LABOR MARKET TRANSITIONS DURING THE COVID-19 PANDEMIC IN MALAWI

MASTER OF ARTS (ECONOMICS) THESIS

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MA (ECONOMICS) THESIS

BY

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DECLARATION

This thesis is my own original work and it has not been submitted to any other institution for similar purposes. Acknowledgements have been duly made where other people's work have been used. I bear the responsibility for the contents of this paper.

Signature: _____

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CERTIFICATE OF APPROVAL

The undersigned certify that this thesis represents the student's own work and effort and has been submitted with our approval.

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DEDICATION

To my father **Mr Emmanuel G. Mwase**. Thank you for always believing in me.

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ABSTRACT

Restrictions that have been put in place to contain the spread of the COVID-19 pandemic have led to reduced economic activity and increased unemployment. These unintended consequences are likely to have long-term effects on economies especially in Sub-Saharan Africa where the resilience of workers in the labour market is already weak. This study therefore, analyses labour market transitions during the COVID-19 pandemic in Malawi. Specifically, the study interrogates, the drivers of exit of participants, from the labour market into permanent or temporary unemployment. In addition, the study investigates gender-differentials and employment type differentials with regard to risk of exiting the labour market. To achieve these objectives; use was made of data on a sample of 2,337 households from a High Frequency Phone Survey on COVID-19 in Malawi collected monthly from May 2020 to April 2021 by the National Statistical Office of Malawi. This data was chosen since it made it possible to follow the trajectory of men and women in the labour market since the exposure to the COVID-19 pandemic. Analytically, both non-parametric and parametric survival analysis models were used. The survival analysis models used included the Kaplan-Meier and Nelson-Aalen nonparametric estimators and the Cox proportional regression. The results indicated that the expected hazard is 98% higher in women compared to men, and those with primary education risk highly (at 87%) than those with secondary (77.1%) and tertiary education (74.8%). Manufacturing sector was found to have a higher hazard risk (at 95.8%) followed by the education sector (at 59.5%). The expected hazard for individuals that tested positive for Covid-19 was 42.9% higher compared to individuals that tested negative for Covid-19. Based on these results, the paper has identified the groups at risk and recommended effective outreach strategies to provide integrated, comprehensive and well-targeted support.

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ABBREVIATIONS

GoM	Government of Malawi
HFPS COVID -19	High Frequency Phone Survey on Covid -19
ILO	International Labour Organisation
NSO	National Statistics Office
OECD	Organisation of Economic Cooperation and Development
PHIM	Public Health Institute of Malawi
VCW	Voluntary Compliance Window
WEF	World Economic Forum
WHO	World Health Organisation

CHAPTER 1

INTRODUCTION

1.1 Background

On 11 March 2020, the World Health Organization (*WHO*, 2020) declared Covid-19 as a global pandemic. Ever since, various governments and agencies responded with a series of health policies to reduce the spread of the virus. Although majority of countries did not have a full lockdown, these attempts to limit the spread of the virus have resulted in profound economic impacts, and a significant contraction in the global economy is expected (*World Bank Group*, 2020.). Africa's growth was, of course, on a downward trajectory after recovery from the 2007 financial crisis contracting from 6.8 percent growth rate in 2012 to 2.1 percent in 2016 rebounding later in 2017 with a growth rate of 3.8 percent. The recovery in 2017 brought growth to a steady rate for the next three years until 2019 growing at 3.4 percent and 3.4 percent in 2018 and 2019 respectively. However, the onset of the COVID-19 pandemic and crisis reversed the gains as output plummeted by rates even lower than the rates recorded during the financial crisis of 2007. By the end of 2020, growth shrank by 1.8 percent representing a decrease of 1.4 percentage points between 2019 and 2020(WEF, 2021). For the case of Malawi, a state of national disaster was declared on 20 March 2020 and containment policies were adopted immediately. Schools were closed on 23 March 2020 and remained closed for 5 months. There was also an immediate ban on all public events and gatherings were restricted to less than 100 people (PHIM, 2020). This ban was intended for all religious gatherings, weddings and funerals. And, on 4 April 2020 the Government of Malawi recommended closure of workplaces with non-essential staff. Public transport was recommended to reduce seated capacity by 60% and all commercial flights and entry into Malawi by foreign nationals were suspended but land borders remained open for cargo and returning residents who were required to undergo 14 days of quarantine(GoM, 2020). An important highlight during the implementation of these health policies occurred when there was public resistance to the adoption of the lockdown policy on 14 April 2020 which was

subsequently overruled on 10 September by the Malawi High Court citing that a lockdown would be unconstitutional because it could have negative consequences on the socioeconomic state of the majority of Malawians.

Despite some success in containing the spread of the virus since 2020, Malawi, just like most of African economies is struggling to rise above the pandemic impacts especially on the socioeconomic impacts. A survey by the Institute of Public Opinion and Research in May 2020, revealed that the majority of Malawians depend on agriculture (59% of women and 44% of men) and unskilled manual labour (20% of women and 25% of men) for work. As a result, policies that reduce the ability to sustain livelihoods have been challenging to adopt but also have ripple effects on overall well-being of citizens as well as the economy in general. For instance, the closure of borders and airlines caused a significant drop in demand for passenger travel threatening the viability of many firms in both the air transport sector and the rest of the aviation industry, with many jobs at stake (OECD, 2021). Besides that, air transport is closely linked to other sectors like trade in goods and services and promoting tourism. The ban on all public events impacted the entertainment as well as transport sector largely as people could not frequently hold functions like weddings, festivals and shows or travel to attend certain events.

Economic activity and good levels of employment contribute highly to poverty reduction, food security and economic growth. Having a stable and protected employment is the most sustainable path to exiting poverty and promoting inclusion (ILO, 2019) given that labour is the main, if not only, source of income for most people in developing countries. As such, high levels of employment will result in increase in the value of aggregate output. But with the COVID-19 pandemic restrictions, there is reduced economic activity and low employment levels as most individuals risk losing their jobs. The unintended consequences of the policies are likely to have long term effects, as such studies like this are required to address these issues. The study will, therefore aim at analyzing labour market transitions during the COVID-19 pandemic in Malawi. Specifically, the study will analyze the factors that are determining the exit of participants from the labour market into either permanent or

temporary unemployment. The study will also investigate gender-differentials and employment type/sector differentials with regard to risk of exiting the labour market. In order to achieve these objectives, we will use data from a High Frequency Phone Survey on COVID-19 in Malawi collected from May 2020 to April 2021 by the National Statistical Office of Malawi. This data was chosen since it made it possible to follow the trajectory of men and women in the labour market since the exposure to the COVID-19 pandemic. The analysis has included both non-parametric and parametric survival analysis models. The survival analysis models used include the Kaplan-Meier and Nelson-Aalen non-parametric estimators and the Cox Proportional Regression. And, the results indicated that male individuals, those with secondary and tertiary levels of education and those employed in agriculture, manufacturing, and education sectors were more likely to maintain their jobs for a longer period. On the other hand, women and individuals in the transport and health sector were more likely to lose their jobs, but with the risk of becoming temporarily unemployed being significantly higher than for permanent unemployment situation.

1.2 Research problem

There is worrisomely ever-increasing unemployment and underemployment coupled with not only slower school-to-work transitions but also the susceptibility of the labour markets to negative shocks in developing economies particularly the sub-Saharan Africa region. The labor market participation is largely determined by wages and the level of education, among other factors. However a number of factors influence the susceptibility of losing jobs. Not only is it hard for job seekers to find a job, they are also at a risk of losing their jobs due to negative shocks in the economy, especially in Sub-Saharan Africa. Additionally, even though labour market participation for women has increased throughout the past century, women have the highest risk of losing their jobs comparing to men (ILO, 2019). A research on the impact of Covid-19 on the labor market in Malawi by Thula et al (2020) found that the pandemic is expected to have an impact on the country's labor market with an expected loss of current and future jobs between 273,712 and 680,496. In their study, they utilized a scenario based analysis and the results might not quite inform policy clearly since this is a new pandemic and the scenarios might not reflect what happens in reality. Another study,

by Murat & Bonacini (2020) on the effect of the Covid-19 lockdown on work conditions showed that factors like gender and number of children affect the working conditions of academic staff at home. This study will provide evidence-based research to help understand and evaluate the policies being implemented and if need be, improve on them. As highlighted, static results would not be appropriate to show the extent of the shock on the labour market. While we can clearly see that employment levels are declining, it is also important to have research that will reflect the transitions that occur in and out of the labour market overtime.

Most of those studies that have been done on Covid-19 or the labour market have focused on the impact of the pandemic on labor force participation analyzing the static variables like rates of employment and unemployment (Beland et al., 2020; Fairlie, 2020; Murat & Bonacini, 2020), however it is imperative to look at the movement of people in and out of the labor market and the extent to which they can or cannot find employment (unemployment spells), and to what extent different groups are impacted more than others. For instance, a 5% unemployment rate can prevail in entirely two different contexts. One, where individuals remain unemployed for at most 4 weeks per year and another where individuals remain unemployed for the whole year. Thus a labor market where participants become unemployed for longer periods is worse than high unemployment rates with shorter unemployment durations.

1.3 Research objectives

The main objective of the study is:

- To assess if COVID-19 has affected labour market transitions in Malawi.

The following are the specific objectives:

- To establish the resilience of participants in the labour market during the COVID-19 pandemic, across genders and sectors of employment
- To determine if the risk of exiting the labor market is different across genders and sectors of employment

1.4 Significance of the study

The unintended consequences of the policies implemented to contain the spread of the pandemic are likely to have long term effects (WEF, 2021). For instance, closure of schools now as a pandemic policy measure, imply interrupted education and training, and increased dropout rates for the youths. This might have long term impacts on the youth to secure jobs if they lack the necessary skills. This paper contributes new evidence by providing comprehensive research on the extent of the damages that the pandemic and associated measures has on the labour market, and the economy. The findings produced from this paper will help understand and evaluate policies being implemented, and if need be, improve on them for the improvement of livelihood of Malawians. For example, the findings can help in developing measures that will strengthen the resilience of workers that are at high risk. It will also help advise policy on which people to be targeted if they are to adopt social protection policies as a cushion to the impacts of the pandemic.

The remainder of this paper is organized as follows. Section 2 provides a review of related literature and research. Section 3 describes the methodology. Results and discussion of the study is presented in Section 4. Section 5 presents the summary, conclusion and implications.

CHAPTER 2

REVIEW OF RELATED LITERATURE

This chapter gives an overview of the situation of Covid-19 on the labour market and how it has affected different sectors of employment but also participants like women, youth and those employed in the informal sector. Individuals in the informal sector have been hit adversely by the pandemic more than those in the formal sector. Similarly, women and the youths in the labour market are reported to have worst impacts of the pandemic. Highlighting on how these sectors and participants are affected, will give an overview on how the pandemic has affected the labour markets in general.

2.1 Covid-19 and the labour market

The impact of Covid-19 pandemic on the labor market is very ambiguous considering that there are so many channels at work. The first mechanism is through the pandemic infections which could potentially reduce labour productivity by reducing income-generating activities. It is likely that these deaths as well as active cases will affect the labor supply of these individuals. Infected individuals are normally required to skip work until they are diagnosed and test negative for the Covid-19 virus. Additionally, other people are forced to leave work so that they can take care of their family members who are infected by the pandemic. This is common among women because of the traditional gender roles (Beland et al., 2020). Secondly, the government directives like closure of non-essential businesses and mobility restrictions affected business operations and most of them risk shutdown. Ultimately, workers risk losing their jobs or experiencing reduced income earnings as business struggle to survive in the face of the pandemic (Barrett, 2020).

Barrero et al (2020) also demonstrated that significant impact is on certain jobs especially those that have high exposure to the contraction of the virus. Individuals whose occupations

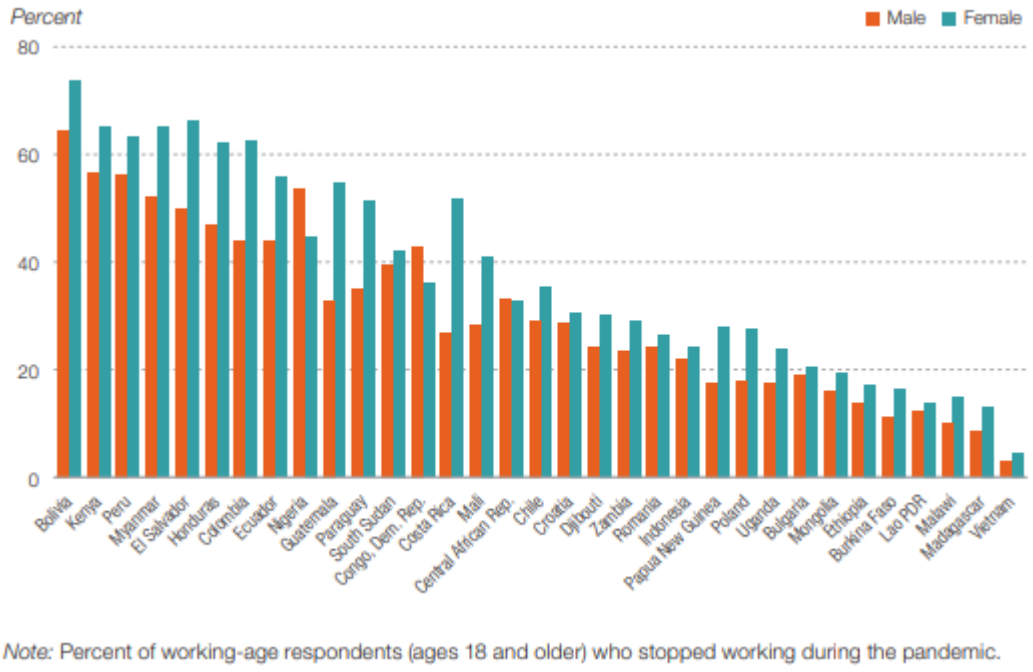
are at high risk, will have significant COVID-19 impacts because they are more likely to be infected and fail to work. However, a positive impact is also plausible on their earnings because their wages will go up due to the sudden increase in risk. In Malawi, the Ministry of Health revised upwards the risk allowance for health workers amid the pandemic (M0G, 2020). In Zimbabwe, health workers sued the government for lack of protection and lack of extra bonuses for healthcare professionals (www.afrinews.com). There is also an increased in demand for workers in these sectors to meet the crisis demands. These include workers in the health sector, law enforcement, and transport sector (Beland et al., 2020). For instance, the Minister of Health in Malawi, confirmed in a press briefing that the ministry had recruited 755 health workers (Nation Newspaper, 2020).

These effects of the pandemic are expected to differ both by sector of employment and gender. The preexisting vulnerabilities to labour market shocks are also likely to be amplified by the pandemic associated measures (Eichenbaum et al., 2020). Malawi, just like most of Sub-Saharan countries has underlying disparities in the labour market across factors like gender, age, race and sector of employment. Almost eight out of ten workers (80%) are employed in the informal sector (ILO, 2020). These workers in the informal sector as well as women, youths, migrants are usually characterized by unstable jobs, lack of social protection, limited access to education and healthcare, and low earnings. Hence, these vulnerable groups experienced the pandemic with lower resilience, such that they are expected to be hit hardly by the pandemic.

2.2 Covid-19 and women

The World Economic Forum reported that women have been affected by the impacts of the crisis differently than men in so many ways, and this poses a risk of widening the already existent gender gaps in the African labour markets (WEF, 2020). There is an overrepresentation of women in the informal sector, which is said to be hit hard by the pandemic. It therefore implies that a lot of women are vulnerable to external shocks like the pandemic since the informal sector is characterized by low wages and lack of social protection. Women are also affected in the life of work through the “double-shift” that comes

with the directives to close non-essential workplaces and schools. They are faced with a double burned of having to work from home and unpaid work with the increased child-care needs. Research has shown that persistent "double shift" on women can cause an overall increase in stress, anxiety and challenges in maintaining work-life balance among women with children. As a solution, most women tend to leave their jobs in order to focus on the non-paid households work; implying job losses and, consequently, loss of labour income (Ipsos, 2021). Figure 1 below, shows the proportion of women and men who stopped working during the pandemic. Except for Nigeria and Congo, all of the countries had more women exiting the labour market compared to men. For Malawi, 15% of women left employment compared to a 10% of men who left employment during the pandemic.



Note: Percent of working-age respondents (ages 18 and older) who stopped working during the pandemic.

Figure 1: Percentage of Respondents who stopped working, by gender

Source: ILO (2020)

2.3 Covid-19 and the informal sector

In the face of the pandemic, so many workers in the African region risk losing their jobs because majority of them are employed in the informal sector (ILO, 2020). For the case of Malawi, the formal sector is very narrow estimated at 7.2% of the labour force in 2018. The agricultural sector is the largest employer of workers in Malawi which is predominantly female (with over 68% women). These workers are facing the pandemic with low resilience since the informal sector is often characterized by low productivity, low rates of savings and investment, and negligible capital accumulation and this makes them particularly vulnerable to shocks like the COVID-19 pandemic (WEF, 2020). Due to limited and access to credit and stimulus packages, these businesses in the informal sector risk shutting down in the context of the pandemic related measures like restricted mobility and lockdowns (ILO, 2020). The figure below shows the proportion of informal employment significantly impacted by lockdown and social distancing measures. The low income country's informal workers experience high impact of 68% compared to an impact of 15% in the high income countries.

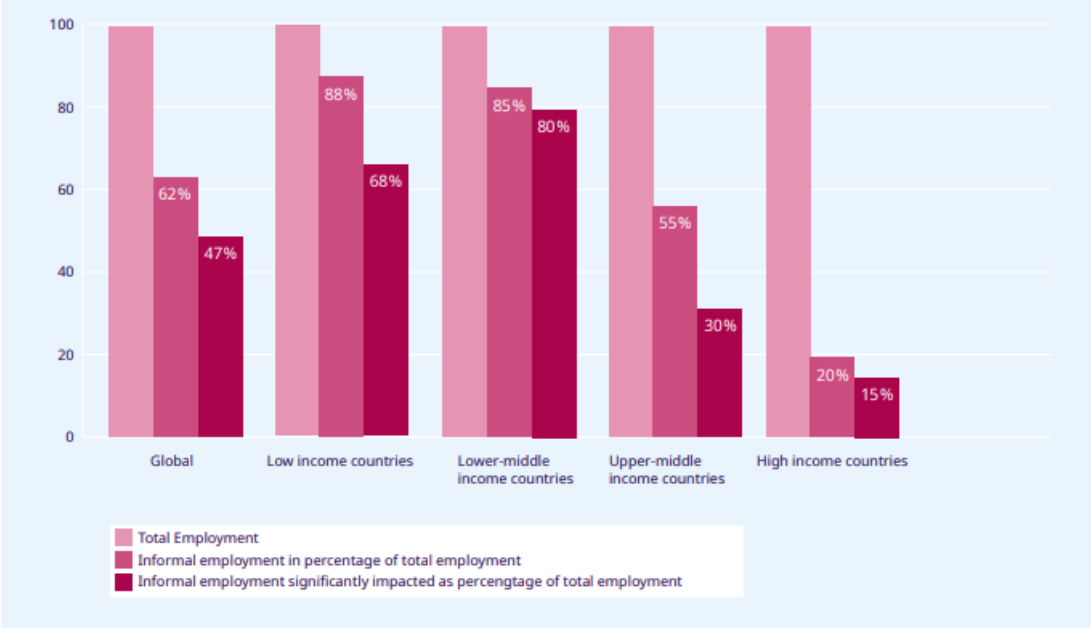


Figure 2: Proportion of informal employment significantly impacted by lockdown and social distancing measures by country income groups (2020, percentages)

Source: ILO (2020)

2.4 Empirical review

The literature and research on the magnitude of the impacts of the COVID-19 pandemic are still in the inception stage since this is a new pandemic. The few studies conducted, this far generate important evidence on the negative impacts of the pandemic on the labour market. A study on Employment impact of COVID-19 crisis: from short term effects to long terms prospects in three European countries showed that countries that are being hardest hit by the pandemic itself (Spain and Italy, and also the UK) are the countries more likely to suffer the worst employment implications of the confinement, because of their productive specialization and labour market institutions (Pouliakas & Branka, 2020).

Further studies focused on how the COVID-19 shock has impacted the employment status of racial and ethnic minorities compared with whites. Fairlie (2020) in his research found that there was no substantial increase in unemployment among blacks but Latin's workers experienced an increase in the level of unemployment in the United States. They also noted that there was over 31% increase in the level of unemployment among Black and Latin's when they consider absent workers as well as workers who are out of the labour market but would like a job. Borjas & Cassidy, (2020) found similar results when they conducted a study on the labor-market experience of immigrants relative to native-born workers and found that the former group were disproportionately hurt by the COVID-19 shock.

Beland *et al*., (2020) also conducted a different study where they examined the short-term consequences of COVID-19 on employment and wages in the US. From their results, it was found that the pandemic increased the unemployment rate, decreased hours of work and labour force participation and had no significant impacts on wages. They also found out that the impacts affected different groups disproportionately, with high impacts on men, younger workers, Hispanics and less educated workers. This provides evidence that the COVID-19 pandemic amplifies the preexisting inequalities in the labour market. They also found out that occupations that depend on face-to-face interactions are facing adverse impacts in the face of the pandemic compared to jobs that can be done remotely. Similarly, Pouliakas &Branka, (2020) also found that the pandemic related measures like social distancing have

adverse impacts on vulnerable groups like women, non-natives, temporary workers, the lower educated, those employed in small and medium enterprises. This also showed that the differences in the pandemic impacts are heightened by the overrepresentation of these vulnerable groups in sectors or activities that are hit hard by the pandemic like entertainment, hospitality and tourism. Clearly, in the medium and long term, the COVID-19 pandemic impacts will be more determined by structural and institutional differences such as economic specialization, labour market regulations and social protection and less determined by the confinement measures.

A research on the impact of COVID-19 on the labor market in Malawi by Thula (2020) found that the pandemic is expected to have an impact on the country's labor market with an expected loss of current and future jobs between 273,712 and 680,496. This was a timely research as it showed the extent of the impacts of the pandemic in Malawi.

CHAPTER 3

RESEARCH METHODOLOGY

This paper aims at analysis the labour market during the Covid-19 pandemic in Malawi. It is a panel data analysis and will focus on assessing the effects of COVID-19 on labour market transitions through determining the resilience of participants in the labour market and the risk of exiting the labor market during the COVID-19 pandemic, across genders and sectors of employment.

The rest of the chapter is structure as follows: Section 3.1 provides a review of the data and variables used. Section 3.2 describes the analytical framework. Section 3.3 presents the scope and limitations of the study.

3.1 Data and variables

This research uses data for households who were interviewed in the High Frequency Phone Survey on COVID-19 (HFPS COVID-19) conducted by the National Statistical Office of Malawi in 2020. This is a sub sample of the Integrated Household Panel Survey (IHPS 2019). The IHPS 2019 households were also interviewed in 2010, 2013, 2016, and the extensive information collected in the IHPS 2019 just over a year prior to the pandemic provides a rich set of background information on the HFPS COVID-19 households. The time of study has been limited to 9 rounds covering the period from May 2020 to April 2021, because this was the information that was available at the time of conducting this research. As mentioned, The HFPS COVID-19 is a sub-sample of IHPS 2019, except that the HFPS sample provides further detail on the trajectory of the COVID-19 pandemic. This sample includes a total of 2,337 households from which data was collected monthly. Analysis is done only on those individuals aged between 15 and 65, since these are the active participants in the labour market. Data was collected on demographic information, status of employment, sector of employment, level of education, and COVID-19 status, and, the survival of participants in

the labour market with exposure to COVID-19 pandemic was analyzed. Table 1 on the next page, provides a summary of the variables included in this study:

Table 1: Variables Included in the model

Age	**Age of the individual at the time of interview**
Gender	Dummy: 1=man, 0=woman
Level of Education	
Primary	Dummy: 1=primary level, 0=other levels
Secondary	Dummy: 1=secondary level, 0=other levels
Tertiary	Dummy: 1=tertiary level, 0=other levels
Sector of Employment	
Agriculture	Dummy: 1=employed in agricultural sector, 0=other sectors
Buying & selling	Dummy: 1=employed in buying and selling sector, 0=other sectors
Transport	Dummy: 1=employed in transport sector, 0=other sectors
Manufacturing	Dummy: 1=employed in Manufacturing sector, 0=other sectors
Education	Dummy: 1=employed in education sector, 0=other sectors
Health	Dummy: 1=employed in health sector, 0=other sectors
COVID	Dummy: 1=individual/family member was diagnosed with Covid-19, 0=individual/family member was not diagnosed with Covid-19

3.2 Analytical Framework

To achieve the objective outlined in the prior section, the study used the survival analysis, particularly the survival rate and hazard ratios to measure the resilience of participants in the labour market.

Survival analysis is also called duration analysis, transition analysis, failure time analysis, and time-to-event analysis. Survival analysis has been widely used in economics, for instance, studies in Finance: Loan performance (borrowers obtain loans and then they either default or continue to repay their loans), Adoption of new technology, Firm survival and exit and in the market and Time to retirement for individuals etc. Survival Analysis is commonly and originally used in the medical sector where studies are conducted to analyze the probability of patients surviving after a treatment (e.g. kidney transplant, or cancer treatment).

3.2.1 Survival analysis set up

Subjects are tracked until an event happens (failure) or we lose them from the sample (censored observations). The major interest is in how long they stay in the sample (survival) but also, their risk of failure (hazard rates).

3.2.2 Survival analysis features

The dependent variable is duration (time to event or time to being censored) so it is a combination of time and event/censoring.

Time variable = length of time until the event happened or as long as they are in the study

The event variable = 1 if the event happened or 0 if the event has not yet happened

This study will analyze both the non-parametric and parametric models. And these include the Kaplan-Meier and Nelson Aalen non-parametric models, but also the Exponential, Weibull, and Cox –Proportional Hazard parametric models.

The study will adopt a modified methodology used by Wardhana *et al*. (2020) used in their study. According to Wardhana *et al*., (2020), the length of a spell for a subject person, is a

realization of a continuous random variable T with a cumulative distribution function (cdf), $F(t)$, and probability density function (pdf), $f(t)$. $F(t)$ is also known in the survival analysis literature as the failure function. Survival function $S(t)$ in this case, is a function that an individual in this sample will remain employed until a certain point in time within the period of analysis defined as:

$S(t) = 1 - F(t) = Prob(T \geq t)$, *where;……..(1)*

T is a continuous random variable

t is the elapsed time since entry into the labour market at time 0 (Wardhana et al., 2020)

Hazard rate is defined as the chance that an individual will lose their job at a certain point, within the period of analysis(Wardhana *et al*., 2020). It is defined as follows:

$\gamma(t) = \frac{f(t)}{S(t)}$ ……..(2)

Both the Survival rate and the hazard ratio functions are probabilities and thus adopt the properties of probabilities. The survival rate is strictly a decreasing function of t, starting with a value of 1 at the beginning of the study period (t=0) and 0 at infinity. On the other hand, the Hazard rate is a non-decreasing function (Jenkins, 2005).

3.2.2.1 Non-parametric models

- **Kaplan-meier function**

The Survival Analysis data provides for details on the number of persons that have lost their jobs between two time periods, "job loss rate" "d_j". Such that the Kaplan-Meier function is given as the product of 1 minus the ratio of "job loss rate" and the number of persons at risk of jobloss "n_j" i.e.

$\check{S}(t_j) = \prod_{j,t_j<t}\left(1 - \frac{d_j}{n_j}\right)$ …….(3)

This will help to determine the resilience of participants as well as the risk period of exiting the labour market. Separate analysis will be made for men and women, as well as sectors to determine if the risk period of exiting the labour market is different across genders and sectors

- **Nelson-aalen function**

Alternatively, there is the Nelson-Aalen estimator, which is defined as the cumulated hazard ratios over time. the Nelson-Aalen function $\breve{H}(t_j)$ is given by:

$\breve{H}(t_j) = \sum_{j,t_j>t} \frac{d_j}{n_j}$ ……...(4)The Kaplan-Meier function and Nelson Aalen function are similar, so the study will only analyze the Kaplan Meier which analyses the resilience overtime; while the Nelson-Aalen analyses risk overtime.

3.2.2.2 Parametric models

Weibull and exponential model

- **The Weibull model hazard rate is given by:**

$\theta(t, X) = \alpha t^{\alpha-1} exp(\beta' X)$ ……..(5)

$= \alpha t^{\alpha-1}\lambda$ ……*(6)*

The expression of the hazard rate implies that:

$log[\theta(t, X)] = \log \alpha + (\alpha - 1) + \log(t) + \beta' X$ ……(7)

This model satisfies the general properties of Proportional Hazard Model where:

$\theta(t, X) = \theta_0(t) exp(\beta' X) = \theta_0(t)\lambda$ ……(8)

This is also the case with Exponential model, since an Exponential model is simply the Weibull model with α = 1 (Jenkins, 2005)

Therefore, $\frac{\partial \theta(t,X)}{\partial X_K} = \theta\beta_K$ where,……(9)

$X_K = K_{TH}$ Covariate in the vector of characteristics X. in this case, age, gender, level of education, COVID-19 status, and sector of employment.

Thus each coefficient summarizes the proportionate response of the duration of employment to a small change in the relevant covariate.

- **The Weibull Survival Function**

You will recall that, $\theta(t, X) = \propto t^{\propto-1}\lambda$

However, for all models $S(t, X) = 1 - F(t, X) = \exp\left[\int_0^t \theta(\mu, X) du\right]$

Such that substituting the Weibull hazard function into this expression yields:

$S(t,X) = \exp\left[-\lambda\alpha\left(\frac{t^{\alpha}}{\alpha} - \frac{\theta^{\alpha}}{\alpha}\right)\right]$ ……(10)

$S(t,X) = exp(-\lambda^{\alpha})$ ……..(11)

- **Cox-proportional hazard model**

The distinguishing feature of Cox proportional hazard model proposed by Cox in 1972, sometimes simply referred to as the Cox model, is its demonstration that one could estimate the relationship between the hazard rate and explanatory variables without having to make any assumptions about the shape of the baseline hazard function. Hence, the Cox Proportional Hazard Model is sometimes referred to as semi-parametric model (Jenkins, 2005)

Recall, the proportional hazard is given by:

$\theta(t,X) = \theta_0(t)\lambda_i$ ……..(12)

For computation sake, we will assume the X vector is constant, but note that the Cox model can in fact also handle time-varying covariates. The probability density of survival times is the product of the hazard rate and the survival function i.e.

$f(t) = \theta(t)S(t)$ ……..(13)

Such that the probability that an event will occur in the smallest interval $[t, t+\Delta t]$ is

$f(t)dt = \theta(t)S(t)dt$ …….(14)

The application of the analysis methods i.e. both the parametric and non-parametric models; is conducted using Stata.

3.2.3 Diagnostic Tests

Table 2: Log-rank test for equality of survival functions

Gender	**Events observed**	**Events expected**
Women	1355	1340.59
Men	1037	1051.41
Total	**2392**	**2392.00**

Chi2(1)= 0.54

Pr>chi2= 0.000

We reject the null hypothesis of no difference in the survival between men and women, and conclude that the survival of men and women in the labour market differs significantly.

Definitions (ILOSTAT)

The duration of unemployment has been defined as a period of time from when the person began seeking employment or, if that job search was interrupted by a period of employment, since the person was last employed, until the end of the survey reference week, whichever is the shorter.

Persons in employment are defined as all those of working age who, during a short reference period, were engaged in any activity to produce goods or provide services for pay or profit. They comprise employed persons "at work", i.e. who worked in a job for at least one hour; and employed persons "not at work" due to temporary absence from a job, or to working-time arrangements (such as shift work, flexitime and compensatory leave for overtime).

Informal employment comprises persons who in their main job were: (a) own-account workers, employers or members of producers' cooperatives employed in their own informal sector enterprises; (b) own-account workers engaged in the production of goods exclusively for own final use by their household; (c) contributing family workers, irrespective of whether they work in formal or informal sector enterprises; or (d) employees holding informal jobs, whether employed by formal sector enterprises, informal sector enterprises, or as paid domestic workers by households.

Employment in the informal sector refers all persons who, during a given reference period, were employed in at least one informal sector enterprise, irrespective of their status in employment and whether it was their main or a secondary job. An informal sector enterprise is (1) an unincorporated enterprise and (2) a market enterprise (i.e., it sells at least some of

the goods or services it produces), and (3) meets at least one of the following criteria: (i) the enterprise is not registered, (ii) the employees of the enterprise are not registered, or (iii) the number of persons engaged on a continuous basis is below a threshold determined by the country.

A job or work activity is defined as a set of tasks and duties performed, or meant to be performed, by one person for a single economic unit. The term job is used in reference to employment.

Persons experienced Job loss when they become unemployed either permanently or temporarily. Excluding those with reduced working hours.

Temporary employment, whereby workers are engaged only for a specific period of time, includes fixed-term, project- or task-based contracts, as well as seasonal or casual work, including day labour.

Persons in unemployment are defined as all those of working age who were not in employment, carried out activities to seek employment during a specified recent period and were currently available to take up employment given a job opportunity.

The unemployment rate expresses the number of unemployed as a percent of the labour force (which includes persons in unemployment plus those in employment). The unemployed are persons of working age who were not in employment, carried out activities to seek employment during a specified recent period and were currently available to take up employment given a job opportunity.

3.3 Scope and limitations

3.3.1 Illogical values

Recording of some of the responses was illogical, for instance, individuals would report decreasing age (age in one period being less than the other consecutive periods)

3.3.2 Measurement errors

These errors arose due to misunderstanding of the questions especially as to the exact time individuals experienced the pandemic, i.e. the determination of time at risk was difficult; as to whether individuals were at risk at the date of being diagnosed with the pandemic or when the interview was conducted.

CHAPTER 4

RESULTS AND DISCUSSION OF THE STUDY

In this paper, the study has analyzed how different characteristics affect labour market participation in Malawi during the COVID-19 pandemic using data collected from the HFPS COVID-19 conducted by the National Statistical Office of Malawi. The total sample size was 3,624 with the mean age for the participants at 31.2 years. Just like most of the Sub-Saharan countries, small enterprises and the informal sector play a major role as providers of jobs. And, most of these enterprises fall within sectors that are also at high risk during the COVID-19 pandemic.

4.1 Descriptive Statistics

From Table 2 below, there is a high representation of workers in the Agriculture, Buying and selling, and manufacturing industries, which have been mentioned to be sectors that are at high risk (ILO, 2020).

Table 3 describes the variables included in the model as at April 2020, which is also the first month of our analysis.

The figures in the table 3 indicate that the largest share from the sample were women with a 54% representation compared to a 45% of their male counterparts. Low levels of employment were also observed; with only 33% of the sample being employed, highlighting the extent of the issue of unemployment in the country, and in most Sub-Saharan countries in general. Lastly, there was a 24.78% prevalence of the COVID-19 infections from the sample. 2.96% reported to have no education, while the majority of the sample reported to have primary education (49.90%) and 36,95% had secondary education, and 10.19% had tertiary education level. The statistics also show that there was a 7.78% prevalence of the pandemic as at April 2020.

Table 3: Descriptive Statistics

VARIABLE	Observations	Percentage
Age	3,595	31.2 (mean)
Gender	3,595	54% female 45% male
Working status	3,624	33% employed 66.6% unemployed
Sector	3,624	Agriculture 15.29% Buying&selling 8.8% Transport 1.6% Manufacturing 5.88% Education 0.80% Health 0.97% Other 71.6%
Level of education	3,613	No education 2.96% Primary 49.90% Secondary 36.95% Tertiary 10.19%
Covid-19 status	3,624	Positive 7.78% Negative 92.22%

4.2 Assessing the risk of exiting the labour market

The survival rate, as guided by theory, begins at 1 meaning that all subjects belong in the sample. As time lapses, the survival rate is declining from 82.19% in the 2nd round to 11.88% in the 8th round. This shows that there was a higher probability (82,19%) of individuals remaining employed in the labour market as at May 2020 when we had just started

experiencing the COVID-19 pandemic. However, towards the end of the study period, as at March 2021, there was only 11.88% probability of participants remaining employed. This means that out of 100 people only 11.88 would be able to maintain their jobs in times of this pandemic. This implies that the unemployment levels are increasing rapidly, within a 70.31 percentage drop in employment level in a space of 7 months.

Table 4: Survival Function Life Tables

Time	Beg. Total	Fail	Net Lost	Survival rate
1	3624	0	1209	1.0000
2	2415	430	0	0.8219
3	1985	382	0	0.6638
4	1603	309	0	0.5358
5	1294	292	0	0.4149
6	1002	169	0	0.3449
7	833	206	0	0.2596
8	627	340	0	0.1188
9	287	287	0	

4.3 Assessing the risk of exiting the labour market between men and women

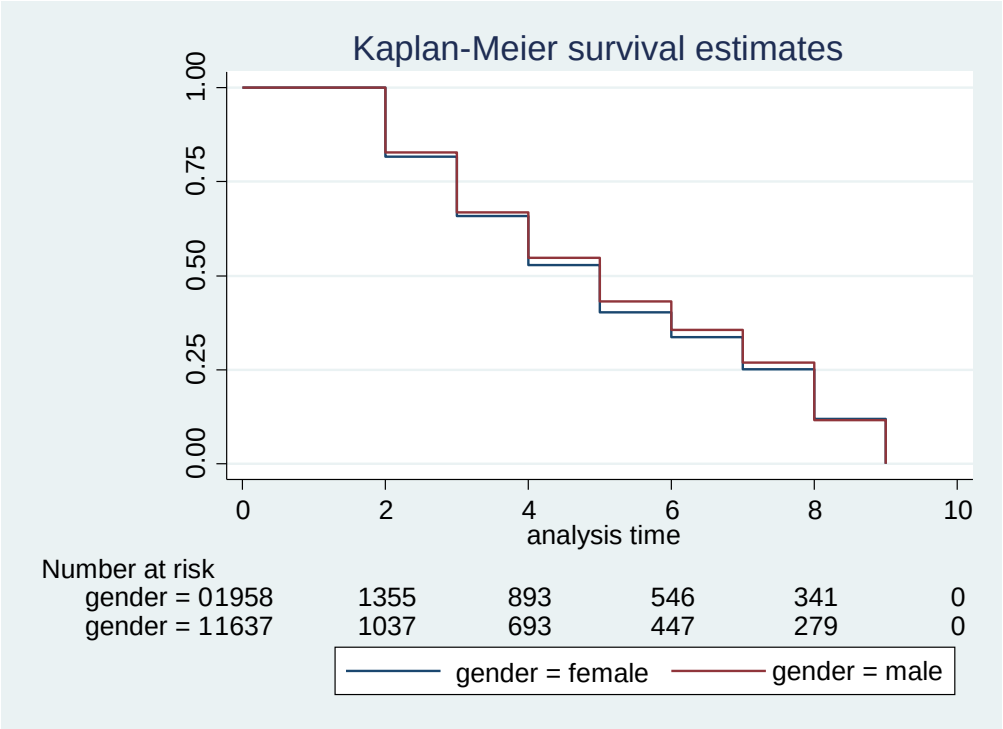


Figure 3: Kaplan-Meier Survival Estimates by Gender

According to Graph 1 above, the probability of maintaining a job during the pandemic declines over time for both men and women. However, at any point except the 9th month, it is shown that men have a higher probability of maintaining their jobs during the 9 months period of study compared to women. This means that if someone is male, they are more likely to remain employed. Women, on the other hand, risk highly at losing their jobs. Basically, because women represent a largest proportion of workers in the informal sector which means a lot of women are vulnerable to external shocks like the pandemic since the informal sector is characterized by low wages and lack of social protection. But also, with closure of non-essential workplaces and schools, women have been affected by a double burden of having to work from home and unpaid work with the increased child-care needs. Ipsos data from January 2021 shows that a longer "double-shift" of paid and unpaid work in a context of school closures and limited availability of care services have contributed to an

overall increase of stress, anxiety around job insecurity and difficulty in maintaining work-life balance among women with children. As a result, many women have resorted to leaving their jobs in order to focus on the non-paid households work; implying job losses and, consequently, loss of labour income. In the long run, this trend poses a risk of widening the already existent gender gaps.

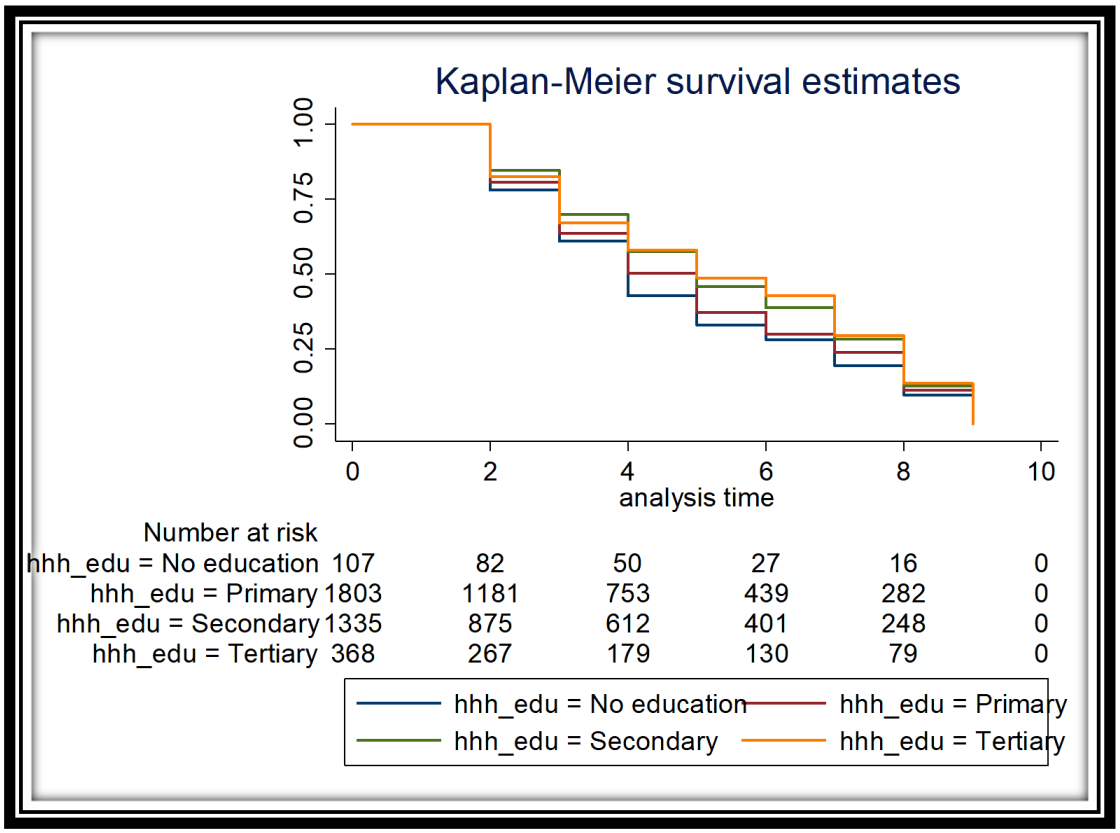


Figure 4: Kaplan-Meier Survival Estimates by Level of Education

According to figure 4 above, survival rates are declining for all categories of level of education, with a significant drop from the 2nd to 7th month. However, more educated individuals have a higher probability of maintaining their jobs over time compared to individuals with primary or no education. For instance in month 4, the survival rate for individuals with tertiary education was approximately 0.65 while for those with no education was 0.4, implying a 0.25 percentage point difference. This is not surprising because majority of those with low level education are usually employed in the informal sector, which as

mentioned earlier is characterized by low wages and lack of social protection. As a result, most workers in the informal sector are facing the pandemic with lower resilience and risk losing their jobs. Additionally, businesses in the informal sector have low capacity to adopt the work-from home policy, a lot of small and medium enterprises have been shut down, putting their workers at risk.

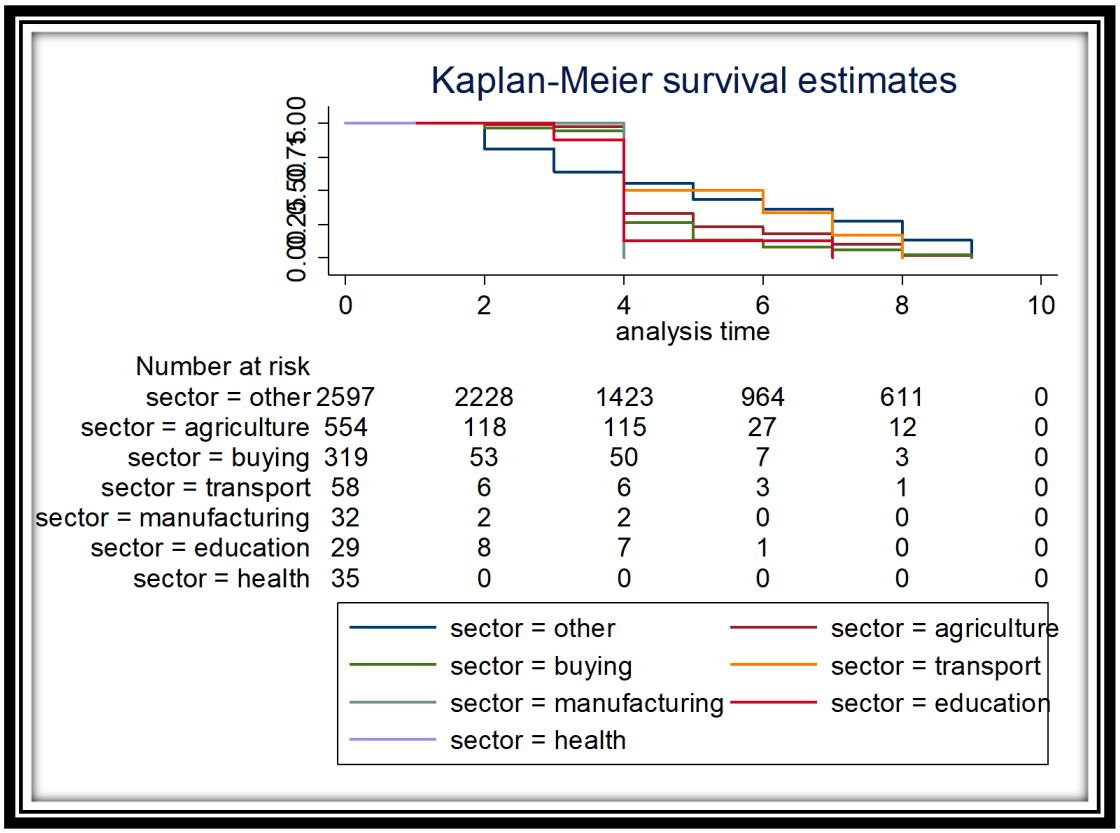


Figure 5: Kaplan-Meir Survival Estimates by Sector of Employment

With regard to the Sector of Employment, you can see the impact of the insurgence of the pandemic was not contemporaneous. Changes in the probability of maintaining jobs started in the second month with a massive drop in other sectors. The education and Transport sectors had a significant drop in month 4 compared to the rest of the sectors. This may be indicative of the April-May 2020 policy adoption when the government instituted strict measure to contain the spread of the virus through closure of schools and closure of airlines and borders in Malawi. Similarly, the Manufacturing and Buying and Selling sectors also experienced a drop in the survival rates of workers. The ILO Monitor in its second edition

identified the accommodation and food services; the real estate, business and administrative activities; the manufacturing; and the wholesale and retail trade as sectors hardest hit by the pandemic. The sector of employment either exacerbates or slows the impact of the pandemic through the flexibility and capability of jobs to allow workers to work from home. Difference in occupational structure determine whether one is able to work from home or not, of course besides internet availability and capacity. Jobs that are not flexible to work from home experienced high levels of job losses, but those that maintained their jobs experienced work hour losses, with a likelihood of having its workers working from home. It is not surprising that workers in developed economies are better able to work from home. The majority are employed in sectors that have a higher flexibility to work from home, additional to the easy access to the internet. However, many workers in developing nations like Malawi are employed in occupations such as construction work or in informal services and cannot work from home. Such differences in occupational structure alone account for a difference of ten percentage points between workers in advanced economies and developing ones (13% for developing economies against 23% for developed ones) (WEF, 2021)

4.4 Resilience of Participants in the labour Market

With the aim of estimating the resilience of participants in the labor market during the COVID-19 pandemic in Malawi and to establish if there are any differences across gender and sector of employment; the Cox regressions were used. The results of the estimates are presented in Table 4 below.

In Table 4 above, I have presented the regression results (coefficients). Analysis will particularly be based on the Cox Proportional Hazard Model because it is the most preferred model for analysis because it makes no assumption about the shape of the base line. It also allows for analysis using the time-variant characteristics that is why it is sometimes referred to as semi-parametric.

For interpretability, we need to compute hazard ratios by exponentiating the parameter

estimates (coefficients). The results are presented below:

Table 5: Parametric Model Estimation (Coefficients)

Variable	Cox Model
Age	0.001 (0.32)
Gender	-0.013 (-0.30)
Level of education	
Primary	-0.139 (-1.21)
Secondary	-0.260** (-2.23)
Tertiary	-0.291** (-2.29)
Sector of employment	
Agriculture	0.127 (1.32)
Buying	0.195** (1.39)
Transport	0.125 (0.31)
Manufacturing	0.672 (0.95)
Education	0.467** (1.31)
Health	-2.000 (.)
COVID-19	-0.847*** (-18.58)
Cons	-

*Robust standard errors are reported in parentheses (*** p‹0.01, ** p‹0.05, *p‹0.10. These are results* from *the Cox Proportional Hazard Model, the column shows the resilience of participants in the labour market disaggregated by age, gender, sector of employment and Covid-19 status, of Malawians during the Covid-19 Pandemic*

4.3.1 Age

The expected hazard is 1.001 times higher in a person who is one year older than another. Or put differently, there is a 0.1% increase in the expected hazard relative to a one year

increase in age holding all other variables constant.

4.3.2 Gender

The expected hazard is 0.987 times higher in women as compared to women. Or, there is a 98.7% increase in the expected hazard for a woman relative to a man. A negative coefficient indicates that men are highly resilient in their employment as tend to stay employed in their job longer than women implying that women have a higher probability of losing their job than men. These results are consistent with the results obtained from the non-parametric models presented earlier in Section 4.2.

Table 6: Parametric Model Estimation (Hazard Ratios)

Variable	**Cox Model**
Age	1.001
Gender	0.987
Level of education	
Primary	0.870
Secondary	0.771**
Tertiary	0.748**
Sector of employment	
Agriculture	1.135
Buying	1.215**
Transport	1.133
Manufacturing	1.958
Education	1.595**
Health	0.135
COVID-19	0.429***
Cons	-

4.3.3 Level of Education

For the variables representative of the education level, all of them have negative coefficients

indicating that individuals with primary, secondary or tertiary education are more likely to lose their job in the period of the study. The hazard ratios, further postulate that those with lower level of education risk highly to losing their job than their counterparts. The expected hazard is high in those with primary education (87%) followed by those with secondary education (77.1%) and lastly those with tertiary education at 74.8%.

4.3.4 Sector of Employment

The expected hazard is higher in the manufacturing sector (95.8%), education sector (59.5%), Buying and Selling Sector (21.5%), Health Sector (13.5%), Agriculture Sector (13.5%) and lastly the transport Sector (13.3%).

4.3.5 Covid-19

The expected hazard is 0.429 times higher in those that tested positive for Covid-19 relative to those that tested negative. Or, there is a 42.9% increase in the expected hazard for an individual who tested positive for Covid-19 relative to an individual that did not.

CHAPTER 5

SUMMARY, CONCLUSION AND IMPLICATIONS

Given the current situations where the pandemic has caused enormous damage to livelihoods and economies; it has been quite a challenge for most countries, Malawi inclusive, to return to normalcy and recovery. Countries need to ensure that they provide measures that, not only normalize livelihood and economic activity, but also provide a platform for a resilient and sustainable long-term growth and development of its citizens. This study, investigated the drivers of exit in the labour market in order to advise policy. It has been shown that factors like sector of employment, gender, level of education and formality of work influence the pandemic-induced damage to the life of work. The policy implications for improving the labor market conditions and some contested policy options are suggested in this section, such as the provision of social security to vulnerable groups in the labour market like women, youths, workers in informal sector and rural communities, and formalization of the labour market. Furthermore, there should be increased adoption and application of technology but also increased access to credit and to stimulus packages for small and medium enterprises.

Women have been found to have a higher risk of exiting the labour market, regardless of the fact that they represent a large proportion of workers. Literature has shown that most women are employed in the informal sector, but also sectors that have been recognized as high risk to the pandemic. Additionally, women are faced with a double burden of unpaid household work and paid work. Thus it is not surprising that the results show that they have a higher risk of exiting the labour market than their male counterparts. To ensure that women participation in the labor market is high, the government should provide women with social protection like cash transfers. Social protection is a critical strategy for poverty reduction, inclusive growth and building resilience to shocks in the labor market. Given the enormous damage caused by the pandemic, social protection is a given solution for these vulnerable groups to be able to maintain their livelihoods. This is also applicable to other vulnerable

groups that risk highly in the face of the pandemic like the youth, informal sector workers and migrants.

Malawi, just like majority of African countries has the highest share of workers in informal employment with eight out of ten workers employed in the informal sector. It has been noted from the results in this study, that most of those that are highly affected by the pandemic measures in the labour market are employed in the informal sector. These include women, youths, and the high risk sectoral jobs are operational in the informal sector. Informal markets are usually characterized by low-skilled workers, including unpaid family workers, mainly women, who labour in precarious conditions, without social protection or health and safety measures at the workplace. They have low productivity, low rates of savings and investment, and negligible capital accumulation, which makes them particularly vulnerable to shocks like the COVID-19 pandemic. Most businesses in the informal sector have been shut down due to the restrictions implemented to contain the virus, and this temporary or permanent shutdown has led to loss of jobs and consequently, reduced income earnings. Thus, it is not surprising from the results that, women, youths and sectoral jobs risk highly to the pandemic.

If Malawi has to create sustainable work environment and a generation that is useful in the labour market, it is imperative now that there should be increased adoption and application of technology. Firstly, the closure of schools as a pandemic policy measure has caused educational loss either by disruption to education and training or increased dropout rates. This might have long term impacts on the youth to secure entry level jobs if the youths lack necessary skills. Due to the restriction of large gatherings and face-to-face interactions, most institutions resorted to using the online platform to offer lessons. Unfortunately, large segments particularly in rural areas were not able to participate due to insufficient resources to buy devices and data, limited telecommunication infrastructure, inter alia. With that in mind, the government should invest more in telecommunication infrastructure, to cover all communities for increased access to internet. This will also stimulate financial inclusion, innovation and knowledge dissemination. Additionally, job loss was heightened by the

inability of workers to work from home because of limited access to internet. Adoption of technology in this context will allow people to be able to work from home, besides the differences in occupational structure.

Despite the efforts that the Malawi Government has put to spur economic activity like the directive to implementation of a Voluntary Compliance Window (VCW) in order to relieve taxpayers during the COVID-19 pandemic, there is still room for more initiatives. The study suggests that small and medium enterprises (which are dominant in sectors that have been hit hardly by the pandemic, like manufacturing, buying and selling sectors) should be provided with easy access to credit, and ensure that they are able to benefit from fiscal measures in general and from the stimulus packages related to the current crisis, in particular. This is key to dealing with long-term effects on unemployment because these measures are core to the existence of these businesses, which are also key players as providers of jobs. Access to credit and stimulus packages will ensure fast recovery of the businesses to bring back normal business operations.

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