ESSAYS ON THE LABOUR MARKET IN GHANA

Charles N.F. NIMOH

The University of Salford

A thesis submitted in partial fulfilment of the requirement for the degree of Doctor of Philosophy

2018

Content

List of Tables

List of Figures

Abstract

Using a three-essay approach, we focus on three issues related to the labour market: unemployment, underemployment and informality.

Chapter 2 examines the unemployment, the job search and job expectations of the unemployed using a probit model. Results show that, unemployment is inequitably distributed in Ghana with the youth, medium educated, Christian, single, residents of Accra and urban dwellers more vulnerable to unemployment, all of which have plausible explanation. The results also show that, the behaviour of men and women in the labour market is diverse. This is because, effects of the explanatory variables differ between both genders which is highlighted by the low exit rate from unemployment into employment among women relative to men. Furthermore, evidence shows that, job creation has not been sufficient due to the higher probability of unemployed individuals who expected to secure wage employment relative to self-employment and any employment.

In chapter 3 we employ the probit model to test the likelihood of an individual becoming underemployed. Additionally, we use the Fairlie decomposition analysis akin to that which is normally used to analyse wage discrimination to explain the gender gap in underemployment. Results show that underemployment is high among women, low and highly educated and agricultural sector workers. Furthermore, the female-male gap is widened by residing in urban areas, being married and individuals with low and high education. There still remains a residual which could not be explained this way. The unexplained part of the gender race gap in underemployment probability may be due to unobserved characteristics such as employer discrimination or quality of education.

The final chapter uses a finite mixture model to test the heterogeneous nature of the Ghanaian informal sector. The chapter sought to understand whether workers are able to self-select into formal and informal sector employment. I find no evidence of workers being able to self-select into formal sector employment. Thus, workers face entry barriers that restrict them from moving into formal sector employment. Evidence shows that, some workers choose to work in the informal sector due to comparative advantage, whiles for others, it is a place of last resort to avoid unemployment.

DECLARATION

I declare that no portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

Acknowledgements

Firstly, I thank the Almighty God for all his blessings and guidance throughout this process.

I would like to express my sincere gratitude to my supervisor, the inimitable Dr. Tony Syme for the invaluable mentorship, support and guidance he has provided to me during this process. I am grateful to him for offering me lecturing opportunities. Additionally, I thank Kevin Marshall for furthering my lecturing experience.

I must also express profound gratitude to the Ghana Statistical Service, for making available the Ghana Living Standards Survey dataset (GLSS).

I am greatly indebted to my parents and siblings for their unfailing love and support throughout this process. This thesis is dedicated to them. To all my friends and the support staff of the PhD program most especially Shell I say thank you.

1.0 Introduction

Economists constitute a fraction of the social science cohort with their interest being in events and their causes. They are particularly interested in many issues related to the labour market such as employment, unemployment, underemployment, informality and government regulations/policies among many others and since it turns out that, majority of workers have only one job, labour market outcomes are therefore highly important to the welfare of individuals. Additionally, labour market outcomes allow policymakers in a country to understand the proportion of employed, unemployed and economically inactive individuals because the more the working population, the higher the amount of wealth being created which in effect leads to not only improved living conditions but also reduction in poverty.

The focus of this thesis is developing countries because they are the most faced by labour market challenges. The presence of informal labour markets, underemployment, and tax evasion is a salient feature of most developing countries that has consequences on individuals, government revenues and the economies in general (Satchi and Temple, 2008; Blades, Ferreira and Lugo, 2011; Gerxhani, 2004). Ghana is the country which has being chosen as the object of this study in all three chapters. Ghana is considered a good benchmark to study labour market challenges due to the fact that, Ghana is similar to small group of countries in terms of labour market segmentation i.e. high informal sector employment and low rates of unemployment but none of these have been subjected to major studies and in addition, Ghana's economic size and status as a developing country makes it fit for this study. By observing statistics for the Ghanaian labour market, one cannot ignore three things namely unemployment, underemployment and informal sector employment. As argued by Benjamin and Mbaye (2014) a common response to unemployment, underemployment and low income has evolved through the growth of the informal sector. Furthermore, they state that, among the most significant features of the modern economy are underemployment and the informal sector with underemployment being the fundamental cause of urban poverty and the informal sector serving as a survival strategy for the poor. LaPorta and Shleifer (2014) further argued that, in developing countries, the informal sector is not only a major part of the economy it also plays a major role in it with little or no access to capital. The size of the informal sector in developing countries increased from about 37 percent of gross domestic product in the 1990s to more than 50 percent by 2010 (Charmes, 2012) absorbing about 40 – 80 percent of the working age population (ILO, 2004; Schneider et al. 2010; Darbi, Hall and Knott, 2018).

Despite being a high growth developing country, the Ghanaian economy is largely informal with the sector employing about 80 percent of the workforce (Osei-Boateng and Ampratwum, 2011) which has hidden the true nature of unemployment. This is further evident by the fact that, even though the employment rate in the public and formal sector have fallen in 2012/13 from where it was in 2000, instead of there been an increase in the unemployment rate the reverse is the case. These facts motivate this thesis because looking at unemployment, underemployment and informal sector employment cumulatively gives a broader picture and understanding of the labour market of Ghana and it is worth noting that, whiles Ghana's labour market is worthy of a detailed analysis on its own, it is also helpful in highlighting the labour market issues faced by countries with labour market issues i.e. very large informal sector and low rates of unemployment such as Rwanda, Burkina Faso and Tanzania. These are countries for which they relatively lack economic investigation of the labour market.

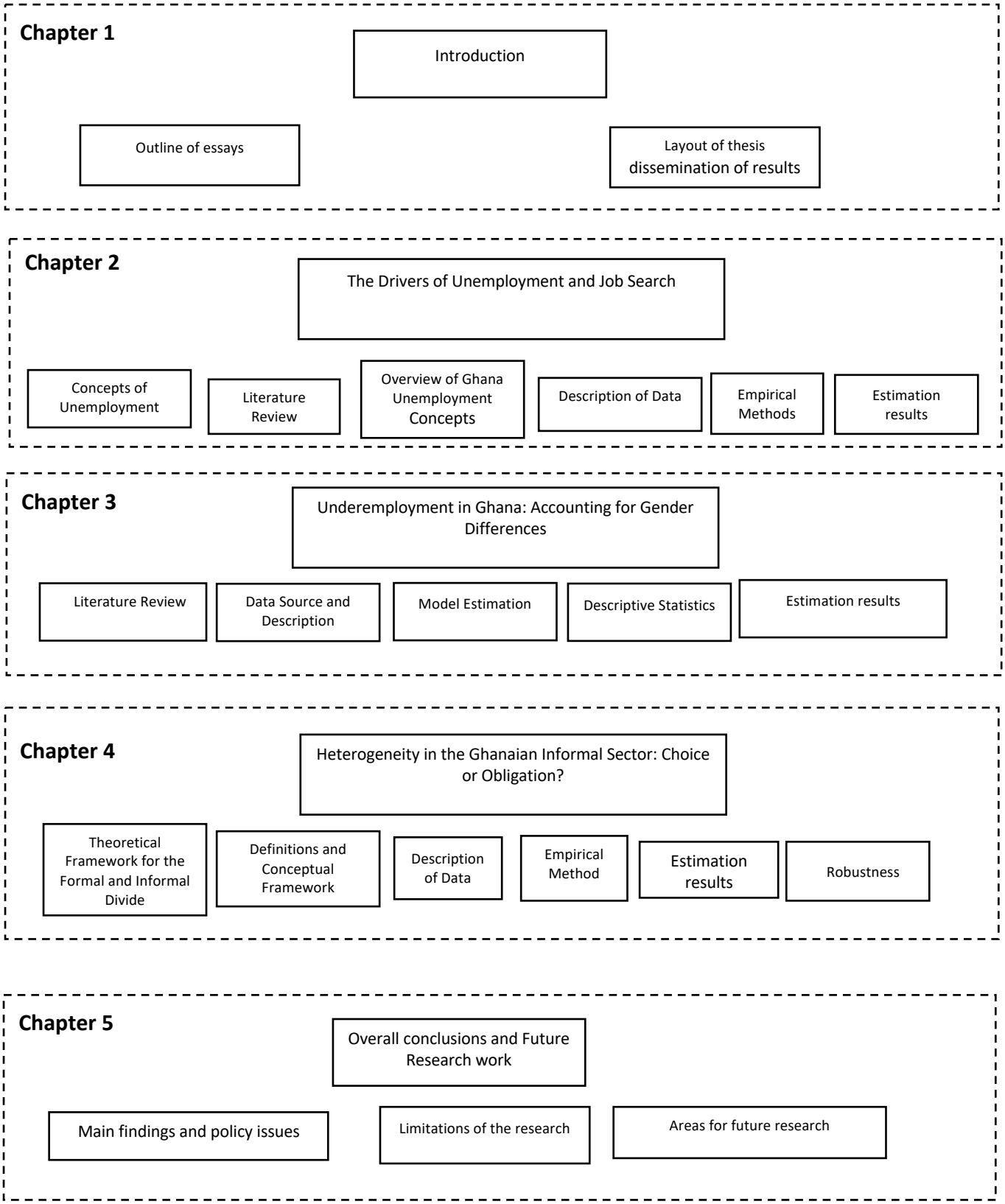
Additionally, like any other country whether in the developed or developing world, the economy of Ghana has its own labour market challenges and as has being highlighted by Aryeetey and Baah-Boateng (2015) labour market challenges has a direct bearing on the economic activities of a country. Thus, given the importance of labour market, policy makers and economists are increasingly concerned with having a true picture of the Ghanaian labour market. Additionally, it is our view that, development in the labour market holds the key to Ghana's prosperity or penury.

In light of the preliminary observations raised above, the aim of the thesis is to show that neither unemployment, underemployment or informality can be explained in isolation of each other and therefore any analysis of the labour market in developing countries would need to look at the three issues together. In other words, looking at unemployment, underemployment or informality on its own is insufficient hence this thesis presents three highly related chapters focusing on unemployment, underemployment and informality in a developing country with a special focus on Ghana. The contribution of the entire thesis would be to provide labour market outcomes in Ghana which would help policymakers in shaping policies that would be of great benefit to individuals in the labour market. This is important because any enacted policy may lead to completely unexpected results due to the different structural features that exist in the economy which means it is highly imperative to understand these structures as thoroughly as possible before any policies are introduced. Secondly, for countries that have high informal sector and those that have increasing informal sector employment, this thesis highlights the importance of looking at unemployment, underemployment and informal sector employment

cumulatively and not in isolation since they have consequences on each other. Thirdly countries with high rates of unemployment and low rates of informal sector employment (e.g. South Africa) can learn from the findings in this thesis to open up the informal sector in order for individuals who are unemployed to be able to either find work or start a business since this thesis has shown that the informal sector is heterogeneous in nature and when people gain employment there they are more likely to pay income/corporation tax to the government which would then increase government revenue. Additionally, as highlighted by Brown and Neku (2005) unemployed individuals in South Africa earn social welfare benefits which means revenues earned by the government from other sources are being offered to the unemployed which also shows why the South Africa social welfare system is collapsing (Mabugu and Chitiga-Mabugu, 2013; Potts, 2012; Seekings, 2015) because funds are not enough and by opening up the informal sector people can enter there instead of staying unemployed.

Figure 1 shows a diagrammatic approach to the structure of the thesis. A summary of the outline and the content of each of the substantive chapter's is shown below:

Figure 1 Thesis structure



Chapter 2 titled, ***"The Drivers of Unemployment and Job Search",*** focuses on unemployment and Job search. The unemployment rate in Ghana, over the last decade has being on the decline which seems to suggest that unemployment is not an economic problem in Ghana. The low unemployment rate in Ghana may be due to the high rise in underemployment rate and informal sector employment which is shielding the true nature of unemployment. Given the importance of income earned from employment in total household income in Ghana (Novignon, 2017), the inability of the unemployed in a country to secure employment could create disaffection among them which could cause some of them most especially the youth to resort to social vices such as political unrest and crimes (Feldmann, 2010) among other things (Baah-Boateng, 2014). Job expectations and the job search activities of individuals on the other hand are important because they aid in understanding the characteristics of the unemployed in terms of their job search and job expectation. Giving the foregoing the aim of this chapter is to address the unemployment challenges in Ghana by understanding the true nature of unemployment. In order to achieve the aim, five objectives of the chapter are to:

1. Identify and examine the contributory factors to unemployment
2. Identify which groupings follow the same trend over the years as the whole sample and whether over the years, the differences between groupings become larger or smaller
3. Identify which grouping is likely to be unemployed at the end of the sample period as against the beginning of it.
4. Examine the uncompleted spells of unemployment duration.
5. Determine the job search and job expectations of the unemployed.

My main finding is that, unemployment is not evenly distributed in Ghana with the youth, single, medium educated urban dwellers and residents of Accra more susceptible to unemployment. The results also highlight the diverse behaviour of men and women in the labour market. Furthermore, there is evidence to suggest that unemployment duration was longer in 2005/06 (3-6months) than it was in 2012/13 (1-3months). The study also show that, there is a higher probability of unemployed individuals who are in search of wage employment relative to self-employment and any employment which highlights the slow rate of job creation in the wage employment sector.

Chapter 3 ''***Underemployment in Ghana: Accounting for Gender Differences''.*** Underemployment in simple terms is the amount of slack in the labour market

which in other words means it is a kind of inefficiency and source of welfare loss (Bell and Blanchflower 2013; Walling and Clancy 2010; Wilkins and Wooden 2011). The rise in underemployment in Africa can be attributed to the lack of social insurances which means in order to make ends meet individuals accept any kind of employment. Whiles Dooley and Prause (2004) argue that, any kind of job is better than no job, underemployment has an impact on the life satisfaction, income and welfare dependency of individuals (Wilkins, 2007) and it also understates the true nature of unemployment in an economy. This chapter explores the incidence of underemployment due to the fact that, underemployment is more likely to affect individuals in the informal sector (Golub and Hayat, 2014) and in order to have a true picture of the labour market challenges it is imperative to look at the likelihood of individual becoming underemployed. Additionally, the Fairlie decomposition technique is employed to explain the gender gap in underemployment. The aim of this chapter is to explore and investigate the incidence of time related underemployment in Ghana as well as analysing the gender gap. For this purpose, two objectives of the chapter are to:

1. Examine the main factors that drive time-related underemployment
2. Identify and analyse the drivers of the gender gap

The study shows that, underemployment is high among women, low and highly educated individuals. Additionally, relative to the informal sector, workers in the formal sector are less likely to be underemployed. Building on the results obtained, we propose a decomposition technique to complement our gender differences results and find that, the female-male gap widened by residing in urban areas, being married with education explaining the gender gap in some instances.

Chapter 4 ‘’***Heterogeneity in the Ghanaian Informal Sector: Choice or Obligation?’’*** The informal sector represents an important part of the economy of many countries through employment creation which translates into income generation with little or no access to the capital market and very limited labour mobility to the formal or organised sector (LaPorta and Shleifer, 2014). The sector is a pervasive feature of most developing countries and tends to absorb most of the expanding labour force. Whiles the sector is deemed to be very important, there are two broad views that explain the reason behind the growing informal sector employment in developing countries. Some argue from the labour market segmentation point of view whiles others argue from the competitive choice point of view. Since informal sector employment in Ghana is on the rise and in order to understand the sector

the aim of this chapter is to truly determine whether Ghana's informal sector employment is due to labour market segmentation or competitive choice. For this purpose, three objectives of the chapter are to:

1. Identify the number of segments in the informal sector
2. Determine the wage differences across all sectors
3. Explore and examine whether entry barriers exist

In order to answer the objectives, we employ a finite mixture model with sample selection which we used to estimate whether the growth in the Ghanaian informal sector is due to a choice or obligation since all work carried out have assumed the informal sector to be homogenous in nature. Our results show that, informal sector employment in Ghana is heterogeneous in nature and that it is made up of a combination of comparative advantage and last resort for some workers. The empirical evidence also shows that, the Ghanaian labour market does not have unlimited sector mobility.

At the end of the chapter, findings and limitations of the research are also discussed. Additionally, the chapter provides areas for further research.

The Drivers of Unemployment and Job Search

2.1 Introduction

The rate of unemployment has always been at the centre of both policy and theoretical debates in terms of the determinants, the effects and policy implications. In emerging economies around the world, there is a heightened renewed interest to address the unemployment challenges. This is because, across the world, over 200 million individuals are unemployed with youth and long-term unemployment recording the highest in many countries (IMF, 2013). The IMF (2013) report further highlights that, the employment rate (the employment to population ratio) remains at 60 percent globally which is considered to be its lowest rate in two decades even though unemployment is projected to remain on the rise for several years. Furthermore, unemployment in majority of instances serves as an indicator of the economic welfare (health) of a country and as argued by Kingdon and Knight (2007), developments in the labour market leads to the growth of an economy. Unemployment in developing countries is believed to differ from that of high-income countries. The limited number of researches carried out all show that unemployment in developing countries is a queuing phenomenon where the unemployed in the society, tend to wait for better jobs and the job tends to be concentrated among the relatively well-educated individuals who are in most cases from the middle income class of the country. In support of the above, Myrdal (1968) states that, unemployment is a bourgeois phenomenon (Serneels, 2008).

When job opportunities are limited to the labour force, it indicates the failure of policies with political, social and economic implications for the country (Loundes, 1997; Dooley, 2003; Wu and Eamon, 2011; Mclean, Carmona, Francis, Wohlgemuth and Mulvihill, 2005). The inability of the unemployed in a country to secure employment could create disaffection among them which could cause some of them most especially the youth to resort to social vices such as political unrest and crimes (Feldmann, 2010) among other things (Baah-Boateng, 2014).

Ghana has a distinct labour market with sharp segmentation. The market portrays high informal sector employment rates and low unemployment rates. Over the last decade, the unemployment rate in Ghana has declined significantly to single digits, which seems to suggest that, in Ghana unemployment is not a major labour market problem/issue and this low figure may largely be due to the high degree of private informal work. Furthermore, the unemployment rates for different groups show great disparity in the incidence of

unemployment by locality, age, gender, literacy level, education, marital, nationality and regional. Given the importance of income earned from employment in total household income in Ghana (Novignon, 2017), the great disparity in the incidence of unemployment across different groups has dire consequences for the distribution of income and for the incidence of poverty. The primary concern of this chapter is with unemployment and the job search characteristics and job expectations of job seekers particularly due to the fact that, empirical research on the determinants of unemployment is relatively sparse in Africa (Baah-Boateng, 2013). However, in order to understand these phenomena, it is imperative to consider a range of related indicators such as the labour force and labour force participation rate. In the first instance, this chapter would seek to investigate the nature of unemployment in Ghana, in addition to the contributory factors to unemployment by identifying the characteristics that are more likely to lead to an individual been unemployed.

It will also highlight which groupings follow the same trend over the years as the whole sample and whether over the years, the differences between groupings become larger or smaller. Furthermore, the study will look at which groupings are likely to be unemployed at the end of the sample period as against the beginning of it. The study would also look at the duration of uncompleted spells of unemployment. All of the above would be achieved through descriptive statistics. The next phase of the work would be to carry out an estimation of a probit equation of unemployment. The main idea behind the probit equation is due to the fact that, it will allow us measure or explore the influence each of the explanatory variables has on the probability of an individual becoming unemployed holding other factors constant. It is important to look at this because, it will reveal whether potential policy-amenable variables such as education, locality and regions alter the probability of unemployment in different ways across both years of study**.**

Secondly, this study will focus on the job search and job expectations of the unemployed due to the fact that, labour economics places great importance on job search; it is ‘‘the process whereby job seekers are matched to suitable job opportunities **(**Green, Hoyos, Land Owen, 2011; Abdel-Mowla, 2012). The job search strategies of job seekers play an important role in determining their future status in the labour market. Thus, it is important to understand and improve search effectiveness in order to match job seekers with job opportunities which will translate into economic growth. However, there is insufficient empirical information on job search in Ghana. Whiles different studies of job search activities have emerged in the last two decades, majority of them have focused on job search activities

of individuals in developed countries (Smirnova, 2004; Boheim and Taylor, 2002; Kuhn and Skuterud, 2004; Krueger and Mueller, 2010; Weber and Mahringer, 2008) with fewer studies looking at developing economies (Abdel-Mowla, 2012; Sackey and Osei, 2006). It is therefore of particular interest to extend the literature on job search activities and job expectations of the unemployed in Ghana since to the best of our knowledge whiles Nyarko, Baah-Boateng and Nketiah-Amponsah (2014) researched on job search intensity in Ghana, they studied only individuals in Accra with a sample size of 404 individuals and Sackey and Osei (2006) worked with 1999 dataset which briefly touched on job search of job seekers – the economic downturn may have changed the dynamics of the labour market therefore working with relatively new data sets should reveal any changes. Additionally, since unemployment in itself is a multidimensional concept studying it over again would reveal any changes and dynamics in order to draw reasonable conclusions and policy directions.

This chapter is structured as follows. Section 2.2 presents an overview of the concepts of unemployment. Section 2.3 presents the theoretical literature review. Section 2.4 review empirical literatures on determinants of unemployment. Section 2.5 presents an overview of the Ghanaian labour market. Section 2.6 discusses the data, empirical methods and more importantly variable description. Section 2.7 presents the estimation results for both determinants of unemployment and job search and job expectations. Section 2.8 concludes.

2.2 Concepts of Unemployment.

Unemployment tends to be poorly understood even though in macroeconomics it is a subject of great importance and study (Carruth, Hooker and Oswald 1998). This could be due to the fact that, unemployment is sometimes classified or equated to joblessness even though conceptually, the two are different (Baah-Boateng, 2015). According to Fujita and Moscarini (2017) unemployment is a state of job search and is measured accordingly. Winklemann (2014) also defines unemployment as a situation where job is needed by a person but cannot access it.

The ILO definition of unemployment is based on what can be termed as the labour force framework which tends to group the labour force at any point in time into three main groups namely employed, unemployed and out of the labour force (inactive). Both the employed and unemployed make up the labour force. Although since 1954, the definition of unemployment has been revised periodically, its basic components still remain (Hussmann, 2007). The ILO has two definitions of unemployment – the narrow (strict) and the broad (expanded). The narrow or strict defines unemployment as those who are currently not in employment but are

actively seeking for work and available for work (Bryne and Strobl, 2001; O'Higgins 1997). Seeking means taking active steps to search for work such as direct application to employers, checking at worksites/farms, seeking friends/relative's assistance gaining licence to start business (ILO, 2008; Baah-Boateng, 2015). The broad definition of unemployment on the other hand, relaxes the requirement of actively seeking for work and available for work and captures all those who were not in employment.

In Ghana, important sources have defined an unemployed person as an individual who is 15 years and older who is not in employment, available for work and seeking work during the reference period (Baah-Boateng, 2013) which means the strict definition of unemployment tend to be used more in Ghana. Furthermore, Baah-Boateng (2013) state that, a jobless individual who is available for work but does not make an effort to search for work for various reasons cannot be classified as unemployed but rather classified as a discouraged worker. This in effect means unemployment figures that use the broad definition tends to understate the ''true'' unemployment situation in the labour market (Baah-Boateng, 2015). This study will therefore adopt the strict definition of unemployment but restrict the age to 15 and 64 which is the working age. The broad definition is not used in this study because, whiles technically the people who are not searching are part of the labour force, it is very difficult to tell if their perception is real and also, if they would have gotten a job should they have searched (Baah-Boateng, 2015). Additionally, the second part of this chapter looks at the job search characteristics and job expectations of job seekers therefore taking out job search and working with the broad definition of unemployment would seriously undermine the first part of this chapter.

2.3 Theoretical Literature Review

The economic literatures on unemployment explains it from different theoretical perspective. The objective of this section is to discuss the two main macroeconomics theories approaches to the causes of unemployment. Classical and Keynesian make up the theories that are considered by the different economic school of thoughts. The theories are used in developing public policies that could be employed to reduce the level of unemployment.

2.3.1 Keynesian Theory of Unemployment

Keynesian theory of unemployment traces its roots to British economist John Maynard Keynes work titled ''The General Theory of Unemployment, Interest and Money'' with further work carried out by authors such as Paul Samuelson, Arthur Okun, John Hicks and Franco

Modigliani. The theory links employment to the effective demand for goods and services produced by firms under the assumption of fixed prices (Raifu, 2017). This means aggregate demand produces an income at a given price which then leads to generation of employment for individuals. In other words, there is a change in employment when aggregate demand changes.

Keynes (1936) further argued that, labour supply as in classical theory is a function of real wage however not flexible due to the labour bargaining power. This implies that, wages stay the same even when there is surplus of labour supply. The mismatch between labour supply and the intersection of labour demand and spiral wages leads to involuntary unemployment. This therefore means that, under the Keynesian framework unemployment occurs due to the deficiencies in aggregate demand over certain periods in the business cycle such that jobs created are not sufficient for all individuals who are in search of work (Keynes, 1936).

Contrary to the classical theory view that attributes involuntary unemployment to institutional factors, this type of demand deficient unemployment is involuntary in nature since the unemployed are restricted by the limited number of jobs available. Hall, Gordon and Holt (1970) therefore define involuntary unemployment as the difference between supply and demand. Furthermore, Keynes states that, unemployment tends to persist due to the lack of active policy because, the driving forces which causes movement's towards aggregate equilibrium are weak (Hall et al, 1970).

2.3.2 Classical Theory of Unemployment

Among the many proponents of the classical theory are Adam Smith, David Ricardo, Jean-Baptiste Say, John Stuart Mill and Thomas Malthus and they describe the determinants of unemployment from a labour demand and labour supply perspective. Labour demand is a function of wages and it negatively sloped downwards which implies that, as wages rise, the demand for labour decreases and vice versa.

The labour supply on the other hand, is a function of the labour force and the willingness to either supply labour or not which is also, a function of wages. There is a unique equilibrium of wages and employment when both labour supply and demand are in an equilibrium. Additionally, the classical theory of unemployment which is premised on the assumption of free market, perfect competition and flexible wages argue that there is no involuntary unemployment as they state that, the economy is always at full employment. This means, classical economist understand unemployment to be voluntary in nature which is contrary to

the view shared by Keynesian economist. An example of voluntary unemployment within the classical framework is structural unemployment which arises as a result of mismatch between demand for labour and skills of jobseekers made obsolete due to the slow response to technological advancement. They however argue that, any intervention in the labour market that distorts the flexibility of wages would lead to involuntary unemployment.

In expanding on involuntary unemployment, the main theories that contribute to the microeconomics foundations of involuntary unemployment are efficiency wage theory and the insider-outsider theory (Lindbeck and Snower, 1987). Implicit contract theory is another of the theory that explains involuntary unemployment.

In explaining, involuntary unemployment arises as a result of the views shared by firms which state that, higher wages paid to employees tend to motivate and encourage higher labour efficiency from the employees (Campbell III, 1993). The efficiency wage theory tends to have several mechanisms which explains the various reasons behind firm's decisions in adopting such a model (Danthine and Donaldson, 1990). According to Shapiro and Stiglitz (1984**)** in order for firms to prevent employees from shirking pay higher wages. In other words, since employees are rehired by other firms at the pre-layoff wage when they caught shirking, firms, in order to reduce or prevent shirking tend to pay higher wages. Akerlof (1982) in describing another of the theory's different version state that, higher wages improve both the morale and effort of employees; ''gift of exchange'' or as stated by Akerlof (1970), higher wages tend to draw more qualified applicants to a job opening. Stiglitz (1976) concurs with Akerlof (1970) by stating that in addition to attracting more qualified applicants, higher wages also increases hires.

Salop (1979) in arguing proposes that, efficiency wages reduces labour turnover (Yellen, 1995) and also reduces the number of employees who quit their jobs. The argument therefore is that since the general hallmark of efficiency wage theory is that, firms pay their employees above the market-clearing wage in order to gain higher productivity from them (employees) (Krueger and Summers, 1988; Katz, 1986; Raff and Summers 1986), when firms partake in efficiency wages the result is that aggregate wages tend to be higher than the market clearing wages which results in involuntary unemployment. The insider-outsider model is another way of explaining involuntary unemployment (Lindbeck and Snower, 1988; Akerlof, 1991). This model shows a distinction between the bargaining status of people who are currently in employment (insiders) and people seeking jobs (outsiders). This means that, unemployment

arises as a result of wages being set by only taking into consideration the interests of the current employees of the firm (insiders) without taking into consideration that of the individuals seeking employment who are known as the outsiders (Bentolila, Dolado and Jimeno, 2012). Insiders therefore tend to enjoy some form of protection and favourable employment opportunities even during periods where they seek higher wages from the firms because firms, in order to reduce labour turnover cost (hiring cost, firing cost and training cost for newcomers) refuse to employ outsiders. In addition, insiders also tend to resist competition by not cooperating with outsiders and are in some instances rather hostile to outsiders who try to accept lower wages as compared to their higher wages (insiders). This leads to involuntary unemployment because outsiders tend to have limited opportunities to employments due to such challenges.

A third theory which explains involuntary unemployment is the implicit contract theory (Ito, 1982). Implicit contract model which was developed and introduced by Baily (1974**),** Azariadis (1975) and Gordon (1974) perceives wage contracts as a form of long-term risk sharing relationship between risk averse workers and less risk averse employers. Their contributions suggest that the employers, in these contracts, ‘‘insure’’ their employees by paying them wage rates with small variations over the state of nature; in return, the employers are compensated for their ‘‘gamble’’ by premia in the form of lower average wages (the average being taken over states of nature) which workers are implicitly willing to pay for such wage insurance (Akerlof and Miyazaki, 1980). Whiles implicit contracts can be of great benefits in the form of ‘‘strong performance incentives’’, they on the other hand could distort the labour market as a whole (Altmann, Falk and Huffman, 2010**).** Implicit contracting could therefore cause a rise to involuntary unemployment. Under this model the labour contracts in most cases make it difficult for firms to cut wages of employees in the short run (Azariadis, 1975). Firms therefore turn to layoffs rather than pay cuts due to implicit contracts. This in other words means that employers may find it optimal to lay off employees rather than to reduce wages during recessions in order to avoid adverse reactions to wage cuts (Bewley, 1998). In view of this, risk averse workers in their quest to increase their earnings would prefer unstable jobs which offer higher wages over stable jobs with lower wages, in circumstances where there is the existence of either unemployment insurance benefit or other forms of social security (Boateng, 2000**).** Azariadis (1975) therefore argues that unemployment may arise in unstable labour market if there is an increase in the social safety of the unemployed. The concerns and challenges of economists, however, are mostly with involuntary unemployment rather than

voluntary unemployment due to the fact that the latter reflects the utility maximization household choices (Beggs, 2012).

As stated by Baah-Boateng (2016) the theories of unemployment were formulated in more developed countries where wage employment dominates the labour market. He further argues that, they have limited relevance to Africa due to the fact that, the African labour market is dominated by self-employment. Whiles the proportion of self-employment is high in Ghana (about 86%) the above theories are relevant to models of wage employment within Ghana as in Europe and the United States of America. This is because the Ghanaian labour market is different to other labour markets but there is sufficient transferability of the literature for one section of the Ghanaian labour market i.e. formal sector. For the other section of the labour market this would require a different literature, and this would be addressed in the subsequent chapters. In other words, the Ghanaian formal sector sufficiently mirrors the formal sector in Europe and Northern America for these theories to be applicable to the formal sector within Ghana and where it doesn't the informal sector chapter addresses. These theories that are used are relevant in the formal sector and as discussed in the introduction section, unemployment is closely related to the formal sector hence we employ these theories. This is not a limitation because it is a focus of research on specific sections of the Ghanaian labour market i.e. formal and informal sector and that is why three chapters of the whole would give a fuller picture of the Ghanaian labour market.

2.4 Empirical Literature Review on Determinants of Unemployment

There are various studies that have looked at the determinants of unemployment. The studies have investigated the determinants of unemployment from the microeconomics perspective in both developing and developed countries. Additionally, majority of the empirical research on the determinants of unemployment have focused on the supply-side of the market. The benefit of the empirical review section is to highlight how similar or dissimilar non-African countries are from African countries.

Choi and Valladares-Esteban (2015) document in their paper the patterns regarding worker flow and unemployment rates between married and unmarried individuals in the U.S. economy making use of monthly CPS data from 1976 to 2013. They found that, married individuals face a lower unemployment rate than single individuals both for males and females. They also state that, the difference is persistent overtime despite the notable changes in the labour market in the U.S: the increase of female labour force participation. Additionally,

Nickell (1979) found unemployment rates to be lower among married individuals than single individuals which is also confirmed by Ekert-Jaffe and Solaz, (2001) in their study. In terms of religion, Alidadi (2017) study on Belgium, Netherlands and Great Britain found that, Muslims are more likely to be unemployed than Christians.

Kingdon and Knight (2004) in studying the incidence of unemployment in South Africa employed the probit model in their estimations. They found that, unemployment is very inequitably distributed in the country and tends out that, certain groups are much more likely to be unemployed and stay in it than others. Young uneducated Africans residing in homelands and remote areas are more likely to be unemployed than others. They also found that, in South Africa, unemployment rates are much higher in rural areas than in urban areas which atypical among countries.

Echebiri (2005) studying the determinants of unemployment in Umuahia, Nigeria argued that, Umuahia has a faster population growth rate hence the reason why most of the population are unemployed. The study found that, not only are the youth more likely to be unemployed but also, education and job preference have a direct relation with unemployment. It was discovered that, majority of the unemployed and first-time job seekers preferred wage employment over self-employment. Additionally, the youth showed their dislike for rural residency due to the lack of employment opportunities and poor social and physical infrastructure hence their quest to migrate to urban areas.

Assad, El-Hamidi and Ahmed (2000) in examining the various determinants of unemployment in Egypt found that, the Egyptian labour market is starving from a span of high overall unemployment where unemployment is increasing with a constant rate. Their results show that, educated female sector is being affected much more than their male counterparts' sector by the transition to a private sector.

Baah-Boateng (2012) found unemployment to be of a bigger challenge for men than women from 1960 until 2000 when the reverse was recorded. He attributed the higher rate of unemployment among women relative to men since 2000 to the increasing nature of women participation in the labour market on the account of improved education for women. Dickens and Lang (1995) also found unemployment rates to be higher among women than men in Sri Lanka.

Sackey and Osei (2006) posit that, younger individuals are more vulnerable to unemployment because of their lower labour market skills relative to older workers. Anyanwu

(2013) in explaining also, argue that, the unemployment rate is higher among younger people than older due to the fact that, they are much easier and less expensive to lay off than their older counterparts.

Finney and Kohlhase (2008) in their study state that, cities in urban areas have the advantage of matching the skills of job seekers to local demand hence the higher number of job seekers in urban areas. (Sato, 2001; Helsley and Strange, 1990; Wheeler, 2001). Another emerging concern about unemployment is the increasing nature of unemployment among the educated relative to the uneducated. For instance, Baah-Boateng (2013) found higher proportion of unemployment among the educated than uneducated in Ghana (Sackey and Osei, 2006; Dickens and Lang, 1995).

2.5 Overview of the Ghanaian Labour Markets

2.5.1 The Fall in Unemployment

Table 1 shows the disparity in unemployment rates across the thirteen-year period from 2000 to 2012/13 (see Figure 2). The table shows that, there was a substantial drop in the unemployment rate in 2005/06 from 2000 representing 4.8 percent and 10.9 percent respectively which is 6.1 percentage points. However, in 2010, the unemployment rate rose by 1 percentage point to 5.8 from the 2005/06 rate falling again to 5.5 percent in 2012/13. Additionally, the unemployment rate fell more for males (by 5.3 percentage points) than for females (5.6 percentage points). This is consistent with the laborforce participation rate which fell more for males than for females representing 10.6 percentage points and 11.0 percentage points respectively.

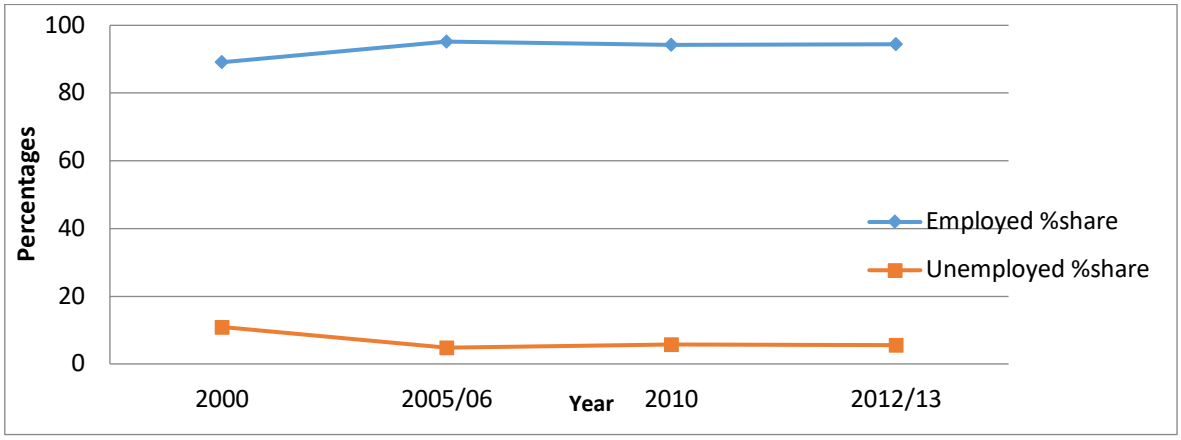
Table 1 Distribution of the Labour Force in Ghana

					Change (percentage points)
	2000	2005/06	2010	2012/13	2000 – 2012/13
All persons					
Employed	89.1	95.2	94.2	94.5	5.4
Unemployed	10.9	4.8	5.8	5.5	-5.4
Laborforce	100	100	100	100	-
LFP rate	70.9	69.9	71.6	81.7	10.8
Males					
Employed	89.5	95.2	94.7	94.8	5.3
Unemployed	10.5	4.8	5.3	5.2	-5.3
Laborforce	100	100	100	100	-
LFP rate	72.7	72.6	71.2	83.3	10.6
Females					
Employed	88.7	95.3	93.6	94.3	5.6
Unemployed	11.3	4.7	6.4	5.7	-5.6
Laborforce	100	100	100	100	-
LFP rate	69.3	70.8	68.7	80.3	11.0

Note: The 2000 and 2010 figures are from the 2000 and 2010 population census respectively. The 2005/06 and 2012/13 figures are from the labour force survey of 2005/06 and 2012/13 respectively. LFP rate is the labour force participation rate in the working-age population

Source: Authors calculation.

Figure 2 Proportion of employed and unemployed



Source: Authors calculation.

2.5.2 The Changing Incidence of Unemployment

According to Nickell (1980) incidence of unemployment should be placed into two different components namely: the duration for which an unemployed individual remains unemployed and the chances of becoming unemployed. He further states that, these two components may be affected by different factors and are also determined in different ways hence the separations.

In line with Nickell's (1980) suggestion, this section looks at the changes in the incidence of unemployment across different worker groups defined by gender, age, education, locality, marital, nationality and region by looking at the descriptive statistics. It examines two aspects of the changes in unemployment over the 2000 – 2012/13 periods:

a) How the distribution of unemployment has changed across the different worker groups, whether over the years the differences between groupings become larger or smaller and also which groupings are likely to be unemployed at the end of the sample period as against the beginning?
b) How the duration of unemployment has changed overtime

2.5.3 Changes in the trends of unemployment

Table 2 shows the unemployment changes overtime in gender, educational, marital, locality, region, age and nationality. Overall unemployment decreased by 5.8 percentage points.

2.5.3.1 Urban versus Rural unemployment

There is a higher rate of people in urban areas who are not able to find jobs than there are in rural areas. This is highlighted by the fact that, across the thirteen-year period urban unemployment has always being higher than rural unemployment. Thus, urban unemployment has become a challenging problem facing Ghana. Additionally, both localities do not follow the national trend. Furthermore, the analysis shows that, the gap between urban and rural dwellers seems to have reduced significantly in 2012/13 from the largest gap which was recorded in 2005/06.

2.5.3.2 Unemployment by gender

This section highlights the continued disadvantaged position of females in the labour market. In disaggregating the unemployment rate by gender, it is evident that, unemployment rate was higher among females than males across all years with the exception of year 2005/06. The Table also shows that, whiles females follow the national trend of a decrease in 2005/06 followed by an increase in 2010 then a decrease in 2012/13, males follow the national trend up until 2010. Additionally, the analysis shows that, the gap between females and males seems to be much larger in 2010 than those of the other years but then in 2012/13 reduces to lower gap than what was recorded in 2000.

2.5.3.3 Unemployment by Age Group

The change in the unemployment rate by age is very revealing: unemployment is of great problem to the youth. This is because persons between the age group 15-24 (youth) recorded the highest rate of unemployment across all years. In terms of the national trend, with the exception of 36-60 (adults) all the other age groups follow the national trend. The analysis also shows that, in the first year, unemployment was more prevalent among the youth and old, but then whiles the youth continued to experience high rates of unemployment in the further years, the old recorded the lower rates. The observation also highlights the gap difference by showing that, whiles the gap between the youth and the baseline reduced in 2005/06 from the largest gap recorded across all age cohorts in 2000, in the subsequent years the gap increased but remained the same in both years 2010 and 2012/13. Furthermore, the gap recorded among the 15-24 (youth) at the end period was lower than what was recorded at the beginning and also the gap between the old followed the national trend across all years. The age distribution of unemployment in Ghana signals a great threat to not only the economy but also to future stability of the country because many energetic youths with dynamic resources are moving around without being in any gainful employment.

2.5.3.4 Unemployment by Education Attainment

Unemployment varies dramatically by education: individuals with medium form of education recorded the highest rates of unemployment across the whole years. It is also evident that, only individuals with low education followed the national trend. Unemployed individuals with medium education recorded the largest gap across all years with the baseline.

2.5.3.5 Religious distribution of unemployment

The unemployment rate among Christians was the highest across all years with the exception of 2012/13 where indigenous individuals recorded the highest unemployment rate. Whiles both Christians and Muslims follow the national trend, indigenous individuals do not. The gap between indigenous individuals and the baseline increased significantly in 2010.

2.5.3.6 Unemployment by Marital status

Marital status is an obvious important factor in the determinants of unemployment. This is because, single individuals recorded the highest rate of unemployment across all the years and they also followed the national trend of decrease, increase and decrease. Previously married

individuals recorded the smallest gap as opposed to married individuals who recorded the largest gap against the baseline.

2.5.3.7 Regional distribution of unemployment

Table 2 shows that, there is a substantial variation in unemployment rates across regions. There is also a noticeable movement in ranking among regions of the years covered. Unemployment rate seems to be higher among the residents of Upper East in 2000 and 2012/13 than any other region whiles in the same respective years, residents of Brong Ahafo recorded the lowest unemployment rate than any other region. All the regions with the exception of Greater Accra, Western, Northern, Upper East and Upper West follow the national trend of decrease in 2005/06 from 2000, then increase in 2010 followed by decrease in 2012/13. The observations show that, whiles Greater Accra recorded a much larger gap against the baseline in 2005/06 and 2010 than all the other regions, Upper East recorded the largest gap in 2000 and 2012/13. Ashanti was the only region which gap difference with the baseline follows the national trend. Furthermore, whiles Eastern region recorded the smallest gap in 2000, Ashanti region recorded the smallest in 2012/13.

2.5.3.8 Nationality distribution of unemployment

The nationality observation shows that, citizens of Non-African States were more likely to be unemployed than any other group in 2000, whiles citizens of African, other than ECOWAS recorded the highest rate of unemployment in 2012/13. Citizens of other ECOWAS States were more likely to be unemployed in 2005/06 than any other group. In terms of the national trend, Ghanaians by birth, Dual nationality & Ghanaian by naturalisation and Bordering African States were in line with it. Citizens of Non-African States on the other hand recorded a zero percent unemployment rate in 2005/06 but then in the subsequent year recorded a sharp increase followed by a further 2.0 percentage point increase in 2012/13. Additionally, whiles there was no gap between African, other than ECOWAS and the baseline in 2010, in 2012/13, the gap was the largest in that year among all groups under nationality. It is also important to note that, the gap between dual nationality and the baseline seems to be larger in 2005/06 than all the other years.

Table 2 Unemployment Rate in Ghana 2000 -2012/13

	2000	2005	2010	2012/13	Change (percentage points) 2000 - 2012
Locality					
Urban	13.6	9.6	8.0	7.0	-6.6
Rural	8.9	2.1	3.5	4.5	-4.4
Gender					
Male	10.5	4.8	5.2	5.2	-5.2
Female	11.3	4.6	6.3	5.7	-5.6
Age					
15-24	17.8	8.8	11.7	10.3	-7.5
25-35	9.4	5.6	6.2	4.8	-4.6
36-60	7.8	2.4	2.4	3.0	-4.8
61-64	11.3	2.6	5.7	3.8	-7.5
Education					
None	9.8	2.5	3.2	3.8	-6.0
Low	11.2	4.8	5.9	5.2	-6.0
Medium	15.4	13.0	10.8	12.3	-3.1
High	11.4	8.4	8.3	5.8	-5.6
Religion					
Christian	10.9	5.3	6.4	5.8	-5.1
Muslim	11.5	3.9	5.2	4.5	-7.0
Indigenous	10.1	4.0	3.7	6.7	-3.4
Marital Status					
Couple	8.2	2.7	3.3	3.1	-5.1
Previously	10.3	5.1	4.3	4.7	-5.6
Single	15.8	8.2	10.6	9.0	-6.8
Region					
Western	9.6	3.8	6.2	6.3	-3.3
Central	8.6	5.5	5.7	5.2	-3.4
Greater Accra	13.7	13.1	8.3	7.8	-5.9
Volta	7.9	2.5	4.0	4.1	-3.8
Eastern	8.8	3.4	5.6	3.7	-5.1
Ashanti	11.2	4.8	7.1	5.5	-5.7
Brong Ahafo	7.5	2.2	4.3	2.8	-4.7
Northern	10.0	1.0	3.3	3.5	-6.5
Upper East	22.8	5.6	3.1	8.4	-14.4
Upper West	16.5	3.8	3.5	7.4	9.1
Nationality					
Ghanaian by birth	10.8	4.7	5.8	5.5	-5.3
Dual nationality	10.4	3.3	5.6	4.4	-6.0
Bordering African	-	2.2	5.5	1.6	
Other ECOWAS state	10.6	21.0	6.3	4.1	-6.5
African, other than ECOWAS	17.1	6.0	5.8	15.2	-1.9
Non-African states (other)	18.2	0.0	6.2	8.2	-10.0
Overall Unemployment rate	10.9	4.8	5.8	5.5	-5.4

Author's own calculation

2.5.4 Duration of Uncompleted Spells of Unemployment

The second part of the incidence of unemployment which Nickell (1980) suggest is talked about is the duration of unemployment. The duration of unemployment is important because, the amount of time an individual spends being unemployed is based on the rate at which the individual receives job offers and the extent to which the offers advanced are accepted. For instance, younger people are more likely to receive job offers for jobs that require physical capabilities (manual work) than older people. In Ghana, there is no satisfactory data on unemployment duration. This is because, the main source of data for unemployment is the labour force survey and as it is in many African countries, labour force survey has never been conducted in Ghana (Baah-Boateng, 2015).

As a result of the absence of labour force survey data' s labour market indicators are sourced from Population and Housing Censuses and Living Standards Surveys. Additionally, the nature of the Living Standard Survey data sets is cross-sectional rather than panel since these surveys are not conducted regularly in Ghana[1]. Furthermore, the data available is the duration of uncompleted spells of unemployment of those who are currently unemployed so that, it represents uncompleted duration of an individual's spell of unemployment[2] and it is only captured in the Ghana Living Standards Surveys 5 and 6 and not the Population and Housing Census datasets. The responses were recorded in categorized form (of less than one month, 3 months, 6 months and 12 months) rather than in a continuous form. However, having assigned midpoints to the categories, we have been able to create a continuous variable titled ''number of months'' for the uncompleted duration of unemployment[3].

[1] The datasets that capture uncompleted duration of unemployment in Ghana, have many drawbacks: the data are in categorized rather than continuous form. This is because the data asked how long individuals have being seeking for a job and the answers were recorded in categorized form.

[2] The data captures only duration of uncompleted spells of unemployment, but it is possible to get completed duration by just multiplying the figures obtained by a factor of 2 and that works in a steady state. This in other words means, it is possible to do it but only if unemployment is stable i.e. in a steady state and since we know unemployment is never stable because for instance, the rate of unemployment for month 1 would not be the same unemployment rate for month 2 which therefore then possess an issue to calculate completed duration of unemployment with uncompleted duration datasets. If unemployment is rising the calculated duration of unemployment would be biased downwards whiles if unemployment is falling the duration of completed unemployment would be biased upwards. This therefore means that, whiles it is possible to determine the completed duration of unemployment using duration of uncompleted spells of unemployment data, this would be based on assumptions and we want to measure unemployment duration with data not assumption therefore this study would work with duration of uncompleted spells of unemployment since the data's are readily available for those one's.

[3] We exclude individuals who are 65 years and older from the analysis because at that age, they are more likely to be transitioning to non-employment.

Table 3 Duration of uncompleted spells of unemployment

	Percentage of uncompleted spells of unemployment 2005/06				Duration of unemployment	Percentage of uncompleted spells of unemployment 2012/13				Duration of unemployment
Variables	<1 month	<3 month	<6 month	<12 month		<1 month	<3 month	<6 month	<12 month	
Gender										
Male	19.9	21.4	40.4	18.1	2.7	22.3	25.1	23.0	29.3	2.9
Female	14.4	19.0	41.3	25.1	3.1	21.1	23.3	23.8	31.6	3.1
Locality										
Urban	16.6	26.8	27.4	29.0	3.0	16.3	23.4	26.5	33.6	3.2
Rural	17.1	15.3	50.4	17.1	2.8	34.0	25.7	16.4	23.7	2.4
Age										
15-24	17.7	22.4	35.1	24.7	2.9	21.0	21.0	26.9	30.9	3.0
25-35	13.3	23.3	39.4	23.8	3.0	21.1	27.8	20.1	30.7	2.9
36-60	19.7	14.0	48.6	17.5	2.8	23.4	27.6	19.1	29.7	2.8
61-64	8.3	16.6	66.6	8.33	2.7	100	-	-	-	0.5
Education										
None	15.7	14.5	55.4	14.2	2.8	25.8	22.5	22.5	29.0	2.8
Low	19.6	22.2	31.5	26.5	2.9	22.0	20.6	20.0	37.3	3.2
Medium	17.0	29.2	21.9	31.7	3.0	20.8	28.1	29.1	21.8	2.7
High	6.81	29.5	31.8	31.8	3.3	19.5	28.2	23.9	28.2	2.9
Religion										
Christian	17.1	20.8	37.8	24.0	2.9	18.6	24.7	24.7	31.9	3.0
Muslim	11.7	18.4	29.4	40.3	3.6	36.0	24.0	18.0	22.0	2.4
Indigenous	19.0	19.4	52.3	9.09	2.4	30.0	10.0	20.0	40.0	3.3
Marital Status										
Couple	19.8	20.2	55.2	26.3	3.6	28.1	18.7	26.5	26.5	2.8
Previously	14.1	17.9	50.0	17.9	4.4	15.0	30.0	25.0	30.0	3.1
Single	18.1	23.9	34.5	23.3	2.8	20.5	25.1	22.5	31.7	3.1
Region										
Western	20.5	23.5	20.5	35.2	3.1	29.2	29.2	12.1	29.2	2.6
Central	11.1	33.3	38.8	16.6	2.7	14.2	33.3	28.5	23.8	2.8
Greater Accra	10.5	25.4	35.0	28.9	3.2	12.9	25.8	23.5	37.6	3.4
Volta	31.0	44.8	10.3	13.7	1.9	35.7	21.4	7.14	35.7	2.8
Eastern	36.3	27.2	22.7	13.6	2.0	17.2	13.7	41.3	27.5	3.1
Ashanti	21.8	17.2	26.3	34.5	3.2	18.7	16.6	33.3	31.2	3.2
Brong Ahafo	23.3	36.6	13.3	26.6	2.6	21.0	42.1	15.7	21.0	2.4
Northern	24.1	31.0	17.2	27.5	2.7	26.6	6.66	20.0	46.6	3.6
Upper East	18.2	8.85	47.9	25	3.1	32.3	26.4	26.4	14.7	2.2
Upper West	5.73	17.8	71.9	4.45	2.7	33.3	33.3	0	33.3	2.6
Nationality										
Ghanaian by birth	17.0	20.1	41.1	21.7	2.9	21.6	24.1	23.5	30.7	3.0
Dual nationality	20.0	10.0	50.0	20.0	2.9	-	100	-	-	1.5
Bordering African states	-	20.0	-	80.0	5.1	-	100	-	-	1.5
Other ECOWAS states	-	100	-	-	1.5	100	-	-	-	0.0
African, other than ECOWAS	-	-	-	-	-	-	-	-	-	0.0
Non-African states (other)	-	-	-	-	-	-	-	-	100	6.0
Overall Duration of	16.9	20.0	40.9	22.0	2.9	21.6	24.1	23.5	30.6	3.0

uncompleted
spells

Note: Note: The 2005/06 and 2012/13 figures are from the labour force survey of 2005/06 and 2012/13 respectively. For the purposes of computing "mean duration in months, for both GLSS 5 & 6" the mid-points of the categories <1 month, <3 months, <6 months, & <12 months are taken as 0.5, 1.5, 3 and 6 months respectively. 15-24 (youth) 25-35 (young adults) 36-60 (adults) and 61 -64 (old). Source: Authors calculation

Table 3 shows that, the uncompleted duration of unemployment varies substantially by group. It highlights that, the average uncompleted duration of unemployment is lower for males, rural dwellers and individuals with no form of education than their opposite numbers in both years. This may be consistent with the notion that, rural dwellers and individuals with no form of education are more likely to quit unemployment sooner to locate work in the burgeoning informal sector hence reducing their uncompleted duration of unemployment. The lower uncompleted duration of unemployment for males may be due to the fact that, on the demand side of labour market, groups that are deemed by employers to be more desirable (males) tend to receive job offers more quickly than their opposite counterparts. Both youth and young adults recorded on average higher levels of uncompleted duration of unemployment than other members in their cohort highlighting the important factor of age. Both the youth and young adults are more likely to search for work rather than enter jobs that are undesirable to them. Additionally, they both are less likely to have more financial commitment than their opposite numbers which in effects means they can afford unemployment job-search. They may to an extent have unrealistic demands in terms of higher reservation wages as compared to what their skills can command in the labour market.

In terms of region, Greater Accra recording the highest levels of uncompleted duration of unemployment in both years could be due to the notion that with it being the capital, individuals may migrate there in search of jobs. The uncompleted duration of unemployment for single persons, was the lowest compared to their opposite numbers because some are more likely to enter the informal sector due to their greater adaptability and flexibility which means they tend to quit unemployment quicker. It is also worth noting that, in terms of median, whiles in 2005/06 there was long uncompleted duration of unemployment – between 3 to 6 months- in 2012/13 there was shorter uncompleted duration of unemployment which was between 1 to 3 months. Taking locality for instance, individuals in urban and rural areas experienced long uncompleted duration of unemployment in 2005/06 when compared to year 2012/13 where urban and rural dwellers experienced shorter uncompleted duration of unemployment and results obtained in both 2005/06 and 2012/13 are consistent with all other explanatory variables

in their respective years of 2005/06 and 2012/13. In other words, there was a significant drop in uncompleted duration of uncompleted spells of unemployment from 3 to 6 months in 2005/06 to 1 to 3months in 2012/13 which goes to show that, whiles in 2005/06 the uncompleted duration of uncompleted spells of unemployment for individuals was recorded between 3 to 6monhts, in 2012/13 it is more uniformed, that is evenly distributed across board which in effects highlights that uncompleted unemployment duration was more concentrated between 3 to 6 months in 2005/06.

To summarise the overall trends in the incidence of unemployment in 2000 – 2012/13:

(a) The foregoing shows that, unemployment in Ghana is more prevalent among females, urban dwellers, youth, never married individuals, educated persons and residents of Greater Accra region. The analysis shows that, being in the youthful age bracket makes one much more vulnerable to unemployment than older workers and this is supported by the fact that, across all years, age group 15-24 (youth) recorded the highest. It is also interesting to note that, both youth (15-24) and old recorded the highest form of unemployment in 2000 but then in the subsequent years with the exception of year 2012/13, the old cohort recorded the lowest form of unemployment. The gender dimension of unemployment continues to show that, females have recorded higher rate in all years than males with the exception of year 2005/06. In terms of education, the analysis suggests that, the relevance of education in reducing levels of unemployment has not yielded successful results due to the evidence of higher rates of unemployment from the start of the period to the end of the period among the educated than the uneducated (no education) even though there has being a significant drop at the end period in the proportion of unemployed persons among both cohorts. Not only does the marital status analysis highlight that single individuals are much more likely to be unemployed from the start to the end of the period, it also shows that, married individuals have a less likelihood of being unemployed from the start to the end of the thirteen-year period. In terms of religion, whiles Muslims were more likely to be unemployed at the start of the period, they were less likely to be unemployed at the end, the opposite is however the case for indigenous individuals. Although the nationality dimension of unemployment does not show any clear pattern of differences between them, in 2000 being a citizen of a Non-African State made an individual more susceptible to being unemployed than at the end of the period, even though at the end period there still is a significant percentage of unemployed workers who fall in that cohort. Additionally, citizens of African, other than ECOWAS States were much more

likely to be unemployed at the end of the period compared to all other forms of nationality than at the beginning even though it is important to note that, they still recorded a higher rate at the beginning of the period too. On regional basis, residents of Upper East and Upper West regions were much more likely to be unemployed than any other resident in other regions at the beginning and at the end period. However, the rates of unemployment in those regions reduced significantly at the end, which shows that, much more people were unemployed in those regions at the start of the period than at the end of the period. Greater Accra region on the other hand, maintain a high level of unemployment than any other region in both 2005/06 and 2010.

(b) Whiles some of the groups recorded decreases in their uncompleted duration of unemployment between the periods 2005/06 to 2012/13, a couple of cohorts recorded increases in their uncompleted duration of unemployment.

2.6 Description of Data

The econometric analysis of the incidence of unemployment is carried out using two nationally representative cross-sectional datasets from the last two rounds of the Ghana Living Standards Surveys (GLSS) – GLSS 5 & 6. The Ghana Living Standard Survey 5 selected a nationally representative sample of 8,700 households in 580 enumeration areas out of which 8,687 households were interviewed containing 37, 128 household members representing a 99.85 percent response rate whiles in the Ghana Living Standard Survey 6, the number of enumeration areas were increased to 1,200 from 580 in GLSS 5 and so were households selected increased to 18,000. It is important to note that, in the Ghana Living Standard survey 6 out of 18,000 households selected, 16,772 were interviewed representing 93.2 percent response rate (GLSS 6 main report, 2014 - see appendix 1). The sampling framework of the GLSS 5 was based on the 2000 Population and Housing Census (PHC) whiles the GLSS6 sampling framework was based on the 2010 Population and Housing Census.

The analysis covers individuals who are between the ages of 15 – 64 years in the labour force which then leaves the final sample of 14,607 and 32,289 in GLSS 5 and GLSS 6 respectively. Due to the fact that, both surveys are cross sectional rather than panel, this limitation restricts the analysis from obtaining an individual's unemployment situation over a period of time to rather, a point in time. This therefore means that, a number of important questions about the Ghanaian unemployment situation cannot be interrogated. Examples of questions that cannot be investigated are; what the completed duration of unemployment is.

However, on a positive note, the nationally representative nature of both data sets and the large sample size of both data sets means that, the interrogation of the datasets will yield reliable analysis.

2.6.1 Empirical Methods

Having carried out a descriptive analysis, this section of the research would adopt a probit estimation technique to ascertain the determinants of unemployment which is in line with Lindley (2005), Kingdom and Knight (2004), Sackey and Osei (2006), Wilkins(2004), Baffoe-Bonnie and Ezeala-Harrison (2005) and Baah-Boateng (2013) estimation of unemployment determinants.

The main idea behind the probit estimation is that, it will allow us to measure/explore the influence each of the explanatory variables has on the probability of an individual becoming unemployed holding other factors constant. Whiles logit is an alternative estimation technique for estimating a dichotomous dependent variable (e.g. yes/no, agree/disagree), the difference between logit and probit is normally due to the general assumption of distribution of the error term amongst the two. Whiles both logit and probit yield similar results/inferences (though not identical), the error terms in logit estimation are assumed to follow the standard logistic regression whiles for the probit, the errors are assumed to follow the normal distribution. Logit is more popular in health science since the coefficient can be interpreted in terms of odd ratios whiles probit is more popular in econometric setting, we chose the probit model estimation because it is fairly easy to comprehend when it comes to interpreting its marginal effects.

The estimation is based on unemployed individuals aged between 15 years to 64 years. Conceptually, unemployment or employment is as a result of interaction between supply side (worker-related) and demand side (employer-related) factors. However, given data constraints we are unable to fully account for the demand side determinants of unemployment in Ghana. Baah-Boateng (2015) also states that, empirical analysis of the determinants of unemployment to particularly capture the demand side factors of the labour market in Ghana is highly challenging. Whiles Aryeetey et al. (2014) and Baah-Boateng (2015) attempted to incorporate demand side factors when looking at the determinants of unemployment, it was not explicit and also, the variables used did not directly measure demand side factors of unemployment. A model for the empirical analysis takes the following term;

$$U_I = \alpha + S_i'\beta + Z_i'\phi + \varepsilon \quad (1)$$

where U_I is unemployment, S_i is a vector of explanatory variables of supply factors and Z_i is a vector of other control variables that are likely to cause an individual to be employed or unemployed. ε is the standard vector representing the stochastic error term whiles α represents the intercept term. β, δ and $\emptyset$ are all vectors of parameters of explanatory variables.

2.6.1.1The estimation of a probit model

Since the main aim of this study is to find the determinants of unemployment, the dependent variable of the estimation is unemployment which is measured in a dichotomous or binary form with the variable taking up a value of one if an individual is unemployed and zero if the individual is in employment. In other words, by virtue of the fact that, U_I is a latent variable, it can only observe whether an individual is unemployed or otherwise. Unemployment in this context, is defined as an individual who is between the ages of 15 years and 64 years without work, in search of work and available for work. The probit model will enable us measure or explore the influence each of the explanatory variables has on the probability of an individual becoming unemployed holding other factors constant as:

$$Pr(U_I = 1|X_I) = Pr(U_I = 1|S_I\ Z_I) \qquad (2)$$

where U_I is the dependent variable and X_I represents the different set of explanatory variables that capture S_I which is supply side factors and also, Z_I which represents other control variables. Z_I represents the probability of an individual becoming unemployed. Assuming that the model is linear in the set of parameters, the estimated model of the determinants of unemployment is written as:

$$Pr(U_I = 1|X_I) = G(\alpha + S_i'\beta + Z_i'\phi) = \alpha + S_i'\beta + Z_i'\phi + \varepsilon_i \qquad (3)$$

where G is a function taking on values that are between zero and one. ε_i represents the disturbance term with mean zero and variance σ_i^2

The extent to which demographic factors influences the choices made by the unemployed in their job search quest is investigated by estimating a multinomial probit model on the choices of job search activities available to the unemployed. This estimation is underpinned by theoretical work which states that, unemployed individuals are assumed to have different set

of job search alternative which they can make choices from (Granovetter, 1995). Each unemployed individual gets utility (U) from a given job search alternative j such that;

$$U_{ij} = \alpha + \beta' x_{ij} + \varepsilon_{ij} \quad (4)$$

where x is a vector of explanatory variables such as the unemployed age, gender, locality and educational status; β is a vector of coefficients and ε represents the error term. The unemployed individual is assumed to be rational and makes a choice among the different set of job search alternatives that will lead to a maximization of utility. In line with Nguyen and Taylor (2003) and Sackey and Osei (2006), where there are j choices, the probability of choice k is specified as below;

$$\Pr(U = k) = \Pr(U_k > U_j, for\ all\ j \neq k) \quad (5)$$

The dependent variable is the choice that the unemployed individual makes in their search for a job. The choices are specified below:

- checked at farms/worksites (U = 1)
- applied directly to potential employer (U = 2)
- start business (U = 3)
- asked relatives/friends (U = 4)
- applied at employment agency (U = 5)
- other (U = 6)

All the job search alternatives listed above are used as dependent variables in the multinomial probit model. In estimating the model, we use ‘‘asked relatives/friends’’ as the base category/reference dummy due to the fact that, it was the job search option which was utilised the most by job seekers during my analysis (see table 6) and has been found to be highly effective form of job search which in effect has caused it be used in empirical analysis of this sort (Krueger and Mueller, 2011; Holzer, 1988; Granoveter, 1974; Altmann, Armin, Jager and Zimmermann, 2015; Weber and Mahringer, 2008 and Rees 1966). This may be due to the fact that, it needs little time and resources (Woltermann, 2002; Weber and Mahringer, 2008) and for employers recruitment through informal channels (employee referrals) is not only cost effective and reliable but also useful for screening devices (Fernandez, Castilla and Moore, 2000; Hunter and Gray, 2004). Similar explanatory variables used in the unemployment are used in this model.

Table 4 summaries the definitions of all explanatory variables used in the probit estimation. Whiles some of the variables are self-explanatory some may need additional explanation.

Table 4 Variable Description

Variable	Description
Gender	1 = female, 0 = male
Age	Youth (15-24) = 1, 0 =otherwise Young adults (25-35) = 1, 0 =otherwise Adults (36-60) =1, 0 =otherwise Old (61-64) = 1, 0 = otherwise
Marital status	Previously married =1, 0 =otherwise Couple = 1, 0 = otherwise Single=1, 0= otherwise
Education	None = 1, 0 = otherwise Low =1, 0 = otherwise Medium =1, 0 = otherwise High =1, 0 = otherwise
Religion	Christianity = 1, 0 = otherwise Muslim = 1, 0 = otherwise Indigenous = 1, 0 = otherwise
Locality	Urban = 1, 0 = otherwise
Region	Western= 1, 0= otherwise Central = 1, 0= otherwise Volta= 1, 0= otherwise Eastern= 1, 0= otherwise Ashanti = 1, 0= otherwise Brong Ahafo = 1, 0= otherwise Northern = 1, 0= otherwise Upper East = 1, 0= otherwise Upper West = 1, 0= otherwise Greater Accra= 1, 0= otherwise
Headship Status	Head =1, 0 = otherwise
Number of children in HH	Number of children under 14 years of age
Number of elderlies in HH	Number of elderly household member over 64

Source: Authors calculation

Notes: Education: None education corresponds to no qualification in both GLSS 5 & 6. Medium education corresponds to secondary in both GLSS 5 & 6 . High education corresponds to vocational/technical, post-secondary and tertiary in both GLSS5 & 6. Marital status: Previously married corresponds to divorced, separated and widowed in GLSS 5 & 6. Single corresponds to never married in both GLSS 5 & 6. Couple corresponds to married in both GLSS 5 & 6. Religion: Christianity corresponds to Christianity; Muslim corresponds to Muslim and Indigenous corresponds to traditional all in both GLSS5&6.

Human capital theory plays a very crucial role in the firms demand for labour which in effects gives an insight to the incidence of unemployment. According to the theory, the quality of the labour force by way of their educational and skills level acquired over time and its relationship to the needs of a firm plays a role in determining who gets a job, who can hold onto a job and who is made redundant by firms. Consequently, human capital variables have been placed in models that attempt to throw more light on the probability of being unemployed (Magnac, 1991; Lindley, 2005; Osberg, 1986; Bryne and Strobl, 2004 and Sackey and Osei, 2006). We follow this approach by including educational status variables. The educational variable is measured by three categorical dummies of low, medium and high education with no education as a reference dummy. In other words, the educational variables are mutually exclusive dummy variable which shows the highest level of education attained. If all educational dummies have a value of zero, then it indicates that, the individual has no form of educational background.

The number of dependents in the household is another important variable which could give an insight into the probability of an individual becoming unemployed (Kingdon and Knight, 2004). In line with that, we include in our estimation a variable that captures the number of elderly and children under 14 years in the household. The number of children under 14 years and number of elderly in the household are very important because they could either cause an increase in the probability of unemployment due to reason like greater childcare responsibilities, particularly for females making them less flexible participants of the labour market or it could cause a drop in the probability of unemployment due to a greater economic need which in effect means lower reservation wage (Kingdon and Knight, 2004).

Much attention has been given to the relationship between rural and urban migration following on from the works of Harris and Todaro (1970). Higher wages in the industrial and government sectors causes workers to migrate from rural areas to urban areas (Antoine, 2004, p.15). Antione (2004) further states that the incentive to migrate to the urban areas is still higher even in the absence of job opportunities in the cities. For everyone person who got hired in the urban sector, more than one person migrated from the rural sector (Nolen, 2017**).** Therefore it is evident from Harris and Todaro model of rural to urban migration that with (urban) formal sector wages set significantly above the rural agricultural sector wage, and the decision to migrate based on the perception that working in the urban areas comes with higher wages (higher expected wages than actual wages), migration to the urban areas is a rational decision although this might mean the likelihood of being unemployed (Shi, 1999). Additionally,

Bencivenga and Smith (1997) also posit that, not only does the rural to urban migration distort the commission of employment and output, it also leads to unemployment or underemployment. To get a clearer picture of the extent of unemployment to urban dwellers, we include a locality variable. Furthermore, we include another non-worker related characteristic- a set of regional dummies - in my estimation with the main aim being to capture the effects of regional economic differences. In terms of the location variable, a value of 1 represents urban, with rural being the base category. The base category for the set of regional dummies is Greater Accra.

2.7 Estimation Results

2.7.1 Determinants of Unemployment

Table 5 and 6 presents three sets of results: for all unemployed individuals (1); for unemployed men only; and for unemployed women only for both GLSS 5 and GLSS 6. The results for all unemployed individuals include a dummy variable for gender.

Demographic factors play a crucial role in explaining the incidence of unemployment. The probability of unemployment decreases with age. Whiles young adults are 1.1 percentage points less likely to be unemployed, adults and old are 3.1 and 1.7 percentage points respectively less likely to be unemployed in 2005/06. In 2012/13, there was 1 percentage point increase in the less likelihood of young adults being unemployed and 0.5 and 0.3 percentage point decrease of adults and old respectively in the less likelihood of them being unemployed. Younger individuals are more likely to be unemployed because, they do not only have lower labour market skills relative to adult workers but also, lower level levels of firm specific human capital (Kingdon and Knight, 2004; Sackey and Osei, 2006) which are consistent with the general notion (Dietrich, 2012; O'higgins, 2001; Biagi & Lucifora, 2008; Kieselbach, 2003; O'Reilly, Eichhorst, Gábos, Hadjivassiliou, Lain, Leschke, & Russell, 2015 and Cahuc, Carcillo, Rinne & Zimmermann, 2013). Dietrich (2012) also argues that, younger people who are already integrated into the labour market are more likely to be unemployed compared to their adult counterparts due to reasons such as temporary contract, lack of experience and lower productivity and also, incumbents may be protected against competition from young entrants by labour market laws or level of experience (Kingdon and Knight, 2004). Additionally, younger individuals have higher reservation wage relative to their adults' counterparts due to

the lack of relevant information about the labour market which in effect means reservation wages tends to fall with age (Kingdon and Knight, 2004).

In terms of education, the model suggest that, medium education and high education are associated with relatively more unemployment levels in 2005/06 whiles in 2012/13 medium education is associated with the probability of an individual becoming unemployed and in the same year, low education is negatively significant which in other words means having low education reduces the likelihood of being unemployed. This finding is not only consistent with Baah-Boateng (2013) and Sackey and Osei (2006) but also with that of Dickens and Lang (1995) who arrived at similar results in their work. The reason behind the increasing rate of job seekers with medium education can be attributed to the shrinking nature of the formal sector where individuals with medium education search for jobs. Furthermore, Ghana's education system was reformed in 1987 and 2007 which shortened the duration of education (Tonah, 2007) which then means that, more people are entering the labour market earlier than what is expected. Individuals with lower education on the other hand tend to have lower likelihood of unemployment, which is not surprising because, they have a lesser education qualification needed by employers to work in the formal sector hence the reason why they look for work in the informal sector.

Individuals living in urban areas are more likely to be unemployed than their counterparts in rural areas. This is confirmed by the strong marginal effect of the urban dummy on the probability of being unemployed in both years. Unemployment may be an urban phenomenon due to the perception that, job search in urban areas are considered to be more effective than job searches carried out in rural areas (Kingdon and Knight, 2004). Additionally, several authors have argued that, cities in urban areas have the advantage of matching the skills of job seekers to local jobs and that, urban areas place job seekers in close proximity to large number of potential employers (Anyanwu, 2013; Kim, 1987, 1990; Finney and Kohlhase, 2008; Sato, 2001; Helsley and Strange, 1990 and Wheeler, 2001).

Other demographic factors which were included in the estimation of the determinants of unemployment are gender, marital status and religion. In terms of gender, whiles females are more likely than males to be unemployed, the gender variable in both years were not statistically significant. The estimation also found that, in both years being married reduces the likelihood of being unemployed with the couple dummy recording a statistically negative marginal effect whiles in 2005/06, a previously married individual is more likely to be

unemployed with a statistically positive marginal effect. Choi and Valladares-Esteban (2015) in support of the couple notion argued that, married individuals face a lower unemployment rate than their other counterparts. Nickell (1979) also argued that, married individuals are more likely to find employment than single individuals which in effect means couples have lower probability of being unemployed (Ekert-Jaffe and Solaz, 2001). Married individuals due to their greater economic responsibility have lower reservation wage which means lower likelihood of being unemployed (Kingdon and Knight, 2004). In terms of religion even though the statistically negative marginal effect in both years shows a lower percentage point of the likelihood of being unemployed when an individual is a Christian as opposed to being a Muslim, being a Christian or a Muslim was found to decrease the likelihood of an individual being unemployed compared to the base category which is highlighted by the statistically negative marginal effect in both years. Whiles being a Muslim or Christian reduces the likelihood of being unemployed, Ghana being a majority Christian country explains the lower percentage point among Christians. Alidadi (2017) further argues that, Muslims face significantly higher unemployment than Christians.

Regional dummies are included to see whether unemployment incidence varies substantially regionally, using Greater Accra as the base region and according to Acosta-Ballesteros et al. (2018) residence in regions reflects the general conditions of local demand for work making the inclusion of such a variable important. The estimation revealed that, individuals in Western, Volta, Eastern, Ashanti, Brong Ahafo and Northern region compared to the base region are less likely to be unemployed in 2005/06 whiles in the same year, individuals in Central, Upper East and Upper West regions did not record any statistical significance. The labour market pictured changed in 2012/13 because individuals in Volta, Eastern, Ashanti and Brong Ahafo were less likely to be unemployed compared to the base region whiles both Upper East and Upper West regions compared to the base region recorded a higher probability of unemployment. From the results, it can be concluded that, residence in Greater Accra, in both years still entails substantial greater risk of unemployment than residence in other regions of Ghana which may be due to the fact that, Greater Accra region is not only the capital but also the major metropolitan area in Ghana which in effect serves as a magnet in attracting job seekers.

Table 5 Unemployment Results of Probit estimation (GLSS5)

	All variables			Male			Female		
Variables	Coeff.	Robust Standard error	Marginal effect	Coeff.	Robust Standard error	Marginal effect	Coeff.	Robust Standard error	Marginal effect
Age									
25-35	-0.200	0.056***	-0.011	-0.104	0.087	-0.004	-0.200	0.076***	-0.012
36-60	-0.524	0.067***	-0.031	-0.292	0.110***	-0.014	-0.604	0.089***	-0.038
61-64	-0.418	0.184**	-0.017	-0.100	0.260	-0.004	-0.670	0.265**	-0.024
Education									
Low	0.026	0.055	0.001	-0.081	0.085	-0.004	0.104	0.073	0.006
Medium	0.309	0.075***	0.024	0.256	0.106**	0.015	0.343	0.111***	0.030
High	0.156	0.082*	0.010	0.089	0.117	0.004	0.168	0.119	0.012
Religion									
Christian	-0.156	0.057***	-0.009	-0.196	0.081**	-0.010	-0.128	0.084	-0.008
Muslim	-0.172	0.071**	-0.009	-0.278	0.101***	-0.011	-0.063	0.104	-0.003
Marital Status									
Couple	-0.156	0.052***	-0.009	-0.047	0.082	-0.002	-0.124	0.074*	-0.008
Previously	0.194	0.075***	0.013	-0.207	0.160	-0.008	0.234	0.095**	0.017
Region									
Western	-0.282	0.083***	-0.013	-0.237	0.121*	-0.009	-0.293	0.117**	-0.015
Central	-0.116	0.081	-0.006	-0.159	0.120	-0.006	-0.075	0.112	-0.004
Volta	-0.465	0.095***	-0.019	-0.776	0.172***	-0.020	-0.281	0.118**	-0.014
Eastern	-0.398	0.081***	-0.017	-0.516	0.124***	-0.017	-0.303	0.108***	-0.015
Ashanti	-0.300	0.062***	-0.015	-0.401	0.093***	-0.015	-0.218	0.087**	-0.012
Brong Ahafo	-0.602	0.094***	-0.023	-0.634	0.138***	-0.019	-0.578	0.129***	-0.024
Northern	-0.709	0.110***	-0.026	-0.961	0.187***	-0.025	-0.552	0.142***	-0.024
Upper East	0.014	0.087	0.000	-0.077	0.124	-0.003	0.100	0.122	0.007
Upper West	-0.044	0.094	-0.002	-0.099	0.132	-0.005	-0.233	0.141	-0.012
Other Variables									
Female	-0.058	0.048	-0.003	-	-	-	-	-	-
Urban	0.679	0.051***	0.051	0.746	0.079***	0.047	0.629	0.068***	0.050
Children	-0.041	0.012***	-0.002	-0.062	0.018***	-0.003	-0.037	0.016**	-0.002
Elderly	0.020	0.050	0.001	-0.089	0.078	-0.004	0.074	0.066	0.004
Household Head	-0.310	0.056***	-0.018	-0.691	0.087	-0.049	-0.080	0.080	-0.005
Log-likelihood	-2349.9			-1068.6			-1245.3		
Pseudo-R2	0.1591			0.2082			0.1382		
Wald chi2	687.19***			406.44***			331.06***		
N	14,607			6,969			7,638		

Note: Probit Estimation, Dependent Variable: Underemployed individuals between ages 15 and 64. Authors own calculations.

* significant at 10%; ** significant at 5%; ***significant at 1%;

Table 6 Unemployment Results of Probit estimation (GLSS6)

	All variables			Male			Female		
Variables	Coeff.	Robust Standard error	Marginal effect	Coeff.	Robust Standard error	Marginal effect	Coeff.	Robust Standard error	Marginal effect
Age									
25-35	-0.249	0.035***	-0.020	-0.168	0.054***	-0.012	-0.249	0.047***	-0.022
36-60	-0.315	0.041***	-0.026	-0.015	0.070	-0.001	-0.443	0.052***	-0.041
61-64	-0.188	0.095**	-0.014	0.101	0.146	-0.008	-0.357	0.127***	-0.025
Education									
Low	-0.039	0.033	-0.003	-0.107	0.056*	-0.008	-0.025	0.042	-0.002
Medium	0.321	0.044***	0.035	0.288	0.065***	0.026	0.308	0.062***	0.037
High	0.051	0.053	0.004	0.074	0.076	0.006	-0.072	0.080	-0.006
Religion									
Christian	-0.248	0.050***	-0.023	-0.239	0.065***	-0.019	-0.269	0.082***	-0.028
Muslim	-0.363	0.056***	-0.028	-0.361	0.074***	-0.024	-0.377	0.089***	-0.031
Marital Status									
Couple	-0.251	0.033***	-0.022	-0.152	0.053	-0.011	-0.251	0.044***	-0.024
Previously	0.021	0.053	0.001	-0.165	0.107	-0.010	0.029	0.067	0.002
Region									
Western	0.007	0.050	0.000	-0.021	0.074	-0.001	0.026	0.069	0.002
Central	-0.042	0.056	-0.003	0.048	0.080	0.003	-0.132	0.078*	-0.011
Volta	-0.169	0.057***	-0.013	-0.249	0.086***	-0.015	-0.124	0.077	-0.011
Eastern	-0.288	0.056***	-0.020	-0.483	0.091***	-0.026	-0.172	0.073**	-0.014
Ashanti	-0.126	0.050**	-0.010	-0.144	0.074**	-0.009	-0.127	0.069**	-0.011
Brong Ahafo	-0.393	0.060***	-0.026	-0.484	0.092***	-0.026	-0.340	0.080***	-0.026
Northern	-0.092	0.059	-0.007	-0.204	0.090**	-0.013	-0.011	0.080	-0.001
Upper East	0.288	0.052***	0.031	0.226	0.077***	0.020	0.324	0.071***	0.038
Upper West	0.246	0.053***	-0.025	0.329	0.077***	0.031	0.138	0.076**	0.014
Other Variables									
Female	0.016	0.029	0.001	-	-	-	-	-	-
Urban	0.283	0.027***	0.026	0.273	0.041***	0.022	0.293	0.037***	0.030
Children	-0.035	0.006***	-0.003	-0.048	0.010***	-0.003	-0.033	0.009***	-0.003
Elderly	-0.019	0.025	-0.001	-0.103	0.040**	-0.007	0.032	0.033	0.003
Household Head	-0.317	0.036***	-0.027	-0.656	0.056***	-0.062	-0.152	0.056***	-0.013
Log-likelihood	-6245.8			-2761.1			-3427.7		
Pseudo-R2	0.0896			0.1242			0.0749		
Wald chi2	1062.4***			660.19***			561.60***		
N	32,289			15,387			16,902		

Note: Probit Estimation, Dependent Variable: Underemployed individuals between ages 15 and 64. Authors own calculations.

* significant at 10%; ** significant at 5%; ***significant at 1%;

Interestingly, the number of children in the household is found to be negatively and significantly associated with the probability of being unemployed in both years. This in other means that, the more children under 14 years a household has, the less likelihood of becoming unemployed. This may indicate that, a higher number of children in the household seems to be associated with the greater economic need and lower reservation wage argument which reduces the likelihood of unemployment. This in other words means that, more children in the household leads to an increase in the need for income due to the fact that, in majority of cases children cannot contribute to the economic wellbeing of a household (Heintz and Pickbourm,2012).

We included in our estimation household composition variable (household head) in order to ascertain the relationship between being unemployed and the household head. The estimation revealed that, in both 2005/06 and 2012/13, household headship status tends to be associated with a decline in the probability of being unemployed which is consistent with the notion that, economic responsibilities among them providing necessary amenities to other members of the household tends to fall more on the household head (Sackey and Osei, 2006; Woolard and Leibbrandt, 2013; Klassen and Woolard, 2009) which in effect means accepting job offers with lower reservation wage (Kingdon and Knight, 2004).

Due to the fact that, in both years the gender dummy variables were not statistically significant raises significant questions of whether gender plays no role in the likelihood of being unemployed (employed). We therefore ran different estimates for males and females to show if any gender differences exist (see Tables 5 & 6). A number of significant differences are highlighted by this separate probit estimations.

In terms of age, whiles an adult aged male is less likely to be unemployed compared to the base age, in 2005/06, in the same year young adults, adult's and old aged females are less likely to be unemployed relative to the base age. In 2012, young adult aged males were less likely to be unemployed compared to the base age which differs from 2005/06. However, the picture remains the same for females in 2012/13 from 2005/06. This goes to show that, not only do differences exist in terms of age among the males and females in the same years, there also are significant differences across years.

On the human capital level, in 2005/06 both medium educated males and females were more likely to be unemployed whiles in 2012/13, among males, both low and medium education have negative impact on being unemployed which in effect means low and medium education reduces the likelihood of becoming unemployed, medium educated females were more likely to be unemployed compared to the base category in the same year.

In terms of religion, whiles being a male Christian or Muslim decreases the likelihood of being unemployed in 2005/06, the religious variable in the female probit estimation was not statistically significant. In 2012/13, being a Christian or Muslim has a negative statistically significant impact on both females and males. As expected across both years, residing in an urban area has a positive statistically significant impact on males and females. Regional dummies further show that in 2005/06 relative to Greater Accra, residing in Western, Volta, Eastern, Ashanti, Brong Ahafo and Northern reduces the likelihood of for both males and

females becoming unemployed. In 2012/13, male residents of Volta, Eastern, Ashanti, Brong Ahafo Northern relative to the base category were less likely to be unemployed whiles male residents in Upper East and Upper West were more likely to be unemployed. The female estimation shows that, residents of central, Eastern, Ashanti and Brong Ahafo regions relative to the base category were less likely to be unemployed whiles Upper East and Upper West residents were more likely to be unemployed.

As the marital status affects the labour market choice of men and women differently (Dauth, Findeisen, Sudekum and Woessner, 2017; Petrongolo, 2004) we find that, whiles couple and previously married variables was not statistically significant among men across both years, in both 2005/06 and 2012/13 women who were married were less likely to be unemployed. Additionally, in 2005/06 previously married women were more likely to be unemployed whiles in 2012/13 the variable was not statistically significant.

In terms of household variables, we also notice gender differences in the sense that, whiles the number of children in the household reduces the likelihood being unemployed across both genders in 2005/06, in 2012/13, the number of children and number of elderly in the household reduces the likelihood of males becoming unemployed, amongst females, only number of children in the household reduces their likelihood of becoming unemployed. Furthermore, the probit estimation revealed that, a male household head has a negative statistically significance impact on being unemployed in 2005/06, whiles the female estimation did not return any statistically significance on the household head variable. However, in 2012/13, both female and male household head return a negative statistically significance impact on being unemployed which means, being a household head in 2012/13 regardless of gender reduces the likelihood of being unemployed.

2.7.2 Job expectation and job search activities of the Unemployed

Job expectations and the job search activities of individuals are important because they aid in understanding the characteristics of the unemployed and also their search intensity. The major search activities for the unemployed in Ghana involve the following: checked at farms/worksites for job availabilities, applied directly to employer, taking actions to start a business, asked relatives and friends and applying at employment agency (see table 7 and 8).

Table 7 & 8 show that, for the economy as a whole in 2005/06 whiles 34.1 percent of unemployed expected to secure wage employment exclusively, in 2012/13 36.1 percent of the unemployed expected to secure wage employment which is 2 percentage point increase. In

terms of spatial distribution, in 2005/06 about 79.7 percent of the unemployed with wage employment expectations are found in urban areas whiles 20.3 percent are found in the rural areas.

The spatial distribution in 2012/13 recorded 78.2 percent which is a decline among the unemployed with wage employment expectations whiles among rural workers there was an increase recording 21.8 percent. Additionally, the analysis shows that, over 80 percent of the unemployed in urban areas sought wage employment from government or State institutions compared to 74.4 percent of the unemployed in urban areas who sought wage employment from private firms. The picture was however different in 2012/13. The proportion of unemployed in urban areas who sought wage employment from government or State institutions reduced to 74.6 percent whiles the proportion who sought wage employment from private firms increased to 79.6 percent.

The increase in the expectations of the unemployed to secure jobs in the private sector is in line with the general argument that, the private sector of an economy is very important hence growth in the private sector would translate into economic growth of a country (Ruprah and Sierra, 2016). The structural adjustment program, which was introduced in Ghana in the 1980s, led to the downsizing of public sector employment which therefore means enough employment opportunities are not being created in the public sector to absorb potential job seekers who are hoping to secure job opportunities in government institutions**.** This is further evident by Table 9 which shows that, public sector employment fell from 7.8 percent in 2000 to 5.9 percent 2012/13. Additionally, formal sector employment also fell from 15.1 percent in 2000 to 5.6 percent in 2012/13 whiles informal sector employment increased from 76.9 percent to 88.4 percent in 2000 and 2012/13 respectively.

The major concern here is that, whiles the expectations of job seekers to secure jobs in the private sector is met by a fall in the number of jobs in the private formal sector which Table 9 shows, the only other option that job seekers are left with is to secure employment in the informal sector hence the rise in the number of people working in the informal sector. In this regard, the main challenge to policymakers is to ensure the attractiveness of private sector investment. Altmann, Armin, Jager and Zimmermann (2015) argue that unemployed individuals in majority of instances find work through their social networks (Rees, 1966). The role played by relatives and friends in helping members of their social network groups commence self-employment activities is highlighted in Tables 7 and 8. Both Tables show that,

in 2005/06 and 2012/13 majority of the unemployed who wanted to commence self-employment activities sought the assistance from their friends and relatives. Breman (1980) emphasis that, social network is very significant in assisting individuals find self-employment (Gerxhani, 2004).

Table 7 Job expectation and job search activities of the unemployed in 2005/06 (%)

	Job expectations					
	2005/06					
	Urban			Rural		
Type of job search activity	Wage employment	Self employment	Any employment	Wage employment	Self employment	Any employment
Checked at farms/worksites	8.0	0.0	11.6	20.8	3.3	36.4
Directly to potential employer	40.1	6.1	20.0	22.9	0.0	7.3
Start business	5.3	42.9	5.8	6.3	33.7	5.5
Asked relatives/friends	31.0	44.2	55.5	31.3	31.5	43.6
Other	15.6	6.8	7.1	18.7	31.5	7.2
Total	100	100	100	100	100	100
Type of wage sector job sought						
Government enterprise	80.2			19.8		
Private firm	74.4			25.6		

Computed from GLSS 5 & 6. Note: Both 2000 and 2010 Population and Housing Census data's do not capture job search activity hence our inability to look at it from year 2000 & 2010. Authors own calculations.

Table 8 Job expectation and job search activities of the unemployed in 2012/13 (%)

	Job expectations					
	2012/13					
	Urban			Rural		
Type of job search activity	Wage employment	Self employment	Any employment	Wage employment	Self employment	Any employment
Checked at farms/worksites	7.6	0.0	5.5	14.8	0.0	13.6
Directly to potential employer	43.6	2.4	22.5	59.3	4.7	13.6
Start business	4.7	67.2	3.2	0.0	60.5	0.0
Asked relatives/friends	37.2	28.0	63.2	7.4	20.9	70.4
Other	6.9	2.4	5.3	18.5	13.9	2.4
Total	100	100	100	100	100	100
Type of wage sector job sought						
Government enterprise	74.6			25.4		
Private firm	79.6			20.4		

Computed from GLSS 5 & 6. Note: Both 2000 and 2010 Population and Housing Census data's do not capture job search activity hence our inability to look at it from year 2000 & 2010. Authors own calculations.

Table 9 Distribution of the population by employment sector, 2000 to 2012/13

	2000	2005/06	2010	2012/2013
Employment Sector				
Public	7.8	5.6	7.1	5.9
Private Formal	15.1	7.9	7.1	5.6
Informal	76.9	86.4	85.6	88.4

Source: Computed from 2000 & 2010 Population and Housing census and GLSS 5 & 6. Note: The informal sector figure is inclusive of all agricultural activities. Restricted age to 15-64. Authors own calculations.

Table 10 & 11 show the results of our estimation on the extent to which education, locality, gender, age, marital status, religion and region influences the choice made by an unemployed individual as far as searching for jobs are concerned, following the models specified in equations (4) and (5) above. The results in Table 10 & 11 for each of the choice categories are in relation to the base category which is ''asking friends or relatives for help in finding a job'' and the results show considerable variations in the successful job search method by individual characteristics.

In terms of applying directly to the employer, the estimations show that, in 2005/06 females were less likely than males to apply directly to employers whiles in 2012/13, the gender variable was not significant. As expected, it is observed that individuals with medium education and high education in relation to the base category are more likely to apply directly to the employer in both 2005/06 and 2012/13. This is consistent with Chapple (2006), Ponzo and Scoppa (2008) and Tasci (2008) argument that, highly educated job seekers are more likely to use formal methods such as applying directly to employer when searching for a job (Abdel-Mowla, 2012). In support of the above, Boheim and Taylor (2001) state that, highly educated are less likely to use informal networks as part of their job searches (Bergin, 2009). In explaining, relative to the uneducated, unemployment imposes a significant cost on the educated by eroding the returns from education. Therefore, the highly educated are incentivised to devote more time to search for job in order to reduce these cost (Nyarko, Baah-Boateng and Nketiah-Amponsah, 2014). Furthermore, the results are consistent with the uncompleted duration spells whereby in 2012/13 individuals with medium and high education levels have on average a short-uncompleted duration of unemployment compared to individuals with low education. This may be due to the fact that, individuals with low education tend to use friends/relatives in their search for jobs which leads to them staying longer in unemployment whiles medium and high educated individuals apply directly to the employer reducing their uncompleted duration of unemployment. Additionally, as highlighted in the determinants of unemployment section of this chapter, the educational reforms carried out in both 1987 and 2007 shortened the duration of individuals staying in education which meant an increase in the number of individuals entering the labour market with medium and high education which is then causing them to apply directly to the employer due to their educational background.

Whiles adult (36-60) variable is not significant in 2005/06, in 2012/13 the adult (36-60) variable is positive and statistically significant which shows that, adults (36-60) are more likely to apply directly to the employer. This may be due to the experience they may have gathered during their younger working age (Boheim and Taylor, 2001; Sabatier, 2000 and Heath, 1999) and also, as argued by Hunter and Gray (2004) job seekers who have spent a substantial amount of their working lives employed tend to use more active searching methods such as direct contact with an employer. This also goes to show why adults (36-60) have short uncompleted duration of unemployment as confirmed by the descriptive statistics on duration of unemployment and also, lower incidence of unemployment.

With regards to taking an initiative to start a business, in both years' females are more likely than males to take the initiative to start a business. This is not really surprising due to the motivation to gain personal independence and the flexibility gained when one owns their own business enterprise (O'Neil, Hopkins and Sullivan, 2011). Additionally, the low levels of interest from employers to recruit females due to childcare, family commitments and other family conflict (Hunter and Gray, 2004; Schwatrz, 1989; Gueutal and Taylor, 1991) starting a business enables females to earn an income and also, gain personal independence. In other words, not only are females more likely to be unemployed than males but they also have on average long uncompleted duration of unemployment than males which therefore confirms why they would seek to start their own business because, they staying longer in unemployment and in order to make an income they start their own business. Married individuals are also more likely to start a business in 2005/06 whiles in 2012/13 the marital status dummy variables did not record any significance**.**

Whiles in 2005/06 the age variable was not statistically significant in terms of starting business, in 2012/13, informal opportunities were exploited more by young adults (25- 35) and adults (36-60) relative to youth (15-24) which is highlighted by the fact that, young adults (25-35) and adults (36-60) relative to youth (15-24) were more likely to start a business. This is consistent with Boheim and Taylor (2001) who posit that, workers within such age groups are more likely to take steps to start a business as part of their job strategy**.**

Additionally, residents of Accra relative to the base category were also more likely to start a business in 2012/13 whiles in 2005/06 the region dummy was not statistically significant. This shows how the labour market of Ghana has changed over the years and consistent with the argument that, employment creation is reducing hence individuals taking their own initiate to start a business.

Furthermore, the results show that, in terms of checking at farms/worksites, in both years, females are less likely than males to embark on job searches at farms/worksites. Conversely, females are therefore more likely to depend on their relatives and friends to find jobs than go searching for jobs as farms/worksites (Ajrouch, Blandon and Antonucci, 2005). Additionally, in 2005/06 individuals with low education in relation to the reference category are less likely to search for jobs at farms/worksites, whiles in 2012/13 individuals with low education and medium education are less likely to search for jobs at farms/worksites probably because of their educational background due to the fact that farm/worksites jobs are deemed to be more catered

towards uneducated individuals **(**Wanberg, Kanfer and Rotundo, 1999; Abdel-Mowla, 2012; Boheim and Taylor, 2001). This in other words means that, since education is considered as an important factor in the job market (Smirnova, 2004) job seekers with low and medium education are more likely to depend on relatives or friends for jobs and less likely to search for jobs in farm/worksites ceteris paribus (Nyarko, Baah-Boateng and Nketiah-Amponsah, 2014).

Christians in relation to the base category are more likely to search for jobs at farms/worksites in 2005/06, in 2012 the religion dummy variables was not statistically significant. Urban dwellers were less likely than rural dwellers in 2005/06 to search for jobs at farms/worksites, in 2012/13 the dummy variable for locality was not statistically significant.

Additionally, with regard to other types of searches relative to asking friends/relatives, whiles the age dummy variables were not statistically significant in 2005/06, in 2012/13 individuals aged 25-35 (young adults) were more likely to use other means of job searches than ask friends/relatives. The opposite is the case for gender. Whiles in 2005/06 females were less likely to use other form of job search, in 2012/13 the gender dummy variable was not statistically significant. In terms education, whiles the low education dummy variable was negative and statically significant in 2005/06, in 2012/13 none of the educational dummy variables were statistically significant. Muslims relative to the base category are less likely to use other means of job in 2005/06 whiles in 2012/13 the religion dummy variables were not statistically significant. Residents of Accra are less likely to use other forms of job search in 2005/06 whiles in 2012/13 the region dummy variable was not significant. In both 2005/06 and 2012/13 the locality (urban) dummy variable was not significant. Whiles the dummy variable for marital status were both not statistically significant in 2005/06, in 2012/13 married individuals were less likely to use other forms of job searches relative to asking their friends/relatives.

Table 10 Choice of job search mechanism used by the unemployed (GLSS 5)

Multinomial Estimation

	Choice 1: Applied to Directly Employers			Choice 2: Checked at farms/worksites			Choice 3: Start business			Choice 4: Other		
Variables	Coeff.	Robust Standard error	Marginal effect	Coeff.	Robust Standard error	Marginal effect	Coeff.	Robust Standard error	Marginal effect	Coeff.	Robust Standard error	Marginal effect
Age												
25-35	0.261	0.197	0.035	-0.332	0.236	-0.060	0.219	0.203	0.028	0.306	0.207	0.042
36-60	0.329	0.290	0.039	-0.204	0.288	-0.048	0.411	0.253	0.062	0.229	0.281	0.017
Education												
Low	0.268	0.310	0.090	-0.457	0.265*	-0.034	-0.368	0.227	-0.042	-0.726	0.239***	-0.097
Medium	1.323	0.347***	0.231	0.053	0.332	-0.018	-0.055	0.300	-0.048	-0.244	0.309	-0.076
High	1.805	0.370***	0.332	-0.227	0.424	-0.055	-0.339	0.357	-0.109	-0.339	0.362	-0.088
Religion												
Christian	0.415	0.291	0.057	0.525	0.285*	0.055	0.091	0.243	-0.004	-0.129	0.235	-0.050
Muslim	0.410	0.346	0.073	0.376	0.349	0.049	0.081	0.291	0.129	-0.562	0.315*	-0.114
Marital Status												
Couple	-0.076	0.240	-0.046	0.378	0.252	0.031	0.568	0.219***	0.096	0.146	0.222	-0.005
Previously	-0.063	0.335	-0.010	-0.053	0.418	0.002	0.373	0.279	0.088	-0.408	0.348	-0.075
Region												
Greater Accra	0.007	0.050	0.085	-0.582	0.239**	-0.059	0.073	0.189	0.044	-0.775	0.223***	-0.118
Other Variables												
Female	-0.687	0.179***	-0.086	-1.105	0.205***	-0.113	0.333	0.179*	0.129	-0.488	0.182***	-0.039
Urban	-0.065	0.225	0.014	-0.537	0.235**	-0.059	-0.163	0.217	-0.008	-0.232	0.219	-0.014
Log-likelihood	-0.362											
Prob > chi2	0.000											
Wald chi2 (48)	256.4											
N	702											

Note: working with only people between ages 15-60. Authors own calculations.

Table 11 Choice of job search mechanism used by the unemployed (GLSS 6)

Multinomial Estimation

	Choice 1: Applied to Directly Employers			Choice 2: Checked at farms/worksites			Choice 3: Start business			Choice 4: Other		
Variables	Coeff.	Robust Standard error	Marginal effect	Coeff.	Robust Standard error	Marginal effect	Coeff.	Robust Standard error	Marginal effect	Coeff.	Robust Standard error	Marginal effect
Age												
25-35	0.135	0.201	-0.015	-0.108	0.293	-0.032	0.775	0.224***	0.112	0.601	0.243**	0.039
36-60	0.793	0.312**	0.095	0.529	0.388	0.006	1.201	0.310***	0.150	0.284	0.427	-0.018
Education												
Low	-0.161	0.387	-0.001	-0.681	0.350*	-0.055	0.144	0.313	0.053	-0.766	0.474	-0.061
Medium	0.894	0.410**	0.219	-0.890	0.420**	-0.088	-0.581	0.396	-0.106	-0.094	0.465	-0.017
High	2.070	0.457***	0.402	-0.475	0.546	-0.093	0.191	0.464	-0.040	0.402	0.551	-0.020
Religion												
Christian	-0.298	0.470	-0.026	-0.444	0.573	-0.028	0.035	0.560	0.038	-0.887	0.585	-0.069
Muslim	0.052	0.519	-0.005	-0.058	0.609	-0.019	0.912	0.595	0.154	-0.570	0.658	-0.066
Marital Status												
Couple	-0.388	0.279	-0.052	-0.084	0.354	0.007	-0.133	0.249	0.003	-0.629	0.325*	-0.043
Previously	-0.042	0.403	-0.006	0.133	0.451	0.001	0.303	0.366	0.056	-0.564	0.549	-0.055
Region												
Greater Accra	-0.001	0.205	-0.036	0.480	0.253*	0.032	0.464	0.227**	0.060	0.342	0.257	0.020
Other Variables												
Female	-0.253	0.183	-0.065	-1.506	0.250**	-0.054	0.620	0.210***	0.116	0.123	0.239	0.013
Urban	-0.061	0.203	-0.028	-0.251	0.242	-0.020	-0.017	0.213	0.005	-0.390	0.263	-0.034
Log-likelihood	-0.686											
Prob > chi2	0.000											
Wald chi2 (48)	221.5											
N	610											

Note: working with only people between ages 15-60. Authors own calculations.

2.9 Conclusion

The aim in this chapter is to address the unemployment challenges in Ghana by understanding the true nature of unemployment. In order to address the aim, we achieve the objectives in this chapter by looking at the personal characteristics of the unemployed, in addition we have also shown their job search and job expectations. Furthermore, we have looked at the uncompleted spells of unemployment duration. The results show that unemployment is very inequitably distributed in Ghana and certain groups are much more likely to be unemployed and stay in it than others. Youth (15-24), medium and highly educated, Christian, single, residents of Accra and urban dwellers are more vulnerable to unemployment. The incidence of unemployment is 13.6 percent and 7.0 percent in 2000 and 2012/13 respectively for urban dwellers whiles that of rural dwellers is 8.9 percent in 2000 and 4.5 percent in 2012/13. The relatively high unemployment rate among urban dwellers implies that, many individuals in the labour force

are unable to support themselves due to lack of earnings. Additionally, empirical evidence shows that crime is highest in developed and densely populated areas in Ghana – urban and Accra - (Kwami, 2017; Appiahene-Gyamfi, 2002; Appiahene-Gyamfi, 2003) which is consistent with the high rate of unemployment in urban areas than rural areas. The high unemployment rate among urban dwellers may force individuals into illegal ways of acquiring income. A World Bank Survey (2013) on 720 manufacturing firms in Ghana found that crime, theft, disorder and vandalism were listed as the top constraint to firm growth. This in itself can lead to another vicious cycle: higher levels of crime can reduce potential profits of firms, reduce business confidence and productivity of workers. This in turn would affect economic growth which in effect would impact the labour market.

The analysis also shows that, the behaviour of women and men in the labour market are diverse. The effects of the explanatory variables differ between both genders. For women, the exit rate from unemployment into employment is lower than in the case of males. The differences may be due to the fact that, traditionally males have more attachment to the labour market than female's whiles females have more family-oriented responsibilities.

A striking fact about Ghana's uncompleted unemployment duration situation is that youth (15-24) and young adults (25-35) tend to stay unemployed for longer periods than other members in their age cohort which is atypical among countries where there exists a burgeoning informal sector. This may however be due to the fact that, youth (15-24) and young adults (25-35) are more likely to search for work rather than enter jobs that are undesirable to them and also, they are less likely to have more financial commitment than other members of their cohort which in effects means they can afford unemployment job-search.

The analysis reveals the characteristics of the unfortunate individuals who are liable to be at the end of the queue for employment. Whiles improving their characteristics may lead to an improvement in their place in the queue it will not necessarily lead to a reduction in unemployment (Kingdon and Knight, 2004). Myrdal (198) suggest that, unemployment is a queuing phenomenon where the unemployed in the society tend to wait for better jobs and the job tends to be concentrated among the relatively well-educated individuals who are in most cases from the middle-income class of the country.

The higher probability of unemployed individuals who expected to secure wage employment relative to self-employment and any employment confirms the observation that, job creation in Ghana has not being sufficient. This may also be due to the number of

individuals with medium and high education entering the labour market due to educational reforms which is causing them to seek wage employment over self-employment because of their educational background. This notion is supported by the fact that, individuals with low education relative to the base category are less likely to be unemployed which then means instead of waiting to secure wage employment they enter self-employment which highlights the reason why they are less likely to be unemployed. Additionally, in terms of spatial distribution much more unemployed individuals who are in search of wage employment can be found in urban areas as against those in rural areas. It is further evident from the analysis that, since job creation in formal and public sector are reducing job seekers are left with no option but to secure employment in the informal sector which according to Baah-Boateng (2013) they tend to find unattractive. Design and implementation of policies to promote not only investment in high labour absorption sectors like agriculture and manufacturing but also, offer entrepreneurial skill training and start-up support for which there is market clearing and to reduce the number of unskilled labour for which the market fails to clear would be prudent. This is however straying beyond the evidence of this work.

The youth (15-24), urban dwellers and single individuals – the groups which suffer the highest unemployment rates – human capital characteristics such as education and employment experience may significantly reduce the likelihood of unemployment. A policy prescription that education and skills of the mentioned groups should therefore be upgraded may not solve the unemployment challenge unless the economy has enough jobs to accommodate all job seekers, upgrading the education and skills of such groups will at best change the composition of employment in their favour. Of course, it is possible that, an expansion of both education and skills will decrease the overall unemployment. Policies makers need to look at whether the kind of training being offered them is sufficient which would prepare them for the labour market, because if they rushed and get into the labour market so early and there are no available jobs this would also cause challenges. The mechanism might rather be to provide entrepreneurial training and start-up support to attract both the youth and young adults into establishing their own small businesses since as argued by Nichols et al. (2013) unemployment leads to the underutilization of human resources and failing to address such issues does not only cause poverty among the unemployed but also leads to a fall in the potential income tax revenue the country can accrue. Serneels (2007) further posits that, young people are credit constrained which means they do not have start-up capital to establish their own businesses. Establishments such as the Kenya Youth Business Trust which is aimed at young people with

entrepreneurship desires by providing them with not only start-up capital but also mentorship training is one among many initiatives which could motivate young individuals to indulge in business start-ups.

The analysis also shows that, the choice of job search used by the youth is social networks, which is the most important channel through which a job is found and the analysis shows that, this option sets in after the youth become unemployed, implicitly encouraging the youth to be unemployed rather than take up a temporary job (Serneels, 2007). This phenomenon may be due to the lack of financial responsibilities on the youth which means they can afford unemployment. Further research incorporating data on the quality of education will be of great value, secondly, research that would delve deeper by shedding light on the puzzle why the youth rather prefer to queue for jobs than take up temporary job will be great and lastly longitudinal data sets will also be needed to interrogate further policy questions concerning unemployment duration and unemployment dynamics.

Underemployment in Ghana: Accounting for Gender Differences

3.1 Introduction

Public policy discussion and academic research on excess labour supply around the world has traditionally focused on unemployment, but there is a growing awareness that underemployment is an important factor in excess labour supply. Underemployment is defined as excess labour supply of employed individuals arising when an employed individual wants and is available for more hours of work in order to increase income or wages. In principle, both part-time and full-time workers can be underemployed but in practice the argument has being that, underemployment is more with excess supply by individuals working fewer hours than full-time hours (Wilkins, 2006). In Africa, a major challenge for countries is the inability to use more effectively and efficiently human resources. There is a growing debate that in order to reduce poverty levels and poverty among workers, steps need to be taken to promote job creation, ensure productivity growth (Sackey and Osei, 2006) and decent work.

It is therefore of no surprise that, the African continent which holds the world's highest rates in both open underemployment and youth unemployment also account for the highest number of people living in abject poverty (ILO, 2003).The World Bank (2007a) also states that, youth unemployment and underemployment are both major issues that face sub-Saharan Africa as in many other parts of the developing world. Even though both underemployment and unemployment tend to be more visible form of labour underutilization, it is argued that, the most difficult and challenging of the two for the African continent is underemployment (Osmani, 2003). He further states that, it is the case in Africa due to the fact that, majority of countries on the continent lack social insurance mechanism which means in order to survive citizens are compelled to work all kind of jobs, however small to make ends meet (Majid, 2001). In other words, workers tend to accept any kind of work regardless of the wages earned or working pattern (fulltime or part-time). This is consistent with Dooley and Prause, (2004) who argued that, any type of work whether good or bad is better than no job.

From an individual perspective, underemployment has an impact not only on life satisfaction and income but also on welfare dependency (Wilkins, 2007). At an aggregate level, since underemployment is a measure of the amount of slack in the labour market, it can be understood to mean a kind of inefficiency and source of welfare loss (Bell and Blanchflower 2013; Walling and Clancy 2010; Wilkins and Wooden 2011). Furthermore an increase in underemployment tends to understate the true nature of unemployment (Sackey and Osei,

2006; Beukes**,** Fransman, Murozvi and Yu, 2017**)** and also, hinder the reduction of unemployment since employers would offer longer hours to employees to avoid recruitment cost and other uncertainties which are likely to arise as a result of recruiting of new employees (Bell and Blanchflower 2013). This then means that, the apparent growth in underemployment rate –both relative to unemployment and in absolute terms – means that, underemployment ought to be of increasing concern to policymakers. In this context, it is of great importance to not only understand the personal but also the work characteristics of the underemployed. That is, in order to develop policies that would improve both the employability of those affected and enhance their employment opportunities, identification of the causes and dynamics of underemployment is potentially valuable (Findeis, et al, 2000).

In support of the above, Shapiro (1989), Findeis and Jensen (1998) also state that, this understanding is highly important in order to get a better picture of the individuals who are most likely to face the risk of employment difficulty and distress. Particularly of interest is whether the predictors associated with underemployment are significantly different from those associated with unemployment in which case policies that are used to address unemployment may not be appropriate for addressing underemployment.

Given the foregoing, this chapter would attempt to extend the literature on underemployment in Ghana because to the best of our knowledge only Sackey and Osei (2006) have looked at underemployment in Ghana - their paper provide little evidence on the personal and work characteristics of underemployed in detail - and even with their work, they used 1999 dataset of the GLSS whiles this work would use relatively new data's– GLSS 5 (2005/06) and GLSS6 (2012/13) – to understand and gain a better picture of the underemployed in Ghana.

The contribution of this chapter is in three folds. Firstly, thanks to the novel nature of both GLSS 5 and GLSS 6 data set, their time span allows exploring the existence and extent of any effect of global economic crisis in a developing country in Sub-Saharan Africa where underemployment have not been studied in detail. This is important because whiles unemployment is low in many of those countries, underemployment is high which means the use of unemployment measure to determine labour underutilisation is not sufficient and studying underemployment in detail from the Ghanaian perspective will extend the literature on underemployment. Secondly, we contribute by examining gender differences in underemployment in Ghana by using the Extended Blinder-Oaxaca Decomposition method which was developed by Fairlie (2003) and has not being employed in any study on labour

market in Ghana to the best of our knowledge. This is vital because it identifies and quantifies the underlying causes of gender differences and their separate contributions in measurable characteristics such as education, marital status and regions and the findings will be useful for policy debate over the causes and consequences of the female-male gap. This adds to the literature studying gender disparities in labour utilization across the globe. Thirdly, this chapter will provide insights to policy prescriptions by identifying the channels through which incidences of underemployment can be reduced in order to promote effective & efficient labour force, enhancing the quantity and quality of the labour supply and meeting equity objectives thereby stimulating vigorous analyses of the labour markets and policies.

The plan of the chapter is as follows. Section 3.2 provides the conceptual framework, theoretical framework and antecedents of underemployment. In Section 3.3, the data and variables used in the econometric model are presented. Section 3.4 presents the methodological approach adopted. Section 3.5 presents the descriptive statistics whiles 3.6 presents the empirical results. Section 3.7 concludes and discusses future lines of work.

3.2 Literature review

3.2.1 Conceptual framework

In most cases, the challenge with underemployment is due to the fact that, it is based on the personal assessment of employed individuals (Zvonkovic, 1988, p.162; Bonnal et al, 2009). Of course, no standardised measure of any relevant indicator would be perfect, and underemployment has got its challenges (Slack and Jensen 2003). In explaining, Power (2010) states that, underemployment in most cases is subjective that is, it is based on the perception of the workers (Glyde, 1977; Slack and Jensen 2003) on how they think their skills and abilities are being utilized (Scurry and Blenkinsopp, 2011, p. 646; Jones Johnson and Johnson, 1995).

Bonnal et al. (2009) in support of the above also state that, underemployment could arise due to various personal reasons. He states that spousal employment and income, spatial restrictions, family constraints or other personal preferences are among others, the various personal reasons that could cause underemployment. This becomes difficult to interpret and quantify when the personal views of employed could change on a daily basis. In other words, the perception or idea of being underutilised constitutes underemployment (Maddock, 2012). Bonnal et al. (2009) in addition also suggests that, due to the nature of underemployment, it must be well defined in any study in order to enable a better understanding and proper use of

its results since in some studies it has being defined very narrowly to simply mean surplus of high skill labour.

Since the aim of this chapter is to study underemployment in the context of Ghana, it is highly important to know how underemployment is defined both locally and internationally. The impact of underemployment is felt by employed individuals in the labour force. Two commonly adopted approaches are used to distinguish between the underemployed namely time-related based approach (sometimes referred to as visible underemployment) and the inadequate employment approach (sometimes referred to as invisible underemployment) (Wilkins, 2007; Baah-Boateng, 2015; Hauser, 1977). In terms of the former approach, underemployed refers to individuals who are employed but worked fewer hours than they would have preferred to work (Walling and Clancy, 2010; Brown and Pintaldi, 2006) whiles in terms of the latter approach, underemployed is defined as a situation where workers find themselves in employments where their skill, experience and training are underutilised (Bonnal et al., 2009; Wilkins & Wooden, 2011). This in turn means that, these individuals are not given the opportunity to fully make use of their productive ability, despite their willingness to work more effectively (Greenwood, 1999).

Sackey and Osei (2006) state that, underemployment in Ghana is defined as a situation where individuals work less than 40 hours during the reference week and willing to work more hours. In other words, the definition of underemployment in Ghana is the time-based approach.

The crux of underemployment in terms of international definition is drawn by the ILO. According to the International Labour Organization (ILO), time related underemployment is ‘‘when the hours of work of an employed person are insufficient in relation to an alternative employment situation in which the person is willing and able to engage’’ (Bonnal et al, 2009, p.319; Walling and Clancy, 2010; Brown and Pintaldi, 2006). Individuals are classified to be in time related underemployment when during the short survey reference week, a) were willing to work more hours, b) were available to work the additional hours and c) had worked less hours than a selected number of hours. In terms of willingness to work additional hours it means an employed person in addition to their additional work wanted another job (jobs) in order to increase their total number of working hours; to replace any of their current jobs with another job which would enable them work more hours; to increase the hours of work in any of their current job; or a combination of all the above criteria. In explaining the second criteria (available to work additional hours) it identifies individuals who are ready to work additional hours within a specified subsequent period if given the opportunity to do so (OECD, 2003).

The third criterion which qualifies an individual to fall under the time related underemployment deals with "worked less than a threshold relating to working time", i.e. persons whose "hours actually worked" in all jobs during the reference period, as defined in current international guidelines regarding working time statistics, were below a threshold, to be chosen according to national circumstances. In other words, the number of hours a person must work before they are considered to be underemployed differs from country to country. This threshold may be determined by e.g. the boundary between full-time and part-time employment, median values, averages, or norms for hours of work as specified in relevant legislation, collective agreements, agreements on working time arrangements or labour practices in countries (ILO, 1998).

As outlined earlier, in Ghana the threshold is deemed to be less than 40 hours a week. According to Bonnal et al. (2009) the time-related definition given by the ILO while superior, excludes an important cause of underemployment—labour productivity growth**.** He states that when workers productivity rises, they can become underemployed because they can carry out more work in the same time frame. He therefore suggests that in order to determine underemployment among workers it is best for the respondents to state whether or not they are underemployed since they tend to be in a better position to compare their work conditions with their personal characteristics. Edwards and Shipp (2007) also state that the effects of some types of underemployment may actually impact performance in a way that would yield a positive outcome. Erdogan and Bauer, (2009), Fine and Nevo (2008) and Holton, Lee and Tidd (2002) also support the above.

Indicators of inadequate employment situations on the other hand is defined by the 16th International Conference of Labour Statisticians (1998) as a situation in the work environment whereby wellbeing and capacities of workers is reduced as compared to an alternative employment situation. However, as stated in the international definition, the inadequate employment situations may be different among countries and that both the statistical definition and methods necessary to define such situations will still need further development (Hussmann, 2007). The 16th ICLS does however identify a number of situations for which countries may want to consider producing separate indicators namely:

Skills-related inadequate employment comprises of all employed individuals who during the survey reference week, wanted to change their current work situation in order to utilize their occupational skills to the fullest and were available to do so. This occurs when an individual finds themselves in a job where their skills and qualification are too advanced for that particular job ((Kazan, 2012).

Income related underemployment: individuals tend to be classified under this form of inadequate employment, if during the survey reference period they were employed and had the desire to change their current work situation in order to increase income limited due to insufficient tools, equipment or training, deficient infrastructure, low level of organisation of work or productivity and were available to do so.

Inadequate related to excessive hours is as a result of the desire of employed persons to work fewer hours than they did during the survey reference week either in the same job or in another job with a corresponding reduction of income.

McGuinness (2006) argues that, four different methods can be employed to measure over-qualification of which two are subjective and the other are considered to be objective. The first subjective approach asks the employee if he/she think they are overeducated or not whiles the second subjective measure is carried out by asking the worker to carry out a comparison between their own subjective assessment of the minimum requirement of education for their current job against their attained educational level (Wilkins and Wooden, 2011). In terms of the objective approach, a worker is considered to be overeducated if their years of education are one standard deviation above the mean years of education associated to the relevant occupation category (McGuinness, 2006). Whiles the use of the standard deviation method of capturing over qualification is on the rise, Wilkins and Wooden (2011) argues that, some researchers prefer occupation mode instead of mean (Beukes et al. 2017).

The second objective approach in measuring over qualification is carried out by determining the education level required by an individual's job title and then carrying out a comparison of the individual's actual educational level with the required educational level for that particular job. Wilkins and Wooden (2011) and McGuinness (2006) posit that, the subjective measure of over qualification may lead to higher rates of underemployment than the objective measure because issues are more likely to arise from data collection because workers may not clearly understand the job requirement in terms of the educational qualification. The objective approach might seem to be better option to measure over qualification, but it has its draw backs too. Many argue that, in terms of the standard deviation option used to capture over qualification, the cut-off point is arbitrary and also, the approach is unrealistic since the method makes use of assumption of symmetry (Beukes, Fransman, Murozvi and Yu, 2017). The occupation dictionary approach has also been criticized as being unrealistic since there is an assumption that the educational requirements are the same for all jobs that are within the same occupation code. Additionally, as argued by Wilkins and Wooden (2011) even at extremely

disaggregated levels, occupation is heterogonous in nature. Ghana Statistical Service does not distinguish the underemployed using the inadequate employment situation approach which means it is not possible to employ the inadequate employment situation approach in this study. In explaining not only does the Ghana Statistical Service not ask questions in relation to over qualification, there also exist no education level for each broad occupation category as it in countries like South Africa (Beukes, et al., 2017).

Qualitative and quantitative has being cited as other ways by which underemployment can be described (Beukes et al. 2017). Qualitative underemployment is described as the type of underemployment where persons have no option or choice but to accept job offers that are below their qualification, skills and experience which also described as objective underemployment by Khan and Morrow (1991). This in effect leads to low wages in some cases (Ruiz-Quintanilla and Claes, 1994). Quantitative underemployment on the other hand is the type of underemployment where persons find themselves in employment contracts where the hours offered to them by their employers are less than the hours they desire to work. Khan and Morrow (1991) also describe this as subjective underemployment meaning workers feel their abilities are underutilized. This type of situation is in most cases found to be predominant in non-voluntary part-time work. This therefore means that in describing, whiles quantitative underemployment relates to time-related underemployment, qualitative relates to inadequate employment (Beukes et al. 2017).

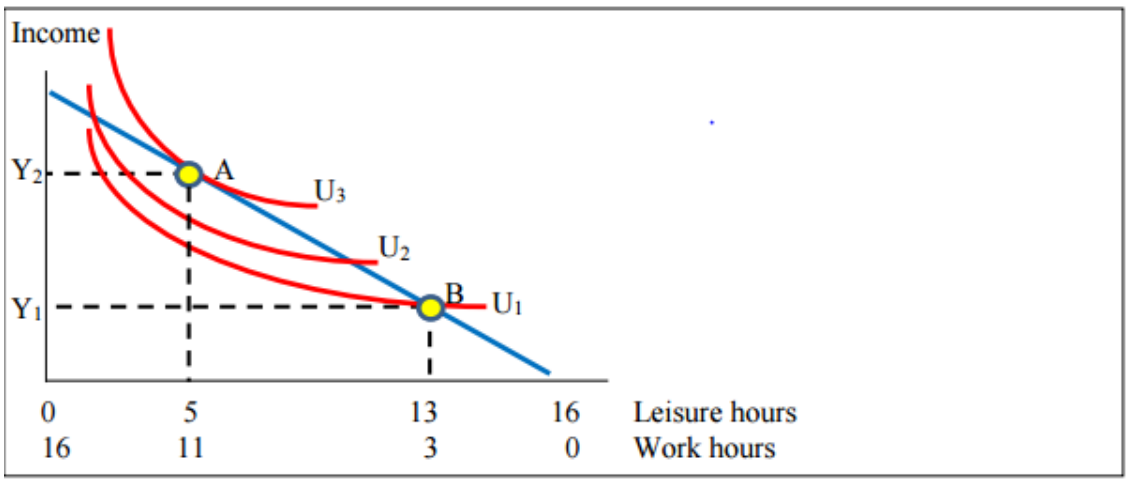
3.2.2 Theoretical framework

Most economists tend to dismiss instinctively the idea of underemployment upon initial encounter. The conventional wisdom tends to be that, people are either in work, searching for work or out of the labour force voluntarily. Golden and Gebreselassie (2007, cited in Tam, 2010) argues that, people will search for better opportunities until they find jobs, they deemed fit if they do not like their job or the number of hours per week they allocated by their employers. Another argument is that, the underemployed are better off than the unemployed due to the fact whiles the former receives wages/income, the latter receives nothing (Wilkins, 2007). A bit of reflection however throws light on the importance and relevance of underemployment (Berger et al, 2003) since being underemployed has its social and economic implications (Beukes et al. 2017). This is because not only are underemployed individuals synonymous with lower wages but also work fewer hours which then translates into lower level of welfare. From a theoretical point of view, some researchers tend to argue that, the

underemployed are considered to be outsiders within the labour market (Wilkins, 2007; Beukes et al. 2017).

Figure 3 is a graphical illustration of time-based underemployment. Assume that, an individual spends sixteen hours on either leisure or work each day. This individual is currently employed and receiving an hourly wage of (W) but would have preferred to work only 11 hours per day which is indicated by point (A) attaining a utility level of U3. The individual is however offered 3 hours of work per day (point B) which in effect means they attain a lower utility level of U1. The individual can be considered to be underemployed at point B because they would want to 8 hours of more work per day. Lesser hours of work are associated with a lower wage income (Y1) in comparison to the potential income the individual would have earned (Y2) should they have worked their fully desired hours.

Figure 3 Underemployment: time-based approach



Source: (Beukes et al. 2017).

Scholars, from a theoretical perspective, have also applied multiple theories to underemployment, such as person-environment fit, human capital theory, latent deprivation theory, and relative deprivation theory (Luksyte and Spitzmueller, 2011; Allan, Tay and Sterling, 2017). Allan et al. (2017) argues that, rather than being models of underemployment themselves, such as Feldman (1996) model, these theories attempt to explain what causes people to underemployed and what the outcome of underemployment is.

Person environment fit theory posits that, underemployment is as result of the lack of match between an individual's skills and competencies to their work environment that is their jobs and its demands (McKee-Ryan and Harvey, 2011; Beukes et al. 2017; Kristof, 1996;

Edwards, 1991). In other words, a greater degree of fit between an individual and his or her job leads to more positive work outcome (Kristof Brown, Zimmerman, & Johnson, 2005). Discrepancy theory suggest that, workers who receive their desired number of job-related outcomes will show an increase in positive job-related attitudes and behaviours (Lawler, 1973; Locke, 1969). In the context of underemployment, the theory argues that, when differences exist between a worker's abilities (education, experience and skills) and the actual job requirement, there is lack of fit or a discrepancy. Such discrepancies can be used to explain some of the negative outcomes which are associated with underemployment. Human capital theory on the other hand argues that, underemployment results from a mismatch between an individual's human capital and their job requirements (Luksyte and Spitzmueller, 2011). Latent deprivation is another theory which explains underemployment by way of highlighting the result, which is that, underemployment leads to poorer well-being (Jahoda, 198). In explaining, Jahoda (1981) asserts that, employment affects well-being through its latent consequences. The argument is that, people work for income which provides access to necessities such as shelter, food and clothing. However, employment has benefits beyond income which represents its ''latent'' consequences including personal status, regular activity, time structure, social contacts and collective purpose. Underemployment in majority of instances deprives individuals of some or all of these latent benefits which leads to poorer well-being, an argument which is supported by Tay and Harter, (2013) who state that, economic downturns does not only lower life satisfaction but also lowers job satisfaction.

Relative deprivation theory is among the many theories that underpin underemployment and it is especially relevant to a subjective model of underemployment. In simple terms, relative deprivation theory describes how individuals compare their current working situation to normal/ideal work situations which tends to differ from person to person (Luksyte and Spitzmueller, 2011). A mismatch between an individual's comparison of ideal and real work situation can lead to an experience of underemployment. In other words, the theory is a reflection of the subjective aspect of underemployment – individual's desires- and the different measures of comparisons individuals employ.

3.2.3 Antecedents of Underemployment

International research has attempted to document trends in the extent of underemployment (Sorrentino, 1995) and examine the determinants or factors that are associated with underemployment (Ruiz-Quintanilla and Laes, 1996). Schoeman et al (2010) in using capital/labour ratio as the proxy variable studied the role of labour conflict on the persistent of

macro underemployment during the periods of 1970-2004. The estimations revealed a statistically significant positive relationship between strike frequency and capital/labour ratio. In other words, the rise in underemployment is as a result of a switch in technology; bad labour relations have highlighted the reason behind the choice of more capital-intensive techniques hence less labour absorptive measures.

Wilkins and Wooden (2011) examined involuntary part-time employment among OECD countries and the underemployment rate ranged from 0.4 percent in Hungary to 4.3 percent in Italy. Bell and Blanchflower (2013) adopted similar definition, by asking British workers whether they felt working hours to be limited. They found that, since the 2008 recession underemployment has risen sharply. Tam (2010) also found that the rates of underemployment in the United Kingdom rose sharply during the recession as the demand for labour reduced.

Wilkins (2006) used survey data to interrogate the factors that lead to incidence of underemployment in Australia. In estimating, a multinomial logit model with four labour force status (unemployed, underemployed, part-time and fulltime) were used. The results show that, whiles underemployment has many common determinants with unemployment, several differences also exist. For instance, whiles age, educational level, disability and labour market history were common determinants amongst underemployed and unemployed, area of residence and housing situations were irrelevant to both unemployment and underemployment.

Walling and Clancy (2010) as well as Cam (2014) found that, in the United Kingdom, the probability of females relative to males becoming underemployed was higher but varies across demographics and work-related factors. Cam (2010) posit that, individuals in part-time employment, sales and customer services were more likely to be underemployed. Similarly, Kjeldstad and Nymoen (2012) and Valletta, Bengali, and van der List (2016) found in their study that, underemployment seems to be more prevalent in sales, care, services and hospitality probably due to the nature of the demand for services offered. Kjeldstad and Nymoen (2012) further found that, there exist a negative relationship between underemployment and firm size with small firms showing the highest risk which may be because of the financial constraints they may have.

Altman (2003) examining whether jobless or job creation growth took place during 1994-2001, briefly looked at underemployment by defining them as individuals working in the informal sector, domestic services and subsistence agriculture. She found that, underemployment accounted for 14 percent of all the employed in 1994 before increasing to

21 percent in 2001. In 2009, Altman (2009) carried out another study where she examined time-based underemployment in 2008 and the results showed that, black females aged between 15 and 24 years residing in KwaZulu-Natal and Free State were more likely to be underemployed. Yu (2009) also found in his study that majority of the underemployed where not only black and females but also involved people in unskilled occupation.

Burke (1997) in studying underemployment analysed self-reported underemployment status using the probit regression analysis. The analysis found that, age, career satisfaction and job involvement of the respondents was found to be highly correlated with underemployment. Additionally, females were found to have a higher probability than their male counterparts to be underemployed. In contrast, work situation characteristics were found not to be related to probability of underemployment. It is also important to note that, the finding are not representative since the sample was drawn from graduates in only one university.

Sengenberger (2011) states that, although the results varied across countries, time related underemployment rose over the period 1990-2005. Time-related underemployment was more prevalent among females than males. Similarly, Wilkins (2006) found underemployment to be higher among females than males (Haataja, Kauhanen, and Natti 2011; Kjeldstad and Nymoen 2012).

Sum and Khatiwada (2010) and Wilkins and Wooden (2011) argue that, low levels of education are associated with underemployment, however, other researchers have refuted that, by arguing that, no effects of education level (Cam 2014 for men) or even a negative impact (Bell and Blanchflower 2011; Cam 2014 for women). Additionally, Johnson and Johnson (2000) stated that, there was no significant relationship between education and underemployment. This shows the mixed results attained when analysing the effects of education.

Acosta-Ballesteros et al. (2018) in analysing the effects of education on young workers time-related underemployment found that, underemployment is negatively related to education level for each period and tertiary education has smoothed the negative effect of recession.

In accounting for the main reason behind underemployment in Africa, Golub and Hayat (2014) argue that, the dualistic nature of most of the African labour market was to blame for the underemployment situation in Africa that is deficient of labour demand. The high rate of informal sector employment and agricultural activities leads to underemployment rather than open unemployment. An OECD report (2017) argued that, underemployment was

characterised by workers in low paid, informal, agricultural and part-time employment. It was also revealed that, about 80 percent of workers in low-income Sub Saharan African countries were employed in the informal sector since the formal sector does not provide enough employment for job seekers thereby resulting in growing underemployment.

Vuluku, Wambugu and Moyi (2013) paper analyses the gender gaps in open unemployment and underemployment in Kenya using data from the Kenya Integrated Household Budget Survey 2005/06. The results show that, individual human capital characteristics, marital status, region of residence, non-labour income and individual's age were significant determinants of unemployment and underemployment.

Beukes et al. (2017) study on the determinants of underemployment in South Africa revealed that, whiles 3 percent to 6 percent of the employed individuals were underemployed based on the time-based approach, between 6 percent and 15 percent were underemployed based on the inadequate employment approach. They also found that, the prevalence of underemployment is higher amongst the blacks, females and individuals working in elementary occupations or private households and the informal sector. Additionally, economic recession was negatively associated with the time-based underemployment rate. Mathebula (2013) study on the determinants of time-related underemployment in South Africa found that females, individuals with post-Matric qualifications, leaving in urban areas, with limited contract duration and working in the community, social and personal services are more likely to be underemployed.

Sackey and Osei (2006) working on a 1999 dataset from Ghana, employ a probit model to study both unemployment and underemployment as the human resource underutilization. They show that, in certain industries an association exist between poverty and underemployment. Their analysis also showed that, rural areas where found to have higher levels of underemployment with the type of economic activity influencing it. Females were also found to have higher incidence of underemployment relative to their male counterparts.

Denu, Tekeste and Van Der Deijl (2005) study on Ethiopia found that time-based underemployment among the youth was prevalent in rural area as the mean weekly hours of rural youth employed (21.3 hours) were significantly lower when compared to the urban youth employed (36.8 hours). Fogg, Harrington, and McMahon (2011), Prause and Dooley (2011) and Wilkins (2006) in their study found that, young workers, who have limited labour

experience and usually hold weak position in the marketplace are more likely to be underemployed. The evidence on gender is mixed (Acosta-Ballesteros et al. 2018).

Kiflea, Klerb and Shankarc (2017) in utilising 2001 -14 household, income and labour dynamics Australian panel data investigate the phenomenon of underemployment among part-time employees and its impact on job satisfaction. They found that, part-time underemployment is gender sensitive, affecting males proportionally more than females, though more females are actually underemployed given their significant presence in part-time employment. Furthermore, the underemployed display lower levels of job satisfaction and do so across all six different workplace satisfaction. Their results also show that, while part-time underemployment is significant, it is well hidden within the Australian labour market and the consequences of this on job satisfaction and potentially is pronounced both between non-underemployed and underemployed.

Empirical research has also linked the high incidence of underemployment to self-employment since it is argued that, this option tends to be used more often when there are no work opportunities available (Bell and Blanchflower 2013; Wilkins 2006). Conversely underemployment seems to be less likely for workers who are engaged in high level occupations (Tam, 2010; Cam, 2014). This negative relationship is also found for trade union membership due to the relative protection to implies in the firm worker relationship (Cam, 2014) and for job tenure (Doiron 2003; Veliziotis, Matsaganis, and Karakitsios 2015). Otterbach (2010) study found that, unemployment rate is an important determinant of underemployment since it shows the local demand for labour.

In terms of nationality, Slack and Jensen, (2011) found that, nationality, immigrants and racial/ethnic minorities are more likely to be underemployed. The impact of marital status and number of children in the household for males and females is mixed and this could be due to the gendered division of time both at work and home.

Research also shows that, underemployment occurs among employees from different professions. Underemployment is experienced, for example among expatriates (Bolino & Feldman, 2000; Kraimer, Shaffer, & Bolino, 2009; Lee, 2005), retail sales workers (Erdogan & Bauer, 2009; Holtom et al., 2002), hospital workers (Holtom et al., 2002), non-academic university employees (Khan & Morrow, 1991), business school graduates (Feldman & Turnley, 1995), executives (Feldman et al., 2002; Leana & Feldman, 2000), faculty (Feldman & Turnley, 2004; Maynard & Joseph, 2008), postal workers (Johnson & Johnson, 2000), medical

and laboratory technicians (Watt & Hargis, 2010) and professional and technical workers (Kinicki et al., 2000; McKee-Ryan et al., 2009).

The literature review demonstrates that, on an international level, several studies have been carried out to examine the determinants of underemployment. These studies have however focused on developed and transition economies with relatively fewer studies in existence on the determinants of underemployment in Africa. This chapter extends the literature on underemployment focusing on Ghana in several ways. Firstly, there are hardly any in-depth studies that examined whether the characteristics of various groups of underemployed differ significantly in Ghana. Secondly, the study draws from the two most recent cross-sectional data sets from Ghana (GLSS 5 & 6) which no work exists on in relation to underemployment.

Thirdly, this study will employ the Fairlie decomposition technique to look at the decomposition of the gap between males and females in underemployment. In other words, the technique allows for the computation of the differences in the predicted probability of the dependent variable occurring between the two group's females and males and quantifies the contribution of group differences in the right-hand variables (independent variables) to the outcome differential. This makes it highly imperative to analyse the evolution of underemployment among the different groups with two most current data sets.

3.3 Data Source and Description

The empirical analysis is based on the Ghana Living Standard Survey (GLSS) 2005/06 (GLSS5) and 2012/13 (GLSS6) which is a nationally representative cross-sectional household survey. The data were collected through personal interviews using pre-prepared questionnaire by the Ghana Statistical Service. The data's have a variety of detailed demographic, social, health and economic information for individuals which includes hours of employment; earnings; sources of earning; labour force and employment status; educational attainment; industry and occupation of employment; trade union membership status and locality among many others. The sample for this study is restricted to individuals in the working age population (15-64) who were in the labour force[4].

The final sample includes 13,583 individuals in GLSS 5 and 28,903 individuals in GLSS6. The dependent variable in the econometric analysis is a dummy variable which is

[4] We exclude those in aged 65 and over from the estimation because at the age majority of people are more likely to be transitioning into non-employment.

equal to one if underemployed and zero if otherwise**.** The independent variables included in the econometric analysis reflect the main factors previously found to determine underemployment as outlined in the empirical literature section. The explanatory variables are age, marital status, human capital, region, locality, the interaction between gender, number of children under 16 in household, elderly in the household, religion, household head which all capture personal characteristics. Additional specifications are estimated including variables for industry and economic sector choice.

Whiles the definitions of some of the variables are self-explanatory, in a few cases additional explanation is warranted. In terms of locality, the area of residence, can be a crucial determinant of human resource underutilisation. The variable takes a value of 1 if urban residence and 0 for rural. Furthermore, nine regional variables are added in the estimation because, regional variables tend to reflect many influences such cultural, labour demand conditions and availability of labour market information. The age of an individual is important in determining the labour force status. The age variable can also capture the work experience. It also expected that, females and males of the same age tend to possess not only different characteristics but also different responsibilities. Youth (15-24), young adults (25-35) adults (36-60) and old (61-64) with the age cohort 15-24 being the base category. The marital status is shown to be a very important indicator from the literatures reviewed since it plays a role on an individual's labour force status. This was estimated to see if the same applies to Ghana. A dummy variable was employed where being married took a value of 1 and 0 for otherwise. Gender is measured as a dummy variable where being male takes a value of 1 and 0 otherwise.

In terms of human capital, the theory states that, individuals with higher education attainment are more likely to be employed. This in effect means, the higher the educational attainment level, the lower the unemployment or underemployment rate. Three dummy variables were created to capture educational level namely low education, medium education and high education.

3.4 Model Estimation

3.4.1 Underemployment model

In this section, a probit model similar to the one used in the unemployment chapter is used to estimate the determinants of underemployment for the two different periods. We use a national cut-off point of 40 hours of work a week to distinguish the underemployed individuals from

those that are not (Sackey and Osei, 2006; Amu, 2005). Thus, anyone who worked less than 40 hours a week in the reference period is considered underemployed. The population of interest is therefore individuals in the labour force since the underemployed are a subset of the sample of employed workers. A dummy variable with a value of 1 for labour market participants who work less than 40 hours a week, available to work more hours and zero for otherwise is created. This approach is in line with Gorg and Strobl (2003), Bell and Blanchflower (2013), Sackey and Osei (2006) and Ruiz-Quintanilla and Claes (1996).

A model for the empirical analysis takes the following term;

$$U_I = \alpha + S_i'\beta + Z_i'\phi + \varepsilon \quad (1)$$

where U_I is underemployment, S_i is a vector of explanatory variables and Z_i is a vector of other control variables that are likely to cause an individual to be underemployed. ε is the standard vector representing the stochastic error term whiles α represents the intercept term. β, δ and $\emptyset$ are all vectors of parameters of explanatory variables. The probit model will enable us measure or explore the influence each of the explanatory variables has on the probability of an individual becoming underemployed holding other factors constant as:

$$Pr(U_I = 1 | X_I) = Pr(U_I = 1 | S_I \; Z_I) \quad (2)$$

where U_I is the dependent variable and X_I represents the different set of explanatory variables that capture S_I and also, Z_I which represents other control variables. Z_I represent's the probability of an individual becoming underemployed. Assuming that the model is linear in the set of parameters, the estimated model of the determinants of underemployment is written as:

$$Pr(U_I = 1 | X_I) = G(\alpha + S_i'\beta + Z_i'\phi) = \alpha + S_i'\beta + Z_i'\phi + \varepsilon_i \quad (3)$$

where G is a function taking on values that are between zero and one. ε_i represents the disturbance term with mean zero and variance σ_i^2 .

3.4.2 Decomposition of the Gender Underemployment Gap

The extended Blinder – Oaxaca decomposition technique developed by Fairlie (2003) for non-linear models is employed in this section to decompose the female-male gap in underemployment. Whiles the standard Blinder-Oaxaca technique is easy to apply and only requires coefficients estimates from linear regressions for the outcome of interest and sample

means which the independent variables uses in the estimation, an issue arises however if the outcome is binary, such as employment and college attendance and the coefficients are derived from either a logit or probit estimation (Fairlie, 2005). These coefficients cannot be interpreted directly in the standard Blinder-Oaxaca technique which led to Fairlie (2003) developing a simple method of performing decomposition where estimates from logit/probit model can be used hence this work adopting Fairlie's extended Blinder – Oaxaca decomposition technique. This adoption of the extended Blinder – Oaxaca decomposition technique developed by Fairlie (2003) has recently been used to study cross-country differences in levels of obesity and overweight in Italy and Spain (Font, Fabbri and Gil, 2010), gap in the use of maternal healthcare services between social groups in India (Kumar and Singh, 2016) and unemployment and underemployment gender gap in Kenya (Vuluku, Wambugu and Moyi, 2013).

For the decomposition of female-male difference /gap in the predicted probability of underemployment we consider the following two equations[5]:

$$U_i^m = F(X_i^m \beta^m + \varepsilon_i^m) \quad (4)$$

$$U_i^f = F(X_i^f \beta^f + \varepsilon_i^f) \quad (5)$$

Given that U is a dummy variable, we use the probit estimator and therefore F denotes standard normal cumulative density function. The estimated average probability of being underemployed for both groups (male vs females)

$$\overline{U}^m = \frac{1}{N^m} \sum_{i=1}^{N^m} F\left(X_i^m \widehat{\beta}^m\right) \quad (6)$$

$$\overline{U}^f = \frac{1}{N^f} \sum_{i=1}^{N^f} F\left(X_i^f \widehat{\beta}^f\right) \quad (7)$$

[5] Note: Both S and Z representing explanatory and other control variables respectively which were used in the underemployment probit estimation are nested in X which is a vector which includes all independent variables.

As we are interested in the difference in predicted probability of underemployment, we employ the extended Blinder-Oaxaca decomposition developed by Fairlie (2003). Essentially, this decomposition involves the differencing of Eq (6) and Eq (7) as shown by Fairlie (2005). Decomposition of non-linear models such as the probit can be expressed as:

$$\overline{U}^{m} - \overline{U}^{f} = \left[\sum_{i=1}^{N^m} \frac{F(X_i^m \widehat{\beta}^f)}{N^m} - \sum_{i=1}^{N^m} \frac{F(X_i^f \widehat{\beta}^f)}{N^f}\right] + \left[\sum_{i=1}^{N^m} \frac{F(X_i^m \widehat{\beta}^m)}{N^m} - \sum_{i=1}^{N^m} \frac{F(X_i^m \widehat{\beta}^f)}{N^m}\right] \quad (8)$$

In this case, the female coefficients estimates $\hat{\beta}^F$ are used as weights for the first term in the decomposition and the male distributions of the explanatory variables $\overline{U}^M$ are employed as the weights for the second term.

Intuitively, the first term in brackets represents the part of the gender gap that is due to group differences in distributions of the explanatory variables and the second term captures the part of the gender gap which is due to group differences in unmeasurable or unobserved endowments (Fairlie, 2005). This non-linear decomposition technique was used together with the probit estimations to identify the drivers of gender differences in underemployment in Ghana.

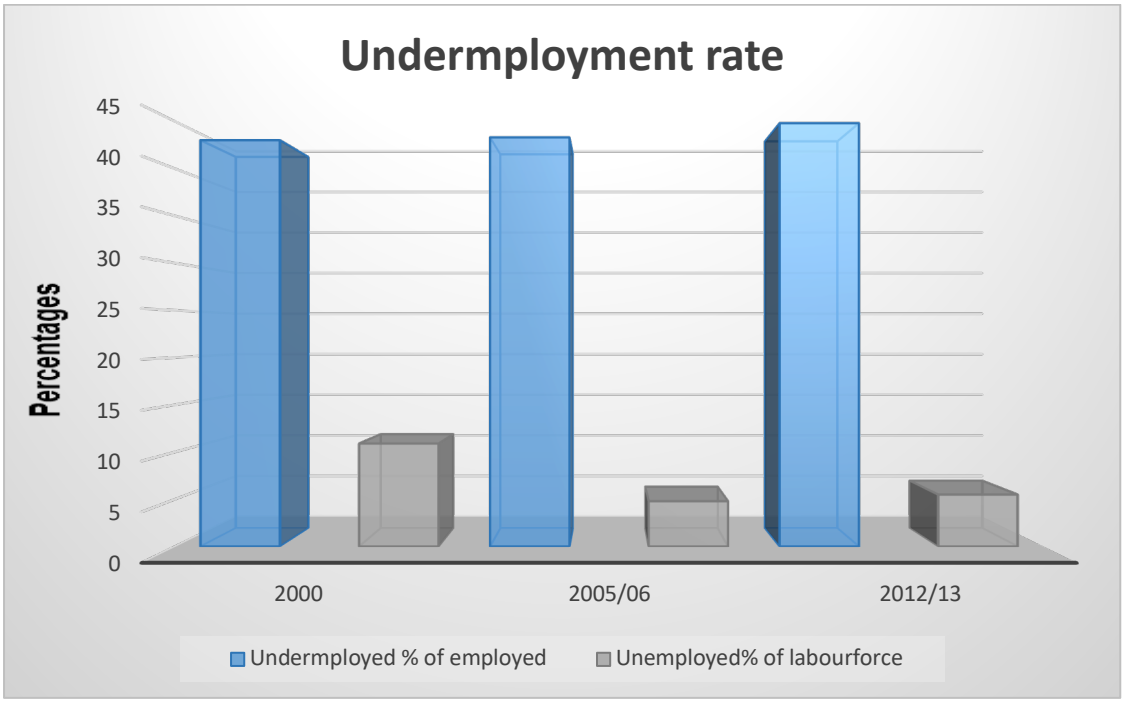
3.5 Descriptive Statistics

3.5.1 The Extent of Underemployment/ Changes in the trends of underemployment

Figure 4 shows that, underemployment is widespread and has being on the rise relative to unemployment. This is highlighted by the fact that; the rate of underemployment has increased from 43.0 percent in 2000 to 44.8 percent in 2012/13 (Table 12). In other words, there has been a 1.8 percentage point increase in the underemployment rate from 2000 to 2012/13. It is particularly important that the decline in unemployment from 2000 to 2012/13 has not been accompanied by a corresponding decline in underemployment, with the proportion of the labourforce underemployed more than the proportion of unemployed. The increasing nature of the underemployment rate may be due to the global economic recession which took place causing employers to reduce the hours of employees. Acosta-Ballesteros et al. (2018) argue

that, from a microeconomic perspective, a higher underemployment rate during economic recession can be attributed to businesses reducing the hours of working time for their employees when there is a decline in the demand for their produce/services. Employers may be reluctant to lay off trained and experienced workers who they might need in the future which then causes them to reduce their working time. This goes to show that, underemployment is a significant feature of the Ghanaian labour market.

Figure 4 Underemployment and Unemployment rate



Source: Authors' own calculations using PHC 2000, GLSS 5 and GLSS 6

Table 12 presents the descriptive statistics of different groups who are underemployed in 2000, 2005/06 and 2012/13. The Table shows that, urban accounted for a lower share of underemployment in all years. This goes to show that, more individuals in rural areas seek more hours due to the nature of the jobs that go on in those areas. Both urban and rural do not follow the national trend.

In terms of gender, across all the year's females recorded the highest form of underemployment than males. This implies that, females are more willing to work extra hours because they tend to be highly associated to involuntary part-time work. It is also evident that, both genders do not follow the national trend of increase, decrease and increase. The analysis also shows that, in terms of percentage point change, whiles females recorded a lower percentage point change, males recorded a higher change.

The age cohort 61-64 (old) recorded the highest form of underemployment in all years with the exception of year 2012/13 where age group 15-24 (youth) recorded the highest. This is not surprising because, age group 61-64 (old) may be nearing retirement and productivity may be slowing which then causes employers to reduce their hours and offer more hours to middle age group individuals. Additionally, the higher incidence of underemployment recorded among age group 15-24 (youth) may be attributed to their limited skills and experience. In terms of the national trend with the exception of individuals between ages 15-24 (youth) no other group followed the national trend.

Table 12 Underemployment Rate in Ghana 2000 -2012/13

	2000	2005	2012/13	Change (percentage points) 2000 - 2012
Locality				
Urban	30.3	30.3	33.5	3.2
Rural	52.8	50.1	51.5	-1.3
Gender				
Male	38.3	35.9	40.3	2.0
Female	47.7	50.1	49.0	1.3
Age				
15-24	37.4	51.4	56.9	19.5
25-35	36.7	41.2	38.8	2.1
36-60	50.5	40.8	41.7	-8.8
61-64	66.1	54.7	48.2	-17.9
Education				
None	50.1	47.9	45.1	-5.0
Low	39.6	43.3	47.1	7.5
Medium	29.6	31.1	38.6	9.0
High	31.1	29.5	32.7	1.6
Religion				
Christian	42.2	42.7	45.0	2.8
Muslim	40.7	43.3	44.5	3.8
Indigenous	48.4	44.8	43.2	-5.2
Marital Status				
Couple	44.5	42.7	40.9	-3.6
Previously	55.0	44.0	45.9	-9.1
Single	36.4	44.3	50.3	13.9
Region				
Western	49.6	45.1	48.0	-1.6
Central	47.7	48.5	48.6	0.9
Greater Accra	24.9	18.7	19.4	-5.5
Volta	51.2	46.0	53.2	2.0
Eastern	49.4	52.7	44.6	-4.8
Ashanti	39.9	46.1	42.1	2.2
Brong Ahafo	46.7	42.6	45.3	-1.4
Northern	47.4	53.2	50.4	3.0
Upper East	47.7	39.2	50.5	2.8
Upper West	51.4	40.8	44.7	-6.7
Overall Underemployment rate	43.0	43.3	44.8	1.8

Source: Author's own construct

As might be expected, underemployment is highest amongst individuals with no form of education than their other counterparts for all the years with the exception of year 2012/13 where individuals with low form of education recorded the highest with 2 percentage point difference between those with low education and those with no education in that year (2012/13). It also bears to note that, whiles low and medium education follow the national trend the other cohorts do not.

In terms of religion, the incidence of underemployment was highest among individuals in the indigenous cohort in both year 2000 and 2005/06 and highest for the Christian cohort in 2012/13. Both Christian and Muslim cohort follow the national trend. In terms of marital status, whiles married individuals recorded the highest underemployment rate in years 2000 and 2005/06, single individuals recorded the highest underemployment rate in year 2012/13. Under marital status, only single followed the national trend. As was expected, Greater Accra, which is the capital town of the country, recorded the lowest form of underemployment in comparison to the other regions. This may be due to the high number of formals sector jobs that are based there, which provides employees with a full day working hour. Whiles the Central and Upper West regions follow the national trend of increase, increase and increase the remaining regions do not.

Table 13 presents the distribution of underemployment by employment sector. It shows that, whiles both public and private formal sector recorded lower incidence of underemployment, informal sector recorded the highest incidence of underemployment. These findings are consistent with what was found in by studies which were discussed in the literature review section of this work; that is, underemployment was much more prevalent in the informal sector than any other sector.

Table 13 Distribution of the Underemployed by employment sector, 2000 to 2012/13 (%)

	2000	2005/06	2012/2013
Employment Sector			
Public	4.1	3.6	4.9
Private Formal	5.6	4.0	3.0
Informal	90.3	92.4	92.1

Source: Computed from 2000 Population and Housing census and GLSS 5 & 6. Note: The informal sector figure is inclusive of all agricultural activities. Restricted age to 15-64. Authors own calculation.

Table 14 presents the distribution of underemployed by economic sector. The analysis shows that, over 60 percent of the labour force in agriculture are underemployed which is not surprising. The last column of the table shows that, manufacturing and other have the highest decrease in the percentage of workers considered to be underemployed.

Table 14 Distribution of the Underemployed by economic sector, 2000 to 2012/13 (%)

	2000	2005/06	2012/2013	Change (percentage points 2000-2012/13
Economic Sector				
Agriculture	63.6	70.2	63.8	0.2
Manufacturing	12.3	9.9	7.4	-4.9
Trade	12.9	10.9	11.7	-1.2
Services	3.9	7.4	13.9	10
Other	7.3	1.6	3.2	-4.1

Source: Computed from 2000 Population and Housing census and GLSS 5 & 6. Note: The informal sector figure is inclusive of all agricultural activities. Restricted age to 15-64. Authors own calculation

3.6 Estimation results

3.6.1 Determinants of Underemployment

In this part, we analyse the determinants of underemployed for the ‘‘whole’’ data and separately for ‘‘males’’ and ‘‘females’’ with the estimation results presented in Tables 15 & 16 for GLSS 5 and GLSS 6 respectively. As is well known, raw coefficients estimates are readily not interpretable for probit estimations, (Abel and Deitz, 2017) and the effects individual explanatory variables have on the outcome variable depend on the values of the explanatory variables at which they are evaluated (Wilkins, 2007) marginal effects tend to be used in probit estimations (Acosta-Ballesteros, Osorno-del and Rodríguez-Rodríguez, 2018). We therefore report both coefficients and marginal effects for all the analysis but interpret the explanatory variables based on their marginal effects (Acosta-Ballesteros, Osorno-del and Rodríguez-Rodríguez, 2018). This econometric analysis is important because the preceding analysis is limited in the sense that, it only considers one variable at a time when describing the characteristics of underemployed. Many variables in an econometric analysis act together to determine whether an employed individual is underemployed or not (Beukes, Fransman, Murozvi and Yu, 2017). It is evident from the estimates that, the marginal effects of the explanatory variables are in line most common findings in the literatures mentioned above. This in other words means, underemployment is influenced not only by demographics and

number of dependents in the household but also regions and locality. It also shows that, against the pooled version of the estimations, differences exist between males and females estimations.

The empirical results confirm that, relative to the base category (youth), young adults and adults are less likely to be underemployed in both years. This means that, young adults and adults are less likely to be underemployed which in effect means the youth are more likely to be underemployed which confirms the general argument that many researchers hold (Fogg, Harrington and McMahon, 2011; Wooden, 1993; Cam, 2014; Wilkins 2007; Bell and Blanchflower, 2013 and Prause and Dooley, 2011). Tam (2010) in examining underemployment by age category also found that, underemployment tend to be high amongst workers between age group 18-24 before declining. She also stated that, older workers may face also face underemployment, as these relatively long-tenured workers face much more layoffs and age discrimination upon reemployment.

Mixed results were found when analysing the effects of education on underemployment (McKee-Ryan and Harvey, 2011). The empirical results reveal that, whiles low and high education relative to the base category did have a positive statistically significant marginal effects in 2005/06, in 2012/13, all levels of education: low, medium and high education increased the probability of being underemployed relative to no education. Educated people are more likely to experience higher form of underemployment because these workers are apt to be employed in jobs that are not commensurate with their education (Weststar, 2009; Acosta-Ballesteros et al., 2018). Holtom, Lee and Tidd (2002) and Mason (1996) in their study also found that, the levels of education was positively related to underemployment. In terms of religion, whiles being a Muslim in 2005/06 increased the likelihood of an individual becoming underemployed, the Christian dummy variable was not statistically significant. In 2012/13, Christian and Muslim individual were more likely to be underemployed.

Whiles in 2005/06 an individual's marital status recorded no significance, in 2012/13 a married individual was less likely to be underemployed which is highlighted by the negative statistically significant marginal effect of the couple dummy and this is relative to the base category (single). This is consistent with Sackey and Osei (2006) who found in their study that, being married tends to reduce the likelihood of becoming underemployed. Additionally, Bonnal, Lira and Addy (2009) argue that, married workers are less likely to be underemployed than those that are not due to the fact that, a higher degree of motivation to maximize disposal

income will require or ensure a better match between the skills, education and experience to the jobs of married workers.

The number of children and elderly in the household are very important variables because they could either increase or decrease the probability of underemployment. Whiles a negative statistically significant marginal effect was recorded for the number of children dummy in 2005/06, in 2012/13, the number of children dummy returned no statistically significant marginal effect which goes to show that, the number of children in the household played no role in the likelihood of an individual becoming underemployed in 2012/13. However, in 2012/13, while the number of elderlies in the household tend to reduce the probability of becoming underemployed, in 2005/06, the elderly dummy returns no statistically significant marginal effect. This goes to show the dynamic nature of the Ghanaian labour market. However, in both years, being a household head relative to the base category (not a household head) tends to reduce the probability of becoming underemployed due to their greater household responsibility. This is consistent with Madamba (1998), Bates (1976) and Gorg and Strobl (2003) who also found that being a household head reduces the probability of an individual becoming underemployed.

Table 15 Underemployment Results of Probit estimation (GLSS5)

	All variables			Male			Female		
Variables	Coeff.	Robust Standard error	Marginal effect	Coeff.	Robust Standard error	Marginal effect	Coeff.	Robust Standard error	Marginal effect
Age									
25-35	-0.193	0.030***	-0.752	-0.308	0.059***	-0.110	-0.144	0.050***	-0.057
36-60	-0.203	0.040***	-0.797	-0.334	0.066***	-0.122	-0.160	0.052***	-0.063
61-64	0.052	0.089	0.020	0.006	0.132	0.002	0.029	0.121	0.011
Education									
Low	0.056	0.029*	0.022	0.130	0.045***	0.048	0.016	0.039	0.006
Medium	0.086	0.055	0.034	0.211	0.734***	0.080	-0.042	0.089	-0.016
High	0.194	0.061***	0.077	0.365	0.081***	0.140	0.052	0.099	0.020
Religion									
Christian	0.012	0.031	0.004	0.028	0.044	0.010	-0.004	0.046	-0.001
Muslim	0.064	0.038*	0.025	0.063	0.055	0.023	0.072	0.053	0.028
Marital Status									
Couple	0.010	0.031	0.004	-0.088	0.048*	-0.014	0.098	0.045	0.039
Previously	0.024	0.048	0.009	0.061	0.083	0.022	0.010	0.061	0.004
Region									
Western	0.453	0.056***	0.179	0.326	0.082***	0.125	0.530	0.077***	0.203
Central	0.538	0.059***	0.211	0.463	0.086***	0.179	0.572	0.081***	0.218
Volta	0.374	0.057***	0.148	0.246	0.085***	0.093	0.459	0.078***	0.178
Eastern	0.637	0.053***	0.249	0.532	0.078***	0.206	0.686	0.073***	0.258
Ashanti	0.522	0.048***	0.205	0.450	0.071***	0.173	0.575	0.066***	0.222
Brong Ahafo	0.280	0.056***	0.111	0.045	0.084	0.016	0.458	0.076***	0.178
Northern	0.512	0.058***	0.202	0.431	0.085***	0.166	0.686	0.079***	0.218
Upper East	0.114	0.623*	0.045	0.091	0.092	0.034	0.127	0.084	0.050
Upper West	0.090	0.623	0.035	-0.004	0.095	-0.001	0.155	0.083*	0.061
Other Variables									
Female	0.403	0.030***	0.156	-	-	-	-	-	-
Urban	-0.169	0.031***	-0.066	-0.153	0.047***	-0.056	-0.158	0.043***	-0.063
Children	-0.023	0.005***	-0.009	-0.012	0.008	-0.004	-0.031	0.007***	-0.012
Elderly	0.005	0.029	0.002	-0.023	0.049	-0.008	0.027	0.037	0.010
Household Head	-0.096	0.033***	-0.037	0.008	0.060	0.002	-0.026	0.047	-0.010
Employment Status									
Public sector	-0.019	0.068	-0.007	-0.023	0.081	-0.008	-0.020	0.121	-0.008
Formal sector	-0.260	0.052***	-0.099	-0.224	0.076***	-0.079	-0.228	0.075***	-0.090
Industry									
Manufacturing	-0.380	0.399***	-0.142	-0.670	0.073***	-0.211	-0.249	0.121	-0.098
Trade	-0.570	0.039***	-0.209	-0.756	0.077***	-0.232	0.512	0.075***	-0.200
Services	-0.544	0.051***	-0.199	-0.577	0.067***	-0.192	0.583	0.083***	-0.223
Other	-0.438	0.077***	-0.160	-0.576	0.088***	-0.184	-0.088	0.216	-0.351
Log-likelihood	-8508.93			-3919.12			-4543.56		
Pseudo-R2	0.0853			0.0856			0.0675		
Wald chi2	1428.2***			640.99***			614.99***		
N	13,583			6,553			7,030		

Note: Probit Estimation, Dependent Variable: Underemployed individuals between ages 15 and 64 (standard errors in parentheses).
* significant at 10%; ** significant at 5%; ***significant at 1%;

Table 16 Underemployment Results of Probit estimation (GLSS6)

	All variables			Male			Female		
Variables	Coeff.	Robust Standard error	Marginal effect	Coeff.	Robust Standard error	Marginal effect	Coeff.	Robust Standard error	Marginal effect
Age									
25-35	-0.268	0.024***	-0.105	-0.356	0.038***	-0.135	-0.203	0.034***	-0.081
36-60	-0.184	0.027***	-0.073	-0.285	0.044***	-0.110	-0.124	0.036***	-0.049
61-64	-0.016	0.056	-0.006	-0.070	0.081	-0.027	-0.012	0.078	-0.004
Education									
Low	0.217	0.020***	0.086	0.332	0.033***	0.128	0.149	0.275***	0.059
Medium	0.227	0.034***	0.090	0.413	0.047***	0.163	0.059	0.053	0.023
High	0.255	0.041***	0.101	0.497	0.055***	0.196	-0.013	0.063	-0.005
Religion									
Christian	0.114	0.034***	0.045	0.081	0.043*	0.031	0.165	0.057***	0.065
Muslim	0.081	0.037**	0.032	0.027	0.048	0.010	0.164	0.060***	0.065
Marital Status									
Couple	-0.161	0.022***	-0.064	-0.143	0.033***	-0.556	-0.143	0.031***	-0.057
Previously	0.028	0.034***	0.011	0.054	0.060	0.021	-0.070	0.044	-0.028
Region									
Western	0.636	0.037***	0.246	0.684	0.557***	0.267	0.580	0.051***	0.219
Central	0.568	0.039***	0.220	0.581	0.059***	0.228	0.536	0.053***	0.203
Volta	0.692	0.039***	0.265	0.675	0.059***	0.264	0.680	0.053***	0.252
Eastern	0.434	0.037***	0.171	0.449	0.055***	0.177	0.409	0.050***	0.158
Ashanti	0.488	0.037***	0.191	0.461	0.055***	0.182	0.508	0.050***	0.194
Brong Ahafo	0.422	0.038***	0.166	0.445	0.057***	0.176	0.389	0.052***	0.151
Northern	0.618	0.040***	0.240	0.641	0.059***	0.251	0.587	0.055***	0.223
Upper East	0.614	0.040***	0.237	0.683	0.060***	0.266	0.547	0.055***	0.208
Upper West	0.404	0.040***	0.159	0.375	0.060***	0.148	0.414	0.055***	0.160
Other Variables									
Female	0.286	0.020***	0.113	-	-	-	-	-	
Urban	-0.160	0.019***	-0.063	-0.141	0.028***	-0.054	-0.175	0.027***	-0.069
Children	-0.006	0.004	-0.002	-0.009	0.006	-0.003	-0.002	0.005	-0.001
Elderly	-0.041	0.018**	-0.016	-0.778	0.029	-0.030	-0.020	0.023	-0.008
Household Head	-0.162	0.022***	-0.064	-0.202	0.0385	-0.079	-0.000	0.034	-0.000
Employment Status									
Public sector	0.155	0.041***	0.061	0.139	0.054**	0.054	0.187	0.064***	0.074
Formal sector	-0.201	0.039***	-0.079	-0.120	0.049**	-0.046	-0.321	0.065***	-0.127
Industry									
Manufacturing	-0.417	0.030***	-0.160	-0.539	0.050***	-0.191	-0.351	0.037***	-0.138
Trade	-0.578	0.025***	-0.219	-0.817	0.049***	-0.273	-0.497	0.031***	-0.195
Services	-0.501	0.027***	-0.192	-0.538	0.040***	-0.197	-0.473	0.037***	-0.186
Other services	-0.389	0.040***	-0.149	-0.461	0.046***	-0.167	-0.302	0.109***	-0.119
Log-likelihood	-18230.3			-8451.94			-9684.5		
Pseudo-R2	0.0882			0.1082			0.0670		
Wald chi2	3218.7***			1822.6***			1305.3***		
N	28,903			13,911			14,992		

Note: Probit Estimation, Dependent Variable: Underemployed individuals between ages 15 and 64 (standard errors in parentheses).

* significant at 10%; ** significant at 5%; ***significant at 1%;

The incidence of underemployment decreases based on the locality of the individual. This is because, urban localities relative to the rural localities are associated with a reduction in the likelihood of being underemployed hence the negative statistically significant marginal effect recorded in both 2005/06 and 2012/13. Gorg and Strobl (2003) posit that, due to work opportunities in urban areas, underemployment is likely to be lesser there. In terms of regional

differences, it is found there is greater incidence of underemployment in all regions relative to the base region ibn both years. The regional difference that exist (Tasci, 2005) are mainly as a result of the nature of predominant economic activities that take place in these areas (Sackey and Osei, 2006).

Accounting for the industry of the employed, workers in manufacturing, trade, services and other sectors were significantly less likely to be underemployed relative to workers employed in the agricultural industry in both 2005/06 and 2012/13. This is consistent with Beukes et al. (2017) who found that workers in other industries were less likely to be underemployed relative to workers in the agricultural sector (Acosta-Ballesteros et al., 2018).

Private formal sector workers were less likely to be underemployed relative to informal sector workers whiles the public sector variable was not statistically significant in 2005/06. Finally, in 2012/13 whiles workers in the public sector were more likely to be underemployed, workers in the private formal sector were less likely to be underemployed

In terms of gender separation, we observe different estimation results for males and females across both years. Whiles the marginal effects of urban dummy, all regional dummies, young adults and adult dummy relative to their respective base category for both males and females across both years do not differ significantly and that, in both genders they play a role in reducing the likelihood of an individual becoming underemployed, other variables in the different gender estimations do not follow similar patterns.

Whiles in 2005/06 the male estimation showed no statistically significant marginal effect in terms of educational attainment, the female estimation showed that medium education and high education reduces the likely of a female being underemployed relative to the base category. The story is however different in 2012/13. It was observed that, all three levels of education: low, medium and high increased the likelihood of a male individual becoming underemployed and amongst females, whiles low education increased the likelihood of becoming underemployed, high education reduced the likelihood of becoming underemployed. Whiles the result may be mixed Mau and Kopischke (2001) found that, females with high levels of education were more likely to be underemployed. The authors however noted that, the choice of college major may be a contributory factor to this as in most cases the majors selected by females tend to have lower job market demand.

Marital status has no significant effect on males and females in 2005/06, whereas being married decreases the probability for males and females in 2012/13 in both separate

estimations. Interestingly, the number of children in the household recorded a negative statistically significant marginal effect for females in only 2005/06 whiles the number of elderlies in the household recorded a negative statistically significant marginal effect for males in 2012/13. Household head has no significant effect on female's underemployment in both years, whereas being a male household head reduces the probability of being underemployed in only 2012/13.

The effect of religious background appears to differ between males and females. Whiles the Christian and Muslim dummies for the male estimation, does not have any significant marginal effect in both years, for females, a Christian and Muslim both have a positive statistically significant marginal effect in 2012/13.

Accounting for the industry for employed males and females we find that, males were significantly less likely to be underemployed in manufacturing, trade, services and other relative to workers in the agricultural industry in both 2005/06 and 2012/13. Females on the other hand had mixed results. The analysis shows that, whiles in 2005/06 females employed in trade and services industry were more likely to be underemployed relative to workers in the agricultural industry with manufacturing, and other not statistically significant, in 2012/13, female workers in manufacturing, trade, services and other industry were less likely to be unemployed relative to workers in the agricultural industry.

In terms of sector choice, in 2005/06 and 2012/13 both males and females in the private formal sector were less likely to be underemployed compared to workers in the informal sector. However, whiles in 2005/06 both males and female workers in the public sector was not statistically significant, in 2012/13 both male and female workers in the public sector were less likely to be underemployed relative to workers in the informal sector.

3.6.2 Decomposition of the gender Underemployment gap

The Fairlie decomposition technique was employed after the probit estimation. The technique was employed to serve as confirmatory to the results attained in the separate male and female estimations carried out in Tables 15 & 16. In other words, the decomposition results are meant to uniquely compliment the separate male and female estimations in Tables 15 & 16. The decomposition technique identifies and quantifies the contribution of different social-economic and demographic predictors in explaining the underemployment gender gap (Fairlie, 2005; Kumar and Singh, 2016). In other words, the technique allows for the computation of the differences in the predicted probability of the dependent variable occurring between the two

group's females and males and quantifies the contribution of group differences in the right hand variables (independent variables) such as education, marital status and locality to the outcome differential. Since the male group has being the most advantaged in Ghana with the lowest underemployment rate, we are interested in decomposing the gap between males and females and Table 17 shows the decomposition results based on the female coefficients. The findings are useful for the policy debates over the causes and consequences of the gender gap. The analysis shows that, females have a higher probability of underemployment at 0.505 and 0.519 in 2005/06 and 2012/13 respectively compared to males at 0.361 and 0.423 in 2005/06 and 2012/13 respectively. The recorded male-female gap in predicted probability of underemployment in 2005/06 is 0.144 whiles in 2012/13 the male-female gap in the predicted probability is 0.096.

Whiles the decomposition results show that 0.020 (13.8%) and 0.036 (37.5%) which were recorded in 2005/06 and 2012/13 respectively of the gender gap can be explained there still remains a residual that could not be explained this way. It is important to note that, even if the gender gap can be fully explained by compositional differences, this does mean that, there exist perfect equal labour market opportunities for both men and women (Dauth et al., 2017). The unexplained part of the gender race gap in underemployment probability may be due to employer discrimination but that cannot be avoided which Kingdon and Knight (2004) highlight by stating that employer discrimination is inevitable. It can also be due to the lack of control in our underemployment probit for expected productivity or productivity related characteristics such as quality of education which employers may observe but are unmeasured in our datasets. Lambert, Perrino and Barreras (2012) report that, poverty, harassment and cultural mind-set devalues female education which translates into poorer quality of education for females' relatives to males. Further evidence shows that, some firms offer females lesser hours than males on the basis of their family responsibilities (Hunter and Gray, 2004).

Gender differences in underemployment may also be as a result of high entry barriers in the formal sector where underemployment is less likely relative to the informal sector for women. Other factors which may account for the unexplained residual are traits such as trust, attitudes and trust which employment may use at the time of recruitment but are not measured in most datasets (Kingdon and Knight, 2004). The Fairlie decomposition technique cannot account for this type of gender inequalities of opportunity in the labour market (Dauth et al., 2017).

The variables used to explain the gender gap in underemployment in Ghana include age cohort, industry, employment status, education, region, locality, marital status, household head, number of children and elderly in the household and religion. The decomposition results in Table 17, shows the mixed results across the two years. In terms of young adults, 0.3 percent explains the gender gap in 2005/06 whiles in 2012/13 there is no explanation. Adults does not explain the gender gap in 2005/06 but then in 2012/13 3.3 percent explains the gender gap. The analysis further found that, in 2005/06 young adults (25-35) increases the underemployment gender gap whiles in 2012/13, the reverse was the case. Additionally, whiles in 2005/06 adults (36-60) was not statistically significant, in 2012/13 being an adult (36-60) increases the underemployment male-female gap. The decrease in the gender gap among young adults in 2012/13 may be due to the fact that, men may be delaying the formation of families and women may now be postponing child birth or in other words there may be a slowdown in the transition into motherhood and to further childbirth amongst women (Adsera, 2005). There has been an increasing common desire across the globe amongst women to begin working life before having children (Meron, Widmer and Shapiro, 2002; Sobotka, Skirbekk and Philipov, 2011; Kreyenfeld, 2009) which then gives them the flexibility to take on full time employment at earlier stages of their career life's hence the reduction in the gender gap in underemployment amongst young adults (25-35). The increase in the gender gap in underemployment amongst adults (36-60) goes to buttress the point why the gender gap among young adults (25-35) is decreasing whiles that of adults (36-60) is increasing because since women are now postponing their childbirth from early career into late career employers tend to recruit them on part-time basis later on in their career life's due to family responsibilities and offer men more working hours hence the increase in the gender among adults (36-60).

Education plays an important role in explaining the gender gap. The variable low education explains 1.2 percent of the gender gap in underemployment in 2005/06 whiles in 2012/13, the same variable explains 3.9 percent of the gap. Additionally, whiles the medium education variable does not explain the gender gap in 2005/06 in 2012/13 it explains 3.8 percent of the gender gap. Furthermore, in 2012/13 low, medium and high education increases the underemployment male-female gap, whiles in 2005/06 only low and high education increases the underemployment gender gap with medium education not statistically significant. The results obtained here shows the importance of education which is line with the literatures that show the diverging levels of educational attainment between men and women (DiPrete and Buchmann, 2013; Mammen and Paxson, 2000) making it very relevant in the Ghanaian society.

Low and high educational attainments widening of the gender gap may be due to the fact that, women are mostly disadvantaged in the labour market, when a man and a woman possess the same level of education which Mammen and Paxson (2000) found that, the probability of a woman getting a full-time job over the man is reduced if both have the same qualification.

Locality also appears to be a contributor in explaining the gender gap. Whiles urban does not explain the gender gap in 2005/06, the same variable explains 1.3 percent of the gender gap in 2012/13. Furthermore, while residing in urban areas reduces the underemployment male-female gap in 2005/06, in 2012/13 residing in urban areas increases the underemployment male-female gap. Previous studies have found that, geographical areas have great effect on the male-female gap. This may be due to the fact that, employers are offering males in urban areas more hours to work relative to females due to family responsibilities (Hunter and Gray, 2004).

The couple variable does not explain the gender gap in 2005/06 but does in 2012/13 with 1.4 percent. The couple (married) and previously married dummy variables were not statistically significant in 2005/06, in 2012/13 being married increases the male-female underemployment. Previously married was not statistically significant. Married women are generally found to have less employment opportunities than married men which is largely due to motherhood and other family commitments. The division of labour at home is unequal because employers tend to give women more responsibilities due to the assumption of childbirth and other related family responsibilities (Kamiya, Akpalu, Mahama, Ayipah, Owusu-Agyei, Hodgson and Jimba, 2017; Hoon, Keizer and Dykstra, 2014).

Remarkably, the trade variable recorded a significant increase in its explaining power from 2005/06 to 2012/13. The results obtained show that, 11.2 percent explains the gender gap in 2005/06 whiles 23.2 percent explains the gap in 2012/13. The manufacturing variable explains 3.3 percent of the gender gap in 2005/06 whiles 4.6 percent explains the gap in 2012/13. Services does not contribute in explaining the gender gap in 2005/06, but then it explains 1.4 percent of the gender gap in 2012/13. In terms of public sector 1.2 percent explains the gender gap in 2012/13, there is no explanation for 2005/06. In 2005/06 working in services and other industry reduces the underemployment gender gap whiles working in the manufacturing and trade industry increases the underemployment gender gap with the public sector dummy variable not statistically significant. In 2012/13 whiles working in the public sector, manufacturing, trade and services industry increases the underemployment male-female gap, working in other industry reduces the underemployment gender gap.

Whiles the economic crisis has a bearing on the labour market conditions in Ghana (Aryeetey and Baah-Boateng (2015) in terms of job opportunities and job creations, the sectors that increase the male-female gap (public, manufacturing, trade and services) tend to be mostly physically challenging and male dominated which causes employers to recruit more of males than females widening the gender gap.

Overall our results indicate that, there are socio-economic and demographic factors contributing to widening the gender gap in underemployment. These results are consistent with, for instance, Vuluku, Wambugu and Moyi (2013) suggesting that age, educational levels and locality are key characteristics generating female and male gaps in underemployment (Azmat, 2015).

Table 17 Decomposition of Gender Underemployment Gap

	2005/06 All variables			2012/13 All variables		
Variables	Coeff.	%	Standard error	Coeff.	%	Standard error
Age						
25-35	0.0005	0.3%	0.0001***	-0.0005	-0.5%	0.0001***
36-60	0.0002	0.1%	0.0002	0.0032	3.3%	0.0004***
61-64	-0.0000	0.0%	0.0000	-0.0000	0.0%	0.0000**
Education						
Low	0.0017	1.2%	0.0008*	0.0038	3.9%	0.0003***
Medium	0.0012	0.8%	0.0008	0.0037	3.8%	0.0005***
High	0.0020	1.4%	0.0006***	0.0034	3.5%	0.0005***
Religion						
Christian	-0.0002	-0.1%	0.0006	-0.0036	-3.7%	0.0010***
Muslim	0.0003	0.2%	0.0002	0.0014	1.4%	0.0006**
Marital Status						
Couple	-0.0000	0.0%	0.0003	0.0014	1.4%	0.0001***
Previously	0.0005	0.3%	0.0015	0.0017	1.7%	0.0012
Region						
Western	-0.0000	0.0%	0.0002	0.0009	0.9%	0.0001***
Central	-0.0001	-0.1%	0.0001	-0.0029	-2.9%	0.0002***
Volta	-0.0005	-0.3%	0.0001***	-0.0011	-1.1%	0.0001***
Eastern	-0.0021	-1.5%	0.0001***	-0.0001	-0.1%	0.0000**
Ashanti	0.0029	2.0%	0.0002***	-0.0004	-0.4%	0.0000***
Brong Ahafo	-0.0000	0.0%	0.0000	0.0009	0.9%	0.0001***
Northern	0.0024	1.7%	0.0003***	0.0001	0.1%	0.0001***
Upper East	-0.0000	0.0%	0.0000	0.0005	0.5%	0.0001***
Upper West	-0.0005	-0.3%	0.0002**	0.0018	1.8%	0.0002***
Other Variables						
Urban	-0.0012	-0.8%	0.0002***	0.0013	1.3%	0.0001***
Children	0.0025	1.7%	0.0006***	0.0002	0.2%	0.0003
Elderly	0.0004	0.3%	0.0005	0.0002	0.2%	0.0003
Employment Status						
Public sector	-0.0001	-0.1%	0.0008	0.0012	1.2%	0.0003***
Formal sector	-0.0015	-1.0%	0.0002***	-0.0025	-2.5%	0.0004***
Industry						
Manufacturing	0.0048	3.3%	0.0004***	0.0045	4.6%	0.0002***
Trade	0.0163	11.2%	0.0010***	0.0225	23.2%	0.0008***
Services	-0.0078	-5.4%	0.0005***	0.0014	1.4%	0.0003***
Other industry	-0.0049	-3.3%	0.0007***	-0.0076	-7.8%	0.0006***
	0.0200			0.0369		
Total explained gap						
Gap in the probability (G=1 – G=0	0.1443			0.0967		
Probability (G=1)	0.5054			0.5198		
Probability (G=0)	0.3610			0.4230		

Note: Fairlie decomposition, Dependent Variable: Underemployed individuals between ages 15 and 64. G=1 and G=0 denotes females and males respectively. * Significant at 10%; ** significant at 5%; ***significant at 1%; Replications (100).

The overall explained percentage is made up of the sum of explained shares that every single variable contributes to the gap. The explained share of one variable is the mean difference of that variable between women and men weighted with estimated coefficient for the pooled sample and ten dived by the differences in gender. The decomposition quantifies the degree to which each variable contributes to explain the gender gaps.

3.7 Conclusion

Underemployment is a highly relevant and increasingly important subject area as the underemployment rate in Ghana continue to rise which raises the important question about the incidence of time related underemployment in Ghana as well as the gender gap in underemployment. In achieving the aim the analysis undertaken in this study has provided information on the personal and work characteristics of the underemployed. The snapshot of the time-based approach shows that, 43 percent to 44.8 percent in 2000 and 2012/13 respectively of the employed were underemployed. Particularly telling is that, the prevalence of underemployment is greater for females, individuals any form of education (low, medium and high) and Muslims across both years.

Females tend to face much more incidence of underemployment relative to males because, they tend to be excluded from the labour market (Kjeldstad and Nymeon, 2012) and due to the hesitance of some employers to offer them more hours of employment probably due to child bearing factors and cultural factors (Jaumotte, 2003; Kifle et al., 2017), females in order to maintain their relationship with the labour market seek/settle for employment with low number of hours where employers tend to be much more flexible whiles seeking more hours of work. This raises challenging policy issues because how can policymakers tackle underemployment when low hours of employment is clearly a type of employment that tends to favour on average some females than males even though some may prefer more hours of work. Any policy which is introduced to intervene in a flexible labour market to cap the rise in low hour employment in order to reduce underemployment may hurt individuals who are not able to work extra hours which would disproportionately affect females with young children who may be put in the position of having to choose to work more hours or removing themselves totally form the labour force. Additionally, young and older workers should be considered in this argument due to the fact that, some may either be transitioning into the labour force or out of the labour force which goes to show that, it is simply not a gender challenge.

The incidence of underemployment amongst individuals with low and high education in 2005/06 and with low, medium and high education in 2012/13 may be due to the slow growth of job creation in the Ghanaian economy which is led to individuals with that level of qualification seeking any form of employment to make ends meet. This therefore means that, policymakers must carefully understand the incidence of underemployment before implementing policies in order not to alienate individuals with low education and rather

concentrate on individuals with medium and high education. The results also show that, the choice of manufacturing, trade, services and other sector's over agricultural sector is a better way to escape underemployment. This in other words means agricultural sector employment is synonymous with underemployment. This may be due to the seasonal farming that takes place in the agricultural sector causing farmers/farm workers to seek more hours of work when farming season elapses.

Gender differences abound, with males who possess low, medium and high education more likely to be underemployed in both 2005/06 and 2012/13 whiles amongst females, only those with low education were more likely to be underemployed in 2012/13 with 2005/06 educational dummy variables recording no significance. Furthermore, whiles male Christian were more likely to be underemployed in 2012/13, female Christians and Muslims were more likely to be underemployed in 2012/13.

The analysis suggests that, gender differences in underemployment cannot simply be dismissed raising central policy question that to what extent does gender differences in underemployment be attributed to gender differences in age, education, marital status and other observable characteristics. Whiles the decomposition results show that, 0.020 (13.8%) and 0.036 (37.5%) which were recorded in 2005/06 and 2012/13 respectively of the gender gap can be explained there still remains a residual that could not be explained this way. The residual may be attributed to gender discrimination/inequality or pure employer discrimination who treat otherwise identical workers differently depending on whether the worker is a man or a woman. Furthermore, some of these inequalities could be due to differences in productivity or preferences between males and females. Analysing which of these explanations is most crucial/important is very challenging due to unmeasured determinants or confounding factors. Additionally, there are often different forms of interactions between different factors (Azmat and Petrongolo, 2014; Azmat, 2015). For instance, Ferrer and Azmat (2015) in their study found that, there exist gender differences in performance among young lawyers that are partly driven by differences in career goals and not due to discrimination. They further state that, there may be feedback effects from social norms or some other form of social pressures that help to shape career goals so that, fully understanding these factors is not feasible (Azmat, 2015). Therefore, further research incorporating data on other factors and longitudinal datasets will be needed to examine the policy questions concerning underemployment dynamics. In terms of polices, interventions should target the most affected age group, locality, industries and education levels.

The central findings of this study are not only in line with empirical evidence they also add to the growing empirical evidence (Ruiz-Quintanilla et al., 1994; Wilkins, 2007; Wilkins and Wooden, 2011; Beukes et al. 2017; Acosta-Ballesteros, 2018) on the dynamics/determinants of underemployment. The empirical evidence presented in this study adds weight to the argument that, focusing exclusively on unemployment rate as the main measure of labour underutilization is unsatisfactory and that, not only does underemployment represent a great slack in production and failure to fully assimilate a significant number of the economy's available labour, it is also associated with high degree of adverse consequences for individuals who are underemployed. Policymakers will therefore need to familiarise themselves with the determinants of underemployment in order to better understand the phenomenon. Undoubtedly, the clear message is that, underemployment deserves a great amount of attention and recognition as not only an economic problem but also a social one in Ghana.

4.1 Introduction

Traditionally, the informal sector has being perceived to be a temporary alternative to unemployment and poverty which tends to wane as an economy grows and becomes more developed. It is therefore not surprising that, initially, researchers associated informal economic activity with developing countries (De Soto, 1989) where earnings were not only low but also volatile and workers had no social security. However, in contrast to the previous views shared by researchers about the informal sector disappearing when an economy evolves, recent works since the end of 1990s have underlined the relevant role of the informal sector in developing countries showing that, it is more of a permanent feature of the labour market (Bekkers and Stoffers, 1995; Charmes, 2000). Due to the large nature of informal sector in developing countries, the overall rate of unemployment provides a less informative picture to which Fields (2011) argues that, unemployment rate is an unreliable way to measure labour market distress because it is lower in developing countries than in developed countries and people in order not to stay unemployed seek work in the informal sector. This therefore means that, knowing the intricacies of the informal sector will be crucial to understanding the proper functioning of labour market which in effect will be of great importance to policy makers on their quest to reducing poverty and inequality and promoting decent employment.

The informal sector has a history dating back to the 1970s with Keith Hart credited with coining the word which then led to the ILO mission to Kenya using the term. The early conceptualisation of the informal sector had highlighted it as residual sector which is separate from the formal sector (Lewis 1954; Harris and Todaro 1970). The structuralist school of thought on the other hand highlighted in late 1980s the link between formal and informal sector. Unfortunately, due to data constraints, researchers have not been able to identify informal sector employment adequately. Additionally, these constraints have limited the number of detailed empirical studies on informal sector to just a handful to the extent that, even stylized facts about informal sector is highly disputed.

One seemingly stylized fact is that workers in the informal sector, even if they are equally as productive as their counterparts in the formal sector receive low earnings (Mazumdar, 1983; Heckman and Hotz, 1986). Many explanations have been offered in this regard with majority of them based on the segmented view of the labour market. According to

the labour market segmentation view, informal sector workers are made up of disadvantaged workers who are waiting to be employed in the formal sector (Lewis, 1954; Harris and Todaro, 1970). For instance, the presence of entry barriers in the formal sector restrict workers from accessing work in the formal sector causing them to seek employment in the informal sector where wages tend to be lower for equally productive workers (Fields, 1975 and Mazumdar, 1975). Furthermore, employers also ration formal sector work which in turn leads to a queue for these jobs. In the absence of entry barriers and with the availability of jobs in the formal sector, a worker is likely to choose the sector that offers the highest earnings and non-wage benefits. Proponents of efficiency wage theory also argue that, formal wages are set higher than the clearing wage in the market in order to increase worker productivity and discipline which creates segments in the labour market (Stiglitz 1981; Solow 1980). Burdett and Mortensen (1998) search frictions theory is another that may lead to labour market segmentation due to the search cost involved.

However, in recent times, several researchers have argued that, it is more efficient for entrepreneurs to operate in the informal sector (Tybout, 2000). Similarly, this emphasises the voluntary nature of some workers to seek employment in the informal sector due to the cost and benefits of working in the informal sector. In other words, as posited by Fields (1990) and Maloney (2004) informal sector employment has desirable non-wage features that causes workers to voluntarily move from formal sector to informal sector. Fields (2000) states that, two segments make up the informal sector: upper and lower tier. Whiles the upper tier comprises of workers who voluntarily move out of formal sector work, the lower tier is made up of disadvantaged workers who cannot access formal sector employment hence settling for low paying jobs in the informal sector. This is in effect highlights the two contrasting points: one view sees informal sector employment as a competitive choice whiles the other argues that informal sector work is due to labour market segmentation.

Several authors have discussed the labour market segmentation hypothesis and whiles some researchers have supported the labour market segmentation hypothesis; others have rejected it. For instance, Magnac (1991) developed a microeconomic model incorporating into it, the cost of entry into the formal sector to test for labour market segmentation in Columbia and found that, the Columbian labour market is competitive in nature. Gindling (1991) also argues that, if workers were free to choose the sector of employment, a worker is more than likely to choose the sector that pays higher wages indicating the competitive nature of the labour market in Costa Rica. Pratap and Quintin (2006) in their study also found that, the labour

market of Argentina is competitive in nature. Heckman and Holtz (1986) in testing for labour market segmentation among male Panamanian based on their earnings found that, labour market segmentation exist due to the differences in earnings for different groups.

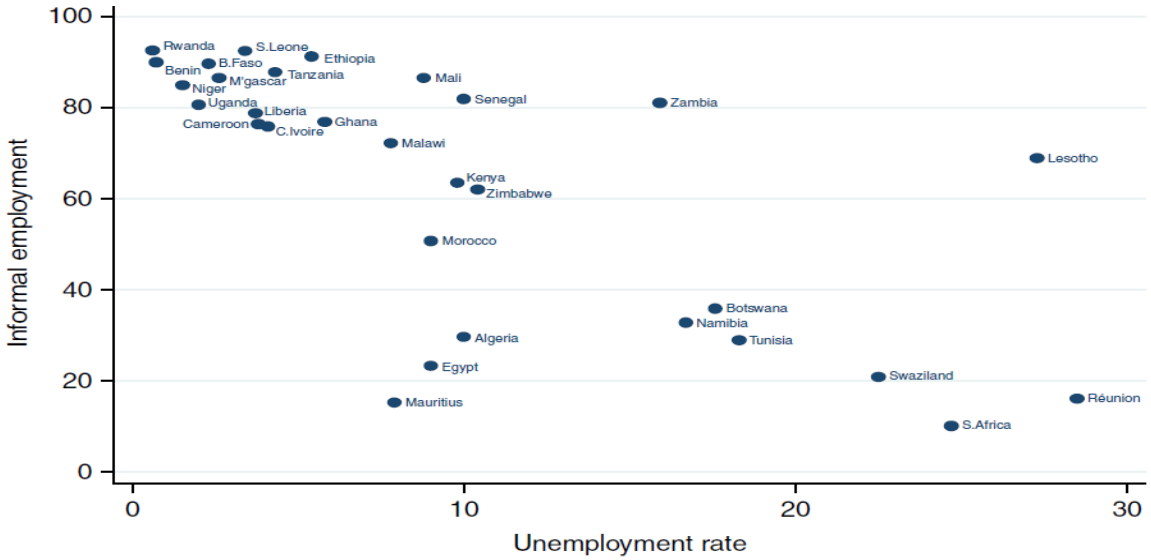
Gunther and Launov (2012) conducted the first study to look at the heterogeneous nature of the informal sector employment due to the fact that, previous studies had assumed homogeneity within the informal sector employment (Sastry 2004; Mehrotra and Ghandi, 2012). In order to capture heterogeneity in informal sector employment, Gunther and Launov (2012) developed a framework called finite mixture model with sample selection, to classify informal sector workers into different segments with corrections for possible selection bias based on differences in earnings. In their results, they found the Ivorian informal sector to be dual structured in the sense that, there exist both voluntary and involuntary employment which highlights that, the Ivorian informal sector is made up of two distinct sections. Their results show that a dual-structured informal sector with both voluntary and involuntary employment best describes the empirical data on the Ivorian labour market since over half of the labour force is engaged in the informal labour.

The main goal of this chapter is to find answers to the questions of whether informal sector employment in Ghana is as a result of labour market segmentation where workers enter as a last resort, or from a competitive labour market where workers enter voluntarily. Due to the fact that, to the best of our knowledge no empirical work exist on the heterogeneous nature of the Ghanaian informal labour market, this chapter will use Gunther and Launov (2012) technique that uses finite mixture model with selection bias to identify heterogeneity in the Ghanaian informal sector. Taking into consideration the rapid growth and development of informal sector employment, the process of dynamic change in relation to Ghana's informal sector employment makes it of great interest. We, therefore, employ the use of two cross-sectional datasets -GLSS 5 (2005/06) and GLSS 6 (2012/13) - to have a comprehensive understanding of how the Ghanaian informal sector has fared. Different set of policies are needed to address the presence of segmentation or comparative advantage in the labour market. This is because, if informal sector employment is as a result of labour market segmentation (entry barriers), then a rise and development of informal sector employment will lead to efficiency loss or distortion of the labour market which then means, policies that will tackle entry barriers and rigidities must be introduced in addition to policies that address tax evasion (Arias and Khamis, 2008). However if informal sector employment is driven by comparative advantage that is, workers freely move to work in the Ghanaian informal sector, then that means

the Ghanaian labour market may have certain levels of flexibility which means policies that would enhance and support informal sector workers must be introduced instead of policies that will shift workers into the formal sector employment. As we cannot observe self-selection into the informal sector, we employ the use of the finite mixture model to detect the heterogeneous nature of the Ghanaian informal sector. We apply this technique to the Ghana Living Standards Survey 5 dataset (GLSS 5) which yields lots of information. In order to determine how the Ghanaian labour market has changed overtime, we estimate the model using Ghana Living Standards Survey 6 dataset (GLSS 6).

The contribution of this chapter is in three folds. Firstly, this chapter looks at a developing West African country that has not been studied on earlier works on labour market segmentation. This makes this chapter important because whiles the nature of informal sector differs significantly among countries with different structure as argued by Gerxhani (2004) it is helpful in highlighting the labour market issues faced by countries with very large informal sector such as Rwanda, Burkina Faso and Tanzania (see Figure 5). These are countries for which they relatively lack economic investigation of the labour market. Moreover, informal sector employment is an important issue for a developing country like Ghana because, lack of benefits for informal workers makes it challenging for them to get insurance against health injuries and idiosyncratic shocks etc. Secondly the chapter gives an opportunity to carry out a cross country comparison in the future since the chapter adopts the International Labour Organisation definition of the informal sector employment. Thirdly, the study would enable policymakers set out beneficial policies that would be of great use in making the Ghanaian labour market more effective and efficient.

Figure 5 Trade-off between Informality and Unemployment



Source: Baah-Boateng (2015)

The remainder of this chapter is structured as follows. Section 4.2 presents theoretical literatures on formal and informal sector employment underpinnings and reviews empirical literatures on labour market segmentation. The definition of the informal sector is presented in section 4.3. Section 4.4 discusses the data, summary statistics and the identification of both formal and informal sector workers. Section 4.5 outlines the empirical models. In section 4.6 and 4.7 the main empirical results and robustness are presented respectively. Section 4.8 concludes the whole work.

4.2 Theoretical Framework for the Formal and Informal Divide

According to Rosaldo, Tilly and Evans (2012) debates on the informal economy over the years crystalized into four main schools of thought: the dualist theory (Hart 1973; Sethuraman 1976; Tokman 1978), the structuralist theory (Moser 1978, Castells and Portes 1989) the legalist theory (de Soto 1989, 2000) and the voluntarist theory (Maloney, 1998, 2004) (see Table 18). Each of these theories presents from a different perspective how the formal and informal economies are linked (Chen, 2005, p.6).

Table 18 Key features of the major schools of thought on the informal economy.

School of thought	General view and focus	Causal roots of informal economy	Policy Implication	Major influences
Dualist	The informal economy is a pre-modern sector acting as an intermediate space between the mainstream formal system and complete unemployment. Focused on 'survivalist' activities by the working poor with few (if any) links with the formal economy.	Labour supply far exceeding the demand brought about by industrialisation.	More state regulation designed to foster informal productivity and more appropriate forms of access to resources, including capital, in addition to the removal of unnecessary state restrictions.	(Hart, 1973 ; ILO, 1972)
Legalist	The informal economy is a market-led response by entrepreneurs to excessive state regulation (as opposed to a temporary condition of excess labour supply). Focused on 'plucky' micro-entrepreneurial activity.	Excessive state regulation.	Less state regulation and more free market policies designed to enable/unlock the growth potential of informal entrepreneurs (particularly through the legalisation of informal property rights).	(de Soto, 1989 ; de Soto, 2000)
Voluntarist	The informal economy is a result of producers and traders who choose to operate informally after weighing the costs and benefits of informality versus formality. Focused on opportunistic informal producers and traders.	Efforts to avoid taxation and costly regulation in the formal economy.	Bringing of informal firms and their workers into the formal regulatory environment in order to increase the tax base and reduce unfair competition to formal businesses.	Levenson and Maloney, 1998 ; Maloney, 2004)
Structuralist	The informal economy is an attempt by formal sector capital, acting with the complicity of the state, to reduce wages and enhance flexibility by exploiting unprotected informal workers. Focused on vulnerable workers exploited by formal sector capital.	Capitalist growth in the context of economic crises.	More regulation of commercial and employment relationships between the informal and formal economies in order to address unequal relationships between 'big business' and subordinate producers.	(Castells and Portes, 1989 ; Moser, 1978)

Source: Brown and McGranahan (2016)

4.2.1 The Dualist Theory

Arthur Lewis in his seminal work "Economic Development with Unlimited Supplies of Labor" first introduced the labour market dualism theory (Field, 2004; Sindzingre, 2006, p.3) as a general model for development in less developed countries (Kay, 2011, p.5). The model introduced, divided the economy into two sector model with the first one being a modern industrial sector located in urban areas and the second being a traditional agricultural sector located in rural areas. Whiles the modern sector is more aligned with capital accumulation,

high wages, economic growth and capital modes of production, the traditional sector is characterised by absence of economic growth, low wages, subsistence agriculture and pre-capitalist modes of production (Kay, 2011, p.5). Lewis explains the theory to mean that, rural areas have large 'reserve army' of labour in unlimited supply and that this could be used to bring about economic development in the urban industrial sector by recruiting the large labour supply from the rural areas. He argued that, urban wages should be increased slightly more than that of rural wages so that, people living in rural areas would be attracted to migrate to the urban areas and be absorbed into the industrial sector (Baffour and Turkson, 2015). As people migrate from the rural areas to the urban areas, the urban modern sector will match the unskilled labour with capital, productivity and output will increase and the consumer prices will decrease. This would lead to an increase in consumer demand which in effect would lead to additional profits for modern sector capitalist. Lewis (1954) further argues that, the high urban profits would encourage the modern capitalist firms to expand. This expansion would increase the demand for unskilled workers from the rural traditional sector. This process would continue until all labour in the rural traditional sector move to the urban modern sector and wages in the traditional sector begin to rise above subsistence levels. The end result of this would not only be modernisation - increases in the level of employment- but also increase in average income per capita. This in other words means that, the dualist theory assumes that, developments and rising per capita incomes would cause the informal sector to disappear, particularly as these entities are considered to be peripheral to capitalist production systems (Onwe, 2013; Chen, 2004).

Partridge and Rickman (1997) state that, the Harris and Todaro model explain further the Lewis model which is the mechanism behind the reallocation of labour from the traditional sector to the modern sector. Under the Lewis model, urban unemployment does not exist therefore the Harris and Todaro model deals with rural to urban migration within a developing country and models urban unemployment (Nolen, 2017). In other words, the mechanism which is the rural to urban migration is further expanded by Harris and Todaro model which explains the reason behind a worker's decision to migrate from rural farm to urban industrial city even when there is unemployment in the urban areas (Baffour and Turkson, 2015). Higher wages in the industrial and government sectors causes workers to migrate from rural areas to urban areas (Antoine, 2004, p.15). Antione (2004) further states that the incentive to migrate to the urban areas is still higher even in the absence of job opportunities in the cities. "For everyone person who got hired in the urban sector, more than one person migrated from the rural sector." (Nolen,

2017**).** Therefore it is evident from Harris and Todaro model of rural to urban migration that with (urban) formal sector wages set significantly above the rural agricultural sector wage, and the decision to migrate based on the perception that working in the urban areas comes with higher wages, migration to the urban areas is a rational decision although this might mean the likelihood of being unemployed hence an increase in informal employment (Shi, 1999). Furthermore, the Harris and Todaro model shows that, as migrants move into urban areas (cities) in search of formal sector employment, majority of them find themselves in a state of joblessness therefore in order to make ends meet in the cities, some will take up business related activities which is working in the informal sector (Antoine, 2004). As a result, migration will continue to reallocate labour from rural areas to urban areas until expected rural wages equals expected urban wages. Thus, even if unemployment exists in the urban areas, migration will occur as long as expected urban wages exceeds expected rural wages.

Fields (1975) on the other hand modifies the Harris and Todaro model by arguing that, a third option exists for rural migrants, which is employment in the urban informal sector (Kay, 2011; Baffour and Turkson, 2015). He argues that the existence of an urban informal sector will lead to lower unemployment rates than predicted by Harris and Todaro. According to Fields (1975) rural migrants who do not find work in the formal sector (industrial manufacturing) will accept jobs in the urban informal sector (Ntlhola, 2010). He states that, due to few barriers that exist in this urban informal sector(jobs such as petty trading and domestic services), unemployed migrants tend to seek work in the sector in order to earn subsistence wages and also because of the flexible hours the sector offers while they continue their search for jobs in the formal sector. The lower unemployment rates that are often recorded by developing countries as against that of developed countries can be attributed to the low entry barriers that exist in the informal sector (Turnham and Jaeger 1971; World Bank, 1995; ILO, 2003). This therefore means that, the dualist labour market approach sees informal employment as an involuntary solution to unemployment in the sense that, it is perceived to be temporary survival sector while workers in that sector wait for job opportunities to open in the formal sector (Kay, 2011, p.7).

In addition to the above, further extensions of the dualistic model have being developed, taking into account factors such as discrimination in the hiring process, level of education, allowance for an urban informal sector and job search costs (Schneider and Enste, 2000 cited in Ntlhola, 2010).

4.2.2 The Structuralist Theory

The structuralist does not only see the formal and informal economies as systematically linked (Chen, 2005, p.6; Brown, McGranahan and Dodman, 2014, p.17) but that, the informal economy is an integral part of the modern capitalist society (Obeng-Odoom, 2011, p.365) and also that, the informal economy is internally heterogeneous (Kay, 2011, p. 13). In addition, the structuralist approach/theory state that, the informal economy aids economic growth and serves as a way for poor households or workers in the informal economy to make ends meet (Obeng-Odoom, 2011, p.365; Kay, 2011, p. 13).

To increase their competitiveness, structuralist argues that, capitalist firms in the formal economy reduce their cost and accumulate capital in the formal economy (Obeng-Odoom, 2011, p.365; Potts, 2007, p.1; Kay, 2011, p. 13) by promoting both informal production and employment relationships with subordinated economic workers and units (Becker, 2004, p.10; Chen, 2005, p.6). The structuralist further argue that, the reason behind the rapid growth of the informal economy is due to the nature of capitalism/capitalist (Obeng-Odoom, 2011, p.365) specifically the reaction of formal firms (capitalist firms) to the power of organised labour, government regulation of the national economy (eg. taxes and social regulation); to the process of industrialisation (eg. flexible specialisation, offshore industries and subcontracting chains) and to global competition (Chen, 2012, p.5). In other words, capitalist firms do not only seek to avoid taxes and regulation (unprotected labour through off the book hiring) (Kay, 2011, p. 13) but also to exploit and dominate their informal employees due to the fact that, they tend to in most cases operate offshore or by outsourcing/ subcontracting work (Chen, 2012, p.5-11) in order to avoid costly labour regulation (Kay, 2011, p. 13).

Furthermore, the structuralist approach argues that, informal wage workers and informal enterprises provide cheap goods and services to the capitalist firms which in effect means they are subordinated to the interest of the capitalist firms (Moser, 1978; Portes, Castells and Benton, 1989). This means, in order for the privileged capitalist firms to reduce their input costs which includes labour cost, they seek to subordinate petty producers and traders. For instance, petty trade of cheap clothing and footwear, inexpensive transportation services and auto repairs, provision of cheap housing (such as those found in the many of the slums/shantytowns in developing countries) and trading of used appliances. This provision of informal goods and services carries with several benefit for people in developing countries. Among the many benefits are, it lowers the cost of consumption and increases the purchasing power of middle class in the urban areas; it also affords poor households the opportunity to

make ends meet; it also provides formal capitalist enterprises with a subsidy that enables them to keep wage costs lower than it would be if the workers consumption occurred entirely within the formal market (Kay, 2011). This goes to show that, the structuralist view is that, the informal economy is subordinated to the formal economy which suggests a hierarchical relationship.

According to Kay (2011, p. 13) the structuralist has attempted to classify the activities of the informal economy based on goals and motivation. For instance, activity by autonomous informal firm that has access to contemporary/modern technology and are motivated by capital accumulation goals, informal economy activity which is subordinate to formal sector enterprises and motivated by labour cost reduction (lower wages) and informal economy activity with direct subsistence goals (Kay, 2011, p. 13). These categories are usually proxied by the class of worker such as owner, informalised wage workers (i.e., once formal – salaried employed), sub-contracted workers, petty producers, casual labourers, domestic servants and traders (self-employed). The first three worker groups/categories are assumed to be associated with the informal sub economy which is dynamic and focused on capital accumulation whiles the remainders are assumed to be associated with the informal economy which is static and focused on subsistence (Kay, 2011, p. 13).

Akorsu (2010, p.34) however argues that, the touting of the formal economy as superior and important to the informal economy is not necessary, since the informal economy like the formal economy contributes to the national economy and generates employment. The structuralist also argues that, government should address the unequal/unbalance relationship between ‘‘big firms’’ and subordinated workers and producers by regulating commercial and employment relationships (Chen, 2012, p.5).

4.2.3 The Legalist Theory

According to Chen (2012) the legalist argues that, due to a hostile legal system, the self-employed tend to operate informally with their own informal extra-legal norms. The legalist focuses on the formal regulatory environment and the informal entrepreneurs/enterprises (Altman, 2008, p.9) to the relative abandonment of the informal wage workers and formal economy (Chen, 2012). They however acknowledge that, formal firms (capitalist interests) collude with government to set the bureaucratic “rules of the game” (de Soto 1989). For example, de Soto (1989) in his study of Peru, argued that, a lack of well-defined private property rights led small-scale entrepreneurs to operate or seek refuge in the informal economy.

In explaining, de Soto (1989) states that, informal economy work is as result of a rational reaction by small and micro enterprises to over regulation by state (government) agencies. This view seems to submit that, work carried out in the informal economy is illegal or contrary to government regulation laws but Baah (2007cited in Akorsu, 2010) in reacting to such views explains that, economic activities in the informal economies of developing countries such as Ghana, are not similar to the ‘‘hidden’’ activities in the advanced countries and that informal economic activities in Africa and other developing countries are perfectly legal and serves as a great source of livelihood for the vast number of workers in that economy.

It is however important to note that, whiles the informal economy in Ghana serves as a great source of livelihood for the workers, Akorsu (2010) argues that, to say that, they are perfectly legal is misleading. She further argues that, the existence of illegal goods and services cannot be ruled out anywhere in the world but rather as argued by Chen (2007, p.4) ‘‘one part of the informal economy – the criminal economy - operates illegally and deals in illegal goods and services. But it is only a small part of a larger whole that is, for the most part, not illegal or criminal”. In this sense, the informal economy is not the same as the criminal economy and also that the informal economy is not equivalent to illegality. This shows that, the informal economy serves as a compliment for formal economy entrepreneurial need by offering a low-cost strategy for the formation of business (Kay, 2011, p.10). As such, not only is the key nature of the informal economy in this regard not an involuntary substitute for insufficient job creation but rather a voluntary cost-saving strategy for small business owners who are seeking to avoid the excessiveness of government laws and regulations (Portes and Schauffler, 1993) and also, is dynamic and contributes to economic growth. The legalist therefore argues that, government in order to encourage informal entrepreneurs and enterprises to register and extend legal property for the assets should introduce simplified bureaucratic processes and procedures (Chen, 2012).

4.2.4 The Voluntarist Theory

The voluntarist school of thought pays relatively little attention to the linkages between formal and informal economic activities and rather focuses on informal entrepreneurs and enterprises (Rosaldo et al., 2012, p.5) who deliberately seek to avoid taxations and regulations but then, unlike the legalist school of thought does not blame over regulation for the reason (Chen, 2012). The voluntarist contend that, working in the informal economy is a choice (voluntary) and that movements of labour are determined by enterprises/individuals (entrepreneurs) who are seeking to maximise their incomes and flexibility which then causes them to opt out of costly

social protection and taxation in the formal economy (Brown et al., 2014, p.20; Heintz, 2012, p.11). This happens when informal enterprises and entrepreneurs draw comparisons between the costs of benefits to be gained whiles operating in the informal economy than in the formal economy which in effect means that, after weighing the cost benefits, informal operators choose to operate in the informal economy instead of the formal economy (Maloney, 2004; Loayza and Rigolini, 2006).

Furthermore, the voluntarist submits that, the operations of informal enterprise leads to unfair competitions for formal enterprises due to the fact that, they avoid taxation, regulations and other production costs. In order to control this, voluntarist propose that, informal enterprises and entrepreneurs should be brought under the formal regulatory environment in order to not only increase government revenues in terms of taxes but also to reduce the unfair competition to the formal economy (Chen, 2012; Maloney, 2004). However, other researchers state that, workers do not so much opt out of the formal economy as circulate between the formal and the informal economies in a process of ‘‘churning’’ which is motivated by economic insecurity (Altman 2008; Valodia and Devey 2010 cited in Brown et al., 2014, p.20).

4.3 Empirical Literature Review

The main purpose of this discourse is to provide evidence that supports or rejects the segmentation hypothesis in the context of formal and informal sector employment in developing countries. Pages and Stampini (2007) in their comprehensive study in exploring the labour market segmentation across formal and informal sectors and self-employment based it on three transitioning countries namely Albania, Georgia and Ukraine and three Latin American countries namely Mexico, Venezuela and Argentina. They analysed the skilled and unskilled labour separately in order to know if segmentation is synonymous with only the unskilled labour force. The study in addition explores mobility patterns and wage differential across the segment by employing the use of longitudinal data. Their results find that, whiles a wage premium exist in the formal sector compared to the informal sector of the Latin American countries selected no wage differentials exist in the transitioning countries. Additionally, their study also found evidence of mobility from informal jobs to formal jobs whiles there is limited mobility between formal sector and self-employment. They therefore conclude that, no significant difference exists between skilled and unskilled labour in the context of mobility and wage differentials.

Our results show that the informal labour market in China in 2006 consisted of two distinct segments (Informal-1 and Informal-2) that accounted for 28.18 percent and 51.06 per cent of the entire labour market, respectively. In 2006 nearly half of informal workers were involuntarily engaged in informal employment, verifying our hypothesis that the informal labour market in China is a combination of a segmented and a competitive labour market. However, we do find a labour market that could be considered as a competitive market in 2010.

Marcouiller, Castilla and Woodruff (1997) using survey data in their study on urban areas in Peru, Mexico and El Salvador presents mixed results for different countries. Their study analysed the determination of sectoral allocation and whether informal sector workers earnings are lower than the same from of workers in the formal sector. They argue that, a wage premium exists among workers in the formal sector in Peru and El Salvador and that, the wage advantage is observed for workers in the informal sector in Mexico.

Pradhan and van Soest (1995) using cross sectional data from urban Bolivia analysed labour supply behaviour and the choice between formal, informal sector and not working of the two spouses in families. The study using two different choice models to explain the choice of employment state used the multinomial logit and the ordered probit model based on the symmetric sector assumption and staging hypothesis respectively. Having modelled for both men and women, they conclude that, whiles an ordered model performs better for men an unordered model is more representative of the data for women. Pradhan and van Soest (1997) in using the same data in a structural labour supply model conclude that, there is a negative rather than a positive wage differential between formal and informal sector which means that, non-monetary job characteristics/benefits such as healthcare access, social security programs and job stability among others are needed to explain why many people choose formal sector jobs. Strassman (1987) also found that, in Lima, 71 percent of home workers require a considerable financial incentive to move to the formal sector.

Gong, van Soest and Villagomez (2004) using a dynamic multinomial logit panel data model with random effects analyse the mobility in urban Mexico between three labour states: working in the formal sector, working in the informal sector and not working. They explain the labour market state of each individual during each time frame. They found that, formal sector jobs are superior to informal sector jobs and that working in the informal sector is temporary in nature for jobseekers who cannot secure jobs in the formal sector and cannot afford not to work. Entry and exit rates for the formal sector are lower than for the informal sector. They

also found that, educational level increases the probability of working in the formal sector and that, men are more likely to secure employment in the formal sector from a non-working state than from the informal sector. Furthermore, their analysis also states that, the level of income of other family members reduces the probability of one working in the informal sector whiles the probability of not working increases with it. Gindling (1991) in his study on labour market segmentation goes beyond the formal and informal sector divide by identifying the segments as public and private formal sectors and the private formal and informal sectors. Firstly, he uses a chow test, which compares the estimated wage equations for different sectors and then tests the hypothesis that based on the observed characteristics identical workers have higher expected wages in the upper sector than in lower sectors. He states that, for 100 percent of public and private formal sector workers, the expected wages in the public sector are higher than that of the private formal sector and for 91 percent of private sector workers, the expected wage in the private formal sector is higher than that of the informal sector.

In a study on Poland, Grotkowska, Wincenciak and Gajderowicz (2016) estimate the public sector wage premium in a post-transition economy, a quarter of century after the collapse of the old regime. They employ the use of a copula method to estimate the switching regression model. In order to control for employment selection into both sectors they use an instrument based on information regarding learned professions. Their results found positive selection into employment into both sectors with positive ATET and negative ATEU. The results further show that, both public and private sector employees join the sectors in which they earn more than they would in a counterfactual scenario.

Lindauer and Sabot (1983) employ the use of the 1971 Tanzanian household survey on urban wage labour force to determine the pattern of wage differential between public and private sectors. Having standardised by worker characteristics, they found that public sector workers have a substantial wage premium over their counterparts in the private sectors. Van der Gaag and Vijverberg (1988) also conduct a similar study on Cote d'Ivoire where they use a switching regression model in sector choice analysis and conclude that taking account of sector allocation could lead to a reversal in the direction of the wage differentials that exist between private and public wage offers. They argue further that, in addition to possible wage differentials various other factors influence the choice of public sector jobs over private sector jobs. Andersson (1993) study on Zambia also finds that differences exist between public and private wage structures and emphasised that, a distinction between formal and informal sector is important for men whiles the reverse is true for women. Boudarbat (2004) study in Morocco

observed that, there is a preference for public sector employment and desire/willingness to engage in unemployment (that is wait) in order to secure well-paid public-sector job among the educated. This point to a segmented labour market due to the apparent wage gap that exist.

Rankin, Sandefur and Teal (2010) employ the use of the 2004/2005 Household worker survey of Ghana and Tanzania in a pooled estimation to investigate the role of formal schooling and time spent in labour market to explain the labour market outcomes of urban workers. In multi sector modelling setting, the labour market was divided into self-employment, public sector employment, not working and employment in both small private firms and large private firms. A random utility model was adopted based on symmetric labour market assumption with covariates such as head of household, age, marital status, parent's educational levels, presence of children and educational level. They found that, education increases the likelihood of employment in large private firms and the public sector in Ghana whiles in Tanzania no such evidence was found.

Collier and Garg (1999) in studying the effects of Kin group patronage in the modern sector in Ghana, make use of rich data to test kin group favouritism empirically distinguishing it from taste discrimination. They found that, in the private sector no evidence exists of kin group patronage and earnings functions revealing that workers are paid based on their human capital contribution. However, public sector workers are rewarded for their credentials and membership of the right kin group, not their human capital attributes. Glewee (1991) in his study on Ghana, with the adoption of random utility model of sector choice concluded that, education is positively associated with entry into wage employment and among wage employees, those with better education are more than likely to be in the public sector than in the private sector.

Heintz and Posel (2008) using the 2004 labour force survey data on South Africa, investigate the puzzle of high unemployment co-existing with relatively low informal employment. They estimate earnings equations and state that, a substantial earnings gap exists between formal and informal sector as well as earning differential between the types of informal employment. They conclude that, the persistent earnings differential in the South Africa labour market is indicative of the complex segmentation that exists in the labour market.

Sackey (2005) using the Ghanaian Living Standards survey data's adopted the random utility model in a study on female labour force participation and fertility and found that, females

schooling matters in both urban and rural localities which in effect means that the high rate of women in the labour force is due to a key determinants which is education.

Baffour (2013) in analysing selection into employment sectors in urban labour markets of Ghana and Tanzania used worker surveys from 2004 to 2006 in a pooled sample model. She applies a baseline participation model and multinomial logit model of occupational choice. The results from the baseline model show that, determinants of participation across Ghana and Tanzania differs which highlights the heterogeneity in the two labour markets. Whiles in Ghana education increases the probability of not working (unemployment) in Tanzania education increases the probability of employment. In terms of selection into sectors, the findings indicate that both labour markets attract the highly educated into formal sector and that, education increases the probability of public and formal sector employment and decreases the probability of self-employment (informal sector). In addition, among the age cohorts, young people compared to older people tend to face more challenges in finding formal sector jobs in both countries.

In a part study by Paul and Dort (2014) on Cameroon using dynamic clod classification to identify different segments of the labour market, the decomposition method of Oaxaca and Blinder to quantify the gender discrimination and to highlight the factors which cause this discrimination. Their findings are that, the Cameroonian labour market is made up of three segments namely, the formal sector, the informal agricultural sector which is the segment with the highest gender inequality and the non-agricultural informal sector. Their results also show that, in order to reduce gender inequality, women access to secondary and higher education must be encouraged.

Uys and Blaauw (2006) study on the South Africa labour market found that, the labour market is fragmented consisting of a well-paid formal sector and periphery sector which is made up of workers in the informal sector, subsistence agriculture and the unemployed. They also found that within the periphery sector itself, a certain degree of dualism exists.

Maloney (2004) finds in his work through several household's surveys that, informal sector employment is voluntary in nature. He argues that, in Mexico, over 60 percent of those in the informal self-employed sector left their previous job voluntary citing a desire for greater dependence or higher pay as the main reasons for entering the informal sector. In Brazil, more than 60 percent of the self-employed where happy with their jobs and were not seeking jobs in the formal sector. In Paraguay, only 28 percent of the workers in the informal sector stated a

desire to change jobs, which in implies that, the vast majority of workers in the informal sector had chosen to work there voluntarily.

Balan, Browning and Jelin (1973) interview of Moneterry workers, found that, the workers considered being one's own boss as superior and that movement into self-employment from salaried jobs often synonymous to an improvement in job status. Blanchflower and Oswald (1998) found that, in the United States 63 percent of workers, 49 percent Germans and 48 percent in Britain would prefer to be self-employed.

Perry et al. (2007) show that in selected Latin American countries, the majority of the self-employed in the informal sector moved voluntarily to that sector whereas most of the wage employees are in the informal sector due to their exclusion from formal activities. Perry et al. (2007) further states that, even within this segment of informal sector, workers who have voluntarily taken this option can be found.

Yamada (1996) using 1985 – 1986 and 1990 data from Lima, Peru, found that, workers enter the informal sector voluntarily due to the higher earnings they earn in informal self-employment. Jutting, Parlevliet and Xenogiani (2008) in their study also found that, not only is informal employment likely to stay but it is sometimes a voluntary choice and can offer better working conditions than formal employment. Narayanan (2015) study of India's labour market also found that, the labour market is more competitive in nature and that, workers freely enter informal sector employment.

Gindling (1991) in his study on labour market segmentation found that, informal sector employment is a voluntary choice. Further argues that, workers choose to work there because, they may have comparative advantage in the informal sector and would not do any better in the formal sector. This shows that, individuals would work in the informal sector to maximise their utility rather than their earnings having weighed the cost and benefits they find that they are better off in the informal sector.

Gunther and Launov (2012) in their study investigate the hypothesis that informal sector has in itself dualism with one part being competitive to the formal sector and the other part arisen as a result of segmentation. Considering the selection bias induced by the employment decision, Gunther and Launov (2012) estimate the wage equations for upper and lower segments of the informal sector for the Cote d'Ivoire urban labour market using Heckman (1979) model. They found that, a wage premium exists in the upper segments of the informal sector which informs theirs decisions to conclude that, the informal sector is made up of both

segmented and competitive employment and also that the informal sector is made up of both voluntary and involuntary employment.

Nemoto and Zhuo (2017) in their study on China's labour market, found that, the Chinese informal sector is both segmented and competitive in nature with almost half of workers in the informal sector entering involuntarily in 2006, whiles in 2010 there were no entry barriers in the labour market.

In general, whiles some literatures on the labour market support the informal sector segmentation hypotheses, others support the competitive theory. Prior to this research, no one has ever tested for the segmentation hypothesis for the Ghanaian labour market in the context of formal and informal sector employment. This makes it imperative to analyse with the two most current data sets how on the Ghanaian labour market is structured.

4.4 Definitions and Conceptual Framework

This chapter would use the definition below for informal sector due to the difficulty in defining the concept of informality (Schneider, 2000; Mintah and Darkwah, 2018) and as highlighted by Benjamin and Mbaye (2014) who state that, researchers studying the informal sector must first deal with the lack of generally accepted definition.

Definition 1: The *informal sector* is a combination of self-employment either with employees or without employees (i.e. own account workers), small-scale activities, wage workers and employers which includes owners of informal enterprises with the primary goal of not only generating employment but also income.

4.5. Description of Data

The data's used for this research comes from individual responses to both the fifth and sixth rounds of the Ghana Living Standards Surveys (GLSS), which were conducted in 2005/06 and 2012/13 respectively by the Ghana Statistical Service. The Living Standards Surveys is probably the most popular survey and it has become the standard data sets when looking at labour market analysis most especially in developing countries (Nguyen, Nordman and Roubaud, 2013). The GLSS data is therefore of great relevance to this research due to the multidimensional nature of the data, which captures/provides rich source of information on not only individuals but also household's labour market conditions. The analysis covers

respondents in the population between the ages of 15 to 64 years[6] with positive wages[7] in the non-agricultural sector.[8] This research excludes all types of agricultural employment from all analysis due to: (1) the lack of quality data on earnings which is due to the inherent challenges/difficulties in capturing the true value of agricultural production for one's own consumption and also existing literature work tend to focus on non-agricultural work (Yu, 2016) and (2) it would make it easier to observe whether a gender difference exists in informality since agricultural employment is more prevalent among female workers (Baslevent and Acar, 2015). The final sample consists of 6,610 observations for GLSS5 out of which 3,490 were in employment and 11,307 observations in the GLSS6 out of which 6,640 were in employment.

4.5.1 Identification of Formal and Informal sectors

The formal and informal sector make up the active population with the formal sector made up of both public sector and private formal sector. Both private formal and public sector are put together because, the focus of this research is to identify heterogeneity in the informal sector and not the formal sector and so, in order to avoid loss of information it is better to combine both public and private formal sector. In order to identify employment in informal sector, it is important to use the right criterion because, previous studies have shown that, results may differ depending on whether a productivity based, social protection or legalistic definition is used in describing employment in informal sector (Huber and Rahimov, 2017). The criterion used in this research to identify employment in informal sector in the active population is self-employed[9] or employed without a written contract which is in line with the statistical

[6] The age was restricted to avoid critical issues like child labour and also, due to the fact that, empirical literatures on labour market analysis in most cases tend to focus on the working age population.

[7] Respondents report earnings from employment also known as employee compensation and hours of work on daily, weekly, fortnightly, monthly or yearly basis. The incomes are then converted into monthly earnings.

[8] One of the many challenges that arise when defining informality is how agricultural work is treated and also that, there is no consistency in the definition followed across countries (Narayanan, 2015). The definition of employment in informal sector stipulated by the ILO allows for some degree of flexibility because, they do not state whether agricultural work should be included or excluded in the estimation of employment in informal sector but then excluding agricultural work from the informal sector estimation is the most preferred option in majority of instances (Wills, 2009). In addition, in the labour market non-agricultural employment in informal sector competes with employment in formal sector more than it does with agricultural activities in developing countries (Aikaeli and Mkenda, 2014).

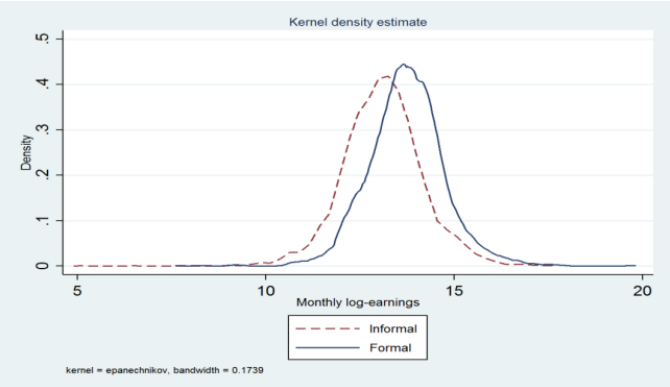
[9] Earnings data are collected for self-employed people so excluding them may not give a true representation of employment in informal sector. This is because statistics on employment in informal sector are important in obtaining a clear understanding of the contribution of all workers especially women. The informal sector therefore serves as a fall back for women who are excluded from waged employment and since the dominant part of informal sector is self-employment (ILO, 1997). It is important to include self-employment in all estimations of formal and informal sector. In addition, in sub-Saharan Africa, self-employment accounts for 53% of non-agricultural employment which means that, self-employment constitutes a greater proportion of informal employment (non-agriculture) than wage employment (ILO, 2015). Including self-employed is also supported by Gunther and Launov work (2012) and also that of Vreyer and Roubaud (2013, p.195-198).

measurement introduced and approved by the International Labour Organisation 17th International Conference of Labour Statisticians in 2003 where they defined employment in informal sector, to be, not having any written contract or social security. Hence the research follows the legal definition by distinguishing between workers with their economic status according to their primary employment. Among this, we consider individuals who are involuntarily unemployed and those who voluntarily stay out of the labour market as inactive[10].

4.5.2 Evidence from Wage Data

Figure 6 and 7 shows the kernel densities of monthly log- earnings in formal and informal sectors in 2005/06 and 2012/13 respectively. Monthly earnings rather than hourly earnings are used due to the fact that, hours of work in the informal sector are more than often considered to be constrained which makes monthly earning a better reflection of earnings opportunities in the informal sector (Salem and Bensidoun, 2012; Gunther and Launov, 2012). The figures show that, there is a considerable difference in mean (average) earnings between formal and informal sector: rightward shifts of the formal sector employment curves in both figures shows that, the earnings distribution of formal sector workers is statistically higher or in other words higher wages when compared to that of informal workers which is also confirmed by Table 20. Both figures 6 and 7 nonetheless shows that, the densities of formal and informal log-earnings overlap, which in effect means, not all informal employment pay less than formal jobs. In other words, both figures 6 and 7 shows that, there are some informal sector workers who earn more than formal sector workers.

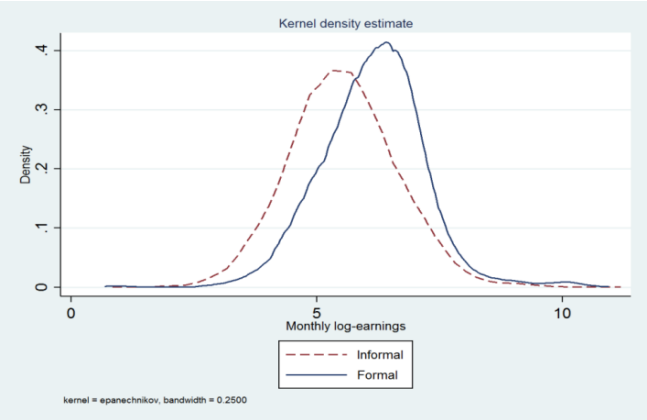
Figure 6 Density of monthly log-earnings for 2005/06



Source: Ghana living standards survey 5; author's calculation

[10] It is not possible to draw a distinction between agricultural unemployment and non-agricultural unemployment since GLSS datasets do not have any codes for this. We therefore include unemployed persons in the non-agricultural labour force.

Figure 7 Density of monthly log-earnings for 2012/13



Source: Ghana living standards survey 6; author's calculations

4.5.3 Summary Description of Variables Used

Table 19 below summarises both the individual characteristics (gender, age, education, religion and marital status) and household characteristics (household size, number of active household members, number of children in the households) used in the wage and selection equation. The additional variables used in the selection equation of entering the labour market: household size, marital status, the number of children under 14years in the household, the number of infants in the household, the number of elderly people in the household (workers tend to retire at 60 years so, if there are family members over that age who need looking after, this may affect ones decision to participate in the labour market) and the number of active members in the household. For instance, theoretically dependents play a role in determining the sector choice of a worker, but then how it affects the sector choice of a worker is an empirical one (Narayanan, 2016).

In explaining, on one hand, a worker who has many dependents would favour a job in the formal sector more than a worker with fewer dependents due to benefits such as job security and social security which in effect means the higher the number of dependents, the higher the likelihood of accepting formal sector jobs over informal sector jobs. On the other hand, a higher number of dependents, would influence the worker to accept a job in the informal sector to make ends meet which means such situations causes the worker to reduce the search time for employment in formal sector and settle for informal sector work (Narayanan, 2015). Therefore, these variables are chosen because they should affect sectoral choice that is, the decision of either participating or not in the labour market, by determining the opportunity cost of not

participating in the labour market but then should not affect potential earnings of individuals. In particular, these additional variables may impact on the labour supply decision without it impacting directly on the wages. Furthermore, the variables that are included in the selection equation should provide enough exclusion restrictions (Gunther and Launov, 2012; Woodbridge, 2010; Olsen, 1980; Trost, 1979; Little, 1985).

Table 19 Variable Description

Variable	Description
Age (years)	A continuous variable taking values from 15-64
$Age^2/100$	Age in years squared
Gender	1 = male, 0 = female
Marital status	Couple =1, 0 =otherwise Single = 1, 0 = otherwise Previously married = 1, 0 = otherwise
Education	None = 1, 0 = otherwise Low =1, 0 = otherwise Medium =1, 0 = otherwise High =1, 0 = otherwise
Religion	Christianity = 1, 0 = otherwise Muslim = 1, 0 = otherwise Indigenous = 1, 0 = otherwise
Household size	Size of the household
Number of infants in HH	Number of infants under 2 years of age
Number of children in HH	Number of children under 14 years of age
Number of elderly in HH	Number of elderly household member
Number of active HH members	Number of active household members

Source: Authors calculation

Notes: Education: None education corresponds to no qualification in both GLSS 5 & 6. Medium education corresponds to secondary in both GLSS 5 & 6 . High education corresponds to vocational/technical, post-secondary and tertiary in both GLSS5 & 6. Marital status: Previously married corresponds to divorced, separated and widowed in GLSS 5 & 6. Single corresponds to never married in both GLSS 5 & 6. Couple corresponds to married in both GLSS 5 & 6. Religion: Christianity corresponds to Christianity, Muslim corresponds to Muslim and Indigenous corresponds to traditional all in both GLSS5&6

4.5.4 Summary Statistics

Table 20 reports the percentage share for gender, education, religion and marital status and means for the other remaining variables used in both the wage and selection equations for both 2005/06 and 2012/13. The information is provided for the population as a whole, as well as

separately for workers in the formal and informal sectors and also separately for inactive workers. Employment in formal sector accounted for the smallest share of total employment in Ghana across the two periods.

Table 20 Summary Statistics

	2005/06				2012/13			
	Total*	Inactive	Active		Total*	Inactive	Active	
			Informal	Formal			Informal	Formal
Sample (%share)	100	47.3	32.8	19.9	100	41.2	41.5	17.1
Monthly Earnings	126.8	-	88.7	189.3	623.6	-	498.9	925.6
Variables in Wage Equation								
Age (means years)	31.5	24.7	36.8	38.8	32.2	24.5	37.3	38.3
Gender (% share)								
Male	46.0	43.8	41.8	58.3	42.0	43.9	37.8	63.7
Female	54.0	56.2	58.2	41.7	58.0	56.1	62.2	36.3
Education (% share)								
None (no qualification)	11.3	9.36	17.1	6.29	10.6	7.70	16.4	3.86
Low	54.9	55.7	63.9	38.1	56.3	59.9	64.3	28.5
Medium	21.0	28.4	11.1	19.5	18.3	23.6	12.2	20.2
High	12.7	6.38	7.74	35.9	14.6	8.73	6.97	47.3
Religion (% share)								
Christian	75.6	75.6	72.8	80.0	77.6	76.8	75.2	85.5
Muslim	17.6	17.8	19.8	13.4	19.7	20.5	21.8	12.9
Indigenous	6.77	6.51	7.33	6.44	2.54	2.64	2.87	1.49
Marital Status (% share)								
Married	38.1	17.3	55.0	59.3	40.8	16.2	57.9	58.8
Previously married	9.86	5.77	15.4	10.3	10.0	5.10	15.0	10.0
Single	52.0	76.8	29.4	30.3	49.0	78.6	27.0	31.0
Exclusion variables in selection equation								
Infants in HH	0.24	0.21	0.28	0.22	0.27	0.24	0.31	0.26
Children in HH	1.30	1.38	1.26	1.21	1.27	1.32	1.34	0.98
Elderly people in HH	0.14	0.20	0.10	0.08	0.19	0.26	0.14	0.12
Active HH members	1.59	1.32	1.80	1.86	1.77	1.50	2.00	1.89
HH size	4.83	5.45	4.20	4.39	4.69	5.33	4.36	3.94

Source: GLSS 5 & 6. Author's calculations

Notes: Monthly earnings in local currency. Old Ghana cedis was converted to new Ghana cedis at a rate of 10,000:1 in 2007, therefore the figure in the column for 2005/06 reflects the change. *Total refers to individuals between 15 to 64

Education: We define low education as primary & Mid/JHS; medium education as secondary. Vocational/technical, post-secondary and tertiary as high education. The residual group none has no education participants.

4.5.4.1 Demographics

The analysis shows that, across both years, majority of workers in the formal sector are males (58.3% in 2005/06 and 63.7% in 2012/13) whiles the reverse is the case in the informal sector and among the inactive population. This therefore means that, there are more males in the formal sector and fewer males among the inactive population and informal sector whiles there are more females in the informal sector and among the inactive population. With regard to age, the analysis shows that, the average age of formal sector workers is the highest which is 38.8 years in 2005/06 and 38.3 years in 2012/13 whiles informal sector workers recorded 36.8 years and 37.3 years in 2005/06 and 2012/13 respectively. The analysis further shows that, the inactive population is the youngest in both periods (24.7 years in 2005/06 and 24.5 years in 2012/13). In terms of religious background, Christian workers are the majority followed by Muslims workers and then indigenous workers in both formal and informal sector and among the inactive population in both years. In terms of dependents, in both 2005/06 and 2012/13, formal sector workers have fewer dependents (i.e. infants, children and elderly) than their counterparts in the informal sector. In comparing with the active population, on average, the inactive population come from a larger household. These significant variations across the different sectors and among the inactive population imply that, there is the likelihood of these playing a role in sector selection or in other words, could contribute to a possible self-selection into work. Finally, the distribution of marital status shows that, there is a higher proportion of married persons in the formal sector than in the informal sector in both years; among the inactive population there are more single individuals. It is also important to note that, in the formal, informal sector and among the inactive population, previously married recorded the lowest rate of workers.

4.5.4.2 Human Capital

Educational levels of individuals with high education in the formal sector recorded 35.9percent in 2005/06 and 47.3percent in 2012/13. The informal sector recorded 63.9percent and 64.3 percent in 2005/06 and 2012/13 respectively of individuals with low education.

4.6 Empirical Methods

From the data, it is possible to tell the number of people who were employed in the formal and informal sector and those who are unemployed. Since the objective of this research is focused more on the informal sector than the formal sector, the main assumption is that, the formal

sector is homogenous whiles the informal sector is heterogeneous. In other words, if supported by the data, there are a number of segments in the informal sector where individuals are involuntarily employed or voluntarily employed. However, since the data only provides information for people in the formal and informal sector, it is impossible to observe affiliation to any of the segments in the informal sector which means the number of segments which constitute the informal sector are unobservable. Therefore, in order to determine the number of segments in the informal sector, the distribution of observed wages is employed. The main reason why the observed wage function is used to determine the number of segments in the informal sector can be attributed to the fact that, if different segments exist in the informal sector then each segment would have its own unique wage function. For this purpose, this research follows the specification model of Gunther and Launov (2012) which is presented below.

4.6.1 Latent segments and Earnings distribution

The entire labour market $\boldsymbol{Y}$ is made up of J segments$\boldsymbol{Y_j}$, such that, $\mathbf{Y} = \boldsymbol{U_{j=1}^{j} Y_j}$. The assumption is that, there exist log earnings which are described by a wage function within any given segment Yj which is written as;

$$\mathbf{ln}\boldsymbol{Y_{ij}} = \boldsymbol{x'_i \beta_j + u_{ij}}, \qquad \boldsymbol{i \in Y_j}, \tag{1}$$

where Y_{ij} are the earnings of an individual i in segment j. There is no correlation for error across the segments as each distribution is independent of the other. This in other words means that, the earnings distribution in each segment is not only different but also independent from one another and also, the earning function and returns $\boldsymbol{(\beta_j)}$ to individual characteristics $\boldsymbol{x_i}$ varies from segment to segment.

The sample may suffer from selection bias due to the fact that, the distribution of observed earnings is influenced by the decision of the individuals to either enter or not enter the labour force (Heckman 1979). In explaining, individuals are faced with a binary decision to either stay out of the labour force or enter the labour force with the binary decision based on the utility of the individual (Narayanan, 2015). Therefore, if the utility from working is less than that of not working, the individual would stay out of the labour force and since utilities are not observed and the earnings are only observed for individuals in the labour force (employment) estimating the earnings equation would lead to biased estimates. In other words, when estimating earnings on the characteristics of individuals in employment, the estimation is not being carried out on the entire population which in effect means the estimation is being carried out on only those in employment which leads to selection bias. In order to take into account this selectin bias, we assume that, individual's decision to work or not work is a function of their personal characteristics $(\boldsymbol{Z_i})$:

$$\boldsymbol{y_{is}} = \boldsymbol{z'_i\,\gamma + u_{is}}, \qquad \boldsymbol{u_{is} \sim N(0,1)}, \qquad \textbf{(2)}$$

such that earning y_{is} is observed only if the outcome of the selection Eq. (2) is positive. If the errors from the wage equation in **Eq. (1)** and the selection equation in **Eq. (2)** are correlated, the estimation of $(\boldsymbol{\beta_j})$ will be biased. Under the assumption that, the error terms in equations **(1)** and **(2)** follow a bivariate normal distribution, their correlation coefficient equal to $\boldsymbol{\rho_j}$. The distribution of observed wages in the $\boldsymbol{j-^{th}}$ segment of the labour market takes the form:

$$\int(\boldsymbol{y_{ij}}|\,\boldsymbol{y_{ij}} > \mathbf{0}) = \frac{\mathbf{1}}{\boldsymbol{\sigma_j}}\,\boldsymbol{\varphi}\;\frac{(\mathbf{lny}_{ij} - \boldsymbol{x'_i\beta_j})}{\boldsymbol{\sigma_j}\phi(\boldsymbol{z'_i\gamma})}\;\phi\left(\frac{\boldsymbol{z'_i\gamma} + (\boldsymbol{\rho_j}/\boldsymbol{\sigma_j})\;[\mathbf{lny}_{ij} - \boldsymbol{x'_i\beta_j}]}{\sqrt{\mathbf{1}-\boldsymbol{\rho_j^2}}}\right) \qquad \textbf{(3)}$$

Here $\boldsymbol{\varphi}$ **(.)** represents the distribution function and ϕ **(.)** denotes the cumulative function of the normal distribution.

The conditional distribution of wages across the entire labour market can be derived from the conditional distributions of observed wages in each segment, using the size of each segment as weights. However, as affiliation to segments is unobserved, the probability that individual $\boldsymbol{i}$ belongs to segment $\boldsymbol{j}$ is estimated such that, each segment is composed of homogenous workers, from the point of view of the relationship that links their wages to their individual characteristics. This probability can be written as $\boldsymbol{P\,(i \in Y_j) = \pi_J}$. Using the notation $\boldsymbol{\theta_j}$ = ($\boldsymbol{\beta_j\ \sigma_j\ \rho_j}$) the distribution of observed wages in the entire labour market is written as:

$$f(y_i) = \sum_{j=1}^{j} \pi_J f(y_i | y_{is} > 0, \theta_j) \quad (4)$$

The model above is finite mixture model with sample selection and its advantage over a simple finite mixture model is due to the fact, sample selection is considered when estimating the model which gives, consistent estimation of segment specific returns to individual characteristics.

4.6.2 A segmented or competitive labour market?

In addition to the finite mixture estimation, the model also allows to test whether the distribution of individuals across sectors is as a result of labour market segmentation or comparative advantage. In order to shed light on whether the labour market is segmented or competitive in nature, the assumption is made that, workers are not only earning maximizers but also know the wage function which in effects means they know their expected earnings given their own personal characteristics for each segment in the labour market. In this situation, competitive theory would imply that, workers given their own personal characteristics would choose the segment that offers them with the highest earnings. In a competitive labour market, the hypothetical distribution of workers across sectors would be written as:

$$P(i \in Y_j) = P(E[\ln y_{ij} | y_{is} > 0; x_i] = \max_{I,i \in [1,j]} \{E[\ln y_{il} | y_{is} > 0; x_i]\}) \quad (5)$$

The above distribution is based on the individual characteristics and returns to these characteristics in each of the segments in the labour market assuming that no entry barrier exists within sectors. Thus, individuals choose the segments where their expected earnings would be the highest. The actual distribution of individuals across sectors is given in Eq. (4). If the hypothetical distribution Eq. (5) and the actual distribution Eq. (4) are equal/same, then it is easy to infer that, there is perfect sectoral mobility. In other words, when both actual distribution and hypothetical distribution are equal, it means that, individuals are in the sector where given their own personal characteristics earn the highest wages. When both distributions are the same, the market can be referred to be competitive in nature. However, if both actual distribution and hypothetical distributions are not the same across sectors, this means that, some

sort of entry barrier exist which is preventing certain individuals from being in the sector that offers the highest wage to them. This therefore means that, individuals choose a strategy of last resort that is entering a sector regardless of the lower earnings in order to escape unemployment or in other words, to avoid unemployment individuals choose to enter a sector regardless of the low earnings. When both distributions are not the same, the labour market can be referred to be segmented in nature.

4.6.3 The estimation of a mixture model

In order to estimate the model, we would proceed in two stages in line with Heckman's (1979) approach.

Step 1: From selection Eq. (2) estimate γ by running a probit for the employed and non-employed.

Step 2: The parameters obtained from step 1 are then used as consistent estimates to estimate the model in Eq. (4) on all employed individuals.

In explaining, this means that in order to estimate the model in Eq. (4) we will first estimate the inverse mills ratio (lambda) by running a probit model on all the employed and non-employed workers in the first stage. This participation decision is known as the selection equation. Having done that, we will then place into the finite mixture model as an independent variable (regressor) the estimation derived from the inverse mills ratio in order to get the consistent results of returns to the characteristics of workers. In other words, the second stage which is the wage equation stage produces consistent coefficient estimates of the wage equation. This is important because Heckman (1979) shows that, the inverse mills ratio is a proxy variable for the probability of participation and when it is placed in the wage equation as an independent variable, it measures the effects of sample selection due to the lack of observations on the earnings of the non-employed (Irfan, 2011) and since the model is a finite mixture model with sample equation we would place the parameters obtained in Eq. (4) when estimating the model[11].

[11] The mixture model with sample selection in Eq. (4) is only estimated on the informal sector, given that, the formal sector is assumed to be homogenous.

As stated in the earlier section of this research, the data shows whether an individual is in the formal or informal sector. It is however unknown which segment within the heterogeneous informal sector an individual works in. The set of earnings outcomes in the formal sector is represented by Y_F whiles the number of formal sector observations is denoted byN_F. The log-likelihood to be maximized can be written as:

$$\ln L = \sum_{i \in Y_F} \ln f\left(\theta_F, \rho \middle| y_{iF}, y_{is},\right. \\ \left. > 0; x_i z'_i \hat{\gamma}\right) + N_F \ln \pi_F \\ + \sum_{i \in Y_F} \ln \left(\sum_{j=1}^{J-1} f\left(\left(\theta_{lj}, \rho \middle| y_{il},\right. > 0; x_i z'_i \hat{\gamma}\right) \pi_{Ij} \right) \quad (6)$$

where π_{1j} is the probability of being in the j-th segment of the informal sector, π_F is the probability of being in the formal sector and $f(.)$ is the component density function in Eq.(3) with the j-specific parameter vector θ_{lj}. As the variance-covariance matrix from the second stage is biased, Murphy and Topel's (1985) correction method is employed. This is because, Lee, Maddala and Trost (1980) argue that, anytime a two-stage model is estimated, a procedure to correct the variance-covariance of the parameters should be run. The log-likelihood is estimated is then estimated for different number of informal segments and the optimal number of these by employing the use of information criteria.

4.5.4. Choice of the number of segments

The first stage in the implementation of finite mixture model is to determine the composition of the labour market or in other words, to determine the most suitable number of segments (Deguilhem, Berrou and Combarnous, 2017). Assessing the number of segments in a mixture model is not only a difficult task but an important one (Preisach, Burkhardt, Schmidt-Thieme and Decker, 2008). Whiles many forms of test such as a standard likelihood ratio test can be used to determine the number of segments, Wedel and Kamakura (2012), McLachlan and Peel (2004) and Malhotra (2010) have pointed out that, standard likelihood ratio test is unsuitable in a finite mixture model. In light of that, information criteria have been argued to be more appropriate in determining the number of segments which is based on the penalised form of the likelihood (Mclachlan and Peel, 2004; Sarstedt, Becker, Ringle and Schwaiger, 2011). Therefore, this research would employ the use of information criteria (CAIC and BIC) to

determine the number of segments in the informal sector estimating the models with a homogenous, two segment and three segment informal sector.

Table 21 Model selection

	2005/06			2012/13		
	Homogenous	2 segment	3 segment	Homogenous	2 segment	3 segment
CAIC	6231	6229	6307	13717	13687	13751
BIC	6220	6207	6274	13706	13665	13718

CAIC: Consistent Akaike Information Criteria; BIC: Schwarz

Table 21 shows that, a breakdown of employment in informal sector into two segments describes the data better than one segment across both criteria and that, adding a third segment does not improve the specification in terms of the information criteria.

4.7 Estimation result

Table 22 shows the results from the estimations for GLSS5 for the wage and selection equations. The first finding from the estimation is the significance of the correlation coefficient (ρ) for GLSS 5 which in effect means that, accounting for sample selection into the labour market when estimating the coefficient of the wage equations is paramount. Secondly, the estimations also reveal that, in the two-segment model for GLSS 5 both segments of informal employment are sizeable meaning, Informal-1 and Informal-2 recorded 69 percent and 31 percent respectively of total employment in the informal sector. However, in the entire labour market, Informal-1 recorded 43.1 percent whiles Informal-2 recorded 19.0 percent which highlights the fact that, Informal-1 has a higher proportion of individuals employed in the entire labour market. Additionally, the expected log earnings in the formal sector are significantly higher than the expected log earnings in the two segments of the informal sector. The estimations also shows that, whiles Informal-1 has a higher proportion of workers than Informal-2, the expected log earnings in Informal-2 are much higher than the expected log earnings in Informal-1 which shows that, Informal -1 is the lower paid amongst the two segment of the informal sector.

Thirdly, significant differences exist in the wage equations across the different segments of the labour market. Gender significantly affects earnings of workers in all segments in the labour market, which is highlighted by the fact that, the male-female earnings gap within the formal sector is smaller than that of the gap within each of the informal segment. In other

words, males in the formal sector earn 25.1 percent more than females in the same sector, in informal-1 males earn 50.3 percent more in wages than females and in informal-2 males earn 51.5 percent more than females. The results indicate that, female workers in informal employment tend to face much more discrimination than the female workers in the formal sector. Whilst there may be other factors that contribute to the wage discrimination in the informal sector the possible reasons could be attributed to the existence of anti-wage discrimination laws in the formal sector which of course do not exist in the informal sector and also, women with better education and experience may self-select themselves into the formal sector. The age variable is also a very powerful predictor of earnings of workers across all segment but then, as people get older the effect of age on once earnings is lessoned.

In terms of marital status, being married in informal-1 shows that, one is more likely to earn 12.5 percent more in wages than not being married whiles being married in formal sector and informal-2 has no impact on the earnings of the workers.

In addition, whiles being a Christian or not has no impact on the earnings of workers across all segments, being a Muslim rather than not is found to significantly but negatively impact the earnings of workers in only the formal sector. This in other words means that, not being a Muslim significantly impacts the earning of workers in the formal sector positively.

Whiles all three levels of education are important in terms of having a positive significant impact on one's earnings in informal-2, only medium and high educations have a positive and significant impact on one's earnings in both formal sector and informal-1. In addition, a worker with high level of education earns much more monthly wages in the formal sector than a worker without followed by informal-2 and then informal-1 (lower paid segment). Furthermore, a worker with medium education in the formal sector earns 53.2 percent more wages than a worker with no education, in informal-1 and informal-2 workers with medium education earn 28.5percent and 50.9 percent respectively more in wages than workers with no education.

From the analysis, it is evident that, informal-2 is more dynamic whiles informal-1 is not so much dynamic. In explaining, whiles age and education are highly important in informal-2, in informal-1 anyone could get a job, making age and education a bit more redundant in that segment. In addition, in informal-2 workers earn a wage whiles in the formal sector workers earn a salary making the formal sector more secured than the informal sector.

Estimations from table 22 which highlights the distinct pattern of returns to individual characteristics emphasises that, informal sector employment should not be considered as homogenous in nature. However, the existence of different patterns of returns to individual characteristics alone is not sufficient to argue that, the labour market is segmented since as Dickens and Lang (1985) stated, a labour market with two different sectors and wage equations does not mean a labour market is segmented as long as individuals can freely move between sectors. In order to determine whether the labour market is segmented or competitive in nature, the next section would examine whether entry barriers exist across the three segments.

Table 22 Finite Mixture Model with a two segment Informal labour Market (GLSS5)

	Formal			Informal-1			Informal-1	
Variables	Coeff.	Standard error	Variables	Coeff.	Standard error	Variables	Coeff.	Standard error
Intercept***	11.295	0.3776	Intercept***	11.680	0.3577	Intercept***	9.9042	0.9273
Gender***	0.2518	0.5459	Gender***	0.5037	0.0602	Gender***	0.5156	0.1591
Age***	0.0822	0.0187	Age**	0.0458	0.0192	Age***	0.1330	0.0501
Age²/100***	-0.0826	0.0225	Age²/100**	-0.0517	0.0251	Age²/100***	-0.1667	0.0632
Education/Low	0.1822	0.1142	Education/Low	0.1108	0.0895	Education/Low**	0.5205	0.2349
Education/Medium***	0.5324	0.1227	Educ/Medium***	0.2852	0.1103	Education/Medium*	0.5097	0.2962
Education/High***	0.9692	0.1152	Education/High***	0.4534	0.1410	Education/High***	0.9088	0.3531
Christian	-0.1222	0.1031	Christian	-0.0664	0.1047	Christian	-0.143	0.2835
Muslim**	-0.1222	0.1225	Muslim	-0.0749	0.1180	Muslim	-0.364	0.3228
Couple	0.0799	0.0685	Couple*	0.1256	0.0699	Couple	0.2451	0.1965
Previously married	-0.1727	0.1034	Previously married	0.0549	0.0961	Previously married	0.2909	0.2651
ρ***	0.1386	0.0421						
π_F	0.3782		π_{I1}	0.4318		π_F	0.1900	
Expected log-wage:	13.7201		Expected log-wage:	13.058		Expected log-wage:	13.1928	
Selection Equation								
Intercept***	0.3236	0.0437		Censored observation:		3,120		
Gender*	0.0631	0.0353		Uncensored observation:		3,490		
Infants***	0.5031	0.0388						
Children***	0.4779	0.0208						
Elderly*	0.0800	0.0479						
HH size***	-0.5295	0.0141						
Active members***	0.9457	0.0253						

* significant at 10%; ** significant at 5%; ***significant at 1%; Dependent variable is monthly wage. Educ which is education has been shortened due to space.

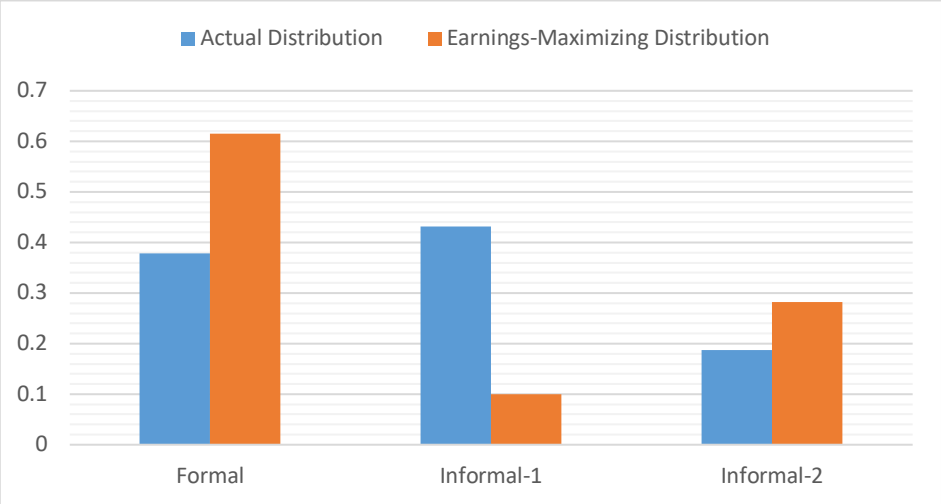
4.7.1. A segmented or competitive labour market?

When sectors in a labour market have no entry barriers, an individual would then be free to move into the sector where their expected earnings given their personal characteristics are the highest which would lead to the distribution of individuals across sectors as shown in Eq. (5). This hypothetical distribution which would be known as earnings-maximizing distribution

should be the same as the actual distribution of individuals across sectors as formulated in Eq.(4) if no entry barriers exist. However, if entry barriers exist, individuals would not be able to access work in the sectors where their expected earnings are highest which means they would be underrepresented in the sectors where their earnings are highest. Therefore, to see whether the Ghanaian labour market is segmented or competitive, the distribution of probabilities from the mixture model with two segments $\{\hat{\pi}_j\}_{j=1}^{j}$ which is the actual distribution in Eq. (4) is compared with the hypothetical distribution which is known as the earnings maximization distribution $\{\tilde{\pi}_j\}_{j=1}^{j}$. The earning maximizing distribution which is the latter one is obtained by computing the proportion of individuals in each segment for whom, given their personal characteristics their earnings would be the highest in the segments. In order to do this, we identify for each individual the segments in which their earnings are the highest, and then for each segment calculate the proportion of individuals for whom this segment is the highest earning.

The two estimated distributions are shown in Figure 8 (GLSS 5). It shows that, much more individuals based on their personal characteristics would prefer to be employed in the formal sector than there currently are in the sector if entry barriers did not exist. In terms of the two segments in the informal sector, whiles much more individuals work in the informal -1 (lower-tier) than the number that would want to work there, in informal -2 (higher-tier) the number of individuals who would be better off in that segment is almost double the actual number of workers there. This goes to show that, whiles Informal-1 is over-represented, Informal -2 is under-represented.

Figure 8 Distribution of individuals across sectors in GLSS5



Source: The Ghana Living Standard Survey 5 (GLSS 5)

The actual distribution $\{\hat{\pi}_j\}_{j=1}^{j}$, earnings maximizing distribution $\{\tilde{\pi}_j\}_{j=1}^{j}$ and their ratios $\hat{\pi}_j/\tilde{\pi}_j$ are presented in Table 23. Table 23 highlights that, the ratios for formal sector and informal-2 (higher-tier) are less than one whiles that of informal-1 is more than one. This means that while both formal sector and informal -2 are under-represented, informal -1 is over-represented which in other words means, there are much more involuntary workers in informal-1. In addition to the above, Table 24 also identifies voluntary and involuntary employment. In other words, Table 24 shows that, some individuals will maximize their potential earnings in other segments of the labour market than the one they currently are in which is highlighted in more detail in Table 23.

Table 23 GLSS 5 Distribution of Individuals across sectors

	Formal	Informal -1	Informal - 2
	Value	Value	Value
$\hat{\pi}_j$	0.3782	0.4318	0.1900
$\tilde{\pi}_j$	0.6146	0.1003	0.2851
$\hat{\pi}_j/\tilde{\pi}_j$	0.6153	4.3050	0.6664

Source: Authors calculation (GLSS5)

Table 24 GLSS 5 Distribution of workers across segments where earnings will be maximized

	Formal	Informal -1	Informal - 2
Better paid segment	% of formal workers	% of informal workers	% of informal workers
Formal	74.8	51.4	57.8
Informal - 1	2.60	14.5	14.8
Informal - 2	22.6	34.1	27.4
Total	100	100	100

Source: Authors calculation (GLSS5)

A substantial number of individuals in the formal sector (74.8%) are working there voluntarily as against 10.4 percent in informal -1 voluntarily and 8.4 percent in informal -2. This therefore shows that, 81.6 percent of workers in the informal sector are there involuntarily. Furthermore, differences also exist in the distribution of employment amongst the two different informal sector segments. Table 24 shows that, 51.4 percent of informal -1 workers will prefer to be in the formal sector whiles 34.1 percent will prefer to be in informal -2 (higher-tier) which means 85.5 percent of workers in informal -1 will prefer jobs in either the formal and informal -2

whiles only 14.5 percent of workers in that segment (informal-1) are there voluntarily. Additionally, in informal-2 (higher-tier) 14.8 percent and 57.8 percent of workers there would prefer to be in informal-1 (lower-tier) and formal sector respectively which then means 72.5 percent of workers in informal-2 are there involuntarily leaving 27.4 percent workers there voluntarily employed. The formal sector also has 28 percent of workers who are employed there involuntarily with 2.6 percent and 22.6 percent individuals preferring to work in informal-1 and informal-2 respectively. The GLSS 5 data which was conducted in 2005/06 shows that, the Ghanaian labour market is segmented with vast majority of informal workers who could be better off in the formal sector prevented from entry due to entry barriers. Therefore, in order to avoid unemployment informal employment serves as employment of last resort for workers who cannot access jobs/employment in the formal sector.

4.7.2. How Has The Labour Market Changed Over Time?

Considering the rapid rise in informal sector employment rates from 2005/06 to 2012/13 (see Table 20.) this subsection would empirically interrogate how different the Ghanaian labour market has been, since 2005/06, by employing the use of the more recent Ghanaian Living Standard Survey 6 (GLSS6) data[12]. The same methodologies are employed; the Heckman (1979) model is employed to determine whether sample selection needs to be accounted for. Table 25 shows that, the correlation coefficient (ρ) is significant which is the same as that of GLSS 5 in Table 22 which means sample selection must be accounted for when estimating mixture model. As outlined in section 5.4 the number of segments is to be determined before carrying out the finite mixture model estimation and Table 21 shows that, a breakdown of informal sector employment into two segments best describes the GLSS6 data. The results of the wage and selection equations are shown in Table 25. Similar to that of the 2006 labour market (GLSS5), formal sector pays more than all the other two segments in the informal sector, whiles informal -1 has more workers than informal – 2 and formal sector. In addition, amongst the two segments in the informal sector, informal -2 pays more than informal -1. Informal-1 and informal -2 represent 64 percent and 36 percent respectively of total employment in the informal sector but then represents 44.9 percent and 25.8 percent of employment in the entire labour market.

It is important to note that, whiles gender significantly impacted the earnings of all workers in formal sector and in both informal -1 and informal -2 in 2005/06, in 2012/13, gender

[12] Sub-section 1.4 describes both GLSS 5 and GLSS6 datasets in more details.

significantly impacted earnings in only formal sector and informal-1 with gender playing no role on the earnings of workers in informal -2. Furthermore, the male-female gap in 2012/13 seems to be increasing in both formal sector and informal-1, however, whiles the increase in the formal sector is not that significant that of informal -1 is. Whiles in 2005/06, workers with medium education were likely to earn 53 percent more in salary in the formal sector, in 2012/13 workers with medium education were more likely to earn 47 percent more in salary in the same sector than workers without which is a decline from where it was in 2005. However, workers with medium education in informal-2 in 2012/13 were more likely to earn 73 percent more in wages than workers without whiles workers in the same sector in 2005/06 were likely to earn 50 percent more in wages.

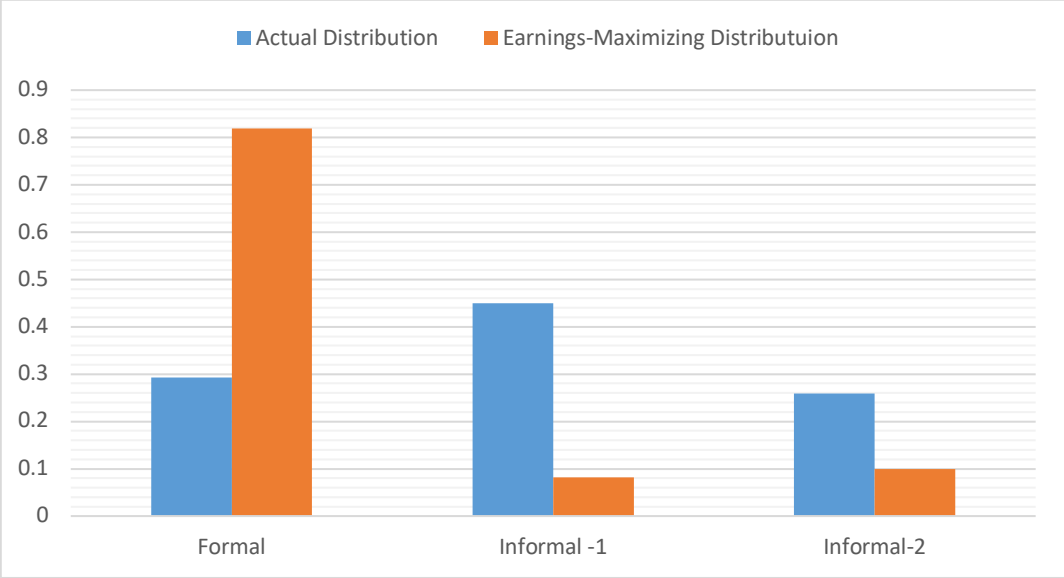
Marital status of workers seems to be of great importance in 2012/13.This is because whiles being married or not played no role on a workers earnings in 2005/06, in 2012/13, being married recorded a positive and significance level of 1% and earned a worker 20 percent more in wages than a worker whose not. In addition, in 2005/06 and 2012/13 being married rather than not was not only positive but also significant in informal -1 while being married or not in informal-2 played no role on one's earnings.

Table 25 Finite Mixture Model with a two segment Informal labour Market (GLSS6)

	Formal			Informal-1			Informal-1	
Variables	Coeff.	Standard error	Variables	Coeff.	Standard error	Variables	Coeff.	Standard error
Intercept***	3.0404	0.3691	Intercept***	3.3390	0.3240	Intercept***	2.9594	0.6760
Gender***	0.2896	0.0470	Gender ***	0.8517	0.6132	Gender	0.0563	0.1386
Age***	0.0933	0.0161	Age***	0.0795	0.0160	Age**	0.0910	0.0321
Age²/100***	-0.0977	0.0190	Age²/100***	-0.0959	0.0196	Age²/100**	-0.0967	0.0391
Education/Low**	0.2899	0.1174	Education/Low	-0.0871	0.0827	Educatio/Low***	0.7033	0.1909
Education/Medium***	0.4733	0.1225	Education/Medium	0.0478	0.1041	Educ/Medium***	0.7328	0.2202
Education/High***	1.1362	0.1161	Education/High***	0.5149	0.1184	Educ/High***	0.6566	0.2202
Christian	0.0113	0.1751	Christian	0.0366	0.1350	Christian	0.2706	0.3000
Muslim	-0.0048	0.1830	Muslim	-0.0547	0.1408	Muslim	0.3466	0.3216
Couple***	0.2008	0.0490	Couple****	0.1758	0.0615	Couple	0.2072	0.1263
Previously married	-0.0056	0.0931	Previ married ***	0.2378	0.0912	Previ married	0.0389	0.1869
ρ***	0.1299	0.0314						
π_F	0.2923		π_{I1}	0.4492		π_F	0.2584	
Expected log-wage:	6.1297		Expected log-wage:	5.3483		Expected log-wage:	5.8637	
Selection Equation								
Intercept***	0.5330	0.0336		Censored observation: 4,664				
Gender*	0.0491	0.0278						
Infants***	0.6462	0.0295		Uncensored observation: 6,640				
Children***	0.6365	0.0171						
Elderly***	0.3083	0.0324						
HH size***	-0.6654	0.0126						
Active members***	1.0041	0.2011						

* significant at 10%; ** significant at 5%; ***significant at 1%; Dependent variable is monthly wage. Previ is previously it has been shortened due to space. Same as Educ, which is education

Figure 9 Distribution of individuals across sectors in GLSS6



Source: The Ghana Living Standard Survey 6 (GLSS 6)

Figure 9 captures the two estimated distributions whiles Table 26 shows the estimated probabilities (actual and earnings-maximizing distributions). Overall, the distributions show a much different trend from 2005/06 labour market. The most important finding is that, in 2012/13 both informal -1 and informal -2 are above 1 which means that entry barriers still exist and that both segments in the informal sector are over-represented. This is different from 2005/06 because, whiles only informal -1 was above 1, in 2012/13 both segments in the informal sector are. Furthermore, Table 27 shows that, in 2012/13 a larger proportion of workers in the formal sector (89.6%) are there voluntarily. The table further shows that, there has being an increase in the number of workers in informal-1 who want to be there voluntarily in 2012/13 from 2005/06 whiles in informal-2 there has being a decline of workers who are there voluntarily from where it was in 2005/06 to 2012/13 which in effect means that, in 2012/13, the number of workers voluntarily in informal-2 has reduced.

Table 26 GLSS 6 Distribution of Individuals across sectors

	Formal	Informal -1	Informal - 2
	Value	Value	Value
$\hat{\pi}_j$	0.2923	0.4492	0.2584
$\tilde{\pi}_j$	0.8191	0.0819	0.0989
$\hat{\pi}_j/\tilde{\pi}_j$	0.3568	5.4847	2.6127

Source: Authors calculation (GLSS6)

Difference also exists across the two segments of the informal sector. In terms of informal-1, there are 73.5 percent of workers in that segment who prefer work in the formal sector which is a significant increase from that of 2005/06, and also, 9.2 percent of informal -1 worker's prefer work in informal -2 which is a significant decline from that of 2005/06. Additionally, in informal -2, 87.7 percent of workers prefer to be employed in the formal sector whiles 0.6 percent prefer to be in informal -2 which is significantly different from the rate of workers in informal-2 who prefer work in the informal-1 in 2005/06.

This therefore shows that, whiles the Ghanaian labour market remains segmented in 2012/13, the rate of workers who prefer work in formal sector, informal -1 or informal-2 varies significantly from that of 2005/06. Whiles the differences are highly concentrated around informal-1 and informal-2, majority of workers who prefer work in any of the three segments

opt for work in the formal sector which may not only be due to expected wages in that sector but also due to the benefits that the sector offers.

The high entry barriers in the formal sector means that, individuals who do not possess the high requirement needed to work in the sector, are left with no choice but to seek employment in the other segments of the informal sector which coupled with the shrinking nature of the formal sector is led to an increase in the earnings of workers in the formal sector who possess the high entry requirement in 2012/13 compared to 2005/06. In other words, the shrinking nature of the formal sector coupled with the high entry requirements needed to work in there, has caused lots of workers to seek employment in the informal sector which has then led to an increase in the earnings of workers in the formal sector in 2012/13 from that of 2005/06.

Furthermore, analysing both datasets has shown that, informal-1 in both 2005/06 and 2012/13 seem to be a segment of the informal sector where anyone in search of work can access work due to the low requirements and earnings that workers in there have attained. This means, whiles informal -1 in both 2005/06 and 2012/13 is made up of any one in search of work, informal -2 seem to be made up of, more entrepreneurs hence the high earnings compared to informal-1.

Table 27 GLSS 6 Distribution of workers across segments where earnings will be maximized

	Formal	Informal -1	Informal - 2
Better paid segment	% of formal workers	% of informal workers	% of informal workers
Formal	89.6	73.5	87.8
Informal - 1	1.10	17.2	0.60
Informal - 2	9.30	9.30	11.6
Total	100	100	100

Source: Authors calculation (GLSS6)

4.8 Robustness

The robustness of the estimates with regards to the assumption that, people are earning-maximizers as against being utility maximizers may leave room to be questioned. This is because, workers tend to maximize utility rather than earnings which in effect means non-wage preferences/features would be of great desire to workers.

It is therefore possible to argue that, the rise of employment in the informal sector may be due to non-wage preferences and not due to entry barriers into the formal sector. The low wages workers in the informal sector earn would then mean that, the non-wage advantages that workers gain in the informal sector are much more than that of what would be gained when they work in the formal sector. It is however our conclusion that, the formal sector would have more non-wage benefits for workers than the informal sector. This is because whiles the informal sector offers much more flexibility and less regulations for workers, working in the formal sector provides workers with not only social security and job security benefits but also, medical benefits, legal protection and pension fund[13] hence the assumption that, people are earning maximizers should not bias the results. Loayza (1996), Ouedraogo (2017), De Soto (1989; 2001), Gokalp, Hyun-Lee and Peng (2017) and Nwabuzor (2005) argue that, tax avoidance is the main driving force behind the growth of the informal sector. In order to avoid the tax argument of the growth of the informal sector, this study works with wages that are after tax so that tax advantage would not have an influence on the final outcome of this study.

4.9 Conclusion

Informality of labour is among the challenging things that economies around the world are tackling today. The growing literature coupled with the role of informality in today's world, highlights the significance of it in current debates on developmental issues. In order to meet the aim of the chapter which is to truly determine whether Ghana's informal sector employment is due to labour market segmentation or competitive choice we employ two datasets, which highlights the considerable diversity in Ghana's informal sector with the results contributing to research gap on informal sector employment in Ghana. Finite mixture modelling analysis reveals that, in both years, the informal sector is made up of two segments, it also highlights that, each segment is made up of its own wage equation. Additionally, in both years, the two segments within the informal sector make up a considerable size of the entire labour market with informal -2 having a higher average wage than informal -1 whiles informal -1 has a higher proportion of workers than formal sector and informal-2. In the language of Fields (2000), whiles one segment of the informal sector offers lower wages, the other segment of the informal sector offers higher wages. The research also sought to answer the question of whether employment in informal sector was as a result of segmentation in the labour market where workers enter as a result of last resort (involuntarily) or from a competitive labour market where

[13] Anuwa-Amarh (2015) found that, majority of informal sector workers do not have pension funds.

workers enter by choice (voluntarily). Evidence from this research confirm that, a significant number of workers in the informal sector would prefer work in other segments of the labour market. It also shows that, in both 2005/06 and 2012/13 some workers tend to have a comparative advantage in the informal sector. Therefore, we can conclude that, not only is the informal sector a place of last resort for some workers who want to escape unemployment but also, some workers enter due to the comparative advantage they enjoy in that sector. In other words, the Ghanaian informal sector in both 2005/06 and 2012/13 is a combination of segmentation and competitiveness which is similar to the results that Gunther and Launov (2012) arrived at on their study of Ivory Coats' labour market. Furthermore, whiles to an extent the results attained in this research is similar to the findings of Nemoto and Zuo (2017) they are also very different in some instances. First Ghana's informal sector and that of China's have two distinct segments in both years; the formal sector in both 2005/06 and 2012/13 in Ghana are superior to both segments of the informal sector whiles the upper tier of informal sector employment in China is superior to formal sector employment. Secondly whiles entry barriers exist in Ghana's labour market in both 2005/06 and 2012/13, in China entry barriers exists in only 2006 and not 2010.

The results highlight the importance of designing policies that would tackle both voluntary and involuntary informal sector employment in the Ghanaian labour market. For instance as argued by Arias and Khamis (2008) informal sector employment which arises as a result of labour market segmentation (involuntary) leads to not only efficiency loss but also distortion of the market whiles informal sector employment which arises out of competiveness (voluntary) means the labour market may be flexible to an extent. This therefore means the introduction of policies that would make the mobility of labour more fluid across all sectors in the labour market in Ghana would ensure that no entry barriers exist which in effect would cause workers to choose the segment/sector in which they prefer to work. Additionally, policies that would promote a macroeconomic environment that supports quality employment must be enacted. Policies that develop skills of workers would also be beneficial since in some instances informal sector workers tend to face discrimination by way of receiving low pay returns to their skills and characteristics. For instance, monopolistic discrimination and efficiency wages among other factors may be some of the reasons behind discrimination and entry barriers that workers tend to face[14]. In this sense, by modifying regulations regarding

[14] Ito (2009) finds that, in the India labour market the transaction cost for the socially backward classes are higher.

labour unions and increasing the flexibility of labour which in other words means, eliminating regulations that hinder the mobility of labour would tackle labour markets with entry barriers. In contrast, reforms that reduce the cost of formality (reducing labour taxes and social security contributions) could be more appropriate in dealing with labour markets which are devoid of entry barriers (Alcaraz, Chiquiar and Salcedo, 2015)

The majority of empirical and theoretical literatures on informal sector employment are mainly not based on African countries but rather Latin American countries. Evidence gained in this chapter contributes to the literature on heterogeneity of informal sector employment in developing countries most especially in the African context which would create a platform for future cross-country comparisons among other African countries. This research also opens up the avenue for further research on the specific types of entry barriers that exist and the impact of the identified entry barriers on informal sector employment in order to introduce direct policy initiatives.

5.0 Overall conclusions

The aim of the thesis is to provide a full understanding of the Ghanaian labour market. In order to meet that this thesis deals with the broad issues of unemployment, underemployment and informality of developing countries particularly Ghana. Throughout the various aspects of this thesis, we have attempted to make significant contributions to the existing literature. In what follows we highlight these points, identify both limitations of the research and possible areas for further research.

5.1 Main findings and policy issues

The aim in Chapter 2 is to address the unemployment challenges in Ghana by understanding the true nature of unemployment. In order to address the aim, we achieve the objectives in this chapter by looking at the personal characteristics of the unemployed, in addition we have also shown their job search and job expectations using a probit model. Furthermore, we have looked at the uncompleted spells of unemployment duration. The chapter provides evidence and arguments that suggest that, women, single, youth, Christians, residents of Accra and urban dwellers are much more likely to be unemployed than any other group. The high rate of urban unemployment in Ghana is consistent with Feldman's (2010) argument that when individuals lack job opportunities they resort to social vices and this is evident by Kwami (2017), Appiahene-Gyamfi (2002) and Appiahene-Gyamfi (2003) who say that, crime in urban areas in Ghana have increased. We have also shown that, there exist gender differences because the effects of the explanatory variables differ between men and women which is highlighted by the low exit rate from unemployment into employment among women relative to men. Furthermore, the attractiveness of wage employment relative to self-employment and any employment is causing much more unemployed individuals to seek wage employment against the limited number and slow job creation of wage employment. Evidence shows that, in terms of starting their own business females are more likely to do that, whiles in terms of visiting farms/worksites for jobs females are less likely to do that. Individuals with medium and high education are more likely to apply directly to employers.

The aim of Chapter 3 is to explore and investigate the incidence of time related underemployment in Ghana as well as analysing the gender gap. The results show that, females, individuals with low and high education, and rural dwellers, are more likely to be underemployed than their counterparts. Workers in the manufacturing, trade, services and other sectors relative to agricultural sector are less likely to be underemployed. With regard to gender

differences, evidence from the analysis show that, whiles a residual exist, 13.8 percent and 37.5 percent explains the gender gap which highlights that, gender differences in underemployment cannot simply be dismissed.

The aim of the final chapter (Chapter 4) is to truly determine whether Ghana's informal sector employment is due to labour market segmentation or competitive choice. The results in Chapter 4 show that, the Ghanaian labour market is a combination of segmentation and competitiveness. Evidence rejects the hypothesis of unlimited sector mobility of workers. The informal sector is not only a place of last resort but also, some workers enter the informal sector due to the comparative advantage they enjoy in that sector. This finding is consistent with some of the empirical evidence from some of African countries that show that, informal sector is a competitive choice for some workers over formal employment. The study further shows that, majority of workers would have preferred employment in the formal sector where wages are higher than both informal 1 and informal 2. Also, informal sector workers earn significantly less than formal sector workers as has been highlighted by the wage gap that exist between the three segments. Thus, the finding refutes the hypothesis of a fully competitive labour market.

5.2 Limitations of the research

The interrogation of the Ghanaian labour market is to understand in a detailed manner the structure and characteristics of individuals in the market which will inform policymakers in their design of policies. Few notable limitations of the research are outlined below:

1. In attempting to understand the labour market – a crucial issue for Ghana – we encountered imperfect data. Whiles there has been tremendous improvement in the collection and availability of data on labour market there are still gaps and issues which need to be addressed in order for future data collection to be more prudent and informative. Policies enacted from researches carried out on much more informative data's will be reliable and effective. This is a constraint and we have done the best we could do with the data's available.
2. The research did not try to explore demand side factors which restricts the number of formal sector jobs available because of data constraint.
3. The study was unable to use the inadequate employment definition of underemployment which uses over qualification as one of the metric to measure inadequate employment because over-qualification implies a situation where a worker is in an occupation where the required educational attainment is below what the worker

currently holds (McGuinness, 2006) and since surveys has no section for educational attainment for each of the occupation it is not possible to look at that aspect of underemployment. The results presented in chapter 4 are rigorous enough even though we just using only one of the two accepted definitions of underemployment.

4. The available data is only in categorised form, rather than continuous form. For instance, the uncompleted duration of unemployment variables in categories form are less 1 month, less than 3 months less than 6 months less than 12 months, which leads to loss of information. The availability of Panel data would not fundamentally/significantly change the results. It would give a richer picture and only relates to the duration of unemployment. In other words, the availability of data would not change the conclusion it would give a richer picture because the difference are so large. For instance, in the uncompleted duration spells we found females tend to stay longer in unemployment relative to males. This conclusion would not change with panel data. Conversely, the scale of differences between each of the groups (e.g., males and females) and across the samples (i.e. 2005/06 and 2012/13) would not fundamentally change the results found in chapter 3 when data is available.
5. Unemployment has both stock and flow elements to it. Our research has a snapshot of unemployment in 2005/06 and 2012/13. Therefore, our research is looking at the stock element of unemployment and not the flow element of unemployment. The available data is looking at unemployment in a particular year and characteristics of the unemployed in those years. Annual household labourforce surveys are not collected so it is impossible to look at the flows of workers into and out of unemployment. In order to look at the flows of unemployment, we need longitudinal data and probably due to the expensive nature of it Ghana has no longitudinal data on labour market.

5.3 Areas for further research

This thesis improves our understanding of not only determinants of unemployment, job search characteristics and job expectation of job seekers but also, determinants of underemployment, gender gap in underemployment and the heterogeneous nature of informal sector employment in Ghana. There is a recognised need to understand fully labour markets in order for policies to be more effective and efficient. Whiles this thesis has looked at a detailed analysis of the Ghanaian labour market, as mentioned above certain limitations exist which therefore means future research could be carried out in the following areas;

1. The main focus in chapter 2 is to examine the unemployment (determinants and duration) and the job search characteristics and job expectations of job seekers. In order for labour market statistics to be used effectively for policy purposes, their deficiencies and challenges must be addressed by means of thorough dialogue among not only policymakers and independent researchers but also with members of Ghana Statistical Service. Since the analysis found that youth queue for jobs than take up temporary jobs research that would delve deeper by shedding light on the puzzle why the youth rather prefer to queue for jobs than take up temporary job will be great. Lack of panel data has hindered the analysis of important issues related to unemployment which therefore means when there are panel data's in the future, researchers could look at areas such as: is low unemployment due to a low rate of entry into unemployment or to short duration of unemployment, i.e., what is the completed duration of unemployment? A high rate of exit from unemployment? In other words, future research could look at entry, exit and duration of unemployment in more details.
2. Chapter 3 looks at underemployment and the gender gap in underemployment in Ghana. Whiles the International Labour Organisation introduced two main definitions for underemployment - time-related underemployment and inadequate employment - this study adapts the time-related definition to study the underemployment challenges in Ghana. As mentioned in the limitations, over qualification is another measure of underemployment and since the Ghanaian surveys have no section for educational attainment for each of the occupations future researches could look at over qualification as a form of underemployment when data are available. Additionally, since this is study is the first that looks at gender gap in underemployment and underemployment in detail in Ghana, more in depth research could look at total income foregone due to underemployment, the econometric relationship between business cycle indicators and underemployment and also, the exit of the underemployed into full employment i.e., the likelihood of underemployed being fully employed.
3. Chapter 4 looks at the heterogeneous nature of informal sector employment in Ghana. The study found that, entry barriers still exist in the Ghanaian labour market which is preventing free mobility between sectors. Further research can therefore investigate what kinds of entry barriers exist and their impact on informal sector employment since understanding these barriers would help in the formulation of effective policies. For instance, monopolistic discrimination, efficiency wages and search frictions are some of the possible causes that may lead to discrimination and entry barriers. Additionally,

modelling more complex sector choice mechanisms may be another area that can be researched further due to the fact, the assumption that sector choice is based only on the expected earnings of workers might be too simple to understand the rationale behind an individual's entry decisions into the various segments of the labour market.

Reference List

Abdel-Mowla, S. A. A. (2012). Females' Off-the-Job Search Methods in Egypt: Formal versus Informal Search Methods.*Jindal Journal of Business Research*, *1*(1), 21-42.

Abel, J. R., & Deitz, R. (2017). Underemployment in the early careers of college graduates following the Great Recession. In*Education, Skills, and Technical Change: Implications for Future US GDP Growth*. University of Chicago Press.

Acosta-Ballesteros, J., Osorno-del Rosal, M. D. P., & Rodríguez-Rodríguez, O. M. (2018). Underemployment and employment among young workers and the business cycle in Spain: the importance of education level and specialisation.*Journal of Education and Work*, *31*(1), 28-46.

Adsera, A. (2005). Vanishing children: From high unemployment to low fertility in developed countries.*American Economic Review*, *95*(2), 189-193.

Aikaeli, J., & Mkenda, B. K. (2014). Determinants of informal employment: a case of Tanzania's construction industry. *Botswana Journal of Economics*,*12*(2), 51-73.

Ajrouch, K. J., Blandon, A. Y., & Antonucci, T. C. (2005). Social networks among men and women: The effects of age and socioeconomic status. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*,*60* (6), S311-S317.

Akerlof, G. A., & Miyazaki, H. (1980). The implicit contract theory of unemployment meets the wage bill argument. *The Review of Economic Studies*, *47*(2), 321-338.

Akerlof, G. A. (1982). Labor contracts as partial gift exchange. *The quarterly journal of economics*, *97*(4), 543-569.

Akerlof, G. (1970). The market for lemons. *Quarterly journal of Economics*, *84*(3), 488-500.

Alcaraz, C., Chiquiar, D., & Salcedo, A. (2015). *Informality and segmentation in the Mexican labor market* (No. 2015-25). Working Papers, Banco de México.

Alidadi, K. (2017). Religion and unemployment benefits: Comparing Belgium, the Netherlands and Great Britain.*European Labour Law Journal*, *8*(1), 67-95.

Allan, B. A., Tay, L., & Sterling, H. M. (2017). Construction and validation of the subjective underemployment scales (SUS). *Journal of Vocational Behavior*, *99*, 93-106.

Altman, M. (2003). Jobless or job creating growth?: some preliminary thoughts.

Altman, M. (2007). Youth labour market challenges in South Africa.

Altman, M. (2008). Formal-informal economy linkages.

Altmann, S., Falk, A., & Huffman, D. (2010). Implicit contracts, unemployment, and labor market segmentation.

Altmann, S., Armin, F., Jager, S., & Zimmermann, F. (2015). Learning about job search: A field experiment with job seekers in Germany.

Altonji, J. G., & Blank, R. M. (1999). Race and gender in the labor market. *Handbook of labor economics*, *3*, 3143-3259.

Amu, N. J. (2005). *The role of women in Ghana's economy*. Friedrich Ebert Foundation.

Antoine, M (2004) Business Development Services, Unemployment and the Kenya Informal Sector. Research Paper, TUFTS University, Medford.

Anuwa-Amarh, E. T. (2015). *Understanding the Urban Informal Economy in Ghana: A Survey Report*. Friedrich Ebert Stiftung Ghana.

Anyanwu, J. C. (2013). Characteristics and macroeconomic determinants of youth employment in Africa. *African Development Review*, *25*(2), 107-129.

Appiahene-Gyamfi, J. (2002). An analyses of the broad crime trends and patterns in Ghana. *Journal of criminal justice*,*30*(3), 229-243.

Appiahene-Gyamfi, J. (2003). Urban crime trends and patterns in Ghana: The case of Accra. *Journal of Criminal Justice*,*31*(1), 13-23.

Arias, O., & Khamis, M. (2008). Comparative advantage, segmentation and informal earnings: A marginal treatment effects approach.

Aryeetey, E., & Baah-Boateng, W. (2015). *Understanding Ghana's growth success story and job creation challenges* (No. 2015/140). WIDER Working Paper.

Assaad, R., El-Hamidi, F., & Ahmed, A. U. (2000). *The determinants of employment status in Egypt*. Washington, DC: International Food Policy Research Institute.

Azariadis, C. (1975). Implicit contracts and underemployment equilibria. *Journal of political economy*, *83*(6), 1183-1202.

Azmat, G. (2015). Gender Gaps in the UK Labour Market: jobs, pay and family-friendly policies. *London School of Economics and Political Science: Centre for Economic Performance*.

Azmat, G., & Petrongolo, B. (2014). Gender and the labor market: What have we learned from field and lab experiments?. *Labour Economics*, *30*, 32-40.

Baah-Boateng, W. (2016). The youth unemployment challenge in Africa: What are the drivers?. *The Economic and Labour Relations Review*, *27*(4), 413-431.

Baah-Boateng, W. (2015). Unemployment in Africa: how appropriate is the global definition and measurement for policy purpose. *International Journal of Manpower*, *36*(5), 650-667.

Baah-Boateng, W., and Ewusi, K. (2013). Employment: policies and options. *Policies and Options for Ghana's Economic Development, 3rd edition. Accra: Institute of Statistical Social and Economic Research (ISSER), University of Ghana*.

Baffour, P. T., & Turkson, F. E. (2015). Selection into Employment Sectors in Urban Ghana and Tanzania: The Role of Education. *Research in World Economy*, *6*(4), 78. #

Baffoe-Bonnie, J., & Ezeala-Harrison, F. (2005). Incidence and duration of unemployment spells: Implications for the male–female wage differentials. *The Quarterly Review of Economics and Finance*, *45*(4-5), 824-847.

Baily, M. N. (1974). Wages and employment under uncertain demand. *The Review of Economic Studies*, *41*(1), 37-50.

Baslevent, C., & Acar, A. (2015). Recent trends in informal employment in turkey. *Yildiz Social Science Review*, *1*(1).

Bates, T. (1976). Involuntary Underemployment Among Heads of Households. Institute for Research on Poverty Discussion Papers.

Bekkers, H., & Stoffers, W. (1995). Measuring informal sector employment in Pakistan: Testing a new methodology. *Int'l Lab. Rev.*, *134*, 17.

Bell, D. N., & Blanchflower, D. G. (2013). Underemployment in the UK Revisited. *National Institute Economic Review*, *224*(1), F8-F22.

Bencivenga, V. R., & Smith, B. D. (1997). Unemployment, migration, and growth. *Journal of political Economy*, *105*(3), 582-608.

Benjamin, N., & Mbaye, A. A. (2014). *Informality, growth, and development in Africa* (No. 2014/052). WIDER Working Paper.

Bentolila, S., Dolado, J. J., & Jimeno, J. F. (2012). Reforming an insider-outsider labor market: the Spanish experience. *IZA Journal of European Labor Studies*, *1*(1), 4.

Bergin, A. (2009). Job mobility in Ireland. *The Economic and Social Review*, *40*(1), 15.

Beukes, R., Fransman, T., Murozvi, S., & Yu, D. (2017). Underemployment in South Africa. *Development Southern Africa*, *34*(1), 33-55.

Bewley, T. F. (1998). Why not cut pay?. *European Economic Review*, *42*(3-5), 459-490.

Biagi, F., & Lucifora, C. (2008). Demographic and education effects on unemployment in Europe. *Labour Economics*,*15*(5), 1076-1101.

Boheim, R., & Taylor, M. P. (2001). *Job search methods, intensity and success in Britain in the 1990s* (No. 2001-07). ISER Working Paper Series.

Boheim, R., & Taylor, M. P. (2002). The search for success: do the unemployed find stable employment?. *Labour Economics*, *9*(6), 717-735.

Bolino, M. C., & Feldman, D. C. (2000). The antecedents and consequences of underemployment among expatriates.*Journal of Organizational Behavior*, 889-911.

Bonnal, M., Lira, C., & Addy, S. N. (2009). Underemployment and local employment dynamics: New evidence. *The Review of Regional Studies*, *39*(3), 317.

Breman, J. (1980). *" The Informal Sector" in Research: Theory and Practice* (Vol. 3). CASP, Erasmus University Rotterdam.

Brown, D., McGranahan, G., & Dodman, D. (2014). Urban Informality and Building a More Inclusive, Resilient and Green Economi. London: IIED.

Brown, D., & McGranahan, G. (2016). The urban informal economy, local inclusion and achieving a global green transformation. *Habitat International*,*53*, 97-105.

Brown, M., & Neku, R. J. (2005). A historical review of the South African social welfare system and social work practitioners' views on its current status. *International Social Work*, *48*(3), 301-312.

Brown, G., and Pintaldi, F. (2006). A multidimensional approach in the measurement of underemployment. *Statistical Journal of the United Nations Economic Commission for Europe*, *23*(1), 43-56.

Burdett, K., & Mortensen, D. T. (1998). Wage differentials, employer size, and unemployment. *International Economic Review*, 257-273.

Burke, R. J. (1997). Correlates of under-employment among recent business school graduates. *International Journal of Manpower*, *18*(7), 627-635.

Byrne, D., & Strobl, E. (2004). Defining unemployment in developing countries: evidence from Trinidad and Tobago.*Journal of Development Economics*, *73*(1), 465-476.

Cahuc, P., Carcillo, S., Rinne, U., & Zimmermann, K. F. (2013). Youth unemployment in old Europe: the polar cases of France and Germany. *IZA Journal of European Labor Studies*,*2*(1), 18.

Cam, S. (2014). The underemployed: evidence from the UK labour force survey for a conditionally gendered top-down model. *Journal of Social Science Studies*, *1*(2), 47.

Cameron, A. C., & Trivedi, P. K. (2010). *Microeconometrics using stata* (Vol. 2). College Station, TX: Stata press.

Cameron, A. C., & Trivedi, P. K. (2005). *Microeconometrics: methods and applications*. Cambridge university press.

Campbell III, C. M. (1993). Do firms pay efficiency wages? Evidence with data at the firm level. *Journal of labor Economics*, *11*(3), 442-470.

Carruth, A. A., Hooker, M. A., and Oswald, A. J. (1998). Unemployment equilibria and input prices: Theory and evidence from the United States. *Review of economics and Statistics*, *80*(4), 621-628.

Chapple, K. (2006). Overcoming mismatch: Beyond dispersal, mobility, and development strategies. *Journal of the American Planning Association*, *72*(3), 322-336

Charmes, J. (1995). The contribution of informal sector to GDP in developing countries: Assessment, estimates, methods, orientations for the future. *Korea*, *16*, 15-9.

Charmes, J. (2012). The informal economy worldwide: Trends and characteristics. *Margin: The Journal of Applied Economic Research*, *6*(2), 103-132.

Chen, M. A. (2005). Rethinking the informal economy: Linkages with the formal economy and the formal regulatory environment (Vol. 10, pp. 18-27). United Nations University, World Institute for Development Economics Research.

Choi, S., & Valladares-Esteban, A. (2015). The marriage unemployment gap. *The BE Journal of Macroeconomics*,*18*(1).

Clogg, C. C., Sullivan, T. A., & Mutchler, J. E. (1986). Measuring underemployment and inequality in the work force. *Social Indicators Research*, *18*(4), 375-393.

Danthine, J. P., & Donaldson, J. B. (1990). Efficiency wages and the business cycle puzzle. *European Economic Review*,*34*(7), 1275-1301.

Darbi, W. P. K., Hall, C. M., & Knott, P. (2018). The informal sector: A review and agenda for management research. *International Journal of Management Reviews*, *20*(2), 301-324.

Dauth, W., Findeisen, S., Südekum, J., & Woessner, N. (2017). German robots-the impact of industrial robots on workers.

Deguilhem, T., Berrou, J. P., & Combarnous, F. (2017). Using your ties to get a worse job? The differential effects of social networks on quality of employment: Evidence from Colombia.

Denu, B., Tekeste, A., & Van Der Deijl, H. (2005). Characteristics and determinants of youth unemployment, underemployment and inadequate employment in Ethiopia.

De Soto, H. (1989), The Other Path: The Economic Answer to Terrorism, Harper and Row,London.

De Soto, H. (2001), The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else, Black Swan, London

De Vreyer, P., & Roubaud, F. (Eds.). (2013). *Urban labor markets in sub-Saharan Africa*. World Bank Publications.

Dickens, W. T., & Lang, K. (1995). An analysis of the nature of unemployment in Sri Lanka. *The Journal of Development Studies*, *31*(4), 620-636.

Dietrich, H. (2012). Youth unemployment in Europe.*Theoretical considerations and empirical findings.*

DiPrete, T. A., & Buchmann, C. (2013). *The rise of women: The growing gender gap in education and what it means for American schools*. Russell Sage Foundation

Doiron, D. J. (2003). Is Under-Employment due to Labour Hoarding? Evidence from the Australian Workplace Industrial Relations Survey. *Economic Record*, *79*(246), 306-323.

Dooley, D. (2003). Unemployment, underemployment, and mental health: Conceptualizing employment status as a continuum. *American journal of community psychology*, *32*(1-2), 9-20.

Eamon, M. K., & Wu, C. F. (2011). Effects of unemployment and underemployment on material hardship in single-mother families. *Children and Youth Services Review*, *33*(2), 233-241.

Echebiri, N. (2005). Characteristics and determinants of urban youth unemployment in Umuhia, Nigeria. In *A paper presented at World Bank Conference on Share growth in Africa held at Accra Ghana*.

Ebrahim, A., Woolard, I., & Leibbrandt, M. (2013).*Unemployment and Household formation*.

Edwards, J. R. (1991). *Person-job fit: A conceptual integration, literature review, and methodological critique*. John Wiley & Sons.

Ekert-Jaffe, O., & Solaz, A. (2001). Unemployment, marriage, and cohabitation in France. *The Journal of socio-economics*,*30*(1), 75-98.

Eita, J. H., & Ashipala, J. M. (2010). Determinants of unemployment in Namibia. *International Journal of Business and Management*, *5*(10), 92.

Erdogan, B., & Bauer, T. N. (2009). Perceived over qualification and its outcomes: The moderating role of empowerment. *Journal of Applied Psychology*, *94*(2), 557.

Feldman, D. C., Leana, C. R., & Bolino, M. C. (2002). Underemployment and relative deprivation among re-employed executives. *Journal of Occupational and Organizational Psychology*, *75*(4), 453-471.

Feldman, D. C., & Turnley, W. H. (1995). Underemployment among recent business college graduates. *Journal of Organizational Behavior*, *16*(S1), 691-706.

Feldman, D. C., & Turnley, W. H. (2004). Contingent employment in academic careers: Relative deprivation among adjunct faculty. *Journal of Vocational Behavior*, *64*(2), 284-307.

Feldmann, H. (2010). Government size and unemployment in developing countries. *Applied Economics Letters*, *17*(3), 289-292.

Fernandez, R. M., Castilla, E. J., & Moore, P. (2000). Social capital at work: Networks and employment at a phone center.*American journal of sociology*, *105*(5), 1288-1356.

Ferrer, R., & Azmat, G. (2015). *Gender Gaps in Performance: Evidence from Young Lawyers* (No. 604).

Fields, G. S. (2004). Dualism in the labor market: a perspective on the Lewis model after half a century. The Manchester School, 72(6), 724-735.

Fields, G. S. (2011). Labor market analysis for developing countries. *Labour Economics*, *18*, S16-S22.

Finney, M. M. and J. E. Kohlhase (2008), 'The Effect of Urbanization on Labor Turnover', Journal of Regional Science, Vol. 48,No. 2, pp. 311–28.

Fogg, N. P., Harrington, P. E., & McMahon, B. T. (2011). The underemployment of persons with disabilities during the Great Recession. *The Rehabilitation Professional*, *19*(1), 3-10.

Font, J. C., Fabbri, D., & Gil, J. (2010). Decomposing cross-country differences in levels of obesity and overweight: does the social environment matter?. *Social Science & Medicine*, *70*(8), 1185-1193.

Fujita, S., & Moscarini, G. (2017). Recall and unemployment. *American Economic Review*, *107*(12), 3875-3916.

Gerxhani, K. (2004). The informal sector in developed and less developed countries: a literature survey. *Public choice*,*120*(3-4), 267-300.

Gindling, T. H. (1991). Labor market segmentation and the determination of wages in the public, private-formal, and informal sectors in San Jose, Costa Rica. *Economic Development and Cultural Change*, *39*(3), 585-605.

Giroud, X., Mueller, H. M., Stomper, A., & Westerkamp, A. (2011). Snow and leverage. *The Review of Financial Studies*, *25*(3), 680-710.

Gokalp, O. N., Lee, S. H., & Peng, M. W. (2017). Competition and corporate tax evasion: An institution-based view. *Journal of World Business*, *52*(2), 258-269.

Golub, S., & Hayat, F. (2014). Employment, unemployment, and underemployment in Africa.

Gordon, D. F. (1974). A neo-classical theory of Keynesian unemployment. *Economic Inquiry*, *12*(4), 431-459.

Gorg, H., & Strobl, E. (2003). The incidence of visible underemployment: Evidence for Trinidad and Tobago. *Journal of development studies*, *39*(3), 81-100.

Granovetter, M. (1995). *Getting a job: A study of contacts and careers*. University of Chicago press.

Green, A. E., De Hoyos, M., Li, Y., & Owen, D. (2011). Job search study: Literature review and analysis of the Labour Force Survey. *Department for Work and Pensions Research Report*, *726*.

Greenwood, A. M. (1999). International definitions and prospects of underemployment statistics. *Proceedings for the Seminario sobre Subempleo, Bogota*, 8-12.

Gueutal, H. G., & Taylor, E. M. (1991). Employee pregnancy: The impact on organizations, pregnant employees and co-workers. *Journal of Business and Psychology*, *5*(4), 459-476.

Gunther, I., & Launov, A. (2012). Informal employment in developing countries: Opportunity or last resort?. *Journal of development economics*, *97*(1), 88-98.

Haataja, A., Kauhanen, M., & Natti, J. (2011). Underemployment and part-time work in the Nordic countries.

Hakim, C. (1997). A sociological perspective on part-time work.

Hall, R. E., Gordon, R. A., & Holt, C. (1970). Why is the unemployment rate so high at full employment?. *Brookings papers on economic activity*, *1970*(3), 369-410.
Hansel P. M.: 1977, 'The measurement of labour utilization - more empirical results', Malayan Economic Review 22, pp. 10-23.

Harati, R. (2013). Heterogeneity in the Egyptian informal labour market: choice or obligation?. *Revue d'économie politique*, *123*(4), 623-639.

Harris, J. R., & Todaro, M. P. (1970). Migration, unemployment and development: a two-sector analysis. *The American economic review*, *60*(1), 126-142.

Heath, A. (1999). *Job-search methods, neighbourhood effects and the youth labour market*. Reserve Bank of Australia.

Heckman, J. J., & Hotz, V. J. (1986). An investigation of the labor market earnings of Panamanian males evaluating the sources of inequality. *Journal of Human resources*, 507-542.

Heintz, J., & Pickbourn, L. (2012). The determinants of selection into non-agricultural self-employment in Ghana.*Margin: The Journal of Applied Economic Research*, *6*(2), 181-209.

Helsley, R. W. and W. C. Strange (1990), 'Matching and Agglomeration Economies in a System of Cities', Regional Science andUrban Economics, Vol. 28, pp. 189–12.

Hoon, S., Keizer, R and Dykstra, P., (2014) Marriage and Female Wages: Do Married Women Pay a Penalty or Earn a Premium? Department of Sociology, Erasmus University Rotterdam

Holtom, B. C., Lee, T. W., & Tidd, S. T. (2002). The relationship between work status congruence and work-related attitudes and behaviors. *Journal of Applied Psychology*, *87*(5), 903.

Holzer, H. J. (1988). Search method use by unemployed youth. *Journal of labor economics*, *6*(1), 1-20.
Huber, P., & Rahimov, U. (2017). The Self-Selection of Workers to the Formal and Informal in Transition Economies: Evidence from Tajikistan. *Finance a Uver*, *67*(2), 140.

Hunter, B., & Gray, M. (2004). Patterns of Indigenous job search activity.

Hussmanns, R. (2007). Measurement of employment, unemployment and underemployment–Current international standards and issues in their application. *Bulletin of Labour Statistics*, *1*, 2007-2001.

Irfan, S. (2011). Modelling wages of females in the UK. *International Journal of Business and Social Science*, *2*(11).

ILO (2004). A Fair Globalization: Creating Opportunitiesfor All. Geneva: International Labour Office

ILO (2008), Global Employment Trends for Youth, International Labour Office, Geneva.

ILO, (2015) Five facts about informal economy in Africa.

Ito, T. (2009). Caste discrimination and transaction costs in the labour market: Evidence from rural North India. *Journal of development Economics*, *88*(2), 292-300.

Ito, T. (1982). Implicit Contract Theory: A Critical Survey.

Jahoda, M. (1981). Work, employment, and unemployment: Values, theories, and approaches in social research. *American psychologist*, *36*(2), 184.

Jaumotte, F. (2003). Female labour force participation: past trends and main determinants in OECD countries.

Johnson, G. J., & Johnson, W. R. (2000). Perceived over qualification and dimensions of job satisfaction: A longitudinal analysis. *The Journal of Psychology*, *134*(5), 537-555.

Jutting, J., Parlevliet, J., & Xenogiani, T. (2008). Informal Employment Re-loaded. *IDS Bulletin*, *39*(2), 28-36.

Kamiya, Y., Akpalu, B., Mahama, E., Ayipah, E. K., Owusu-Agyei, S., Hodgson, A., .& Jimba, M. (2017). The gender gap in relation to happiness and preferences in married couples after childbirth: evidence from a field experiment in rural Ghana. *Journal of Health, Population and Nutrition*, *36*(1), 8.

Katz, L. F. (1986). Efficiency wage theories: A partial evaluation. *NBER macroeconomics annual*, *1*, 235-276.

Kay, D. D. (2011). The relationship between formal and informal employment in South Africa (Doctoral dissertation, University of Illinois at Urbana-Champaign).

Kazan, M. (2012). Underemployment: Implications for organizations. Economic Research Institute. Redmond: Economic Research Institute.

Keynes, J. M. (1936). The general theory of money, interest and employment. *Reprinted in The Collected Writings of John Maynard Keynes*, *7*.

Khan, L. J., & Morrow, P. C. (1991). Objective and subjective underemployment relationships to job satisfaction. *Journal of business research*, *22*(3), 211-218.

Kieselbach, T. (2003). Long-term unemployment among young people: The risk of social exclusion. *American journal of community psychology*, *32*(1-2), 69-76.

Kifle, T., Kler, P., & Shankar, S. (2017). *Underemployment and its impact on job satisfaction: An Australian study on part-time employment*. Griffith University, Department of Accounting, Finance and Economics

Kim, S. (1987), 'Diversity in Urban Labor Markets and Agglomeration Economies', Papers of the Regional Science Association,Vol. 62, pp. 57–70.

Kim, S. (1990), ' Labor Heterogeneity, Wage Bargaining, and Agglomeration Economies', Journal of Urban Economics , Vol. 28,pp. 160–77.

Kingdon, G. G., & Knight, J. (2004). Race and the incidence of unemployment in South Africa. *Review of Development Economics*, *8*(2), 198-222.

Kinicki, A. J., Prussia, G. E., & McKee-Ryan, F. M. (2000). A panel study of coping with involuntary job loss. *Academy of Management Journal*, *43*(1), 90-100.

Kjeldstad, R., & Nymoen, E. H. (2012). Underemployment in a gender-segregated labour market. *Economic and Industrial Democracy*, *33*(2), 207-224.

Klasen, S., & Woolard, I. (2009). Surviving unemployment without state support: unemployment and household formation in South Africa. *Journal of African economies*, *18*(1), 1-51.

Kraimer, M. L., Shaffer, M. A., & Bolino, M. C. (2009). The influence of expatriate and repatriate experiences on career advancement and repatriate retention. *Human Resource Management*, *48*(1), 27-47.

Kreyenfeld, M. (2009). Uncertainties in female employment careers and the postponement of parenthood in Germany.*European Sociological Review*, *26*(3), 351-366.

Kristof, A. L. (1996). Person-organization fit: An integrative review of its conceptualizations, measurement, and implications. *Personnel psychology*, *49*(1), 1-49.

Kristof-Brown, A. L., Zimmerman, R. D., & Johnson, E. C. (2005). Consequences of Individuals Fit at work: A meta-analysis of person –job, person-organisation, person-group and person-supervisor Fit. Personnel psychology, 58(2), 281 -342

Krueger, A. B., & Mueller, A. (2011). Job search, emotional well-being, and job finding in a period of mass unemployment: Evidence from high-frequency longitudinal data. *Brookings Papers on Economic Activity*, *2011*(1), 1-57.

Krueger, A. B., & Mueller, A. (2010). Job search and unemployment insurance: New evidence from time use data.*Journal of Public Economics*, *94*(3-4), 298-307.

Krueger, A. B., & Summers, L. H. (1988). Efficiency wages and the inter-industry wage structure. *Econometrica: Journal of the Econometric Society*, 259-293.

Kuhn, P., & Skuterud, M. (2004). Internet job search and unemployment durations. *American Economic Review*, *94*(1), 218-232.

Kumar, A., & Singh, A. (2016). Explaining the gap in the use of maternal healthcare services between social groups in India. *Journal of Public Health*, *38*(4), 771-781.

Kwami, S. (2017). The level of criminality in upper and lower class residential areas in Accra. The study of Cantonments and Jamestown.

LaPorta, R. and A. Shleifer (2008). The unofficial economy and economic development. Brookings Papers on Economic Activity 2008 (2), 275–363.

Lambert, M., Perrino, E. S., & Barreras, E. M. (2012). Understanding the barriers to female education in Ghana.*Retrieved September*, *10*, 2012.

Lawler, E. E. (1973). Motivation in work organizations. Monterey, CA: Brooks/Cole

Leana, C. R., & Feldman, D. C. (1995). Finding new jobs after a plant closing: Antecedents and outcomes of the occurrence and quality of reemployment. *Human relations*, *48*(12), 1381-1401.

Lee, C. H. (2005). A study of underemployment among self-initiated expatriates. *Journal of world business*, *40*(2), 172-187.

Lee, L. F., Maddala, G. S., & Trost, R. P. (1980). Asymptotic covariance matrices of two-stage probit and two-stage tobit methods for simultaneous equations models with selectivity. *Econometrica: Journal of the Econometric Society*, 491-503.

Lewis, W. A. (1954). Economic development with unlimited supplies of labour. *The Manchester school*, *22*(2), 139-191.

Lindbeck, A., & Snower, D. J. (1987). Efficiency wages versus insiders and outsiders. *European Economic Review*,*31*(1-2), 407-416.

Lindley, J. (2005). Explaining Ethnic Unemployment and Activity Rates: Evidence from the QLFS in the 1990s and 2000s. *Bulletin of Economic Research*, *57*(2), 185-203.

Little, R. J. (1985). A note about models for selectivity bias. *Econometrica: Journal of the Econometric Society*, 1469-1474.

Loayza, N. V. (1996). The economics of the informal sector: a simple model and some empirical evidence from Latin America. In *Carnegie-Rochester conference series on public policy* (Vol. 45, pp. 129-162). North-Holland.

Loayza, N., & Rigolini, J. (2006). Informality trends and cycles.

Locke, E. A. (1969). What is job satisfaction?. *Organizational behaviour and human performance*, *4*(4), 309-336.

Loundes, J., & Loundes, J. (1997). *A brief overview of unemployment in Australia*. Melbourne Institute of Applied Economic and Social Research.

Luksyte, A., Spitzmueller, C., & Maynard, D. C. (2011). Why do overqualified incumbents deviate? Examining multiple mediators. *Journal of occupational health psychology*, *16*(3), 279.

Mabugu, R., & Chitiga-Mabugu, M. (2013). Are social grants a threat to fiscal sustainability?.

Madamba, A. B. (1998). *Underemployment Among Asians in the United States: Asian Indian, Filipino, and Vietnamese Workers*. Taylor & Francis.

Maloney, W. F. (1998). Are Labour Markets in Developing Countries Dualistic? The World Bank: Policy Research Working Paper 1941.

Mammen, K., & Paxson, C. (2000). Women's work and economic development. *Journal of economic perspectives*,*14*(4), 141-164.

Magnac, T. (1991). Segmented or competitive labour markets. *Econometrica: journal of the Econometric Society*, 165-187.

Malhotra, N. K. (2010). Review of marketing research. In *Review of Marketing Research* (pp. ix-xvii). Vol (7). Emerald Group Publishing Limited.

Mason, G. (1996). Graduate utilisation in British industry: the initial impact of mass higher education. *National Institute Economic Review*, *156*(1), 93-103.

Mathebula, I. (2013). The determinants of time-related underemployment in South Africa. *Pretoria: Statistics South Africa*.

Mau, W. C., & Kopischke, A. (2001). Job search methods, job search outcomes, and job satisfaction of college graduates: A comparison of race and sex. *Journal of employment counselling*, *38*(3), 141-149.

Maynard, D. C., & Joseph, T. A. (2008). Are all part-time faculty underemployed? The influence of faculty status preference on satisfaction and commitment. *Higher education*,*55*(2), 139.

Mazumdar, D. (1983). Segmented labour markets in LDCs. *The American Economic Review*, *73*(2), 254-259.

McKee-Ryan, F. M., & Harvey, J. (2011). “I have a job, but...”: A review of underemployment. *Journal of Management*, *37*(4), 962-996.

McLachlan, G., & Peel, D. (2004). *Finite mixture models*. John Wiley & Sons.

Mclean, C., Carmona, C., Francis, S., Wohlgemuth, C., & Mulvihill, C. (2005). Worklessness and health–what do we know about the causal relationship. *Evidence review. London: Health Development Agency*.

Mehrotra, S., & Gandhi, A. (2013). Turnaround in India’s Employment Story. *Economic & Political Weekly*, *48*(35), 87.

Meron, M., Widmer, I., & Shapiro, D. (2002). Unemployment leads women to postpone the birth of their first child.*Population (english edition)*, 301-330.

Mintah, S., & Darkwah, S. (2018). Drivers of Informal Sector Participation of Small and Medium Enterprise in Ghana.*Scientia Agriculturae Bohemica*, *49*(1), 60-67.

Moser, C. O. (1978). Informal sector or petty commodity production: dualism or dependence in urban development? World development, 6(9-10), 1041-1064

Myrdal, G. (1968). Asian drama, an inquiry into the poverty of nations. *Asian drama, an inquiry into the poverty of nations.*

Narayanan, A. (2015). Understanding informal employment in India: competitive choice or a result of labor market segmentation?.

Nemoto, J., & Zuo, H. (2017). Is Informal Employment a Result of Market Segmentation? Evidence from China. *Australian Economic Review*, *50*(3), 309-326.

Nguyen, H. C., Nordman, C. J., & Roubaud, F. (2013). Who suffers the penalty?: A panel data analysis of earnings gaps in Vietnam. *Journal of development studies*, *49*(12), 1694-1710.

Nguyen, A. N., & Taylor, J. (2003). Post-high school choices: New evidence from a multinomial logit model. *Journal of Population Economics*, *16*(2), 287-306.

Nickell, S. (1979). Estimating the probability of leaving unemployment. *Econometrica: Journal of the Econometric Society*, 1249-1266.

Nickell, S. J. (1980). A picture of male unemployment in Britain. *Management Research News*, *3*(1), 19-20.

Nolen, P. (2017) Economic Development Theory Lecture Three

Novignon, J., & Novignon, J. (2017). Household income inequality in Ghana: a decomposition analysis. *African Journal of Economic and Management Studies*, *8*(4), 515-526.

Ntlhola, A.M (2010). Estimating the relationship between informal sector employment and formal sector employment in selected African countries

Nwabuzor, A. (2005). Corruption and development: new initiatives in economic openness and strengthened rule of law. *Journal of business ethics*, *59*(1-2), 121-138.

Nyarko, C. O., Baah-Boateng, W., & Nketiah-Amponsah, E. (2014). Determinants of Job Search Intensity in Ghana.*Margin: The Journal of Applied Economic Research*, *8*(2), 193-211.

Obeng-Odoom, F. (2011). The informal sector in Ghana under siege. Journal of Developing Societies, 27(3-4), 355-392.

O'higgins, N. (2001). Youth unemployment and employment policy: A global perspective.

O'higgins, N. (1997). The challenge of youth unemployment.*International Social Security Review*, *50*(4), 63-93.

Oliveira-Brochado, A., & Martins, F. V. (2006). *Examining the segment retention problem for the "group satellite" case* (No. 220). Universidad do Porto, Faculdade de Economia do Porto

Olsen, R. J. (1980). A least squares correction for selectivity bias. *Econometrica: Journal of the Econometric Society*, 1815-1820.

O'Neil, D. A., Hopkins, M. M., & Sullivan, S. E. (2011). Do women's networks help advance women's careers? Differences in perceptions of female workers and top leadership. *Career Development International*, *16*(7), 733-754.

Onwe, O. J. (2013). Role of the Informal Sector in Development of the Nigerian Economy: Output and Employment Approach. *Journal of Economics and Development Studies*, *1*(1), 60-74.

O'Reilly, J., Eichhorst, W., Gábos, A., Hadjivassiliou, K., Lain, D., Leschke, J., & Russell, H. (2015). Five characteristics of youth unemployment in Europe: Flexibility, education, migration, family legacies, and EU policy. *Sage Open*, *5*(1), 2158244015574962.

Osberg, L., Apostle, R., & Clairmont, D. (1986). The incidence and duration of individual unemployment: supply side or demand side?. *Cambridge Journal of Economics*, *10*(1), 13-33.

Osei-Boateng, C., & Ampratwum, E. (2011). The informal sector in Ghana. *Accra: Friedrich Ebert Stiftung*.

Otterbach, S. (2010). Mismatches between actual and preferred work time: Empirical evidence of hours constraints in 21 countries. *Journal of Consumer Policy*, *33*(2), 143-161.

Ouedraogo, I. M. (2017). Governance, Corruption, and the Informal Economy. *Modern Economy*, *8*(02), 256.

Partridge, M. D., & Rickman, D. S. (1997). Has the wage curve nullified the Harris-Todaro model? Further US evidence. *Economics Letters*, *54*(3), 277-282.

Petrongolo, B. (2004). Gender segregation in employment contracts. *Journal of the European Economic Association*,*2*(2-3), 331-345.

Pratap, S., & Quintin, E. (2006). Are labor markets segmented in developing countries? A semiparametric approach. *European Economic Review*, *50*(7), 1817-1841.

Prause, J., & Dooley, D. (2011). Youth underemployment. In *Underemployment* (pp. 59-80). Springer, New York, NY.

Preisach, C., BurkHardt, H., Schmidt-Thieme, L., & Decker, R. (Eds.). (2008). *Data analysis, machine learning and applications*. Springer.

Ponzo, M., & Scoppa, V. (2008). The Use of Informal Networks in Italian Labor Markets: Efficiency or Favoritisms?.

Portes, Alejandro, Manuel Castells and L.A. Benton (1989). The Informal Economy: Studies in Advanced and Less Developed Countries. Johns Hopkins University Press, Baltimore.

Portes, A. and Schauffler, R. (1993). Competing Perspectives on the Latin American Informal Sector, Population and Development Review, 19(1): 33–60

Potts, R. (2012). Social welfare in South Africa: Curing or causing poverty. *Penn State Journal of International Affairs*, *1*(2), 72-90.

Potts, D. (2007). The state and the informal in sub-Saharan African urban economies: Revisiting debates on dualism. Crisis States Working Paper Series, 2.

Radchenko, N. (2017). Informal employment in developing economies: Multiple heterogeneity. *The Journal of Development Studies*, *53*(4), 495-513.

Raff, D. M., & Summers, L. H. (1987). Did Henry Ford pay efficiency wages?. *journal of Labor Economics*, *5*(4, Part 2), S57-S86.

Raifu, I. A. (2017). On the Determinants of Unemployment in Nigeria: What are the Roles of Trade Openness and Current Account Balance?. *Review of Innovation and Competitiveness: A Journal of Economic and Social Research*, *3*(4), 5-30.

Rees, A. (1966). Information networks in labor markets. *The American Economic Review*, *56*(1/2), 559-566.

Reynolds, J., & Aletraris, L. (2010). Mostly mismatched with a chance of settling: Tracking work hour mismatches in the United States. *Work and Occupations*, *37*(4), 476-511.

Rosaldo, M., Tilly, C., & Evans, P. (2012). A Conceptual Framework on Informal Work and Informal Worker Organizing.

Ruiz-Quintanilla, S. A., & Claes, R. (1994). Determinants of Underemployment during the Early Career: A Longitudinal Multi-country Study.

Ruprah, I. J., & Sierra, R. (2016). Engine of Growth?: The Caribbean Private Sector Needs More Than an Oil Change.

Sabatier, M. (2000, August). Job search model with endogenous search methods: An application on young unemployment spells in France. In *th Annual congress of the European Economic Association, Bozen-Bolzano* (Vol. 30).

Sackey, H. A., & Osei, B. (2006). Human resource underutilization in an era of poverty reduction: An analysis of unemployment and underemployment in Ghana. *African development review*, *18*(2), 221-247.

Salem, M. B., & Bensidoun, I. (2012). The heterogeneity of informal employment and segmentation in the Turkish labour market. *Journal of the Asia Pacific Economy*, *17*(4), 578-592.

Salop, S. C. (1979). Monopolistic competition with outside goods. *The Bell Journal of Economics*, 141-156.

Sarstedt, M., Becker, J. M., Ringle, C. M., & Schwaiger, M. (2011). Uncovering and treating unobserved heterogeneity with FIMIX-PLS: which model selection criterion provides an appropriate number of segments?

Sarstedt, M. (2006). *Sample-and segment-size specific Model Selection in Mixture Regression Analysis. A Monte Carlo simulation study* (No. 2006-08). Discussion Papers in Business Administration.

Sastry, N. S. (2004). *Estimating informal employment & poverty in India*. New Delhi, India: Human Development Resource Centre.

Sato, Y. (2001), 'Labor Heterogeneity in an Urban Labor Market', Journal of Urban Economics, Vol. 50, pp. 313–37

Schneider, F., & Enste, D. H. (2000). Shadow economies: size, causes, and consequences. *Journal of economic literature*, *38*(1), 77-114.

Schneider, F., Buehn, A., & Montenegro, C. E. (2010). New estimates for the shadow economies all over the world.*International Economic Journal*, *24*(4), 443-461.

Schoeman, C. H., Botha, I., & Blaauw, P. F. (2010). Labour conflict and the persistence of macro underemployment in South Africa. *South African Journal of Economic and Management Sciences*, *13*(3), 272-292.

Schwartz, F. N. (1989). Management women and the new facts of life. *Women in Management Review*, *4*(5).

Seekings, J. (2015). *The'Developmental'and'Welfare'State in South Africa: Lessons for the Southern African Region*. Centre for Social Science Research.

Serneels, P. (2007). The nature of unemployment among young men in urban Ethiopia. *Review of Development Economics*, *11*(1), 170-186.

Sengenberger, W. (2011). Beyond the measurement of unemployment and underemployment. *ILO Working Paper, Geneva, International Labour Organization*.

Shapiro, C., & Stiglitz, J. E. (1984). Equilibrium unemployment as a worker discipline device. *The American Economic Review*, *74*(3), 433-444.

Shi, S. (1999). *Unskilled workers in an economy with skill-biased technology* (No. WP-99-5). Federal Reserve Bank of Chicago.

Sindzingre, A. (2006). The relevance of the concepts of formality and informality: a theoretical appraisal. In in Basudeb Guha-Khasnobis, Ravi Kanbur and Elinor Ostrom eds., Linking the Formal and Informal Economy: Concepts and Policies.

Slack, T., & Jensen, L. (2011). Underemployment among minorities and immigrants. In *Underemployment* (pp. 127-143). Springer, New York, NY.

Smirnova, N. V. (2004). *Job search behavior of unemployed in Russia* (No. 0401012). EconWPA.

Sobotka, T., Skirbekk, V., & Philipov, D. (2011). Economic recession and fertility in the developed world. *Population and development review*, *37*(2), 267-306.

Solow, R. M. (1979). Another possible source of wage stickiness. *Journal of macroeconomics*, *1*(1), 79-82.

Sorrentino, C. (1995). International unemployment indicators, 1983-93. *Monthly Lab. Rev.*, *118*, 31.

Stiglitz, J. E. (1981). *Alternative theories of wage determination and unemployment: The efficiency wage model*. Princeton University, Woodrow Wilson School.

Tam, H. (2010). Characteristics of the underemployed and the overemployed in the UK. *Economic & Labour Market Review*, *4*(7), 8-20.

Tasci, H. M. (2008). Job search and determinants of job search intensity in Turkey.

Tasci, H. M. (2005). Recent Trends in Underemployment and Determinants of Underemployment in Turkey.

Tay, L., & Harter, J. K. (2013). Economic and labor market forces matter for worker well-being. *Applied Psychology: Health and Well-Being*, *5*(2), 193-208.

Tonah, S. (2007). The unending cycle of education reform in Ghana. *Education*.

Trost, R. P. (1979). *The Estimation and Interpretation of Several Selectivity Models* (No. CNA-PP-251). CENTER FOR NAVAL ANALYSES ALEXANDRIA VA INST OF NAVAL STUDIES.

Turnham, D., & Jaeger, I. (1971). The Employment Problem in Less Developed Countries. A Review of Evidence.

Tybout, J. R. (2000). Manufacturing firms in developing countries: How well do they do, and why?. *Journal of Economic literature*, *38*(1), 11-44.

Valletta, R., Bengali, L., & Van der List, C. (2016). Cyclical and market determinants of involuntary part-time employment.

Veliziotis, M., Matsaganis, M., & Karakitsios, A. (2015). *Involuntary part-time employment: perspectives from two European labour markets* (No. 15/02). Herman Deleeck Centre for Social Policy, University of Antwerp.

Vuluku, G., Wambugu, A., & Moyi, E. (2013). Unemployment and underemployment in Kenya: A gender gap analysis. *Economics*, *2*(2), 7-16.

Walling, A., & Clancy, G. (2010). Underemployment in the UK labour market. *Economic & Labour Market Review*, *4*(2), 16-24.

Wanberg, C. R., Kanfer, R., & Rotundo, M. (1999). Unemployed individuals: Motives, job-search competencies, and job-search constraints as predictors of job seeking and reemployment. *Journal of Applied psychology*, *84*(6), 897.

Watt, J. D., & Hargis, M. B. (2010). Boredom proneness: Its relationship with subjective underemployment, perceived organizational support, and job performance. *Journal of Business and Psychology*, *25*(1), 163-174.

Weber, A., & Mahringer, H. (2008). Choice and success of job search methods. *Empirical Economics*, *35*(1), 153-178.

Webster (2009) Worker controls as a facilitator in the match between education and job skills. British Journal of industrial relations, 47; 723 -470

Wheeler, C. H. (2001), 'Search, Sorting, and Urban Agglomeration', Journal of Labor Economics, Vol. 19, pp. 879–99

Wills, G. (2009). South Africa's informal economy: A statistical profile. *WIEGO Urban Policies Research Report*, (7).

Wilkins, R. (2004). The extent and consequences of underemployment in Australia.

Wilkins, R. (2007). The consequences of underemployment for the underemployed. *Journal of Industrial Relations*, *49*(2), 247-275.

Wilkins, R. (2006). Personal and job characteristics associated with underemployment. *Australian Journal of Labour Economics*, *9*(4), 371.

Wilkins, R., & Wooden, M. (2011). Economic approaches to studying underemployment. In *Underemployment* (pp. 13-34). Springer, New York, NY.

Winkelmann, R. (2014). Unemployment and happiness. *IZA World of Labor*.

Woltermann, S. (2002). *Job-Search Methods and Labor Market Transitions in a Segmented Economy-Some Empirical Evidence from Brazil* (No. 88). Discussion Papers, Ibero America Institute for Economic Research.

Wooden (1993) Underemployment in Australia, Labour Economics and productivity 5(2): 95:110

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*. MIT press.

World Bank. (1995). World Development Report 1990. Washington: World Bank.

World Bank (2013) what business experience, Enterprise Survey Washington: World Bank. Retrieved from http://www.enterprisesurveys.org/data/exploreeconomies/2013/ghana#crime

Yellen, J. (1995). Efficiency wage models of unemployment. In *Essential Readings in Economics* (pp. 280-289). Palgrave, London.

Yu, K. (2016). *Do informal workers suffer an earnings penalty? A panel data analysis of earnings gaps in South Africa* (Doctoral dissertation).

Yu, D. (2009). *The comparability of Labour Force Survey (LFS) and Quarterly Labour Force Survey (QLFS)* (No. 08/2009).