IBN HALDUN UNIVERSITY
SCHOOL OF GRADUATE STUDIES
DEPARTMENT OF ECONOMICS

MASTER THESIS

COMPARATIVE ANALYSIS OF BEVERIDGE CURVE DURING GLOBAL FINANCIAL CRISIS AND COVID-19 CRISIS IN TURKEY

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THESIS SUPERVISOR

ASSIST. PROF. ASAD UL ISLAM KHAN

ISTANBUL, 2021

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by

SAID JAMILU BABANGIDA

A thesis submitted to the School of Graduate Studies in partial fulfillment of the requirements for the degree of Master of Arts in Economics

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APROVAL PAGE

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Arts in Economics.

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This is to confirm that this thesis complies with all the standards set by the School of Graduate Studies of Ibn Haldun University.

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ACADEMIC HONESTY ATTESTATION

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and reference all materials and results that are not original to this work.

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ÖZ

KÜRESEL FİNANSAL KRİZ VE TÜRKİYE'DEKİ COVID-19 KRİZİ SIRASINDA BEVERIDGE EĞRİSİNİN KARŞILAŞTIRMALI ANALİZİ

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Küresel Finansal Krizin (GFC) ardından, Beveridge eğrisi çalışmasına artan bir ilgi olmuştur. Bu tez, küresel finansal kriz ve Covid-19 döneminde Türkiye işgücü piyasası için işsizlik ve boşluk oranları dinamiklerini Beveridge eğrisinin aynasında analiz etmektedir. Beveridge eğrisinin görsel olarak incelenmesi, Beveridge eğrisinin orijinden uzağa kayması nedeniyle işgücü piyasasının verimsiz olduğunu ortaya koymaktadır. Küresel Finansal Kriz (Covid-19) eğrisinin saat yönünün tersine (saat yönünde) hareketi ile hem işsizlik oranının hem de boşluk oranının dönem içinde arttığı açıktır. Görsel inceleme, işsizlik-boşluk davranışının anlaşılmasını şekillendirdi. İşgücü piyasası için Beveridge eğrisindeki kayma, ekonomideki döngüsel ve yapısal faktörlere bağlanıyor. Ampirik sonucumuz, genç işsizliğinin hem kısa vadede hem de uzun vadede işsizlik dinamiklerini belirleyen önemli bir faktör olduğunu göstermektedir. GSYİH büyümesi ve inşaat sektörü istihdamının da örnekleme döneminde Türkiye'deki işsizlik dinamikleri üzerinde büyük etkisi olduğu gösterilmiştir. Ek olarak, GFC ve Covid-19'un Beveridge eğrisi üzerinde hiçbir etkisi olmadığını bulduk. İşsizlik oranı ile negatif bir ilişkiye sahip olması beklenen açıklığın pozitif anlamlı bir etkiye sahip olduğu gösterilmemektedir. Bu, Beveridge eğrisi önermesine aykırıdır. Bu, Türkiye'deki boşluk oranının işgücü piyasasındaki işsizlik oranının altında kaldığı anlamına geliyor. Ekonomide iş arayan

insan sayısıyla eşleşecek tutarlı bir iş yaratımı yok. Buna dayanarak, Türkiye işgücü piyasası verimsizliklerle karakterizedir.

Anahtar Kelimeler: ARDL**,** Beveridge Eğrisi, Boşluk Oranı, Covid-19, İşsizlik Oranı, Küresel Finansal Kriz.

ABSTRACT

COMPARATIVE ANALYSIS OF BEVERIDGE CURVE DURING GLOBAL FINANCIAL CRISIS AND COVID-19 CRISIS IN TURKEY

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Following the Global Financial Crisis (GFC), there has been increasing interest in the study of the Beveridge curve. This thesis analyses the unemployment and vacancy rate dynamics for the Turkish labour market during the period of global financial crisis and Covid-19 in the mirror of Beveridge curve. The visual inspection of the Beveridge curve reveal that the labour market is inefficient due to a shift in Beveridge curve away from the origin. It is evident that both unemployment rate and vacancy rate increase over the period with a counter clockwise (clockwise) movement of the curve for Global Financial Crisis (Covid-19). The visual inspection shaped the understanding of the unemployment-vacancy behaviour. The Beveridge curve shift for the labour market is attributed to cyclical and structural factors within the economy. Our empirical results show youth unemployment to be the significant factor determining unemployment dynamics both in the short run and long run. GDP growth and construction sector employment are also shown to exert great influence on unemployment dynamics in Turkey during the sample period. In addition, we found that GFC and Covid-19 have no significant effect on the Beveridge curve. Vacancy rate expected to have a negative relationship with unemployment rate is shown to have a positive insignificant effect. This is in contradiction to the Beveridge curve proposition. This implies that vacancy rate in Turkey falls short of the unemployment number in the labour market. There are no consistent job creations to

match the number of people seeking for jobs in the economy. Based on this, the Turkish labour market is characterised by inefficiencies.

Keywords: ARDL**,** Beveridge Curve, Covid-19, Global Financial Crisis, Unemployment, Vacancy.

DEDICATION

This dissertation is dedicated to my mother, my first teacher, who with keen insight and sense of responsibility, taught me from childhood how to love and revere a heritage of great value. Who has taught me to inhabit two worlds - the Islamic culture which I identify with and the African culture.

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Said Jamilu Babangida

ISTANBUL, 2021

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CHAPTER I

INTRODUCTION

1.1. Introduction

The outbreak of Covid-19 has placed global labour markets in crisis by disrupting the supply chains, slumping world trade and export demand, and leading to loss of working hours. Most emerging economies have slipped into recession unlike many developed economies. The Covid-19 induced recession is different not just by the degree of harm it has caused to these economies but by the unique shock it has brought to the labour market. Beyond the trauma job losses have brought on individuals who have borne the brunt of fending for their families due to different measures, their impact on the global economy is severe. Moreover, the asymmetrical impact of the Covid induced recession on the labour market stands contrary to previous economic crisis. Unlike past recessions, labour markets were significantly affected with higher transition of workers. The current crisis is harming labour market prospects more with widespread job losses (Fabrizio, Malta, & Tavares, 2020).

Interestingly, the rate of unemployment is determined by the rate at which workers enter and exit unemployment states. These inflows and outflows help in understanding the unemployment dynamics in the labour market. Accordingly, Gallant, Kroft, Lange, and Notowidigdo (2020) argued that the Beveridge curve showing negative unemployment-vacancy relationship in the labour market typically loops around during and after an economic recession. In general terms, the movement along Beveridge curve is associated with cyclical factors. On the other hand, the Beveridge curve shift is associated to structural changes resulting from matching efficiency (Bouvet, 2012). In the wake of Global financial crisis, most economies recorded an unprecedented rise in unemployment rate coupled with a drop in job vacancies (see, Hobijn & Şahin, 2013). Studies examining which factors drive the shift in Beveridge curve have increased. Similarly, in the early

period of Covid-19 induced recession, there was evidence of a fall in unemployment and job vacancy rate due to restrictive measures put in place. Correspondingly, studies have revealed that short time work is an effective tool to safeguard jobs losses in times of severe economic recessions (Merkl & Weber, 2020). Arguments have emerged about the effects of crises on the labour market. Obviously, it presented poor job opportunities leading to high job flows in the labour market among workers.

Specifically, as far as the pandemic induced behaviour of workers is concerned, two effects are observed. Firstly, it occurs when the conditions in the labour market are devoid of incentives to stimulate job search and labour market participation. This is the "discouraged-worker effect". Secondly, the "added worker effect" increases household members' labour supply to compensate for the decline in labour market wage caused as a result of the pandemic. On theoretical ground, Jonung and Roeger (2006) asserted that a pandemic has both labour supply and demand effects. The former resulting from loss in the number of working hours and the latter from measures of precaution by population against infection. Undoubtedly, the fall in supply stems from the fact that infected people drop out of labour force and most nonessential sectors in the economy get shut down (Demiralp, 2020). This implies that lockdowns from the pandemic have a simultaneous double shock of supply and demand to the markets. These leads to a fall in economies' production level. The recent labour market evidence from developed and developing countries has shown evidence of coexistence of large jobs creation and destruction at all sectors of the economy. Economies respond to all forms of global shocks with numerous policies to thwart the effect. For instance, during the Covid-19 crisis, Turkey unfolded their policies in funding markets and businesses to avoid this health shock from being metamorphosed into a financial crisis; the central banks followed with a reduction in interest rate to support businesses in retaining its workers. This helps in preventing a solvency crisis to linger in effect on the economy.

1.2. Motivation of the Study

Currently, most economies have overtime been struggling with the problem of high rate of job flows (i.e., job creation and destruction) and workers flow/transition (i.e., moving from state of employment to unemployment and vice versa) (Strawiński, 2009). Macro-labour literature has used either job flow rate or worker flow rate as a yardstick in evaluating the search/matching model in the labour market. The flow analysis has become a standard tool to analyse the labour market dynamics (Fujita & Nakajima, 2016). This study deviates slightly to investigate the relationship between vacancy and unemployment for the Turkish labour market. Undoubtedly, Beveridge curve forms an important point for studying most economies characterised by lack of an extensive data on the labour market. The Beveridge curve, an indicator of labour market efficiency shows the empirical unemployment-job vacancies relationships by firms in the labour market (Ghayad & Dickens, 2012). During any economic crisis, there is always changes in the unemployment-vacancy relationship globally with Turkey not being an exception. For example, despite fewer firms hiring during the pandemic to limit the spread of virus, the unemployment rate for Turkey has only trended downward slightly. This could be due to successful match of individuals in the labour market and the government measures to maintain the level of employed persons in the country. This is often interpreted as a decrease in labour market friction or increase in job matching efficiency in labour market.

It is widely recognised that economic crisis like global financial crisis and Covid-19 induced crisis pose dramatic economic, financial, and social consequences on the overall economy and most government corroborate with short time work to safeguard the labour market. However, irrespective of the effectiveness of the policy measures to maintain a constant separation rate in the economy, the labour market always comes under severe pressure. There have been problems of job separation and destruction in the downturn (Merkl & Weber, 2020). This disrupts workers' careers, wages and further diminish aggregate demand in the economy, propagating and leading economies into recession. Since unemployment changes is approximately "the difference between separations from employment and hires from unemployment". Different policy responses have unfolded to

focus greatly on preventing employment ties from being worse in struggling sectors particularly to encourage 'labour hoarding' as well as protecting the wages of workers.

1.3. Objectives of the Study

Following existing empirical evidence and theoretical arguments of the effects of economic crisis and pandemic remains novel and an interesting area of research. This is due to ranging experience for each person, family, economy due to some economic crisis and outbreak of pandemic. It is on this basis that the study's objective is to analyse the relationship between unemployment and vacancy during the global financial crisis and Covid-19 crisis.

The study aim is to make a contribution to the literature in four ways. Firstly, by examining the Beveridge curve (i.e., unemployment-vacancy relationship) during the Global financial crisis and Covid-19 pandemic. Secondly, the study seeks to identify the drivers of the Beveridge curve shift in the Turkish labour market during the sample period. Thirdly, it would attempt to analyse the effects of these crises on the market using a simple trend analysis and visualisations to shed light on potential causal pathways of these crises. Fourthly, it will attempt to quantitatively examine the effect of the crises on the unemployment-vacancy rate behaviour.

1.4. Scope and Significance of the Study

It is widely recognised that economic crisis imposes some dramatic economic, financial and social consequences on the overall economy. Specifically, some of these crises have direct impact on the labour market as firms respond to the economic challenges through retrenchment. This study aims to examine the Beveridge curve of Turkish labour market during the global financial crisis and Covid-19 crisis. It is on this basis that the study consists of data ranging from January 2005 to March 2021 for the Turkish labour market outcomes. The labour market outcomes are unemployment rate, vacancy postings, labour force, youth unemployment, sectoral share of total employment, minimum wage relative to median earnings of full-time workers. The study also uses some cyclical data like GDP and inflation rate to examine the behaviour of Beveridge curve.

The study result will contribute to the labour market research and have significant implications for policy makers. This study aims to contribute to the Turkish labour market literature in many ways. First, this study will present a new and updated discussion on the reality of Beveridge curve (i.e., unemployment-vacancy relationship) before, during and after the Global financial crisis as well as during the Covid-19 pandemic. This study extends the discussion of Beveridge curve for the Turkish labour market through visual inspection and quantitative estimation. In addition, this study analyses the behaviour of Beveridge curve for the understanding of students, academicians, and policy makers. The shift drivers of the curve will be estimated to examine the impact for researchers and policy makers alike. This study will comprehensively highlight and visualise the trend in the labour market for quick understanding of the effect of crisis on some labour market outcomes. The aim would be to identify the potential causal pathways of these crises for policy makers to find a solution to the highlighted challenges.

However, the study is limited by availability of an extensive data set in the Turkish labour market. Extensive data for the Turkish labour market has been difficult to obtain due to unavailability. For the available ones, the unit of frequency is yearly contrary to the monthly data used in this study.

1.5. Organization of the Study

The study will be organised in the following structure: chapter 1 will begin with introduction of the study. Chapter 2 presents the review of literature, some background of the Turkish labour market, empirical literature. Data and methods will be discussed in chapter 3. Chapter 4 will discuss the Turkish labour market with the aid of visual inspection. The result for the estimation of unemployment-vacancy relationship will be discussed and interpreted extensively in chapter 5. The last chapter 6 will comprise the presentation of summary and conclusions.

CHAPTER II

LITERATURE REVIEW

2.1. Theoretical Literature

The Beveridge curve shows a relationship between unemployment and vacancy rate. This depicts a negative relationship. This implies that the higher the vacancy postings of firms, the lower the number of unemployed persons. Apparently, the basic idea is that as more jobs are being created, the lesser we will have people looking for job as everyone would be successfully matched to a job. The search/matching framework of Diamond-Mortensen-Pissarides gives the theoretical foundation to the Beveridge curve. The Beveridge curve has a downward sloping pattern and is distinguished by its unique movement for different economies of the world. Evidence has shown that movements on the curve as well as the entire shift of the curve are due to numerous reasons. Bleakley and Fuhrer (1997) stated that movements along the curve are as a result of vacancy openings and inflow and outflow of workers into unemployment and cyclical effects such as recession/expansion. On the other hand, movement of the entire curve is argued to be due to efficiency in searching for jobs by workers, i.e., matching efficiency. There are other factors that can result in Beveridge curve shift. A sample of such factors are labour force characteristics (age and gender, education), institutional structure, skill mismatches. The shift can be seen from the Figure 2.1 below.

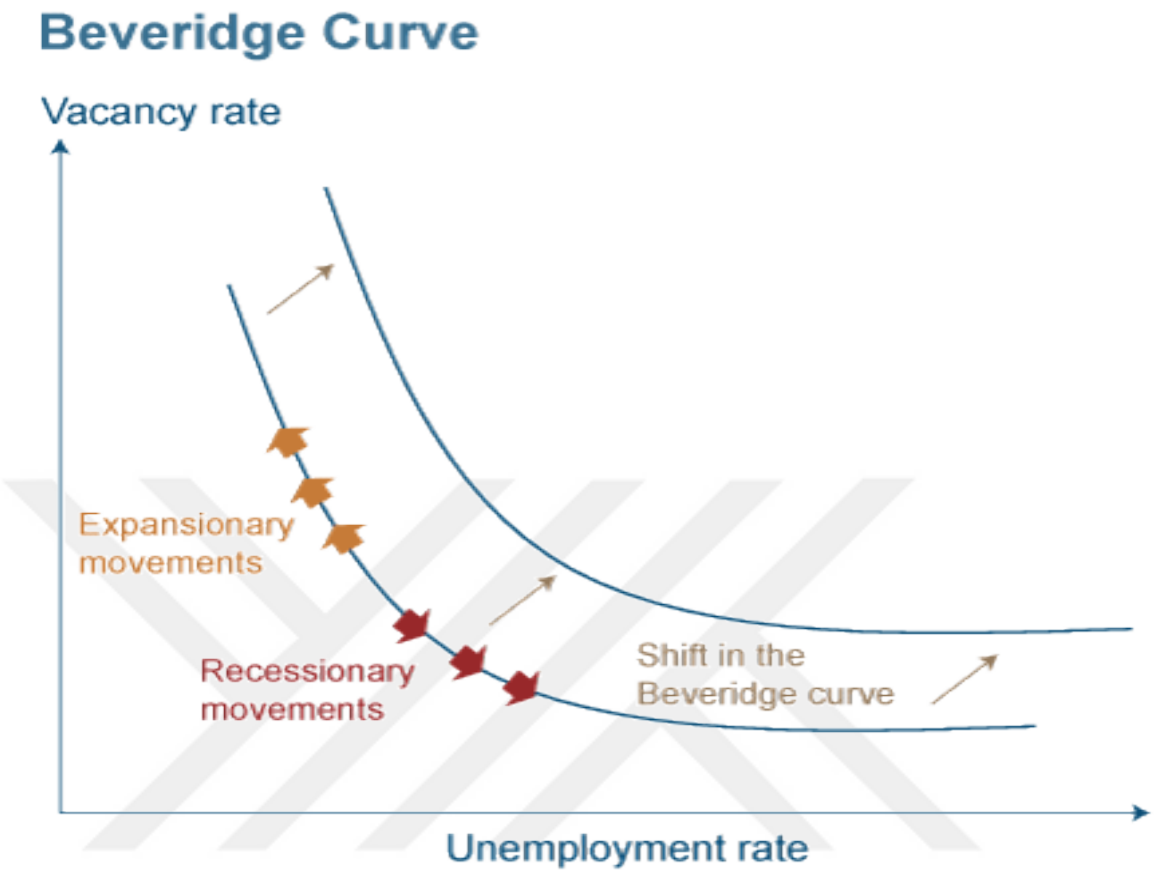

Figure 2.1. Beveridge Curve

The labour market flows are used in deriving the Beveridge curve. It is assumed that search and matching functions form the theoretical background of the Beveridge curve. The initial step in deriving the Beveridge curve is through the matching function. At the beginning, there will be U number of people searching for jobs and V the number of job vacancy posting. The job matching function will be specified as follows.

$$M = em(U, V) \quad ----- \quad (2.1)$$

Where M indicates the number of successful matches between unemployed persons and the firm's vacancy job postings; e is the matching efficiency and perform similar role like total factor productivity in production function. This summarizes the efficiency of information technology in bringing unemployed persons closer to firms searching for workers. The matching function is assumed to have a constant return to scale and number

of successful matches increases with either increase in U or V (Williamson, 2018). It is expressed as the case below.

$$em(xU, xV) = xem(U, V) \; ------ \; (2.2)$$

Using the standard Cobb-Douglas method of specification, equation 2.1 becomes

$$M = AU^{\alpha}V^{1-\alpha} \; ------ \; (2.3)$$

In equilibrium, the workers flow from employment to unemployment $\{S = s(1 - U)\}$ is equal to the number of workers from unemployment to employment i.e. number of workers matched $\{M = AU^{\alpha}V^{1-\alpha}\}$.

$$s(1 - U) = AU^{\alpha}V^{1-\alpha} \; ---- \; (2.4)$$

According to Hall and Schulhofer-Wohl (2018), the matching function is converted to a rate by dividing by the labour force L. s is the separation rate S/L; u is the unemployment rate U/L; v is vacancy rate V/L; and A is the intercept. The equation becomes

$$s(1 - u) = Au^{\alpha}v^{1-\alpha} \; ------ \; (2.5)$$

Taking the log of equation 2.5 and solving the equation, it becomes

$$log(u) = A \; - \; log(v) \; ------ \; (2.6)$$

The equation above is the basic Beveridge curve showing an inverse unemployment-vacancy rate relationship.

2.2. Empirical Literature Review

This study complements other recent research on labour market dynamics during the Covid-19 crisis. This section starts with literature directly linked to the objective of this study. Saglam and Gunalp (2012) investigated the unemployment-vacancy relationship using data for Turkey. Their result found a strong long run negative relationship between unemployment and vacancy rate with an evidence of inefficiency in the labour market. In

a later study, Kanık, Sunel, and Temel Taşkın (2014) investigated the Beveridge curve and matching function for the Turkish labour market during GFC. They suggested that Beveridge curve reveals a negative unemployment-vacancy relationship. Their results also document a positive relation between job finding rate and labour market tightness for the matching function of the Turkish labour market. Their disaggregated results for Beveridge curve based on unemployment reason, waiting duration, age, gender, and education level suggested a Beveridge curve that is line with the theoretical proposition. Similarly, Ghayad and Dickens (2012) investigated the change in vacancy-unemployment relationship using disaggregated data for US labour markets under different demographic characteristics. Their study revealed that a downward sloping and no outward shift Beveridge curve for unemployed workers with less than 27 weeks waiting period. On the flip side, they revealed a counterclockwise movement for individuals unemployed for over 26 weeks. This implies that individuals with shorter duration benefit more from vacancy posting than those that wait for long. The findings across industries, education levels, age and class of workers mirror similar findings for the aggregated data. Furthermore, Hobijn and Aysegul Sahin (2013) found Beveridge curve shift to be caused by decline in quits and extension of unemployment insurance across OECD countries. This result is confirmed in a recent study by Schiman (2020) for Austrian labour market. The study suggested that this is due to labour supply shocks caused by job-related immigration. Bonthuis, Jarvis, and Vanhala (2016) analyses the determinants that leads a shift in the Beveridge curve in the Eurozone using an ARDL. They found a significant Beveridge curve shift since the global financial crisis inception. Their study also reveals that a sample of determinants leading to the shifts are skill mismatch, share of construction workers and home ownership. It is discovered that the female employment helps in reducing the effects on the Beveridge curve during the sample period.

In a pioneer paper of Pissarides, Layard, and Hellwig (1986) who investigated the determinants of unemployment. They revealed that to a large extent, the majority of changes in unemployment could be explained by changes in the flow out of unemployment (i.e., movement to employment), fall in number of vacancies, reduced search intensity and choosiness by employers in Britain. In a similar study, Fahrer and

Pease (1993) investigated the determinants of the unemployment-vacancy relationship for Australia. Their results show that Beveridge curve is characterised by a rightward shift for the study period. They suggested that search effectiveness of the unemployed workers to be the most significant in determining the shift in the Beveridge curve. Conversely, Miyamoto (2011) found both job finding rate and separation rates to contribute significantly to unemployment fluctuation in Japan. On the flipside, Cardullo and Guerci (2019) analysed the unemployment-vacancy relationship along the business cycle using an agent-based approach. They reveal that search friction arises from costly activity from filling vacancy of firms and imperfect information. They show the US labour market to mirror an outward shift of the Beveridge curve with high unemployment despite the rise in vacancies. In another study under imperfect financial condition, Carrillo-Tudela, Graber, and Waelde (2018) analysed the relationship between unemployment and vacancy and revealed that ineffectiveness of the banking sector to aid job creation caused labour market inefficiency. Forsythe, Kahn, Lange, and Wiczer (2020) show the labour market of US to exhibit an unprecedented weakness characterised by collapse in vacancy posting and unemployment insurance claims caused by the spread of Covid-19.

Lastly, there are vast number of studies relating to the recent effect of Covid-19 on the economy. We can selectively review some of these studies. Uysal, Mutluay, and Şahin (2020) stated that within the scope of combating the spread of the virus, many countries including Turkey have put different measure in place. They found that these measures as a result led to a rapid decline in production and a rise in unemployment around the world. Furthermore, they revealed that the Turkish economy was greatly affected as a result of temporal closure of workplaces and the weakening demand for labour. Policies put in place include paid leave/ administrative leave, employees on free leave, time related underemployment. Tessmann (2020) investigated the textile refugee workers economic condition during Covid-19. They found out that the pandemic has fortified the vulnerabilities of Syrian refugees that already existed prior to global health crisis. They revealed that refugees are not protected against any sudden dismissal and lack sufficient social safety nets.

Bell and Blanchflower (2020) studied the performance of US and UK labour market before and during Covid-19 using the Economies of Walking About (EWA) as well as investigate the distributional effect of the shock on the labour market. They revealed that as the Covid-19 pandemic hit, there was an unprecedented increase in unemployment insurance claims in US labour market due to rise in unemployment. They further showed the presence of persistent decrease in employment and labour force participation rate in both UK and US labour markets with simultaneous rise in both unemployment and underemployment rates. Moreover, the self-employed are seen particularly to be exposed to underemployment as available works fall in the UK. Using data for US, Kurmann, Lale, and Ta (2020) investigated the real time effect of Covid-19 pandemic on employment and work hours. They found evidence of employment contraction and one-third of decline in employment is as a result of businesses reducing employment to zero. Their results indicated that there was a sign of recovery for the previously inactive businesses returning to activity with increase in average working hours.

In another study, Biddle, Edwards, Gray, and Sollis (2020) examine the impacts of Covid-19 pandemic on labour outcomes: income, financial distress, social cohesiveness, political attitudes, subjective wellbeing and psychological distress. They found evidence that Covid-19 has a negative impact on the level of distress, sleep anxiety (see also, Kester, 2020; Wang et al., 2020; Pancani et al., 2020). Indeed, the decline in health results from the incidence of job loss or reduction in working hours. Interestingly, higher level of media exposure leads to higher effect of Covid-19 on mental health. This corroborates the fact that Covid-19 has significant negative economic impacts with dramatic loss of jobs in many countries, reduction in hours worked and wages and high levels of financial insecurity. They found no evidence of decline in social cohesion. There is improvement in confidence and trust in government and public service. Their results reveal that large decline in employment and income. They also found a significant increase in psychological distress and large drops in wellbeing. There is increase in income due to government transfer/supports at lower levels of income. It was observed that those most hit is relatively the young and those just beyond retirement age. Interestingly, they found significant declines in employment with fewer adults employed. They revealed larger

declines in the number of hours worked including those still employed and large declines in per-person household income. Similarly, Spurk and Straub (2020) showed that Covid symbolises a crisis that affects several aspects of people's wellbeing around the world. On the flipside, Qian and Fuller (2020) investigated the effect of Covid-19 on gender gap in employment. Their results show that the pandemic has intensified gender inequalities among parents of school-aged children. They also reveal that the employment of mothers with low education had the greatest effect compared with their male counterparts. They concluded that highly educated men and women have equally distributed employment effects due to the employment impact of the pandemic.

Following the GFC, there has been increasing interest in the study of Beveridge curve. However, these studies have focused on developed economies with little on other developing economies. Evidence regarding labour market consequence of exposure to Covid-19 remains interesting and novel. The short-term effect on labour is dramatic and is being documented in the literature. The growing concern is the long run effects on the labour market outcomes as the world is yet to fight it completely. To the best of our knowledge, Beveridge curve has not been given attention during this pandemic for the Turkish labour market. The work of Kanık, Sunel, and Temel Taşkın (2014) contributed to the Beveridge curve during the GFC. This study discusses the evolution of labour market indicators in Turkey (i.e., unemployment, employment, labour force participation during Covid-19 crisis)**.** In addition, the study focuses on the current crisis induced by Covid-19 in comparison with GFC for the estimation of the Beveridge curve for the aggregated labour market.

CHAPTER III

DATA AND METHODOLOGY

This chapter comprises the description of selected variables, model specification, estimation techniques that will aid in analyzing the Beveridge curve in Turkey during the period of crisis.

3.1. Data Description

The study will use a combination of monthly data from both ISKUR and TURKSTAT. Using the set of data described below, the study contributes to the literature in the following ways. This research studies the Beveridge curve (i.e., unemployment-vacancy relationship) with particular focus during the Global financial crisis and Covid-19 crises. Firstly, the study seeks to identify the shift in Beveridge curve in the Turkish labour market during the sample period by the power of visualisation. This clearly show the magnitude and direction of the curve. Thirdly, the Beveridge model would be specified and estimated to examine the shift of the curve and the main drivers of the shift. Lastly, the study will compare the state of Beveridge curve during the global financial crisis and the Covid-19 period in an attempt to analyse their effects on the labour market. Understanding whether shift in Beveridge curve is as a result of institutional structure, cyclical or structural factors, we would estimate the Turkish Beveridge curve by controlling for institutional, cyclical factors and possible structural features of the economy under two different sample periods.

The data sets comprise of unemployment, vacancy, labour force participation rate, construction sector employment, service sector employment. The variables are defined within the context of the Turkish labour market. Labour force is defined as the total job seekers included in the active registration. Vacancy data is obtained from employee request sent to ISKUR by the employers during the month. Unemployment data rate is

obtained from ISKUR. They define unemployment as persons in active registration who are of working age and in labour force, who want to work, who did not have a minimum wage-earning job when they applied for jobs, and who have not yet been able to find a job. Persons looking for job with better conditions, retired workers looking for job and persons looking for job in a specific place are excluded from the unemployed data. The variables are seasonally adjusted. TURKSTAT seasonally adjusted employed data are obtained as the sum of seasonally variables in agriculture, construction, and services sectors and without any seasonality effect in industry sectors. The unemployment is obtained as the sum of seasonally adjusted variables of non-agricultural and unemployed series in agricultural sector. The other variables used are discussed below.

Table 3.1. Key Variables

Variable	Description	Source
Unemployment rate	These are persons in active registration who are of working age and in labour force, who want to work, who did not have a minimum wage-earning job when they applied for jobs, and who have not yet been able to find a job.	TURKSTAT
Vacancy	The employee request sent to ISKUR by the employers during a period.	ISKUR
Labour force	The total number of active people in the labour market.	TURKSTAT
Share of youth unemployment	These are persons between 15-24 that are in labour force, who want to work but have not been able to find job	TURKSTAT
Construction sector employment	This is the share of employment in the construction sector out of total employment	TURKSTAT
Service sector employment	This is the share of employment in the service sector out of total employment	TURKSTAT
Minimum wage relative to the median wage	This is the ratio of minimum wage to median earnings of full-time employees. It accounts for earning dispersion across countries. This excludes overtime and bonus payment.	OECD
Inflation rate	Year on year percentage change in price of consumer goods	EVDS
GDP	Percentage change in GDP from its previous period.	OECD

To analyse the Beveridge curve in Turkey, the choice of relevant variables is a necessary condition to having an economic meaningful result that reflect the labour market. In this regard, there are several factors that could result in a shift in the BC. Some shifts come from government policies, cyclical factors, employment legislation, institutional structure of wage determination, workers characteristics with respect to waiting period, gender, age, and skills, structural factors (Acuna, Carrasco, Carrasco, & Caro, 2018; Bonthuis, Jarvis, & Vanhala, 2016b; Groenewold, 2003; Hobijn & Şahin, 2013b; Vansteenkiste, 2017; Waqas & Awan, 2017). However, the reality is that some variables for the Turkish labour market are missing while others are found incomplete. Therefore, the study is limited by the availability of data. Given this constraint, only variables that are available on monthly basis are to be used for the purpose of this research. The list of variables to be used are described in Table 1 above.

The minimum wage relative to the median wage for full time workers is taken to serve as an indicator for the institutional structure of the Turkey wage determination. They are ideal and preferred measure for average wages. This data is obtained from OECD data set. Due to the problem of limited data, all variables serving as indicators for the generosity of unemployment benefit are excluded (unemployment benefit duration, replacement rate, generosity of unemployment benefits score). Since unemployment increase could be attributed to cyclical factors, inflation and GDP are included among control variables (Borsch-Supan, 1991). Inflation rate proxied with CPI will be used as an indicator for the cyclical effect on the Beveridge curve. This supports the relationship as suggested by Phillip's curve. The data for GDP growth rate is interpolated to become a monthly series for the purpose of this study. This inclusion corroborates the effect cyclical factors could exert on the Beveridge curve relationship. The study uses only variables that are complete and available for the period January 2005 to March 2021. Due to these limitations, the study uses the available data.

3.2. Model Specification

The focus of this study is to test the impact of the shocks on Beveridge curve (unemployment-vacancy relationship) in Turkey. In this study, we use a ARDL technique

on data covering 2005M01 to 2021M03 to document the finding of visual inspection for sample covering periods of both Global Financial Crisis and the Covid-19 crisis. Special attention is given to the two crises individually using same sample. To examine the shift in BC, the general model in similarity with (Tagkalakis, 2016; Vansteenkiste, 2017; Waqas & Awan, 2017) would be specified thus;

$$u_t = \alpha + \beta u_{t-1} + \varphi v_t + \delta v_t^2 + \theta Z_t + \epsilon_t \quad (3.1)$$

Where, U_t is the unemployment rate, u_{t-1} is the lagged unemployment serving as a control for any lingering unemployment in the economy, v_t is the labour market vacancy rate, and v_t^2 accounts for the convexity and any nonlinearity behaviour in Beveridge curve and Z_t is the list of control variables. Many attempts have been made to determine the factors that result in the Beveridge curve shift for different countries particularly to the intercept parameter. Some studies like (Blanchard, Diamond, Hall, & Yellen, 2013) relied on visual inspection of the curve while many other studies that introduced some control variables to explain the possible shift in Beveridge curve (see, Bonthuis, Jarvis, & Vanhala, 2016c; Tagkalakis, 2016; Valletta, 2005; Vansteenkiste, 2017). This model will include variables that will serve as indicators for the effect of crises, institutional structure of Turkish wage determination, structural features as well as the cyclical factors that could lead to unemployment decomposition. The study will estimate several models to account for the shift. The models below will include the crises dummies in addition to the vacancy rates. Equation 3.2 for sample data period of 2005M01-2021M03 to account for the effect of the Global Financial crisis and Covid-19 on the unemployment-vacancy relationship. The model is specified thus.

$$u_t = \alpha + \beta u_{t-1} + \varphi v_t + \delta v_t^2 + \theta Z_t + \psi D_t^{GFC} + \omega D_t^{C19} + \epsilon_t \quad (3.2)$$

In equation 3.2, the dummy variable D_t^{GFC} is used to test the impact of GFC. The dummy variable takes the value of 1 from the first of at least two consecutive quarters of negative growth rate after December 2007 to June 2009 and 0 otherwise. To also identify the effect of Covid-19 crisis on the Beveridge curve during the Covid-19 pandemic, a dummy variable is introduced. This dummy takes the value of one (1) from March 2020 to the end

of the sample and zero (0) otherwise. Another set of models would be estimated with the interaction terms with the crises.

For policy implications, knowing the presence of shifts in Beveridge curve is necessary but not sufficient. The most important is to know what drives the shifts in the Beveridge curve overtime. For the purpose of comprehensive understanding, the study extends the basic Beveridge curve model. This is done by including some additional variables that will reflect the feature of the Turkish labour market with respect to structural features and the cyclical nature of the economy. Proceeding with investigating the factors that result in the Beveridge curve shift, the study rewrites the equation 3.2 within the ARDL framework. The ARDL model is specified as follows.

$$U_t = \vartheta_0 + \sum_{i=1}^{p} \vartheta_{i,1} U_{t-i} + \sum_{j=0}^{q} \vartheta_{j,2} V_{t-j} + \sum_{j=0}^{q} \vartheta_{j,3} V_{t-j}^2 + \sum_{j=0}^{q} \vartheta_{j,,4} Z_{t-j} + \psi D_t^{GFC} + \omega D_t^{C19} + \epsilon_t \quad (3.3)$$

Where $\vartheta_{i,1}$ is the coefficient of the lagged dependent variable unemployment, $\vartheta_{j,2}$, $\vartheta_{j,3}$ are the coefficients of vacancy rate, vacancy rate squared. Z_t is the matrix of 5 the control variables (Institutional, demographic, cyclical, and structural factors). These variables include minimum wage relative to the median wage for full time workers, inflation and GDP, youth unemployment and share of construction (service) to total employment for GFC (Covid-19) crisis. $\vartheta_{j,4}$ is the coefficient for the matrix of other control variables. Matching efficiency increases (decreases) through better (lesser) information technologies and particular skill requirement in particular sectors (Williamson, 2018). Interestingly, a sectoral shock leads workers to migrate across sectors of the economy. It is evident that the crises necessitated migration across sectors and geography particularly for Covid-19. The GFC crisis has exerted influence on the construction sector as the Covid-19 measures influences the service sector. Sectoral shock could result to some form of mismatch for the labour market. This is because the skills of workers leaving the service sector as a result of lockdown restrictions might not be a good fit for other sectors. The same applies to the construction sector during the GFC crisis. The next step is to estimate the Error Correction Model (ECM) that accounts for both short run and long run dynamics. The ECM model is specified as follows.

$$\Delta U_t = \beta_0 + \beta_1 U_{t-1} + \beta_2 V_{t-1} + \beta_3 V_{t-1}^2 + \beta_4 Z_{t-1} + \sum_{i=1}^{p} \vartheta_{i,1} \Delta U_{t-i} + \sum_{j=0}^{q} \vartheta_{j,2} \Delta V_{t-j} + \sum_{j=0}^{q} \vartheta_{j,3} \Delta V_{t-j}^2 + \sum_{j=0}^{q} \vartheta_{j,,4} \Delta Z_{t-j} + \psi D_t^{GFC} + \omega D_t^{C19} + \psi ECM_{t-1} + \epsilon_t \quad (3.4)$$

Where β_0 is constant, β_1, β_2, $\beta_3, and\ \beta_4$ are long term coefficients; ϑ_j represents error correction dynamics; ECM_{t-1} is the error term indicating the adjustment parameter from short run to long run equilibrium level.

3.3. Estimation Procedure

3.3.1. Unit Root Test

The unit root test will be performed on the series to examine the stationarity. The test is of great importance before proceeding to regression. The study adopts three variants of the stationarity tests, namely, Augmented Dickey Fuller (ADF), Phillip Perron (PP) and Kwiatkowski Phillip Schmidt Shin (KPSS). The other tests were performed to confirm the validity of the ADF result. A structural ADF would be tested for variables suspected to have a structural break. The unit root tests would be tested on the following equation.

$$\Delta X_t = \pi_1 + \pi_2 t + \pi_3 X_{t-1} + \gamma_i \sum_{i=1}^{k} \Delta X_{t-i} + \varepsilon_t \quad (3.5)$$

Where Δ is the difference operator; ΔX_t is the first difference from X; π_1 is the intercept, π_2 is the coefficient for trend; π_3 is the coefficient of the lagged value of X; and γ_i is the coefficient for X lag difference. The ADF test is constructed when a nonsymmetric component of Dickey Fuller model is autocorrelated. This is done by adding extra lags. The null hypothesis $H_0: \pi_3 = 1$ implies the process is has unit root/stochastic trend i.e., nonstationary process or is a random walk. A differencing process is performed to be denoted as I(1). The alternative hypothesis $H_1: \pi_3 < 1$ suggests that there is no unit root and hence stationary. The process is denoted as I(0). On the other hand, PP test is similar to the ADF test. The only difference is that it does not use a differentiated equation and the replacement of linear trend with a centred time variable. PP modifies the test statistics to account for serial correlation and heteroscedasticity of the error term. The advantage of

PP over ADF is that it is robust to heteroscedasticity in error term and does not specify lag length for the regression.

Conversely, KPSS test proposed that the stationarity of time series occurs around deterministic trend. It is calculated as the sum of a random walk, deterministic trend and white noise. KPSS start with the model below.

$$\Delta X_t = \mu D_t + \phi_t + \varepsilon_t \text{ (3.6)}$$

$$\phi_t = \phi_{t-1} + u_t \text{ (3.7)}$$

Where D_t is the deterministic components, and ε_t is I(0) and may be heteroscedastic. u_t is I.I.D $(0, \sigma_u^2)$. KPSS relies on Langrange Multiplier test as compared to the t-statistics and Z statistics for ADF and PP.

3.3.2. Autoregressive Distributive Lag (ARDL)

The study would adopt the Autoregressive Distributive Lag (ARDL) approach proposed by Pesaran, Shin, and Smith (2001). This technique is considered to be the best method when variables are integrated of different order. ARDL helps in generating short run and long run dynamics in a single model using the OLS approach. This technique has advantages over other methods. Interestingly, it is nested within it is the combination of both short run and long run parameters. It accounts for autocorrelation.

The ARDL model presents a new approach to testing relationship for regressors that are both I(0) or I(1). The Wald or F test is used to test the significance of the lagged levels of variables under the condition of unrestricted equilibrium correction model (Pesaran, Shin, & Smith, 2001). The Wald or F or T tests help in making inference about cointegration (see, Pesaran, Shin, & Smith, 2001). The ARDL is followed by a stability test after confirming the long run association. The Cumulative sum (CUSUM) and Cumulative sum of square (CUSUMSQ) tests is used to portray goodness of fit for the ARDL model.

CHAPTER IV

VISUAL INSPECTION

This chapter presents the Turkish labour market outcomes using visual inspection as a contribution of the study to the literature. The visual presentation will bring to light the behaviour of the Turkish labour market during global financial crisis in comparison with the Covid-19 crisis.

4.1. Background to the Turkish Labour Market

Under this section, the background of the labour market will be discussed and place the conditions of the current crisis in broader historical context with the Great recession. Ostensibly, a country's movement in some parameters could be used to ascertain the extent of crisis within an economy. A sample of these indicators are the GDP, unemployment, inflation, exchange rate etc. For many years, the Turkish labour market has been distinguished due to persistent effort to maintain high employment amidst varying economic crisis. According to OECD, before the global financial crisis, the unemployment rate of Turkey stood at an average of 9.51% in 2005 and decline to 9.07% in 2006. The unemployment rate value is significantly above other OECD countries and even above the OECD average value of 6.84 and 6.32 for 2005 and 2006 respectively. In general, comparison should be done for unemployment with respect to vacancy. Turkish lowest unemployment stood at 1.9 million people in May 2006 with an unemployment rate of 8.8%. Furthermore, unemployment in Turkey recorded highest during the 2009 period. This was due to Global financial crisis that ravaged most part of the world. In recent time, unemployment hit a double-digit value in 2015 since 2010 with 3.3 million people unemployed. The unemployment rate stood at a high value at the onset of 2019 with a value of 4.6 million people and rate of 13.9% in March due to rise in the labour force. The rate has declined with the economic performance registered within the

economy due to employment generation. The government in 2018 created 546,000 new jobs in order to reduce the unemployment figure in 2018. With the expansion in the labour force, the effect of the job creation was not seriously felt. The vacancy posting from both public and private sectors is highly insignificant to neutralise the effect of unemployment in the country. Vacancy postings among firms have increased overtime with more firms looking for workers. From Figure 4.1, the vacancy posting maintain an upward movement during the period from 2005 to March 2020. The vacancy inflow is stable until March when it experienced a sharp slump when the lockdown measures were put in place. During this period, vacancy rate fell significantly due to the restrictive measure put in place and work at home policies. The demand for labour continued to rise after relaxing some of the measures put in place. This could be spotted with a sharp rise in the second half of 2020.

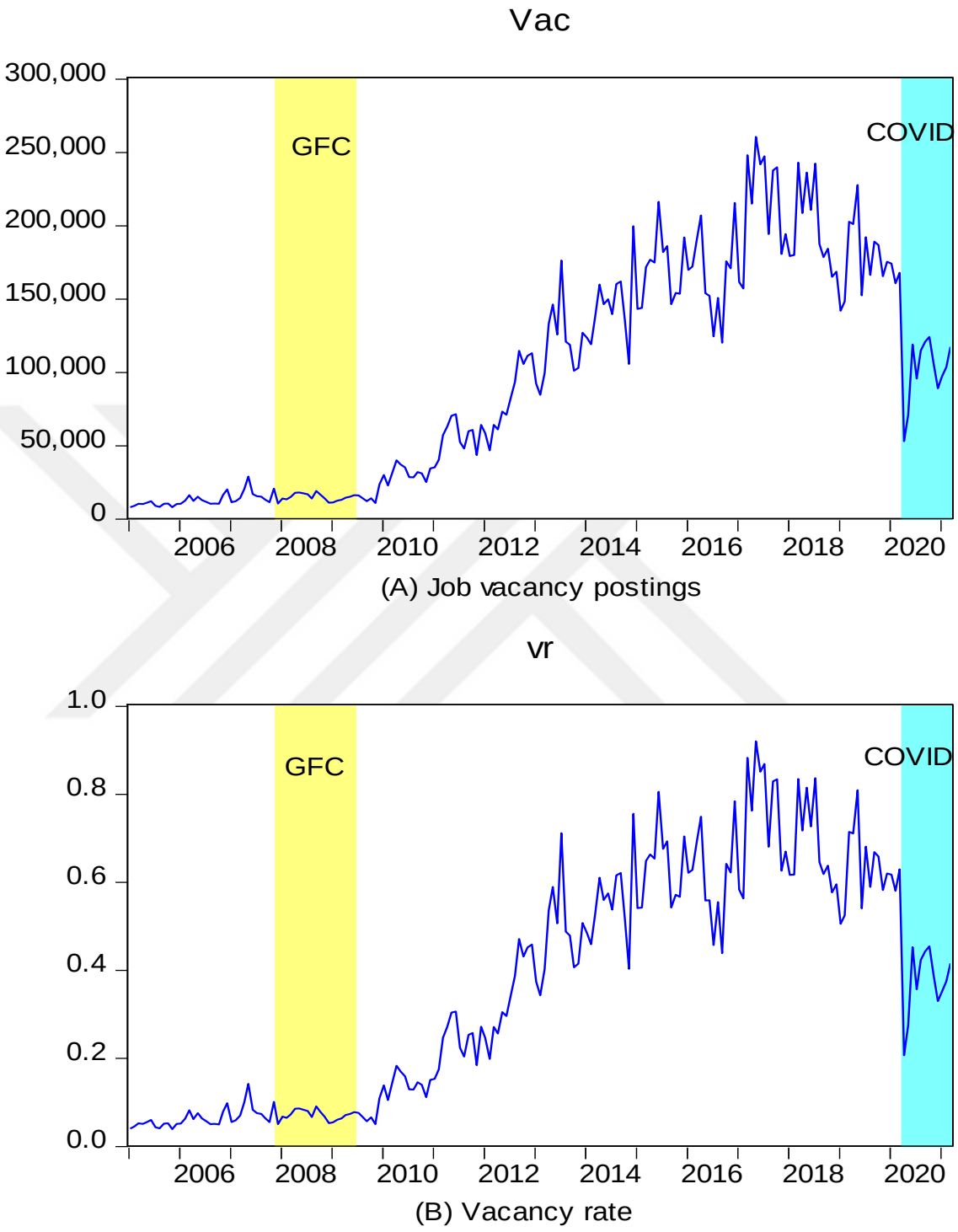

Figure 4.1. Job Vacancy Postings

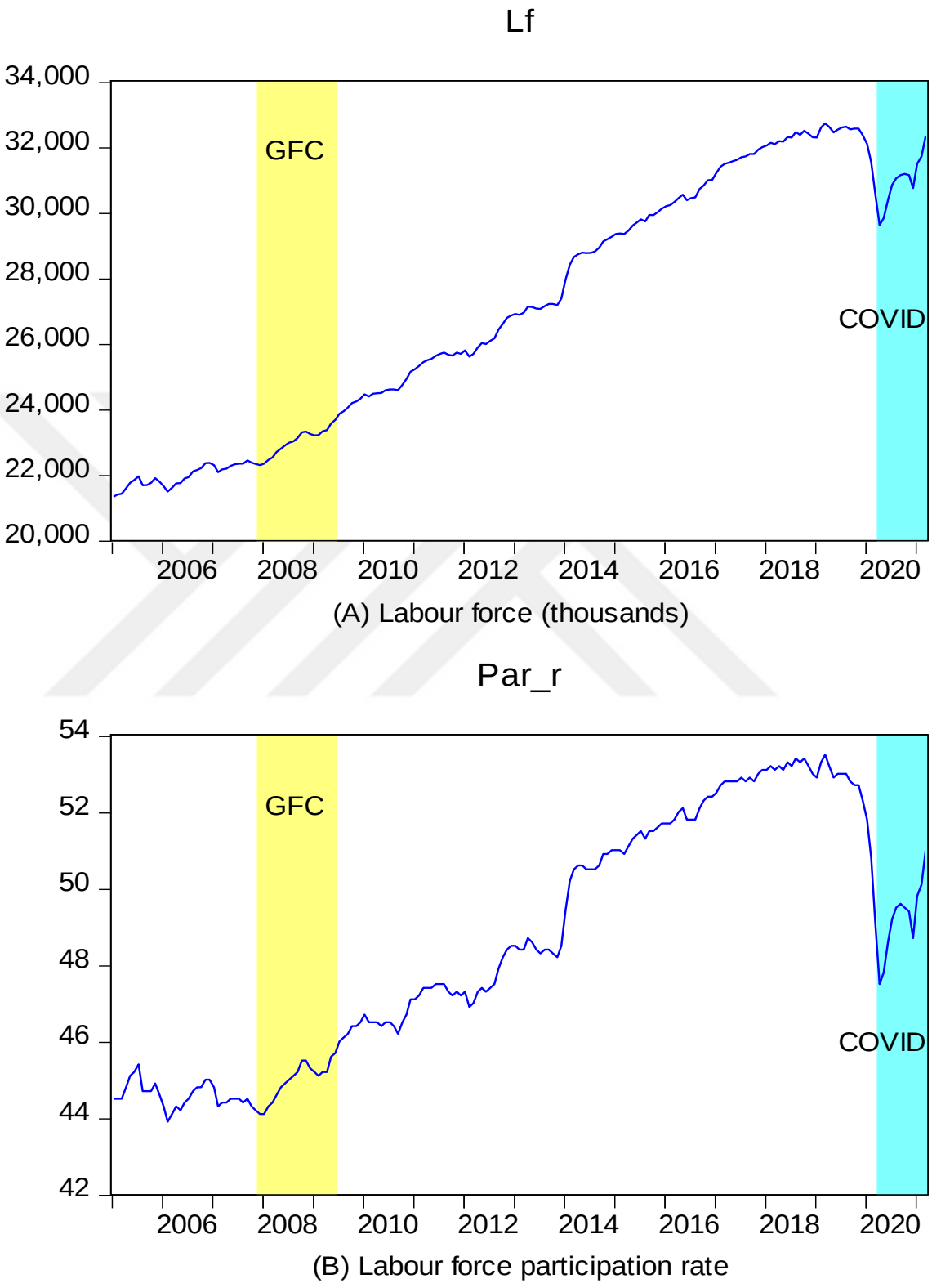

Figure 4.2. Labour Force

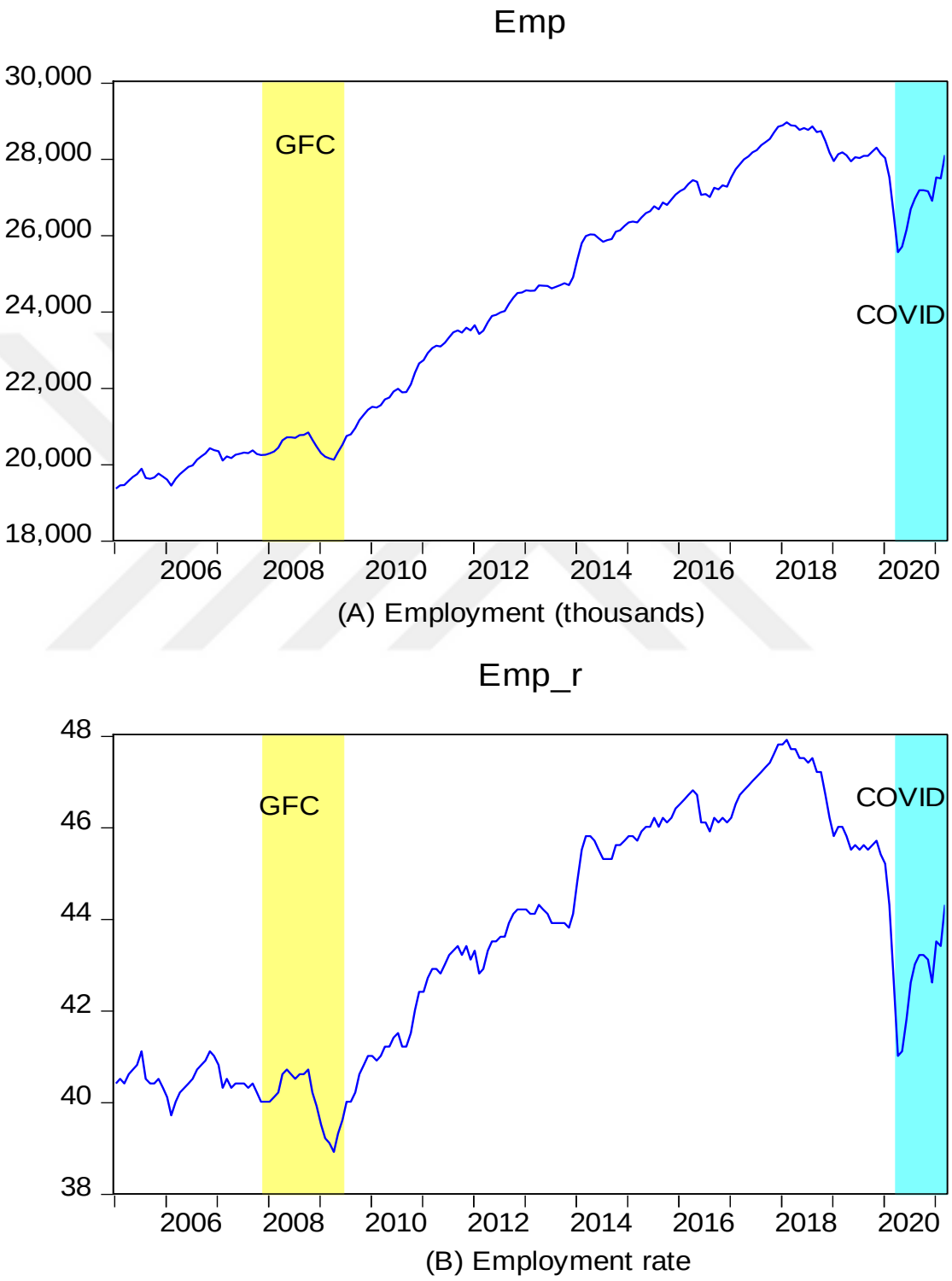

Figure 4.3. Employment

On the other hand, the rate of employment among the population did not experience much increase. During the financial crisis, the rate of employment hovered around 39% in 2009. According to Figure 4.2 and 4.3, the labour force and employment has maintained a persistent increase overtime. In the second half of 2018, employment rate experienced a slight decline to 47.4% from 47.9%. Following the outbreak of Covid-19, labour force and employment rate witnessed a further decline due to various policy measures unfolded by the government. The rate hovered around 41% in March to June 2020. The labour participation rate in the lower part of Figure 4.2 shows an upward trend until the outbreak of Covid-19. This implies that people are dropping out of the labour force due to the pandemic. The labour market witnessed an improvement in the employment due to the government effort to retain all workers during the pandemic. The rate took a slight upturn in July to a value around 43%. This rise could be due to the ease of the lockdown and return of some activities in the economy.

Unemployment in Turkey could be attributed to large growth in the number of youths that are unable to have a job placement. This could be due lack of experience and high birth rate among other factors. Data from TurkStat show that the population of Turkey has an upward trend. According to data from TurkStat, the unemployment data for the young is shown to soar higher in the wake of GFC from 16.6% in May 2008 to 25% in May 2009 in Figure 4.4. During a period of one year, the unemployment rate has recorded a marginal growth of about 7%. During this period, it implied that one out of four youth is employed. This was more than the world average. Data shows that the global financial crisis hit the youth more than the old. The crisis has posed a big challenge on domestic production with massive influence on youth unemployment. The extent of this effect on employment has with the passage of time appeared to increase due to increasing number of youths. Despite rapid growth in Turkey, the economy has been unable to generate jobs for the youth. It is expected that GDP growth rates are accompanied by high rate of employment and participation rates. In the wake of the financial crisis, Turkish government has implemented several fiscal stimulus. This makes Turkey the country with highest stimulus among OECD economies. The labour force of Turkey was reported to expand with a realized value of 30.5 million peoples in 2016.

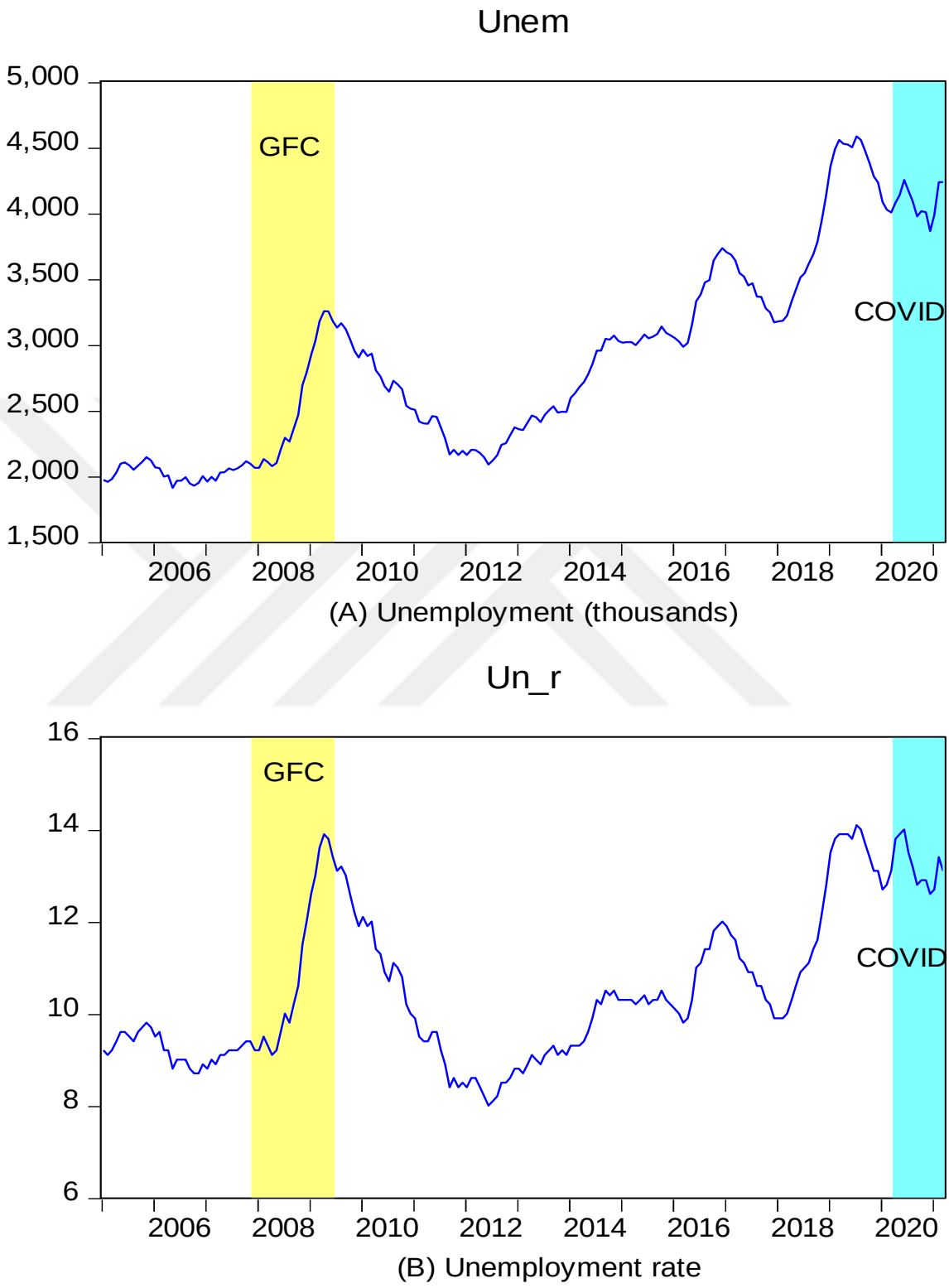

Figure 4.4. Unemployment

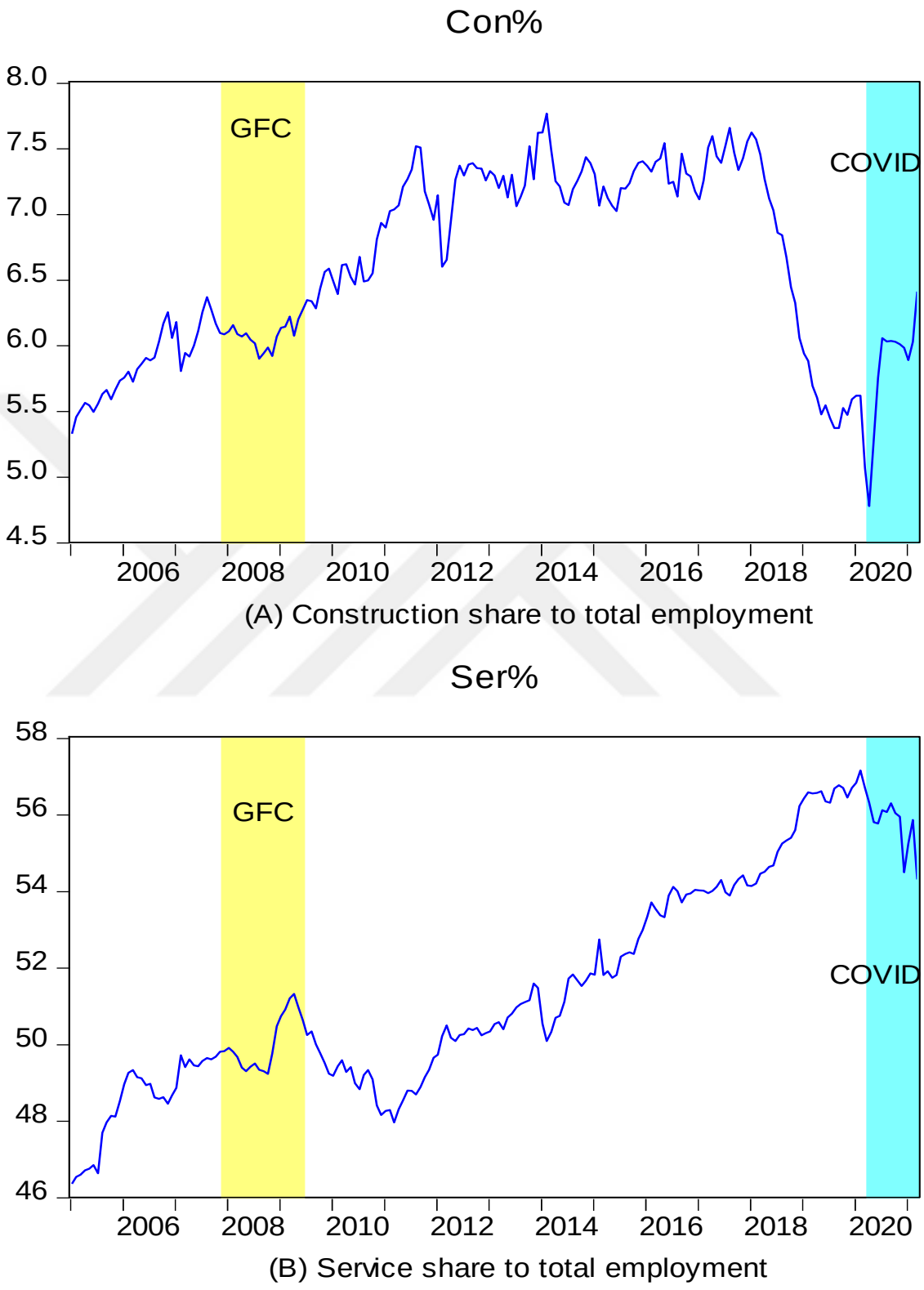

Figure 4.5. Construction and Service Sector Employment

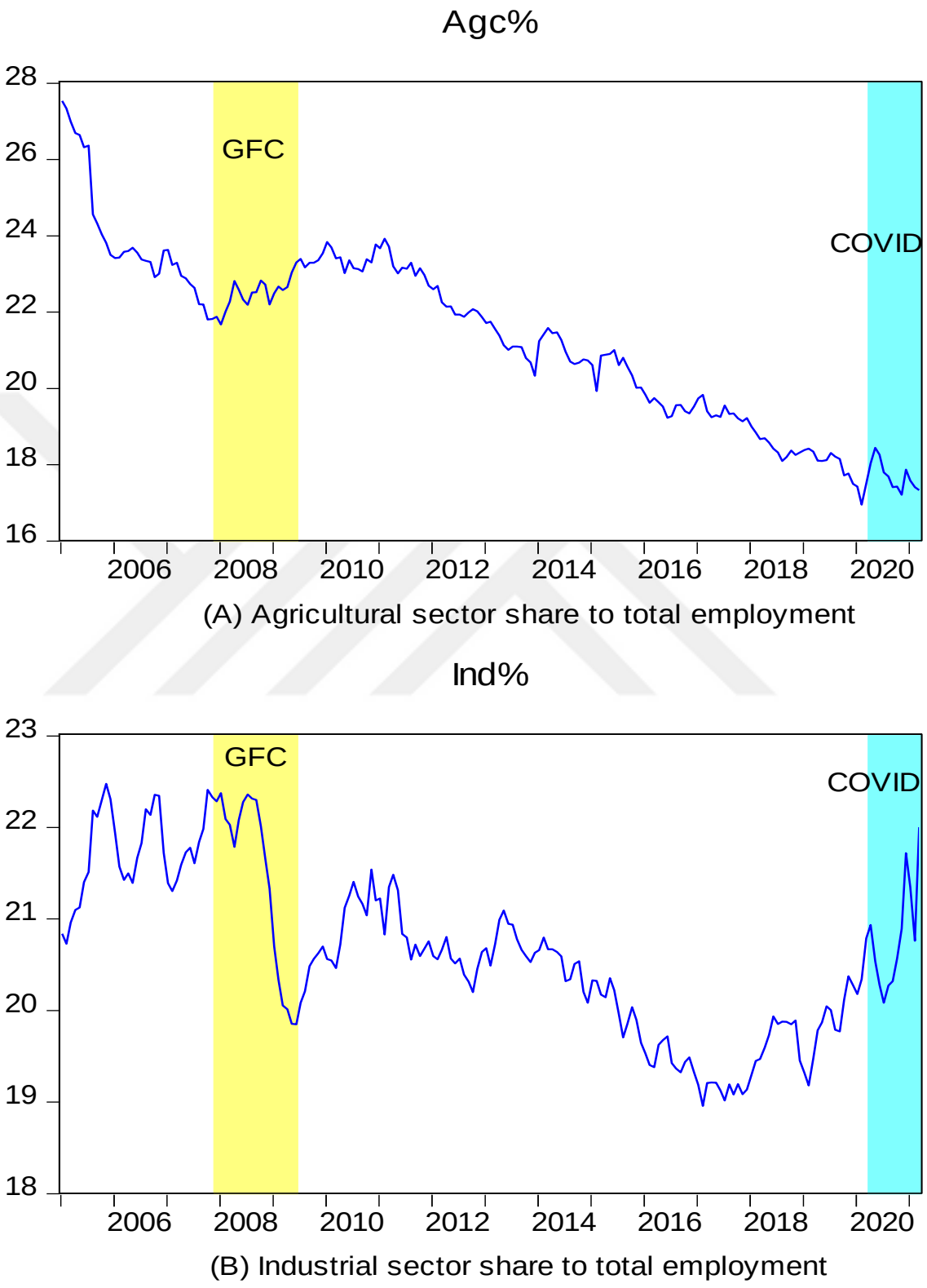

Figure 4.6. Agriculture and Industry Sector Employment

Figures 4.5 and 4.6 show the sectoral breakdown of employment in Turkey during the sample period. In fact, there has been significant restructuring of rural-urban labour market formation. According to Figure 4.6 from data sourced from TurkStat, agricultural employment is shown to maintain a downward trend. This could be due to widespread of family businesses, rural-urban migration and more mechanized system of farming that have substituted a number of workers. Conversely, in the service and construction sectors, they have experienced expansion from 2005 to date. The service sector is characterized by large informality. It is expected that the workers moving from rural areas should flow into the industry sector. However, the industry sector has downward sloping trend until 2018 when it took an upturn. During the Covid-19 period, due to the measures put in place, the service sectors was hit the most. Activities of tourism, transportation and other service subsector plummeted.

Over the last few decades, the Turkish economy has experienced series of economic imbalances such as macroeconomic instability, high inflation rates, foreign exchange crisis etc.(Saglam & Gunalp, 2012). This has contributed to weakening the labour market particularly on the unemployment rate. Figure 8 shows the behaviour of GDP growth rate and inflation rate. Based on the data, it is clear that growth rate of Turkey is maintaining a regular pattern of growth. The growth rate is shown to drop from 4.9% in first quarter of 2005 to about 1.15% in 2006. Before the global financial crisis, the economy recorded a relatively stable GDP growth. This growth rate took another turn by increasing to 3.05% in the quarter two of 2006. In quarter three, it witnessed a negative growth of -0.75%. Turkish GDP declined by 4.9% during the 2008-2009 period. The data reveal significant information about the behaviour of the GDP growth rate. The Global Financial crisis of 2008 lasted for four consecutive quarters. According to data from OECD, the economy witnessed a low negative growth of -5.7%. The Turkish economy was significantly affected by the global financial crisis due to fall in domestic demand. Digging further into the data, the private consumption and investment contributed negatively to the GDP during this period. This is corroborated by four consecutive quarters of negative growth in GDP. However, growth picked up in the second quarter of 2009 with a value of 4%. A

positive growth rate was maintained all through the year until the last quarter of 2011 with the exception of first quarter of 2010 having a negative value of 0.29%.

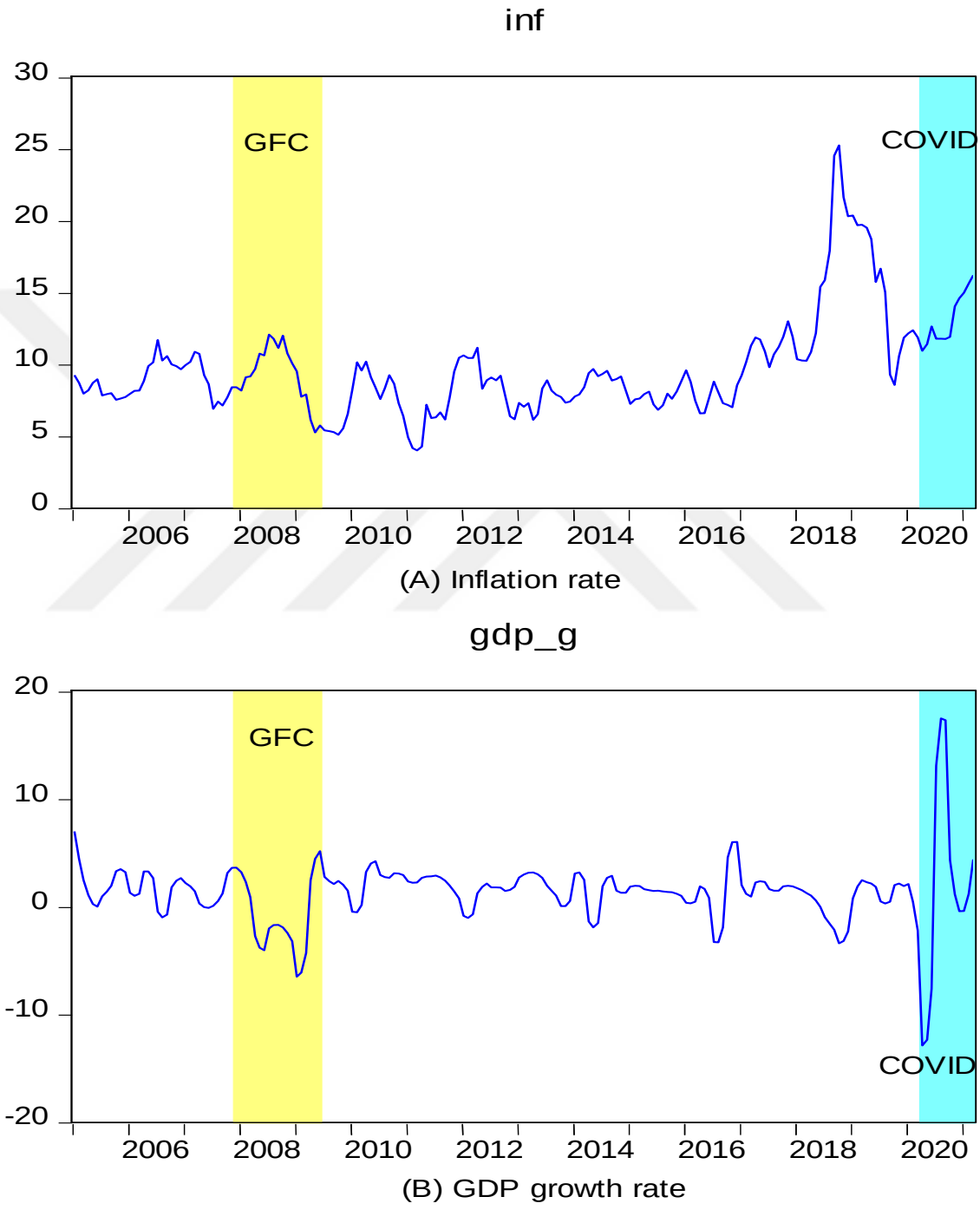

Figure 4.7. GDP Growth and Inflation

During the financial crisis, the Turkish economy happens to be one of the worst hit economies (Cömert & Yeldan, 2018). Turkey was slightly better than some European countries like Ukraine and Russia. The Global financial crisis took effect in the economy in the fourth quarter and existed throughout the year 2009. However, it is believed that output has some seasonal effect particularly during the winter which might be the reason for the fall in output level. Unemployment rate is shown to have gotten to a high level during the period of negative growth in Turkey. After the global crisis, there was no significant growth in employment. The GDP growth that came with the end of the crisis did not generate a meaningful employment to the economy. The period witnessed a jobless growth. Moreover, inflation rate in Turkey gives important information about the fragility of the economy. High and persistent inflation exacerbate uncertainty and present serious distortions in the economy through discouraging investors. From the Figure 4.7 above, it is seen that the Turkish economy has severe inflation problem. From 2005 to 2008, the inflation rate increase from 8.2% to 10.4%. During the 2009 period, the country witnessed improvement in the price level with a yearly average value of 6.3%. The inflation hovers averagely below 10% for over ten years. However, the rate rose to around 11.4% in the year 2017 and went further to 16.3% in 2018. This is due to the foreign exchange crisis faced by the economy. The rate saw an improvement by falling to an average value of 15.2% in 2019. In terms of wages, there has not been so many changes to wage in Turkey. the minimum wage relative to median earning of full-time employed workers showed a step wise decline up to 2010. From 2010, it took an upturn until 2012 when it plummeted. During the financial crisis, it has been stable. Despite high growth rate in Turkey, there was no significant increase in wages. During the period of 2009, wages fell and later increased in 2011 as can be seen in the lower part of Figure 4.8.

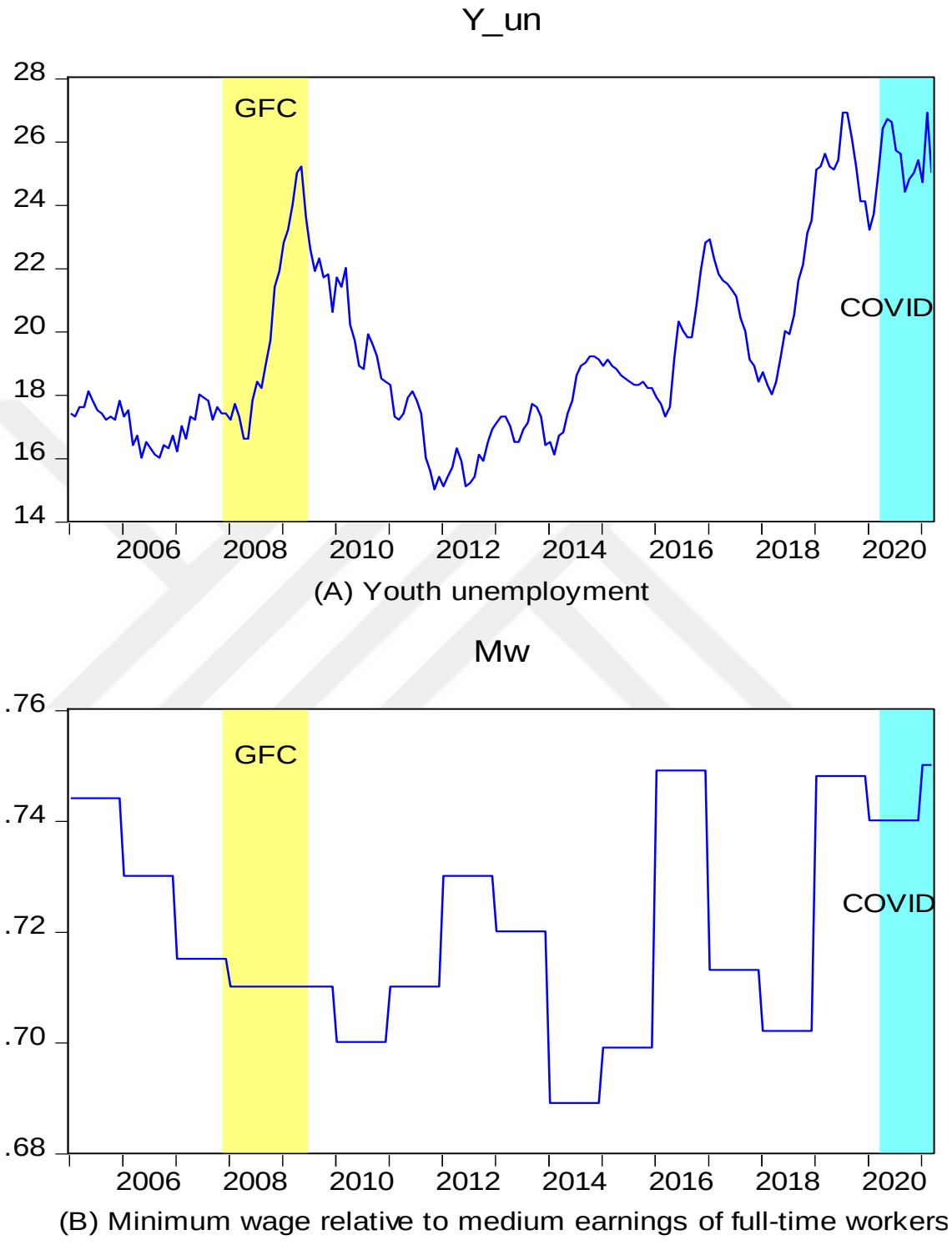

Figure 4.8. Youth Unemployment and Minimum Wage Relative to Median Earnings

4.2. Turkish Economy During the Covid-19 Outbreak

In the late 2019, there was an outbreak of a virus from the Wuhan district of China. The virus was renamed Corona Virus Disease (Covid-19) with the declaration as a Public Health Emergency of International Concern (WHO, 2020). The spread of Covid-19 has led to the fears of a worldwide pandemic with the virus spreading from human to human leaving the world to suffer the effect without a vaccine for long time. This global pandemic or health catastrophe has metamorphized to become an economic and financial crisis the world has never seen in history. Comparatively, the international effect of Covid-19 is spreading just like the economic depression. Hence, if an economy is hit by an abrupt economic shock or outbreak of disease, the economy's revenue is expected to fall due to break on economic activities. This pandemic is an exogenous shock spreading its impact through the economic and financial system of most economies in the world (Mortensen & Pissarides, 1994). Moreover, Covid-19 has the capabilities to create harmful and abysmal social and economic scars to the populace. This has generated a metamorphosis of crisis from health, financial to economic crisis. The IMF projected that the world economy will experience a sharp contraction of about 3% in 2020, expecting poverty to rise. This is reported to dip further 40 to 60 million people into extreme poverty (World Bank 2020).

Turkey with its Gross Domestic Product value standing at $771 billion is among the largest economy. The outbreak of Covid-19 has resulted in change in the supply chain, which hurt the overall economy through reduction in exports and increase in imports. The Central Bank of Turkey reported a current account deficit of $1.804 million. Indeed, the trade deficit is expected to rise in 2020 due to lower goods export resulting from economic disruptions. Specifically, Turkey has been struggling with a high unemployment rate. The Turkish Statistical Institute projected that employment would fall due to the bankruptcies as a result of closing down of factories. In most parts of the economy, there has been a tax holiday due to 'force majeure'. Interestingly, credit opportunities were provided as a policy response for the small and medium-sized enterprises which have been significantly impacted by liquidity deficit induced by the pandemic. For instance, Turkish government announced some economic stimulus package (i.e., tax cuts, payment deferrals and

increased pension disbursement) to support its citizens and businesses (Açikgöz & Günay, 2020).

The outbreak of this pandemic has made labour market outcomes worse due to restrictions of lockdown of factories (Açikgöz & Günay, 2020). Many businesses have different employment experiences during this pandemic in accordance with the overall economic conditions. This is caused by limitations on economic activities, leaving most industries such as aviation and tourism with the greatest blow (Zhang, Hu, & Ji, 2020). It is reported that every day, the labour market experiences large job destruction with no idea of when normality will return. This is supported by the ILO report that approximately 25 million jobs could be lost due to this global pandemic and it will cost the world $860 billion to $3.4 trillion income (ILO, 2020). The government of Turkey has rolled out different policies and stimulus packages to forestall the impact of the virus on the economy. For instance, the government has developed long term economic measure to save businesses and jobs as well as support those who must have dropped out of work. Before the Covid-19 outbreak, the unemployment rate in Turkey was closer to 13.6. Unlike other economies, the Turkish labour market experienced improvement amidst the outbreak of Covid-19 with record low unemployment of 12.7 in September since 2018. The closure of nonessential services in the country coupled with ensuing uncertainty and a fall in demand has not led to a substantial reduction in employment (ILO, 2020). During the Great Depression, increases in unemployment were highly dramatic taking most countries years to return to their pre-1930 economic state. It is expected that the effect from Covid-19 will be far lesser in duration than the shock from Great Depression and some other recent recessions that left deep scars on the workforce of most economies. Among the major economic impacts of Covid-19 is job and working hour losses. This is directly attributable to lockdowns whereas others are due to lack of aggregate demand. For instance, the annual unemployment rate averaged 13.2 between February-April, 13.4 between May-July. The Covid-19 crisis has unfolded itself with tremendous speed and is affecting the labour market in unprecedented ways. The Covid-19 pandemic has caused a significant effect on aggregate demand over the past few months due to measures taken by authorities to flatten or crush the spread curve. Most economies of the world have shown evidence of non-

immunity to this health crisis but the labour market in Turkey stands to be immune. The Turkish lockdown policies is specifically interesting given that many countries adopted a total lockdown policy. To cope with the second wave, most of these countries have moved towards more of a partial lockdown. Comparatively, unemployment in the labour market has not been significantly affected by the crisis. The Turkish relative leniency of its Covid-19 measures has helped in safeguarding jobs in the economy.

4.3. Unemployment-Vacancy Relationship

The Turkish labour market primary measure of labour demand like other economies is job vacancy posting from companies. To visually inspect the labour market, unemployment and vacancy data for Turkey is used. Unemployment data is sourced from Turkish Statistical Institute (TURKSTAT), while vacancy data is obtained from ISKUR. Since the outbreak of Covid-19 in Turkey, the economy has experienced severe measures leading to an unprecedented blow on the labour market. Under this subsection, the behaviour of Beveridge curve will be reviewed and place the conditions of the current crisis in broader historical context with the Great Recession. The main features of the relationship during this period of global financial crisis shows the role of cyclical effect on unemployment as vacancies increased. As the economy slipped into crisis, the vacancy rate showed a sharp decline and unemployment rate increased dramatically. The behaviour of the curve could be attributed to response of firms to recession on the business cycle by laying off workers. Another explanation could be that the Beveridge curve of Turkey for the period is due to unemployment responding to economic shock faster than vacancy rate. The behaviour of unemployment-vacancy relationship is irregular. In sum, there is a positive relation existing between unemployment and vacancy rate. This irregular pattern of Beveridge curve could be due to explosion in labour force over the last few years. Kanık, Sunel, and Taşkın (2014) stated that newly unemployed did not enjoy new job openings during this sample period. An interpretation of the relationship is that the reaction of unemployment to vacancy is highly insignificant.

In summary, the number of vacancies both public and private posted by companies on the ISKUR fall short of unemployment numbers. It is obvious from the graph that the vacancy

rate has been constant with increasing trend of unemployment rate. The vacancy rate has been increasing but not at par with the unemployed persons in Turkey. Accordingly, unemployment-vacancy relationship for Turkey is argued to be associated with structural factors that affect matching between vacant jobs and the unemployed persons. This implies low matching efficiency and inefficient labour market. Indeed, the overall interpretation of this visual inspection is that the shift in Beveridge curve occurs due to (i) an increase in unemployment for a given rise in vacancy rate. (ii) simultaneous rise in vacancy rate and unemployment rate (iii) or an increase in vacancy rate for a given unemployment rate. These leads the Turkish labour market to be inefficient in matching workers with vacant jobs which results to structural unemployment (see, Saglam & Gunalp, 2012). The result also suggests the role of other factors responsible for the shift in Beveridge curve and the slack feature of the Turkish labour market. The Beveridge curve for the two sample periods shows a low job creation capacity to match the unemployed persons in Turkey. In other words, it is evident that both unemployment rate and vacancy rate increased but the growth in vacancy rate is significantly lower than the unemployment rate to result in efficient labour market. For the two sample periods, it is observed that the labour market tightness of Turkey has fallen with Beveridge curve far away from the origin.

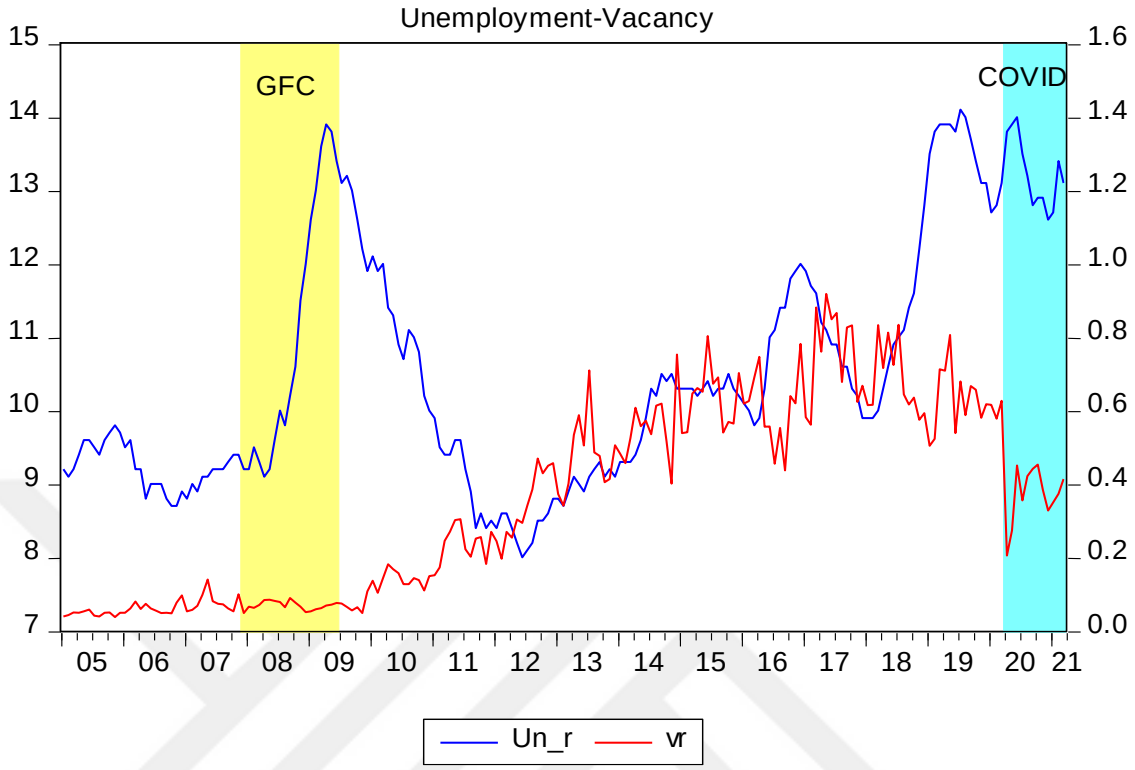

Figure 4.9. Unemployment-Vacancy Relationship

CHAPTER V

PRESENTATION AND INTERPRETATION OF RESULTS

This chapter consists of results and analyses of the study. The chapter will begin with the descriptive statistics of the variables. Secondly, the unit root result will be discussed for the various time series. Finally, the ARDL result comprising both long run and short run dynamics will be presented and analysed with some robustness to confirm validity of the results.

5.1. Descriptive Statistics

Table 5.1. Descriptive Statistics

Descriptive Statistics

Variable	Obs	Mean	S Dev.	Min	Max	Skewness	Kurtosis	J-B
Un_r	195	10.55	1.66	8.00	14.10	0.66	2.25	18.86
Vr	195	0.36	0.26	0.04	0.92	0.21	1.65	16.22
Vr^2	195	0.20	0.21	0.001	0.84	0.88	2.85	25.36
GDP_g	195	1.27	3.16	-12.91	17.46	0.38	13.03	821.94
Inf	195	9.72	3.51	3.99	25.24	1.81	7.26	254.17
Y_un	195	19.48	3.13	15.00	26.90	0.84	2.58	24.20
Con	195	6.59	0.72	4.77	7.76	-0.23	1.74	14.58
Ser	195	51.51	2.81	46.34	57.14	0.42	2.04	13.26
Mw	195	0.72	0.02	0.69	0.75	0.24	1.85	12.61

Table 5.1 above shows the descriptive statistics of the time series. From the table, we could observe that the average unemployment rate (un_r) during the sample period is 10.55% while average vacancy rate (vr) is shown to be around 0.36%. Unemployment is shown to reach a maximum value of 14.10% during August 2019. This could be explained by the sharp growth in the labour force over the period. A large percentage of the rise is

from the young population. This coincided with a maximum values of youth unemployment in 2019. There has been a maximum vacancy rate for the Turkish labour market hovering around 0.92% in May 2017 following a steady economic growth during the periods. While it maintains a mean value of 0.36%. it recorded the minimum value hovering around 0.04% during the period of 2015 due to low job postings by both public and private firms. With an increasing labour force for the Turkish economy, the unemployment rate would be explained to experience small improvement. The high unemployment rate implies a rising youth population in the economy. Ostensibly, the unemployment rate of young (y_un) in Turkey hits the maximum at 26.9% with an average of 19.48% and minimum of 15% during the sample period. The minimum value coincided with November 2011 following the aftermath of economic pressure during the 2011 election. The highest youth unemployment value coincided with August 2017, a period where labour force participation hovers around the maximum value of 53% for the Turkish labour market. This implies that more people entered the labour market particularly the young population. This provides the plausible explanation for the rising unemployment rate in the economy with small improvement in the job vacancy postings.

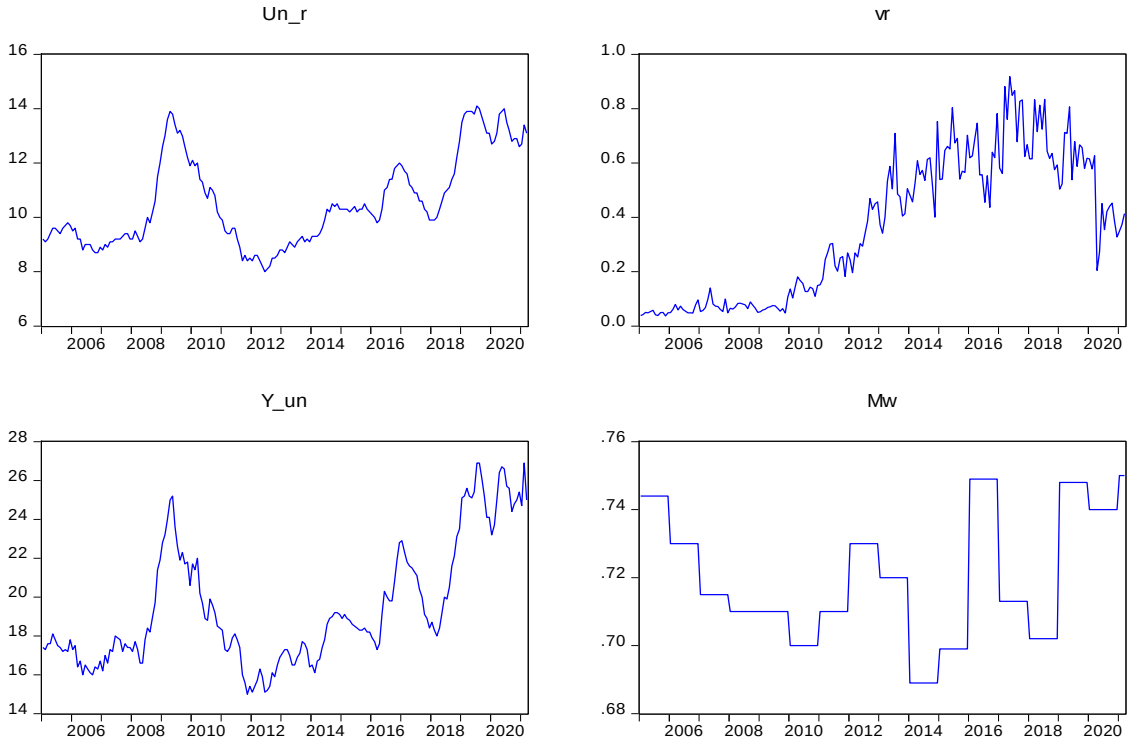

Figure 5.1. Time Series Graph 1

Figure 5.2. Time Series Graph 2

Moreover, GDP growth rate (GDP_g) for Turkey during the sample period averaged 1.27% with a maximum and minimum value of 17.46% and -12.91% respectively. The minimum growth value coincided with the outbreak of Covid-19 which resulted in measures that shutdown economic activities. The economy experienced a sudden decline resulting to a negative growth. With government efforts to reverse this effect and reviewing the lockdown measure, policies were put in place to thwart the effect which resulted in a surprising improvement of highest GDP growth for the economy. Inflation rate (Inf) for Turkey maintain an average value of 9.72% with a bound between 3.99% as minimum and 25.24% as the maximum. Inflation in Turkey has always been a problem. A value of 25.24% as inflation in an economy means a great concern for the people. This implies that people are paying high prices for goods and services. Inflation rate in Turkey is largely driven by currency crisis. This coincided with a period where Lira fell 30%

against the dollar. On the other hand, Turkey experienced the minimum inflation rate in 2011. This coincided with a period where the GDP growth was around 11% and ranked 18th economy with the highest GDP with a stable exchange rate of 1.68 Turkish lira to a dollar.

On the sectoral contribution of employment, service sector (ser) has the highest average employment of 51.51% as compared to construction sector (con) with an average value of 6.59%. Service sector has a maximum share of 57.14% in February 2020 and a minimum value of 46.34% in January 2005. The service sector is composed of wholesale and retail trade, transport, financial services, education, tourism, health care and real estate. A plausible explanation for the growth in service sector could be due to improvement in these subsections. The Turkish economy overtime has seen a remarkable rise in education, health, real estate, and tourism. The sudden rise results to increase in employment for the economy. The service sector employment fell with the outbreak of Covid-19 in the economy due to shutdown of most component of the service sector and implementation of work from home measures. Construction sector on the other hand maintains a maximum value of 7.76% in February 2014. This could be attributed to the mega projects that include construction of third bridge on Bosporus, third Airport in Istanbul, railway lines, hospitals and rise in housing. The minimum value of 4.77% coincided to be April 2020 following the Covid-19 outbreak. Due to better technology and improved labour productivity, the manufacturing and agricultural sector will have less employment as compared to the growing service sector. Interestingly, minimum wage relative to median earnings of fulltime workers (mw) has an average value of 0.72. The minimum wage ranges between 0.69 in December 2014 to 0.75 in January during the sample period. This is a measure for international comparison of average wages. The ranging value shows a stable value for average wages ranking among the top 30 countries of the world.

Turning to standard deviation of the variables, it is shown that minimum wage relative to median earnings of full-time employment has the smallest standard deviation followed by vacancy rate. This implies small improvement in the vacancy rate over the period of study. The labour market of Turkey sees a small number of job postings as compared to the unemployment rate with a standard deviation of 1.66. Inflation rate is revealed to have the

highest standard deviation. This implies that Turkish inflation rate is characterised by high volatility. The volatile inflation indicates the real experience of the economy as regards inflation rate. One of the challenges of the Turkish economy has been persistent rise in prices due to the foreign exchange instability as mentioned above. The GDP growth rate is also shown to have large volatility characteristics due to a high standard deviation. This growth could be attributed to persistent policy measure to ensure the economy maintains its status as an emerging economy.

From Table 5.1 above, the time series are all positively or rightly skewed except for Con which is negatively skewed. Furthermore, Un_r, Vr^2 and Y_un are shown to be moderately skewed. On the other hand, Vr, GDP_g Con, ser and mw are shown to be approximately symmetric in nature. Only inf among the time series is highly skewed with a value of 1.81. The result for the kurtosis suggests that GDP_g and Inf are leptokurtic with a value greater than 3. This means that their central peak is higher and sharper; and their tails are longer and fatter. The other time series have a kurtosis value that are less than 3 meaning that Un_r, Vr, Vr^2, Y_un, con, ser and mw are platykurtic. This suggests that the series have a central peak that is lower and broader; and their tails are shorter and thinner. The higher value of Jarque bera indicate that series exhibit no standard normality features. This suggest that the null hypothesis that residuals are normally distributed are rejected for all the time series.

5.2. Unit Root Test

Table 5.2 below shows the result for Unit root test. In analysing the time series data for this study, testing for stationarity is important to avoid the problem of running a spurious regression and a misleading prediction. These tests check whether the series are stationary or not. The basic idea behind testing for stationarity is the assumption that the statistical properties of a process generating a time series does not change overtime. It is required that variables be stationary in order to proceed with regression for an unbiased and efficient results. The unit root test was carried out on the time series with two tests for the null hypothesis of unit root i.e., ADF, PP and a null of stationarity, namely, KPSS. The null hypothesis of ADF and PP are that variables have unit root. On the other hand, the

KPSS has a null that variables are stationary. Obtaining a consistent and reliable result, the time series that are not stationary at levels undergoes transformation through differencing to make it stationary under the unit root process of constant, or constant and trend for all the variables. Variables that undergo this transformation through differencing are not considered stationary at levels but stationary at first or second difference depending on the number of times a differencing is done.

Table 5.2. Unit Root Test Result

Variable	Level			First Difference			
	ADF	PP	KPSS	ADF	PP	KPSS	Remark
Constant only							
Un_r	-2.09	-1.58	0.62**	-4.68***	-9.58***	0.07	I(1)
Vr	-1.78	-1.90	1.44***	-21.62***	-29.00***	0.20	I(1)
Constant and Trend							
Un_r	-2.74	-2.10	0.18**	4.68***	-9.56***	0.05	I(1)
Vr	-2.40	-3.71	0.24***	-21.60***	-30.26***	0.13	I(1)

From Table 5.2 above, the three test of stationarity indicates the presence of unit root for both unemployment rate and vacancy rate at level. Interestingly, the result show that unemployment rate and vacancy rate are stationary at first difference at 1%, 5% and 10% level of significance for ADF and PP. For KPSS, the result suggests the rejection of null hypothesis at 5% and 10% for both constant only and/or constant and trend at level. Therefore, unemployment and vacancy rates are found to be stationary at first difference. Table 4 below shows the unit root result for the additional variables of the study. Among all the variables, only GDP growth rate is shown to be stationary at levels at 1%, 5% and 10% levels of significance. Inflation shows a mixed findings for the unit root tests. Inflation is also shown to be stationary at level at 10% significance level for ADF only with constant only. It is shown to be stationary at levels for ADF at 5% and 10% levels of significance for constant and trend. The inflation results for PP and KPSS reveal the

contrary. They suggest that inflation is stationary at first difference. The result for inflation is shown to have mixed finding. Overall, inflation is considered to be stationary at levels in this study. Youth unemployment and service share of employment are all stationary at first difference at all levels of significance for ADF, PP and KPSS both when model is specified with constant only or constant and trend. Construction employment is shown to have a unit root at level since the null hypothesis of stationarity for KPSS is rejected at both 5% and 10% for constant only and 1%, 5% and 10% for constant and trend. Therefore, it suggests that construction is stationary at first difference. This is supported by the ADF and PP test that shows the suggestion of null hypothesis of unit root at first difference. Similarly, minimum wage is also shown to be stationary at first difference both when model is specified using constant only; and constant and trend.

Table 5.3. Unit Root Test for Other Variables

Variable	Level			First Difference			
	ADF	PP	KPSS	ADF	PP	KPSS	Remark
Constant only							
GDP_g	-4.11***	-4.74***	0.05	====	====	====	I(0)
Inf	-2.71*	-2.30	0.73**	====	-10.58***	0.07	Mixed
Y_un	-1.56	-1.34	0.74***	-5.97***	-11.68***	0.08	I(1)
Con	-2.003	-2.003	0.47**	-12.46***	-12.47***	0.21	I(1)
Ser	-1.56	-1.56	1.55***	-12.34***	-12.34***	0.12	I(1)
Mw	-2.42	-2.53	0.24	-13.82***	-13.82***	0.13	I(1)
Constant and Trend							
GDP_g	-4.05***	-5.17***	0.05	====	====	====	I(0)
Inf	-3.39**	-3.04	0.23***	====	-10.56***	0.02	Mixed
Y_un	-2.37	-2.08	0.24***	-5.99***	-11.66***	0.05	I(1)
Con	-1.74	-1.80	0.34***	-12.49***	-12.43***	0.05	I(1)
Ser	-1.90	-1.94	0.29***	-12.34***	-12.34***	0.10	I(1)
Mw	-2.57	-2.66	0.20**	-13.86***	-13.86***	0.03	I(1)

We proceed to test for structural unit root for all the time series. the result for the structural unit root test is presented in Table 5.4 below. The table revealed that GDP growth rate and

is stationary at levels at 1%, 5% and 10% level of significance. Inflation on the other hand shows that it is stationary at levels at 5% and 10% level of significance for constant only while it is stationary at 10% only for constant and trend. Therefore, for the overall structure of this study, inflation is treated at levels. Unemployment rate and construction employment result for constant and trend specification show that they are stationary at level at 10% level of significance only. The period of structural breaks could be seen from the table.

Overall, based on the majority findings for different variant of unit root test, all the variables are stationary at first difference except for GDP growth rate and inflation the result for inflation reveals evidence of stationarity at levels.

Table 5.4. Structural Break Unit Root Tests

Variable	Level		First Difference		Remark
	ADF	Break point	ADF	Break point	
Constant Only					
Un_r	-3.46	2018M03	-9.14***	2006M05	I(1)
Vr	-3.88	2012M03	-22.78***	2020M04	I(1)
GDP_g	-5.75***	2005M11	====	====	I(0)
Inf	-4.84**	2018M03	====	=====	I(0)
Y_un	-3.51	2018M03	-11.54***	2006M03	I(1)
Con	-2.92	2018M01	-13.20***	2020M03	I(1)
Ser	-3.52	2014M03	-13.19***	2020M12	I(1)
Mw	-3.79	2018M12	-16.40***	2016M01	I(1)
Constant and trend					
Un_r	-4.81*	2010M08	====	====	I(0)
Vr	-4.51	2019M05	-22.72***	2020M04	I(1)
GDP_g	-5.74***	2005M11	====	====	I(0)
Inf	-4.85*	2018M03	====	====	I(0)
Y_un	-4.33	2010M08	-11.50***	2006M03	I(1)
Con	-4.84*	2018M03	====	====	I(0)
Ser	-3.71	2009M04	-13.16***	2020M12	I(1)
Mw	-3.88	2018M12	-16.40***	2016M01	I(1)

5.3. ARDL Test Results

Table 6 below shows the output of the final ARDL result. In our analysis of the drivers of the unemployment-vacancy relationship, we use available data on youth unemployment, minimum wage, sectoral employment (construction and service sectors). In a bid to not only assess the impact of labour force characteristics and institutional structure but to also assess the cyclical factors, we use data for GDP growth rate and inflation. The GDP determines the cyclical path of the economy oscillating from recession to recovery. We use data for the square of vacancy rate to account for the convexity of the Beveridge curve. This study uses the time series to examine the shift in Beveridge curve of Turkey since 2005. The ARDL technique is employed on the time series to examine the statistical significance of unemployment-vacancy relationship for Turkey**.** We begin by estimating the model with complete variables of the study. Due to the advantage of ARDL technique in eliminating insignificant factors through general to specific approach, some variables were eliminated and were left with the result below. The model was specified with four lags for all the variables of the study (i.e., un_r, vr, vr^2, GDP_g, inf, y_un, con_, ser_ and mw). All the time series that are stationary at first difference (un_r, vr, vr^2, y_un, con_, ser_ and mw) were estimated as dynamic regressors while the time series shown to be stationary at level (GDP_g and inf) were estimated as fixed regressors in addition to the crisis dummies (shock to capture the global financial crisis and the Covid-19 crisis). For the general model, 1458 models were evaluated on the basis of SIC criteria and ARDL (2,1,0,1,0,2,0) was selected among all the models evaluated. This implies that un_r has 2 lags, vr has 1 lag, vr^2 has 0 lag, con is shown to have 1 lag and ser with 0 lag. Y_un has a lag of 2 and 0 lag for mw. From the general ECM model, there is evidence of no cointegration as suggested by Bound test. General ECM regression shows large number of insignificant variables in the short run and long run. This resulted in eliminating some variables to arrive at the final model in Table 6 below.

After series of model version estimation, we arrive at the most appropriate model of the study following 16 number of models evaluated. Table 6 below reports the final model, which is ARDL (1,1,1,1,0) order. In comparison with the general model, we could see that in the dynamic regression un_r (-2), y_un(-2) are dropped completely due to high p-value.

As a final model, mw and vr_2 are also completely dropped due to their insignificance in the model. Among the fixed regressors, inflation is dropped completely as all the lags are highly insignificant. The selected model has as a component one lag of un_r, one lag of vr, one lag of y_un, one lag of con_, zero lag for ser_.

Table 5.5. ARDL Estimates

Model		(1, 1, 1, 1, 0)
UN_R	Coef.	Std. Error
UN_R(-1)	0.880***	0.032694
VR	0.129	0.130443
VR(-1)	-0.211*	0.127263
Y_UN	-0.280***	0.018862
Y_UN(-1)	-0.217***	0.022404
CON_	-0.28***	0.072250
CON_(-1)	0.30***	0.074930
SER_	-0.005	0.011759
GDP_G	-0.021***	0.003796
GDP_G(-3)	-0.012***	0.003654
D_COV	-0.043	0.058830
D_GFC	0.040	0.041689
C	-0.322	0.596836

Table 5.5 shows that lagged unemployment rate has a significant impact on unemployment in Turkey. This implies that the current rate of unemployment is largely explained and determined by the number of people that are unemployed in the previous period. Furthermore, the vacancy result suggests that unemployment rate is positively and related by vacancy rate in the Turkish labour market in the current period. The relationship is found to be insignificant. This situation reveals a clear contradiction of the Beveridge curve i.e., the unemployment-vacancy relationship and findings of Saglam and Gunalp (2012) that found evidence of a negative significant relationship. On the other hand, the lagged vacancy rate is shown to have a negative significant effect on unemployment rate. Moreover, this could be explained by the number of vacancies falling too short of the unemployed persons to make bring more changes to unemployment (Kanık et al., 2014). This result reveals the decreasing job creation capacity of the Turkish economy. Turning to the results for other determinants of the unemployment-vacancy relationship, we

examined the role of other variables in the Beveridge curve. From the ARDL estimates, we found construction sector employment to be significant in the unemployment-vacancy rate relationship. This could be explained by the rise in mega construction projects all around the country. Expansion of railway lines and booming real estate business. Conversely, service sector is shown to have insignificant power in the unemployment dynamics. Youth unemployment is found to have a positive impact on unemployment. The result is rightly signed. A plausible explanation for this could be due to the rising population of youth entering the labour force after the global financial crisis. GDP growth rate indicating economic prosperity is shown to have significant effect on unemployment in the labour market. This indicates that the more the higher the growth rate in the economy, the more jobs are created for larger number of unemployed to find jobs. Turning to the dummy variable for the two periods of GFC and Covid-19, they are found to have no significant impact from the ARDL result. For the Turkish labour market, the model suggests weak and insignificant unemployment-vacancy relationship during the global financial crisis and the Covid-19 crisis. This could be due to the government effort to retain employment of workers during crisis with varying measures put in place.

Table 5.6. Long Run Estimates

Model		(1, 1, 1, 1, 0)
UN_R	Coef.	Std. Error
VR	-0.684	0.964
Y_UN	0.527***	0.054
CON_	0.173	0.207
SER_	0.049	0.099

The Long run estimates of the ARDL show that only youth unemployment is significant in the long run at all levels of significance. It is obvious that only youth unemployment drives the long run relationship in the labour market. This implies that unemployment in the Turkish labour market is due to the teeming population growth of youth that are unable to find jobs. This could be associated to lack of experience and high birth rate among other

factors. Data from TurkStat shows that the population of youth in the labour force is rising in the wake of global financial crisis.

On the other hand, Table 5.7 present the result for the short run dynamics. In the short run, vacancy rate has an insignificant positive relationship with unemployment rate. This contradicts the proposition of Beveridge curve that there is a negative relationship between vacancy rate and unemployment rate. This result is contrary to the finding of Kanık et al. (2014) and Saglam and Gunalp (2012) for the Turkish economy during the global financial crisis. The construction sector stands out as an important factor to unemployment dynamics. It is shown to have a significant negative relationship with unemployment in the short run. This implies that larger the amount of employment in the construction sector, the lower the unemployment rate in the labour market. Interestingly, among the cyclical factors generating unemployment dynamics, current GDP is shown to have a significant negative relationship with unemployment. The more the economy experiences economic growth and prosperity, the lesser the unemployment rate. Lagged GDP growth is also shown to have significant negative relationship with unemployment. The impact on the labour market is shown to be a quarterly lag effect. Moreover, the result reveals the role of youth unemployment on the unemployment dynamics in the short run. Youth unemployment is shown to have significant relationship in the short run. Large amount of the unemployment rate in the labour market is explained by the teeming population of young entering the labour force. On the flipside, the crisis dummies are shown to have no significant effect on the Beveridge curve during the sample period. Both global financial crisis and Covid-19 induced crisis do not have impact on unemployment dynamics. This shows the effort of the government to forestall any problem in the labour market.

Based on the result for the labour market, the bound test presents the evidence of long run relationship. From the Table 5.8, following the procedure of Banerjee et. al (1998), the result indicates the presence of cointegration at 5% and 10%. Therefore, in this case, we considered the model to have a long run relationship. The finding of the study highlights the importance of long run relationship in the Turkish labour market. Furthermore, the ECM is rightly signed and highly significant. This coefficient measures how strongly the dependent variables react to deviation from the equilibrium in one period or it shows how

distortion in equilibrium is corrected. This means that equilibrium distortion is corrected with a speed of 12%.

Table 5.7. ECM Regression

Model		(1, 1, 1, 1, 0)
UN_R	Coef.	Std. Error
C	-0.322***	0.094263
D(VR)	0.129	0.114176
D(Y_UN)	0.280***	0.017779
D(CON_)	-0.280***	0.069742
GDP_G	-0.021***	0.003644
GDP_G(-3)	-0.012***	0.003469
D_COV	-0.043	0.044173
D_GFC	0.040	0.036545
ECM(-1)*	-0.120***	0.030354

Table 5.8. T-Statistics Bound Test

Bounds Test		
Signif.	I(0)	I(1)
10%	-2.57	-3.86
5%	-2.86	-3.99
2.5%	-3.13	-4.49
1%	-3.43	-4.6
T-statistic		-4.026**
K		4

On the other hand, from Table 5.8, we may consider the model not to be cointegrated at 1% and 2.5%, respectively but inconclusive. Therefore, we proceed to estimate an ARDL model in differences. The result indicates the presence of no cointegration at 1% and 2.5% respectively. Therefore, it is considered that there is no long run relationship. In an attempt to check robustness of the findings of this study, we estimated an alternative and simple ARDL in differences to broadly support the previous finding. Table 5.9 reports the result for the ARDL model with differences when there is no cointegration. The ARDL model in differences is obtained based on general to specific technique by dropping the

insignificant variables from the model. We begin by estimating a simple ARDL in differences with four lags. More than 40 models were estimated and evaluated on the basis of SIC before arriving at the final model similar to the selected ARDL model. This result is presented in Table 5.9 below.

Table 5.9. ARDL in Differences/Short Run Dynamics

Model		(1, 1, 0, 1, 1)
UN_R	Coef.	Std. Error
D(VR)	0.186	0.118
D(Y_UN)	0.265***	0.018
D(CON_)	-0.290***	0.072
GDP_G	-0.022***	0.004
GDP_G(-3)	-0.012***	0.004
D_COV	0.029	0.042
D_GFC	0.044	0.038
C	0.047***	0.014

The Table 5.9 show similar result as reported in the Table 5.7 above. The slight difference comes from the size of the coefficient. They maintain similar behaviour as compared to Table 5.7 above. The final ARDL model with differences is obtained with included observation of 192 after adjustments. Vacancy rate is confirmed to have an insignificant positive relationship with unemployment rate. Thus, contradicting the proposition of Beveridge curve having a negative relationship between vacancy rate and unemployment rate. Like Table 5.7, construction sector is revealed to be significant in changes in unemployment. Obviously, current GDP is confirmed to have a significant negative relationship with unemployment. The more the economy experience economic growth and prosperity, the lesser the unemployment rate. Similar to current GDP, the lagged GDP growth is also shown to have significant negative relationship with unemployment. The impact on the labour market is shown to be a quarterly lag effect. Interestingly, youth unemployment, the only significant variable in the long run also indicated a significant relationship in the short run. Large amount of the unemployment rate in the labour market is explained by the teeming population of young entering the labour force. Conversely,

the crisis dummies are shown to have no significant effect on the Beveridge curve during the sample period. This is similar to the result in Table 8 as a confirmation of the findings.

CHAPTER VI

SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS

The purpose of this study is to analyse Turkish Beveridge curve during global financial crisis and Covid-19 pandemic. The Turkish labour market like any other labour market could be affected by a crippling economic crisis. In this view, the study uses monthly data spanning from 2005M01 January to 2021M03. The study is limited by data availability for some variables that determines the Beveridge curve dynamics. A visual inspection of the unemployment-vacancy relationship is followed by an ARDL estimation technique to examine the relationship. The study variables include unemployment rate, vacancy rate, GDP growth rate, inflation rate, construction sector employment, service sector employment, youth unemployment and minimum wage relative to median earnings of full-time workers. The visual inspection shows that the crises have no significant effect on the Beveridge curve of Turkey. The notable effect recorded from the visual inspection are on vacancy rate and labour force during the Covid-19 pandemic due to lockdown measures. This is confirmed by the ARDL result which found that youth unemployment to be the significant factor determining unemployment dynamics both in the short run and long run. GDP growth and construction sector employment are also shown to exert great influence on unemployment dynamics in Turkey during the sample period. Vacancy expected to have a negative relationship with unemployment rate is shown to have a positive insignificant effect. This is in contradiction to Beveridge curve and some studies like Kanık et al., (2014) and Saglam and Gunalp (2012). This implies that vacancy rate in Turkey is highly falling short of the unemployment number in the labour market. There are no consistent job creations to match the number of people seeking for job in the economy. The overall finding is to some extent similar to the work of Borsch-Supan (1991); Bouvet (2012); Christl (2019); Stegman (2004); and Vansteenkiste (2017).

Based on the results, the behaviour of unemployment-vacancy relationship is irregular with relatively different pattern. Overall, our empirical finding suggests no significant relationship between unemployment and vacancy rate. The Beveridge curve in Turkey has an irregular pattern indicating vacancy rate to be insignificant. This irregular behaviour of Beveridge curve for the Turkish labour market could be as a result of explosive nature of labour force over the last few years. Kanık, Sunel, and Taşkın (2014) argued that newly unemployed did not enjoy new job openings during this sample period. From the visual inspection, a plausible interpretation of the irregular curve is that the responsiveness of unemployment to vacancy is highly insignificant. The study therefore concludes that unemployment dynamics in Turkey is significantly impacted by the growth in youth population overtime. The implication of this finding is that economic prosperity and employment in some sectors are what leads to improvement in unemployment. The result has implication for policy makers. Identifying a path for job creation and employment generation for the youth is imperative for a meaningful improvement in the unemployment rate of Turkey. The more jobs are created the higher the job vacancy postings that will help in reducing the unemployment rate in the labour market.

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