that the sector of employment of an individual affects earnings as well, where both males and females had higher marginal returns on formal and informal jobs, relative to agriculture and for this case, except for the public sector employment where female returns are by far higher than for male, in all other cases the magnitude off the effect are larger for males than females. The un-weighted results in Table are nearly replicated in the weighted results in Table 8.

We turn now to the estimates of the returns to general education (GED) and TVET in Tanzania in Tables 7 and 8, for both weighted and un-weighted results, where males results are treated separately from females. In both tables, the estimated results show that females have higher rates of return across all levels of education. These findings are in line with findings obtained by previous studies on returns to education in developing countries (Twumasi-Baffour, 2013; Tien, 2014; Leyaro *et al.,* 2014). Several explanations have been proposed for this empirical phenomenon including scarcity of

supply of well educated and trained females in relation to the demand for educated and trained females in developing countries (Aslam, 2009). As a result females may be paid a scarcity-premium or some jobs are reserved for females due to gender-equity promoting policies that deliberately reserve a certain proportion of jobs for females.

Table 7: Un-weighted Regression Results on Returns to GED and TVET

	(1)	(2)	(3)	(4)
VARIABLES	Male	Female	Male	Female
Primary education is a reference category				
Secondary	0.390***	0.475***	0.386***	0.466***
	(0.029)	(0.040)	(0.030)	(0.040)
TVET	0.081***	0.148***		
	(0.028)	(0.037)		
On job tvet			0.053	0.321***
			(0.056)	(0.097)
Apprenticeship			0.072**	0.066
			(0.036)	(0.056)
Vocational			0.037	0.093
			(0.088)	(0.129)
Technical			0.114***	0.193***
			(0.038)	(0.047)
Tertiary	1.075***	1.167***	1.072***	1.168***
	(0.045)	(0.058)	(0.045)	(0.058)
Experience	0.046***	0.042***	0.046***	0.041***
	(0.004)	(0.004)	(0.004)	(0.004)
Expersq/100	-0.075***	-0.061***	-0.075***	-0.061***
	(0.008)	(0.009)	(0.008)	(0.009)
Dar es Salaam is a reference category				
Other urban	-0.317***	-0.382***	-0.315***	-0.378***
	(0.025)	(0.030)	(0.025)	(0.030)
Rural	-0.608***	-0.560***	-0.606***	-0.558***
	(0.041)	(0.051)	(0.041)	(0.051)
Logwwh	0.137***	0.428***	0.136***	0.427***
	(0.036)	(0.040)	(0.036)	(0.040)
Union	0.259***	0.446***	0.258***	0.436***
	(0.043)	(0.059)	(0.043)	(0.059)
Marital (Married=1)	0.232***	-0.015	0.233***	-0.013
	(0.028)	(0.030)	(0.028)	(0.030)
Agriculture is a reference category				
Public	0.748***	0.917***	0.747***	0.902***
	(0.066)	(0.077)	(0.066)	(0.077)
Private	0.576***	0.505***	0.578***	0.500***
	(0.043)	(0.055)	(0.043)	(0.055)
Informal	0.603***	0.456***	0.605***	0.458***
	(0.042)	(0.048)	(0.042)	(0.048)
Constant	10.464***	9.071***	10.467***	9.083***
	(0.150)	(0.173)	(0.151)	(0.173)
Observations	8,511	5,801	8,511	5,801
R-squared	0.297	0.309	0.297	0.310

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Coming to the results on technical and vocational training, the coefficient on training (TVET) is statistically significant and it has a positive effect on labour market earnings as

shown both in Table 7 and 8. The returns to TVET training is higher for females than males, as they are twice more higher than those for male although at the same time the coefficients are smaller compared to those for general education. Consequently female workers that had attended TVET training were more likely to earn higher income in the labour market than males. In addition, on job training have large impact in terms of females' earnings, followed by technical training.

Table 8: Weighted Regression Results on Returns to GE and TVET

Variables	Male	Female	Male	Female
Primary Education is a reference category				
Secondary	0.352***	0.481***	0.345***	0.466***
	(0.031)	(0.044)	(0.033)	(0.042)
Tvet	0.076**	0.140***		
	(0.031)	(0.040)		
On job tvet			0.043	0.313***
			(0.057)	(0.098)
Apprenticeship			0.068*	0.069
			(0.038)	(0.057)
Vocational			0.034	0.086
			(0.090)	(0.128)
Technical			0.111***	0.186***
			(0.042)	(0.049)
Tertiary	1.003***	1.097***	0.996***	1.090***
	(0.052)	(0.067)	(0.052)	(0.065)
Experience	0.045***	0.040***	0.045***	0.039***
	(0.006)	(0.005)	(0.006)	(0.005)
Expersq/100	-0.076***	-0.056***	-0.076***	-0.055***
	(0.011)	(0.010)	(0.011)	(0.010)
Dar es Salaam is a reference category				
Other urban	-0.327***	-0.391***	-0.322***	-0.385***
	(0.029)	(0.033)	(0.029)	(0.032)
Rural	-0.660***	-0.592***	-0.656***	-0.588***
	(0.056)	(0.056)	(0.055)	(0.055)
Logwwh	0.110***	0.412***	0.107**	0.411***
	(0.042)	(0.042)	(0.042)	(0.042)
Union	0.235***	0.403***	0.234***	0.390***
	(0.042)	(0.060)	(0.043)	(0.059)
Marital (married=1)	0.240***	0.011	0.242***	0.014
	(0.033)	(0.035)	(0.034)	(0.035)
Agriculture is a reference category				
Public	0.817***	0.984***	0.816***	0.962***
	(0.069)	(0.079)	(0.069)	(0.079)
Private	0.586***	0.518***	0.588***	0.510***
	(0.055)	(0.063)	(0.055)	(0.062)
Informal	0.566***	0.404***	0.569***	0.405***
	(0.055)	(0.052)	(0.055)	(0.053)
Constant	10.629***	9.169***	10.637***	9.192***
	(0.172)	(0.181)	(0.173)	(0.181)
Observations	8,511	5,801	8,511	5,801
R-squared	0.279	0.330	0.279	0.331

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

6.3 Gender Wage Gap

Table 9 presents the decomposition results obtained by applying the Oaxaca-Blinder (1973) procedure in assessing the gender wage gap between males and females given their level of education and training. The decomposition of the OLS estimates reveal that the labour earnings difference between males and females, when male earnings is the reference category, is 0.458 log points, which corresponds to a wage gap of (exp(0.458)-1)*100 = 58 percent. However, the result shows further that the explained proportion is smaller in magnitude than the discriminatory proportion of the gender wage gap. The finding is consistent with that obtained by previous studies in developing countries like Garcia *et al.* (2009) and Ejaz (2015).

Turning to the contribution of different characteristics (endowments) of males and females in explaining the wage gap, as shown Table 9, males are better off in terms of education and training attainment. Differences in education and training level attained especially advanced secondary education, tertiary education, TVET training, potential labour market experiences, weekly working hours, being in union as well as variation in employment sectors, largely explain the outcomes of differential gender wage gap. Meanwhile, there are no statistically significant apparent differences in earnings related to lower secondary education attainment. The main driver of the unexplained component of earning structural were upper secondary and tertiary education levels, training, potential labour market experiences, nature of the job (casual), being youth as well as being married.

Table 9: Mean Wage Gap: Oaxaca-Blinder Decomposition Results

	Values	% of Values
Mean log wage for Males	12.295***	
	(0.015)	
Mean log wage for Females	11.838***	
	(0.018)	
Unadjusted mean log wage	0.458***	58.1

gap		
	(0.024)	
Total endowments(explained)	0.089***	9.3
	(0.015)	
Total wage structure (unexplained)	0.368***	
	(0.021)	44.5

Variables	Contribution effects attributed to	Wage structural effects attributed to
Secondary	-0.007*	-0.037**
	(0.004)	(0.016)
TVET	0.015***	-0.031
	(0.004)	(0.023)
Tertiary	0.001	-0.007
	(0.006)	(0.006)
Experience	0.117***	0.109
	(0.014)	(0.165)
Expersq/100	-0.085***	-0.115
	(0.012)	(0.087)
Other urban	0.013***	0.023
	(0.003)	(0.016)
Rural	-0.030***	-0.010
	(0.004)	(0.011)
Logwwh	0.045***	-1.222***
	(0.005)	(0.238)
Union	0.002	-0.019**
	(0.002)	(0.008)
Marital	0.026***	0.147***
	(0.006)	(0.030)
Public	-0.004	-0.017
	(0.006)	(0.011)
Private	0.047***	0.020
	(0.006)	(0.023)
Informal	-0.052***	0.067**
	(0.006)	(0.032)
Observations	14,312	14,312

Dependent Variables Logarithms of Monthly Earnings, Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. Omitted categories are primary education, agriculture and Dar es Salaam.

7. Summary and Policy Implications

Using data from the 2014 Integrated Labour Force Survey (ILFS) and applying the descriptive statistics and estimation methods, this study set to investigate and examine the gender labour market outcomes differential effects of technical and vocational training relative to general education in Tanzania. In most countries in the region (i.e. SSA) where gender disparity have remained high in most of its forms, with rising women unemployment (according to 2014 ILFS 74 percent of females in Tanzania are unemployed compared to males) and where the majority of them are in informal sector with un-decent jobs and erratic and low incomes, which exacerbate high level of poverty

and inequality; understanding the labour markets of female comparing to male is indeed very critical. This therefore entails clear analysis of employment mobility and returns to technical and vocational training comparing to general education of females relatively to male.

The MLM estimated results reveal that different levels of education (dummies) are negatively associated with probability of working in agriculture and informal jobs. Also, males and females who acquired TVET training are significantly more likely to be engaged in formal jobs, but are less likely to work in agricultural self-employment. This could be because education and TVET training gives access to better opportunities in formal employment that are also relatively secure and have stable income. Though, the impact of education on formal wage employment appears much more important for males than females. Policy-wise, given the current concerns about the plight of women in the country, it can be argued that providing them with further education and TVET training would be a useful investment, since they would be more productive in the labour market.

Nevertheless, TVET training increases men's and female's earnings substantially, however the returns to TVET are higher for females than males. Nonetheless, the findings from gender earnings gap decomposition shows existence of gender earning differential in Tanzania where males tends to earn significantly higher income than females. This is mainly caused by difference in education attainments between males and females. For this reason, there is a need to resolve earning and occupational differences through promotion of females' higher levels of educational attainments, as well as in TVET training courses. The government should deliberately increase efforts in ensuring that parity is achieved at higher levels of education through subsidization and provisions of loans.

Likewise, much of the debate in the international literature has focused on the relative merits of general versus vocational or other training. Though, evidence from this study implies that training confers benefits independent of general schooling. Thus, providing quality training at different exit points from general education can improve females' labor market outcomes. Therefore the government should initiate strategies that aim to promote TVET training as one essential root towards skills infusion, as well as improving the

quality of TVET trainings. There should be also incentives to maintain individuals in TVET channel.

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Appendix

Appendix A: Construction of Wage Variable

The income (wage) question is often a sensitive one, especially for those in privately-owned enterprises. In many cases getting reliable answers is very difficult. This is due to the fact that many people regard the income question as a way for the government to acquire evidence for taxation purposes. The situation is exacerbated when the agency collecting this information is a government institution. In respect of wages and salaries, too, individuals often regard the information as personal and confidential. Because of the sensitivities, the income questions in the individual questionnaire were deliberately placed at the end after the respondent had supplied all other employment information.

Under this study wages is broadly defined as the compensation in cash or in-kind which accrues to employed persons as a result of their involvement in either waged employment or self-employed jobs or compensation for engaging in agricultural activities over a given reference period. From 2014 ILFS questionnaires, all individuals identified as having worked during the reference week in a waged job or self employment in respect of either the main or secondary activities were asked about income from employment. Respondents in formal wage employment were asked the monthly gross cash income earned from their paid employment during the last month. Gross cash income referred to total income before any deduction of tax, rent, etc. and included any monthly responsibility earnings. If the respondent had just started a job and had not yet been paid, interviewers were advised to record the respondent's expected gross income. If the respondent was temporarily absent from his/her wage job in the last month and was not paid during the reference week, his/her usual monthly income recorded.

Self-employed respondents were asked the gross income/takings in cash earned from their business or businesses in the last week or month. They were then asked about all expenses incurred in earning that gross income during the same reference period. The net profit was calculated by deducting all expenses incurred from the gross income earned. Income from self-employment was often difficult to calculate as many small enterprises do not keep records. However, interviewers were equipped with techniques for getting estimates of income, even if they were a rough approximation. The individual questionnaire included a further question on income that was posed to individual engaged

in agriculture during the past week. These individuals were asked to provide the net income from their agricultural week over the last week or month. Net monthly income (wages) from self-employment is calculated by multiplying the net weekly income by 4 for those who reported their net income in the last week instead of last month. We focus exclusively on monthly earnings from the main job due to the small number of multiple job holders in the sample survey that prevent us to obtain reliable income variables from the secondary job disaggregated for men and women in formal, agriculture and informal employments.

Appendix B

Table B1: Multinomial Logit Model Estimates for General Education Levels and TVET

	Male			Female		
VARIABLES	Formal	Informal	Agriculture	Formal	Informal	Agriculture
Age	0.299***	0.280***	0.140***	0.284***	0.166***	0.041
	(0.029)	(0.028)	(0.030)	(0.029)	(0.022)	(0.025)
Agesq	-0.386***	-0.368***	-0.159***	-0.316***	-0.180***	0.023
	(0.038)	(0.037)	(0.040)	(0.040)	(0.032)	(0.036)
Primary education is a reference category						
Secondary	-0.088	-0.815***	-1.222***	1.069***	-0.409***	-0.534***
	(0.114)	(0.111)	(0.127)	(0.100)	(0.078)	(0.111)
Tvet training	0.493***	-0.241*	-1.193***	0.945***	0.197**	-0.729***
	(0.128)	(0.128)	(0.146)	(0.113)	(0.098)	(0.150)
Tertiary	0.737***	-2.127***	-2.695***	3.190***	-1.031***	-0.903**
	(0.225)	(0.253)	(0.336)	(0.196)	(0.244)	(0.365)
Dar es Salaam is a reference category						
Other urban	1.297***	1.140***	3.529***	1.502***	1.154***	3.723***
	(0.140)	(0.138)	(0.159)	(0.105)	(0.083)	(0.124)
Rural	0.458**	0.480**	4.797***	1.442***	0.950***	5.535***
	(0.202)	(0.196)	(0.200)	(0.193)	(0.155)	(0.167)
Hhead	2.074***	1.984***	1.753***	1.780***	1.299***	1.055***
	(0.175)	(0.170)	(0.193)	(0.166)	(0.147)	(0.169)
Migrant	0.578***	0.542***	-0.183	0.347***	0.361***	-0.484***
	(0.116)	(0.114)	(0.128)	(0.090)	(0.068)	(0.090)
Hhsize	-0.039*	-0.056***	0.046**	-0.054**	-0.010	0.086***
	(0.020)	(0.019)	(0.020)	(0.021)	(0.015)	(0.017)
Marital (Married=1)	0.523***	0.550***	0.581***	-0.689***	-0.759***	-0.197*
	(0.164)	(0.162)	(0.181)	(0.118)	(0.090)	(0.111)
Constant	-5.165***	-3.688***	-4.066***	-6.954***	-2.482***	-3.971***
	(0.501)	(0.474)	(0.516)	(0.496)	(0.344)	(0.399)
Observations	9,934	9,934	9,934	9,264	9,264	9,264

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table B2: Multinomial Logit Model Estimates for TVET Levels

	Male			Female		
Variables	Formal	Informal	Agriculture	Formal	Informal	Agriculture
Age	0.300***	0.280***	0.141***	0.283***	0.167***	0.042*
	(0.029)	(0.028)	(0.030)	(0.029)	(0.022)	(0.025)
Age sq/100	-0.388***	-0.366***	-0.160***	-0.319***	-0.179***	0.024
	(0.038)	(0.038)	(0.040)	(0.041)	(0.032)	(0.036)
Primary education is a reference category						
Secondary	-0.092	-0.756***	-1.199***	1.004***	-0.377***	-0.516***
	(0.116)	(0.113)	(0.129)	(0.103)	(0.079)	(0.112)
On job tvet	0.861*	-0.163	-1.099**	1.446***	-0.087	-1.186**
	(0.480)	(0.488)	(0.520)	(0.405)	(0.384)	(0.521)
Apprenticeship	0.546***	0.155	-1.006***	0.287	0.451***	-0.567***
	(0.192)	(0.189)	(0.213)	(0.199)	(0.143)	(0.202)
Vocational	-0.043	-0.914***	-1.618***	1.512***	0.480	-0.334
	(0.283)	(0.293)	(0.332)	(0.475)	(0.449)	(0.627)
Technical	0.508***	-0.525***	-1.227***	1.091***	-0.057	-0.857***
	(0.181)	(0.186)	(0.230)	(0.145)	(0.137)	(0.253)
Tertiary	0.731***	-2.092***	-2.682***	3.155***	-1.015***	-0.907**
	(0.224)	(0.253)	(0.336)	(0.197)	(0.244)	(0.368)
Dar es Salaam is a reference category						
Other urban	1.307***	1.132***	3.529***	1.534***	1.138***	3.717***
	(0.141)	(0.138)	(0.159)	(0.106)	(0.083)	(0.124)
Rural	0.469**	0.487**	4.806***	1.460***	0.941***	5.532***
	(0.203)	(0.197)	(0.201)	(0.192)	(0.155)	(0.167)
Hhead	2.062***	1.974***	1.741***	1.778***	1.297***	1.054***
	(0.175)	(0.170)	(0.193)	(0.166)	(0.147)	(0.168)
Migrant	0.572***	0.539***	-0.186	0.356***	0.356***	-0.488***
	(0.116)	(0.114)	(0.128)	(0.091)	(0.068)	(0.090)
Hhsize	-0.040**	-0.057***	0.045**	-0.053**	-0.010	0.086***
	(0.020)	(0.019)	(0.020)	(0.021)	(0.015)	(0.017)
Marital (Married=1)	0.543***	0.574***	0.603***	-0.676***	-0.768***	-0.199*
	(0.165)	(0.163)	(0.182)	(0.118)	(0.090)	(0.111)
Constant	-5.168***	-3.714***	-4.094***	-6.875***	-2.497***	-3.983***
	(0.504)	(0.477)	(0.519)	(0.497)	(0.345)	(0.400)
Observations	9,934	9,934	9,934	9,264	9,264	9,264

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1