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CHILD DISABILITY AND MOTHER'S LABOUR FORCE PARTICIPATION

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DEPARTMENT OF ECONOMICS

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DECLARATION

I, MERCY OPOKU, hereby declare that this thesis is the original research undertaken by me under the guidance of my supervisors; and with the exception of references to other people's work which have been duly cited, this thesis has neither in part nor in whole been submitted for another degree elsewhere.

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ABSTRACT

The world and especially, Sub-Saharan Africa (SSA) continues to experience relatively low female labour force participation rates– a phenomenon mainly attributed to childbirth and childcare, coupled with the primary role of being the caretaker of the home. However, the growing phenomenon of increased female labour force participation in recent times has caught the attention of researchers and development practitioners because of its usefulness in measuring gender inequality.

The study draws on the Ghana Living Standards Survey Round Seven(GLSS VII), to investigate the effect of child disability on maternal labour force participation. It applies the probit and multinomial logistic models to estimate the effects that child disability has on maternal employment status and the type of employment chosen after the incidence of child disability. Also, to account for endogeneity bias, differences in a mother's ability to handle children were considered.

The study finds a negative but insignificant correlation between child disability and mother's employment status which suggests that mothers with children who are disabled are less likely to be employed. Taking the types of disabilities into consideration on mother's employment status, only sensory disability predicted mother's employment status. Mothers with children who had a sensory disability are 17.1 percent less likely to be employed. Considering mothers' choice of employment, we observe a positive correlation between child disability and no employment and a negative correlation for formal and informal employment. We suggest that policies or programmes that provide childcare centers or services and after school careservices in schools can greatly help release mothers for labour market activities.

DEDICATION

I dedicate this thesis to the Sovereign God who reigns in majesty now and forever; and to my parents – Mr and Mrs Opoku who gave out all they had to raise me and give me education; and to all who advised, taught and supervised me to produce this material.

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ACRONYMS

ADHD/DD Attention Deficit/ Hyperactivity Disorder, Attention Deficit Disorder

AFDC Aid to Families with Dependent Children

CRPD Convention on the Right of Persons with Disabilities

FLFP	Female Labour Force Participation
GDP	Gross Domestic Product
GLSS	Ghana Living Standards Surveys
ICT	Information Communication and Technology
ILO	International Labour Organization
LFP	Labour Force Participation
LFPR	Labour Force Participation Rate
MEPS	Medical Expenditure Panel Survey
MoGCSP	Ministry of Gender, Children, and Social Protection
NEP	National Employment Policies
PHC	Population and Housing Census
PwD	Persons with Disability
SSA	Sub Saharan Africa
SSI	Social Security Income
SDGs	Sustainable Development Goals
UN	United Nations
USA	United States of America
WFP	World Food Programme
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

1.1Introduction

This chapter introduces the study by giving some facts associated with child disability, globallabour force and Ghana labour force as well. It also states the problem, gives the research questions, objectives of the study and how this study is significant as well. Finally, it outlines the order of the study.

1.2 Background Study

The labour force refers to the proportion of the working-age population who are either employed or unemployed. In 2018, the global working-age population, comprising women and men, aged 15 years and older was 5.7 billion of which 3.3 billion were in employment and 172 million were unemployed. Thus, the global labour force stood at 3.5 billion in 2018, which represents approximately 61 percent of the world's working-age population (1LO, 2019). Labour force participation (LFPR) refers to the proportion of a country's working-age population that engages actively in the labour market. These include persons who are either working (employed) or looking for work (unemployed) (ILO, 2018).

Female labour force participation (FLFPR) refers to females' (over the working age of a country) that engages actively in the labour market (that is, the sum of females of the working-age population who are employed or unemployed). FLFP has been extensively studied in many countries in recent years (Hosney, 2015; Mon, 2000; Bbaale, 2008, Bbaale and Mpuga, 2011;

Yakubu, 2010; Powers 2001, 2003; Baah-Boateng et al., 2013; Betilde, 2007; Sackey, 2005) because of its importance to the immediate country and the world at large.

\Female labour force participation is very useful in measuring the progress towards gender equality (Amoateng et al., 2003). As a result, the United Nations (UN) in its 17 Sustainable Development Goals (SDGs) clearly seeks gender equality and reduced inequality (Goals 5 and 10) among member nations. These goals aim at eliminating all forms of discrimination, violence and harmful practices against all women and girls everywhere and seek to ensure full and effective participation and opportunities for leadership at all levels of decision making in the political, economic and public life. A policy like the "25 by 25" by the G20 aims at reducing gender inequality by reducing the gap in participation rates between men and women by 25 percent by the year 2025. In spite of these goals and policy implementations around the globe, gender gaps persist.

As of 2018, the LFPR of women aged 25-54 was 63 percent while that of men of the same age group was 94 percent (UN Women, 2018). When the younger (15 years and up) and the older women (aged 55 and above) are included, in 2018, women's global LFPR was lower at 48.5 per cent which was 26.5 percentage points below that of men (ILO, 2018). Globally, the gender wage gap is estimated to be 23 per cent, which implies that women earn 77 per cent of what men earn (UN Women, 2018).

Ghana, as a member country in pursuance of these goals, has implemented several policies aimed at increasing FLFP and decreasing gender gaps in the labour market. For example, the Vision 2020 (which aimed to reduce poverty, increase employment opportunities and average incomes, and reduce inequalities to improve the general welfare and the material well-being of all

Ghanaians (Baah-Boateng, 2012); the National Employment Policy (NEP) in 2014 (to create gainful and decent employment opportunities for the growing labour force and to improve living conditions for economic growth and development within a framework of equity, fairness and security (NEP, 2014); and the National Gender Policy in 2014 (which also provides broad guidelines, strategies and institutional framework to ensure government commitment for achieving gender equality and women empowerment (MoGCSP, 2015). Although these policies sought to reduce the gender gap in the economy, inequality persists in the country.

According to the Ghana Living Standards Survey Round Seven (GLSS VII), FLFP rate was at 69.7 per cent in 2017 and 72.3 for male'sper cent in the same year. Employment-to-population ratio was 65 per cent of which 66.9 per cent were males and 63.3 per cent were females. The proportion of the Ghana's labour force reported to be unemployed was 8.4 per cent in 2017 of which 9.2 per cent were females and 7.5 per cent were males. Greater Accra Region and Ashanti region of Ghana had a high incidence of unemployment rates of 11.8 per cent and 10.3 per cent respectively.

A mother's labour market activities are believed to be influenced by her health status and the health of her children (Wolfe and Hill, 1995). Health is defined as "a state of physical, mental, and social well-being and not merely the absence of disease or infirmity of an individual" (WHO). "Health conditions can be visible or invisible; temporary or long term; static, episodic or degenerating; painful or consequential" (WHO, 2011). A mother's poor health is a strong deterrent to her labour market attachment (Powers, 2003; Porterfield, 2002).

The subject of child health and its influence on maternal labour supply and family income is of growing importance due to the significant increase in child health problems across the globe.

Corman et al. (2005) suggest that children's health affects family resources and supports the notion that children's health determines a family's economic activities. This is true considering the costs that are borne by families with children in poor health.

The costs associated with a child in poor health come in two forms. They include direct and indirect costs borne by the family (WHO, 2011). Direct costs attend in the form of additional costs that families incur to achieve a standard of living equivalent to that of a healthy child. These additional spending go towards healthcare expenditures (Jacobs and McDermott, 1989). Indirect costs can be economic or non-economic (Sickness, Disability and Work, 2019). The major components of economic costs are the loss of productivity from the exit from work and/or reduced working hours by family members (WHO, 2011).

Disability is known to be an extreme form of poor health in both adults and children, where the conditions of people are judged to be significantly impaired relative to the usual standard of an individual. According to the United Nations Convention on the Right of Persons with Disabilities (CRPD), Persons with Disabilities (PwD) "include those who have long term physical, mental, intellectual or sensory impairment, whose interactions with various barriers may hinder their full and effective participation in society on an equal basis with others".

Based on the 2010 population estimates and the 2004 Disability Prevalence estimates by the World Health Survey and Global Burden of Disease, about 785 to 975 million persons who were 15 years and older had some form of disability, 110 to 190 million of these estimates had a severe disability (WHO, 2011) of which the aged represented a high percentage due to accumulated health risks across their life span of diseases, injuries and chronic illness. Including children, over a billion (or about 15 per cent) of the world's population were estimated to be

living with a disability (WHO, 2011). The Global Burden of Disease reported that the number of children who were experiencing moderate and severe disability aged `0-14` years were 93 million with 13 million of these children facing severe difficulties.

In Ghana, the 2010 Population and Housing Census (2010 PHC) reported that 737, 743 persons were partially and completely disabled which represented about 3 per cent of the total population. Disability is classified into sight, speech, hearing, emotional, physical, intellectual and other disability conditions. Sight impairment represented the highest recorded impairment of 40.1 per cent, followed by physical disability with a percentage of 25.4 and then speech impairment for the lowest proportion of 13.7 per cent. Disability is more pronounced in the rural areas. The proportion of the disabled who lived in rural areas represents 3.3 per cent while that of the urban areas represent 2.7 per cent. This number increased in the 2021 Population and Housing Census (2021 PHC). About 8 per cent that is 2,098,138 of the population had varying degrees of disability andwas higher among females and that was 8.8 per cent than males, which was 6.7per cent. The proportion of the population with varying degrees of disability in rural areas (9.5per cent} was higher than in the urban areas which was 6.5per cent. Those living in rural areas are more likely to be prone to infectious diseases because they are less likely to have access to appropriate health care services (Ghana Statistical Service, 2014). As a result, an illness that would have required little medical attention is left unattended to and it grows to becomeimpairment. These counts show the increasing number of disability in the country and therefore the need for this study.

Children (0-19 years) represented approximately 26 per cent of the disabled of which 27.3 per cent are males and 22.8 per cent are females. In this age group, 22.3 per cent were found in rural

localities and 26.2 per cent lived in urban localities. The Ashanti region has the highest percentage (16.9%) of disabled persons followed by Greater Accra (14.1%), Eastern region (12.8%) and then Volta region (12.4%) (2010 PHC).

Children with chronic conditions are becoming an increasingly prevalent phenomenon as the world's population continues to rise and as a result, an increasing number of mothers with children who are disabled are faced with both the direct and indirect cost of having a child in poor health.

For instance, considering the disability estimates on Ghana, disability was prevalent in the Greater Accra and Ashanti regions, likewise the estimates for unemployed females in these regions. With the subject under discussion, one could easily conclude that the high incidence of disability in these areas contributes to the higher levels of unemployment in these regions; however, this is yet to be empirically tested. This has become a great concern to families, nations and the world at large in both the short-run and long-run as these mothers and the families of these disabled children continue to suffer the economic loss of having such children. Therefore, it is very important to investigate the labour force participation of mothers with disabled children for policy implications.

Some mothers choose to be at home when their children are very young and re-enter the labour market when their children are matured. However, this can be sometimes far different from mothers with children who are disabled as the care required by these children is different compared to children without disability. The decision taken by mothers to re-enter the labour force is mostly dependent on the constraint the disability imposes, that is either a financial constraint or a time constraint (Gould 2004; Simo 2017).

Child disability often requires the family members to adjust resources such as time and money and this can significantly change the labour supply behaviour of parents, especially mothers since they are assumed the primary custodian of children. Parents are faced with a financial burden, whichcomes in the form of additional spending towards healthcare services, assistive devices, costlier transportation options, special diets, personal assistance and among others (Jacobs and McDermott, 1989). Researchers have attempted to calculate these costs by asking mothers of the disabled to estimate them by pricing the goods and services the disabled need and by comparing actual spending patterns of people with and without disabilities or by using econometric techniques (Gould, 2004; Simo, 2017; Zan, 2012; Zan and Scharff, 2014). It is hypothesized that if a child's disability increases the financial burden on the family, mothers (especially single mothers) are forced to supply more labour to provide for the healthcare needs of the child. In effect, child disability then increases the mother's labour supply (Gould, 2004; Zan, 2012).

Mothers are also faced with time burden that comes with disabled children especially in the absence of childcare (paid or unpaid). Mothers reduce labour supply by reducing working hours to care for their disabled children. Mothers may be even required to exit the labour force if the time burden imposed by the disability is great. Researchers have estimated the time burden faced by mothers with disabled children by considering if the presence of a disabled child causes mothers to reduce their working hours or leisure, or takes mother from full employment to part time/seasonal employment or reduces mother's earnings.

Previous studies have examined the relationship between child poor health or child disability or chronic illness and the labour supply decisions of mothers (Salkever, 1982; Powers 2001, 2003;

Loprest and Davidoff, 2004; Hatzmann et al., 2013; Gupta et al., 2013; Tilford et al., 2009; Simo, 2017; Zan, 2012). While some researchers found a negative relationship between child disability and mothers labour supply (Salkever, 1982; Powers, 2001), some found a positive relationship (Gupta et al., 2013; Simo, 2017). Others also found no significant effect between child disability and mothers labour force participation (Loprest and Davidoff, 2004). Powers (2003) gave two possible reasons for these inconsistent findings. She attributed the first reason to small sample sizes of mothers having disabled children compared to mothers without children who are disabled across countries. The second reason for the discrepancies is how child health or the disability variable is classified and defined in various studies. For example, while Powers (2001) and Porterfield (2002) classified disability by age of disabled children, Loprest and Davidoff (2004) used an aggregate measure of disability. Gould (2004) also classified disability according to the constraint illness imposes – time-intensive illnesses, high financial cost illnesses, and illnesses with unpredictable disruptions. Others also used specific chronic illness like asthma and spina bifida (Tilford et al., 2009; Feng, 2006) and some also used specific or types of disabilities primarily defined by surveys in different countries (Zan, 2012; Zan and Scharf, 2014; Simo, 2017)

Another reason could be the setting within which these relationships were examined which can alsobe linked to the level of development of the country. For example, Powers (2001), Porterfield (2002), Gould (2004), Tilford et al. (2009) examined this relationship in developed countries while Gupta et al. (2013) and Simo (2017) examined this relationship in developing countries. Some of these settings also have some form of social assistance associated with children in poor health in cash or kind that can also influence mothers labour supply decisions. For instance, Powers (2003) included the Aid to Families with Dependent Children (AFDC) and Social

Security Income (SSI) benefits given to citizens of the United States of America and found an inverse relationship between child disability and mothers labour supply, Simo (2017) on Cameroon didn't include such benefits, probably because there was none and found a positive relationship between child disability and mothers labour supply.

It could also be how heterogeneity was captured; while Powers (2001) captured heterogeneity by mother's marital status, Simo (2017) captured mother's heterogeneity according to the level of education. Marital status is chosen on the assumption that husbands relative income can increase the reservation wage of the wife and that she might find it less attractive entering the labour force while education is chosen to capture the skills and knowledge of the mother.

One important thing to be considered in examining the relationship of child's poor health on mother's labour force participation is the issue of endogeneity - where unobserved mother's characteristics can affect the probability of having a disabled child which consequentially affects her labour supply activities (Zimmer, 2007) or where mothers labour market activities can also result in having a disabled child (Zan, 2012). This makes results biased although estimates may prove the true relationship as expected. Few researchers have identified the case of endogeneity and they have attempted in correcting it (Zimmer, 2007; Corman et al., 2005; Powers, 2003; Frijters et al., 2009; Simo, 2017). Frijters et al. (2009) and Simo (2017) corrected it by mother's ability to handle and care for children. Powers (2001) corrected for endogeneity bias with longitudinal data and found that there exists a negative relationship between child disability and mothers labour force participation whiles Zimmer (2007) in using different variables to represent access to healthcare as instrumental variables found that effects disappear when endogeneity bias is being corrected.

This study seeks to fill the gap in research about women in Ghana by investigating the relationship that exists between child disability and mother's labour market outcomes by considering the effects on employment types with the cases of formal and informal settings.

1.3 Problem Statement

Low participation rates and high unemployment rates continue to persist to be an issue of women. It is being estimated that the participation gap is 42 per cent for lower-middle-income countries which is above that of the world's participation gap of 27 per cent and the unemployment gap is 1.6 per cent for lower-middle-income countries (ILO, 2018).

A reason for these gaps is the unpaid household and childcare work that is mainly performed by women (ILO, 2016). Unpaid childcare activities include bathing, feeding, playing, assisting children in studies, taking them to the hospital for medical check-ups, administering medicines, cleaning and washing their stuff. These activities, however, increase with the number of children and the poor health status of children.

Disabled or chronically ill children often require special time in their care or extra money for medical expenses, special diets, assistive devices and transportation services or both depending on the type of constraint disability imposes and the severity of the disability. In effect, weaving motherhood and work together becomes a great task for mothers with children in poor health. Mothers are therefore compelled to decrease working hours or adopt flexible working arrangements or take a career break. In the extreme, mothers may be forced to leave the labour market. These labour market outcomes, as a result of the childcare roles performed by mothers, largely contributes to the differences in human capital indicators such as education and experience therefore creating gender gaps in the labour market.

Literature has observed several factors such as education, fertility rate, household size and marital status on female labour force participation (Hosney, 2015; Mon, 2000; Ackah et al, 2009; BaahBoeteng et al, 2013; Sackey, 2005; Betilde, 2007; Mujahid, 2013; Yakubu, 2010) but less attention has been given to children's poor health status specifically on maternal labour force participation especially in less developed countries except for India and Cameroon (Gupta et al., 2013; Simo, 2017). In most developing countries, this has led to the implementation of policies and programmes that seek to increase female education and reduce fertility rate, Ghana is not an exception in this regard.

In Ghana, several studies have focused on the effects of education and fertility rate (Ackah et al., 2009; Baah-Boeteng et al., 2013; Sackey, 2005; Abraham et al., 2017) and also the effects of maternal work on childcare and nutrition (Akasise, 2017; Nkrumah, 2017) with less attention given to child health status and maternal work. It is therefore important to investigate how disabled children or children with poor health conditions in the family affect maternal labour market activities.

Researchers have explored child disability (with several disability measures) on several maternal labour outcomes. Some disability measures include the aggregate measure, specific chronic illness, specific disability measures, disability by age of children and disability by the constraint it imposes. Mother's employment status, working hours, leisure and earnings are the measures of labour market outcomes mostly examined by literature (Salkever, 1982; Powers, 2001, 2003; Porterfield, 2002; Gould, 2004; Corman et al., 2005; Gupta et al., 2013; Zan, 2012; Zan and Scharff, 2014; Simo, 2017; Tilford et al., 2009; Feng, 2006; Hatzmann et al., 2013).

One factor that influences a mother's economic activities is the flexibility of working conditions of the mother's work. This current study estimates variables that partly capture the flexibility of a mother's work to combine childcare and working activities. This will enable policymakers to implement specific policies that will be beneficial to all mothers with poor health or disabled children in the country. In view of this, the current study seeks to employ an aggregate measure of disability and author's grouped type of disability (sensory and non-sensory disabilities) as measures of disability on maternal labour market outcomes. Considering the effects on the sectors of the Ghanaian economy (formal and informal sectors) which partially capture the flexibility in mother's economic activity. The study adopts the definition of a child given by the survey of the ages of 0-14 years, 0-21 years that have some form of disability, and mothers are defined as any female who has given birth before who is either a household head or a spouse.

1.4 Research Questions

The current study seeks to provide answers to the following questions:

- What effects do child disabilities have on a mother's employment status?
- What effects do child disabilities have on a mother's employment choice?

1.5 Research Objectives

GLSS VII provides useful information for assessing the living conditions of Ghanaians. It provides information on demographic characteristics, education, health, employment, migration, remittances, information communication and technology (ICT), agriculture, enterprises, tourism,

housing, income and expenditure, financial services, assets, security, peace and governance. The objectives of this paper are to therefore utilize data from the GLSSVII to:

- Determine whether child disability causes mothers to be employed or not correcting for endogeneity bias arising from unobserved maternal characteristics by a mother's ability to handle children.
- Determine whether the types of disability (sensory and non-sensory) cause mothers to be employed or not.
- Determine the effects of child disability on mother's choice of employment - no employment, formal and informal employment after the incidence of having a disabled child in the family (where formal employment is basically defined as wage employment and informal employment refers self-employment and others)
- Determine whether the flexibility of mother's work is influence by the health conditions of their children.

1.6 Significance of the study

1) The study will be among the early studies examining the effects of child disability or child poor health on maternal labour supply in the Ghanaian setting.
2) The effects on the formal and informal employment arrangement are captured to compare the impacts in these employment sectors. This will help policymakers to implement appropriate policies that will help mothers with children in poor health in both sectors.
3) The study will also inform policymakers on how to formulate policies to increase the labour force participation of mothers with disabled children

1.7 Structure of the study

The current study comprises of five chapters. The first chapter provides the background for the study, problem statement, research questions, objectives of the study, significance of the study and description of chapters. The second chapter provides a review of the existing literature on theoretical and empirical works. The third chapter describes the theoretical model and methodology used in the study. Chapter four presents the descriptive statistics, the results and its interpretations and chapter five gives the conclusion and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter provides the theoretical reviews on female labour force participation from pioneering studies to recent studies explaining how these theories has changed and evolved over time. It then dives into empirical reviews of previous literature on the subject matter – Child disability and mother's labour force participation.

2.2 Theoretical Review

The increase in the proportion of females especially mothers in the labour market is one of the most significant rising trends worldwide (Verick, 2014) and this has gained the attention of most researchers considering the fact that they remain the primary caregivers. Most researchers have used the traditional labour supply and its extensions to the household production theory to explain female labour force participation (FLFP) (Zan, 2012; Simo 2017)

In the traditional or static labour supply, decisions are the results of utility maximization subject to constraints. The individual maximizes utility by choosing between work and leisure or the combination of both that gives the highest level of utility. Wages from work are used to purchase goods and services for consumption. The choice between these two goods (thus consumption of market goods and leisure) are constrained by the individual's time and income. The individual maximizes utility subject to the constraints of her total income (earned and unearned income) and time. At the optimal point, the utility gained (lost) from spending one more (less) unit of

currency on consumption and one less (more) unit of currency on leisure would offset the utility that would be lost (gained) by the reduction (increase) in leisure (Killingsworth et al., 1981).

From this simple analysis, this implies that the traditional model assumes a simple trade-off between leisure and the consumption of goods and services, thus it assumes these are the only two uses of time. Consequently, available time spent on caregiving responsibilities given to children with disabilities may affect the time left for women to attend to their job responsibilities.

The works of Mincer and Becker in the 1960s were very useful in the extension of the traditional model to explain the household production model. Mincer (1962) an attempt to uncover the basic economic structure which was partly responsible for increased labour force participation of married women in America recognized that the concepts of work and leisure with its proposed income and substitution effects needed critical elaboration in its application to particular groups of persons in terms of labour choices, and in this case, married women. He argues in his paper that the logical complement of leisure is broadly work; whether it includes paid work in the market place or work that is currently not paid for (non-paid work). He introduced the three-way decision among leisure, paid work and non-paid work. Non-paid activities include various forms of investment on oneself, the production of goods and services for the home and family. It is, therefore, necessary to consider the demand for hours of work at home derived from the demand by the family for home goods and services since working at home remains an exclusive occupation of many women especially with the presence of children. In his analysis, he simply argues that paid work is not the only logical substitute for leisure but also other activities that are not paid for.

Mincer (1962) opening the window to household production theory by introducing non-paid work as another element of the utility function, Becker (1965) recognized the importance of incorporating the efficiency of non-working time (thus the time used in non-paid work) in the economic analysis. He extended this theory by proposing a general theory of the allocation of time. In this theory, time can be used for either paid work or non-paid work. He systematically incorporated the cost of time on decisions about non-working activities. He states that, households are assumed to combine time and market goods to produce some basic commodities, which are very needful to them, and these commodities enter directly into their utility functions. In this case, households become both producers and people who maximize utility.

The household combines capital goods, raw materials and labour to produce useful commodities such as cleaning, feeding, child care and others just as any production firm does but for themselves. In effect, the full cost of these activities is the sum of the market prices and the time used up - direct cost and indirect costs.

The key implication of this theory is how women's employment decisions are influenced by the market wage rate and home production activities which include caring for the home, caring for children, a sick relative, and spouse. With the current study in view, mothers with disabled children also combines capital goods, raw materials and labour to produce useful commodities such as cleaning, feeding, frequent visit to the hospitals, administering drugs, etc. These home production activities increase according to the number of disabled children, severity of disability and sometimes as these disabled children grow. This would imply a negative relationship between labour force participation and home production activities that occurs as result of mothers having disabled children, that is, if more time is devoted to market activities (labour

force activities) then less time remains for non-market activities (home production activities), all things being equal. Example, changes in the structure of the family by the presence of babies or young children under age six, sick relative or disabled persons will increase the demand for home production activities, therefore, leaving less time for labour market activities. However, in this age of technological advancement where most production processes are aided by appliances, like the washing machine, blender, electric cooker, gas burners, microwave ovens and others, some basic household production activities will require less time even if the need be, leaving much time for labour market activities (Baah-Boateng et al., 2013).

2.3 Empirical Review

2.3.1 Child Health, Child Disability and Mother's Labour Supply.

Most empirical studies have confirmed that there is a negative influence on the labour supply of women with more and very young children (Connelly, 1992; Connelly and Kimmel, 2003; Ribar, 1992). Likewise, the presence of a child in poor health who need more extensive or intensive care.

Literature has explored the economic effects of having a child in poor health (Wolfe and Hill 1995; Lukemeyer et al., 2000; Kuhlthau and Perrin, 2001; Zimmer, 2007). Wolfe and Hill (1995) used data from the 1984 Survey of Income and Program Participation (SIPP) to investigate a child's health influence on a single mother's decision to work. They observed that the presence of a disabled child has a negative influence on mother's labour supply decisions.

Lukemeyer et al., (2000) studied the direct costs (in the form of out-of-pocket expenditures because of having a child with a special need) and indirect costs (in the form of maternal employment reduction of caring for chronically ill children). They observed that more than half of mothers with special-needs children indicated that care for the child acted as a limitation to work. The percentage of women reporting this limitation to the labour market increased substantially with both the number of special-needs children and the severity of the health condition. Caring for a child with severe health condition reduced the probability of mothers working by 15 per cent and mothers who were employed also worked an average of 15 hours per week which represented an average income loss of 80.52 dollars per month at the prevailing minimum wage. Kuhlthau and Perrin (2001) had similar observations. They observed that all the odd ratios for child health status were all significant and indicated that poor child health status is associated with reduced maternal labour force participation.

Zimmer (2007) also estimates the effect of child health on a wider sample of women with the assumption that child health was predetermined from birth. Zimmer utilizes data from the 1996,2000 and 2001 waves of Medical Expenditure Panel Survey(MEPS) and applies the linear probability model (LPM)to these datasets. Although the linear probabilityhas it flaw of estimated probability outcomes of the dependent variable falling below 0 or exceeding 1 depending on the value of the independent variable (which is not supposed to be so), the LPM offers two advantages over a non-linear model. First, the LPM formulation a permit use of instrumental variables (IV) analysis to account for potential endogeneity and permits a formal test of instrument validity in the presence of over identifying restrictions.It was reported that generally, child health is associated with a reduction in the labour market activities of a mother.

Mothers with less healthy children were approximately 5 per cent less likely to be employed; a mother with a child who needed mechanical or personal assistance was 7 per cent less likely to be employed and the probability of employment also decreased by approximately 5 percentage points if a mother has a child in fair or poor mental health. Hours of work reduced by 2.4 hours and 4.03 hours per week for mothers with children who had less healthy and fair or poor mental health respectively. Loprest and Davidoff (2004) on the other hand used data from the 1999 and 2000 National Health Interview Survey (NHIS) and subjected the data to a multivariate statistical regression (the probit and logit models) which is presumed to more accurate than the LPM because it outcomes for a binary dependent variable falls within the probability of 0 to 1. They failed to find any significant association between having children with special health care needs and the probability of employment as well as the number of hours worked especially by a low-income single parent. This might be due to the differences in the statistical methods used in their estimations.

Chronic illness, disability and chronic conditions are often interchangeably used and activity limitations are used as proxies for measurement (Corman et al., 2005). Disability or chronic illness is defined by Ludder-Jackson and Vessey (1996) as an ongoing health condition and one or more of the following features are present at the time of diagnosis or during the occurrence of the illness: (1) limitation of function, (2) disfigurement, (3) dependency on medication, (4) special on-going treatment at home or in school, (5) special diet and/or medical technology, and (6) need for medical care above the normal need for on-going health maintenance.

From the theoretical and empirical analysis of the home production model, one might be tempted to conclude that there should always be an inverse relationship between most children in poor

health and maternal labour supply. However, this might not always be the case as theory talks about two opposing effects related to the trade-off between home productivity and paid work-the substitution effect and income effects, and the net result of these is what determines the final decisions of the individual. The same analysis is applied to the caregiver; the net results of these effects determine her labour supply decisions. The relationship mostly captured in literature is the substitution effect neglecting the income effect.

Salkever (1982) explains that if the production care to a child in poor health is more time-intensive than the production of other goods, thus if the illness increased the marginal product of maternal time used in child care production then a decline in maternal work time will be the result. Conversely, if the child care production relating to a child in poor health is relatively less time consuming (and if the marginal product of purchased medical care is very large), maternal work time will increase, other things being equal.

Literature has explored the effects of childhood disability or children's chronic conditions on maternal employment in different countries and has yielded different results (Salkever, 1982; Loprest and Davidoff, 2004; Baker and Drapela, 2010; Bayder et al., 2007; Yamauchi, 2012; Feng, 2006; Gordon et al., 2006; Powers, 2001,2003; Porterfeild, 2002; Tilford et al., 2008; Frijters et al., 2009; Hatzmann et al., 2013; Gupta et al., 2013; Simo 2017). Powers (2003) attributed these discrepancies to smaller data sets and the differences in disability or health measures used.

Some studies have used aggregated health measure of disability to demonstrate the relationship between the effects of child disability on maternal labour supply decisions (Salkever, 1982; Loprest and Davidoff, 2004; Hatzmann et al., 2013; Gupta et al., 2013; Simo, 2017). These studies reported

different effects of child disability on maternal labour supply decisions. For example, Salkever (1982) measures disability by any child who was reported to have an activity or mobility limitation caused by chronic disease. Race and marital status-white two-parent, non-white two parents, white female-headed and non-white female-headed families captured heterogeneity. He used data from the 1972 Health Interview Survey and observed that the coefficients of disability are significantly negative, and indicated reductions of about 10 per cent in the probability of a mother working. Hatzmann et al., (2013), also found the same relationship. Loprest and Davidoff (2004) failed to find any significant association between having children with special health care needs and the probability of employment as well as the number of hours worked especially by a low-income single parent but Gupta et al. (2013) on India, and Simo (2017) on Cameroon found a significant positive relationship between child disability status and maternal labour supply. However,Gupta et al. (2013) on India, and Simo (2017) on Cameroon found a significant positive relationship between child disability status and maternal labour supply. Simo (2017) reported that child disability increases by a significant 7 per cent the probability that the mother will be employed. The severity of disability was also considered and a strong negative relationship was found to exist between mothers having a severely ill child and the probability of participating in the labour force.

Despite the simplicity in using just an indicator for the variable disability or chronic illness, some studies have proved that such measures hide the individual effects across different disabilities, which might be very useful in policymaking (Zan, 2012). Loprest and Davidoff (2004) and Simo (2017) further explored child disability by using specific disability measures to capture the individual effects of disabilities on mothers. Loprest and Davidoff (2004) used three other variables to test for individual effects of disability - activity limitation, elevated service and chronic health conditions. When these were examined separately, results showed that parents of

children with activity limitation illness were less likely to work or even if they were engaged in any economic activity, worked for fewer hours while parents of children with chronic health conditions were associated with increasing working hours. Simo (2017) also used motor disability, sensory disability and mental disability as types of deficiencies. He observed that overall; only having a child with sensory disability increased the mother's probability of working. For non-graduated mothers, both motor and sensory disabilities increased mother's probability of employment while there was no significant effect for graduated mothers (heterogeneity was captured by graduated and non-graduated mothers). The coefficient for mental disability was negative but statistically insignificant for all mothers. It was seen that these two - sensory and mental disabilities were the disabilities that obliged mothers to work more.

Lemmon (2015) created four disability groups - physical disability (which included children with only physical disability or sensory disability), neurodevelopmental disability, compounding disability and any other disability. Results proved that children's physical disabilities reduced a mother's paid employment while neurodevelopmental disability does not have any effect on mother's labour force participation. According to him, neurodevelopmental disability included illness such as autism, epilepsy, ADHD. These chronic conditions were also estimated by Zan and Scharff (2014) to have a high financial burden and as such, the influence of the financial needs of these conditions did not alter the mother's working activities. Mothers of children with compounding disabilities were more likely to be out of the labour force. Wasi et al., (2012) also used physical, sensory, and mental/emotional/cognitive disability as disability variables and found different effects on maternal labour outcomes. These differences in maternal outcomes

emphasize the need to distinguish between different kinds of disabilities when considering their effects on maternal outcomes.

Other studies used specific chronic illness as proxies for poor child health (Feng, 2006; Baydor et al.,2007; Baker and Drapela, 2010; Tilford et al., 2008). For example, Tilford et al. (2008) estimated labour market productivity costs for caregivers (primarily mothers) of children with spina bifida. Variables employed included the location of the lesion - sacral, lower lumbar and upper/thoracic lumbar, and severity of the condition was captured by the height of the lesion. They observed that the presence of a child with a spina bifida in a household decreased the average probability of having worked in the previous year by 21.5 per cent for sacral lesion, 27.3 per cent for upper lumbar and 25.5 per cent for lower lumbar. In all, caregivers of children with spina bifida worked on an annual average of 7.5 to 11.3 hours less per week depending on how severe the disability was. Baydor et al. (2007) assessed the employment behaviour of mothers who have a child with asthma. Having a child with asthma reduced the probability of full-time and part-time employment and this effect did not vary according to the mother's marital status or level of education. Feng (2006) also found decreased working hours for single mothers who have a child with asthma.

Baker and Drapela (2010) also considered the adverse effects on maternal employment decisions of mothers with children who have autism. They found that though the presence of a child with autism had an adverse effect on mother's labour force participation, the increase in the number of children of age 18 as well as families who were experiencing financial hardship were less likely to have mother's career being affected as a result of having a child with autism.

Generally, the caregiving burden of children reduces when they are growing and accordingly, mothers reconsider their decision on the allocation of time between home and work to re-enter the labour market. However, for families with disabled children, the decision of one parent not to work may be of a necessity than of a choice (Porterfield, 2002). Powers (2001) explains that the additional burden of a child with a disability on maternal labour supply is relatively low for families with young children but becomes great as children grow older. On the knowledge of this, some studies categorized child's poor health by the ages of children (Powers, 2001; Powers, 2003; Porterfield, 2002).

Porterfield (2002) measured child health status by considering the ages of children with poor health; 0-5, 6-14, and 15-19. Mothers with children under age six were significantly less likely to work regardless of the health status but single mothers were far less likely to engage in paid work if they had a young child in poor health. A significant proportion of married mothers with disabled children chose to remain out of full-time employment even when their children reached high school because of the caregiving burden accompanied by the disability.

Powers (2001) deploying longitudinal data from SIPP estimated the probability of mother's employment, hours of work and changes in their work activity over time. She found that married mothers with disabled children were more likely to be out of the labour force and even worked for fewer hours probably because of higher household income or the earnings of their husbands. However, these mothers were also not likely to be out of the labour force or reduce their working hours in one or two years later.

Though many studies have used several measures of disability to determine the labour supply of mothers, it is better estimated when one is aware of the economic costs of illness for a good

balance in caregiver's decision because mothers labour market activities respond to the care needs (or costs) of their children (Lukemeyer et al., 2000). Child disability in the family is costly especially for low-income families (Lukemeyer et al., 2000). Child disability comes with economic costs which families incur related to caring for the disabled child. These are additional costs to those that would have been incurred in the absence of the disability condition (Jacobs and McDermott, 1989). Some researchers have tried estimating the various costs (both direct and indirect costs) that comes with it (Lukemeyer et al, 2000; Jacobs and McDermott, 1989; Zan, 2012; Zan and Scharff, 2014; Gould, 2004).

Direct costs come in the form of money outlays, which are mostly directed, to medical expenditure and indirect costs come in the form of lost productivity and earnings as a result of having a disabled child. Lukemeyer et al. (2000) measured disability-related expenses by computing the amount of money involved in the purchase of special clothes, special foods, special transportation, medicine and health care, childcare and other expenses. Findings proved that direct expenses were highly variable across families even though some families reported no expenses in the previous month, which was the referenced period for the survey. Among the families that reported some form of expenditure, 12 per cent reported a modest cost of $25 or less, 43 per cent incurred cost of $100 or more. Costs increased with the number of disabled children in the family and the severity of a disability.

Jacobs and McDermott (1989) calculated caregiver costs as the summation of costs involved in direct home costs on recurring items (such as adaptive aids for toileting, feeding, learning, special clothing and others), direct travel costs related to disability and cost for durable items and home renovations. They observed that patients of spina bifida have high expenditure until age 8

and then moderated afterwards. Family expenditure for severely emotionally handicapped children was low until age 8, followed by high expenditures until about age 14 before levelling off.Zan and Scharf (2014) also calculated the heterogeneity in the financial burden of caregiving to children in America. Results showed that epilepsy, migraine, asthma, allergies, ear infection, ADHD/DD and vision difficulty were associated with high financial costs. Relative to children without having such problems, having a child with ADHD/ADD came with an additional cost of $68 anually on healthcare and children with pervasive developmental order (example, autism) came with an additional cost of $1, 300 (annually).

Concerning indirect cost, some studies used forgone earnings, quitting jobs and reduced working hours, missed school days due to illness, number of doctor visits and hindrance to entering school (Jacobs and McDermott, 1989; Zan, 2012; Zan and Scharff, 2014; Simo, 2017). The idea is that if the number of school days missed or the number of visits to the doctor is high or prevented the child from attending school then caregivers, mostly mothers should allow more time to this kind of child. On the knowledge of this, some researchers classified illness or disabilities according to the constraints it imposes- time or financial constraints.

Gould (2004) explores how the financial and time burden of a child's poor health may affect the employment decisions of the mother. She classified illness into financially intensive, time intensive and unpredictable illness based on the nature and caregiving requirement of the illness. She examined the employment and working hours of mothers having children with any of these categories of diseases. She classified an illness to be financially intensive if the condition requires an extraordinary amount of out-of-pocket expenditure (above $750 per year) or a substantial increase in the need for an incentive for medical insurance because of the illness. Time intensive illness was grouped based on doctors' opinions if illness requires special attention

and care at home, and/or frequent visits to the doctor. Results revealed that the estimated coefficient of time intensive illness was negative and significant as expected indicating that a mother who has a child with time-intensive illness is less likely to be employed. Conversely, the estimated coefficient of financially-intensive illness was insignificant but had a positive sign as it was anticipated that mothers who have children with large medical outlays are more likely to participate in the labour force.

Zan (2012) also estimated the effects of the caregiving burden on mother's labour market behaviour in America. She improved upon Gould (2004) analyses by using two continuous variables to measure the financial burden, thus the absolute burden (the annual out-of-pocket healthcare costs and the relative burden (measured by the ratio of out-of-pocket to the family's income). She also used the number of school days missed and the number of visits to the doctors as proxies for measuring time-intensive illness and found convincing evidence than Gould did. Results proved a significant positive relationship between estimated financial burden chronic conditions and mother's employment behaviours and a significant negative relationship between time burden chronic conditions and mother's employment behaviours after controlling for characteristics of mothers, children and the family. She found that additional financial burden had greater effects on single mothers than married mothers did. Simo (2017) also found similar results.

The issue of endogeneity can also be associated with child disability and maternal labour force participation. Endogeneity causes estimates to be inconsistent and biased although a coefficient may appear to adequately reflect the hypothesized relationship. It is mainly caused by the omission of some important and predictive variables, measurement errors in independent

variables and also reverse causality where a change in the independent variable can cause a change in the dependent variable and vice versa. Employment and caregiving decisions are taken simultaneously and as a result, caregiving burdens can influence mothers labour market decisions, working hours and earnings. Also some employee's benefits can also determine caregiving decisions (Zan, 2012).An association between the child's characteristics from birth or in the process of growth and mother's employment does not establish whether the child's characteristics are truly "causing" mother's employment decision (Norberg, 1998). It might be that mothers with healthy children might differ from mothers with unhealthy children in ways that might not be observed in household surveys and as a result, these unobservable characteristics might be the factors that affect maternal work patterns and not necessarily the presence of healthy or unhealthy children (Powers, 2001; Zimmer, 2007). Mothers who are particularly 'able' and hardworking may be more careful observers of their children's health and vice versa (Powers, 2003). The issue of endogeneity has been considered by some studies (Norgberg, 1998; Powers, 2001, 2003; Corman et al., 2005; Zimmer, 2007; Simo, 2017; Frijters et al., 2009; Zan, 2012).

Norberg (1988) used the 1994 wave of the National Longitudinal Survey of Youth (NLSY) on the Americans to examine women's labour force participation after one, two, three and five years from birth. Four indicators of child health from birth were used - prematurity, intrauterine growth retardation (IUGR), congenital defects and child's length of hospitalization. IUGR, extended hospitalization and congenital defects were captured by a single variable "high risk" illness. Results proved that mothers with high-risk children from birth began work at about 13 weeks later than mothers with healthy children but mother with premature infants began working at 7

weeks earlier than mothers with full-term infants. However, after controlling for unobserved maternal characteristics with within-family fixed effects model, results changed. Unobserved maternal characteristics were controlled for by considering whether the presence of a newborn health among siblings predicted within-family differences in the timing of a mother's return to work. Findings after controlling for unobserved maternal characteristics proved that high-risk illness remained strongly significant but the prematurity becomes insignificant. About 50 per cent were likely to have worked within five years after the birth of a child who has a high-risk illness but prematurity did not predict differences in maternal employment among siblings.

Corman et al. (2005) used the number of adoption agencies per ten thousand women in the city in which the child was born and the presence of a Level III neonatal intensive care unit in the hospital where the baby was delivered as instruments and found that child's illness is completely exogenous in his study. Simo (2017) captured mother's unobserved abilities by using a dummy variable indicating if a mother had had at least three dead children though the variable was insignificant in her studies.

Zimmer (2007) used three instruments as measures of access to health care services to capture unobserved heterogeneity. Results under the assumption that child health is predetermined without correcting for endogeneity exhibited a general inverse relationship between measures of child health and maternal work activities. Adversely, results for correcting for unobserved heterogeneity revealed that none of the measures of child health appears to influence the likelihood of maternal work patterns. He concluded that "This shows that mothers with healthy children differ from mothers with unhealthy children in ways that are not observed in household

surveys and it is this differences that affect maternal work patterns not necessarily the presence of an unhealthy or healthy child per se".

Zan (2012) also used instrumental variables approach in correcting for endogeneity related to chronic illness with financial burden. She divided her sample into three groups - those with private insurance, public insurance and no insurance. Private insurance is typically associated with high income and employment and public insurance is typically associated with low income and unemployment. The basic idea was that comparison of the effects of children's chronic illness on financial burden between private and public insurance would prove whether the income level and/or employment status affected financial burden of chronic illness. She found no systematic difference in the effects of children's chronic conditions on financial burden between the private and the public insurance groups. This proved that the effect of mother's labour market activities on financial burden was not a concern.

2.3.3 Female Labour Force Participation

Previous studies have proven that one of the most personal factors that influence FLFP is education. This is mostly explained by the human capital theory (Becker, 1962). The theory postulates that just as physical capital enhances productivity so does human capital acquired through education and training. The human capital theory has been applied in many studies to explain the effects of schooling on FLFP (Sackey, 2005; Baah-Boateng et al., 2013; Abraham et al., 2017; Fadayomi and Oluranti, 2014; Betilde, 2007; Mon, 2000; Mujahid, 2013; Yakubu, 2010).

Baah-Boateng et al. (2013) utilized data from the fifth round of the Ghana Living Standards Survey (GLSS V) to examine the forces behind female labour force participation in Ghana

focusing on the role played by education and fertility for both rural and urban dwellers. Through the logistic regression model, results showed that females with basic and tertiary educational attainment were more likely to participate in the labour force compared to females with no education. Maglad, (1998), Sackey, (2005), Yakubu, (2010), Abraham et al., (2017) and Serrano et al., (2019) also concluded that education has a powerful impact on FLFP and this increased with higher educational attainment in their studies on Sub-Saharan Africa, Sudan, Ghana, South Africa, Germany and Egypt respectively.

However, Kottis (1988) found different results in his study in an attempt to examine FLFP in Greece. He experimented with two alternative variables of education - the percentage of women who had completed secondary school or higher education and the percentage of uneducated women (which included those who had no education at all and percentage of women who had completed primary level and those who did not complete secondary school). He observed that the estimated coefficient of the percentage of women with secondary or higher level of education was statistically insignificant. However, on replacing this variable by the percentage of women who were uneducated, the regression coefficient became highly significant. The insignificance of higher levels of education was therefore attributed to the relative scarcity of suitable employment opportunities for educated women, which had a discouraging effect on their entrance into the labour force. On the other hand, the significant positive effects of the uneducated women on labour force participation rate were attributed to favourable conditions in the labour market for the uneducated. Similar observations were found by Smith and Ward (1985) and it was suggested that the effects of education on FLFP rate were dependent on the stages of development of a country.

Education remains a major determinant to the choice of work. Education plays an important role in promoting access to lucrative formal sector jobs, especially employment in the public sector Baffour (2015). Thus, access to the type of employment - formal employment or informal employment, in most literature has been dependent on the level of education (Nam, 1991; Sackey, 2005; Bbaale and Mpuga, 2011; Abraham et al., 2017).

Sackey (2005) used a multinomial logistic model to estimate female employment by choice of sectors and found that the marginal impact of additional years of schooling on formal employment choice increased but also resulted in a decline for self-employment. This was significant for both urban and rural dwellers though the former was very high. The marginal impact of schooling on wage employment choice was three times higher in urban areas than in rural areas. Bbaale and Mpuga (2011) and Abraham et al. (2017) also observed that higher educational levels lead to the increased probability of women being employed in the formal sector. The reason being that they were able to meet the high requirements of the formal sector.

Considering the static model and the household production theory is the common factor of wages and non-labour income. In the static model, individuals decide simultaneously on whether to join the labour force (and the number of hours they should work) and leisure. These decisions are dependent on the wage rate and non-labour income and there exist positive substitution effects and negative income effects for leisure. Though the substitution effect and income effects of increased wages seem to pull the individual in opposite direction, the net effects depend on the strengths of both effects.

However, Motkuri (2016) in employing a quadratic form of equation to study the FLFP in rural

India found that there exist an inverse relationship between FLFP and wages. In reference to the theory of the backward bending labour supply curve, he explains that this might be due to high opportunity cost of women with respect to their leisure time or engagement in domestic duties or household's social prestige.

Non-labour income is defined as any other income derived from sources that are unrelated to the personal work of an individual. The assumption is that higher non-labour income increases the reservation wage of the individual which makes the individual less likely to participate in the labour force and this has been empirically tested to be true (Mincer, 1962; Betilde, 2007; Hosney, 2015). Previous studies have defined and constructed non-labour income variable of women in different ways. Mincer (1962) in his study of married women's labour force participation particularly defined non-labour income as the income of the husband. This strategy has been adopted by several studies (Porterfield, 2002; Gould, 2004; Tienda and Glass, 1985). Some studies constructed a non-labour income by considering certain composite variables that could determine the income of the husband. Powers (2001) used father's age, father's age squared, father's level of education and father's health. Hamid and Al-Jalali (1991) represented non-labour income with husband's job, wage rate and the number of adult male earners in the household. Simo (2017) and Gupta et al. (2013) also adopted the number of adult men working in a household in their studies.

Marital status is a major influencing factor on FLFP as women (especially those staying with their spouses and children) have greater household responsibilities than unmarried women do. Tan and Subramanian (2013) in a qualitative analysis wanted to know the cause of low growth of FLFP in the midst of marked educational attainment for women in Malaysia. They found that

about 80 per cent of females in tertiary education (who were interviewed) were willing to work after school, nevertheless half of the respondents indicated that they would not work if their husbands forbade them. Tienda and Glass (1985), Mon (2000), Gould (2004), Yakubu (2010) and Hosney (2015) observe that females who participated in the labour force were more likely to be single women and this proportion highly consisted of divorced women. However, some studies also found results contrary to these findings (Nam, 1991; Baah-Boateng et al., 2013; Abraham et al., 2017; Bbaale, 2008; Betilde, 2007; Fadayomi and Oluranti, 2014) in Korea, Ghana, Uganda, Venezuela and Nigeria respectively. Their results proved that marital status had a significant positive influence on labour force participation rate. This can be attributed to higher educational attainment as already discussed or the willingness of married women to participate in the labour force to provide a higher standard of living for themselves and their families (Fosu et al., 1999). It can also be explained that husbands with low incomes were a compelling reason for their wives to enter the labour force temporally to help settle higher bills and other household expenditures.

Other personal factors that may affect women's labour force participation include age, experience, culture/ethnicity, health and family background.

Age is reported to have a non-linear effect on female labour force participation – increasing first and decreasing later in life (Abraham et al., 2017; Sackey, 2005). Bbaale and Mpuga (2011). These literature observed that women in the age cohorts 15-19 and 45-49 were more likely to participate in the labour market although the percentage of participation was higher for the latter. This is not quite surprising since women in the age cohort 15-19 are mostly schooling or have completed the secondary level. The participation rate is observed to decline with the age cohort

35-39 when it rises again. During the declining times are the responsibilities of childbearing and child caring and much time is devoted to these home production activities. Hosney (2015), Fadayomi and Oluranti (2014) found a positive relationship between FLFP and age.

Culture is considered as one of the strongest forces that shape human behaviour and thereby economic outcomes (Bakas et al., 2019). Viewing culture in the lens of ethnic groups or race affect the behaviour, tastes and therefore choices of individuals. Zan (2012) utilizes data from the 2006-2007 National Health Interview Survey (NHIS-Sample Child) and 2004-2008 Medical Expenditure Panel Survey (MEPS-Household Component) to analyse the caregiving burden of chronically ill children and the impact it has on maternal labour market behaviour. She finds that the non-Hispanic mothers are the most responsive groups to adjust their job behaviour based on childcare burdens. Tienda and Glass (1985) also argued that women's educational attainment, age and race or ethnicity determined the marketability of women in the labour force.

Mother's health is an inevitable factor that can determine her labour supply decisions. Studies have shown that a mother's poor health has a negative influence on her labour force activities. Wolfe and Hill (1985) reported a statistically negative coefficient of mother's health (measured by poor or fair health condition) on her labour force activities. Powers (2003), Gould (2004) and Zimmer (2007) also give similar reports in their studies.

Porterfield (2002) in investigating the work choices of mothers also observed that the variable with the largest effect on mother's probability of choosing not to work at all was the disability status of the mother herself. Similarly, Bradon (2000) revealed that the disability status of the mother was a more important determinant of their labour force participation.

Job and environmental factors such as public insurance coverage (Gould, 2004; Loprest and Davidoff, 2004;), regional characteristics (Baydar et al., 2007), employment-related health insurance coverage (Baydar et al., 2007) and policies like the earned income tax credit (Moffit, 2002) also influenced women's labour force participation though these policies seem to be more prevalent in developed countries.

Some household factors like the presence of children, child health condition, the presence of young children from 0-6 years and changes in the household structure affect the labour supply decisions of the mother since she assumes the primary caregiver role of the house. Simo, (2017) and Zimmer (2007) found an inverse relationship between the presence of young children (0-5 years) and mothers labour force participation. Hosney (2015) and Fadayomi and Oluranti (2014) observed that the participation rate of females decreases with household size as females tend to be preoccupied with household activities leaving them with fewer hours for economic activities. However, Baah-Boateng et al., (2013) found a positive significant effect for women with children. According to them, the high degree of flexibility associated with the work women engaged in enabled them to combine work and household responsibilities in both rural and urban areas.

The presence of a family member with poor health can also necessitate the fact that a mother reconsiders her decisions concerning labour force participation. The family traditionally has been an important provider of care to the frail elderly and this care are provided by family members, primarily wives and adult daughters. Viitanen (2005) observed that, overall, informal elderly care decreases women's labour force participation in most European Union countries at some point in time. Cohorts of age 45-49 old women in Germany, Austria, France, Greece, and Portugal

exhibited significant negative effects in their labour force participation owing to informal elderly care and young women in Italy were constrained in labour force participation due to eldercare. Johnson and Sasso (2006) on the Americans revealed that employment rates were relatively low among women with parents whose health were poor and also informal care to elderly parents was incompatible with full time paid employment. A similar result was also found in Zheng et al. (2010) where care for parent-in-laws had a statistically significant negative effect on married women's probability of employment.

Raising and caring for children (especially young children) is ultimately seen as a primary duty of the mother. For all mothers with young children, participating in the labour market is strongly connected with the duty of caring for a child. Empirical studies have shown a negative relationship between the presence of young children in the household and mothers labour force participation as mothers are seen as the custodian of childcare services.

Powell (1997) provides estimates for Canada of the impact of childcare cost on the labour supply of married mothers by utilizing two micro datasets - the 1998 Canadian National Child Care Survey and the 1998 Labour Market Activity Survey. She found that the number of infants and pre-school age children in the family has a significant negative effect on the likelihood that a married mother participated in the labour market but the substantial amount was found for infants.

Ribar (1992) in examining married women labour supply and childcare expenditure in America also finds that labour supply decreased with the number of small children in a household. Similar results were also found by Lokshin (2000), Wolfgang (1985), Hosney (2015), Fadoyomi and Oluranti (2014), Ackah et al. (2009) and Mon (2000). However, some studies (Baah-Boateng et

al. 2013 and Lockshin 2000) find a positive relationship between the number of older children (12 years and above). For mothers with young children (especially pre-school age) to be committed to the labour market will be the need for some form of childcare - formal or informal.

Availability and affordability of childcare have been a key determinant for increased FLFP in most developed countries. Childcare can be formal (mostly provided by governments and private institutions) or informal (provided by friends, relatives or neighbours). Tienda and Glass (1985) explore the effects of extended composition households with nonnuclear members on maternal labour market activities. The presence of these people could directly influence the propensity of women with children to enter the labour force. It was emphasized that household extension with nonnuclear family members as an economic strategy recognizes that nonnuclear adults in the household may facilitate the entry of nuclear members into the labour force by taking the responsibility of some the household domestic chores. In America and Russia respectively, Compton and Pollack (2011), Posadas and Vidal- Fernandez (2012) and Lockshin (2000) observed that geographical proximity or access to grandparents, mothers and mother-in-law's childcare has substantial positive effects on maternal labour supply.

Childcare prices also play a strong role in a mother's decision about the use of formal care. Increase in childcare prices may lead to substantial changes in the labour supply of mothers (Fong and Lockshin, 2000; Connelly and Kimmel, 2003; Tekin, 2007).

Connelly and Kimmel (2003) using data drawn from the 1992 and 1993 panels of the SIPP finds a significant negative effect of childcare price on the employment of single mothers. Tekin (2007) studies the price of child care on part-time and full-time employment decisions among single mothers. It was observed that a higher childcare price was a very strong deterrent to full-

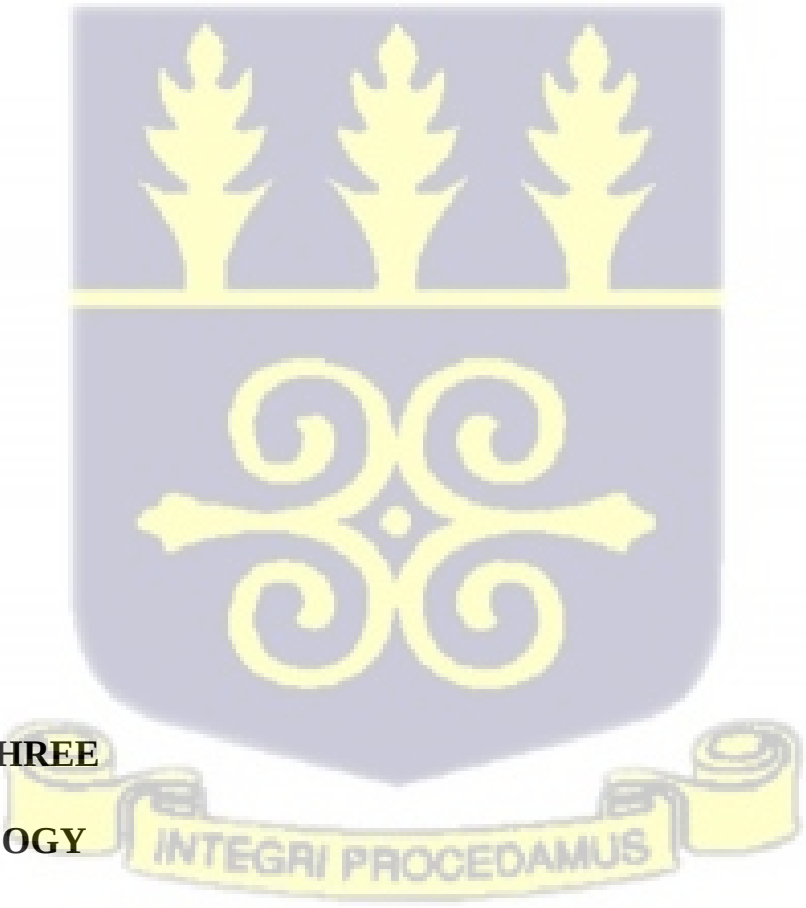
time employment than part-time employment. Anderson and Levine (1999) also find an inverse relationship between mother's labour market participation and childcare cost.

Governments of some countries (example, Canada, Germany, U.S.A) have seen the provision of childcare services as a mechanism to increase mothers' labour force participation and have therefore implemented policies to increase mothers' economic activities. Schlosser (2011) evaluates the impact of the Preschool Law which provides free and compulsory preschool education for all children aged 3 and 4 for all Israeli Arabs. She observed that maternal labour force participation increased as a result of the implementation of such a policy. Gelbach (2002) also finds that free public enrolment though not compulsory increased maternal labour supply among mothers whose youngest child was 5 years old. Casio (2007) also found that an introduction of state funding for public school kindergarten in the late 1990s increased the employment of single mothers whose children qualified for the programme. In Quebec, Baker et al. (2008) found a positive relationship between a policy that charges an amount of 5 dollars per day and renders child care service to married (and cohabiting) mothers with children up to 5 years old.

The current study closely follows Simo's study on Cameroon, which examines child disability on mothers' employment status and how various categories devised by the author affects mothers labour market participation taking heterogeneity by mother's level of education. This study also examines how child disability affects mothers labour market participation but also focuses on how child disability affects the choice of employment of a mother with a disabled child.

2.4 Summary of Chapter

The current chapter has reviewed previous literature on the static and household production model, female labour force participation, childcare and maternal labour force participation and child health, child disability and maternal labour market outcomes with issues of endogeneity being discussed. Aside the relevant understanding of the aforementioned literature and its significance contribution towards child disability and mother's labour force participation, this current study will add strength to the existing literature by estimating effects of child disability on mother's employment status and the choice of employment (formal and informal).



CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter gives a vivid explanation on the methodology used in the study and justify why the theory fits this study. It starts with the discussion of the basic theory and its changes overtime. It explains the simple linear regression model and some binary regression models and tells why the linear regression model cannot be used. It also talks about the data used in the analysis. Finally, it discusses and justifies the choice of the selected variables of interest in the study.

3.2 Theoretical model

The most common theoretical model used in modelling childcare responsibilities and female labour market participation has been the household production model (Zan, 2012; Simo, 2017; Porterfield, 2002). This study, therefore, follows the theories of the household production model that have been used in the literature mention above.

3.2.1 The Household Production Model

The fundamental theory underlying the household production model is the constrained utility maximization where individuals maximize their utility subject to their incomes and time. The ground-breaking study of Mincer (1962) in examining the rise in the labour force participation of married women actually provided another basis for the household production theory. He simply proposed that the substitute for leisure in the static model was not only paid work but also nonpaid work. Becker (1965) introduced the allocation of time where he explains that households combine time and market goods to produce goods needed for the consumption of the household and these products enter directly into their utility function. In such sense, the household becomes both a producing and a consuming unit.

The theory is very useful for this study because childcare provided by mothers involves the combination of time and market goods such as special food, special clothes, etc. to produce a certain level of quality childcare which the household consumes to derive satisfaction. However, the household is constrained by time and their total income (earned and unearned). Time is fixed and the mother allocates it among paid work, non-paid work specifically childcare, and leisure. Thus, quality childcare is dependent on the time spent on childcare and the money expenditure on childcare.

A mother, therefore, maximizes her utility function (with the quality childcare component) subject to her constraints of income and time. The decision taken by a mother is dependent on the marginal utilities and marginal products derived from the consumption of good and services and marginal products of the production processes of childcare. The ratio of the marginal utility of consumption to the marginal utility of leisure equates their relative prices and also the ratio of the marginal products of childcare time to childcare expenditure equals the market wage at the optimal level.

In reference to the law of diminishing marginal product of returns which states that holding all other inputs constant, as one input variable is increased, there is a point where the marginal increase in output begins to diminish. This implies that the marginal product of time input in childcare decreases as the time for childcare increases. Similarly, the marginal product of the financial input of childcare decreases as the financial input increases. Thus, if a child who is disabled or chronically ill demands an increasing amount of time input of care, then the marginal product of time devoted to childcare decreases. This will imply that the market wage that serves as an incentive for mothers to enter the labour force reduces and will rather serve as a

disincentive discouraging mothers to enter the labour force. Likewise, if a disabled child demands an increasing amount of money for care, then the marginal product of financial input decreases. This will then increase the market wage serving as an incentive for mothers to enter the labour force. In a nutshell, a mother with a disabled child will choose to work or not based on the relative marginal products of both the time and financial input that go into the production of quality childcare. (Zan, 2012; Simo, 2017).

3.3 Empirical Model

The aim of this study is to quantify the effect of a child's disability on a mother's labour force participation. In view of that, two main variables of labour market decision are employed. Firstly, the employment status of mothers with disabled children. We predict the employment status of mothers with disabled children. This is binary and follows that the dependent variable takes 1 (Y=1) if the mother is employed and then 0 (Y=0) if the mother is not employed. Other factors influencing the decision to work is pulled together (including her characteristics, household characteristics and geographical characteristics) and represented by vector **X** and the variable child disability is represented by **CDis**, and a set of parameters **β** reflect the impact of changes in **X** and $\boldsymbol{\gamma}$ also reflects changes in **CDis** on the probability of mother's labour market participation. Thus,

$$\Pr (Y = 1| X) = F (\beta X + \gamma CDis)$$

$$\Pr (Y = 0| X) = 1 - F (\beta X + \gamma CDis)$$

One possible solution is to retain the normal linear regression, thus the linear probability model. This takes the form

If $= \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \cdots + \beta_k X_{ki} + \gamma CDis + U_i$; where Y_i is binary so that its expected value or mean is the probability that $Y_i = 1$. Thus

$$E(Y) = Pr(Y = 1|X) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_k X_k + \gamma CDis$$

This can be estimated by the normal OLS with standard confidence intervals. The population coefficient, let's sayβ_1 on a regressor X_1 is the change in the probability that Y = 1 associated with a unit change in X_1. Similarly, the OLS predicted value $\hat{Y}_i$, computed using the estimated regression function is the predicted probability that the dependent variable equals 1, and the OLS estimator $\hat{\beta}_1$ estimates the change in the probability that Y = 1 associated with a unit change in X. This is very simple but the linearity that makes this model very simple and so easy to interpret is also its major flaw. Estimated probability outcomes of the dependent variable can fall below 0 or exceed 1 depending on the value of the independent variable which is not supposed to be so. To address this problem, we will have to provide a model that will be consistent with our predictions and these are the non-linear estimation models - the logit and probit regression models.

Thus for a given vector, we would expect (Stock and Watson, 2015)

$\lim_{X\beta \to +\infty} Pr(Y = 1|X) = 1$; or

$$\lim_{X\beta \to -\infty} Pr(Y = 1|X) = 0$$

The normal distribution has been used in many analyses given rise to the probit model.

3.3.1 Probit Model

In this model, the study assumes the mother's labour force participation (LFP_i) to be unobserved therefore the latent variable probit model is used. The latent outcome variable LFP_i^* depends on the current labour force participation status of the mother LFP_i, thus if mother participates or not.

The presence of a disabled child is included in the model as well. Thus.

$$LFP_i^* = \beta' X_i + \gamma CDis_i + \varepsilon_i \quad \text{..... (3.12)}$$

$LFP_i = 1$ if $LFP_i^* > 0$

$LFP_i = 0$ if $LFP_i^* \leq 0$

Where LFP_i^* is mother's unobserved labour force participation decision; $CDis_i$ is captured as a binary variable taking the value of 1 if the child was reported to be disabled within the two weeks preceding the survey and 0 if the child is not; ε_i is the unobserved variation related to the mother's labour market participation decision.

Child disability status is also considered to be unobserved and modelled after the latent variable probit model, thus

$$CDis_i^* = \alpha' C + \mu_i \quad \text{..... (3.13)}$$

$CDis_i = 1$ if $CDis_i^* > 0$

$CDis_i = 0$ if $CDis_i^* \leq 0$

Where C is a vector of exogenous observed characteristics that influence child disability, including a set of instrumental variables; μ_i is the error term associated with child disability; β', and α'in equations (3.12) and (3.13) are the parameters that need to be estimated. This implies that the probability that a mother participates in the labour market given her characteristics, household characteristics and the presence of a disabled child is;

$$\Pr(LFP_i^* \mid X_i; CDis_i) = \Pr(LFP_i^* > 0) = \Pr(\beta' X_i + \gamma CDis_i + \varepsilon_i) = \Phi(\beta' X_i + \gamma CDis_i) \quad \ldots\ldots (3.14)$$

Where ϕ is the cumulative density function of the standard normal distribution (Wooldridge 2002).

The parameters only give the correct sign of the effects of the variables of the exogenous variables. For example, will only give the correct sign of the effects of the variable X_K, therefore it is very necessary to compute the marginal effect for the exogenous variables. For a binary independent variable, let's say child disability(CDis);

$$\text{Marginal effect} = \Phi(\beta' X_i + \gamma CDis_i) - \Phi(\beta' X_i)$$

Simply taking the derivative with respect to the binary variables as if it were continuous provides an estimation that is often accurate.

3.3.2 Recursive Bivariate Probit Model for Testing for Endogeneity

It is likely that the non-random elements of the child disability variable (μ_i) are correlated with the error term of the mother's labour force participation (ε_i). If this occurs, then the child disability variable is endogenous. Endogeneity is basically caused by omitted variables that are

linked with both the child disability and mothers labour force participation (example, unobserved heterogeneity) or causality between child disability and mothers labour force participation.

In the presence of endogeniety, probit estimation of the effects of child disability on mother's labour force participation decisions will be inefficient and inconsistent. The study estimates the effects of a binary independent variable (thus if a child is disabled or not) on a binary outcome variable (maternal labour force participation). In view of this, an appropriate estimation procedure must be employed to account or test for this effect.

The current study adopts the recursive bivariate probit model. This model enables one to correctly estimate the effects of a binary endogenous independent variable on a binary dependent variable. The recursive bivariate model is a two-equation binary outcome model, as in equations (3.12) and (3.13) but with correlated error terms. It builds on a first reduced form equation for the potentially endogenous dummy and a second structured form of an equation which predicts the outcome of interest.

Maddala (1983) stated that the second equation is unidentified unless the covariates of the equation (which is the mother's labour force participation) included at least one variable that is not contained in the covariates of the first equation (child disability). However, Wilde (2000) refuted this assertion that provided there is one varying exogenous regressor in each equation then exclusion restrictions are not needed and as such the covariates of the second equation (mother's labour force participation) and the first equation (child disability) are not necessarily distinct repressors and can be estimated by the maximum likelihood estimator (MLE).

The target of inference is the estimate of"γ" in equation (1), the parameter of the endogenous binary explanatory variable, child disability. It is assumed that the error terms ($\varepsilon_i$and μ_i) are

identically spread as a bivariate normal zero means, constant variance and correlation coefficient rho (ρ), independently distributed across observations.*Rho* measures the correlation between the unobserved variable in child disability and mother's labour force participation equation. The exogeneity hypothesis is therefore stated in terms of the correlation coefficient ρ;

$H_0 : \rho=0$

$H_1 : \rho \neq 0$

When$\boldsymbol{\rho}$=0, this implies the error terms of child disability and mothers labour force participation are not correlated and therefore a univariate probit equation analysis will yield consistent results. Conversely if$\boldsymbol{\rho}$ $\neq$0, then there is an issue of endogeneity, therefore, the univariate probit equation will yield inconsistent results.

Statistical tests like the Lagrange Multiplier (LM), Conditional Moments Tests (CM), Likelihood Ratio (LR) and the Wald Test are used to test for the significance of the hypothesis. The first two involves a single equation probit estimation while the second two are based on simultaneous equation estimations. The LR Test is based on the MLE ofwhich its square gives the Wald Test. If the test is insignificant, then we fail to reject the null hypothesis and as such, the univariate probit equation estimation can be used but if not then there will be the need for instrumental variables to correct for endogeneity with a different estimation approach.

3.3.3 Multinomial Logistic Model

The second labour variable is the employment choice of mothers with disabled children. In this category, we consider whether mothers will fall into no employment (basically unpaid family work), informal employment or formal employment. With this, the dependent variable takes on

more than two variables. Since the outcome variable is taking on more than two variables, a multinomial response model can be used for the estimation. Multinomial probability models are also known as polychotomous or polytomous models.

The ordered probability model is a type of a multinomial response model used when the responses are ordered, thus, the value assigned to each outcome is not arbitrary but might range from" less to more" or "more to less". The multinomial logistic model is also a type of response model used when the outcomes are not ordered, thus all alternative outcomes are treated on the same footing. These are nominal outcomes. They can be estimated by the discriminant analysis, constructing two categories or making binary outcomes and using logistic regression or by using the multiple logodds (the N− 1 method)

With the multiple log-odds approaches, N−1 predicted log-odds are constructed with reference to a chosen categorical outcome (the referenced categorical outcome can be any of the outcomes since they are all treated on the same footing). These predicted log-odds are a set of equations with both dependent variables and independent variables. Considering a choice set of three outcomes – no employment, formal employment, and informal employment (thus N = 3). This implies for three categorical outcomes, we will have 2 (3 – 1) predicted log odds. Let "no employment" (represented by *noemp*) be the reference categorical outcome. The predicted log odds of informal and formal will take the following forms:

For formal employment which is represented by,

$$ln\left(\frac{\Pr(form)}{\Pr(noemp)}\right) = \alpha_0 + X_i\beta_s + \gamma CDis = Z_{form}\ (\beta, \gamma, \text{X,CDis})$$

$$\left(\frac{\Pr(form)}{\Pr(noemp)}\right) = \exp Z_{form}\ (\beta, \gamma, \text{X,CDis})$$

$$\Pr(form)=\Pr(noemp)\cdot\exp Z_{form}\ (\beta, \gamma, \text{X,CDis}) \quad (3.14)$$

Similarly, for informal which is represented by,

$$\ln\left(\frac{\Pr(inform)}{\Pr(noemp)}\right) = \alpha_1 + X_i\beta_s + \gamma CDis = Z_{inform}\ (\beta, \gamma, X, CDis)$$

$$\left(\frac{\Pr(inform)}{\Pr(noemp)}\right) = \exp Z_{inform}\ (\beta, \gamma, X, CDis)$$

$$\Pr(inform)= \Pr(noemp)\cdot\exp Z_{inform}\ (\beta, \gamma, X, CDis) \quad (3.15)$$

But $\Pr(noemp) + \Pr(form) + \Pr(inform) = 1$

Thus $\Pr(noemp) + \Pr(noemp)\cdot\exp Z_{form} + \Pr(noemp)\cdot\exp Z_{inform} = 1$

Making Pr (*noemp*) the subject, we obtain

$$\Pr(noemp) = \frac{1}{1+\exp Z_{form} + \exp Z_{inform}}$$

From equation (3.14) and (3.15),

$$\Pr(form) = \frac{\exp Z_{form}}{1+\exp Z_{form} + \exp Z_{inform}}$$

$$\Pr(inform) = \frac{\exp Z_{inform}}{1+\exp Z_{form} + \exp Z_{inform}}$$

3.4 Data Source

The study utilizes a secondary cross-sectional household data from the seventh round of the Ghana Living Standards Survey (GLSS VII), conducted by the Ghana Statistical Service (GSS) in 2016/17. The GLSS VII is the most current data of the living standard surveys conducted in Ghana and it covers a nationally representative sample of 15,000 households in 1000 enumeration areas. 14,009 households out of the 15000 were successfully surveyed giving a response rate of 93.3 percent. The sampling employed a two-stage stratified sampling design. At the first stage, one thousand (1,000) enumeration areas (EAs) were selected to form the Primary Sampling Units (PSUs). The PSUs were allocated into the 10 administrative regions using probability proportional to population size (PPS). The second stage involved a systematic selection of a fixed number of households (15 households) from each selected PSU to give 15,000 households nationwide.

The data provides detailed information on Demographic Characteristics; Education; Health; Employment; Migration and Tourism; Housing; Household Agriculture; Expenditure and Income; Governance, Peace and Security; Financial Services, Credit; and Assets. The GLSS VII provides detailed information on the economic activities of individuals as well as the working conditions of the economically active population of the country. Its health module also contains detailed information about the general health condition of the population in the two weeks preceding the interview. Merging the employment and health modules, in addition to the demographic, education and housing modules provides a unique data set for this study.

The survey shows that males constitute 48.5 percent and females constitutes 51.5 percent of the entire sample.The survey recorded a labour force participation rate (LFPR) of 70.9 percent and the employment-to-population ratio of 65.0 percent. Regarding unemployment, an estimated 1,027,594 persons 15 years and older were unemployed, out of this, 57.4 percent are females and 42.6 percent are males. The overall unemployment rate for the country is 8.4 percent.

The GLSS VII data is appropriate for analysing the effects of child disability on maternal labour force participation because;

1) It contains detailed information on each individual and their labour market activities.
2) It gives detailed information on disability considering the types of disability.
3) It also provides detailed information on household characteristics.

3.5 Description of Variables.

3.5.1 Outcome Variables of Interest.

3.5.1.1.Maternal Employment Status and Type of Employment.

The outcome variables of interest in this analysis are the labour market activities of mothers with disabled children, which is measured by two variables: employment status and type of employment. A mother in the study refers to anyone who has given birth. Mothers from age 15-49 are used for fertility reasons. These mothers are either household heads or spouses to the head of the family.

The GLSS VII data set directly gives information on the work status of all individuals in the last seven days prior to the survey. In this regard, maternal labour force participation in this analysis captures a woman engaged in any economic activity (thus employed) or women not working.

The employed consist of women who worked for pay or profit. Therefore, the employment status variable is captured as "1" if the mother engaged in any economic activity that earned her some form of profit or pay in the last seven days prior to the survey and "0" if otherwise.

The type of employment basically captures the employment of mothers in the various sectors (no employment, the formal or informal sectors). The study groups types of employment by a mother's job status. A mother is classified to be in formal employment if her job status is a paid employee, a casual worker or a paid apprentice. Although persons in these categories may not be fully formally employed, they are assumed to be formally employed in this study because these groups of people, in the survey, were asked questions that characterize formal employment of which most participants gave positive answers. Example of such questions include;Does [NAME] have a contract/agreement (written or verbal) or letter of appointment for this job? Does [NAME's] employer provide health insurance coverage (either partial or full)? Is [NAME] entitled to any social security benefits in this job? etc.

Informal employment basically refers to self-employment and any other employment (no agriculture self-employed with employees, non-agriculture self-employed without employees, non-agriculture contributing family worker, agriculture self-employed with employees, agriculture self-employed without employees, agriculture contributing family worker and domestic workers).

The last type of employment is "no employment". this variable captures those women in our sample size who are simply not working. The mother's type of employment variable is a categorical variable taking "1" if the mother is without employment "2" if the mother is in formal employment and "3" if the mother is in informal employment as defined above.

3.5.2 Treatment Variables of Interest.

3.5.2.1Child Disability

The GLSSVII provides information on the general health conditions of all respondents in the two weeks preceding the survey. The GLSS VII captures a person to be disabled if a person answered "YES" to the question "Does (NAME) have any disability?".

Following the works of Powers (2001; 2003) and Gupta et al. (2013) children from 0 to 21 years were considered. However, the definition for a child (0-14 years) according to the monograph on "Children, Adolescent and Youth in Ghana" prepared from the 2010 Population and Housing Census was also considered. Though persons, most especially teenagers (15 years and above), are not really considered as children, literature explains that these people, with cases of disability pose a great burden on mothers and caretakers and also have a great influence on mother's decision to work or not. Because the current study is interested in the effects of disability status of children, persons of the ages 0-14 and 0-21 years who answered 'Yes' or whose parents answered 'Yes' to the disability questions were captured. This is a dummy variable and it is captured as "1" if a child is reported to be disabled during the last two weeks prior to the survey and "0" if otherwise.

This study also considers the effects of classified disability types by the author on mother's employment status. The GLSS VII classifies disability into seven categories - sight, hearing, speech, physical, intellectual, emotional and other disabilities. Sight impairment includes those who are partially or completely blind. Speech impairment includes persons who have serious

communication problems (that is the speaker or listener cannot be understood). Hearing impairment include persons who have serious hearing limitations. Physical disabilities involve persons who have difficulties in moving parts of their bodies and might need human support or mechanical support. The intellectually challenged or mentally retarded are persons who have substantial limitations in their mental functioning. Emotional disability is characterized by behavioural and emotional responses which sometimes affect people and imposes stress on them. The other disability category is characterized by disabilities such as autism, cerebral palsy, epilepsy, heart disorder, and others. The study groups these disabilities in to two - **sensory disability and non-sensory disability**. Sensory disability includes disabilities that affect the senses - sight, speech and hearing disabilities. Non-sensory disability includes physical, emotional, intellectual, and the other types of disabilities.

3.5.2.2 Other Variables

Following existing literature (Baah-Boateng et al., 2013; Sackey, 2005; Ackah et al., 2009) on the determinants of maternal labour market participation are the characteristics of the mother herself. These are the mother's age in years, level of education, health status, place of residence, ethnic group, religion, marital status and the region of mother.

For the mother's age, both the linear (mother's age) and quadratic relations (mother's age squared) are included in the model in order to capture potential life cycle effects.

Mother's level of education influences her career opportunities, the probability of her participation in the labour market and the type of employment she chooses. The level of education of the mother will help us to draw a relation to the mother's labour market behaviour.

This is included in the model as a categorical variable grouped into 4 - mothers with no education, mothers with basic education, mothers with secondary education and mothers with tertiary educational attainment and above.

There is the need to also control for mother's health based on the fact that there can be a potential upward or downward bias in the effects of child disability on maternal labour outcomes when omitted. A mother's poor health can be the main reason of her inability to enter the labour market. Mother's health is a dummy and takes "1" if a mother was reported to be ill or injured during the last two weeks prior to the survey and "0" if otherwise.

Marital status of the mother helps us to disentangle the effects of the presence of a primary earning family member whose role is to cater for the needs of the family and how that affect maternal labour market activities. It is also a dummy variable and takes "1" if a mother is married or in some form of consensual union and "0" if otherwise.

A mother's ethnic group is included in the analysis to capture the culture of individuals. Culture influences the behaviour and the way of life of an individual. This variable is included as a categorical variable taking "1" if the mother is from any of the Akan ethnic groups, "2" if the mother is from any of the Ga-Adangbe ethnic groups, "3" if the mother is from any of the Ewe ethnic groups, "4" if the mother is from any of the Northern ethnic groups and "5" if the mother is from any other ethnic group.

Mother's religious' status is included in the analysis to capture various religious beliefs of the mothers. This also included as a categorical variable which takes "1" if the mother does not belong to any religious group, "2" if the mother is a Christian, "3" if the mother is a Muslim and "4" if the mother is a traditionalist.

Mother's place of residence is very important to capture the differences that exist in the characteristics of various in terms of development and the types of employment prevalent in various places. For example, the rural labour markets are largely dominated by agricultural self-employment whiles the urban places are a mixture of paid employment and non-agriculture self-employment. In this regard, child disability can have varying effects depending on the residence of the mother. Therefore, mother's place of residence is included in the model as a dummy variable ("1" if a mother dwells in the rural areas and "0" if a mother dwells in the urban areas) to capture these differences.

There were ten regions in Ghana as at the time the survey was conducted and these regions also have different levels of economic development, the natural composition (soil, climate, weather, etc.). These regional dummies basically capture the natural composition of the area which influences the mother's decision to work and the type of work she is likely to choose in the labour market in different places. It is, therefore, necessary to include regional variables to account for the differences in mother's employment status and the type of employment she engages in. This is a categorical variable and takes "1" if a mother is from a foreign country, "2" if the mother is from the Western region, "3" if the mother is from Central region, "4" if the mother is from the Greater Accra region, "5" if the mother is from the Volta region, "6" if the mother is from the Eastern region, "7" if the mother is from the Brong Ahafo region, "8" if the mother is from the Ashanti region, "9" if the mother is from the Northern region, "10" if the mother is from the Upper East region and "11" if the mother is from the Upper West region.

The size and composition of the household can be very influential in the labour force participation of the mother (Tienda and Glass, 1985; Fadayomi and Oluranti, 2014). Example,

the presence of other potential caretakers in the house, such as healthy aged persons and older siblings reduce the childcare burden on the mother and that can positively influence the mother's labour market participation decisions. Therefore, household and demographic characteristics are included in the model. They include the presence of help in the house (older persons with relations such as parent and parent-in-laws 60 years and above and the presence house help in the house), the number of males of the working age population employed in the family, the presence of children 0-5 years, the presence of children 6-14 years and the presence of a child or children who is not disabled but reported ill or injured or both in the last two weeks prior to the survey.

Since younger children require much care compared to older children (Porterfield 2002), the increase in the number of children in the younger age category (0-5 years) usually impose a higher time constraint on the mother and this affects her ability to effectively engage in labour market activities. Conversely, older children, irrespective of gender, can take a principal role in assisting and caring for their younger siblings. In effect, the presence of older children (6-14years) is captured in the model. Both variables are captured as a continuous variable.

The presence of a relative (the aged) in the family can also provide childcare to release mother for labour market activities. The presence of a house help also represents a form of paid childcare to the mother which can directly affect her labour market outcomes. The presence of older persons and house helps in the house is combined with the presence of a house help in the house to generally represent the presence of help in the house. This is also captured as a dummy variable and takes "1" if a household is reported to have the presence of at least one house help or the presence of at least one aged person in the house and "0" if otherwise.

The presence of males (of the working age population) who are employed signifies other sources of income for the mother and this sometimes raises her economic welfare and also likely to influence her reservation wage. This, in most cases, reduces the labour market participation of the mother. This is included in our analysis as a binary variable and takes "1" if a household reported the presence of such person and "0" if otherwise.

3.5.2.3Unobserved Maternal Characteristics.

Mothers could differ in a way that is not observed in surveys and it could be that these unobserved differences are responsible for mothers varying labour market outcomes (Zimmer, 2007). If this happens, then the child disability variable would be endogenous. These unobserved factors of child health and mother's labour supply could be either positively or negatively related. Following the work done by Simo (2017), this study employs a variable that captures a mother's ability to handle children. If a mother has had two children or more dead, the mother is considered to have a poor ability to handle children and as such these mothers are more probable to have disabled children that can directly affect their labour market participation.

Table 3.1: Summary of definition and expected signs of selected variables

Variables	Definition	Expected sign
Dependent variables		
Mother's employment status	whether a mother if employed "1" or not "0"	ambiguous
Mother's employment type	whether a mother is without employment "1" or formally employed "2" or informally employed "3"	ambiguous
Treatment variables		
Child disability (0-14; 0-21 years)	whether a child is disabled "1" or not "0"	ambiguous
Sensory disability (0-14; 021 years)	whether a child has a sight or hearing or speech impairment "1" or otherwise "0"	ambiguous
Non-sensory disability(014; 0-21 years)	Whether a child has physical, emotional, intellectual or other impairment "1" or otherwise "0"	ambiguous
Mother's Characteristics		
Age	age of the mother	+
Age squared	mother's age squared	-
Health status	whether the mother is in poor health "1" or not "0"	-
Highest educational attainment	whether a mother has no educational qualification '1" or basic educational attainment "2" or secondary educational attainment "3" or tertiary educational attainment	+
Religion	whether a mother has no religion "1" or a Christian "2" or a Muslim "3" or a Traditionalist "4"	ambiguous
Ethnicity	whether a mother is an Akan "1" or Ga-Adangbe "2" or Ewe "3" or from other tribes "4"	ambiguous
Place of residence	whether a mother dells in the rural area "1" or not "0"	+
Marital status	if a mother is married "1" or not "0"	-
Region	whether a mother is from a foreign country "1", "2" Western region, "3" Central region, "4" Greater Accra region, "5" Volta region, "6" Eastern region,"7" Brong Ahafo region, "8" Ashanti region, "9" Northern region, "10" Upper East region and "11" Upper West region	ambiguous

Mother's poor ability	whether a mother has had at least two dead children "1" or not "0".	
Household Characteristics		
Children (0-5 years)	number of children from 0 to 5 years	-
Children (6-14)	number of children from 6 years to 14 years	+
Presence of working males	whether there is a male of the working-age population who is employed in the household "1" or not "0".	_
Presence of a sick child	whether at least one child in the household who is not disabled is ill or injured "1" or no "0"	-
Presence of help in the house	whether there is at a least a house help present in the household or the presence of a parent or a parent-in-law(60 years and above) "1" or not "0".	+

Source: Author's compilation

3.5.3Summary of the Chapter

This chapter has explained theoretical framework on which the study is built on and also elaborates on the methodologies that are used in the study. It has also specified and explained the empirical model used for the data analysis of the current study. The current chapter has discussed the data and how the data was collected and also justified the choice of the selected variables of interest in the study.

CHAPTER FOUR

EMPIRICAL RESULTS AND DISCUSSION OF FINDINGS

4.1 Introduction

The current chapter first presents the descriptive statistics of the variables used in the estimations of the current study. It also presents the empirical results and discusses the findings of the study. To investigate the effects of child disability on mother's labour market participation, a sample of mothers with child disability isselected from the Ghana Living Standards Survey, Round Sevenand is subjected to the probit and multinomial logistic models.

4.2 Descriptive Statistics of Variables

Table 4.1a presents the summary of descriptive statistics of all the variables used in the study. The variables were generated from the GLSS VII micro data set. The dependent variables are mother's employment status and mother's type of employment. The treatment variables are the child disability variables (for both 0-14 and 0-21 years), and the types of disability - sensory and no sensory disability (for 0-14 and 0-21 years). The control variables are the mother's characteristics and household characteristics. The mother's characteristics include the mother's

age, age squared, poor health status, highest level of educational attainment, religion, ethnicity, place of dwelling, marital status, and region. Household characteristics include the number of children from 0 to 5 years, number of children from 6 to14 years, the presence of a sick child, the presence of working males and presence of help in the house.

The analytical variables used in the current study are dummy variables and categorical variables with the exception of mother's age, mother's age squared, the number of children from 0-5 years and the number of children from 6 to 14 years. The dummy variables include mother's employment status, child disability (0-14 and 0-21 years), sensory disability (0-14 and 0-21 years), non-sensory disability (0-14 and 0-21 years), mother's poor health status, mother's place of dwelling, mother's marital status, mother's ability to handle children, the presence of a sick child, presence of working males and the presence of help in the house.

From *Table 4.1a* the dummy variables have a maximum value of 1 and a minimum of 0. A maximum value of 1 implies a mother is employed for mother's employment status; a mother has a disabled child for child disability (0-14 and 0-21 years); a mother has a child who has a sensory disability (0-14 and 0-21 years) for sensory disability; a mother has a child who has a non-sensory disability (0-14 and 0-21 years) for non-sensory disability; a mother is in poor health for mother's poor health status; a mother lives in the rural area for mother's place of dwelling; a mother is married for marital status; a mother has a poor ability to handle children for mothers poor ability; households that have at least one sick child for presence of a sick child; households that have at least one male (of the working age population) who is employed for presence of a working males and households that have at least a help in the house help for the presence of help in the house. The minimum of zero represents the otherwise of these variables which are usually

the reference variables. In regards to categorical variables, the maximum values represent the number of categories of the variable and the minimum values refers to the first categorical variable which is usually the reference variable.

From *Table 4,1a* a maximum of 3 for mother's type of employment represents the three employment types used in the analysis - no employment, formal employment, and informal employment. Mother's highest educational attainment has four categories - no educational qualification, basic school attainment, secondary educational attainment and tertiary educational attainment. Mother's religion has a maximum of 4 categories - no religion, the Christian religion, the Islamic religion(Muslims) and traditionalists. Mother's ethnicity has a maximum of 5 categories - the Akans, the Ga-Adangbe, the Ewes, the Northern tribes and other ethnic groups. Mother's region has a maximum of 11 categories - mother's from foreign countries, Western region, Central region, Greater Accra region, Volta region, Eastern region, Ashanti region, Brong Ahafo region, Northern region, Upper East region and Upper West region.

Mother's employment status has a total observation of 3587 with a mean of 0.77 and a standard deviation of 0.42. Likewise, mother's employment type has a total observation of 3587 but a sample mean of 1.43 and a standard deviation of 0.83.

Considering our treatment variables, 3587 observations were found for the variable child disability between the years 0 to 21 with an average of 0.01 and a standard deviation of 0.102. This represents about 1 percent of our total sample size considered in the study. Observations for sensory disability and non-sensory disability for disabled children between the ages of 0 to 21 were also 3587 with same averages of 0.006 each and standard deviations of 0.074 and 0.078

respectively. Observations for child disability (0-14 years) were 3443 with a mean of 0.008 and a deviation of 0.091. The sensory disability observations for this child disability (0-14) is 3442 with a mean of 0.004 and a standard deviation of 0.066. Likewise, the observations, mean and standard deviation for the non-sensory disability of this child disability are 3442, 0.006 and 0.072 respectively.

For mother's characteristics, the mean age of mothers is 12.4. The youngest mother is 16 years old and the oldest mother is 49 years old with a standard deviation of 5.51 approximately. The number of observations for the variable mother's health status is also 3587 with an approximated mean of 0.15 and a standard deviation of 0.36. Mothers ethnicity had the same number of observations as the mother's health status, with a mean of 2.41 and a standard deviation of 1.40. The mean for mother's highest level of education and mother's religion are approximately 2.27 and 1.20 with standard deviations of 0.62 and 0.51 respectively. Three thousand five hundred and eighty-seven mothers reported their locality (whether they lived in a rural area or urban area). The mean and standard deviation of this variable are 0.53 and 0.50 respectively. Mother's marital status considered in the study, had an approximated mean of 0.94 and a standard deviation of 0.23. Mothers who were reported to have at least two children dead averagedof 0.03 and a standard deviation of 0.02. These are mothers who are classified to have poor ability in handling and taking care of children.

Averagely, each household has at least one child between the ages of 0 to 5 with a standard deviation of 0.85. However, some households could count as high as 6 children in this age group. Likewise, each household has at least one child who is between the ages of 6 to 14 with an approximated standard deviation of 1.13. Some mothers could also count as high as 7 children of

this age group in their household. The presence of help in the house has an approximated mean of 1.12 and a standard deviation of 0.33. Mothers who reported the presence or absence of sick children intheir homes in our analytical sample size were 3587 with a mean and standard deviation 0.25 and 0.43 respectively.

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Table 4.1a Summarry Statistics of Analytical Variables

Variables	Observations	Mean	Standard Deviation	Minimum	Maximum
Dependent Variables					
Mother's employment status	3587	0.774	0.418	0	1
Mother's employment type	3587	1.434	0.835	1	3
Treatment Variables					
Child disability (0-21 years)	3587	0.011	0.102	0	1
Sensory disability (0-21 years)	3587	0.006	0.074	0	1
Non -sensory disability (0-21 years)	3587	0.006	0.078	0	1
Child disability (0-14 years)	3343	0.008	0.091	0	1
Sensory disability (0-14 years)	3442	0.004	0.066	0	1

Non-sensory disability (0-14 years)	3442	0.005	0.072	0	1
Mother's characteristics					
Age	3587	34.292	7.915	16	49
Age squared	3587	12.386	5.507	2.56	25.01
Poor health status	3587	0.151	0.358	0	1
Highest educational attainment	3587	2.265	0.620	1	4
Religion	3587	1.203	0.508	1	4
Ethinicity	3587	2.411	1.399	1	5
Place of dwelling (rural)	3587	0.530	0.530	0	1
Marital status(married)	3587	0.942	0.234	0	1
Region	3587	6.248	2.705	1	11
Mother's poor ability	3587	0.033	0.018	0	1
Household Characteristics					
Children (0--5 years)	3587	0.857	0.849	0	11
Children (6-14 years)	3587	1.072	1.127	0	10
Presence of working males	3587	0.861	0.346	0	1
Presence of help in the house	3587	0.118	0.329	0	1
Presence of a sick child	3587	0.247	0.431	0	1

Source: Author's Compilation

In addition,the study performs a Chi square test to have a fore knowledgeof the effects of some categorical outcome on the dependent variable, whichis a mother's labour market outcome. The study takes the within row frequencies and the Pearson's Chi Square Test for this analysis.The within row frequency This shows whether these independent variables are associated with the dependent variables (thus whether mothers are employed or not).

From *Table 4.1b*shows the Pearson's Chi square test of independence for the child disability and other categorical independent variables with the dependent variable. The Chi square test of independence determines whether two categorical variables in a single sample are independent from or associated with each other (Todd, Ho and Christie, 2011).The results showthat the child disability, sensory disability, non-sensory disability, mother's health and mother's locality variables are not associated with the dependent variable thus the mother's employment status. Though the Persons test proves insignificant for these variables, it does not show how these two variables are insignificant. For instance, the p-value of the child disability variable is insignificant which means that there is no associationbetween the child disability variable and the mother's employment status. However, it cannot be told where the insignificance lies. It can be that the insignificance lies between disabled children and employed mothers or disabled children and mothers who are not employed orabled children and employed mothers or children who are not disabled and mothers who are not employed.

Likewise, other variables like mother's health and mother's locality. With the mother's health, the insignificance can lie between mothers in good health and mothers who are employed or mothers in good health and mothers who arenot employed or mothers are who are in poor health and mothers who are employed and or mothers who are in poor health and mothers who are not employed.

On the other hand, mother's education, mother's tribe, mother's religion, mother's region and child's health have a significant association with mother's employment status as found in other literature.This result doesnot truly reveal where the association is. Considering mother's education, even though research has revealed that education determines a mother's employment status, this test does not reveal where the level of significance lies; whether it lies between mothers with no education and mothers who are employed or mothers without employment, mothers with basic education and mothers with employment or no employment, mothers with secondary education and mothers with employment or no employment and or mothers with tertiary education and mothers who are employed or mothers without employment.

This implies that a more skillfullstatistical instrument will be needed to draw this specific conclusion. And this will be proven by the probit statistical method in the subsequent sections.

Table 4. 1b Chi Square Test of Independence for Categorical Variables

Variables	**Frequency**		**p-value**
	Mother's employment status		
	Employed	**Not employed**	

Child disability (0-21years)			
Disabled	21	81	0.278
Not disabled	1585	5607	
Sensory disability (0-21years)			
Sensory disabled	5943	1596	0.310
Not sensory disabled	45	17	
Non sensory disability (0-21years)			
Non sensory disabled	5640	1595	0.122
Not non sensory disabled	44	19	
Mother's health			
Good health	4916	1399	0.121
Poor health	1001	253	
Mother's marital status			
Married	5064	1480	
Single	909	190	0.000
Mother's locality			
Urban	2256	661	0.178
Single	4726	1009	
Mother's education			
No education	28	10	
Basic education	3085	807	0.001

Secondary education	354	138	
Tertiary education	370	83	
Mother's tribe			
Akan	2170	495	
Ga-Adangbe	282	64	
Ewe	746	138	0.000
Northern Tribes	2388	863	
Others	286	61	
Mother's religion			
No religion	175	49	
Christians	4152	1069	0.000
Muslims	1318	427	
Traditionalists	328	125	
Mother's region			
Foreign country	121	55	
Western region	409	98	
Central region	595	109	
Greater Accra	306	76	
Volta region	652	111	
Eastern region	581	117	0.000
Ashanti region	692	210	

Brong Ahafo	496	125	
Northern region	960	234	
Upper East	619	217	
Upper west	542	318	
Child health			
Good health	1121	3771	0.006
Poor health	381	1538	

Source: Author's Compilation

4.3 Test for Endogeneity.

The recursive bivariate estimation procedure is carried out to test for potential endogeneity. The overall fit of the model is checked by the Wald test (Wald chi2(64) =321.45) with Prob > chi2= 0.000) which shows that the model is significant. The Wald test for the rho (ρ) fails to reject the null hypothesis of zero correlation (chi2(1)=2.31752, Prob > chi = 0.1211). This means that the correlation between child disability and mother's work status is insignificant. This implies that the child disability variable is not endogenous with mother's work status, therefore a univariate probit model can be used to determine the probable outcome that child disability has on mother's labour market participation. The probit model uses the MLE technique which produces

coefficients that are not normally meaningful. In view of that, the marginal effects are estimated in order to get the real effect of change of the independent variables on the dependent variables.

The study first of all estimates the probability that a mother with at least one disabled child will be employed or not (thus mother's employment status). The study further looks at the effect a disabled child has on the type of employment the mother chooses to engage in.

The analysis is carried out on three different levels. The first model is a simple baseline model - the effect of only the child disability variable on mother's employment status. The second model controls for mother's characteristics such as mother's age, age squared, poor health status, education, ethnicity, religion, place of residence, marital status and region. The model three builds on the previous model by controlling for household characteristics (number of children aged 0-5, number of children aged 6-14, presence of a sick child, presence of working males and the presence of help in the house).

4.4 Empirical estimation.

4.4.1 Estimation and discussion of the effect of child disability on mother's employment status.

This section explores the probability that a mother with a disabled child will be employed or not. This section is in two parts. First, the aggregate measure of child disability is used to know the effect on mother's employment status. Secondly, the types of disabilities (constructed by the author) are applied to know their varying effects.

Table 4.2 shows the marginal effects for the aggregate measure of child disability on mother's employment status. It shows that, in all the models, child disability has an insignificant effect on mother's employment status as the Pearson's Chi square gave. This finding is consistent with the findings of Loprest and Davidoff (2004) as they also failed to find significant association between the aggregate measure of children with special health care needs and the probability of employment. However, the signs in all the models indicates that child disability has a negative effect on the probability that a mother gets employed and the magnitude of it increases as the mother's characteristics are added to the model. This could be probably because of the greater time burden imposed by the disability. This finding also aligns with the findings of Powers, (2003).

In model 2 and model 3, the significant and positive marginal effects of mother's age and as well as the negative effects of mother's age squared, reflects a nonlinear inverted U-shape relationship between maternal labour force participation and mother's age. This is in line with the findings of Abraham et al. (2017) and Sackey (2005). This implies that mothers increase labour force participation at younger ages and decrease it as they grow. Considering the set of mothers in our sample size, most of these mothers are traditional agriculture workers and it is reasonable for maternal labour force participation to increase at relatively early ages where mothers are still strong and decrease in older ages as their physical strength reduces as they grow.

In model 2 and 3, as anticipated, higher levels of education have a positive correlation with mother's employment status. Mothers with tertiary education have a greater chance of being employed than mothers with no education. This is consistent with literature (Ackah et al., 2009; Mon, 2000). This can be explained that these mothers are able to enhance and increase

productivity through the knowledge and skills they have been able to acquire. Therefore, employers are more readily to employ these mothers.

In model 2 and 3, we find a significant negative correlation between mother's marital status and the probability of being employed. From model 3, married mothers are 12.1 percent less likely to be employed against mothers who are not married. Though this result contradicts the findings of Betilde (2007), Fadayomi, and Oluranti (2014), it makes sense because married mothers are mostly considered to have primary income earners (husbands) which become a source of no labour income. This increases their reservation wage and makes them unwilling to participate if the reservation wage is not met.

Mother's place of residence has a significant and positive correlation with mother's employment status. Thus, mothers who dwell in the rural areas are more likely to be employed than mothers in the urban areas are. Precisely, mother's in the rural areas are 5.8 percent more likely to be employed at a 0.01 level of significance. These findings counter the work of Ackah et al., (2009) but in line with Sackey, (2005). This can be attributed to the kind and availability of work in the rural areas compared to those in the urban areas. As traditional agriculture and small-scale businesses are the types of work prevalent in the rural areas, a husband can give his wife a land to cultivate and sell the produce to earn some income. In addition, some of the jobs in these areas require less capital so mothers are able to raise start-up capitals for their small-scale businesses.

On average, the results presented in *Table 4.2* revealed that mothers from the northern ethnic groups and the Ewes had a less likelihood (even though insignificant) to be employed. This finding agrees with the findings of Baah-Boateng et al., (2013). This can be attributed to the household sizes in these ethnic groups. It could be that mothers from the northern ethnic groups

and the Ewe ethnic group have larger household sizes and as such tend to be preoccupied with household activities. This can impose a greater home production activities leaving less time or no time for the labour market activities.

The results proved that a mother's region did not predict mother's employment status. However, mothers from the upper west region and Ashanti region are less likely to work compared to mothers from foreign countries. This finding contradicts the findings of Ackah et al., (2009) as he found that mothers from the Upper West region were more likely to participate in the labour force. One probable reason could be the less availability of jobs in this region and this could also be attributed to the level of development in this region.

Likewise, mother's religion did not predict mother's employment status however, only mothers who were traditionalists were less likely to work. One probable reason could be the traditional gendered roles deeply rooted in these societies as women are taught to be caretakers of the house and men to be breadwinners.

Although the inclusion of household characteristics in model 3 changed the magnitude of the probability that rural mothers gets employed, these mothers were persistently more likely to be employed. At 1 percent significance level, mothers living in the rural areas were 6.5 per cent more likely to be employed than mothers living in the urban areas. This correlates with the findings of Sackey (2005) for the rural savannah of Ghana. One reason owing to this can the flexibility associated with the kind of jobs prevalent in these areas. Jobs in these areas are mostly informal and do not require many qualifications and capital therefore mothers are easily able to find work with which they can weave with home production activities.

The presence of males working in the family has a positive correlation with the mother's employment status. At 1 percent significance level, the presence of males who are working in the household increased by 22 percent the probability that a mother gets employed. This is consistent with the findings of Simo (2017). This is plausible in the sense that these men can be a great source of capital for mothers in the home to also start up their own business. Likewise, the presence of a child in poor health also has a positive relationship (though insignificant) with the probability that a mother was going to get employed. This finding agrees with the finding of Simo (2017).

The presence of help in the house has the expected sign but was statistically insignificant. Likewise, the number of children from 0-5 years. However, an increase in the number of children from 6-14 years increased the likelihood that a mother gets employed at 2.3 percent (at a 1% significance level). This is consistent with the findings of Baah-Boateng et al. (2013) as these children were able to release mothers from some household production activities. Another reason could be that the higher expenditure associated with this group of children compelled mothers to work more to meet their needs.

Table 4. 2. Marginal effects of child disability (0-21 years) on mother's employment status.

	Mother's employment status					
Variables	**Model 1**		**Model 2**		**Model 3**	
Child disability	-0.043	(-1.02)	-0.066	(-1.11)	-0.065	(-0.96)
Mother's characteristics						
Age			0.038***	(6.10)	0.018**	(2.28)
Age square			-0.041***	(-4.39)	-0.011	(-1.01)
Poor health			-0.014	(-0.81)	0.002	(0.09)

Highest educational attainment				
Basic	0.055	(0.75)	0.088	(1.06)
Secondary	0.021	(0.28)	0.050	(0.58)
Tertiary	0.087	(1.16)	0.136	(1.47)
Religion				
Christians	0.018	(0.39)	0.026	(0.51)
Muslims	0.029	(0.59)	0.028	(0.52)
Traditionalists	-0.033	(-0.54)	-0.052	(-0.80)
Ethnicity				
Ga-Adangbe	0.015	(0.50)	0.021	(0.65)
Ewe	0.007	(0.30)	-0,005	(-0.17)
Northern tribes	-0.030	(-1.20)	0.023	(-0.85)
Others	0.042	(1.39)	0.006	(0.16)
Place of residence				
Rural	0.058***	(4.60)	0.065***	(4.46)
Marital status				
Married	-0.046**	(-2.86)	-0.121***	(-4.82)
Region				
Western	-0.006	-(0.08)	0.022	(0.26)
Central	0.023	(0.41)	0.051	(0.60)
Greater Accra	-0.017	(-0.25)	0.017	(0.20)
Volta	0.036	(0.55)	0.057	(0.67)
Eastern	0.010	(0.15)	0.049	(0.58)
Ashanti	-0.051	(-0.78)	-0.041	(-0.48)
Brong Ahafo	-0.009	(-0.13)	0.043	(0.51)
Northern	-0.019	(-0.28)	0.018	(0.22)
Upper east	-0.024	(-0.35)	0.026	(0.31)
Upper west	-0.084	(-1.20)	-0.050	(-0.57)
Household characteristics				
Children (0-5 years)			-0.009	(-0.09)
Children (6-14years)			0.023***	(3.33)
Presence of working males			0.220***	(8.71)
Presence of help in the house			0.004	(0.20)
Presence of a sick child			0.020	(1.25)

No. of obs.	7302	4522	3587
Wald chi2	1.14	319.51	336.70
Prob>chi2	0.2846	0.0000	0.0000
R-square	0.0001	0.0708	0.0979

******, **, **** *denote the levels of significance at 1%, 5% and 10% respectively. The t of the variables are reported in parenthesis.*

Source: Author's calculation from GLSS VII

4.4.2 Estimation of the effects of the types of disability on mother's employment status.

This section explores the effects of sensory and non-sensory disabilities on mother's employment status**.** Sensory disability basically refers to the disabilities related to the human senses and the non-sensory disability is any other type of disability other than those that constitute a sensory disability.

From the baseline model of the results presented in *Table 4.3*, none of the types of disabilities seems to predict mother's employment status, however, after controlling for mother's characteristics, we found that sensory disability is negatively correlated with mother's employment status. From model 2, results show that mothers who have children with sensory disability are 17.1 percent (at 10 percent significance level) less likely to be employed than mothers with children who don't have such disability. This indicates that children with sensory disability imposes a greater time burden and therefore mothers with such children have lesser chance to participate in any economic activities. This finding confirms the finding of Simo (2017) but opposes the study of Zan and Scharf (2014) and Gould (2004) on their groupings of chronic illness according to the burden they imposed on mothers. Simo (2017) defined sensory disability according to Cameroon's 2010 disability law classification: sensory disability for

children with sight, speech or hearing problems while Zan and Scharf (2014) and Gould (2004) grouped illness such as epilepsy, migraine, retardation or down syndrome, anaemia, asthma, autism and heart infections as chronic conditions that have high time burden and therefore have the high probability of reducing mother's employment activities. Likewise, the sensory disability used in our estimation consists of chronic conditions of the sight, speech and hearing and it is therefore probable of reducing the likelihood that a mother gets employed.

Following the findings of the aggregate measure of disability on mother's employment status, high educational levels, the presence of a sick child and mother's place of residence are positively correlated with mother's employment status. Likewise, the presence of males who are working in the household and children aged 6-14 years increased the chances that a mother is going to be employed.

Table 4.3: Marginal effects of child disability type on mothers' employment status

	Mother's employment status					
Variables	**Model 1**		**Model 2**		**Model 3**	
Sensory disability type	-0.057	(-0.95)	-0.171*	(-1.92)	-0.012	(-1.24)
Non-sensory disability type	-0.054	(-0.95)	-0.007	(-0.09)	-0.024	(-0.27)
Mother's characteristics						
Age			0.038***	(6.09)	0.018**	(2.28)
Age square			-0.041***	(-4.39)	-0.012	(-1.01)

Poor health	-0.014	(-0.84)	0.002	(0.10)
Highest educational attainment				
Basic	0.055	(0.76)	0.088	(1.06)
Secondary	0.022	(0.30)	0.050	(0.59)
Tertiary	0.088	(1.17)	0.126	(1.47)
Religious status				
Christians	0.017	(0.37)	0.027	(0.52)
Muslims	0.026	(0.55)	0.028	(0.52)
Traditionalists	-0.034	(-0.57)	-0.052	(-0.80)
Ethnicity status				
Ga-Adangbe	0.015	(0.51)	0.022	(0.66)
Ewe	0.007	(0..29)	-0.005	(-0.18)
Northern tribes	-0.028	(-1.16)	-0.022	(-0,83)
Others	-0.042	(1.39)	0.006	(0.16)
Place of residence				
Rural	0.058***	(4.60)	0.065***	(4.46)
Marital status				
Married	-0.045**	(-2.80)	-0.120***	(-4.80)
Region				
Western	-0.005	(0.08)	0.022	(0.26)
Central	0.027	(0.41)	0.051	(1.60)
Greater Accra	-0.017	(0.25)	0.018	(0.20)
Volta	0.035	(1.56)	0.057	(1.68)
Eastern	0.010	(0.15)	0.049	(0.59)
Ashanti	-0.051	(-0.79)	-0.041	(-0.48)
Brong Ahafo	-0.008	(-0.13)	0.044	(0.51)
Northern	-0.019	(-0.27)	0.019	(0.22)
Upper east	0.024	(-0.35)	0.026	(0.31)
Upper west	-0.085	(-1.21)	-0.051	(-0.57)
Household Chracteristics				
Children (0-5 years)			-0.009	(-0.94)
Children (6-14 years)			0.023***	(3.32)

Presence of working males		0.220***	(8.67)
Presence of help in the house		0.004	(0.20)
Presence of a sick child		0.020	(1.26)
No. of obs.	7297	4519	3587
Wald chi2	2.58	321.63	338.00
Prob>chi2	0.2749	0.0000	0.0000
R-square	0.0003	0.0712	0.0981

******, **, **** *denote the levels of significance at 1%, 5% and 10% respectively. The t-test of the variables are reported in parenthesis.*

Source: Author's calculation from GLSS VII

4.4.3 Estimation and discussion of the effects of child disability on mother's employment type.

In achieving the third objective, the study considered child disability on the mother's type of employment. The types of employment include "no employment", "formal employment" and "informal employment". No employment simply means mothers without any form of work and formal employment is used to refer to some form of "wage employment "and informal employment as mothers who are basically self-employed and domestic workers. *Table 4.4* presents the marginal effects from the multinomial logistic regression.

From *Table 4.4*, we find an insignificant positive correlation between child disability and no employment and also an insignificant but negative correlation for formal employment and informal employment. This implies that a mother with a disabled child is more likely to be without employment than a mother without a disabled child. This positive correlation is consistent with the findings of Porterfield (2002) as she found that mothers were more likely to be out of paid work as a results of having a disabled child. The probable reason could be the greater time burden imposed by the disabled children.

Even though mothers with disabled children were less likely to participate in both formal employment and informal employment, the magnitude is higher for formal employment than for informal employment as expected. For formal employment, this was anticipated as the thought of mothers in this type of employment were going to find it difficult because of the rigidities that results from strict rules and regulation that govern institutions that offer formal employment. Also, most formal employment settings are not conducive or do not permit childcare activities and therefore weaving childcare activities and work in a formal workplace was going to be a difficult task. Considering the magnitude for the informal employment, as expected, the flexible nature of informal employment is a greater chance for mothers with children who are disabled to participate in the labour market. This is convincing in the sense that mothers could be able to weave childcare activities and informal work activities as the environment of some informal jobs were conducive for childcare. Example of such jobs include retailing done in the houses.

Mother's age and age squared has the normal positive and negative non-linear effects for both formal and informal employment and the reverse for no employment. Mother's poor health status does not predict mother's employment type across all models. Though it contradicts the finding of Zimmer (2007) and Porterfield (2002), it is consistent with our previous findings.

Concerning mother's religion, the results shows an insignificant relationship for all types of employment. However, mothers who are traditionalists have a positive correlation with no employment and Muslim mothers also have a positive correlation with informal employment. This finding is in line with the findings of Sackey (2005) as he finds an insignificant result for mother's religion in his pooled sample. However, this can be reasonable because Ackah et al. (2009) found that Muslim women were ready and more likely to pick any other paid job. Another

probable reason could be the polygamous practice of this religion as one man is permitted to take on several wives. This increases the financial burden on a husband with such a practice and as a result, mothers who are spouses to these men were compelled to take up any work especially in the informal sector to meet their increasing expenditure.

As expected, we found a negative correlation for all levels of education in our first model (thus "no employment"). In our second model for the formal employment, mothers with higher educational qualifications are more likely to be formally employed than mothers with no education. Mothers with tertiary education are 39.3 percent (at 0.1 significance level each) more likely to be formally employed as compared to mothers with no education. These findings confirm the findings of Portefield (2002); Bbaale and Mpuga (2011) and Sackey (2005). The results also indicate a negative correlation between mothers with high levels of education and informal employment. Relative to mothers with no education, mothers with tertiary education are 29.3 percent (at a 1% significance level) less likely to be informally employed. This is also in line with the findings of Sackey (2005). The probable reason could be that mothers with higher educational level were able to meet the high requirements of the formal employment and as such were more likely to be in formal employment and less likely to be in informal employment.

We also find that the relationship between mothers from the Ewe ethnic group and no employment is negative. This result contradicts the findings of Baah-Boateng et al. (2013). The probable reason could be that women from this ethnic were ready to take up any job regardless of their educational attainments or the nature of the job and this was confirmed by the findings of Ackah et al. (2009). However, a negative (insignificant) correlation is found between women from the northern ethnic groups and informal employment and a positive correlation between no

employment. Similar results were found by Baah-Boateng et al. (2013). This could be probably because of relatively larger household sizes associated with these ethnic groups and as such mothers from these ethnic groups were only confined to home production activities having less time to participate even in informal employment. The GLSS VII final report confirms that at the regional level, the northern, upper east and upper west regions had the highest household sizes.

The results indicate a negative correlation between mother's place of dwelling and no employment and formal employment but a positive correlation for informal employment. This implies that, in reference to mothers in the urban areas, mothers who dwell in rural areas were less likely to be in no employment and formal employment but are more likely to choose informal employment. Specifically, mothers in the rural areas were 6.3 percent and 5.8 percent less likely to be in no employment and formal employment respectively but 12.1 percent more likely to be informally employed (at a 1 percent level of significance each). Similar results were found by Bbaale and Mpuga (2011). This further elaborates the fact that the majority of women staying in rural areas are less educated compared to those residing in the urban areas as reported in the GLSS VII final report and hence are less likely to attain wage jobs particularly formal employment.

Marital status predicted the mother's probability of being in no employment and informal employment but not for formal employment. Married mothers have a higher likelihood (12.3. percent) of being without employment (at a 0.01 level of significance) and a lesser likelihood (13.1 percent) of being in informal employment (at a 0.01 level of significance) compared to single mothers. This finding is in agreement with the findings of Ackah et al. (2009). This is quite convincing as these married mothers are considered to have a source of non-labour income

that comes from their husband. This raises their reservation wage which induces mothers to be sometimes reluctant to entangle themselves in the strict rules and regulations of formal employment. As a result, these women are highly probable of being in no employment especially when the income of the husband is relatively high.

Mother's region cannot be overlooked in determining mother's choice of employment because even though same policies govern all labour markets across the ten regions, the level of development, terms of trading as well as the types, availability and prevalence of jobs in the regions could differ. Although, none of the regions predicted mother's employment type, there exist a negative relationship between all the regions and formal employment and also a positive relationship between all the regions and informal employment. One reason attributing to these results could be low levels of educational attainments associated with the mothers in our analytical sample and as such, these women are not able to fulfil the requirements of the formal employment therefore, they resorted to informal employment which required less or no education.

Considering household characteristics, increase in the number of children between ages 0-5 did not predict the probability of mother's employment type. However, it was found that a negative correlation exists between that variable and formal employment and informal employment as well and a positive correlation for no employment. Similar results were found by Ribar (1992) and Fadoyomi and Oluranti (2014). This finding is plausible because such children also required much care and mothers with these children were less likely to go for formal employment and with a relatively large count of these children in the household, mothers were more likely to be without

employment.

However, children above age 5 predicted all types of employment. At 5 percent level of significance, mothers with such children are 2.3 percent less likely to be in no employment and at 1 percent level of significance, mothers with such children were 3.4 per cent more likely to be informally employed. This finding mimics the finding of Baah-Boateng et al. (2013) and Ackah et al. (2009). It is believed that these children assume some home production activities which helps to release mothers to labour market activities. However, mothers with such children were also 1.2 percent less likely to participate in formal employment at 0.05 level of significance. One probable reason could be that these children especially the teen ages also needed close monitoring for them to put up a good behaviour therefore mothers with such children were less interested to work formally.

Worthy of note are the inconsistent correlations that exist between the presence of a working male in the household and mothers type of employment. Results showed that the presence of a working males in the household did not predict mother's formal employment. However, the presence of a working male decreased the probability that a mother chose no employment by approximately 13 percent and increased the probability that mothers chose informal employment by 24.1 percent at a 0.01 level of significance for each employment category. These findings agree with the finding of Simo (2017). The reason could be that these men provided some form of capital for the mothers to engage in any preferred economic activity in the informal sector rather than leaving these mothers to be without employment.

In general, the presence of a sick child had inconsistent results for all employment types. The presence of a sick child in the house could not predict no employment and formal employment.

Nevertheless, at 5 percent significance level, mothers with sick children were 3.5 percent more likely to be informally employed. This contradicts the finding of Simo (2017) as she finds no significant results for mothers who had at least a child in poor health. Nevertheless, this is quite convincing as mothers of these children increased their labour force participation to pay off unexpected expenditures resulting from the child's poor health. Increase in informal employment also allowed them to care for their sick children while working because of the flexible nature of informal employment. Conversely, a negative correlation was found for formal employment, thus from our results, mothers with children who were not disabled but sick or injured were less likely to be formally employed. This relation mimics the relation found by Kulthau and Perrin (2001). This is plausible in the sense that mothers with such children will require extra time from mothers to attend to their health needs and as such mothers were not willing to enter into formal employment knowing that it was not going to be easy combining the two.

Lastly, the presence of help in the house did not predict any of the types of employment even though some of the employment types have the expected signs. For example, the presence of help in the house increased the likelihood that mothers chose formal employment and decreased the likelihood that mothers chose no employment. This could probably mean that the presence of help in the house released mothers from home production activities for labour market activities.

Table 4.4: Marginal effects of child disability type on mothers' employment type.

	Mother's employment type		
Variables	**NO EMPLOYMENT**	**FORMAL EMPLOYMENT**	**INFORMAL EMPLOYMENT**
Child disability	0.072 (1.06)	-0.039 (-1.10)	-0.033 (-0.47)

Mother's characteristics						
Age	-0.016**	(-2.03)	0.012*	(1.92)	0.004	(0.40)
Age square	0.009	(0.75)	0.017*	(-1.85)	-0.008	(0.63)
Poor health	0.001	(-0.05)	-0.012	(-0.84)	0.013	(0.60)
Highest educational attainment						
Basic	-0.088	(-1.01)	-0.022	(-0.40)	0.120	(1.25)
Secondary	-0.044	(-0.50)	0.094	(1.62)	-0.049	(-0.54)
Tertiary	-0.100	(-1.11)	0.393***	(6.16)	-0.293**	(3.16)
Religious status						
Christians	-0.032	(-0.59)	0.022	(0.52)	0.010	(0.19)
Muslims	-0.032	(-0.57)	-0.004	(-0.08)	0.035	(0.65)
Traditionalists	0.056	(0.82)	-0.000	(-1.01)	-0.055	(-0.83)
Ethnicity						
Ga-Adangbe	-0.022	(-0.67)	0.028	(1.11)	-0.005	(-0.14)
Ewe	0.001	(0.05)	0.008	(0.35)	-0.009	(-0.29)
Northern tribes	0.017	(0.64)	0.003	(0.15)	-0.020	(-0.69)
Others	-0.008	(-0.23)	-0.003	(-011)	0.011	(0.28)
Place of residence						
Rural	-0.063***	(-4.29)	-0.058***	(-5.25)	0.121***	(7.53)
Marital status						
Married	0.123**	(5.02)	-0.008	(0.40)	-0.131***	(-4.32)
Region						
Western	-0.014	(-0.17)	-0.072	(-0.99)	0.086	(0.85)
Central	-0.048	(-1.58)	-0.060	(-0.84)	0.108	(1.08)
Greater Accra	-0.013	(-0.16)	-0.079	(-1.09)	0.092	(0.90)
Volta	-0.047	(-0.57)	-0.057	(-0.77)	0.104	(1.04)
Eastern	-0.041	(-0.50)	-0.082	(-1.14)	0.123	(1.23)
Ashanti	0.048	(0.58)	-0.052	(-0.72)	0.004	(0.04)
Brong Ahafo	-0.038	(-0.46)	-0.032	(-0.45)	0.070	(0.70)
Northern	-0.012	(-0.14)	-0.071	(-0.99)	0.082	(0.82)
Upper East	-0.020	(0.24)	-0.012	(-0.17)	0.032	(0.32)
Upper West	0.053	(0.62)	-0.076	(-1.06)	0.023	(0.22)
Household Characteristics						
Children (0-5yrs)	0.009	(0.99)	-0.003	(--0.51)	- 0.006	(-0.58)
Children (6-14yrs)	-0.023**	(-3.06)	-0.012**	(-2.17)	0.034***	(4.34)
Presence of adult working males	-0.219***	(-8.65)	-0.022	(-1.29)	0.241***	(9.36)
Presence of help in the house	-0.004	(-0.17)	0.018	(-1.28)	- 0.014	(-0.64)
Presence of a sick child	-0.002	(-1.10)	-0.017	(-1.28)	0.035**	(2.01)
No. of obs.	3587		3587		3587	
Wald chi2	857.46		857.46		857.46	
Prob>chi2	0.0000		0.0000		0.0000	
R-square	0.1615		0.1615		0.1615	

******, **, **** *denote the levels of significance at 1%, 5% and 10% respectively. The t-values of the variables are reported in parenthesis.*

Source: Author's calculation from GLSS VII

4.5 Re-estimation of Child Disability (0-14 years) on Mother's Employment Status and Mother's Type of Employment.

Following the monograph on "Children, Adolescent and Youth in Ghana" prepared from the 2010 Population and Housing Census data, we define a child as any person from age 0 to 14. On this note, we present estimations of disabled children in this age group (*see* Appendices 2-4).

From *Appendices 2-4,* the results reveal that child disability and disability type (according to the definition of child in Ghana) have no significant effect on mother's employment status and mother's employment type. However, when the age bracket is broadening to include children with age 21, disability types have a significant result on mother's employment status. This finding is in line with the finding of Simo (2017) for graduated mothers. This could be explained by the fact that children, in general require more parental time investment and as a result mothers have been able to cope with chronic conditions or disability without adjusting their labour force participation.

However, after controlling for the model with mother's characteristics, mother's age, age squared, mothers with tertiary level of education, mothers in the rural areas and married mothers were statistically significant and predicted mother's employment status. For household characteristics, numberof children 6-14 years and the presence of at least one working male in the family predicted mother's employment status.

4.6. Summary of Chapter

The current chapter first all has presented the descriptive statistics of the variables used in the estimations of the current study. It has also presented the empirical results and discussed the findings of the study.

CHAPTER FIVE

SUMMARY, CONCLUSION, POLICY RECOMMENDATION, AND LIMITATIONS AND FURTHER RESEARCH

5.1 Introduction

The concluding chapter highlights the summary of the study, draw conclusions on the findings of the study, suggests key policy directions based on the results from this study for policymakers, government, and its agencies, as well as peter-out the limitations of this study and pinpoints possible areas for further research.

The study, estimates the effects of child disability on mother's employment status and the type of employment the mother chooses because of having a disabled child. The study employs a sample from the health and employment modules of the Ghana LivingStandards Survey Round Seven (GLSS VII) collected in 2016/2017 by Ghana Statistical Service (GSS). This dataset was chosen because it provides detailed and relevant information on economic activities and working conditions of individuals as well as demographic, education, health and household agricultural activities and among others.

The current study gives the observations, mean, standard deviation, minimum and maximum values of analytical variables. It also gives the Chi Square test of independence for all categorical variables with the dependent variable. Itestimates the effects of child disability (its aggregate measure and the author's generated disability types (0-14years and 0-21yers)) on mother's labour market activities.Two labour outcomes were estimated; mothers' employment status and mothers' employment type.

The study revealed that the aggregate measure of disability did not predict mother's employment. However, the results had a negative sign thus compared to a mother without a disabled child, a mother with a disabled child is less likely to be employed. A significant and positive marginal effects of mother's age and as well as the negative effects of mother's age squared, reflects a nonlinear inverted U-shape relationship between maternal labour market participation and mother's age. This implies that mothers increase labour market participation at younger ages and decrease it as they grow.

Also, higher levels of education have a positive correlation with mother's employment status. Mothers with tertiary education have a greater chance of being employed than mothers with no education. In addition, the study finds a significant negative correlation between mother's marital status and the probability of being employed; married mothers are 12.1 percent less likely to be employed against mothers who are not married.

Mothers who dwell in the rural areas are more likely to be employed than mothers in the urban areas are. Precisely, mother's in the rural areas are 5.8 percent more likely to be employed at a 0.01 level of significance.

The results proved that a mother's region and mother's religion did not predict mother's employment status. However, mothers from the upper west region and Ashanti region are less likely to work compared to mothers from foreign countries.

At 1 percent significance level, mothers living in the rural areas were 6.5 per cent more likely to be employed than mothers living in the urban areas. This correlates with the findings of Sackey (2005) for the rural savannah of Ghana. One reason owing to this can the flexibility associated with the kind of jobs prevalent in these areas. Jobs in these areas are mostly informal and do not require many qualifications and capital therefore mothers are easily able to find work with which they can weave home production activities.

The presence of males working in the family has a positive correlation with the mother's employment status. At 1 percent significance level, the presence of males who are working in the household increased by 22 percent the probability that a mother gets employed. Likewise, the presence of a child in poor health also has a positive relationship with the probability (though insignificant) that a mother was going to get employed. The presence of help in the house has the expected sign but was statistically insignificant. Likewise, the number of children from 0-5 years. However, an increase in the number of children from 6-14 years increased the likelihood that a mother gets employed at 2.3 percent (at a 1% significance level).

In respect to the types of disability on mother's employment status, only children with sensory disability predicted mother's employment status. Mothers with children who had a sensory disability were 17.1 percent less likely to be employed which indicated that children with sensory disability imposed a greater time burden and therefore mothers with such children had lesser chance to participate in any economic activities.

In regards to the type of employment mothers chose as a result of having a child who is disabled, we found an insignificant positive correlation between child disability and no employment and an insignificant but negative correlation for formal employment and informal employment.

Mother's age and age squared has the normal positive and negative non-linear effects for both formal and informal employment and the reverse for no employment. Mother's poor health status does not predict mother's employment type across all models. Mother's religion shows an insignificant relationship for all types of employment.

As expected, we found a negative correlation for all levels of education with "no employment. Mothers with higher educational qualifications are more likely to be formally employed than mothers with no education. Mothers with tertiary education are 39.3 per cent (at 0.1 significance level each) more likely to be formally employed as compared to mothers with no education. The results also indicate a ``negative correlation between mothers with high levels of education and informal employment. Relative to mothers with no education, mothers with tertiary education are 29.3 per cent (at a 1% significance level) less likely to be informally employed.

We also find that the relationship between mothers from the Ewe ethnic group and no employment is negative. However, a negative (insignificant) correlation is found between women from the northern ethnic groups and informal employment and a positive correlation between no employment.

The results indicate a negative correlation between mother's place of dwelling and no employment and formal employment but a positive correlation for informal employment. This implies that, in reference to mothers in the urban areas, mothers who dwell in rural areas were less likely to be in no employment and formal employment but are more likely to choose

informal employment. Specifically, mothers in the rural areas were 6.3 per cent and 5.8 per cent less likely to be in no employment and formal employment respectively but 12.1 per cent more likely to be informally employed (at a 1 per cent level of significance each).

Marital status predicted the mother's probability of being in no employment and informal employment but not for formal employment. Married mothers have a higher likelihood (12.3. per cent) of being without employment (at a 0.01 level of significance) and a lesser likelihood (13.1 per cent) of being in informal employment (at a 0.01 level of significance) compared to single mothers.

None of the regions predicted mother's employment type but there exists a negative relationship between all the regions and formal employment and also a positive relationship between all the regions and informal employment. One reason attributing to these results could be low levels of educational attainments associated with the mothers in our analytical sample and as such, these women are not able to fulfil the requirements of the formal employment therefore, they resorted to informal employment which required less or no education.

Considering household characteristics, increase in the number of children between ages 0-5 did not predict the probability of mother's employment type. However, it was found that a negative correlation exists between that variable and formal employment and informal employment as well and a positive correlation for no employment.

However, children above age 5 predicted all types of employment. At 5 per cent level of significance, mothers with such children are 2.3 per cent less likely to be in no employment and

at 1 per cent level of significance, mothers with such children were 3.4 per cent more likely to be informally employed.

Worthy of note are the results that showed that the presence of a working males in the household did not predict mother's formal employment. However, the presence of a working male decreased the probability that a mother chose no employment by approximately 13 per cent and increased the probability that mothers chose informal employment by 24.1 per cent at a 0.01 level of significance for each employment category.

The presence of a sick child in the house could not predict no employment and formal employment. Nevertheless, at 5 per cent significance level, mothers with sick children were 3.5 per cent more likely to be informally employed.

Lastly, the presence of help in the house did not predict any of the types of employment even though some of the employment types have the expected signs. For example, the presence of help in the house increased the likelihood that mothers chose formal employment and decreased the likelihood that mothers chose no employment.

5.4 Policy Recommendations for Findings

From the findings in our study, it appears that child disability can be a hindrance to a mother's labour market participation. This has the ability to increase poverty as mothers of these children are more likely to stay at home which reduces their incomes especially for mothers who receive

no support from families, friends and government and as such there will be the need for policies that will help mothers to work and support themselves and their families. Such policies may include:

- From the study, there is a negative correlation between child disability and mother's employment status. This may be because of the time consuming nature the disabilityimposes. As such, policies that focus on providing services and help parents who have children who are disabled can be very useful in releasing mothers for employment opportunities. Example, affordable and full after-school care services and institutions that provide childcare services at affordable prices in communities even for older children that are disabled can release mothers to take employment opportunities since they sometimes persist to be a burden when they grow.
- The study proved a negative relationship between child disability and formal employment. As a result, policies that insure the health of one and family members especially in the formal sector will encourage one to still participate in the labour force after the incidence of child disability even if a disability is time demanding.
- The study proved a negative correlation between child disability and informal employment so policies and programmes that can equip and train mothers with disabled children while they are at home to get them employed will be very needful and this will be beneficial to the educated and uneducated.

5.5 Limitations and Further research

One key limitation of this study originates from the data used for our analysis. The data provides information on the health of individuals two weeks preceding the survey and information on the economic activities of individuals a week preceding the survey. However, the data failed to consider some key information such as the time disability occurred, specific expenditure made for the disabled, and also children-specific activities that the disabled child was not able to do. Also, the economic activity of mothers before child disability and also economic activity of mothers after child disability and other information on incomes that would have made the data rich were not considered. In this study, and just like any other research, only the information at hand was used and this compelled the study to disregard the dynamics that may have played out in this study.

With much data and detailed information available, further research is needed to understand when mothers return to work after the incidence of having a child who is disabled, how mothers switch from one type of employment to the other and how the incidence of child disability affect their hours of work and incomes comparing information taken before and after child disability on the same individuals.

5.6. Summary of chapter

This chapter has summarized the key major aim of the study, drawn conclusions on the findings of the study, suggested key policy directions based on the results from this study for

policymakers and government and its agencies. It has also as revealed the limitations of this study and has stated possible areas for further research.

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APPENDICES

Appendix 1: Results of the Recursive Bivariate Probit with Seemingly Unrelated Regression

Child disability	Mothers employment status Variables	Coefficients	t-values	Coefficients
t-values				
Child disability			1.287**	(2.55)
Mother's characteristics				
Age	0.112**	(2.27)	0.131***	(5.21)
Age square	-0.126*	(-1.86)	-0.168***	(-4.81)
Poor health	0.184**	(1.96)	-0.061	(-1.00)
Highest educational attainment				
Basic	-0.040	(-0.38)	0.023	(0.43)
Secondary	-0.192	(-0.88)	-0.050	(-0,53)
Tertiary	-0.095	(-0.45)	0.062	(0.61)
Religious status				
Christians	-0.074	(-0.36)	0.154	(1,27)
Muslims	-0.212	(-1.03)	0.166	(1.33)
Traditionalists	-0.458*	(-1.84)	-0.101	(-0.68)
Ethnicity				
Ga-Adangbe	0.195	(0,89)	-0.201	(-1.60)
Ewe	-0.235	(-1.13)	0.125	(1.12)
Northern tribes	-0.027	(-0.16)	-0.051	(-0.62)
Others	-0.625*	(-1.88)	-0.190*	(-1.67)
Place of residence				
Rural	0.246**	(2.55)	0.122**	(2.11)
Marital status				
Married	-0.118	(-1.05)	-0.249***	(-3.05)
Region				

Western	-0.470	(-1.28)	0.298	(1.30)
Central	-0.728**	(-2.11)	0.300	(1.66)
Greater Accra	0.509	(-1.42)	0.307	(1.31)
Volta	-0.243	(-0.72)	0.361	(1.62)
Eastern	-0.773**	(-2.21)	0.442	(1.94)
Ashanti	--0.700**	(-1.99)	0.237	(1.04)
Brong Ahafo	-0.479	(-1.47)	0.141	(0.62)
Northern	-0.151	(-0.47)	0.201	(0.93)
Upper East	-0.421	(-1.27)	0.290	(1.28)
Upper West	-0.648*	(-1.92)	-0.225	(-0.94)
Household characteristics				
Children (0-5yrs)	0.104***	(3.01)	-0.019	(-0.72)
Children (6-14yrs)	-0.064	(-1.95)	0.024	(1.21)
Presence of working males	0.149	(1.39)	0.402***	(3.28)
Presence of help in the house	0.737*	(2.45)	-0.251	(-0.99)
Presence of a sick child	0.189**	(2.08)	0.026	(0.47)
Mother's poor ability	0.284*	(1.84)		
Constant	-4.116	(-4.21)	-1.281	(-2.78)
Atrho	-1.063	(-1.52)		
Rho	-0.787			
Number of observations	3587		3587	
Wald chi2	321.45		321.45	
Prob>chi2	0.0000		0.0000	

Wald test of rho=0: chi2(1) = 2.31752 Prob > chi2 = 0.1211

******, **, * denote the levels of significance at 1%, 5% and 10% respectively***
The standard errors of the variables are reported in parenthesis
Source: Author's calculation from GLSS VII

Appendix 2: Marginal effects of child disability (0-14years) on mother's employment status

	Mother's employment status		
Variables	**Model 1**	**Model 2**	**Model 3**
Child disability	-0.018 (-0.36)	-0.039 (-0.57)	-0.064 (-0.83)
Mother's characteristics			
Age		0.034*** (5.19)	0.139* (1.70)
Age square		-0.034*** (-3.52)	-0.005 (-0.44)
Poor health		-0.006 (-0.34)	0.011 (0.58)
Highest educational qualification			
Basic		0.032 (0.44)	0.068 (0.80)
Secondary		-0.002 (0.03)	0.035 (0.40)
Tertiary		-0.063 (0.84)	0.107 (1.22)
Religious status			
Christians		0.021 (0.44)	0.024 (0.48)
Muslims		0.035 (0.72)	0.031 (0.57)
Traditionalists		-0.016 (-0.26)	-0.036 (-0.55)
Ethnicity			
Ga-Adangbe		0.026 (0.90)	0.033 (0.99)
Ewe		0.005 (-0.21)	-0.008 (-0.28)
Northern tribes		-0.035 (-1.42)	-0.028 (-1.02)
Others		0.042 (1.35)	0.006 (0.16)

Place of residence				
Rural		0.057***	(4.30)	0.062*** (4.18)
Marital status				
Married		-0.048	(-2.86)	-0.122*** (-4.45)
Region	Western			
		0.014	(0.21)	0.050 (0.56)
Central		0.026	(0.38)	0.051 (0.58)
Greater Accra		-0.014	(-0.21)	0.022 (0.25)
Volta		0.039	(0.58)	0.060 (0.69)
Eastern		0.013	(0.20)	0.050 (0.57)
Ashanti		-0.044	(-0.65)	-0.028 (-0.32)
Brong Ahafo		-0.003	(0.05)	0.052 (0.59)
Northern		-0.010	(-0.29)	0.021 (0.23)
Upper East		- 0.012	(-0.17)	0.040 (0.45)
Upper West		-0.075	(-1.04)	-0.035 (-0.39)
Household characteristics				
Children (0-5 years)				-0.008 (-0.89)
Children (6-14years)				0.023** (3.12)
Presence of working males				0.229** (8.72)
Presence of help in the house				0.002 (1.10)
Presence of a sick child				0.020 (1.19)
No. of obs.		7035		4337 3443
Wald chi2		0.13		297.69 320.27
Prob>chi2		0.7146		0.0000 0.0000
R-square		0.0000		0.0692 0.0981

******, **, * denote the levels of significance at 1%, 5% and 10% respectively***

The t-values of the variables are reported in parenthesis

Source: Author's calculation from GLSS VII

Appendix 3: Disability Type and Mother's Employment Status

	Mother's employment status		
Variables	**Model 1**	**Model 2**	**Model 3**
Sensory disability	0.015 (0.24)	-0.046 (-0.46)	-0.026 (-0.26)
Non-sensory disability	-0.072 (-1.00)	-0.047 (-0.51)	-0.085 (-0.79)

Mother's characteristics				
Age	0.034***	(5.15)	0.014*	(1.67)
Age square	-0.034***	(-3,48)	-0.005	(-0.42)
Poor health	-0.005	(-0.31)	0.013	(0.66)
Highest educational attainment				
Basic	0.032	(0.44)	0.068	(0.80)
Secondary	0.002	(-1.03)	0.035	(0.40)
Tertiary	0.063	(0.85)	0.107	(1.23)
Religious status				
Christians	0.021	(0.45)	0.025	(0.48)
Muslims	0.035	(0.71)	0.030	(0.56)
Traditionalists	-0.016	(-0.27)	-0.037	(-0.56)
Ethnicity				
Ga-Adangbe	0.026	(0.90)	0.032	(0.99)
Ewe	0.004	(0.15)	-0.010	(-0.35)
Northern tribes	-0.034	(-1.37)	-0.027	(-0.97)
Others	0.042	(1.36)	0.006	(-0.17)
Place of residence				
Rural	0.057***	(4.37)	0.062***	(4.18)
Marital status				
Married	-0.048***	(-2.83)	-0.122***	(-4.44)
Region Western				
	0.014	(0.21)	0.049	(0.56)
Central	0.026	(0.38)	0.051	(0.58)
Greater Accra	-0.014	(-0.21)	0.023	(0.25)
Volta	0.040	(0.61)	0.063	(0.72)
Eastern	0.013	(0.20)	0.050	(0.57)
Ashanti	-0.044	(-0.66)	-0.028	(-0.32)
Brong Ahafo	-0.003	(0.05)	0.052	(0.59)
Northern	-0.021	(-0.30)	0.020	(0.22)
Upper East	- 0.013	(-0.19)	0.038	(0.43)
Upper West	-0.076	(-1.06)	-0.037	(-0.40)

Household characteristics			
Children (0-5years)			-0.009 (-0.92)
Children (6-14yrs)			0.022** (3.11)
Presence of working males			0.229*** (8.73)
Presence of help in the house			0.002 (0.08)
Presence of a sick child			0.019 (1.15)
Number of observations	7030	4334	3441
Wald chi2	1.15	296.24	319.69
Prob>chi2	0.5632	0.0000	0.0000
R-square	0.0001	0.0689	0.0980

******, **, * denote the levels of significance at 1%, 5% and 10% respectively.***
The t-values of the variables are reported in parenthesis Source:
Author's calculation from GLSS VII

Appendix 4: Marginal effects of child disability type on mothers' employment type.

	Mother's employment type		
Variables	**NO EMPLOYMENT**	**FORMAL EMPLOYMENT**	**INFORMAL EMPLOYMENT**
Child disability	0.069 (0.89)	-0.027 (-0.64)	-0.042 (-0.52)
Mother's characteristics			
Age	-0.012 (-1.44)	0.012* (1.77)	-0.000 (-0.00)
Age square	0.002 (0.18)	-0.016 (-1.64)	0.013 (1.00)
Poor health	-0.011 (-0.55)	-0.008 (-0.58)	0.019 (0.89)
Highest educational attainment			
Basic	-0.067 (-0.75)	-0.024 (-0.42)	0.091 (1.00)
Secondary	-0.028 (-0.31)	0.086 (1.45)	-0.057 (-0.61)
Tertiary	-0.077 (-0.84)	0.388*** (5.94)	-0.311*** (-3.25)
Religious status Christians			
	-0.029 (-0.54)	0.020 (0.47)	0.009 (0.18)
Muslims	-0.034 (-0.60)	-0.003 (-0.07)	0.037 (0.67)
Traditionalists	0.041 (0.61)	0.002 (0.05)	-0.044 (-0.65)
Ethnicity Ga-Adangbe			
	-0.034 (-1.03)	0.023 (0.90)	0.011 (0.31)
Ewe	0.004 (0.15)	-0.000 (-0.02)	-0.004 (-0.13)
Northern tribes	0.021 (0.77)	-0.000 (-0.02)	-0.021 (-0.70)
Others	-0.010 (-0.27)	-0.009 (-0.37)	0.019 (0.47)
Place of residence Rural			
	-0.061*** (-4.02)	-0.058*** (-5.18)	0.119*** (7.21)
Marital status Married			
	0.125*** (4..69)	0.022 (1.04)	-0.147*** (-4.51)

Region			-0.081		0.121	
Western	-0.041	(-0.47)		(-1.08)		(1.17)
Central	-0.047	(-0.55)	-0.069	(-0.94)	0.116	(1.13)
Greater Accra	-0.016	(-0.18)	-0.079	(-1.07)	0.095	(0.91)
Volta	-0.049	(-0.58)	-0.064	(-0.84)	0.113	(1.10)
Eastern	-0.041	(-0.48)	-0.087	(-1.19)	0.128	(1.25)
Ashanti	0.036	(0.42)	0.057	(-0.78)	-0.021	(0.20)
Brong Ahafo	-0.046	(-0.57)	-0.040	(-0.54)	0.086	(0.83)
Northern	-0.012	(-0.15)	-0.079	(-1.08)	0.091	(0.88)
Upper East	-0.032	(-0.37)	0.016	(0.22)	0.048	(0.46)
Upper West	0.040	(0.45)	-0.084	(-1.16)	0.044	(0.42)
Household characteristics						
Children (0-5yrs)	0.009	(0.95)	-0.004	(-0;54)	-0.005	(-0.52)
Children (6-14yrs)	-0.022**	(-2.86)	-0.013**	(-2.25)	0.034***	(4.22)
Presence of working males	-0.228***	(-8.69)	-0.020	(-1.12)	0.248***	(9.29)
Presence of help in the house	-0.002	(-0.08)	0.016	(1.08)	-0.014	(-0.61)
Presence of a sick child	-0.017**	(-1.03)	-0.018	(-1.50)	0.035**	(1.96)
Number of observations	3443		3443		3443	
Wald chi2	806.56	896.56	806.56	Prob>chi2	0.0000	0.0000	0.0000
R-square	0.1630		0.1630		0.1630	

******, **, * denote the levels of significance at 1%, 5% and 10% respectively***
The t-values of the variables are reported in parenthesis
Source: Author's calculation from GLSS VII