Czech University of Life Sciences Prague

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Bachelor Thesis

Statistical Analysis of Unemployment in Cambodia

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CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

BACHELOR THESIS ASSIGNMENT

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Business Administration

Thesis title

Statistical Analysis of Unemployment in Cambodia

Objectives of thesis

This bachelor thesis aims to find significant indicators that affect the unemployment rate, quantify correlations between variables, and evaluate the development trends of the unemployment rate in Cambodia. Furthermore, this thesis will research issues connected to unemployment and its consequence on the economy.

Methodology

The theoretical part of the bachelor thesis will be based on selected literature and other scientific sources. In the practical part, time series analysis methods will be elaborated to describe the development of the unemployment rate.

Based on the regression model, the effect of selected factors on unemployment will be evaluated.

The proposed extent of the thesis

30-40 pages

Keywords

Correlation, cyclical unemployment, frictional unemployment, regression model, structural unemployment, time series, unemployment rate

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Recommended information sources

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Declaration

I declare that I have worked on my bachelor thesis titled "Statistical Analysis of Unemployment in Cambodia" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on 14.03.2023 _____

Chanraksmey Chhour

Acknowledgement

I would like to thank my thesis supervisor Ing. Zuzana Pacáková, Ph.D. for her advice and support. Thank you very much to the university's whole teaching team for assisting me in gaining such valuable knowledge. My deepest thanks to my parents for all their support throughout my studies and my life.

Statistical analysis of unemployment rate in Cambodia

Abstract

This Bachelor Thesis studies the factors that influence the unemployment rate in Cambodia, which is one of the lowest unemployment rates in the world. The theoretical section discusses the various types of unemployment and the differences between them. It also explained the reasons for the always existence of the unemployed.

The practical section of the thesis focuses on the determinants that have an impact on unemployment rate in Cambodia. The descriptive analysis of these determinants was explored, and development was presented, based on the annual time series database from 2009 to 2020. Furthermore, the study employed multiple regression analysis where the dependent variable is the unemployment rate, and the independent variables are the employment rate of agricultural sector and the presence of Covid-19 pandemic. The results indicated that the employment rate of agricultural sector was statistically insignificant, while the presence of Covid-19 pandemic was statistically significant in relation to the unemployment rate in Cambodia.

Keywords: Employment rate of agricultural sector, Labour force participation in Cambodia, Rural unemployment, Statistical analysis, The presence of Covid-19 pandemic, Types of unemployment, Unemployment, Unemployment rate in Cambodia, Youth employment rate, Youth unemployment

Statistická analýza míry nezaměstnanosti v Kambodži

Abstrakt

Tato bakalářská práce studuje faktory, které ovlivňují míru nezaměstnanosti v Kambodži, která je jednou z nejnižších měr nezaměstnanosti na světě. Teoretická část pojednává o různých typech nezaměstnanosti a rozdílech mezi nimi. Vysvětlila také důvody, proč vždy existují nezaměstnaní.

Praktická část práce se zaměřuje na determinanty, které mají vliv na míru nezaměstnanosti v Kambodži. Byla prozkoumána popisná analýza těchto determinant a představen vývoj na základě roční databáze časových řad v letech 2009 až 2020. Studie dále použila mnohonásobnou regresní analýzu, kde závislou proměnnou je míra nezaměstnanosti, a nezávislými proměnnými jsou míra zaměstnanosti v zemědělském sektoru a přítomnost pandemie Covid-19. Výsledky ukázaly, že míra zaměstnanosti v zemědělském sektoru je statisticky nevýznamná, zatímco přítomnost pandemie Covid-19 byla statisticky významná ve vztahu k míře nezaměstnanosti v Kambodži.

Klíčová slova: Míra zaměstnanosti v zemědělském sektoru, účast pracovních sil v Kambodži, nezaměstnanost na venkově, statistická analýza, přítomnost pandemie Covid-19, typy nezaměstnanosti, nezaměstnanost, míra nezaměstnanosti v Kambodži, míra zaměstnanosti mladých lidí, nezaměstnanost mladých lidí

Table of content

List of figures

List of tables

List of formulas

List of equations

1 Introduction

The repercussions of losing a job extend beyond the immediate economic impact and may have serious emotional and psychological ramifications for people. Loss of employment not only results in a lower living standard but may also induce emotions of uncertainty, anxiety, and despondency towards the future. In many instances, people who lose their jobs are left with the difficult and time-consuming responsibility of obtaining new work. In addition, this resulted in financial difficulty, which limited people's and families' access to healthcare and education as well as their overall well-being.

In addition, unemployment is a ubiquitous and chronic problem in the labour market, with far-reaching economic and social repercussions. It is widely considered to be among the most significant measures of a nation's economic success, with a high unemployment rate often indicating an ailing economy. The negative effects of unemployment extend beyond the economic domain and have major short- and long-term societal ramifications.

Furthermore, Cambodia is a developing nation that has witnessed tremendous economic progress in recent years but continues to confront issues in tackling unemployment rates, particularly among youth and women. Cambodia will face big problems for the future development of its fragile economy if it fails to address the issue of unemployment among a growing but poorly educated labour force. Hence, one of the most significant responsibilities in formulating a plan for the efficient development of the country's economy is to measure and forecast the rate of unemployment as well as its dynamics in the future. Therefore, this thesis is dedicated to a statistical analysis of unemployment in Cambodia with the purpose of identifying the most influential variables on unemployment.

2 Objectives and Methodology

2.1 Objectives

The main objective of this thesis is to examine the changes in Cambodia's unemployment rate over time and identify the factors that contribute to its fluctuations. In addition, to determine the relationships between various factors and simulate several alternative scenarios in order to estimate the influence on the unemployment rate.

The specific objectives are:

- Analyse the descriptive nature of the factors that influence the labour force participation in Cambodia and depict the development
- Analyse the variables to determine whether they are statistically significant or insignificant based on the regression model and illustrate the relationship between them.

2.2 Methodology

The analysis of this study was conducted through a comprehensive assessment of relevant scientific publications and the internet libraries of leading institutions to obtain further facts. By drawing on a variety of sources, this research was able to offer a complete overview of the issue and ensure the quality and consistency of its conclusions.

Furthermore, this study includes quantitative research methods, which involve evaluating data from the Cambodia Socio-Economic Survey (CES) conducted by the National Institute of Statistics. Descriptive statistics will be used to evaluate the demographic features of the unemployment rate, and a multiple regression model will be applied to identify the factors that have an impact on the unemployment rate in Cambodia. To achieve the goals of the regression model, Microsoft Excel and SPSS Statistical software will be used.

Equation 1: Multiple linear regression model

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_p x_p + \varepsilon \qquad (1)$$

The equation (1) represents a regression model, where y represents the dependent variable, and x_1, x_2, …, x_p represent the independent variables. β_0 is the intercept, which signifies the value of y when all independent variables are equal to zero. β_1, β_2, …, β_p are the regression coefficients, which demonstrate the change in y for a one-unit increase in each independent variable, while holding all other independent variables constant. ε represents the error term, which captures the random variation in y that cannot be explained by the independent variables. For estimating the unknown regression coefficients (β_1, β_2, …, β_p) in (1), we can use the estimated values (b_1, b_2, …, b_p) to make predictions using the following: (Gareth James, Daniela Witten, Trevor Hastie Robert Tibshirani, 2013)

Equation 2: Estimating the regression coefficients

$$\hat{y} = b_0 + b_1 x_1 + b_2 x_2 + \cdots b_p x_p + \varepsilon \qquad (2)$$

The estimation of parameters involves calculating the i^{th} residual, which is the difference between the i^{th} observed value and the i^{th} response value predicted by the linear model. The residual sum of squared (RSS) can be expressed as follows:

Formula 1: Residual of the sum of squared

$$\begin{aligned} \text{RSS} &= \sum_{i=1}^{n} (y_i - \hat{y}_i)^2 \qquad (3) \\ &= \sum_{i=1}^{n} (y_i - \hat{\beta}_0 - \hat{\beta}_1 x_{i1} - \hat{\beta}_2 x_{i2} - \cdots - \hat{\beta}_p x_{ip})^2. \end{aligned}$$

To determine whether there is a relationship between the response and the predictor variables, we can test the null hypothesis that all regression coefficients (β_1, β_2, …, β_p) are equal to zero. The alternative hypothesis is that at least one of the regression coefficients is not equal to zero. We conduct a hypothesis test of the model (4) using the F-statistic and the P-value at a selected significance level of either 1 %, 5 %, or 10 %. To decide whether

the model is statistically significant or statistically insignificant, we can examine the P-value. If the P-value is greater than the significance level, we fail to reject the null hypothesis, indicating that the model is statistically insignificant. In contrast, if the P-value is smaller than the significance level, we reject the null hypothesis, meaning that the model is statistically significant, and we can use the predicted values.

Equation 3: Hypothesis testing of the model

$$H0: \beta 1 = \beta 2 = \cdots = \beta_p = 0 \quad (4)$$
$$H1: \text{at least one } \beta \neq 0$$

After determining that the overall model is statistically significant, we can examine the T-statistic and the P-value for each independent variable in the model to assess the significance of their relationship with the dependent variable. The selected significance level for hypothesis testing is retained, and based on the computed P-value for each variable, we can determine whether to reject or fail to reject the null hypothesis.

Equation 4: Hypothesis testing of the variables

$$H0: \text{There is no relationship between the dependent and independent variables} \quad (5)$$
$$H1: \text{There is relationship between the dependent and independent variables}$$

The multiple coefficient of determination (R-squared) is a statistical metric that is used to determine the proportion of the variance in the dependent variable that can be explained by the independent variables. The formula is as follows:

Formula 2: Multiple coefficients of determination

$$R^2 = 1 - (RSS / TSS) \quad (6)$$

Where SSR is the sum of squared residuals, and TSS is the total sum of squares. The TSS is the sum of the squared differences between the observed values of the dependent variable and its mean value.

3 Literature Review

3.1 Introduction to Cambodia

Cambodia, officially referred to as the Kingdom of Cambodia, has its capital city situated in Phnom Penh. It is located on the Indochina Peninsula and shares borders with Vietnam to the east and southeast, Laos to the northeast, and Thailand to the west and northwest. The country's land area measures approximately 181 035 square kilometres, and it has a population of around 16.6 million people, with 80 percent being Khmers. The Cambodian government has implemented an open free market economy, trade liberalization, and economic privatization, with particular emphasis on agriculture, processing industries, tourism, infrastructure development, and workforce training. As a result, the country's economy has experienced significant growth. (Analysis of Cambodia's macroeconomic development, 2021)

3.2 Introduction to Unemployment

Perhaps we know someone who was recently terminated from their job. Losing a job is more unpleasant when it is tough to shift to another position. After all, a significant number of us are solely reliant on our jobs for our means of subsistence. Being eager and able to work but unemployed is one of the most stressful situations that may arise. The purpose of this chapter is to demonstrate the definition of unemployment and describe how it is assessed in Cambodia. After gaining a fundamental comprehension of what unemployment is, we will be in a position to study the factors that contribute to it in greater depth.

3.2.1 Definition of Unemployment

The term "unemployment" is frequently misunderstood because it includes people who are hoping to find work after being discharged, however it excludes people who have ceased seeking out work within the past four weeks due to numerous reasons such as retirement, disability, personal issues, and leaving a job to pursue higher education. Additionally, people who desire to work but are not actively looking for work are not classified as

unemployed. Interestingly, individuals who have not looked for work within the past four weeks but have been effectively looking for one within the last 12 months are put into a category called "marginally attached to the labour force". Inside this category, there is another category called "discouraged workers", which alludes to individuals who have given up trying to find a job. (Tyler Cowen, Alex Tabarrok, 2021)

The categories that have been outlined above can often lead to perplexity and wrangling as to whether the unemployment rate completely represents the actual number of unemployed people. For a full understanding, one ought to juxtapose 'unemployment' with the term 'employment', which the Bureau of Labour Measurements (BLS) depicts as people aged 16 and over who have recently put hours into work within the past week, paid or otherwise, because of self-employment. (Tyler Cowen, Alex Tabarrok, 2021)

3.2.2 How is unemployment measured in Cambodia

Since 1993, the Cambodia Socio-Economy Survey, also known as the CSES, has been carried out in Cambodia. The CSES was conducted intermittently in the period 1993-2004, but ever since 2007, the survey has been annual, and it is conducted by the National Institute of Statistics of the Ministry of Planning. It is supported by the Royal Government of Cambodia (RGC), and it receives short-term technical help from the Statistics Sweden Bureau (SCB), Swedish International Development Agency (Sida) and the World Bank (WB). Beginning in 2019, it is expected that the CSES will be carried out at regular intervals of two years using a large sample size of more than 10 000 households throughout the country. (Ministry of Planning, 2020)

Through 2019, state auditors will travel nationwide each month, visiting approximately 4,000 households. For each of these randomly selected households, surveyors inquire about the employment status of all adults living there (all over the age of 15). During the survey, the surveyors will inquire whether all adults are currently employed. If the response is affirmative, then the individual is classified as employed. However, if the response is negative, the surveyors will ask whether the person has been actively searching for a job and is available for work in the past four weeks. If the answer is yes, then the person will

be categorized as unemployed. Conversely, if the answer is no, then the individual will not be counted as part of the labour force. (Ministry of Planning, 2020)

To some extent, the unemployment rate indicates that the labour supply is underutilized. This indicates that the economy is unable to provide jobs for individuals who are willing and able to work, despite their efforts to find employment. It is therefore considered an indicator of an economy's efficiency and effectiveness in absorbing its labour force and labour market performance. The percentage of unemployed people in the labour force is used to calculate the unemployment rate. (International Labour Organization (ILO), 2013)

Formula 3: Unemployment rate

$$\text{Unemployment rate} = \frac{\text{Number of unemployed}}{\text{Labor force}} \times 100. \qquad (7)$$

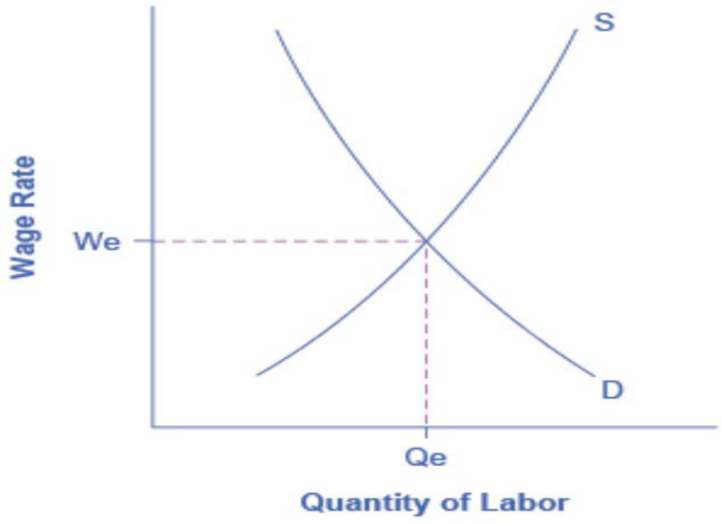
3.3 Types of Unemployment

There are many different scenarios that might lead to an employee losing their job. Each of the factors that contribute to unemployment has a unique set of repercussions, not only for the unemployed individuals themselves but also for public policy.

The concept of the Natural Level of Employment uses a model based on supply and demand to analyse the labour market. The real wage, represented by the Greek letter omega (ω), is determined by dividing the nominal wage by the price level. This calculation determines the price of labour. Figure 1 illustrates the unemployment rate and labour market equilibrium. The supply curve is upward sloping, which reflects the idea that the amount of labour supplied at any given time is relatively fixed. Consequently, if real wages increase, the amount of labour supplied increases only slightly. On the other hand, the demand curve shows the amount of labour needed at each real wage. As the real wage rate decreases, firms require more labour. In this scenario, the equilibrium solution, which is characterized by the intersection of the demand curve D and the supply curve S, corresponds to the real wage rate, which is denoted by ω_e. The quantity of labour, denoted by Qe, sought is equal to the amount of labour supplied. The level of employment that occurs when the amount of labour demanded equals the amount of labour supplied is called

the **natural level of employment**. Also known as full employment. (Lee Coppock, Dirk Mateer, 2013)

Figure 1: The Unemployment and Equilibrium in the Labour Market



Source: Steven A. Greenlaw, David Shapiro, 2017

Even if the economy were to operate at normal employment levels, there would still be some unemployment. The unemployment rate corresponding to the natural employment levels is known as the **natural rate of unemployment**. This rate is influenced by a combination of economic, social, and political factors that exist at any given time, assuming that the economy is neither experiencing rapid growth nor a recession. Maintaining this natural rate is a more rational goal for policymakers. Economists do not know the exact value of the natural rate because it changes over time. In the following paragraphs, we are going to discuss the different sources of unemployment. (Lee Coppock, Dirk Mateer, 2013)

3.3.1 Frictional Unemployment

Although the amount of work demanded was equal to the amount of work supplied, not all employers and potential employees were able to connect with each other. Some people are seeking employment, while some firms are seeking candidates. Employees are unemployed for the time necessary to assemble them. Unemployment that occurs because employers

and employees need time to find each other is known as **frictional unemployment**. (Lee Coppock, Dirk Mateer, 2013)

Frictional unemployment is a natural consequence of the fact that market processes are slow, and information can be expensive. It takes time and effort to find new opportunities, hire new employees, and match the appropriate individuals with the right roles. However, since it is spontaneous, it is not always a bad thing; it may even be a sign of a thriving economy. It reflects optimism towards the economy, the future, and their prospects. In addition, finding the next major step does not imply that there is a dearth of employment opportunities. Furthermore, we live in a world of imperfect information where employees are incentivized to continue searching for the ideal job and employers are motivated to search longer for the finest candidates. (Miles, 2022)

The process of finding employment after completing higher education is an excellent illustration of frictional unemployment. Those who worked while attending school will look for employment. They will get employment someday, but it will take some time. These graduates will be without a job during this period. If labour-market information is costless, companies and potential employees may quickly learn what they need to know about one another, eliminating the need for searching on their parts. Therefore, no frictional unemployment will occur. However, information is pricey. This information requires a job search, and throughout the job search, there is frictional unemployment. (Lee Coppock, Dirk Mateer, 2013)

Governments can take measure to reduce frictional unemployment by concentrating on the information costs that contribute to it. For example, several government entities serve as exchanges of information about the labour market. They encourage job-seeking companies and job-seeking employees to register. Such efforts reduce frictional unemployment as labour market information becomes more accessible. (Lee Coppock, Dirk Mateer, 2013)

3.3.2 Structural Unemployment

Another reason unemployment lingers even when employment equals its natural level stems from the potential mismatch between the skills employers are looking for and the

skills potential workers are offering. Every employee is unique, and each position has its own requirements and features. It is possible that a job applicant's qualifications do not fulfil the standards of the organization. Even if a firm requires the same number of workers as it has available, those whose skills do not meet the company's requirements will find themselves unemployed. Unemployment resulting from mismatches between workers' skills and employers' desired characteristics is called **structural unemployment**. (Gillespie, 2016)

Furthermore, the transformation to the modern economy has brought about the creation of new jobs that demand various talents. This makes some jobs obsolete, which inevitably leads to structural unemployment. As new industries emerge, older ones are destroyed. Economist *Joseph Schumpeter* called this process of economic evolution as 'creative destruction'. It occurs when the introduction of new goods and technologies leads to the demise of other sectors and employment opportunities. This alters the economy's industrial structure. (Lee Coppock, Dirk Mateer, 2013) For instance, an industry may lose its worldwide competitiveness if new global rivals develop. As a result of the collapse of a certain industry, some of its employees will lose their jobs. It may be difficult for these individuals to acquire alternative employment due to their lack of skills to work in other industries or their inability to readily relocate to where the jobs exist. These employees will require retraining.

Despite this, structural unemployment remains a serious problem in economics because of the long-lasting impacts it has and the challenges associated with overcoming the problem. It is possible that this will result in an increase in the natural rate of unemployment. Nonetheless, this is not always an economic recession, as it can also occur during periods of economic growth. (Thomas Janoski, David Luke, Christopher Oliver, 2014)

Sometimes it might be difficult to determine where the line between frictional unemployment and structural unemployment lies. Assume a highly qualified software engineer gets laid off because his company relocates its headquarters overseas and closes its local office. He would like to find a comparable position, but only lower-wage jobs are available in his nearby area. There are jobs available, but none that match his

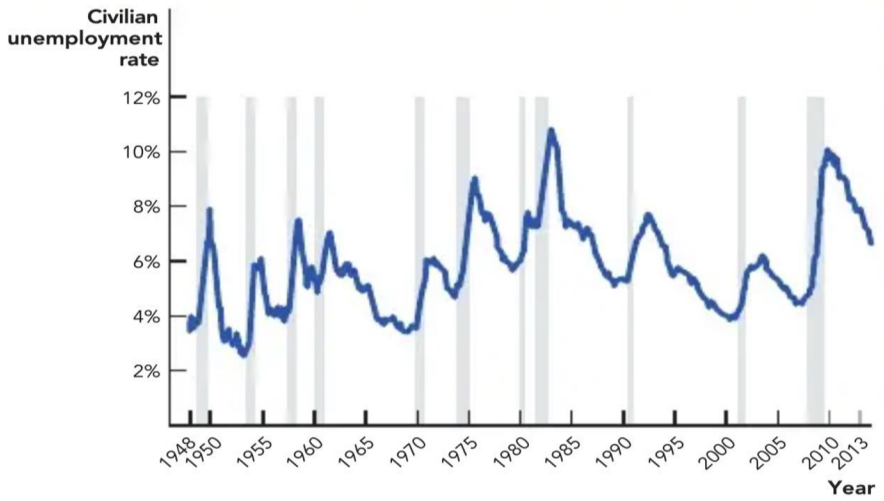
qualifications, and this high-tech company will never return to his region. Is this individual's joblessness the result of friction or structural unemployment? There is no appropriate way to respond to this. You may be under the impression that software engineers are now dealing with either frictional or structural unemployment. However, from a practical standpoint, it does not matter which it is. The former software engineer continues to be unemployed. (Arthur O'Sullivan, Steven M. Sheffrin, Stephen J. Perez, 2016)

3.3.3 Cyclical Unemployment

Obviously, the economy may not be operating at its natural level of employment, therefore the unemployment rate may be higher or lower than expected. **Cyclical unemployment** is unemployment that surpasses what exists at the natural level of employment. It is caused by recessions, or economic downturns, which become the primary cause of the high unemployment rate. (Lee Coppock, Dirk Mateer, 2013) This is consistent with the natural ups and downs of economic growth throughout time. Cyclical unemployment is only temporary, and its length is directly proportional to how long the recession-induced economic contraction lasts. The average length of a recession is around 18 months. Unemployed people tend to be rehired when the business cycle re-enters the growth phase (peak wave). (Amadeo, 2021)

Among the three types of unemployment, cyclical unemployment is the most dangerous since it indicates that a large number of individuals who want to work cannot find jobs. While both frictional and structural unemployment are consistent with economic growth and development, the root cause of cyclical unemployment lies in an unhealthy economy. The darkened region in figure 2 represents recessions. Every recession is accompanied by a significant rise in unemployment, which is cyclical unemployment. Unlike frictional and structural unemployment, cyclical unemployment is not considered a natural form of unemployment. (Lee Coppock, Dirk Mateer, 2013)

Figure 2: An example of the unemployment increases during a recession



Source: Tyler Cowen, Alex Tabarrok, 2021

Furthermore, a decline in consumer demand for goods and services leads to a decrease in production. This reduction in labour requirements results in layoffs. Customers will be required to spend less, leading to further revenue loss. This will compel companies to lay off more workers to maintain profit margins. By the time cyclical unemployment starts to show up on the job market, the economy is often already in recession. Companies typically wait until they are convinced the recession is severe enough to justify layoffs before initiating them. (Arthur O'Sullivan, Steven M. Sheffrin, Stephen J. Perez, 2016)

Cyclical unemployment can be defined as unemployment that correlates with the business cycle. The causes of cyclical unemployment are a matter of debate among economists. Some economists believe that business cycles are mostly the result of actual shocks that necessitate the transfer of labour across industries. According to these economists, the business cycle is merely the real process of economic growth, which is unpredictable and uneven. On the other hand, some economists argue that cyclical unemployment is caused by aggregate demand imperfections – the mismatch between the aggregate wage levels and the price levels in the economy. From the perspective of firms, the salaries that workers seek are not comparable with the general cost of living. (Tyler Cowen, Alex Tabarrok, 2021)

There are several examples that illustrate the aforementioned scenario. It depends not only on the compensation of the prospective employee but also on the wage's relationship to the price of the company's product on the market. For instance, consider a company that manufactures luxury handbags. If the price of the handbag is $1000, the company may be able to afford to pay its staff greater compensation since it may generate a substantial profit on each sale. However, if the company produces a $50 handbag with a considerably lower profit margin, it may not be able to afford to pay its employees hefty compensation. This mismatch leads to cyclical unemployment when wage demands exceed what employers consider profitable. Nevertheless, if aggregate demand for goods and services is somehow high, then higher wage demands may be justifiable, and workers may be employed. In any case, we may see that cyclical unemployment rates were higher during the 2010 recession than in previous recessions. This is commonly referred to as a 'jobless recovery'. (Tyler Cowen, Alex Tabarrok, 2021)

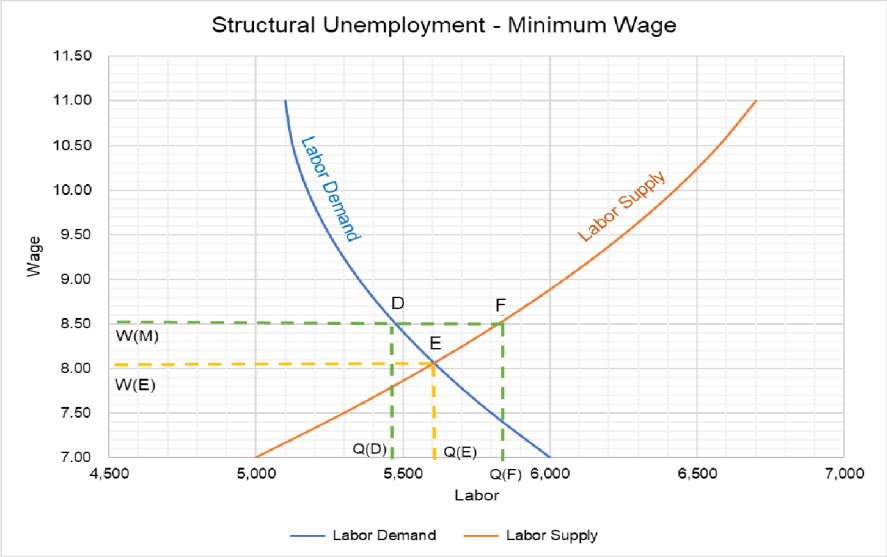
3.4 Reasons for the always existence of the unemployed

Unemployment is caused by various factors that derive both from the demand side, or employers, and the supply side, or employees. Factors that can lead to a decrease in demand for labour include global economic downturns, financial crises, and high interest rates. Meanwhile, the supply side of the labour market can be affected by both frictional and structural unemployment. As long as the output gap persists, unemployment will continue. (CFI Team, 2022) As seen in figure 3, the labour demand curve is downward sloping. This means that if wages go down, companies are willing to hire more workers, and vice versa, as a result of decreasing the marginal product of labour. As the number of workers increases while keeping the capital constant, the productivity of the workers will decrease steadily. In contrast, the labour supply curve slopes upward. This means more workers are willing to work for higher wages.

The interaction of demand and supply determines the prevailing wages in the market and the number of people employed. At a given wage level, if the number of workers needed by firms is greater than the number of workers willing to work, market wages will rise, resulting in an increase in the number of workers willing to work and a decrease in the

number of employees willing to be hired. In contrast, if the number of workers willing to work exceeds the number of workers needed, the number of available jobs increases. However, some factors prevent this automatic adjustment from working. (Obaidullah Jan, ACA, CFA, 2020)

Figure 3: Equilibrium of Labour Market



Source: Obaidullah Jan, ACA, CFA, 2020

There will be discussion of the factors that keep the labour market from reaching equilibrium, including job search, minimum wage laws, unions and collective bargaining, and the theory of efficiency wages.

3.4.1 Job search

Job search is one reason why economics always existence of the unemployed. As discussed above, this is the reason why frictional unemployment is unavoidable. Frictional unemployment is inevitable as a result of the fluctuating demand for labour among diverse firms. For instance, Apple would recruit more employees and Samsung would lay off staff when consumers decide that they prefer Apple smartphones to Samsung ones. This is the period of frictional unemployment. Similarly, employment might fluctuate from one region to another due to the fact that distinct goods are produced in various regions of the nation. Frictional unemployment is also brought on by shifting international trade patterns. As the economy is constantly in flux, frictional unemployment is inevitable. (Mankiw, 2021)

Even if some frictional unemployment is unavoidable, the precise amount is not. The faster information about job openings and the availability of people circulates, the more rapidly the economy is able to match workers and businesses. For instance, the internet may facilitate job searches and reduce frictional unemployment. Public policy may also be involved as well. If policy can accelerate the process by which unemployed people find new employment, the natural rate of unemployment in the economy can be reduced. Furthermore, numerous government initiatives aim to assist job search. Government-run employment agencies, which provide information about job openings, are one option. Public training programs are another option, with the goals of easing workers' transitions from declining to growing industries and helping economically disadvantaged groups escape poverty. (Mankiw, 2021)

3.4.2 Minimum wage laws

The existence of minimum wage laws provides the simplest and most direct explanation possible for the lack of wage underbidding at the microeconomic level. However, it seems that the consensus among labour market economists is that the minimum wage in developed countries has not been sufficiently high in recent decades to account for a significant portion of the structural unemployment in that region. There are minimum wage laws that exist in a multitude of countries, and some of these rules apply to individuals who lack experience or skills, as well as those who are mentally or physically disabled. Furthermore, an increase in minimum wages to a predetermined level could not result in a decline in employment for a company that holds a monopoly position in the regional labour market. In this instance, the firm's demand for workers is held back by the minimum wage, which simply prevents the company from maintaining low wage costs. (Lindbeck, 1999)

In addition, informal social norms may prevent offering lower compensation than existing personnel. In other words, it is feasible that employees and enterprises that accept such bids engage in socially unacceptable behaviours. (Lindbeck, 1999) It should be designed to complement and assist existing employment and social policy efforts rather than act as a distinct organization. Many strategies, including employment-friendly legislation, social transfers, and the construction of an environment conducive to sustainable firms, can be

utilized to reduce income and labour market disparities. The purpose of a minimum wage, which sets a floor, should also be distinguished from collective bargaining, which can be utilized to determine wages above an existing floor. (International Labour Organization)

However, minimum wages are not the primary reason why there is unemployment in the economy as a whole, however, they do have a substantial influence on some groups that traditionally have high unemployment rates. The fact that it can be utilized to understand some of the other factors that contribute to structural unemployment makes it a good place to begin.

3.4.3 Unions and collective bargaining

A labour union is a form of cartel. A union is a group of sellers who cooperate with one another to exert their collective market power, similar to the structure of a cartel. The vast majority of workers discuss with their employers individually about their wages, benefits, and working conditions. In contrast, members of a union operate collectively. The method by which businesses and labour unions reach an agreement on the terms and conditions of employment is called **collective bargaining**. When a union engages in negotiations with a company, it aims to secure better wages, benefits, and working conditions that those that would be offered in the absence of a union. In the event that labour unions and corporations are unable to come to an agreement, the union has the ability to organize a withdrawal of labour from the firm, call a **strike**. When a corporation is threatened with a strike, it is more likely to agree to pay higher wages than it would under normal circumstances. This is due to the fact that a strike lowers production levels, which in turn lowers sales and profits. (Mankiw, 2021)

Unemployment results when a union raises wages above the equilibrium level. This is because it increases the supply of labour while decreasing the demand for labour. Workers who are able to maintain their employment at higher wages are in a better financial position than their counterparts, who are now without work. In fact, it is commonly believed that unions are the source of conflict among diverse worker groups, specifically between the insiders who benefit from high union wages and the outsiders who do not obtain the union jobs. There are two different ways in which the outsiders might react to

their status. Since they wait for an opportunity to become insiders and earn the high union wage, some of them are forced to remain unemployed in the meantime. Others seek employment in companies that are not represented by a labour union. As a direct consequence of this, when unions negotiate wage increases in one area of the economy, more people look for work in other sectors of the industry. In other words, members of unions are the ones who reap the advantages of collective bargaining, while members of non-union organizations are the ones who bear the expenses. (Mankiw, 2021)

Since the mid-1990s, numerous enterprises and high-level unions have been established in Cambodia, resulting in the registration of over 1,687 unions organized under 42 federations, 5 confederations and several independent or unaffiliated groups. The Ministry of Labour and Vocational Training's Department of Labour Disputes (DLD) has effectively established a dispute resolution system, with provincial and municipal Departments of Labour carrying out similar functions. Trade unions in Cambodia are granted most representative status (MRS) if they have at least 51 percent of workers in a particular enterprise as members, allowing them to represent all workers in that enterprise for collective bargaining purposes. Although the apparel sector is still in the early stages of collective bargaining, this practice has been established in several hotels and institutions. It is becoming more widely recognized and practiced as the parties' ability to communicate, negotiate, and trust each other continues to develop. (International Labour Organization, 2010)

3.4.4 Theory of efficiency wages

The market-clearing wage is the wage at which supply and demand are equal. There is neither an oversupply of labour (unemployment) nor an overdemand for labour (labour shortage). According to fundamental economic theory, the economy will reach this market-clearing equilibrium and experience a natural level of unemployment in the long term. However, firms can choose to pay wages in excess of the market-clearing equilibrium. The motive is the relentless pursuit of profit maximization, not generosity or compassion. The logic behind the theory is simple. Paying employees above what economists refer to as 'market equilibrium' has an effect on employee motivation. This is known as the theory of efficiency wages. (Simpson, 2018)

There are several types of efficiency-wage theories in which paying higher wages increases a firm's productivity. These are:

- **Worker Effort:** if it is difficult to determine the quantity or quality of a worker's performance, the worker may have an incentive to 'shirk' (work less than agreed upon). Managers can increase the cost of losing employees by increasing efficiency wages, making the prospect of layoffs more severe. This method can be used to prevent shirking.
- **Worker Turnover:** as mentioned earlier, offering above-market rates diminishes the incentive for employees to quit their jobs and look for a job elsewhere. If the employees are compensated more, then loyalty can influence their behaviour. They become more loyal to organizations that promise to pay for their respect and comfort rather than just survive. This strategy is effective when training a replacement is costly.
- **Worker Quality:** this is another simple concept. When managers give their employees a salary that exceeds the market rate, they are able to recruit and hire the most talented individuals. The performance of an employee on the job depends on his or her talents, which vary from employee to employee. A good example of this is when an organization promotes an employee to a management position. In many cases, this changes individual behaviour in the way employees approach their work. Thus, employees frequently stay longer, strive above and beyond their duties, and assume new tasks.
- **Worker Health:** this relates to the economic benefits of efficient wages for employers; hence, firms must justify paying higher wages for better health. If firms pay their employees more and provide health benefits, they will be better employees. They will take less sick leave and be able to be more concentrated on their work. When employees are healthy, they are more content and motivated. Even if it is not the only aspect that enhances a company’s payments, firms should pay attention to their employees’ health since it boosts productivity and long-term profitability. (Mankiw, 2021)

As a result of the efficiency wage theory, the labour market is unclear, and the unemployment rate might remain above its natural rate. Instead of market forces causing

wage rates to reach equilibrium, wage rates will increase, and supply will exceed demand. This results in better earnings for the employed but higher unemployment. (Simpson, 2018)

3.5 Youth Unemployment

Young people of today have higher levels of education than any other generation in history. Nevertheless, they face obstacles while joining and remaining in the labour market. So many of them have difficulty making the move into the workforce. Opportunities for young people to obtain employment in a nation are contingent on its overall economic and employment conditions. However, they are also impacted by the education and skills that young people acquire, the applicability of these abilities to the job market, and the opportunities youngsters have to use and utilize these skills. Mismatches between these factors can lead to frictional unemployment and structural unemployment. This has a significant impact not just on young people but also on the economies and societies of the nations affected. (International Labour Organization)

However, youth unemployment becomes an issue when statistics indicate that job opportunities are not emerging rapidly enough to keep up with the increase in the labour force. High unemployment rates may also reflect the reality that first-time job-seeking youth lack the education and skills required to meet labour market demands. Furthermore, they feel disheartened in employment with low income and no security. Lack of an adequate job coupled with widespread unemployment can result in squandered youth potential, foregone possibilities for economic growth, and an increased risk of social instability. (ILO Cataloguing in Publication Data, 2007)

The scarcity of available work possibilities is one of Cambodia's significant problems with youth unemployment. A significant number of Cambodia's youth are living in rural regions, where there are fewer options for finding work. In addition to this, there is often a disconnect between the skills that young people possess and the requirements that are present in the job market. There are a lot of young people in Cambodia who do not have the skills required to compete for the jobs that are available in the country, many of which are in industries such as construction and garment manufacturing. Another problem is the

widespread use of informal labour arrangements. There is a significant number of youths who are employed in the informal sector. As a result, they are often not covered by employment rules and do not have access to social protections. It is more challenging for young people to plan for their futures while they are working in the informal sector since it is less reliable than formal employment. (Khmer Youth Association, 2011)

Faced with the difficulty of a growing adolescent labour force, the government of Cambodia is attempting to extend the options accessible to them. The National Strategic Development Plan (NSDP) includes the Rectangular Strategy for Growth, Labour, Equity and Effectiveness, as well as the Cambodian Millennium Development Goals (CMDGs). The NSDP outlines a comprehensive program to create additional employment opportunities, particularly for young people entering the labour market. This program includes several measures, such as enhancing agricultural production to create more rural job prospects, encouraging both domestic and foreign direct investments in critical areas like agriculture, labour-intensive enterprises, and tourism, establishing technical vocational education and training networks to serve all genders, including vulnerable groups, and developing a labour database and statistical system with data on relevant social factors. Additionally, the government aims to support Cambodians seeking employment abroad. (International Labour Organization, 2010)

4 Practical Part

4.1 Unemployment in Cambodia

The majority of people of working age in Cambodia are unable to afford the luxury of spending time seeking the ideal job, which contributes to the country's typically relatively low rate of unemployment. Those who are unemployed often find themselves in a position where they are forced to take whatever work they can get simply to put food on the table because they do not have access to unemployment benefits or money for their families. As a consequence of this, the vast majority of the working population is engaged in the informal sector, and it is extremely challenging to secure a permanent position that provides a stable source of income.

In addition to the challenges faced by individuals seeking employment, the Cambodian economy has also struggled to create a sufficient number of formal jobs. This is partly due to the country's heavy reliance on agriculture, which accounts for a significant portion of the country's GDP but is largely made up of small-scale subsistence farming. Many Cambodians work as farmers, but the industry is vulnerable to natural disasters, climate change, and market fluctuations, which can lead to job losses and reduced incomes. Other sectors of the economy, such as manufacturing and services, have shown growth in recent years, but these jobs are often concentrated in urban areas and require higher levels of education and training. (93% Cambodia workers in informal sector: ADB, 2022)

Table 1 indicates that approximately 84 percent of those who were unemployed in 2019 reported being unemployed for a short period of time (less than 12 months), while 6,4 percent had been job searching for more than 1 year. The majority of the short-term unemployed had been looking for work for less than 1 month (36,6 percent) or less than 3 months (31,5 percent). Just over one in ten people (11,3 percent) had been seeking employment for about 3 to 6 months, and around 4,6 percent for 6 months to just under a year. Furthermore, females were more likely to be among the short-term unemployed than their male counterparts. As a direct consequence of this, the rate of long-term unemployment was significantly higher for males than it was for females.

Table 1: Duration of Unemployment rate, by gender in 2019

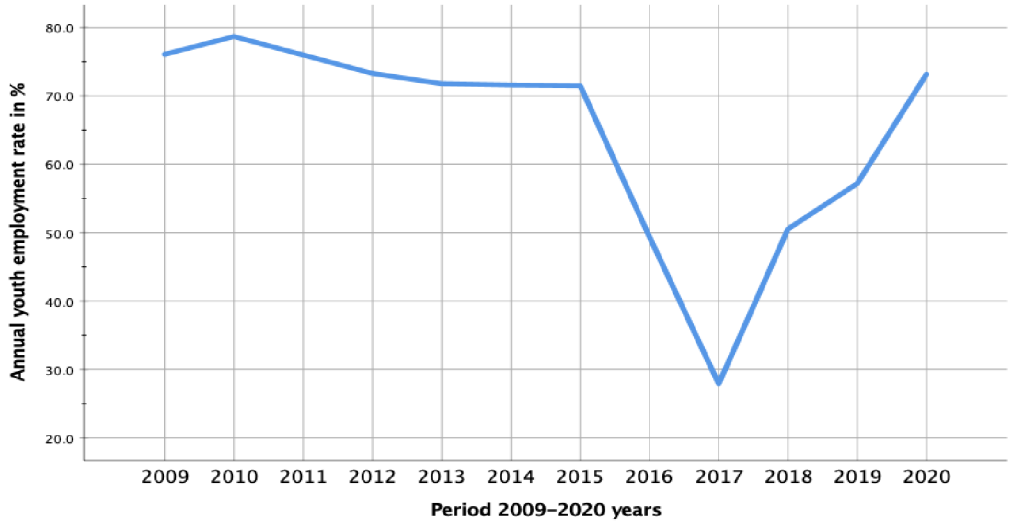
Duration		Both Gender	Male	Female
Short-term unemployment	<1month	36,6	39,8	33,1
	1 to <3months	31,5	30,2	32,8
	3 to <6 months	11,3	9,8	13,0
	6 to <12months	4,6	3,2	6,2
	Short-term total	**84,0**	**83,0**	**85,1**
Long-term unemployment	12months to <2years	5,9	5,8	6,0
	2 years or more	0,6	1,0	0,0
	Long-term total	**6,4**	**6,8**	**6,0**
Available future starter		**9,6**	**10,2**	**9,0**

Source: National Institute of Statistics (NIS), 2019

4.1.1 Youth Employment in Cambodia

The trend shown in figure 4 indicates the youth employment rate in Cambodia from 2009 to 2020. From 2010 to 2015, the percentage decreased slightly, from 78,7 percent to 71,5 percent. However, after 2015, there was a huge drop until it reached 27,9 percent in 2017. Notably, this period coincided with political instability in Cambodia, marked by the collapse of the main opposition party and the imprisonment of its leader, Kem Sokha, on charges of treason. Furthermore, in Phnom Penh, Kem Ley, a well-known political commentator who had expressed numerous criticisms of the government, was fatally shot in public during the day. These factors may have led to a decline in youth employment rates. Political instability can negatively impact foreign investment, consumer confidence, and demand for products and services, thereby limiting the development of new jobs and hindering companies. Additionally, societal disturbances or demonstrations can interrupt economic activity, further eroding corporate trust and lowering job chances for young people. (Pring, 2016) After this event, the youth employment rate increased significantly and returned to its normal level.

Figure 4: Annual Youth Employment rate from 2009-2020



Source: Cambodia Socio-Economic Survey, from 2009 to 2020, own work

As shown in table 2, 57,2 percent of youth participated in the labour force in the year 2019, with 59,1 percent of males and 55,6 percent of females of the total labour force belonging to the 15-24 age group. In rural areas, the proportion of youth actively participating in the labour force was significantly greater than in urban areas, at 61 percent and 49,4 percent, respectively. Young people in rural areas, particularly those between the ages of 15 and 19, have a tendency to drop out of school early to enter the workforce. The primary reason for this is that they do not have access to further education or training. Yet, because of this tradition, their future work and professional opportunities may be more restricted.

Table 2: Youth Labour Force Participate rate, by age group, regions, and gender in 2019

	Cambodia			Urban			Rural		
	Both gender	Male	Female	Both gender	Male	Female	Both gender	Male	Female
Youth labour force (15-24)	57,2	59,1	55,6	49,4	49	49,7	61	63,7	58,6
15-19	40,1	42,1	38,3	29,2	29,5	28,9	44,9	47,5	42,5
20-24	76,3	78,5	74,4	69,5	69,7	69,3	79,9	82,8	77,3
Total labour force (15+)	69,3	77,2	62,4	67,7	76,4	60,2	70,2	77,6	63,6

Source: National Institute of Statistics (NIS), 2019

According to table 3, the overall unemployment rate in Cambodia in 2019 was 1,2 percent, with similar values for males and females but decreasing as the age range increased. The largest proportion is observed among the youth. The youth unemployment rate is 2,5 percent, which is significantly higher than the unemployment rate for adults, which is on average 0,8 percent. Interestingly, the urban area had the highest unemployment rate of 4,1 percent for male youth between the ages of 15 and 24.

Table 3: Unemployment rate, by age group and gender in 2019

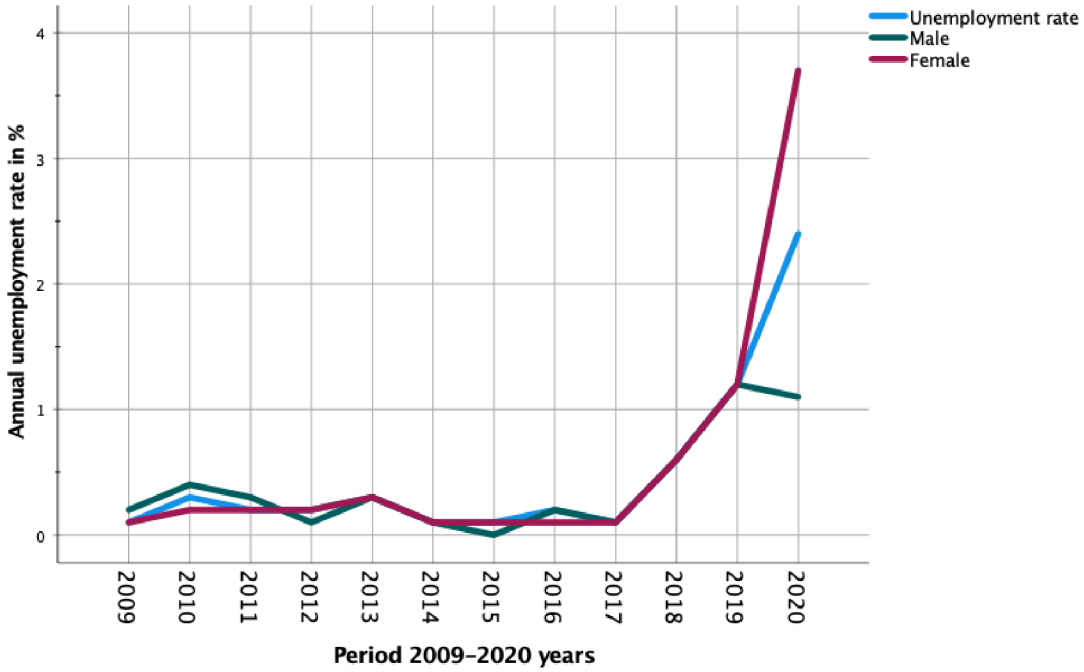
	Cambodia			Urban			Rural		
Age Group	Both Gender	Male	Female	Both Gender	Male	Female	Both Gender	Male	Female
15-24	2,5	2,7	2,3	3,3	4,1	2,6	2,2	2,3	2,2
25-34	1,2	1,4	1,0	0,9	0,8	0,9	1,4	1,7	1,1
35-44	1,0	0,9	1,1	0,4	0,3	0,5	1,3	1,3	1,4
45-54	0,5	0,5	0,6	0,2	0,2	0,2	0,7	0,6	0,8
55-64	0,6	0,4	0,9	0,5	0,4	0,7	0,7	0,4	1,0
65+	0,3	0,4	0,3	0,0	0,0	0,0	0,5	0,7	0,4
Overall	1,2	1,2	1,2	1,0	1,0	1,0	1,4	1,4	1,3

Source: National Institute of Statistics (NIS), 2019

4.1.2 Descriptive Analysis

From 2009 to 2020, the unemployment rate in Cambodia had a low and consistent trend, as seen in figure 5. However, beginning in 2017, the unemployment rate dramatically hit a peak of 2,4 percent by 2020, due to the battles with the COVID-19 pandemic, which caused firms to shut down or reduce their operations, resulting in many temporary layoffs. Additionally, many people were unable to actively seek employment due to the pandemic's restrictions and resulting economic downturn. Furthermore, among them, the female unemployment rate was somewhat higher than the rate for males, which reached 3,7 percent of female unemployment rate.

Figure 5: Annual Unemployment rate, by gender from 2009-2020

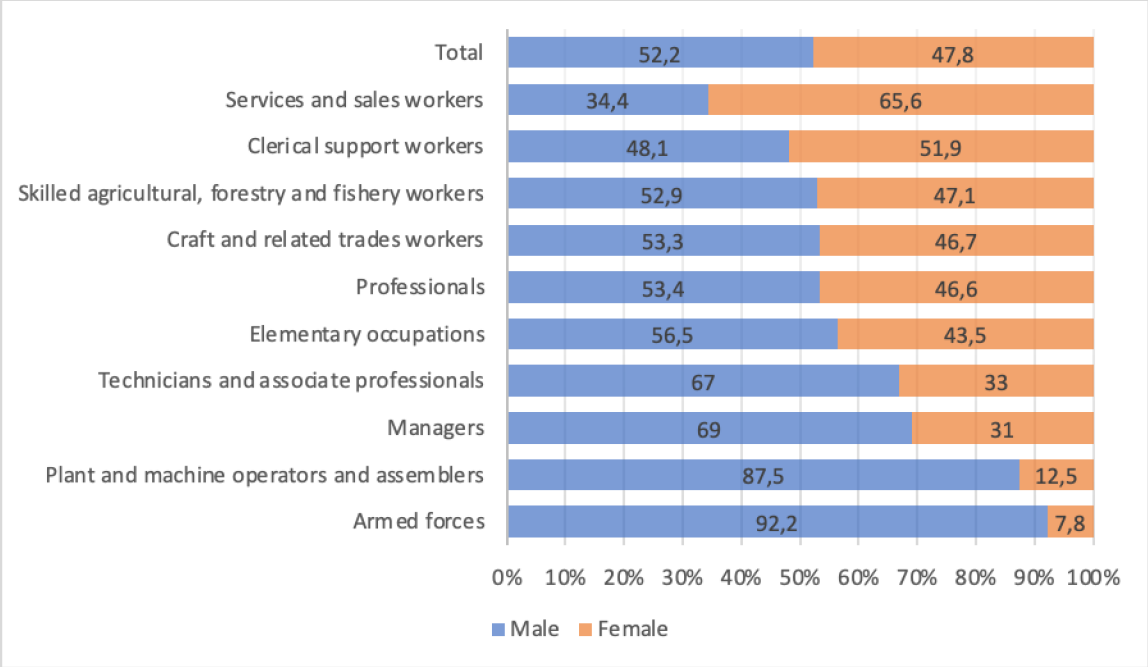


Source: Cambodia Socio-Economic Survey, from 2009 to 2020, own work

Summarizing all the information, it can be concluded that during 2009-2020, the overall average unemployment rate (mean) was 0,483 percent with the standard deviation of 68,07 percent. The standard deviation reveals that the unemployment rate fluctuated significantly during this period. As for gender differences in unemployment, the average unemployment rate for females was higher than that of males at 0,575 percent compared to 0,383 percent, respectively.

According to the data that is shown in table 4, more than half of all workers in 2019 were male. This was the case across all of the major occupational categories, with the exception of clerical support, services and sales. The groups of those who work in the military forces, plant and machine operators and assemblers had the largest proportion of male employees, with nine out of ten people working in both categories being men. The categories of clerical support and services and sales had a larger proportion of female employees than the other categories. The gender disparity in the labor force underlines the necessity for policies and activities that promote gender diversity and fairness in the workplace.

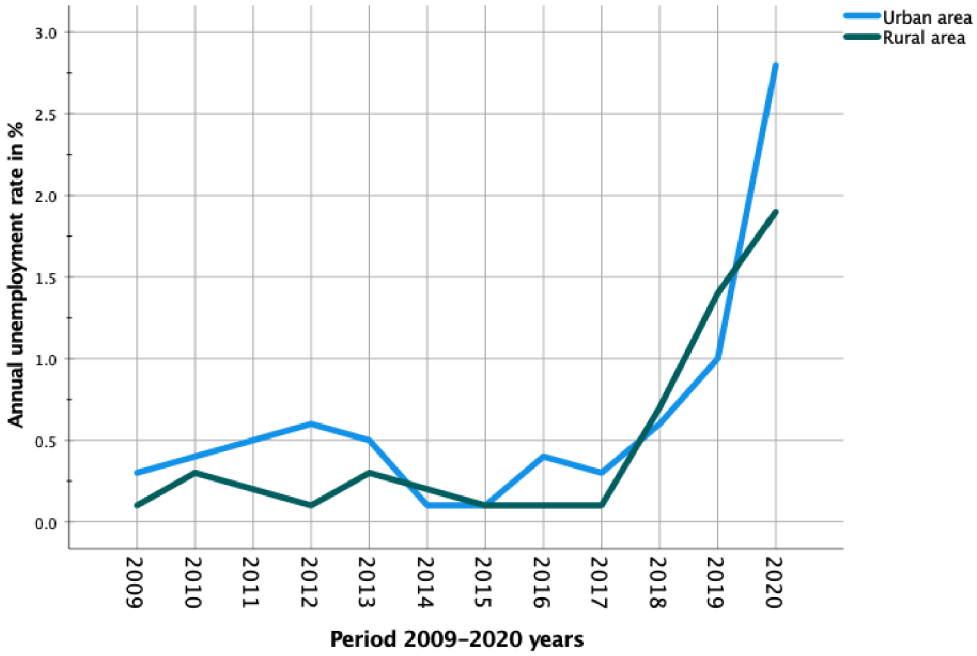
Table 4: Employment rate, by type of occupation and sex in 2019



Source: National Institute of Statistics (NIS), 2019

As stated previously, the majority of workers in Cambodia are employed in the informal sector, with an estimated 93 percent of Cambodian workers engaging in such activities. (93% Cambodia workers in informal sector: ADB, 2022) In figure 6 below shows a comparison of unemployment rates between urban and rural areas in Cambodia from 2009 to 2020. During this period, rural areas typically have lower unemployment rates than urban areas, primarily due to the large population of agricultural laborers, who also contribute to their families' income. The agricultural sector, which is a significant contributor to GDP, is often associated with low tax-to-GDP ratios due to the informal nature of the sector and low salaries. Furthermore, the abundance of informal economic activities in both rural and urban areas, including micro- and small businesses, market vendors, temporary laborers, moto-taxi drivers, and domestic helpers, contributes further to Cambodia's low unemployment rate.

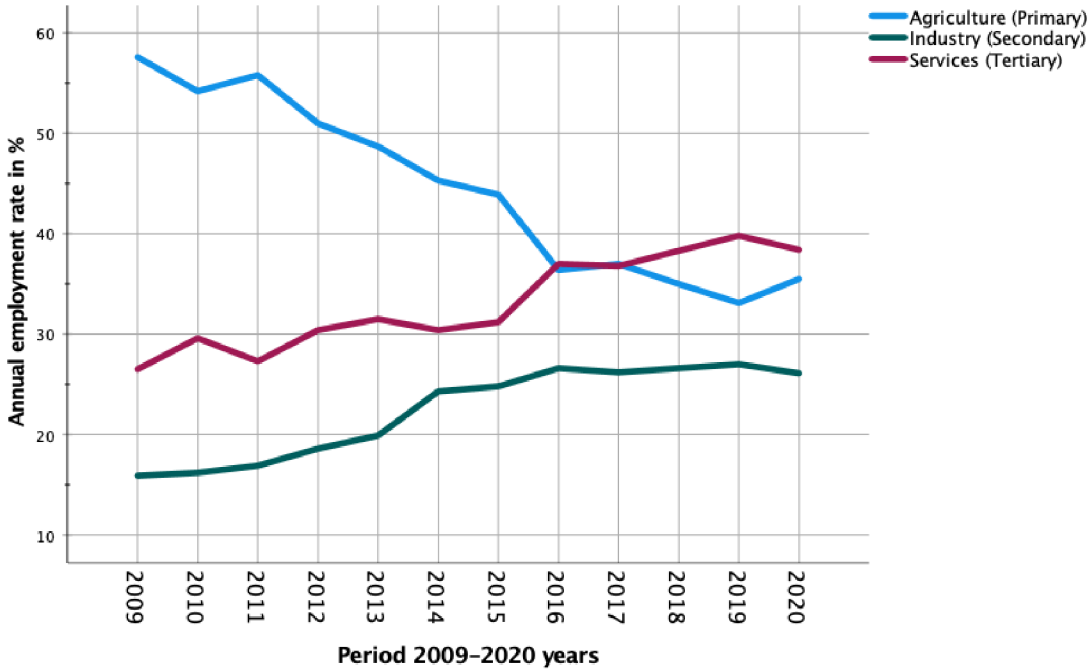
Figure 6: Annual Unemployment rate, by regions from 2009-2020



Source: Cambodia Socio-Economic Survey, from 2009 to 2020, own work

The trends that are shown in figure 6 demonstrate a persistent increase in the unemployment rate in rural areas from 2017 to 2020. The rise in the unemployment rate highlights the significant number of job losses that occurred in these regions during this period. Particularly, the research indicates that the rural unemployment rate increased from 0,1 percent in 2017 to 1,9 percent in 2020. As noted previously, there is a significant number of people working in agricultural labor, therefore changes in this sector can have major impacts on employment rates. As can be seen in figure 7, there has been a slow but steady decrease in agricultural employment rates. Indeed, it is possible that as the agricultural sector sheds jobs, it becomes more difficult for people in rural areas to find work, resulting in increased unemployment rates. Hence, there is a possibility that the rise in unemployment rates in rural areas is connected to the recent decline in employment rates of agricultural sector. Furthermore, the agricultural sector is the most important in the industrial sector of Cambodia.

Figure 7: Annual Employment rate, by industrial sector from 2009-2020



Source: Cambodia Socio-Economic Survey, from 2009 to 2020, own work

4.1.3 Index Analysis

Index analysis focuses on understanding the concept and application of various types of index numbers. Index numbers are widely used in economics and other fields to measure changes in variables over time and across different regions. This chapter provides a comprehensive overview of the first differences analysis. The use of first differences is a common technique in index analysis, that helps identify the changes in the values of a dependent variable over time. In the case of unemployment rates in Cambodia, the analysis of first differences provides insight into the trends in unemployment rates for males and females, allowing for a better understanding of the overall picture of the labour market in the country. By subtracting the previous year's unemployment rate from each year's rate, it is possible to determine whether the rates are increasing or decreasing and the nature of the trend.

Table 5: Index Analysis of unemployment rate, by gender from 2009-2020

Year	Unemployment rate male in %	1st differences	Unemployment rate female in %	1st differences
2009	0,2	-	0,1	-
2010	0,4	0,2	0,2	0,1
2011	0,3	-0,1	0,2	0
2012	0,1	-0,2	0,2	0
2013	0,3	0,2	0,3	0,1
2014	0,1	-0,2	0,1	-0,2
2015	0	-0,1	0,1	0
2016	0,2	0,2	0,1	0
2017	0,1	-0,1	0,1	0
2018	0,6	0,5	0,6	0,5
2019	1,2	0,6	1,2	0,6
2020	1,1	-0,1	3,7	2,5

Source: Cambodia Socio-Economic Survey, from 2009 to 2020, own work

According to table 5, there are increases and decreases in the yearly change in percentage points for both cases. The biggest decrease in the unemployment rate for male was in 2012 and 2014 compared to its previous year, where the 1st difference was 0,2 change in percentage point. Moreover, for the female unemployment rate, the biggest decrease was in the year 2014 compared to 2013, which was also decreased by 0,2 change in percentage point. On the other hand, the highest increase was for the male unemployment rate, which increased by 0,6 change in percentage point in 2019 compared to 2018. It is interesting that the second highest was in 2018 compared to 2017, where there was 0,5 change in percentage point. Furthermore, for the female unemployment rate, there was an increase of 2,5 change in percentage point in 2020 compared to 2019, which was the highest increase in both the male and female unemployment rate. There was also no change in percentage point for the unemployment rate of females in 2011, 2012, 2015, 2016, and 2017 compared to their previous year.

4.2 Regression model and estimation

4.2.1 Regression model

The regression model utilized in this analysis provides a statistical estimate of the relationships between the dependent variable, which is the unemployment rate, and the independent variables, including the employment rate of agricultural sector and the presence of Covid-19 pandemic. By using this model, we may acquire a greater understanding of how changes in these independent variables influence the unemployment rate. The model of regression is as follows:

$$\hat{y} = b_0 + b_1x_1 + b_2x_2 + \varepsilon$$

Where:

$\hat{y}$ = Unemployment rate

b_0 = Y - Intercept

x_1 = Employment rate of agricultural sector

x_2 = Presence of Covid-19 pandemic

ε = Error term

The objective of regression analysis is to determine which variables are statistically significant and which are not. The selection of variables was based on 2009-2020 annual time series data. The statistical software SPSS was used to conduct the regression analysis, with the unemployment rate as the dependent variable, and the employment rate of agricultural sector and the presence of Covid-19 pandemic as the independent variables. The model is set to use a 95 percent confidence interval (significance level alpha = 0,05) to determine the statistical significance of each variable.

Table 6 displays the outcome of the initial regression model estimation. As indicated by the model summary table, the correlation coefficient, R, demonstrates a strong correlation of 0,919 between the unemployment rate and the independent variables. Additionally, the coefficient of determination, R-Squared, equals 0,845. This value signifies that 84,5

percent of the variation of the unemployment rate can be explained by the employment rate of agricultural sector and the presence of Covid-19 pandemic.

H0: $\beta 1 = \beta 2 = 0$

H1: at least one $\beta \neq 0$

Table 6: Regression analysis

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.919[a]	.845	.810	.2967

a. Predictors: (Constant), Presence of Covid-19 pandemic, Employment rate of agricultural sector

b. Dependent Variable: Unemployment rate

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.305	2	2.152	24.457	<.001[b]
	Residual	.792	9	.088		
	Total	5.097	11			

a. Dependent Variable: Unemployment rate

b. Predictors: (Constant), Presence of Covid-19 pandemic, Employment rate of agricultural sector

Source: Own calculation, SPSS Statistics software

The ANOVA table reveals that the p-value of the regression analysis is less than 0,001, which is smaller than the significance level (alpha = 0,05). This indicates that the regression analysis is statistically significant, enabling us to examine the relationships between the dependent variable and independent variables. The hypothesis is conducted as follows:

H0: There is no relationship between the dependent and independent variables

H1: There is relationship between the dependent and independent variables

Table 7: T-test of regression coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.187	.486		2.442	.037
	Employment rate of agricultural sector	-.019	.011	-.254	-1.837	.099
	Presence of Covid-19 pandemic	1.901	.327	.806	5.822	<.001

a. Dependent Variable: Unemployment rate

Source: Own calculation, SPSS Statistics software

According to table 7, it can be seen that the p-value of the employment rate in agricultural sector exceeds the significance level (alpha = 0,05), with a value of 0,099. Hence, the null hypothesis is failed to reject, indicating that no relationship was found between the unemployment rate and the employment rate of agricultural sector. By this result, we can exclude the employment rate of agricultural sector variable and build the final regression model.

4.2.2 Final regression model

The table 8 presents the outcome of the final regression model estimation, wherein the dependent variable is the unemployment rate and the independent variable is the presence of Covid-19 pandemic. Following the exclusion of the employment rate of agricultural sector variable, the correlation coefficient R is equal to 0,887, indicating a strong correlation between the unemployment rate and the presence of Covid-19 pandemic. Additionally, the coefficient of determination, R-squared, is equal to 0,786. This value suggests that 78,6 percent of the variation of the unemployment rate can be explained by the presence of Covid-19 pandemic.

H0: $\beta 1 = 0$

H1: $\beta 1 \neq 0$

Table 8: Regression analysis without the employment rate of agricultural sector

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.887[a]	.786	.765	.3300

a. Predictors: (Constant), Presence of Covid-19 pandemic

b. Dependent Variable: Unemployment rate

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.008	1	4.008	36.797	<.001[b]
	Residual	1.089	10	.109		
	Total	5.097	11			

a. Dependent Variable: Unemployment rate

b. Predictors: (Constant), Presence of Covid-19 pandemic

Source: Own calculation, SPSS Statistics software

Based on the ANOVA table, the p-value for the final regression analysis is less than 0,001, which is smaller than the significance level (alpha = 0,05). This indicates that the regression analysis is statistically significant, allowing for the testing of the relationships between the dependent variable and the independent variable. The hypothesis is conducted as follow:

H0: There is no relationship between the unemployment rate and the presence of Covid-19 pandemic

H1: There is relationship between the unemployment rate and the presence of Covid-19 pandemic

Table 9: T-test of final regression coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.309	.100		3.106	.011
	Presence of Covid-19 pandemic	2.091	.345	.887	6.066	<.001

a. Dependent Variable: Unemployment rate

Source: Own calculation, SPSS Statistics software

The table 9 reveal that the p-value for the presence of Covid-19 pandemic is smaller than the significance level (alpha = 0,05), which is less than 0,001. Thus, the null hypothesis is rejected, indicating that there is a relationship between the unemployment rate and the presence of Covid-19 pandemic. Consequently, the regression equation can be represented as:

$$\hat{y} = 0{,}309 + 2{,}091x_1$$

The equation reveals that the presence of Covid-19 pandemic has a positive relationship with the unemployment rate, indicating that the emergence of Covid-19 pandemic has a positive effect on the unemployment rate. It can be explained that the presence of Covid-19 pandemic has increased the unemployment rate by 2,091 percentage points on average.

5 Results and Discussion

The initial regression analysis was built based on annual time series data where the analysis considered the unemployment rate as the dependent variable, and the employment rate of agricultural sector and the presence of Covid-19 pandemic as the independent variables. Following the estimation, it was found that the p-value of the employment of agricultural sector exceeded the alpha, which means that the variable is statistically insignificant.

The final regression model was developed by excluding the employment rate of agricultural sector, where the dependent variable is the unemployment rate and the independent variable is the presence of Covid-19 pandemic. It was discovered that the p-value of the presence of Covid-19 pandemic was less than alpha, meaning that the variable is statistically significant. Moreover, there is a positive correlation between the presence of Covid-19 pandemic and the unemployment rate.

In the table 10, we can compare the Adjusted R-squared values of the initial and final regression models. It is noticeable that the Adjusted R-squared decreases from 81,0 percent to 76,5 percent in the final model.

Table 10: Comparison of Adjusted R-squared

	Initial model	Final model
Adjusted R-squared	81,0 %	76,5 %

Source: Own calculation, SPSS Statistics software

Despite the fact that the employment rate of the agricultural sector is statistically insignificant in the initial regression analysis, it has a better proportion in Adjusted R-squared. Moreover, the p-value of the employment rate of agricultural sector is close to the significance level, which is 0,099. In other words, if the model sets a 90 percent confidence interval (significance level alpha = 0,10), the p-value of the employment rate of agricultural sector will be smaller than the significance level, indicating that the

employment rate of agricultural sector is also statistically significant to the unemployment rate. As shown in the table 11, the unstandardized coefficient (β) of the employment rate of agricultural sector is -0,019, indicating a negative relationship to the unemployment rate. Therefore, an increase in the employment rate of agricultural sector leads to a decrease in the unemployment rate. Additionally, the discussion above about the trend of the employment rate of agricultural sector confirms this relationship, as it is decreasing.

Table 11: Unstandardized Coefficients of variables

Coefficients[a]

Model		Unstandardized Coefficients B
1	(Constant)	1.187
	Employment rate of agricultural sector	-.019
	Presence of Covid-19 pandemic	1.901

a. Dependent Variable: Unemployment rate

Source: Own calculation, SPSS Statistics software

In addition, the agricultural sector is the primary industry in Cambodia and is a significant contributor to the country's GDP. Agriculture continues to be crucial to the livelihoods of the Cambodian population. According to estimations, 32 percent of holders claimed that about half of their total household income (40 percent to 59 percent) was derived from agricultural income, while 17 percent reported that almost all of their total household income (60 percent to 99 percent) came from agricultural income. A small proportion, 4 percent, reported that all of their household income (100 percent) was accounted for by agricultural income. Furthermore, over one-third (31 percent) of the Cambodian household agricultural holdings reported that their agricultural income contributed less to their total household income than in 2018. Additionally, 56 percent reported a similar contribution, while 13 percent reported a greater contribution to their total household income than in 2018. (Cambodia Inter-Censal Agriculture Survey 2019, 2020)

Furthermore, Cambodia has the highest labour force participation rate in the Southeast Asia/Pacific region. Out of the working population that is aged 15 to 64, 82,7 percent of

Cambodians are either employed or actively looking for work. For the period of 2007 to 2015, the total population of Cambodia increased by just 1,9 percent, whereas the working-age population increased by 2,4 percent during the same time period. This is in contrast to the majority of Asian states. Being placed in this scenario, which affords the possibility of increased economic activity, is a good turn of events. Each year, Cambodia's labour force grows by an estimated 164 000 people on average. As a result, the unemployment rate is below one percent. However, analysts are quick to point out that the statistics do not tell the whole picture; they just tell part of it. (World Bank Group, 2018)

In general, unemployment rates were low owing to the absence of social protection systems and the high number of individuals employed in agriculture with poor productivity. According to the Asean Information Center, Cambodia's unemployment rate is forecasted to be back at 0,31 percent in 2022, which is the lowest among all member states of the Associations of Southeast Asian Nations (Asean). (Sothear, 2022)

6 Conclusion

In conclusion, unemployment is a complicated problem that has effects on economic, social, and political aspects that are both short-term and long-term in nature. Although some level of unemployment is natural and may even be advantageous to the economy, prolonged unemployment can have considerable adverse effects on the country's overall state of affairs. The factors that contribute to unemployment can range from frictional and structural to cyclical, and developments in technology as well as shifts in the composition of the labour force can both play a part in these factors. It is essential for policymakers to take into account the factors that contribute to unemployment rates and to enact policies that can assist in mitigating the negative effects of unemployment.

Furthermore, a statistical analysis of Cambodia's rate of unemployment was carried out, with data spanning the years 2009 through 2020. The results of the analysis indicate that the unemployment rate in Cambodia has maintained a low and stable trend over the years. However, the Covid-19 pandemic has caused a significant increase to 2,4 percent in the year 2020, which we can define as cyclical unemployment. The study also discovered a variety of reasons that have contributed to one of the lowest unemployment rates in the world. These factors include a large proportion of employment in the agricultural sector and youth employment in the informal sector. The research applied a number of methods, including descriptive analysis, time series analysis, index analysis, and regression analysis, in order to identify the factors that had an effect on the unemployment rate in Cambodia.

Regarding the regression analysis, the unemployment rate was designated as the dependent variable, while the employment rate of agricultural sector and the presence of Covid-19 pandemic were designated as the independent variables. Based on the regression estimation, the employment rate of agricultural sector was found to be statistically insignificant to the unemployment rate. On the other hand, the presence of Covid-19 pandemic was found to be statistically significant to the unemployment rate. Therefore, it can be concluded that the primary cause of the high unemployment rate is the presence of Covid-19 pandemic. This finding suggests that the continuous presence of the Covid-19 pandemic has a negative impact on the unemployment rate in Cambodia.

In spite of the statistical insignificance of the employment rate of agricultural sector to the unemployment rate, it had a significantly higher proportion of coefficients of determination, reaching 81 percent. Moreover, the unstandardized coefficient of -0,019 indicates that there is a negative relationship between the employment rate of agricultural sector and the unemployment rate. This implies that the decrease of the employment rate of agricultural sector results in an increase in the unemployment rate, as expected.

Furthermore, from the analysis of youth employment rate, there was dramatically decreased from an average of 74,14 percent (2009-2015) to 27,9 percent in 2017. There is an interesting fact that there was a political instability during 2016 and 2017. There was preparation for the election for 2018. The ruling party has increased its persecution of political opposition, human rights workers, activists, and intellectuals based on their perceived opposition to the government. These actions were aimed at preventing or overturning opposition victories in upcoming elections. Moreover, a prominent political commentator who criticized the government was shot and killed in public. Despite the apprehension of the gunman, there were no attempts made to identify the individuals who commissioned the assassination. These factors all contribute to the problem of political instability, which can negatively impact foreign investment and limit the development of new jobs.

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