

# **UNRAVELING THE IMPACT OF ECONOMIC DIVERSITY ON UNEMPLOYMENT RATES IN ASEAN-6**

**A Thesis**

**Submitted to the Master's Study Program of Economics at the Faculty  
of Economics and Business in partial fulfillment of the requirements  
for the degree of**

**Master of Arts (M.A.)**



by:

**Muhamad Rizki Karim Amrulloh**

**03212210001**

**UNIVERSITAS ISLAM INTERNASIONAL INDONESIA**

**DEPOK**

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## ABSTRACT

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Economic diversification is widely acknowledged as a crucial approach for promoting economic stability. Although the advantages of diversification are well-recognized, its influence on unemployment rates, specifically concerning gender and age dynamics, has not been investigated within the context of the Association of Southeast Asian Nations (ASEAN). This study seeks to address this research gap by examining the influence of economic diversification, along with other factors including inflation, population, foreign direct investment (FDI), human capital, institutional quality, and the COVID-19 pandemic, on the unemployment rates in the ASEAN region. The estimation approach involves the use of a fixed effects model with Driscoll and Kraay standard errors, using panel data from six ASEAN countries covering the period from 2000 to 2022. Before estimating, the model's validity and reliability are evaluated using the Chow test, Hausman test, and Lagrange Multiplier test. Additionally, tests are performed to assess autocorrelation, heteroscedasticity, and multicollinearity. The study demonstrates a strong correlation between economic diversification and reduced unemployment rates in ASEAN, encompassing different types of unemployment. Furthermore, the analysis emphasizes that both institutional quality and population dynamics exert a substantial negative influence on unemployment rates. On the other hand, there is a positive correlation between inflation and unemployment rates, though it is not statistically significant. Meanwhile, foreign direct investment (FDI) and human capital show a non-significant negative correlation with unemployment rates. Additionally, the COVID-19 dummy variable indicates that countries experienced elevated levels of unemployment during the pandemic. These findings suggest that governments in ASEAN should prioritize economic diversification, institutional quality, and targeted support for women and youth to reduce unemployment.

Keywords: Diversification, ASEAN, Unemployment, Macroeconomic, Economic Development, Sustainability, Panel Data.

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## ABBREVIATION DIRECTORY

ACSC	: <i>ASEAN Civic Society Conference</i>
AECB	: <i>ASEAN Economic Community Blueprint</i>
APF	: <i>ASEAN People's Forum</i>
ARDL	: <i>Autoregressive Distributed Lag</i>
ASEAN	: <i>Association of Southeast Asian Nations</i>
BLS	: <i>Bureau of Labor Statistics</i>
CEM	: <i>Common Effects Model</i>
COVID-19	: <i>Coronavirus Disease</i>
DW	: <i>Durbin-Watson (statistic)</i>
ECI	: <i>Economic Complexity Index</i>
EDI	: <i>Economic Diversification Index</i>
FDI	: <i>Foreign Direct Investment</i>
FEM	: <i>Fixed Effects Model</i>
GCC	: <i>Gulf Cooperation Council</i>
GDP	: <i>Gross Domestic Product</i>
HC	: <i>Human Capital</i>
HHI	: <i>Herfindahl-Hirschman Index</i>
ICT	: <i>Information and Communication Technology</i>
ILO	: <i>International Labour Organization</i>
IMF	: <i>International Monetary Fund</i>
IQ	: <i>Institutional Quality</i>
LM	: <i>Lagrange Multiplier</i>
LSDV	: <i>Least Squares Dummy Variable</i>
MBRSG	: <i>Mohammed Bin Rashid School of Government</i>
MENA	: <i>Middle East and North Africa</i>
OECD	: <i>Organisation for Economic Co-operation and Development</i>
OIC	: <i>Organisation of Islamic Cooperation</i>
OLS	: <i>Ordinary Least Squares</i>

PCA	: <i>Principal Component Analysis</i>
PLS	: <i>Pooled Least Square</i>
REM	: <i>Random Effects Model</i>
SDG	: <i>Sustainable Development Goals</i>
SMEs	: <i>Small and Medium Enterprises</i>
S-WI	: <i>Shannon-Weaver Index</i>
UN	: <i>United Nations</i>
UNCTAD	: <i>United Nations Conference on Trade and Development</i>
VECM	: <i>Vector Error Correction Model</i>
VIF	: <i>Variance Inflation Factor</i>
WDI	: <i>World Development Indicators</i>
WGI	: <i>Worldwide Governance Indicators</i>

# CHAPTER 1

## INTRODUCTION

### 1.1 Background

Unemployment topic will always be relevant for discussion. The unemployment rate is a crucial macroeconomic factor. Unemployed individuals are those who have the necessary skills, are eager to work, and need to but are unable to do so. Depending on level development of the nation, different causes of unemployment are related to the economic structure of that nation (Soylu et al., 2018).

This issue has consistently maintained its prominence in discourse, drawing the interest of economists, policymakers, and the general public. Its complex effects reverberate throughout communities, impacting people's means of subsistence, social cohesiveness, and the general state of the economy. Referring to the Association of Southeast Asian Nations (ASEAN) Economic Outlook the unemployment rate in ASEAN labor markets show a declining trend but remain high. Thus, industry and services should create work options, especially for women and youth. This condition calls attention to the crucial role of services in the structural transformation of ASEAN economies, the importance of an internet-based, data-intensive, and technology-dependent future, and the acceleration of digitization resulting from the pandemic (The European Union & ASEAN, 2023).

It is frequently acknowledged that unemployment lowers income and productivity, which has a negative impact on the aggregation of human and physical capital through learning and educational expenses. Therefore, keeping unemployment low is essential and depends on the economy's capacity to bounce back from adverse shocks. Over the last forty years, there have been multiple instances in Southeast Asian nations where economic downturns have resulted in a significant increase in joblessness (Subramaniam & Baharumshah, 2011).

Meanwhile, the Young Development Index Report 2022 identifies inflation, foreign direct investment (FDI), and gross domestic product (GDP) are the primary factors contributing to youth unemployment rates in ASEAN countries. The success of the transition from education to work is another factor that determines unemployment rates. The transfer of youth into work during secondary schooling may assist the economy; but, when employment takes precedence over education, both youth and the economy suffer in the long run. In their final statement to the ASEAN Civic Society Conference-ASEAN

People's Forum (ACSC/APF 2021), the youth urge the policymakers and government leaders to establish a benchmark for national employment policies that include all populations.

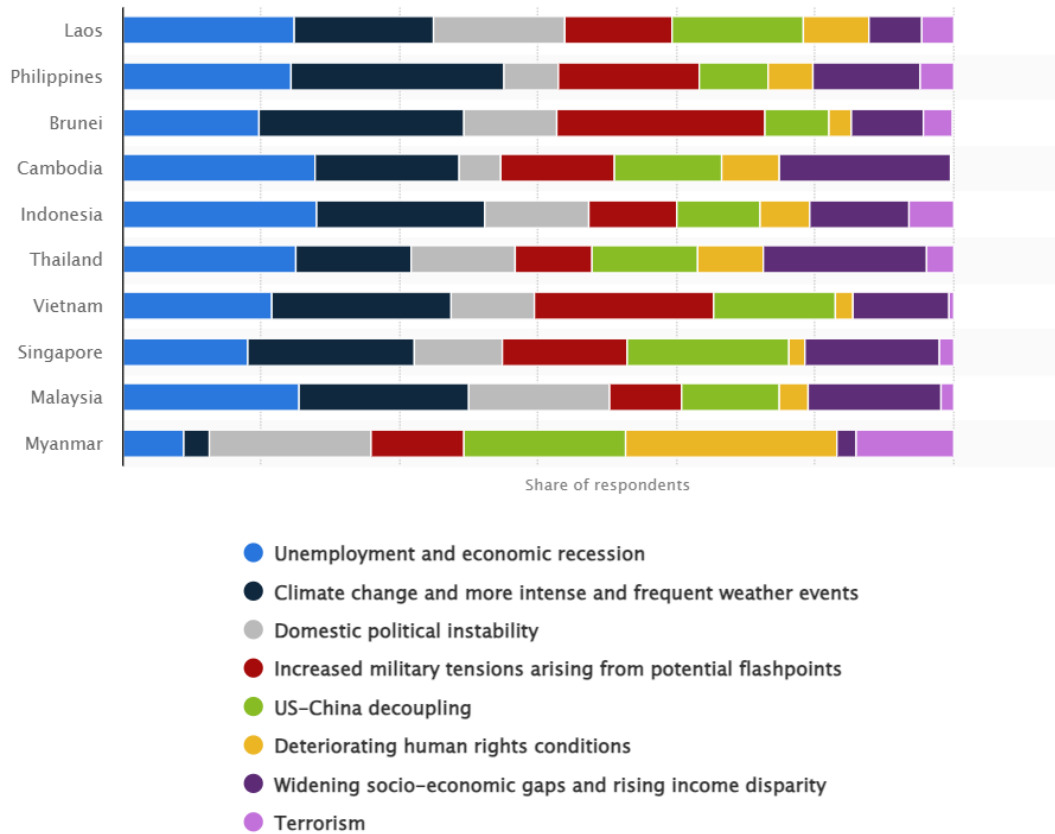
Besides, in the majority of emerging nations, economic development has accelerated since the early 2000s. ASEAN's exceptional economic results can be attributed to the significant rise in primary commodities' worldwide prices. Despite these encouraging statistics, there are certain negative aspects to the majority of developing nations' economies. Booms in natural resources could be worse for developing nations than beneficial if they cause their productive systems to become less industrialized and increase their reliance on resource extraction (Botta, 2010).

According to Martinez-Fernandez & Powell (2009), the Southeast Asian region has experienced some of the world's fastest growth, with investments in skills playing a critical role in assisting national economies to adjust to changes in working practices, technological advances, and globalization challenges. This process has been more successfully managed in some countries, resulting in significant advances in growth and employment levels. However, in others, it has caused in economic stagnation, underemployment, rising unemployment and social exclusion for large segments of society. But, across the region, population growth, combined with migration from rural to urban areas and increased urbanization, has resulted in large pools of semi and unskilled workers, many of whom are unable to integrate socially, politically, or economically into mainstream society.

The ongoing prevalence of unemployment highlights the need for a more thorough comprehension of its complex causes and consequences, especially in light of the rapidly evolving economic landscapes. Consequently, some nations in Southeast Asia are experiencing a greater effect from the financial crisis compared to others. The worldwide economic recession, together with increased caution in financial markets, has started to negatively impact investment in the area. Additionally, there has been a lack of attention to the significance of ineffective lab or market institutions. This leads to ineffective implementation and restricted societal discourse, which together hinder national efforts to foster equitable employment. Moreover, there is often a discrepancy between the development of skills and the requirements of businesses in the area. An optimal environment is necessary for the enhancement of skills in the workforce, ensuring a

harmonious balance between the acquisition of skills and the availability of chances to use these talents.

**Figure 1.1 Leading Challenges Facing ASEAN by Country, 2023**



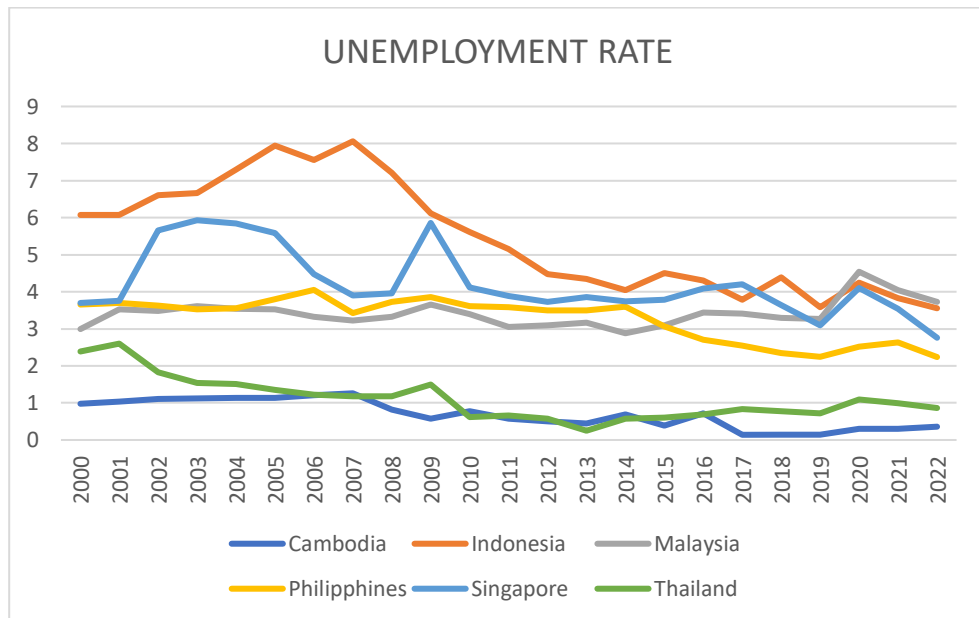
Source: Statista, 2023

The issue related to unemployment in Southeast Asia is reaffirmed by a recent survey conducted by Statista (2023). The unemployment rate and economic recession along with climate change give a big portion of the leading economic and socio-political issues faced by Southeast Asia in 2023, the big portion of the unemployment rate may indicate a serious and deeper economic problem. High rates of unemployment may have a detrimental consequence on equity, increase the level of poverty, and diminish individuals' overall well-being. It exposes structural inefficiencies and discrepancies in the labor market, revealing underlying financial difficulties beyond mere unemployment. Continued unemployment worsens economic disparity and poverty, leading to a decline in the overall living quality and social harmony.

In addition, the simultaneous problem of climate change further compounds the situation by interrupting industries, relocating populations, and increasing living expenses,

hence worsening economic difficulties. To tackle these interrelated issues, a holistic strategy is needed, encompassing economic measures aimed at fostering employment and economic expansion, social initiatives centered on education and the enhancement of skills, and robust climate policies to promote sustainable development and mitigate environmental damage.

**Figure 1.2 ASEAN Unemployment Rate 2000-2022**



Source: World Development Indicator, 2024 (processed data)

Figure 1.2 shows unemployment rates across ASEAN countries, highlighting the region's diverse economic conditions. Cambodia has the lowest unemployment rate, continuously less than 1%, suggesting a surprisingly high rates of employment. Conversely, Indonesia had the highest level of unemployment in ASEAN, peaking at more than 8% in 2007 before progressively falling to less than 5%, demonstrating that job creation and economic circumstances improved over time. Thailand's unemployment rate has been continuously dropping, with just a tiny uptick in 2009, perhaps as a result of the global financial crisis's influence on employment levels. However, Thailand's general trend shows efficient management in lowering unemployment over time. Malaysia's unemployment rate is constant, ranging from 3% to 4%. This stability indicates a balanced work market in which supply and demand for labor are nearly equal. Singapore's unemployment trajectory is described as dynamic, with rates beginning at less than 4% and rising sharply to 6% in 2003, before being successfully reduced to less than 3% by the end of 2002.

ASEAN countries have been selected for research due to their developing economies and intricate labor markets. Each of the member states is in a different developmental stage as shown in Table 1.1, each of these countries presents unique opportunities for study due to their diverse stages of economic development, labor market dynamics, and reliance on specific resources or sectors. The area demonstrates a wide spectrum of economic development stages: Singapore is the most developed country, while Indonesia, Malaysia, the Philippines, and Thailand are in the intermediate stages, and Cambodia is positioned in the early stages of economic development.

**Table 1.1 ASEAN Income Level**

Country	Average GNI Per Capita (\$)			Average Annual Growth (%)		
	2012-2016	2017-2021	2022	2012-2016	2017-2021	2022
<b>Lower Middle Income Country</b>						
Cambodia	1018	1470	1690	7.14	4.29	5.24
Philippines	3208	3558	3950	6.70	3.12	7.57
<b>Upper Middle Income Country</b>						
Indonesia	3536	3904	4580	5.30	3.38	5.31
Thailand	5564	6672	7230	3.50	1.19	2.60
Malaysia	10346	10412	11830	5.14	2.58	8.65
<b>High Income Country</b>						
Singapore	53802	57730	67200	3.95	2.89	3.65

Source: World Development Indicator, 2024 (processed data)

In 2019, a sudden tragedy occurred when many economic sectors experienced significant disruption due to shutdown regulations implemented to reduce COVID-19 outbreaks, countless of livelihoods have been severely affected. Between 2019 and 2020, the percentage of youth not in employment, education, or training grew in several regions of the ASEAN region (Christian & Phu, 2021). The pandemic has caused disruption and hardship among workers and employers worldwide, as well as in the ASEAN region.

Besides, according to the World Economic Forum, young people manage to deal with the pandemic by using digital technologies. Young people are especially interested in technology serves as a tool for enhancing financial inclusion and facilitating access to banking services. Meanwhile, technology promotes the growth of start-ups and social enterprises in communities, which benefits households. Loans and insurance guarantees for young people can help to accelerate economic growth. The increased financial inclusion and access to banking can lead to economic growth (Asean Youth Development Index, 2022).

On the other hand, as indicated by Weno & Rahma Lestari (2022), there may be imbalances between the skills that are required in certain industries and the skills that are available due to the rapidly changing nature of the workforce. This becomes problematic because a mismatch in skills can lead to the underutilization of highly skilled workers, low productivity from underperforming employees, high employee turnover, and a greater need for business employers to invest in employee training to ensure that workers have the necessary skills. Regretfully, ASEAN already has a substantial problem with skill mismatch. According to data from World Bank Enterprise Surveys conducted in 2015, finding employees with the necessary skills for their business operations is already a challenge for 10% to 18% of employers in the Philippines, Indonesia, Laos, Malaysia, and Cambodia.

## **1.2 Problem Statement**

The mismatch could cost the business more in training costs, low productivity, high employee turnover, and inefficient use of highly skilled labor. The COVID-19 induced economic collapse has compounded the region's unemployment and financial problems. It has had varying effects on different sectors, increasing unemployment and generating significant losses. As a result, a country in ASEAN must seek measures to reduce its high unemployment rate, one of which is via economic diversification.

Furthermore, a lack of extensive studies on the economic diversification influence on unemployment in the ASEAN region gives additional justification. This knowledge gap underscores the need for more investigation and analysis to fully understand the dynamics and repercussions of ASEAN nations' economic diversification initiatives. As a result, it is an excellent case study for investigating the correlation between economic diversity and unemployment, particularly given the region's diverse age and gender demographics. Analyzing ASEAN may assist in increasing understanding of this vital topic and give insight into the complicated effects of economic diversification policies on diverse demographic sectors.

Strengthening ASEAN's economic integration and resilience through economic diversification aligns with the objectives of the ASEAN Economic Blueprint 2025, the objective is to create deeper and more cohesive economic integration, enhance competitiveness, improve social inclusion, and accelerate sustainable economic development in the ASEAN region. Diversification contributes to the formation of a more cohesive and shock-resistant economy by lowering reliance on particular industries and widening the industrial base. Additionally, by closing development gaps and enhancing

people's quality of life, it promotes inclusive growth. In keeping with the Blueprint's goal of fostering a greater number of high-tech and knowledge-based industries, diversification also helps to boost productivity and competitiveness through innovation and technology. In addition, diversification promotes the objective of sustainable growth by facilitating the flow of capital and skilled labor, increasing regional connectivity, and fostering cooperation (AECB, 2015).

Economic diversification and unemployment in ASEAN also may be considered in terms of the Sustainable Development Goals (SDGs) initiated by the United Nations (UN). The SDGs, which contain 17 goals and 169 quantifiable accomplishments, give guidelines for governments throughout the globe, including ASEAN members, to achieve sustainable development in environmental, social, and economic areas. Goal 8 of the SDGs, which calls for inclusive economic development, the creation of productive jobs, and decent work for everyone, applies to unemployment. Achieving Goal 8 is particularly important for ASEAN given the region's recent rapid economic expansion. Economic diversity promotes economic stability and is essential for long-term growth and development. Then to ensure long-term economic stability and enhanced resilience to global change, governments and regions must utilize economic diversification as a crucial strategy to lessen dependency on specific industries. A diversified economy may have a direct or indirect impact on the rates of unemployment in ASEAN, both the unemployment rates for women, men, and youth, as well as the overall unemployment rate.

In addition, the advantages of an export diversification-based economic development plan are widely acknowledged in economic research. Diversification fosters structural transformation and promotes economic growth and development through multi-sector technological exchanges. The accomplishment experience of Asian understanding of newly industrialized countries, as well as several economic research, demonstrate that export diversification helps developing nations to boost their growth (Mania & Rieber, 2019). In his research, Agosin (2009) indicates that diversification leads to increased economic growth, he believes there are two ways via which diverse export growth supports production growth, one of which is known as the Portfolio Effect. Export diversification reduces volatility, which results in reduced production volatility. Countries with unstable economies grow at a slower rate. Even though export diversification promotes economic development, research has failed to show a definite impact on unemployment. While export diversification promotes economic growth and structural transformation, research has focused less on its direct relationship with unemployment.

To promote economic diversification, all relevant parties, government, private sector, and others should be cognizant of the interrelationships and possible outcomes of this trend. This will enable them to do their respective duties and efficiently enforce applicable laws. Regulators and other policymakers can prevent or minimize the likelihood of adverse effects on everyone by understanding how the economy is affected by diversification from various demographic sectors. In addition to the diversification economy, it is imperative to understand the broader labor market.

This research explores the complex relationship between the economic diversification index and unemployment in six ASEAN nations (Cambodia, Indonesia, Malaysia, Philippines, Singapore, and Thailand), taking into account demographics related to gender and age. Although economic diversification is widely recognized as an essential strategy for fostering economic stability, its effects on unemployment rates particularly concerning gender and age dynamics remain unstudied in the context of ASEAN. The part of this paper is divided into sections, section 2 literature review, section 3 offers data and methodology used in the analysis. The main empirical results are reported in section 4 while the conclusion and policy recommendation are in section 5.

### **1.3 Research Question**

Based on the background, the research question of this study is:

1. What is the effect of economic diversification on unemployment in ASEAN countries?
2. How do unemployment rates vary between gender and age groups across ASEAN countries?
3. How do unemployment rates vary across ASEAN countries based on the estimation?
4. What are the current trends in unemployment and economic diversification in ASEAN countries

### **1.4 Research Objectives**

The objectives of this study are:

1. To examine the impact of economic diversification on unemployment rates across ASEAN countries.
2. To assess the variations in unemployment rates in gender and age groups across ASEAN countries.

3. To analyze how unemployment rates vary across ASEAN countries based on estimation.
4. To analyze the current trends in unemployment and economic diversification across ASEAN countries.

## **1.5 Hypothesis**

Based on the research question and objectives, the hypotheses are:

1. Economic diversification has a positive effect on reducing the unemployment rate in ASEAN countries.
2. Economic diversification has a differential impact on the unemployment rate across gender and age groups in ASEAN countries.
3. There are significant differences in unemployment rates among ASEAN countries.
4. Economic diversification is positively correlated with decreasing unemployment rates in ASEAN countries.

## **1.6 Research Significance**

This thesis is expected to contribute to the study of economic behavior and governance in ASEAN countries as well as future research. This research offers various advantages:

1. For Academician

By controlling for gender and age in ASEAN member nations, this study sheds light on how economic diversification affects unemployment. The study uses a new Economic Diversity Index (EDI) to illuminate the complex relations between economic diversity and unemployment. The analysis is likely to inspire further research into this complicated topic and offer more nuanced viewpoints and insights.

2. For Government

The study emphasizes the need for ASEAN governments and stakeholders to pursue economic diversification measures to reduce unemployment. By increasing synergy and adopting strong governance frameworks, governments may reduce unemployment and boost economic performance to meet sustainable development goals.

### 3. For labor market stakeholders

The research emphasizes the importance of considering economic diversification as a potential strategy for addressing unemployment issues. Stakeholders can help make the labor market more dynamic and resilient by promoting diverse job opportunities and inclusive hiring practices. Embracing economic diversification measures will not only lower unemployment rates but will also encourage fair access to job possibilities for people of all backgrounds.

## **1.7 Thesis Outline**

### Chapter 1: Introduction

Chapter 1 discusses topics that lead the reader to the primary subject. The first chapter is explained progressively, beginning with the problem's background, formulation, aims, research question, objectives, and hypothesis.

### Chapter 2: Literature Review

Chapter 2 discusses the theoretical foundation and conceptual framework, which are related to the themes to be examined. The theoretical background, also known as a literature review, is derived from a variety of sources, including books, international journals, yearly reports, and official reports received from official institutions and government websites. The following section presents previous research from international journals. This chapter concludes with a theory of the problem and a framework.

### Chapter 3: Methodology

Chapter 3 discusses the research approach utilized to analyze the situation. study methods include study approaches, variable identification, data kinds and sources, data collection procedures, and analytic techniques.

### Chapter 4: Result And Analysis

Chapter 4 contains a general description of the research object, variables used in the study, a description of the research results, the selection of estimation models, model analysis and hypothesis testing, statistical tests, proof of hypotheses, and a thorough discussion of the research findings.

## Chapter 5: Conclusion

Chapter 5 contains the last section of writing research results, which includes conclusions that address the formulation of problems and policy suggestions based on study findings.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Theoretical Background**

Structural change in an economy, based on Lewis' (1954) dual economy model, defines the process by which an economy transitions from a traditional agricultural structure to a more contemporary, industrialised framework. This model divides the economy into two sectors: the subsistence sector, which has low productivity and excess agricultural labour, and the capitalist sector, which has greater productivity and more industrial activity. As the capitalist sector grows, it absorbs excess labour from the subsistence sector, resulting in increasing productivity, urbanisation, and economic expansion. This transformation is fuelled by the reinvestment of capitalist profits back into the economy, which pushes greater industrialisation and modernisation. Lewis's approach emphasises the importance of labour mobility and capital accumulation in attaining long-term economic growth. Diversification of the economy further supports this structural change, this process can significantly reduce unemployment as surplus labor is progressively absorbed into more productive industrial roles.

In addition, Markowitz's (1952) portfolio theory, aims to maximise investment returns while limiting risk via diversification. While the theory is mostly used in finance, its concepts apply to economics in general. The idea emphasises the need of diversification by distributing investments across numerous assets in order to reduce risk and maximise profits. This principle may be used to economics by spreading economic activity across many sectors to decrease risk while increasing overall economic stability and growth. Economic diversity, like diverse portfolios in finance, attempts to generate a balanced return. It helps control risk and creates a more resilient and strong economy. This economic diversity enables a nation or corporation to better weather market volatility and economic instability, resulting in a stronger and more sustainable economic foundation in the future.

##### **2.1.1 Unemployment**

The unemployment rate is a well-recognized and important metric in the labor market that is used worldwide to communicate information about the condition of the labor market and the economy's ability to provide sufficient job opportunities to satisfy the needs of job searchers. The unemployment rate offers valuable information on the extent to which the available labor force is not being fully used. It serves as a reliable indicator of the disparities in the availability and need for workforce. It is also a crucial and widely used

measure that is included in many global indicator frameworks, such as the Global Indicator Framework for the Sustainable Development Goals.

Despite its importance, the unemployment rate alone is insufficient to indicate the labor market. It concentrates on the percentage of people who are jobless in the labor force and does not provide any information about the employment status of those who do have a job, the circumstances surrounding those who are not in the labor force, or the circumstances facing the unemployed. Because it ignores other types of labor underutilization, like time-related underemployment and the potential labor force, it cannot provide a completely comprehensive measure of labor underutilization (Gammarano et al., 2019).

Furthermore, unemployment is the macroeconomic problem with the greatest and most immediate effects on people. When they lose their job, most people suffer from psychological distress and a reduction in their standard of living. It should come as no surprise that politicians frequently assert that their suggested policies would contribute to job creation and that unemployment is a common topic of discussion. Economists investigate unemployment to pinpoint its root causes and enhance governmental initiatives that impact the jobless (Mankiw, 2005).

As per (Mankiw, 2015), the rate of unemployment represents the proportion of individuals who wish to work but are unable to find employment. The Bureau of Labor Statistics (BLS) assigns each adult in each surveyed household to one of three groups based on the responses to survey questions:

- **Employed:** This category comprises paid employees, self-employed individuals, and unpaid workers in family businesses. Both full-time and part-time employees are counted. This group also covers persons who were not working but were temporarily absent from their occupations due to reasons such as break, sickness, or adverse weather conditions.
- **Unemployed:** This covers persons who were ready and prepared to work and attempted to obtain a job within the previous four weeks. It also includes people who have been laid off and are waiting to be recalled to their previous work.
- **Not in the workforce:** This category comprises full-time students, homemakers, and retirees who do not fit into the first two categories.

According to the Bureau of Labor Statistics, the labor force is made up of both employed and unemployed people. The equation is as followed:

Labor force = Number of employed + Number of unemployed.

The unemployment rate, as defined by the BLS, is the percentage of the labor force that is unemployed. The Equation is as followed:

Unemployment rate = Number of unemployed / Labor force\*100.

According to Gwartney & Stroup (2014), unemployment is divided into 3 categories; The first type of unemployment is called frictional unemployment, which results from ongoing economic fluctuations that make it difficult for competent jobless individuals to be quickly matched with available positions. Both employer's and job seekers' incomplete information and the length of time job seekers spend looking for work (pursuit of expensive information) are the causes of it. Structural unemployment is the second type of unemployment, which results from economic structural changes that destroy some jobs while creating opportunities for which the unemployed workers lack the necessary qualifications. The causes of structural unemployment are numerous. Certain jobs may have different skill needs due to dynamic shifts in demand. Certain abilities can become outdated, while others might not be as readily available as needed. Structural unemployment could result from an influx of less experienced, younger people who are unable to match the standards of open positions. And lastly, cyclical unemployment occurs when the economy shrinks, most businesses experience a drop in sales, and there is a general decrease in the demand for labor. It has previously been noted that frictional unemployment happens when demand falls in some industries and rises in others due to employers' and employees' lack of awareness about job openings and potential candidates.

As per the Gammarano et al. (2019) published by the International Labor Organization (ILO), The unemployment rate may be impacted by the characteristics of the data. For instance:

a. Impact of definitions and operational criteria used

The unemployment rate has international standard definitions, as declared in the 2013 Resolution of the 19th International Conference of Labour Statisticians about work, employment, and labor underutilization statistics. However, any departure from these definitions would affect the final unemployment statistics. Consequently, while assessing data, such discrepancies need to be taken into account. Analytical value, international comparability, and trend analysis can all be hampered by even small adjustments to operational criteria, such as changing the cutoff point for what counts as employment or

unemployment. Misinterpreting the unemployment rate to mean that it covers the whole population instead of simply those in the labor force is a frequent error.

b. Impact of geographical coverage

Within a nation, labor market structure and features can change significantly between areas, especially when it comes to varying degrees of urbanization. Labor markets in major cities and other metropolitan areas typically differ from those in other locations, and urban labor markets are typically significantly distinct from rural ones. Therefore, it's imperative to remember if the unemployment rate figures we have pertain to the entire nation or just a few particular regions, and if so, which ones.

c. Impact of age coverage

The age coverage of the data source, which refers to the lowest and highest (if any) age thresholds used to identify the respondents from the survey on whom labor market data is gathered, will affect the labor market indicators that are produced. Certain age groups are more or less likely to be employed, jobless, or not in the workforce, depending on the labor market characteristics they possess. For this reason, including or excluding them from the working-age population affects the outcomes.

d. Impact of the reference period

For countries that depend on economic sectors such as agriculture and tourism, seasonal changes can greatly affect the level of unemployment, for example in the holiday or harvest season, there can be a supply of labor demand which reduces the unemployment rate, meanwhile during the low season, the unemployment rate moves to in the opposite direction, then in some cases, we can conclude that these seasonal changes can influence changes in unemployment rates.

e. Impact of significant methodological changes

Any modification to the technique used to calculate unemployment rates, such as adjustments to the coverage, definitions, sample design, questionnaire design, or operational criteria, will affect the statistics and cause a break in the series. Depending on the kind of modification that is made, the extent of the disruption will vary.

Furthermore, based on many literatures, numerous macroeconomic variables may impact unemployment in the country, including population (Maqbool et al., 2013), external debt, GDP (Farsio & Quade, 2003; Moosa, 2008; Sadiku et al., 2015), Wage (Gabriel,

2023), Inflation (Gallegati et al., 2006), Policy promoting growth (Jumpah et al., 2020), Foreign Direct Investment (Sadikova et al., 2017), Trade (Fugazza et al., 2014), Education (OECD, 2014), ICT (Mirzaei Abbasabadi & Soleimani, 2021), Financial Development (Raifu et al., 2023).

A nation's unemployment rate is a vital indicator of the state and dynamics of its labor market as a whole, reflecting the health of an economy's workforce. However, there are a lot of different causes that can cause changes in this indication. According to Duval & Bassanini (2007) besides macroeconomics, Additional variables that might have an influence include minimum salaries, trade unions role and collective bargaining arrangements, employment protection laws, product market regulation, active labor market policies, taxes, and factors affecting house ownership.

In this matter, scholars have performed a substantial amount of research that has increased our understanding of the many variables that affect unemployment rates, from macroeconomic indicators to policy choices and global economic dynamics. However, there is still a large study vacuum in the understanding of how economic diversity affects unemployment, even with the thorough analysis these studies have provided. It can be concluded from examining the results of numerous earlier studies (Al Naimi, 2022; Albassam, 2015; Brenton et al., 2019; Soyuyigit et al., 2023) that there is a correlation between economic diversification and overall economic performance.

Nevertheless, a lot of research has shown the relationship between unemployment rates and economic performance (Hasan, 2021; Jumpsah et al, 2020; Moosa, 2008). The objective of the present research is to gain more insights into the potential correlation between economic variety and unemployment rates. Notably, to offer a thorough grasp of the dynamics at work, this inquiry will take into account some demographic variables, such as age and gender. The research intends to shed light on how economic diversification policies may affect unemployment outcomes within particular population groups by elaborating on previous findings and including demographic variables.

Soylu et al. (2018) conducted a panel analysis on Eastern European nations between 1992 and 2014, they researched the relationship between economic expansion and joblessness. Panel Johansen Co-integration tests, Pooled Panel OLS, and Panel Unit Root are used in each case. The result found the rise of the economy has had a positive affect on unemployment.

In addition, income growth is not the only factor to consider when evaluating the economic performance of a country. Quality development determines how revenue is allocated evenly to each community and who benefits from development. The unemployment rate is a single metric among other indicators used to characterize a nation's economic performance. Unemployment is a pervasive issue that impacts nations around the globe, regardless of their level of economic development. This is because unemployment is a key component of development, particularly economic development (Hasan, 2021).

### **2.1.2 Economic Diversification**

Economic growth and unemployment have a complicated and frequently nuanced relationship that is influenced by many variables, including changes in global market dynamics, government policies, and technological developments. According to the Organisation for Economic Co-operation and Development (OECD, 2019), diversification refers to the process of transitioning towards a more diverse structure of domestic production and commerce, to enhance productivity, generate employment opportunities, and establish a foundation for long-term growth that reduces poverty.

Many researchers have researched economic development and unemployment. In the subject of macroeconomics, Okun's law has been empirically validated as one of the most universally acknowledged notions. It explains how the GDP and unemployment are related to each other. Farsio & Quade (2003) present an empirical study that examines the disputed relationship between GDP and unemployment. They analyze the research by using 25 years of quarterly United States to investigate the correlation between unemployment and GDP. It has been shown that there is an adverse association between the two variables, and Okun's rule applies to time changes.

Nevertheless, it differs from the research in the Former Yugoslav Republic of Macedonia. Sadiku et al. (2015) found that there is no causal relationship between economic growth and unemployment, indicating that changes in real GDP rates do not affect changes in unemployment rates and vice versa. The two primary factors that contribute significantly to the explanation of the regression outputs are the high rate of informal employment, which makes up around one-fourth of all employment, and structural unemployment.

Furthermore, Moosa (2008) examines in selected Arab countries (Algeria, Egypt, Morocco, and Tunisia), by using two models to examine how unemployment responds to

output changes while adhering to Okun's law principles. The result indicates that Okun's law is insignificant in this case, where an increase in output isn't able to increase the job. Several potential theories are proposed to throw light on this baffling phenomenon, demonstrating that simply focusing on economic growth isn't necessarily enough to properly address the continuing issue of unemployment in Arab countries. These explanations go into a variety of elements, such as structural challenges in labor markets, mismatches in skills and job possibilities, and the prevalence of informal employment, highlighting the intricate interplay of socioeconomic processes at work.

The study by Jumpah et al. (2020) employed a content analysis methodology to analyse official policy papers pertaining to the economic growth of the country from 1996 to 2017, along with other relevant policies targeting the creation of employment opportunities for young individuals in Ghana. The findings indicate that policies promoting overall economic growth have a positive influence on reducing youth unemployment. Specifically, there is an inverse correlation between GDP growth and the rate of unemployment among young people. When the economy experiences robust growth, the youth unemployment tends to decrease, and conversely, during periods of weaker growth, the youth unemployment tends to increase.

Despite barely focusing on the impact of GDP growth like previous studies Farsio & Quade (2003), Jumpah et al. (2020), Moosa (2008), and Sadiku et al., (2015). Alfalih (2024) study the influence of oil prices, inflows of FDI, real GDP, and trade openness on unemployment in Saudi Arabia from 1991 to 2019. He identified the adverse and significant long-term effect of trade openness on unemployment, demonstrating that trade liberalization decreases Saudi Arabia's unemployment rate. Additionally, according to Overton & Bland (2017), it is important to focus on export diversification to enhance the favorable outcomes of trade liberalization in reducing unemployment.

Classical economists are credited with developing the theoretical hypothesis regarding the connection between trade and employment. The comparative advantage theory was proposed by Ricardo in 1817, and it states that a nation should import goods that it has a comparative disadvantage in and specialize in producing and exporting goods that it has an advantage. The necessity of export diversification into manufacturing in developing nations has been underlined by recent theories. The empirical data appears to support both ideas, as the export-diversifying nations have fared better in terms of long-term development and growth. Furthermore, according to the theory of derived demand, such growth would probably lead to a relatively high demand for labor, which would raise

employment, though the rate of increase would depend on how labor-intensive the technology being used (UNCTAD, 2018).

Jimenez & Afonso (2022) investigate the connection between government-wide budgetary solvency and the diversification of tax and non-tax revenue. The findings indicate that expanding into non-tax revenue streams enhances fiscal stability, as demonstrated by increased government-wide operating ratios and reserves. Conversely, diversifying inside the tax system has a detrimental impact. Thus, Pissarides (2009) examines empirically, from 1971 through 1993, The correlation between the increase in output and the level of unemployment in 13 areas of Greece. Likewise, the findings highlight the potential advantages of output diversification to strengthen economic resilience by indicating that a long-term correlation between output growth and unemployment can be established in Greek regions.

Another interesting research by Izraeli & Murphy (2003), through an analysis of the influence of industrial diversification on state unemployment rates and per capita income in seventeen states, the result shows there is strong empirical support that diversity lowers unemployment. The findings also indicate that the relationship between diversity and unemployment is unclear until state heterogeneity is appropriately controlled.

Instead of focusing only on economic growth and specific diversification like export diversification (Carrol in Overton & Bland, 2017), tax diversification, (Jimenez & Afonso 2022), or industrial diversification (Izraeli & Murphy 2003) on the unemployment rate, in this research, on this thesis, the author tends to focus on the level of economic diversification of a nation. It is intended that more diversification will lower poverty rates, increase employment, and lessen a nation's reliance on a small number of ASEAN economic sectors. Commodity-producing countries must consider diversification to ensure their economic development. It allows for a gradual shift towards higher value-added activities and reduces trade concentration, allowing for a wider range of exports to a wider range of partners.

Another definition of economic diversification, as described by Brenton et al. (2019) refers to the process by which a nation shifts towards a more diverse production and trading structure, and is recognized as a crucial factor for economic growth. Lack of economic diversity is often linked to higher vulnerability to external disruptions, which can undermine the prospects of sustainable economic growth. The most economically disadvantaged countries in the world tend to exhibit highly concentrated economic structures due to their small size, lack of access to international trade routes, geographical

isolation, and heavy dependence on primary agricultural activities or natural resources. This poses challenges to the vulnerability of the organisation to industry-specific disruptions, such as abrupt fluctuations in mineral prices or agricultural catastrophes induced by weather.

However, there was no one universally accepted metric or indicator to assess the level and development of national diversification, despite the interest of policymakers in this phenomenon. One of the indexes used includes: the Economic Complexity Index (ECI), which evaluates the export system's variety and complexity of a nation export system, ECI is an index that is frequently used to measure economic diversification or complexity. It combines data on a country's diversity (number of exported items) and ubiquity or number of nations exporting those products (Hausmann et al., 2014).

Additionally, there is the Shannon-Weaver (S-W) Index. The S-W Index is a metric based on entropy that quantifies the economic variety of a region by comparing it to a hypothetical scenario where employment is evenly distributed across all industries. Put simply, it quantifies the number of industries in a particular area and the degree to which employment within that area is evenly spread throughout those industries. It ranges in value from zero to one, with zero indicating minimum diversity and a value of one indicating maximum diversity (Thorvaldson & Squibb, 2017).

Another index used to measure diversification is the Herfindahl–Hirschman Index (HHI), it was first put forth in 1945 by Albert O. Hirschman, presented in 1950 by Orris C. Herfindahl. The higher the HHI value, the more concentrated the market is among a small number of enterprises, the values can vary from close to zero to 10,000, with lower values reflecting a less concentrated market. Therefore, as the HHI value increases, the market becomes more concentrated in the control of a small number of enterprises (Naldi & Flamini, 2014).

Furthermore, despite the advantages and disadvantages of several indexes, this research the EDI was chosen as the economic diversification indicator in place of the other numerous indexes due to its more all-around coverage. Whereas the ECI often focuses on the complexity of its exports, the S-W Index quantifies the number of industries in a particular area and the degree to which employment within that area is evenly spread throughout those industries. The HHI value indicates the degree of concentration, the EDI evaluates a nation's diversification across a spectrum of economic sectors, including non-experts. This allows one to more fully assess the economic structural variety of a country by including activity in sectors including services, domestic industry, and other sectors that

might not be fairly reflected by export statistics alone. The index's primary components were measures of trade, output, and government revenue diversification. Thus, EDI offers a more complete picture of the degree of economic variety of a country, enabling a closer study of the economy's long-term resilience and development possibilities.

The Global Economic Diversification Index (EDI), which released in 2022, aimed to close this disparity by analyzing data from 90 countries between 2000 and 2019. In 2023, a second version was released that covered 105 countries and included information on the impact of the global pandemic. Even though, quantifying the level of diversification in an economy remains a challenging task.

With its review and summary of a nation's economic diversification performance, the EDI helps cross-national score comparisons. Examining three elements trade diversification, government revenue diversification, and production and output diversification, it helps one to determine the degree and scope of economic diversification of a nation. These sub-indices are each made up of multiple underlying indicators. A dimensionality reduction technique called principal components analysis (PCA) is used to compute a sub-index score for each of the three dimensions. The result is that each of the three sub-indices has a single value. These three figures are averaged using the simple arithmetic mean to determine the final national EDI score (Prasad et al., 2023).

The first set of indicators in this category assesses the degree of economic diversification among sectors, products, services, and activities that are related to and unrelated to commodities. The World Bank's dataset is the primary source of information for this category. Identifying the manufacturing, services, and agriculture sectors of the economy is the primary collection of indicators in this category. Second, the variables in this section include total exports and imports for a country and the percentage of fuel exports to goods exports. Moving from commodities to manufacturing and services, trade diversification metrics include the total share of services exports and manufacturing exports as a percentage of GDP and merchandise exports. Additionally, the last sub-index looks at how non-commodity revenue is diversified in terms of revenue sources and taxation (covering trade, income & social security, corporate, property, value added tax, and sales taxes, among other forms of taxation) (Prasad et al., 2022).

The output sub-index includes the following data series: agriculture as a percentage of GDP, gross fixed capital formation as a percentage of GDP, industry as a percentage of GDP, manufacturing as a percentage of GDP, resource rents as a percentage of GDP, services as a percentage of GDP, medium and high technology manufacturing as a

percentage of GDP, manufacturing value added per capita. Furthermore, the revenue sub-index covers the following variables: excise tax revenue as a percentage of GDP, income tax revenue as a percentage of GDP, goods and services tax revenue as a percentage of GDP, tax revenue as a percentage of GDP, total revenue as a percentage of GDP, and trade revenue as a percentage of GDP. Lastly, the EDI trade sub-index is based on the following indicators: total value of exports, fuel exports as a percentage of GDP, export market concentration index, total value of imports, manufactured exports as a percentage of total merchandise exports, medium and high technology manufactured exports as a percentage of total merchandise exports, Merchandise exports as a percentage of GDP, total value of services exports, export product concentration index, import product concentration index (Prasad et al., 2023).

**Table 2.1 EDI Components**

<b>OUTPUT</b>	Real GDP	WDI
	Agriculture, value added, as a percentage of GDP	WDI
	Gross fixed capital formation as a percentage of GDP	WDI
	Industry as a percentage of GDP	WDI
	Manufacturing value added, as a percentage of GDP	WDI
	Total natural resources rents as a percentage of GDP	WDI
	Service value added, as a percentage of GDP	WDI
	Medium and high technology manufacturing value added share in total manufacturing value added	WDI
	Manufacturing value added per capita	UNIDO
<b>EXPORT</b>	Total value of exports	WDI
	Fuel exports as percentage of merchandise exports	WDI
	Export market concentration index (Hirschman-Herfindahl Index, HHI)	WDI
	Total value of imports	WDI
	Manufactured exports as a percentage of total merchandise exports	WDI
	Medium and high technology manufacturing exports as a percentage of total manufactured exports	UNIDO
	Merchandise trade as a percentage of GDP	WDI
	Total value of services exports	WDI
	Export product concentration index	UNCTAD
	Import product concentration index	UNCTAD
<b>REVENUE</b>	Excise tax revenue as a percentage of GDP	IMF
	Income tax revenue as a percentage of GDP	IMF
	Goods and services tax revenue as a percentage of GDP	IMF
	Tax Revenue as a percentage of GDP	IMF
	Total Revenue as a percentage of GDP	IMF
	Trade Revenue as a percentage of GDP	IMF

Source: Global Economic Diversification, 2024

The primary objective of economic diversification is to ensure the economy is robust and resilient (Al Naimi, 2022). Diversification of the economy mitigates the risks associated with excessive dependence on a single industry and serves to maintain economic expansion. Furthermore, economic diversification entails transitioning an economy reliant on a single revenue source, such as oil and gas in GCC countries, to one where non-hydrocarbon sectors like industry, agriculture, and tourism play a significant role. Economic diversification occurs concurrently in both horizontal and vertical directions. Horizontal diversification entails the expansion of a range of choices for innovative items in contrast, vertical diversification involves focusing the expansion process inside a certain sector by incorporating additional stages.

Generating and manufacturing new sophisticated items can advance toward a more sophisticated economy. This process of creative destruction has an immediate impact on the labor market, both by generating and destroying jobs. While it is reasonably easy to identify the positive and bad consequences in specific circumstances, analyzing and quantifying the overall result of the diversification improvements across the economy is less clear (Adam et al., 2023).

Furthermore, diversification is a quantifiable indicator of a country's capability for output. Economic complexity quantifies several capacities, including human capital, technical institutions, and the legal system. The know-how that a corporation develops is known as firm-level competencies. These capabilities include organizational capacity, the beginning of production operations, and managerial and operational capacity (Soyyigit et al., 2023). Additionally, by broadening the nation's economic base and gradually severing the link between economic growth and resource abundance, economic diversification provides a stronger defense against the resource curse (Matallah, 2020).

According to Albassam (2015), resource-rich nations may combat instability and avert a worldwide decline in resource prices by implementing economic diversification, it is an essential element of sustained economic growth. Diversity may help with unemployment and point institutions along the correct path, which makes it crucial to unemployment. The smooth running of an economy depends on a stable environment.

Talking about stability, the problem of stability can be divided into three distinct economic objectives: price stability, full employment, and real production growth. These three objectives are connected. An economy cannot reach its maximum potential output without full employment. Likewise, price volatility will increase unpredictability and impede economic expansion (Gwartney & Stroup, 2014).

### **2.1.3 Factors Influencing the Diversification**

Some studies explore the relationship between diversity and sustainable growth. However, the factors promoting diversification have not been fully examined, and countries have their specific pathway limits defined by their economic, social, demographic, and policy and decision-making systems. Several prior studies have revealed factors influencing diversification, including Adeola & Evans (2017), Ahmadov (2014), Gelb (2010), Jolo et al. (2022) and Wani (2024).

Jolo et al. (2022) conducted an empirical analysis of the factors driving economic diversification in 14 resource-rich nations from 2001 and 2019. It gives solid evidence that gross capital creation, financial development, labor force participation, education, and the rule of law all have a statistically significant and positive impact on economic diversity. In contrast, inbound FDI, real GDP growth, and the self-employment rate all have a negative significant relation with diversity.

Furthermore, Ahmadov (2014) analyzes the effect of geographic characteristics, trade openness, and political institutions on one of the primary potential paths for alleviating the resource curse of export diversification. He discovered that natural resource-rich emerging countries with authoritarian institutions, weak executive restrictions, low legislative efficacy, and inadequate rule of law are less likely to accomplish export diversification. On the other hand, export concentration is not predicted by government quality or political participation competitiveness. There is also little evidence to support the claim that trade integration, trade policy, and tariff rates influence export concentration in this group of nations. Population growth, ethnic or religious fractionalization, and human capital appear to have no effect on export diversity. Finally, unlike oil wealth, the richness of non-fuel minerals, forest resources, and coal is associated with greater export diversity.

Even though every nation has a unique strategy for diversification, successful examples of sustainable trade-led structural change share several characteristics. Based on multiple nations' experiences, the following elements are crucial for the achievement of effective diversification attempts: (i) a high level of political commitment by the government and the general public to the goals of social stability, economic growth, and poverty alleviation. (ii) a focus on attracting FDI, increasing exports, and diversifying the range of commodities and services. (iii) the need to have a capable, strong administration to oversee the diversification process. (iv) powerful stakeholders with vested interests in exportable non-mineral sectors, which partly counteracts the political clout of the dominant

sector. (v) the importance of improving institutional capability and human capital (Gelb, 2010).

Another interesting finding by Adeola & Evans (2017), using the fully modified least square method is that financial development and FDI have a positive impact on diversification, though the impact is not statistically significant. Furthermore, economic diversification is positively and significantly impacted by financial inclusion, GDP per capita, capital formation, and human capital development. Contrarily, trade openness and exchange negatively associated with diversification.

Last but not least, Wani (2024) looked at the factors that influence export diversification in the economies of ASEAN and the South Asian Association for Regional Cooperation. The findings reveal a strong association between export diversification and variables including natural resources, macroeconomic performance, national investment progress, efficiency and competitiveness, and institution resilience in both areas.

These results highlight the intricate interaction between economic, structural, and policy factors in shaping economic diversification. The positive impacts of factors such as gross capital creation and financial development underscore the economic foundations necessary for diversification. Meanwhile, the negative impacts of factors like inbound foreign direct investment and weak governance highlight the challenges posed by external economic influences and institutional weaknesses. This intricate interaction underscores the complexity of achieving sustainable economic diversification, emphasizing the need for robust policy frameworks, strong institutional governance, and strategic economic planning aligned with global market dynamics.

Furthermore, Lashitew et al. (2021) underline its competitive advantages for diversification. These are: (i) Increased human capital. This covers indicators of human development, human capital, and higher education enrollment rates. (ii) Aggregate investments in public services are tracked using public infrastructure per capita and innovation performance. (iii) Expanded business capability. This section examines credit availability, entrepreneurship small business development, and per capita new company entry as indices of business dynamics.

## **2.2 Previous Research**

### **2.2.1 Relationship Between Economic Diversification and Unemployment**

Neumann & Topel (1991) studied the determinants of the geographic distribution of unemployment in the U.S since 1950. The main finding indicates that demand variability

and diversification play a significant role in determining equilibrium unemployment differences in labor markets. They discover that economies with a more varied range of job options also have consistently lower unemployment rates. The data supporting this claim is based on variations in unemployment among labor markets with distinct geographic locations, which provides identifying information unavailable in more conventional time-series models. Diversification can decrease the unemployment rate by enabling workers to move more freely between industries within a market. This allows them to take advantage of variances in demand and allocate labor more efficiently, resulting in lower jobless rates.

Watson & Deller (2017) analyze the correlation between economic diversity and unemployment in response to the significant impact of the Great Recession. Consider employing US county-level data to examine impact of enhanced industrial diversity on unemployment. The study spans from 2007 to 2014. The results indicate a strong correlation between a county's economic diversity and reduced unemployment rates for each year. Diversity acts as a buffer against unemployment shocks and dampens the recession effects. Further, counties that had a greater variety of neighboring counties experienced better outcomes during the Great Recession. The study's conclusions emphasize the process and importance of regional spillover effects in shaping unemployment rates.

Additionally, Adam et al. (2023) utilize mean data from 70 developed and developing nations between 1990 and 2010, as well as yearly data from OECD countries spanning from 1985 to 2008. They also incorporate several control variables to investigate the influence of economic complexity on the labor market. The findings indicate that enhancing the economic complexity of exported goods does not lead to job reductions, but instead contributes to reduced unemployment and increased employment. Furthermore, scholars acknowledge that the aforementioned study demonstrates a correlation between nations that have a higher export of intricate items and lower unemployment rates, as well as a higher level of employment. In short, a country with a higher sophistication of exported goods and more variety of exports results in a higher growth rate and lower unemployment rates.

As the recovery from the great recession proceeded, economic development experts were refocusing on the pace and sustainability of recovery to reduce the severity of future downturns. Brown & Greenbaum (2017) examine the effects of industrial concentration and diversification on the stability of Ohio counties' unemployment rates between 1977 and 2011. The result demonstrates that counties with a greater variety of

industries have more favourable outcomes in response to both local and national employment disruptions, even while more concentrated counties had lower unemployment rates during prosperous periods. The reason for this is that counties that have specialized in specific industries and have developed localization economies may gain competitive advantages when there is growth and their concentrated industry is flourishing. Nevertheless, these counties exhibited lower levels of resilience when it came to their capacity to withstand and recover from shocks.

However, the study by Soyyiğit et al. (2023) revealed that the level of economic complexity had a notable influence on unemployment rates in Poland. However, this relationship was not observed in the Asian and African countries that were included in the study, which focused on the 10 major emerging market economies (Argentina, Brazil, China, India, Indonesia, Mexico, Poland, South Africa, South Korea, and Türkiye). Based on this finding, the author suggests that other factors such as institutions and structure have an impact on this phenomenon.

Consistent with the discovery of Soyyiğit et al. (2023), Fu et al. (2010) also conclude that industry diversity does not have a stabilizing effect on unemployment. The researchers examined the impact of diversification, industry specialization, and churning on unemployment rates in Chinese cities, from 1997 to 2006. Contrary to findings from industrialized nations, they discovered that industry diversity is strongly and positively correlated with unemployment rates. This is likely because of the significant turnover rate observed during the sample period.

Existing studies in general show varying impacts of economic diversification on unemployment rates. Neumann & Topel (1991) and Watson & Deller (2017) found that economic diversification has a positive impact by reducing the unemployment rate because it allows workers to more easily switch between industries, take advantage of variations in demand, and improve labor allocation. In contrast, Fu et al. (2010) found that industrial diversification in Chinese cities was positively related to unemployment rates, possibly due to high turnover rates during the study period. Meanwhile, research by Soyyiğit et al. (2023) reveals that economic complexity does not have a significant effect on unemployment rates in most of the countries studied, except Poland. This suggests that other factors such as institutions and economic structure may play a more dominant role in influencing unemployment rates in these countries.

## **2.2.2 Other Control Variables**

### **2.2.2.1 Relationship Between Inflation and Unemployment**

Inflation is a crucial economic subject that academics and policymakers have focused on extensively. It denotes to a gradual and consistent rise in the overall price level of goods and services within an economy throughout a certain timeframe. Demand pulls, rising costs, and foreign inflation are only a few of the potential causes of inflation. Inflation is a critical element in the investigation between economic development and unemployment; consequently, uncontrolled inflation may cause overall prices to increase, making it harder for companies to hire new workers.

Maqbool et al. (2013) apply Autoregressive Distributive Lag (ARDL) to analyze the empirical link between unemployment, FDI, population, GDP, inflation, and external debt on Pakistan's unemployment rate from 1976 to 2012. The findings indicate these variables have a considerable long-term effect on unemployment. Unemployment and inflation have a significant adverse correlation in both the short and long term. This scenario indicates the Phillips curve's existence in Pakistan, both short and long-term.

The link between wage inflation and unemployment is a crucial basis for monetary policy. Gabriel (2023) gives a comprehensive analysis of salary and unemployment data from 18 industrialized economies starting from 1870. The aim of the study is to reexamine the historical correlation between pay inflation and unemployment, which was the main focus of Phillips' original research. The article highlights a weakened relationship between wage inflation and unemployment in a low-inflation scenario. The results confirm the hypothesis that the tradeoff is less significant when there is low price inflation. This aligns with the idea that higher trend inflation leads to more frequent adjustments in prices, resulting in greater price movements (inflation) for small changes in unemployment, and consequently a larger tradeoff.

Another research found the correlation between inflation and unemployment is negative, but the relationship between inflation and employment is positive, which provides evidence for the validity of the Phillips curve. Surprisingly schooling has a positive correlation with higher unemployment rates. This contradicts the prevailing belief that education decreases the frequency and length of unemployment. One potential rationale might be that individuals with higher levels of education may be unwilling to accept low-quality, non-formal employment opportunities. However, simultaneously, there may be a lack of adequate, stable work with regular salaries accessible to them (Chen et al., 2021).

Meanwhile, Raifu et al. (2023) found the influence of financial development on unemployment, they discovered that inflation has a linear relation with unemployment, implying that the inflation rate worsens employment in MENA nations, he proposed to lower high-level inflation rates to help these countries profit from financial systems in the medium and long run. Mirzaei Abbasabadi & Soleimani (2021) also examine the relationship between ICT and unemployment. The data comprises 163 nations and is arranged in a cross-sectional manner for observations in 2016. The results suggest that almost half of the nations involved in the study have not reached their maximum level of unemployment due to technological expansion and discovered Inflation is insignificant to unemployment.

According to the cited study, there is a strong inverse link between inflation and unemployment in Pakistan, suggesting the presence of a Phillips curve in both the short and long term (Maqbool et al., 2013). Nevertheless, in an environment characterized by low inflation, the correlation between wage inflation and unemployment tends to diminish (Gabriel, 2023). Additional research indicates that inflation can lead to an increase on unemployment in MENA nations (Raifu et al., 2023). However, when examining the association between inflation and unemployment in the context of ICT research, it is shown to be insignificant (Mirzaei Abbasabadi & Soleimani, 2021). This demonstrates that the impact of inflation on unemployment is contingent upon economic circumstances and the particular forces at play.

#### **2.2.2.2 Relationship Between Population and Unemployment**

Although there are differences in the relationships between population growth and unemployment, Malthusian theory predicts that more unemployment will result from uncontrolled population growth. On the other hand, if a sizable portion of the population consists of creative and entrepreneurial individuals who can learn new skills and work for themselves, creating jobs, rather than job seekers who primarily depend on the government to create jobs for them, then an increase in population may reduce the unemployment rate.

According to Azolibe et al. (2022), the association between population growth and the unemployment rate is positive in Nigeria, with a 1% increase in population resulting in a 2.43% increase in the jobless rate. This validates the Malthusian hypothesis, that unrestrained population expansion will produce increasing unemployment. But, the outcome in South Africa demonstrates a negative relationship, for every 1% increase in population, the unemployment rate fell by 3.26%. This bolsters the argument that a highly populated economy will have a low unemployment rate if a sizable fraction of its citizens

are creative and entrepreneurial individuals who can learn new skills and work for themselves. In other words, these individuals will be job creators rather than job seekers who primarily depend on the government to create jobs for them.

In addition, Sadikova et al. (2017) states that the planet's population, including its age and sex composition, length and standard of living, labor force participation, population movement, and socioeconomic effects, all have a significant effect on the patterns in the evolution of the contemporary world and its economy. On the conducted research for Russia utilizing quarterly data from 1992-Q1 to 2015-Q4. Using Johansen cointegration to evaluate the long-term relationship between the estimated variables. The studies indicate that population increase and energy use have a positive significant effect on unemployment.

Besides, Hasan & Sasana (2020) examine the factors that affected ASEAN countries' young unemployment rates between 2001 and 2017 with the model of the fixed effect panel. The focus of empirical research is on the demographic and economic aspects of ASEAN nations. The study's primary findings are as follows: inflation, foreign direct investment, and the GDP all empirically have a reverse significant impact on youth unemployment. The young unemployment rate in ASEAN countries is positively and significantly impacted by the openness variable, the HDI, and the percentage of the population aged 0-14.

Ibrahiem & Sameh (2020) in their study, analyze the causes and effects and long-term connections between Egypt's population, financial development, unemployment, and renewable energy between 1971 and 2014. To achieve this objective, the methods used include those developed by Johansen and Juselius, as well as ARDL and vector error correction (VECM) approaches. The data indicate that although renewable energy resources have an adverse effect on unemployment, population expansion, and financial development have a positive impact.

In summary, Sadikova et al. (2017) found for Russia that population increase positively influences unemployment, which is the same as Azolibe et al. (2022) found a linear correlation between population growth and unemployment in Nigeria, reflecting the Malthusian hypothesis. Conversely, in South Africa, a negative relationship suggests a lower unemployment rate with population growth, emphasizing entrepreneurial opportunities. Hasan & Sasana (2020) reveal the negative impacts of inflation, on ASEAN youth unemployment, countered by positive effects from openness, human development, and younger demographics. In Egypt, Ibrahiem & Sameh (2020) find population growth and financial development have positive impacts. This finding is possible because

uncontrolled population expansion can increase the unemployment rate. Conversely, the negative relationship in South Africa shows that a densely populated economy can have a lower unemployment rate if it is supported by high creativity and entrepreneurship in creating jobs.

### **2.2.2.3 Relationship Between Foreign Direct Investment and Unemployment**

The commonly accepted definition of Foreign Direct Investment is referred to as the IMF/OECD definition. This definition was formulated through a collaborative effort between the International Monetary Fund and the Organisation for Economic Co-operation and Development. Its purpose was to provide guidance to national statistical agencies for generating FDI statistics. FDI, or foreign direct investment, refers to an international business endeavor when an investor from one country has significant long-term control over the management of a company located in another country. As to the definition, the presence of significant long-term impact can be deduced when the multinational corporation possesses voting shares or rights that amount to at least 10% of the total voting shares of the foreign firm. FDI can be categorized into two distinct types: inward FDI and outbound FDI. The aggregate quantity of FDI during a specific timeframe is referred to as the “stock of foreign direct investment,” and it can lead to either a positive or negative net FDI inflow (Evans et al., 2017).

The study conducted by Alalawneh & Nessa (2020) investigates the relationship of FDI on unemployment rates in six Middle Eastern and North African countries, namely Egypt, Jordan, Lebanon, Morocco, Tunisia, and Turkey. Three economic models were employed to analyze panel data from 1990 to 2018 to examine the impact of FDI on unemployment, primarily focusing on male and female unemployment. The results indicated that foreign direct investment reduces unemployment rates for both genders over a period of time.

Furthermore, Alalawneh & Nessa (2020) also conducted a study titled “FDI and The Unemployment – A Causality Analysis for The Latest EU Members” which examined the relationships between FDI inflow and unemployment from 1991–2012. The paper’s key finding is that, for four of the thirteen countries examined, a causal relationship exists between FDI inflow and unemployment. These countries are Hungary, Malta, Bulgaria, and Estonia. Thus, while developing policies aimed at lowering unemployment, the governments of these nations should consider every facet of the FDI landscape. The study’s second finding is the detection of a causal relationship between unemployment and FDI inflows, namely in the cases of Romania, the Czech Republic, and Slovakia. Increased

unemployment leads to increased foreign direct investment inflows, demonstrating that foreign investors seek regions where labor supply won't be an issue.

In Schmerer (2014) study, a simple multi-industry trade model is used to examine the impact of a nation's net FDI on its unemployment rate. The net FDI is calculated by subtracting outbound FDI from inward FDI. The research examines the correlation between FDI and unemployment by analyzing macroeconomic data on unemployment, FDI, and labor market institutions in 19 OECD countries. The theory is corroborated by the findings, which indicate a robust link between net foreign direct investment and decreased levels of total unemployment.

Furthermore, Alfalih (2024) examines how the key macroeconomic determinants, such as oil prices, trade openness, real GDP, and inflows of foreign direct investment, affect the unemployment rate in Saudi Arabia. The study employed the ARDL model. The analysis covered the period from 1991 to 2019. The results shows that alterations in the four factors exert a significant and enduring adverse impact on the unemployment rate. Additionally, the findings suggest that the entrance of foreign direct investment gradually reduces Saudi Arabia's unemployment rate. Unemployed Saudi citizens are hired by foreign firms, hence reducing the nation's unemployment rate.

In addition, Vacaflores (2011) conducted a study on the FDI on job creation in several Latin American countries from 1980 to 2006. Find that FDI has a substantial and beneficial impact on job creation in host countries by employing a dynamic panel model estimated using the Arellano-Bover/Blundell-Bond system estimator. The main driver of this effect is the influence of FDI on the male workforce. The favorable impact is particularly notable in underdeveloped economies, periods of low inflation, and the latter part of the data set.

Previous studies (Alalawneh & Nessa, 2020; Alfalih, 2024; Schmerer, 2014; Vacaflores, 2011) have found an inverse relationship between FDI and unemployment. This correlation may be explained by the potential for FDI to expand the labor market and lead to the hiring of workers by foreign companies. However, other studies, such as one conducted in Turkey by Mucuk & Demirsel, (2013) have found the opposite relationship. This is because the majority of FDI entering Turkey comes from brownfield investments, which are primarily composed of mergers and acquisitions rather than greenfield projects, which generate new jobs.

#### **2.2.2.4 Relationship Between Human Capital and Unemployment**

Education and training have a crucial role in enhancing a nation's productivity and facilitating access to lucrative employment prospects. The significance of educational achievement in attaining favorable outcomes in the job market has been proven by the research conducted by the International Labour Organization (ILO, 2015), which focused on the educational trends in the workforce. Education not only facilitates increases the human capital but also enhances the probability of securing a job of superior quality. Hence, it is evident that countries with a substantial proportion of the workforce having completed only primary education or below should maintain their focus on enhancing educational attainment levels. However, the research emphasizes that there is an imbalance between the supply and demand of skilled labor in multiple countries.

Previously, the nature and direction of the link between education spending, a proxy for human capital, and economic growth in the six GCC countries were examined using time-series data spanning from 1977 to 2004. Al-Yousif (2008) found the results are mixed and vary across countries.

Singh & Shastri (2020) investigated the relationship between public education expenditure, secondary educational attainment, and the unemployment rate in India from 1987 to 2017. By using ARDL the empirical data reveal that educational attainment, as measured by the gross enrolment ratio at the secondary level of schooling, has inverse long-term and short-term impact on unemployment rates. However, public investment in education is ineffective in influencing both educational attainment and the unemployment rate, the findings indicate that obtaining universal secondary education for all people, and the lack of a relationship between unemployment and public education spending and educational attainment suggests that the government's role is not limited to directing a certain amount of funding toward the education sector.

Additionally, Binuomoyo (2020) looks into how government spending affects unemployment in Nigeria. The federal government's expenditures on education and economic growth were examined using OLS estimates adopted for secondary data regressed over 27 years for unemployment, and the results showed that while growth significantly negatively influences unemployment in line with prior expectations, it does not have the same effect on public spending on education. His conclusions from this were that although Nigeria can now educate more people, the effect is only marginal because the country's economy cannot employ graduates.

Lastly, Ali et al. (2022) look at the link between unemployment and state spending, institutional performance, human capital, and trade openness in various income groups of Organization of Islamic Cooperation (OIC) nations. By utilizing dynamic common correlated effects. It was discovered public spending is negatively and strongly associated with unemployment. Furthermore, human capital increases unemployment in lower-income economies while decreasing unemployment in higher-income countries and the OIC. One probable reason for this positive link between human capital and unemployment is that most low-income OIC countries have had agricultural-based economies for decades, which do not require highly educated or skilled personnel. Thus, as trade openness has increased, many nations have prioritized the growth of technological industries that demand skilled labor, causing low-skilled workers in low-income OIC nations more likely to be unemployed, particularly in higher-skilled technological areas.

The impact of human capital provides mixed results Al-Yousif (2008), Singh & Shastri (2020), Binuomoyo (2020), and Ali et al. (2022). The finding shows government spending on education has insignificant effect on unemployment, gross enrolment shows a good influence in lowering it. This indicates the importance of human capital, the need for increased government involvement, and the fact that a nation's economy cannot support graduates.

#### **2.2.2.5 Relationship Between Institutional Quality and Unemployment**

Khouya & Benabdelhadi (2020) in their comprehensive systemic literature review, emphasize the role that institutional quality plays in the economy. Drawing from a wide range of theories, a substantial body of literature, and even contradictory results, they conclude that good governance is necessary for economic development.

Moreover, Abé Ndjié et al. (2019) identify which elements of governance can help to lower youth unemployment in Africa. As a result, the authors integrated governance metrics into their growth model. The model's dynamic panel estimation was conducted using data from the World Bank, IMF, and UNCTAD from 2002 to 2016. According to the findings, key governance variables, such as corruption control and political stability, have a negative impact on African youth unemployment rates. Furthermore, political stability does not alleviate youth unemployment in highly corrupt, resource-rich economies. Other governance indices, such as government effectiveness, regulatory quality, rule of law, and voice accountability, are not yet yielding the desired results in African countries. In summary, African political authorities must enhance governance indicators, such as corruption control and political stability.

Agostino et al. (2020) look into how the quality of local institutions affects the development of employment in social enterprises. Three conclusions are drawn from FE and GMM calculations using a panel dataset of social entrepreneurs from 2011 to 2020. First, employment in enterprises is positively impacted by improved institutional quality at the regional level. Secondly, the impact is diverse and differs depending on the size of the organization. Third, the speed at which employment for Micro and SMEs grows is considerably slowed down by corruption in the delivery of public services.

From the other perspective, Through an empirical investigation in Italian provinces from 2004 to 2012, Agostino et al. (2020) investigated the quality of local institutions, particularly the rule of law and regulatory environment influence entrepreneurship entry rates. The findings are consistent with their working hypothesis, robust to various estimating approaches, and compatible with the majority of the current literature. The institutional qualities of the legal framework appear to have a considerable effect on entrepreneurial vigor, as assessed by the entry rate. In general, the empirical data presented in this study suggests that legal stability, crime control, efficacy, and fairness of judicial systems may have favorable effects on growth through the incentives provided to new economic endeavors.

To summarize, the literature highlights the essential significance of institutional quality in both economic development and employment. Effective governance, marked by the ability to combat corruption and maintain political stability, is crucial for decreasing unemployment rates and promoting entrepreneurial endeavors. Nevertheless, a substantial public sector might worsen the issue of unemployment. In general, improving governance indicators such as the ability to regulate corruption, maintaining political stability, and upholding the rule of law can stimulate economic growth and increase employment opportunities.

#### **2.2.2.6 Relationship Between COVID and Unemployment**

Several studies have found that COVID-19 significantly increases the unemployment rate. Su et al. (2022) utilizing data from five different nations to examine unemployment rates during the pandemic crisis from 2019 to December 2020, it was determined that Germany, Spain, the United Kingdom, and Italy were particularly heavily hit and saw a notable spike in the rate of unemployment.

Furthermore, Ahmad et al. (2020) investigate the influence of the coronavirus on the unemployment rate by employing hybrid prediction methodologies backed by linear

and non-linear models to anticipate unemployment rates with greater precision. The results reveal that the unemployment rate will rise in the next years as a result of the coronavirus, and it will take at least five years to recover from the effects of COVID-19 in these nations. This prognosis emphasizes the COVID-19 deterioration of general unemployment.

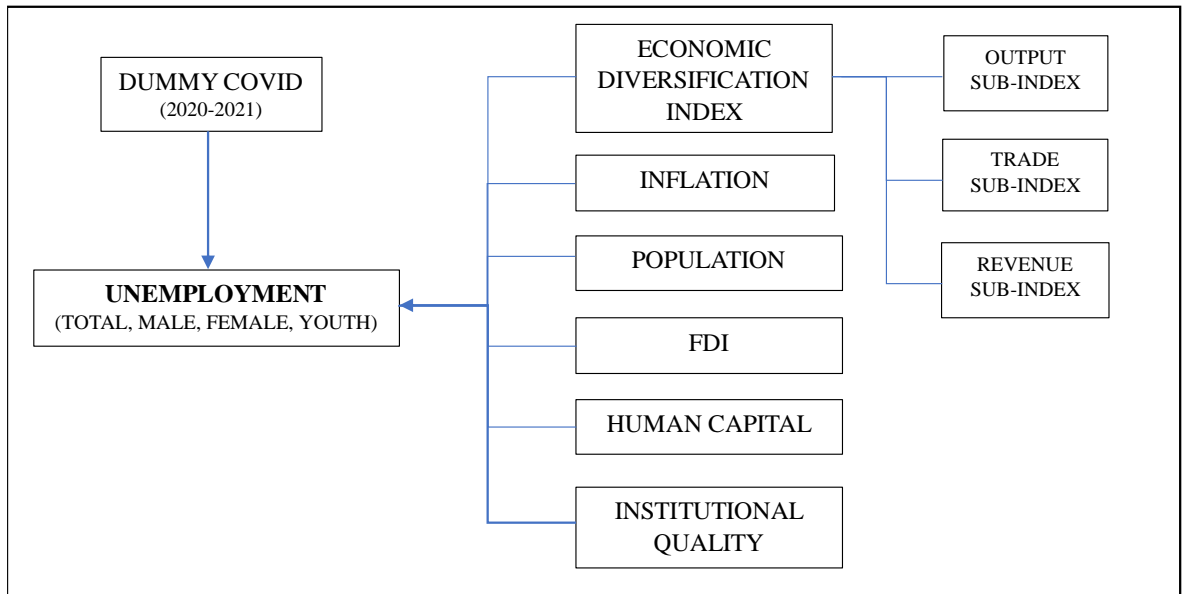
However, the notion that supply generates its demand, as observed by Sirah (2020) is currently rendered worthless due to the impact of COVID-19. She determined that there is a clear correlation between the COVID-19 pandemic and the increase in the unemployment rate and the decline in economic growth. This situation arises from a significant decrease in the demand for labor, resulting in a decrease in labor prices. Many producers are reluctant to hire job seekers due to the low demand for products, leading to a high unemployment rate.

It has been demonstrated in several earlier research (Ahmad et al., 2020; Sirah, 2020; Su et al., 2022) that COVID-19 has a large and unfavorable impact on the unemployment rate. In addition (ElBehairy et al., 2022) Discover that COVID-19 indeed exerts significant effects on reducing employment and exacerbating unemployment. An analysis was carried out on multiple MENA countries, revealing a substantial disparity in unemployment rates before and during the COVID-19 pandemic. In conclusion, the rate of unemployment during the pandemic was significantly higher.

### 2.3 Model Estimation

The study aims to examine the correlation between economic diversification and the unemployment rate, taking into account gender and youth. The analysis will also consider various control variables such as inflation, population, foreign direct investment (FDI), human capital, and institutional quality (government quality). Additionally, the study will explore the impact of the COVID-19 pandemic on unemployment in ASEAN.

**Figure 2.1 Model Estimation**



Source: Author, 2024

## **CHAPTER 3**

### **METHODOLOGY**

To fully comprehend the influence of economic diversification and other factors on the unemployment rate in ASEAN, this study uses an extensive quantitative analysis. With the use of statistical and econometric methods, this research attempts to offer a more complete and detailed analysis of the connection between economic diversification and the unemployment rates. Furthermore, by employing rigorous statistical methods to establish strong findings and critically analyzing the data, this study seeks to confirm previous economic ideas and discoveries.

#### **3.1 Data**

Data on inflation, foreign direct investment, human capital, population, and various types of unemployment (total, male, female, and youth) are all statistically collected for this study from the World Development Indicators (WDI), institutional quality is derived from the Worldwide Governance Indicators (WGI), and data on economic diversification index is derived from the Global Economic Diversification Index, which was launched by the Mohammed Bin Rashid School of Government. The COVID variable is expressed as a binary variable with two distinct categories: 0 denotes the period before the COVID-19 pandemic (2000-2019, 2022), whereas 1 signifies the period encompassing COVID-19 (2020-2021).

The research uses panel data analysis to examine six ASEAN nations (Singapore, Thailand, Indonesia, Malaysia, the Philippines, and Cambodia) from 2000 to 2022. This analytical approach offers a solid basis for understanding the processes of economic diversification in these countries by making it easier to analyze data across time and entities.

The analysis' use of the unemployment rate as an independent variable allows for a more nuanced understanding of the correlation between employment dynamics and economic diversification. The study offers insight into the varied effects of economic policies and conditions on different demographic groups by accounting for four important unemployment metrics: total, male, female, and youth.

**Table 3.1 The Variables**

No	Variables		Definition	Source
1	Dependent	Unemployment (Total %)	The share of the labor force that is without work but available for and seeking employment (%)	World Development Indicator
2		Unemployment Youth	The share of the labor force ages 15-24 without work (%)	World Development Indicator
3		Unemployment Male	The share of the Male labor force that is without work (%)	World Development Indicator
4		Unemployment Female	The share of the Female labor force that is without work (%)	World Development Indicator
5	Independent	Economic Diversification Index	An overview and summary of a country's economic diversification performance. Economic diversification of a given country by assessing three elements: Production & Output Diversification, Trade Diversification, and Government Revenue Diversification.	Global Economic Diversification Index
6		Inflation	Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly (%)	World Development Indicator
7		Population	Total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship. The values shown are midyear estimates.	World Development Indicator

Source: Author, 2024

**Table 3.1 The Variables (Continued)**

No	Variables	Definition	Source
8	FDI	Foreign direct investment is a net inflow of investment to acquire a lasting management interest in an enterprise operating in an economy other than that of the investor (%)	World Development Indicator
9	Human Capital	Human capital is represented by general government education spending (current, capital, and transfers) as a percentage of GDP (%)	World Development Indicator
10	Institutional Quality	The Institutional Quality Index (IQI) emerged from six governance indicators: (1) Voice and Accountability, (2) Political Stability and Absence of Violence/Terrorism, (3) Government Effectiveness, (4) Regulatory Quality, (5) Rule of Law, and (6) Control of Corruption.	World Governance Indicator
11	COVID	Dummy Variable: 0= years before the COVID-19 pandemic 1= year during the COVID-19 pandemic	Dummy Variable

Source: Author, 2024

### 3.2 Models

The model is developed to test the linkage of each category of independent variables: economic diversification and several control variables on the unemployment rate in various types of unemployment in ASEAN.

Model estimation of this study:

$$Unemp_{it} = \alpha_{it} + \beta_1 EDI_{it} + \beta_2 INF_{it} + \beta_3 LogPOP_{it} + \beta_4 FDI_{it} + \beta_5 HC_{it} + \beta_6 IQ_{it} + \beta_7 COVID_{it} + \varepsilon_{it} \dots \dots \dots (3.1)$$

$$MaleUn_{it} = \alpha_{it} + \beta_1 EDI_{it} + \beta_2 INF_{it} + \beta_3 LogPOP_{it} + \beta_4 FDI_{it} + \beta_5 HC_{it} + \beta_6 IQ_{it} + \beta_7 COVID_{it} + \varepsilon_{it} \dots \dots \dots (3.2)$$

$$\text{FemUn}_{it} = \alpha_{it} + \beta_1 \text{EDI}_{it} + \beta_2 \text{INF}_{it} + \beta_3 \text{LogPOP}_{it} + \beta_4 \text{FDI}_{it} + \beta_5 \text{HC}_{it} + \beta_6 \text{IQ}_{it} + \beta_7 \text{COVID}_{it} + \varepsilon_{it} \dots\dots\dots(3.3)$$

$$\text{YouthUn}_{it} = \alpha_{it} + \beta_1 \text{EDI}_{it} + \beta_2 \text{INF}_{it} + \beta_3 \text{LogPOP}_{it} + \beta_4 \text{FDI}_{it} + \beta_5 \text{HC}_{it} + \beta_6 \text{IQ}_{it} + \beta_7 \text{COVID}_{it} + \varepsilon_{it} \dots\dots\dots(3.4)$$

Where;

- Unemp<sub>it</sub> : Unemployment rate country i year t
- MaleUn<sub>it</sub> : Male Unemployment rate country i year t
- FemUn<sub>it</sub> : Female Unemployment rate country i year t
- YouthUn<sub>it</sub> : Youth Unemployment rate country i year t
- α : Constanta
- β : Coefficient of variable
- EDI<sub>it</sub> : Economic Diversification Index country i year t
- INF<sub>it</sub> : Inflation Rate country i year t
- LogPOP<sub>it</sub> : Log of Total Population country i year t
- FDI<sub>it</sub> : Foreign Direct Investment country i year t
- HC<sub>it</sub> : Human Capital country i year t
- IQ<sub>it</sub> : Institutional Quality country i year t
- COVID<sub>it</sub> : Dummy Covid Period country i year (2020-2021)
- ε : Error term

### 3.3 Method

#### 3.3.1 Panel Data

Panel data regression is a combination of cross-section (N) and time series (T) data. Panel data provides a variety of observations, if the number of time units is the same for each individual or observation, then it is called a balanced panel. If the number of time units is different for each individual, it is called an unbalanced panel. Moreover, panel data can provide more accurate analysis and prediction results than time-series data (Hsiao, 2014).

### 3.3.2 Panel Data Advantages

Hsiao (2014) explained some advantages of panel data, the first, panel data allows for more precise model parameter inference. This is because panel data has more degrees of freedom and diverse samples than cross-sectional and time series data, which improves econometric estimate efficiency. Second, greater ability to explain human behavior's complexity since it is created and validated by increasingly intricate behavioral hypotheses. Third, taking into account the effects of additional factors not included in the estimate. Fourth, producing forecasts for individual results that are more precise. Fifth, calculation simplification and statistical inference. Lastly, panel data reduces the bias that results from regressing individual data into large-scale aggregations.

### 3.3.3 Types of Panel Data

#### 3.3.3.1 Common Effect Model

Common effect model (CEM) or pooled least squares (PLS) is a statistical technique commonly used to evaluate panel data, which consists of observations of the same entities over time or across groups. PLS attempts to estimate the relationships between the dependent and independent variables while accounting for the data's panel structure. It is the simplest way to separate the spatial and temporal dimensions by pooling data and applying OLS. Pooled regression is an ideal starting point for the study (Wooldridge, 2016). The model can be expressed as follows:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \dots + \beta_k X_{kit} + \varepsilon_{it} \dots \dots \dots (3.5)$$

In a pooled least squares (PLS) model, the dependent variable  $Y_{it}$  represents the observed data for a specific entity  $i$  at time  $t$ . This variable could include unemployment, growth, or any other metric that is relevant to the entity. The independent variables  $X_{1it}$ ,  $X_{2it}, \dots, X_{kit}$  are the factors or variables that are expected to influence the dependent variable for that entity at that time. These independent variables could include technology, production, trade, or any other relevant variable. The model's coefficients  $\beta_0, \beta_1, \beta_2, \dots, \beta_k$  are the parameters to estimate. These coefficients represent the predicted effects or impacts of the independent factors on the dependent variable. We can quantitatively examine the relationships between the independent and dependent variables by estimating their coefficients.

The error term ( $\varepsilon$ ) refers to unobserved factors and random disturbances that affect the dependent variable but are not accounted for by the independent variables. It refers to the variation in the dependent variable that cannot be explained by the selected independent

variables. Unobserved factors may include measurement errors, omitted variables, or other unobserved influences.

### **3.3.3.2 Fixed Effect Model**

The fixed effect model is a statistical method for analyzing panel data that takes into account individual heterogeneity. It allows for the monitoring of individual-specific characteristics that remain consistent over time but vary according to different units or entities. The fixed effect model assumes that the individual-specific effect is compensated with independent variables but remains constant throughout time. The fixed effect model is a regression approach that estimates panel data through the use of dummy factors (Corlett & Aigner, 1972).

### **3.3.3.3 Random Effect Model**

The random effect model is a panel data estimation model that operates under the assumption that every individual's unique effect is included in the random error component. Because the parameters in this model vary between individuals and over time, they are included in the error, for this reason, it's commonly called the error component model. The underlying presumption is that there is no correlation between the individual-specific effects and the explanatory variables.

### **3.3.4 Determination of The Estimation Method**

To select the most suitable model from the PLS, fixed effect, and random effect models, we conduct the F-test, Hausman, Breusch Pagan, and Lagrangian Multiplier tests.

#### **3.3.4.1 Chow Test**

A Chow test is a statistical test that compares two regression models estimated on different data subsets. It is frequently used to evaluate structural breaks or coefficient disparities between periods or groups. The Chow test compares the sum of squared residuals from two models: one estimated on the combined data of the two subgroups and another estimated separately on each subset. The test assesses whether individual models fit significantly better than the combined model.

The Chow test is used to determine whether the FEM model is preferable to PLS models by examining its significance, which can be done using test F statistics. The hypotheses for the Chow exam are as follows:

$H_0$ : Pooled least square selected model

$H_1$ : Fixed effect selected model

If the p-value is more than 0.05,  $H_0$  is accepted, indicating that the models chosen were pooled least squares. When the p-value is less than 0.05,  $H_0$  is rejected, indicating that the chosen model is a fixed effect.

#### **3.3.4.2 Hausman Test**

Baltagi (2005) states that the Hausman test is necessary to determine estimates in panel data regression. The goal of the Hausman test is to determine which method fixed effect or random effect is best for estimating panel data.

The Hausman test's fundamental approach is to compare the estimated coefficients of the random effects model, which assumes that the individual-specific effects are uncorrelated with the independent variables, with those of the fixed effect model, which assumes that the individual-specific effects are correlated with the independent variables. The hypothesis for the Hausman test is as follows:

$H_0$ : Random effect selected model

$H_1$ : Fixed effect selected model

If the p-value is more than 0.05,  $H_0$  is accepted and the random effect model is chosen; if the p-value is less than 0.05,  $H_0$  is rejected and the fixed effect model is chosen. Once the two tests are completed and the best appropriate model has been chosen to estimate the panel data regression parameters, a goodness of fit test must be performed to determine the estimated.

#### **3.3.4.3 Lagrange Multiplier (LM) Test**

In econometrics, the Lagrange Multiplier (LM) test is a statistical tool used to determine the suitability of a given regression model. The primary formula for the LM test is estimating an auxiliary regression which incorporates additional variables or variable transformations to account for any potential missing variables or functional form misspecification. The LM test compares the residuals from the augmented regression to the residuals from the original regression to see if the extra variables or transformations significantly improve the model fit. The hypothesis for the LM test is as follows:

$H_0$ : Common effect selected model

$H_1$ : Random effect selected model

The Breusch-Pagan Probability serves as the basis for the LM test. If the Breusch-Pagan p-value is smaller than the alpha value, the  $H_0$  is rejected, indicating that a random effect model is the best estimate for panel data regression. If  $H_0$  is accepted with a

probability greater than the alpha value, the Common effect model provides a good fit for panel data regression (Widarjono, 2018).

### **3.3.5 Classical Assumption Test**

Testing this classical assumption aims to verify that the regression equation obtained is consistent, unbiased, and possesses estimation accuracy. These are the outcomes of the test of the classical assumptions in the regression model below (Wooldridge, 2016).

#### **3.3.5.1 Heteroscedasticity Test**

In regression analysis, a situation known as heteroscedasticity occurs when the variability of the error term (residuals) is not constant at all levels of the independent variables. Heteroscedasticity defies a fundamental tenet of traditional linear regression, namely the assumption of homoscedasticity, or that the variance of the error component is constant. The heteroscedasticity test is a statistical tool that academics frequently use to identify and manage heteroscedasticity.

White's heteroscedasticity-consistent covariance matrix estimator, or White's test, is the main formula utilized in the heteroscedasticity test. The residuals squared are computed and regressed against the independent variables that were part of the initial regression model using the white test. The test looks for evidence of heteroscedasticity by determining if the squared residuals and the independent variables have a significant connection. The hypothesis for the heteroscedasticity test is as follows:

H0: there is no heteroscedasticity problem

H1: there is a heteroscedasticity problem

If the white test statistic is statistically significant, the regression model may exhibit heteroscedasticity. In these cases, addressing heteroscedasticity is necessary for producing objective and effective parameter estimates. Heteroscedasticity can be addressed in a variety of ways, including changing variables, using weighted least squares estimation, or using heteroscedasticity-consistent standard errors.

#### **3.3.5.2 Multicollinearity test**

In regression analysis, multicollinearity refers to a situation in which two or more independent variables in a model have a high correlation with one another. It presents a problem because it may produce unstable and erratic coefficient estimates, making it difficult to understand how different variables affect the dependent variable. Researchers

frequently use statistical tests known as multicollinearity tests to detect and treat multicollinearity.

The Variance Inflation Factor (VIF) is a popular multicollinearity testing method. The VIF measures the extent to which multicollinearity raises the variance of the estimated regression coefficient. As a general guideline, researchers typically use a VIF threshold of 5 or 10. When an independent variable's VIF exceeds 10, multicollinearity may be a cause for concern (Widarjono, 2018). In these cases, addressing multicollinearity is critical for obtaining accurate coefficient estimates. Common strategies for dealing with multicollinearity include removing strongly correlated variables, merging variables, and using methods such as principal component analysis or ridge regression.

The identification and treatment of multicollinearity is critical to the validity and accuracy of regression analysis. Multicollinearity may cause reduced statistical power and incorrect interpretations of correlations between variables.

### **3.3.5.3 Autocorrelation Test**

The autocorrelation test is a statistical technique that determines whether variables in a prediction model correlate with their temporal variations. Many types of analysis, including Durbin-Watson analysis, can be used to detect flaws in the autocorrelation assumption. The Durbin Watson test yields a numerical result known as the Durbin Watson (DW) value, which can be divided into two Durbin Watson table values: Durbin Upper and Durbin Lower. The consensus is that autocorrelation does not exist if the Durbin-Watson statistic value exceeds the critical value's upper bound. In contrast, if the DW value falls below the crucial value's lower bound there is autocorrelation.

To ensure the validity and accuracy of regression analysis, autocorrelation must be detected and addressed. True relationships between variables may be distorted by autocorrelation's ability to produce skewed estimates, ineffective standard errors, and incorrect statistical conclusions. To address autocorrelation, one can use generalized least squares, tagged variables, and other corrective techniques.

### **3.3.6 Hypothesis Testing**

Hypothesis testing is used to determine how much influence the independent variables have on the dependent variable in a study.

### 3.3.6.1 Partial Test

The significance of each independent variable's effect on the dependent variable is determined by a partial test or t-test. The tests' significance levels were 1%, 5%, and 10%, corresponding to  $\alpha = 0.01, 0.05, \text{ and } 0.10$ . A t-test value of less than 0.01, 0.05, or 0.10 indicates that the independent variable has a significant effect on the dependent variable. When the p-value exceeds 0.01, 0.05, or 0.10, the independent variable has no significant impact on the dependent variable. The formula for a hypothesis is:

$H_0$  = Independent variable has no significant effect on the dependent variable

$H_1$  = Independent variable has a significant effect on the dependent variable

### 3.3.6.2 Statistical F test (simultaneous)

The F test is used to determine whether each independent variable affects the dependent variable simultaneously. Simultaneous significant effects of the independent variable and dependent variable are observed if the significance level of F is less than 5% or  $p\text{-value} < 0.05$ . On the other hand, if the significance level  $F > 0.05$ , there is no simultaneous significant effect of the independent variables on the dependent variable. Here is the formula for the F-test hypothesis:

$H_0$  = Independent variable has no significant effect on the dependent variable simultaneously

$H_1$  = Independent variable has a significant effect on the dependent variable simultaneously

### 3.3.6.3 Determination Coefficient Test ( $R^2$ )

The goal of the coefficient of determination is to quantify the extent to which the independent variables can be explained by the model. The range of  $R^2$  values is 0 to 1. The more closely a model resembles 1, the more effectively it can explain the independent variable and yield nearly all of the data required to predict the dependent variable. Conversely, if it is near zero, then there is still a limit to the model's capacity to explain the independent variable.

## CHAPTER 4 DISCUSSION

### 4.1 Descriptive Statistics

Descriptive statistics comprise the mean or average value of research items, the minimum or lowest value of the observations, the maximum or highest value, and the standard deviation for each variable. Descriptive statistics provide the following findings:

**Table 4.1 Descriptive Statistics**

	<b>Observation</b>	<b>Mean</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Std.Dev.</b>
<b>Unemp</b>	138	3.026	0.14	8.06	1.856
<b>MaleUn</b>	138	2.885	0.112	6.947	1.707
<b>FemaleUn</b>	138	3.255	0.172	10.043	2.152
<b>YouthUn</b>	138	8.864	0.38	26.379	5.680
<b>EDI</b>	138	103.689	87.436	128.415	9.595
<b>INF</b>	138	3.283	-1.242	24.097	3.194
<b>POP</b>	138	76,610,493	4,027,887	275,501,339	83,055,984
<b>FDI</b>	138	6.505	-2.757	32.691	7.699
<b>HC</b>	136	3.314	1.414	7.658	1.207
<b>IQ</b>	138	-1.01e-09	-1.164	2.190	1.001

Source: Author, 2024 (processed data)

Based on the table, descriptive statistics in common sample estimation show that the average score of the total unemployment rate of ASEAN member countries is approximately 3.03% over the period 2000 to 2022. The minimum total unemployment rate is 0.14% which belongs to Cambodia in 2017. This result suggests that Cambodia had a fairly high level of employment that year, which is surprising given the larger economic issues that frequently affect employment rates. A low unemployment rate indicates that Cambodia's employment policy and economic conditions were effective at the time. In contrast, the maximum total unemployment rate observed was 8.06%, experienced by Indonesia in 2007. This high unemployment rate illustrates Indonesia's economic challenges that year, which could have been caused by many factors, including the 2008 economic crisis. Furthermore, the standard deviation of corruption rates among ASEAN member countries is 1.86. This metric measures the degree of variation or dispersion in the

unemployment rate within a region. A standard deviation of 1.86 indicates that, while unemployment rates vary, they tend to cluster around the mean, showing relative consistency in how unemployment is viewed or measured across ASEAN countries.

Unemployment cannot be discussed without considering gender and demographics. As a result, it is critical to consider the various categories of unemployment: male, female, and youth. Discussing unemployment from a gender and demographic standpoint can provide an overview of the various characteristics of unemployment. According to the table, the average male unemployment rate in ASEAN member countries between 2000 and 2022 is about 2.88%. Meanwhile, the average female unemployment rate is higher at 3.25%.

Further analysis reveals that the minimum male unemployment rate recorded was as low as 0.11%, while the minimum rate for female was higher at 0.17%. This suggests that in the best-performing eras or locations, male unemployment might be very low, whereas female unemployment, while still low, tends to be slightly higher. On the other hand, the maximum male unemployment rate measured was 6.95%, while the maximum female unemployment rate increased to 10.43%. This considerable disparity demonstrates that women are disproportionately affected by high unemployment relative to male.

The standard deviation of unemployment rates provides further information about these patterns. For male, the standard deviation is 1.71, showing that while male unemployment rates vary across ASEAN countries, they tend to cluster quite near to the mean. This clustering indicates a fair degree of consistency in male unemployment trends across the region. In comparison, female unemployment rates have a higher standard deviation of 2.15. This higher standard deviation indicates a greater variety in female unemployment rates among ASEAN countries.

Furthermore, according to descriptive statistics, the average youth unemployment rate is 8.86%. This percentage is much higher than the overall unemployment rate, for both men and women. The standard deviation of the youth unemployment rate is 5.68%. The lowest youth unemployment rate recorded was 0.38%, while the highest was 26.37%. It reveals that some countries have low youth unemployment, while others struggle to create job opportunities for young people.

The average score of the economic diversification index for ASEAN countries is 103.69, with Cambodia having the lowest value at 87.43 in 2000, indicating higher reliance on fewer sectors, and Singapore having the highest at 128.42, indicating a well-diversified

economy with many diverse sectors. This shows that ASEAN has moderate economic diversification relative to the global average. According to data from the Global Economic Diversification Index, the United States has the highest index rating of 153.20, while Angola has the lowest at 78.20. The ASEAN index's standard deviation is 9.60, demonstrating the variety in economic diversification among ASEAN states. This demonstrates that while some ASEAN countries have attained significant levels of diversification, others have more concentrated economic structures.

Next, the model's control variables are inflation, population, foreign direct investment, human capital, institutional quality, and COVID. The table illustrates that ASEAN's inflation rate averages 3.28%, with Cambodia having the highest figure at 24.10% in 2008 and the lowest at -1.24% in 2009. The significant decrease in inflation from 24.10% in 2008 to -1.24% in 2009 can be linked to the global financial crisis. ASEAN inflation rates have a standard deviation of 3.19, demonstrating regional variability.

Moreover, the foreign direct investment (FDI) average in ASEAN is 6.51%, with a minimum value of -2.76% in Indonesia in the year 2000, and a maximum value is 32.60% in Singapore in the year 2021. Singapore is one of the countries that has the biggest level of FDI in the world. The Standard deviation for FDI is 7.70, this shows the high diversity of FDI among the objects of the study.

The total population is a key indicator when considering unemployment rates since it provides context for the labor force size, indicating how many individuals are potentially available for work. Analyzing the population helps us understand the size of the labor market and its ability to absorb or shed jobs in different economic conditions. Singapore has the smallest population in ASEAN, with roughly 4,027,887 people, whereas Indonesia, the region's most populous country, has around 275,501,339 inhabitants in 2022. The enormous range in population sizes across the area underlines each member country's unique labor market dynamics and economic concerns. The standard deviation in population across ASEAN countries is substantial, around 83,055,984.

When addressing the problem of unemployment, human capital is an important factor. With a minimum of 1.41%, a maximum of 7.65%, and a standard deviation of 1.21%, the average government spending on education as a percentage of GDP is 3.31%. The last parameter is the institutional quality index, which consists of six government indicators. This captures how well the governance deals with various problems such as corruption. The average IQ score is -1.01, indicating that ASEAN countries have relatively

low institutional quality, with a minimum value of  $-1.01e-09$ , a maximum value of 2.19, and a standard deviation of 1.001.

## **4.2 Trend and Development**

The ASEAN is an international organization that was founded in 1967 by the governments of Indonesia, Malaysia, the Philippines, Singapore, and Thailand with the goal of fostering peace and security in Southeast Asia while also accelerating social advancement, economic growth, and cultural development. In 1984 Brunei became a member, then Vietnam in 1995, Laos and Myanmar in 1997, and Cambodia in 1999. With a population of over 600 million, the ASEAN region spans 1.7 million square miles. ASEAN took the role of the Association of South East Asia (ASA), which was established in 1961 by the Federation of Malaya, Thailand, and the Philippines. The primary objectives of ASEAN are peace, cooperation, and shared prosperity. Among the initiatives being done to achieve these goals are technological and research cooperation, as well as economic and trade cooperation among ASEAN member states and with other countries.

Examining the unemployment trends in ASEAN can help one to grasp the dynamics of the labor market and the state of the economy in those nations. These nations' unemployment rates have lately changed in response to many shocks like industrialization, global economic crisis, and economic development. Although ASEAN's general economic performance has assisted in generating jobs, structural changes, technology developments, and demographic changes still limit complete employment.

### **4.2.1 Gender (Male and Female) Unemployment**

Beyond Gender unemployment in ASEAN is a significant issue that affects social and economic well-being. Despite economic growth, the gender gap in the work sector remains an issue. This gives an overview of the current situation and cross-country comparisons. This trend analysis is intended to help readers better understand the patterns and changes in gender unemployment in this region.

**Figure 4.1 ASEAN Unemployment Rate by Gender, 2000-2022**



Source: World Development Indicator, 2024 (processed data)

Unemployment in ASEAN, a gender perspective in Figure 4.1 shows changes in unemployment figures in ASEAN countries by gender, male, and female, between 2000 and 2022. This figure shows that Indonesia has the highest unemployment rate among other countries, with women's unemployment reaching 10% in Indonesia. This demonstrates Indonesia's low female labor force participation rate. In 2012, Indonesia saw a significant decrease in women's unemployment rates until they reached the same level as men; moreover, the female unemployment rate in Indonesia continued to be lower than the male unemployment rate the following year.

Meanwhile, Thailand shows a reverse trend compared to Indonesia, with female unemployment lower than male unemployment in the early 2000s, and it experienced a

very low level of unemployment in 2013 with less than 1%. The Thai labor market typically has a low and stable unemployment rate, as well as sluggish wage growth. This is due to four factors: strong demand for low-skilled workers, flexible labor supply, a small fraction of wage earners, and poor bargaining power of employees (Chenphuengpawon et al., 2023).

Singapore, Malaysia, and the Philippines demonstrate consistent fluctuation where the level of male and female unemployment practically rises and falls at the same level, from the early 2000s to 2003. Cambodia is positioned as the country with the lowest unemployment in men and women, even though it shows a fluctuation, the volatility is at a low level of unemployment, and the highest unemployment rate has never exceeded 1.4% for both male and female. The level of male and female fluctuates with each other; sometimes the female is higher, and sometimes the female is lower, indicating a balance in the degree of time between the two.

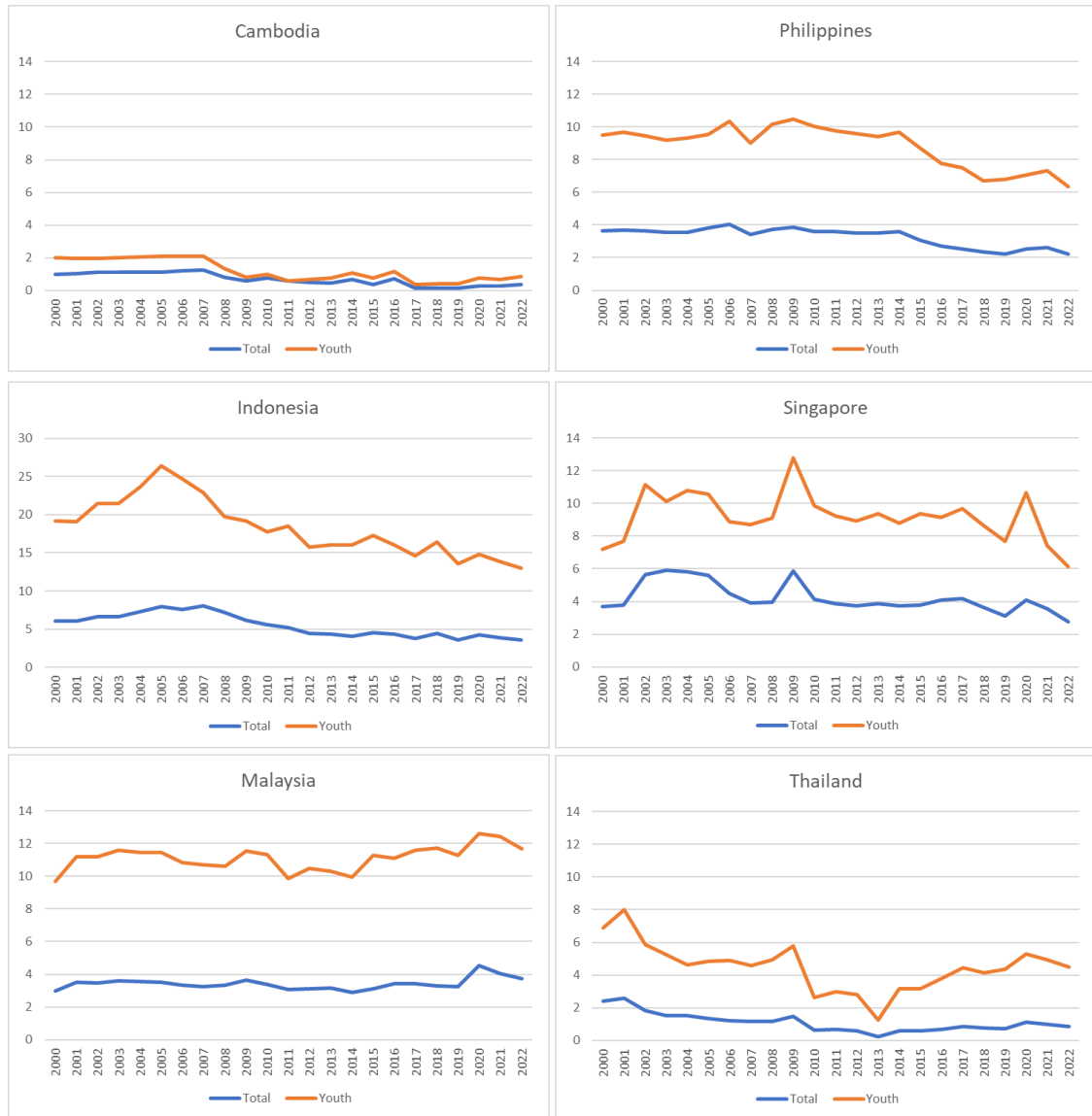
The disparities in unemployment rates between men and women in ASEAN as a whole suggest that issues with the distribution of jobs still exist. This becomes a concern for everyone since people believe that men and women should have equal access to jobs that fit their interests and talents. Stakeholders must cooperate, offer assistance, and implement laws to guarantee equality in the labor market to resolve the issue.

#### **4.2.2 Youth Unemployment**

The existence of variations in unemployment rates, particularly variations in youth unemployment, demonstrates complicated interactions in many areas, including education and economic policies in ASEAN countries. Some countries' unemployment rates are relatively low, while others are higher. High youth unemployment rates may indicate problems with job matching as well as a lack of employment opportunities. Understanding the differences and various trends within these countries can help to understand the appropriate policies for existing conditions.

As shown in Figure 4.2 Indonesia has the highest youth unemployment rate when compared to other ASEAN nations, which was 25% in 2004 but was gradually declining. However, even after the downward trend, the Indonesian gap between total and youth unemployment remains the largest, with the unemployment rate being twice or more of total unemployment. Unemployment in Indonesia is probably caused by high a mismatch between supply and demand, no matter how much a youth wants to work, they cannot find a job if no one requires their services.

**Figure 4.2 ASEAN Youth Unemployment Rate, 2000-2022**



Source: World Development Indicator, 2024 (processed data)

The youth unemployment rates in the Philippines and Singapore were almost identical in 2000. The Philippines experiences relatively stable fluctuations and a downward trend, reaching its lowest point in 2023 with 6.68% of the youth unemployment rate. In contrast, Singapore experienced fast and significant fluctuations, reaching 7% in the early 2000s, increasing to 13% in 2009, and then stabilizing at a level of 9% for the youth unemployment rate. The high fluctuations in Singapore's unemployment rate may be attributed to its open economy and heavy reliance on trade, which is crucial to global supply chains. The data for Malaysia reveals consistent turns in both youth unemployment and

total unemployment, suggesting that there has been no substantial improvement in reducing the gap.

Thailand has the second lowest youth unemployment rate in comparison to other countries. Thailand was able to close the gap and reduce youth unemployment to less than 2% and lower the total unemployment by less than 0.3% in 2013, despite the fact that the trend since 2013 has increased and youth unemployment levels have risen again. Meanwhile, the figure shows that Cambodia has an extremely low unemployment rate. It begins around the year 1999 and varies slightly over time. There may be a period of increased unemployment in the mid-2000s, but the overall rate remains below 2%. The latest recent data point, possibly for 2023, indicates an extremely low unemployment rate of roughly 0.2% and 1.25% for youth unemployment.

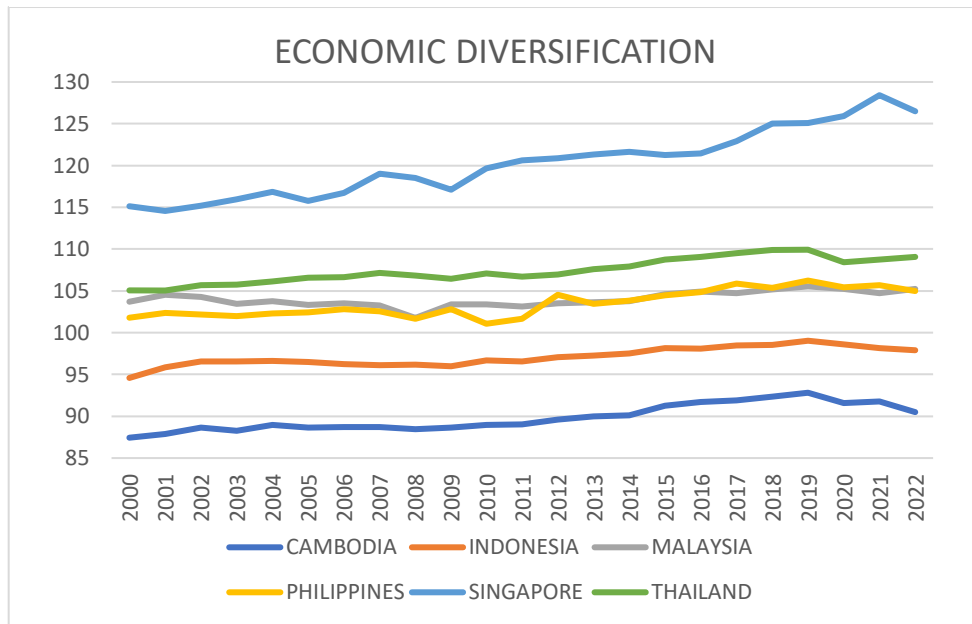
The high rates of youth unemployment in these countries highlight the importance of emphasizing their transition to the workforce, which is a critical stage for young people to achieve financial independence and professional development, as well as for society as a whole to strengthen the economy and achieve greater social inclusion.

#### **4.2.3 Diversification Development in ASEAN**

Global leaders and decision-makers are confronted with recent and critical problems such as emissions, environment, environmental degradation, geopolitical challenges, and pandemic crisis recovery. In addition, the fourth along with the fifth industrial revolution developed rapidly altering the world in numerous ways. As a result, we require an economy that can grow and survive while overcoming challenges. Thus, to have a comprehensive understanding of economic diversity is needed.

In light of this, the Mohammed Bin Rashid School of Government (MBRSG) introduced the Global Economic Diversification Index (EDI) to evaluate and rank nations according to their current state and degree of economic diversification. The index is entirely based on quantitative measurements since it places a high priority on objectivity and precision. It attempts to rate nations' economic diversification efforts and provide a quantifiable baseline, so this may be a more comprehensive insight for all parties (Prasad et al., 2023).

**Figure 4.3 ASEAN Economic Diversification, 2000-2022**



Source: Global Economic Diversification, 2024 (processed data)

Based on the summary of Figure 4.3 economic diversification in ASEAN, we can see that Cambodia has the lowest level of economic diversification of any ASEAN country, despite an uptrend in its diversification efforts; in the early 2000s, Cambodia’s diversification index was 87, and the higher Cambodia diversification was only 92 in 2019. Furthermore, starting from a slightly higher base level than Cambodia, Indonesia’s diversification index begins at 94.5, indicating a more diverse economy in the early 2000s than Cambodia.

The Philippines and Malaysia are notable for starting at the same level of economic diversification, 103, implying similar economic structures or strategies at the start of the period under review. By the end of 2022, the Philippines and Malaysia remain at the same level, 104. Thailand has higher diversification than the other four. Thailand’s diversification began at 105, the highest value in the Philippines, and has steadily increased, reaching 109.

Singapore, on the other hand, emerges as the ASEAN’s most diverse economy, with an initial score of 115 which is significantly higher than the average of another ASEAN member country, which has the highest score of 128. It maintains its executive position while diversifying significantly. Singapore’s high level of diversification can be attributed to a variety of factors, including its strategic location at the intersection of major shipping routes, which has cemented its position as a global trade and logistics hub, as well

as policies that encourage diversification. In addition, Singapore has world-class infrastructure, such as ports and telecommunications networks, which facilitate a wide range of economic activities and increase company efficiency.

In comparison with the world’s two largest economies, the United States and China. In early 2000, the United States had a diversification index of 133. This demonstrates that even in the early 2000s, US diversification was significantly higher than ASEAN economic diversification, and the US diversification index is now at its highest point of 153. Meanwhile, China, the world’s second-largest economy, starts with a lower diversification value of 104, which is comparable to Malaysia, the Philippines, and Thailand, and even lower than Singapore’s initial value. However, China’s diversification has progressed rapidly, and it is now the second most diverse economy after the United States with the highest point 147, according to the Global Economic Diversification Index.

The EDI provides an overview and summary of a country’s economic diversification performance, allowing scores to be compared between countries. It is used to assess the degree to which an economy relies on a variety of industries or sectors rather than being heavily dependent on one or a few. The highest recorded score is 153.20, while the lowest is 78.20.

#### 4.2.4 Informal Employment in ASEAN

**Table 4.2 Rate of Informal Employment by Age, excluding agriculture**

Country	Age Groups					All employed
	15-24	25-39	40-59	60-64	65 and older	
<b>Lower Middle Income Country</b>						
Cambodia	96.7	90.7	82.9	87.5	94.3	90.3
Philippines	N/A	N/A	N/A	N/A	N/A	N/A
<b>Upper Middle Income Country</b>						
Indonesia	31.7	37.4	50.9	71.8	77.9	44.1
Thailand	30.9	26.3	42.5	69.2	82.9	37.1
Malaysia	9.7	11.0	18.9	3.4	-	10.6
<b>High Income Country</b>						
Singapore	N/A	N/A	N/A	N/A	N/A	N/A

Note: Year of informal employment inputted in Report are 2018 (Indonesia, Thailand), 2017 (Malaysia), and 2012 (Cambodia).

Source: ASEANstats, 2024 (processed data)

A worker in informal employment refers to a any worker who does not have access to at least one social security scheme or employment benefit (ASEAN, 2019). Table 4.2 depicts the rate of informal work by age in ASEAN countries. The table is classified depending on the nations' economic levels; for Cambodia, a lower middle-income country, the informal employment rate throughout age categories is quite high and consistent. The percentage of informal employment is highest in the 15-24 age group (96.7%), and lowest in the 40-59 age group (82.9%). The average informal employment rate for all age categories is 90.3%. This high proportion implies that the bulk of Cambodia's workforce works in informal settings.

Upper middle-income nations, such as Indonesia, Thailand, and Malaysia, have a wider range in the level of informal work among age categories. In Indonesia, the proportion of informal workers rises with age, from 31.7% in the 15-24 age group to 77.9% in the 65+ age group. The average informal employment rate across all age categories is 44.1%. This represents the transition from official to informal employment as people age. Thailand follows a distinct trend, with the greatest percentage of informal work in the 65+ age group at 82.9% and the lowest in the 25-39 age group at 26.3%, for an overall average of 37.1%. According to statistics from Malaysia, the 40-59 age group has the greatest rate of informal work (18.9%), while the 65+ age group is not reported, and the general average is 10.6%. There is no data on the level of informal work across various age groups in high-income nations, including Singapore.

High levels of informal work are often associated with a lack of stable formal job opportunities, which in turn affects unemployment rates. In countries with lower- and upper-middle-income levels, where informal employment is widespread, the unemployment rates may seem lower from a statistical perspective since informal workers are often not categorized as unemployed. Nevertheless, it should be noted that the improvement in their economic condition is not always indicative, since informal employment often lacks adequate job stability, social safeguards, and labor rights.

### **4.3 Determining the Model of Panel Data Regression**

To examine the correlations between the dependent and independent variables while also taking into consideration the temporal dependence of the data, this study uses Panel Data Regression as its econometric model.

### 4.3.1 Chow Test

Since it is panel data, finding the common effect model (CEM), fixed effect model (FEM), and random effect model (REM) estimate models that can produce more accurate results is crucial. We do the Chow test after regressing the data using those three estimating methods. A regression model's structural fractures can be detected using the Chow test. In this instance, the fixed effects model and the common effects model are compared using the Chow test. We can conclude that there is substantial evidence against the null hypothesis that there is no structural break based on the incredibly low p-values for both statistics ( $p = 0.0000$ ). This implies that the coefficients vary significantly amongst various cross-sections.

The fixed effects model ought to be chosen over the pooled least squares in light of the Chow test results. Because fixed effects are included for each cross-section, the fixed effects model permits individual-specific effects. These fixed effects capture the time-invariant features of the individual units and account for heterogeneity that is not apparent across various cross-sections.

The fixed effects model fits the data better than the common effects model, which assumes a common coefficient across all cross-sections, according to the significant cross-section F statistic and Chi-square statistic. major disparities between cross-sections imply that the fixed effects model accounts for major variability in the data that the common effects model does not.

### 4.3.2 Hausman Test

Next, we evaluate the consistency and effectiveness of the estimators in the fixed effects model with the random effects model using the Hausman test. In order to ascertain the validity of the random effects assumption, the test looks at whether the random effects have any correlation with the regressors. Strong evidence contradicts the null hypothesis, according to the incredibly low p-value ( $p = 0.0000$ ), which states that there is no correlation between the random effects and the regressors. This implies that the random effects model might not be suitable for the data and that the random effects assumption has failed.

The fixed effects model is recommended since the Hausman test shows that the random effects assumption is invalid. The correlated random effects imply that the regressors are systematically related to unobserved individual-specific characteristics. We

can account for these unseen characteristics and produce reliable and effective estimates by utilizing the fixed effects model.

Given the Hausman test results, the fixed effects model should be preferred over the random effects model. The fixed effects model captures the time-invariant features of individual units while also taking individual-specific effects into account by including fixed effects for each cross-section. In contrast, the random effects model assumes that there is no correlation between the random effects and the regressors.

#### **4.3.3 Lagrange Multiplier Test**

The Lagrange Multiplier test for panel data is an additional test performed to determine whether the random effects assumption in the model is true. It looks for individual-specific heterogeneity to determine if a pooled least squares (model or a random effects (RE) model is better suited.

The test's statistical significance is often evaluated using the p-values. In this instance, strong evidence in favor of the null hypothesis of no random effects is shown by the high p-values. This implies that the common effects model model is favorable compared to the pooled least squares model based on the results of the LM test.

In summary, the author selects the fixed effects model as the estimate method based on the results of the Chow test and Hausman test. The next stage would be to test assumptions and ensure model fit. When employing the fixed effects model for panel data estimation, specific assumption tests and model fit metrics can be employed to determine the model's dependability and suitability.

### **4.4 Testing the Reliability and Appropriateness of The Model**

The model is validated with three diagnostic tests: the heteroscedasticity test, the multicollinearity test, and the autocorrelation test.

#### **4.4.1 Heteroscedasticity Test**

The Panel Cross-section Heteroscedasticity test is used to determine whether the residuals in the regression model are heteroscedastic, which means that their variance varies across levels of the independent variables. The null hypothesis for this test is that the residuals are homoscedastic, which indicates constant variance.

The test's probability is stated as 0.0000, which is less than the 0.05 level of significance. Thus, we reject the null hypothesis that the residuals are not homoscedastic. Based on these findings, we can conclude that the regression model contains indications of

a heteroscedasticity problem. This shows that the variance of the residuals varies with the magnitude of the independent variables.

#### 4.4.2 Multicollinearity Test

**Table 4.3 Multicollinearity Test**

<b>Variables</b>	<b>VIF</b>
<b>IQ</b>	8.66
<b>EDI</b>	6.11
<b>FDI</b>	4.35
<b>logPOP</b>	3.65
<b>HC</b>	1.71
<b>INF</b>	1.29
<b>Mean</b>	4.29

Source: Author, 2024 (processed data)

The second diagnostic test, the Multicollinearity test examines the correlation between independent variables in a regression model. In this case, the correlation matrix shows the pairwise correlations between the variables EDI, INF, FDI, logPOP, HC, and IQ. Based on the provided correlation matrix, there is no strong evidence of multicollinearity among the variables. The VIF ranges between 1.27 and 8.61, indicating relatively low to moderate correlations.

Multicollinearity becomes a concern when the correlation coefficients are higher than 10 suggesting a high degree of linear association between the variables. However, in this case, the correlation coefficients are relatively small, indicating that there is no significant multicollinearity issue present.

#### 4.4.3 Autocorrelation Test

The last diagnostic test, the Wooldridge test for autocorrelation, examines the presence of serial correlation in the residuals of a regression model. In this case, the Wooldridge test statistic yields a p-value of 0.0004. This very low p-value indicates strong evidence against the null hypothesis of no autocorrelation. Thus, we conclude that there is a significant issue of autocorrelation present in the residuals of the regression model. This

finding suggests that the residuals are not independent over time, and appropriate corrections or adjustments may be necessary to address this issue.

Establishing evidence of no multicollinearity among the variables, but identifying that heteroscedasticity and autocorrelation problems exist, the next stage involves elaborating on the findings in the context of the chosen regression model. Consequently, further treatments and adjustments will be implemented to address and rectify these identified issues, ensuring the robustness and reliability of the regression results.

## 4.5 Estimation Result

### 4.5.1 The FEM Model

The Fixed Effects Model is utilized for the analysis of panel data. The model can be expressed as follows:

$$\text{Unemp} = 60.115 - 0.128\text{EDI} + 0.021\text{INF} - 5.762\text{logPOP} - 0.013\text{FDI} - 0.058\text{HC} - 1.653\text{IQ} + 0.385\text{COVID} + \varepsilon_{it} \dots\dots\dots(4.1)$$

**Table 4.4 Baseline Model**

	<b>FEM</b>
<b>EDI</b>	-0.128*** (0.006)
<b>INF</b>	0.021 (0.313)
<b>LogPOP</b>	-5.762*** (0.004)
<b>FDI</b>	-0.013 (0.532)
<b>HC</b>	-0.058 (0.532)
<b>IQ</b>	-1.653*** (0.001)
<b>COVID</b>	0.385* (0.072)
<b>C</b>	60.115
<b>R2</b>	0.432
<b>Prob F sig</b>	0.0000

Note: \*, \*\*, \*\*\* refer to the significance level at 10%, 5%, and 1% respectively.

Source: Author, 2024 (processed data)

Based on the table of FEM estimation, we discovered that the EDI variable is negatively and significantly associated with unemployment, the coefficient of EDI is -0.128, with a probability of 0.006, which is smaller than 0.05 and 0.10. The inflation coefficient is 0.021, with a probability value of 0.313, indicating that inflation has a positive but insignificant relationship with unemployment in this estimation. Meanwhile, the log of population coefficient is -5.762, with a probability of 0.004, which is less than 0.05, indicating a negative and significant relationship between population and unemployment while keeping all other variables constant.

The variables FDI and human capital both have a negative coefficient and a probability value that is not significant with a probability of 0.532. The institutional quality coefficient is -1.653 and has a probability of 0.001, implying that when the quality of an institution or government is higher, the unemployment rate decreases by 1.65% while all other variables remain constant. Finally, the dummy COVID variable in this estimation exhibits positive significant relationships. As previously stated, the FEM model in this analysis has heteroscedastic and autocorrelation issues that may cause bias in the estimation results; thus, we must conduct additional analysis using Driscoll and Kray standard errors.

#### **4.5.2 Driscoll and Kray Standard Error**

As previously stated, we estimate equations using pooled least squares, fixed effect models, and random effect models. These models are likely to have serial correlation and heteroscedasticity, which may make the coefficients inefficient. From the diagnostic test we have conducted, we found that our models have the heteroscedasticity and autocorrelation problem that we have to address.

To tackle these problems, we use the regression methodology put forward by (Driscoll & Kraay, 1998). This approach produces reliable standard errors that stay accurate even when there is cross-sectional dependency, serial correlation, and heteroscedasticity. Although there is a chance of breaking traditional regression assumptions, the use of the Driscoll-Kraay approach enables us to get more dependable coefficient estimations and enhance the credibility of our results.

In addition, the Driscoll-Kraay fixed effects estimator offers a benefit by using a nonparametric variance-covariance matrix. This matrix not only ensures consistent standard deviations when there is both equal variance and correlation between observations, but it also calculates reliable standard errors when there is interdependence across different sections of data. The standard deviation estimation approach proposed by

Driscoll-Kraay guarantees the consistency of the covariance matrix estimator, independent of the magnitude of cross-sectional dimensions (Hoechle, 2007).

#### 4.5.3 Final Estimation

After conducting some tests on the panel data model, which focuses on the impact of economic diversification on unemployment rates in ASEAN countries, it was discovered that the fixed effect is the preferred option. As a result, the model has an autocorrelation problem, as indicated by the Wooldridge test for autocorrelation less than 0.05, as well as a heteroscedasticity problem; the two issues are addressed using Driscoll and Kray's standard error. Given that the Driscoll and Kray standard errors allow for the adjustment of heteroskedasticity and autocorrelation in regression coefficient estimation, they account for the presence of these issues and provide more robust standard errors, thereby improving hypothesis testing and inference.

**Table 4.5 Final Model Estimation**

	<b>Unemp</b>	<b>MaleUn</b>	<b>FemaleUn</b>	<b>YouthUn</b>
<b>EDI</b>	-0.128*** (0.002)	-0.1431*** (0.002)	-0.108** (0.013)	-0.107* (0.093)
<b>INF</b>	0.021 (0.295)	0.012 (0.450)	0.040 (0.210)	0.059 (0.353)
<b>LogPOP</b>	-5.762** (0.020)	-4.451* (0.052)	-7.882*** (0.009)	-11.640** (0.032)
<b>FDI</b>	-0.013 (0.260)	-0.004 (0.685)	-0.024 (0.153)	-0.061* (0.065)
<b>HC</b>	-.0584 (0.550)	-0.040 (0.693)	-0.078 (0.456)	-0.185 (0.433)
<b>IQ</b>	-1.653*** (0.006)	-0.855*** (0.010)	-3.024*** (0.006)	-4.838** (0.012)
<b>COVID</b>	0.385*** (0.010)	0.425*** (0.005)	0.328** (0.035)	0.514* (0.083)
<b>C</b>	63.115	51.551	74.429	109.005
<b>R2</b>	0.4320	0.4463	0.4103	0.3254
<b>Prob F sig</b>	0.0087	0.0030	0.0058	0.0295

Source: Author, 2024 (processed data)

After successfully passing various tests to ensure its dependability, the model moves on to the next stage, which is analysis. After an extensive evaluation, it is possible

to confidently conclude that the model is reliable and suitable for further research. The table summarizes the impact of economic diversification on unemployment.

Although the final model has a relatively low R-squared value, this does not necessarily mean that the impact is small or negligible, as many researchers believe. In other words, a low R-squared value simply means that the dependent variable is influenced by a variety of factors other than those considered in the analysis. Moreover, Moksony (1999) asserts the aforementioned statement,  $R^2$ , is a combination of three factors: the impact of the explanatory variable, the degree of variation in this variable, and, finally, the size of the spread around the regression line.

First, the main independent variable in this study is the economic diversification index (EDI). The EDI coefficient is negative, indicating that economic diversification has a negative impact on unemployment. The coefficient for total unemployment is -0.128 with a probability of 0.002, which is less than the significance level of 0.05, indicating that economic diversification has a negative and significant impact on unemployment in ASEAN countries. The coefficient -0.128 means that increasing EDI by one point on the index reduces the total unemployment rate in ASEAN countries by 0.128% while keeping all other variables constant (*ceteris paribus*).

On the other hand, the coefficient of EDI on male unemployment is -0.143 with a probability value of 0.002, which is greater than the coefficient of economic diversification on female unemployment rate, which is -0.108 with a p-value of 0.013. Both male and female probability values are less than 0.05 indicating EDI has a negative significant impact on both male and female unemployment, despite the fact that the impact of diversification on male unemployment is higher than female unemployment. This means that if the EDI is increased by 1 point, male unemployment will decrease by 0.143%, while female unemployment will decrease by 0.108%, whereas all other variables remain constant.

Looking at the effects of diversification economics on the specific demographic youth unemployment is the last topic to cover in the discussion of the impact of economic diversification on unemployment. According to the results of this fixed effect regression test with Driscoll and Kray standard error, the unemployment rate among youth differs from that of males and females as well as the overall unemployment rate in ASEAN countries. The coefficient of youth unemployment, which stands at -0.107 indicates that economic diversification reduces unemployment rates, or, in other words, creates more job opportunities. However, when it comes to youth unemployment, the probability value is

0.093, which is bigger than the significant values of 0.05, but smaller than 0.10, indicating the apparent relationship between economic diversification and youth unemployment is statistically significant at the 10% level but not at the 5% level. The impact on youth unemployment is relatively lower compared to male and female unemployment.

Moving on to the control variable, the inflation rate, which is calculated as the percentage change in the price of a basket of goods and services consumed by households, measures the increase or decrease in the commodity's price level. The coefficient of the inflation variable is 0.021, with a probability value of 0.295, indicating that inflation is positively associated with unemployment, but the relationship is not significant. Similarly, in all other unemployment categories (male, female, and youth), all coefficients demonstrate positive associations but are not significant to the unemployment rate with a probability greater than 0.05 and 0.10.

The population has a negative significant relationship with unemployment, as demonstrated by the negative coefficient -5.762 and the probability 0.020, which are less than 0.05, indicating that the variable significantly affects the dependent variable. It implies that for every 1% increase in population, ASEAN's unemployment rate will fall by 5.762%, assuming all other variables remain constant. Furthermore, the other part of unemployment shows negative and significant relations, the coefficient of the male population on unemployment is -4.451 with a p-value of 0.052, and the coefficient of the female population on unemployment is -7.882, which is higher than the male with a p-value of 0.009, implying that if total population increases, female unemployment will decrease more than male unemployment by 7.96%. Subsequently, the effect of the overall population on youth unemployment has the biggest effect compared to other unemployment, with a coefficient of -11.640 indicating that for every 1% increase in population, youth unemployment decreases by 11.640%.

The link between the foreign direct investment variable and overall unemployment is negative, but not statistically significant at the levels. The correlation for FDI and unemployment is -0.013 with a p-value of 0.260. With a p-value of 0.685 and a coefficient of -0.004 for male unemployment, there is once more a negative correlation but no statistically significant relationship. The same as for female unemployment, that have negative but not significant. However, FDI has a negative significant impact on youth unemployment. The FDI coefficient for youth unemployment is -0.061 with a p-value of 0.065.

Furthermore, the variable human capital proxied by government spending on education shows a negative coefficient at all unemployment, but not significant, this means that government spending on education as an investment in human quality is not able to reduce the unemployment rate yet in ASEAN. The last control variable is institutional quality, good governance is required for development. It contributes to countries in increasing economic growth, developing human capital, and strengthening society. The table shows that institutional quality significantly reduced the unemployment rate with a coefficient of -1.653 and a probability of 0.006, implying that when an institution's quality increases by 1 point of the index, the ASEAN unemployment rate decreases by 1.653% while all other variables remain constant. The male coefficient is -0.855, and the female coefficient is -3.024, implying that every 1 point increase in the index of institutional quality reduces female unemployment by 3.024% while decreasing male unemployment by 0.855%, and. The same as the population, institutional quality had the biggest impact on youth unemployment by 4.838%.

Lastly, the dummy COVID variable, which covered the 2020 and 2021 years affected by the pandemic COVID-19, is important to consider when examining how this event affected unemployment in ASEAN. The table shows that the COVID dummy period positively increased unemployment at all levels, with a coefficient of unemployment of 0.385 and a probability of 0.010 less than 0.05, indicating a significant positive impact on unemployment. It implied that during the pandemic COVID period, unemployment increased by 0.385%, compared to the non-COVID period. This also applies to other types of unemployment, including men, women, and youth. Covid has had a positive impact on the number of unemployed people compared to the pre-Covid period. The results also indicate that the F-probability for all categories of unemployment is less than 0.05, implying that the independent variables collectively have a significant impact on the dependent variable.

#### 4.5.4 Country Fixed Effect

**Table 4.6 Country Fixed Effect**

<b>Country</b>	<b>FEM</b>
<b>Indonesia</b>	13.437*** (0.002)
<b>Malaysia</b>	8.470*** (0.001)
<b>Philippines</b>	9.859*** (0.001)
<b>Singapore</b>	10.035*** (0.001)
<b>Thailand</b>	7.813*** (0.001)
<b>C</b>	51.869

Source: Author, 2024 (processed data)

The Table 4.6 shows how each country differs in terms of unemployment. By implementing the Least Square Dummy Variable (LSDV) and using Cambodia as a base country, we can see that Indonesia's coefficient is 13.437, with a probability of 0.002, less than 0.05. This implies that Indonesia's unemployment is 13.437% higher than Cambodia's, holding all other variables constant. Meanwhile, Malaysia has a statistically significant probability of 0.001 and a coefficient of 8.470. This indicates that Malaysia's unemployment rate is 8.470% higher than the base country.

Furthermore, Thailand and the Philippines have statistically significant probability values of 0.0001, as well as positive coefficients. Thailand's coefficient indicates that its unemployment rate is 7.813, while the Philippines' coefficient is 9.859. Singapore has a similarly positive and statistically significant coefficient of 10.035, indicating a higher unemployment rate than Cambodia.

This finding is consistent with the earlier trend Figure 1.2 of the unemployment rate in ASEAN, where Indonesia is positioned as the country with the highest level of unemployment in ASEAN followed by Singapore, the Philippines, and Malaysia. Meanwhile, Thailand has the second lowest unemployment rate after Cambodia.

#### 4.6 Discussion

To address the issues and challenges associated with growth and development, especially in unemployment. A multi-faceted, comprehensive approach that considers multiple economic factors and their impact on different groups of unemployment may be

required to properly address these challenges. To understand unemployment comprehensively, it is crucial to understand how economic diversification influences unemployment levels.

In a fixed effect model, the results reveal a statistically significant and negative relationship between economic diversification and unemployment rates. According to the estimation, there is a strong relationship between increasing economic diversification and lower unemployment, this implies when the country has increased diversity the unemployment rate will move in the opposite direction. These findings are consistent with previous investigations by Adam et al.(2023), Neumann & Topel (1991), Watson & Deller, (2017).

Diversification has a negative impact on unemployment, also in line with previous research by Jouili & Khemissi (2019) who conducted a study examining the effect of diversification on graduate employment, They suggest diversification increases the number of jobs. However, it differs with Soyyiğit et al. (2023), they observed that economic complexity does not reduce unemployment in Asian and African Big Emerging Market countries such as China, India, Indonesia, South Korea, and South Africa. And according to Fu et al. (2010) industry variety is positively and significantly related to unemployment rates in China, most likely as a result of the high level of turnover during the sample period.

The observation that economic diversification has less of an effect on reducing female unemployment may be because women experience more obstacles in the job market than men. A disproportionate number of women work in low-paying jobs with little access to social security and benefits. In addition, throughout all ASEAN Member States, the rates of female labor force participation continuously lag behind those of male. These disparities highlight systemic barriers that prevent women from fully participating in and contributing to the workforce in the ASEAN region (ASEAN, 2016).

Diversification of the economy may have the lowest significant impact on youth unemployment due to variations in skill matching and varied dynamics in the labor market, where young people are typically still struggling on their career path. Young people often struggle in comparison to older people because they typically have less understanding, less experience, and fewer useful connections than older people in the work search, as youth employment is highly sensitive to education-job mismatch issues (OECD, 2021).

Meanwhile, Watson & Deller (2017) suggest the structure, diversity, and stability of neighboring countries play a key role in reducing unemployment in one's own country

during times of economic distress and it is these spatial spillover effects. In the same way, Adam et al. (2023) suggest that the negative effect on the unemployment rate is due to changes in the structure of the product space towards the creation of more sophisticated products, rather than increases in the sophistication of existing ones. Also, Notably Al Awaidi & Madbouly (2022), their study indicated that economic diversification has a significant effect on innovation that may lead to wider job opportunities. This is because a diversified economy encourages the development of new industries and technologies, which in turn creates demand for a variety of skilled workers. In addition, Export diversification helps to boost economic growth in developing nations (Mania & Rieber, 2019). And in his research Agosin (2009) indicates that diversification leads to increased economic growth which may lead to lower unemployment.

In addition, there are numerous reasons why economic diversity reduces unemployment rates. Initially, a more diverse economy leads to economic growth and a greater number of job opportunities (Agosin, 2009). There are more jobs available in a wider range of fields when the economy is not solely dependent on one sector (Adam et al., 2023). Furthermore, by lowering the risk of dependence on a single industry, diversification promotes economic stability (Al Naimi, 2022; Albassam, 2015). The overall negative effect on the unemployment rate can be reduced if one sector declines while others continue to grow or even strengthen. A diverse workforce can acquire a range of skills from a variety of industries, which will increase their adaptability to changes in the labor market and lower long-term unemployment.

Moreover, a diversified economy is more resistant to domestic or international economic shocks like natural disasters or financial crises since the success of some sectors can make up for losses in others (Pissarides, 2009), it provides a stronger defense against the resource curse (Matallah, 2020). In general, economic diversification lowers the risk of high unemployment by increasing a more dynamic and long-lasting environment for job growth.

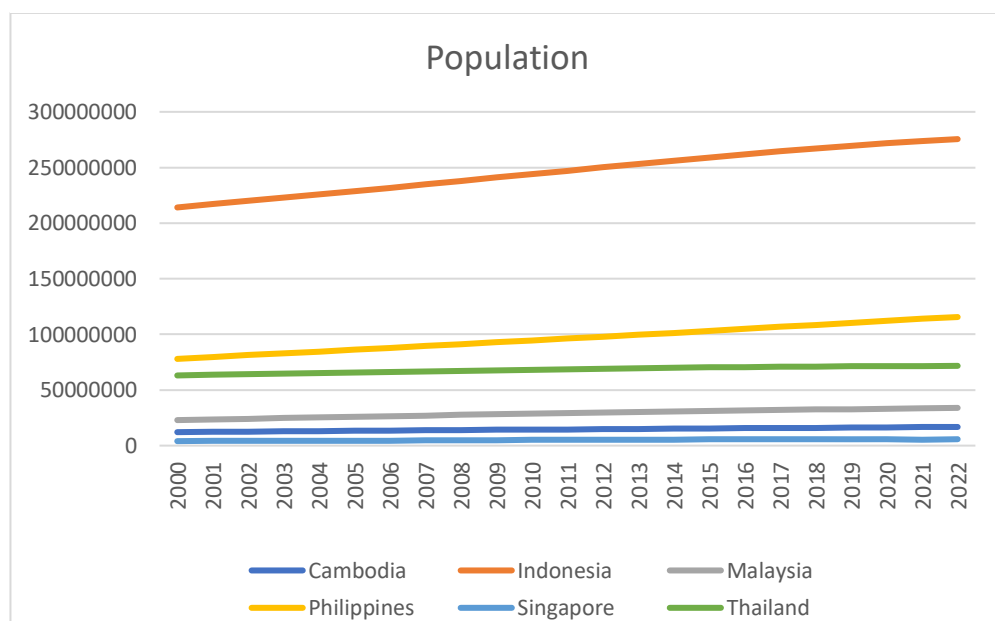
The inflation results of this estimation show a positive but not statistically significant relationship with the unemployment rate. This finding is consistent with research conducted by Mirzaei Abbasabadi & Soleimani (2021) who used data from 163 countries to examine the relationship between ICT and unemployment. also similar to Arshad & Ali (2017) who found the insignificant impact of inflation on unemployment in Pakistan. The observation that inflation has a positive but not statistically significant

association with unemployment suggests that, while inflation may have an impact on the labor market, it is relatively small and may be overwhelmed by other economic factors.

The population variable has shown a negative significant relation with unemployment this result is in line with previous research by Gozgor (2014) who empirically investigates the impacts of trade openness and globalization on the unemployment rate in an unbalanced panel framework. The analysis focuses on the G7 countries. He notes that there are several different findings regarding the relationship between population and unemployment. For example, new trade theories, such as the new economic geography models, imply that increased trade openness and population lead to lower unemployment rates, while neo-classical frameworks, such as urban system models, suggest that a higher population may increase unemployment.

It also aligns with Awad-Warrad (2018), who claims that an empirical review of the theoretical relationship between unemployment and a variety of major macroeconomic characteristics, such as trade policy openness and actual economic growth. He implies that population expansion expands the labor force. This could cause a shift in unemployment rates depending on how well the job market absorbs additional workers. In addition, the inverse correlation between population and unemployment rate can be attributed to the progressive decline in the unemployment rate over time, along with the increasing trend in population, as depicted in the figure.

**Figure 4.4 ASEAN Population Growth, 2000-2022**



Source: World Development Indicator, 2024 (processed data)

Furthermore, this research found that FDI negatively and insignificantly influences the unemployment rate, signaling that FDI in ASEAN cannot directly reduce unemployment, his finding is in line with previous research conducted by Tegep et al. (2019) who studied the relationship between foreign direct investment and unemployment in Indonesia and discovered that while FDI cannot directly reduce unemployment, it can affect it once it is mediated by provincial wage rates and economic growth. It is also supported by previous research by Mohamed (2018) who examined the relationship between FDI and unemployment in Sudan from 1990 to 2016. He concluded that the FDI volume does not initiate unemployment and that unemployment is not attracting FDI in Sudan. However, our analysis indicated that FDI had a considerable effect on youth unemployment, which is consistent with Tanaya & Suyanto (2023) study. According to the study, new technology transfers from FDI can increase demand in the domestic market. Thus, FDI can assist in reducing youth unemployment in ASEAN, indicating that the criteria for hiring the younger generation of individuals are cost-driven.

The human capital shows a negative insignificant relation towards unemployment implying the human capital proxied by education spending in ASEAN is not able to raise significantly the employment rate in ASEAN, this finding is linear with previous findings by Afolayan et al. (2019) in Nigeria. According to the study, human capital has little impact on Nigeria's unemployment rate. The rate of graduation from tertiary institutions, which serves as a gauge of educational attainment, illustrates how inadequate education is in promoting employment and advancing development in Nigeria. The skills that have been acquired appear to be inadequate in comparison to what the economy needs to be vibrant (mismatch). This indicates that despite increased education investment, the skills developed may not match labor market needs, resulting in persistent unemployment. Furthermore, according to Bergim et al. (2019) the issue of overqualification and underqualification is prevalent in low and middle income countries, including the ASEAN countries which are primarily composed of middle income countries. This discrepancy worsens the challenges that these economies encounter in attaining ideal employment results.

It is also supported by Singh & Shastri (2020), the lack of a relationship between unemployment and public education spending and educational attainment suggests that the government's role is not limited to directing a certain amount of funding toward the education sector. The composition of spending, which remained heavily biased in favour

of current rather than capital investment throughout the research period, is a likely explanation for the ineffectiveness of government spending in raising educational attainment. Moreover, increased educational investment may not ensure improved student results. The quality of education and its relevance to the labor market are crucial. Increased expenditure alone may not be successful in reducing unemployment unless educational standards improve and market demands are met. This is further emphasized by (Hanushek & Wößmann, 2014), who argue that the mere greater educational spending does not guarantee better student outcomes. In general, this clarified the notion that investing in human capital does not always result in a direct relationship with reductions in unemployment. The disparity between the skills demanded and the skills available, the allocation of funds for education, and the caliber of human capital elucidate why increased investments in education may not yield significant improvements in employment outcomes.

Besides, the institutional quality variable shows a negative significant impact on unemployment, this highlights the importance of having good governance quality to decrease the unemployment level within the country, this negative significant relation is supported by previous findings by Afolabi et al. (2022), by using data from 2006 to 2019, he used the dynamic ordinary least square method to examine the role of institutional quality in the relationship between entrepreneurship and unemployment for seven MENA countries. He discovered that while opportunity-driven and total early-stage entrepreneurship has the potential to lower unemployment, institutional quality appears to enhance this effect. In addition Therese F. Azeng & Thierry U. Yogo (2013) suggest that political instability is more likely to occur in nations with high youth unemployment, social inequalities, and corruption. Moreover, Matallah (2022) emphasizes the importance of government quality, highlighting in his research that higher governance quality leads to greater diversification.

Lastly, the dummy variable COVID comes with a positive sign, and a probability value smaller than 0.05 implying the covid 19 period significantly affected the unemployment rate. This finding shows that during the COVID-19 period (2020-2021), unemployment rates were higher compared to non-COVID periods. The pandemic's impact on unemployment can be attributed to a variety of factors, including lockdowns, business closures, and economic uncertainty, all of which disrupted global labor markets. These factors not only resulted in layoffs and reduced hiring, but they also created barriers for job seekers attempting to enter or re-enter the workforce. The findings are consistent with many

previous research (Ahmad et al., 2020; ElBehairy et al., 2022; Sirah, 2020; Su et al., 2022) that COVID-19 caused a higher unemployment rate.

#### 4.7 Robustness Test

Robustness tests in panel data regression analysis evaluate the dependability and stability of the projected model and output. It clarifies any questions about the authenticity and dependability of the findings. Different model criteria robustness tests assist in guaranteeing that the results are independent of certain choices. It may also show the strength of the expected correlations, raise the validity and trustworthiness of the findings, and provide a closer look at the data (Weisberg, 2006).

**Table 4.7 Robustness Test**

	<b>D-K Model</b>	<b>FE Model</b>	<b>CE Model</b>	<b>NoCOVID</b>
<b>EDI</b>	-0.128*** (0.002)	-0.128*** (0.006)	-0.195*** (0.000)	-0.116*** (0.006)
<b>INF</b>	0.021 (0.295)	0.021 (0.313)	0.132*** (0.000)	0.016 (0.382)
<b>LogPOP</b>	-5.762** (0.020)	-5.762*** (0.004)	3.156*** (0.000)	-5.207** (0.023)
<b>FDI</b>	-0.013 (0.260)	-0.0126 (0.532)	-0.010 (0.677)	-0.014 (0.262)
<b>HC</b>	-0.0584 (0.550)	-0.058 (0.532)	-0.059 (0.548)	-0.051 (0.583)
<b>IQ</b>	-1.653*** (0.006)	-1.653*** (0.001)	3.632*** (0.000)	-1.652*** (0.007)
<b>COVID</b>	0.385*** (0.010)	0.385* (0.072)	0.121 (0.717)	
<b>C</b>	63.115	60.115	-0.905	54.770
<b>R2</b>	0.4320	0.4320	0.6950	0.4167
<b>Prob F sig</b>	0.0087	0.0000	0.000	0.0076

Source: Author, 2024 (processed data)

In the robustness test, we run the model by using different methods of panel data. The purpose of this is to observe the extent to which coefficients on the variable of interest, economic diversification, change. We evaluated four different methods of regression, one

of which omitted the COVID variable from the model while keeping the dependent and independent variables constant. Though methods vary, the economic diversification index coefficient is consistently negative and statistically significant with a Probability value of less than 0.05 across all three models. This suggests that, throughout the many model criteria examined, the link between economic diversification and unemployment rates is constant and significant.

## **CHAPTER 5**

### **SUMMARY AND CONCLUSION**

#### **5.1 Summary and Conclusion**

This research investigates the influence of economic diversification on unemployment rates in six ASEAN nations while considering gender and age demographics. The significance of economic diversification in enhancing economic stability is well acknowledged, but its specific effects on unemployment rates, especially in relation to gender and age dynamics within ASEAN, are not well understood. The findings indicate that economic diversification has a statistically negative significant impact on reducing the unemployment rate in ASEAN, including male, female, and youth unemployment. This demonstrates that while economic variety may lead to a general rise in employment levels, challenges persist with female and youth employment, stemming from obstacles such as skill mismatch or limited opportunities to enter different sectors.

Moreover, the analysis highlights that both institutional quality and demographic dynamics have a significant adverse impact on unemployment rates. Countries with strong institutional frameworks typically experience lower unemployment rates. Additionally, in the case of ASEAN, an increase in population can contribute to reduced unemployment. On the other hand, the variable of inflation shows a positive correlation with unemployment, but it is not statistically significant. In contrast, both FDI and human capital exhibit a negative correlation with unemployment, although these relationships are also not statistically significant. The insignificant impact of human capital can be attributed to the skill mismatch, and this suggests that the influence of FDI and human capital on unemployment rates might be more intricate, which calls for a more detailed and sophisticated examination.

Finally, the analysis incorporates a dummy variable to account for the COVID-19 era, which indicates a substantial increase in unemployment rates during this time in comparison to non-COVID periods. This emphasizes the significant economic disturbances created by the pandemic in ASEAN nations, emphasizing the need to take into account external shocks when analyzing unemployment patterns. The estimation results also show a significant different of unemployment rates in ASEAN indicating the different level of unemployment rate in ASEAN. Overall, economic diversification has the potential to decrease unemployment rates in ASEAN.

## **5.2 Policy Recommendation**

Governments in ASEAN should give priority to economic diversification, institutional quality, and focused assistance for women and young to mitigate unemployment. One way to equip the workforce for emerging sectors is to foster the expansion of different industries beyond the conventional ones, such as technology, advanced manufacturing, and renewable energy.

Enhancing the quality of institutions by promoting transparency, minimizing corruption, and enhancing bureaucratic procedures can enhance labor market participation. Unemployment has not been significantly affected by foreign direct investment (FDI) and human capital (HC) due to factors such as countries' limited ability to absorb investments and discrepancies between educational achievements and labor market requirements. In order to enhance the efficacy of Foreign Direct Investment (FDI), governments should create a more conducive business environment, guarantee political stability, and foster infrastructural development. Human capital requires the alignment of education systems with market needs, enhancement of vocational training, and investments in ongoing workforce development. These initiatives will lead to a dynamic and all-encompassing job market, fostering ASEAN's sustainable economic expansion.

## **5.3 Limitation of Study**

It is crucial to recognize the constraints of this study. Firstly, the research is focused on the ASEAN countries, which restricts the generalizability of the findings to other contexts. Secondly, not all ASEAN countries are included in this research. The investigation did not cover other ASEAN countries such as Brunei, Laos, Myanmar, and Vietnam. Future study is expected to yield more comprehensive country data.

Another limitation of this study is the lack of analysis of the factors influencing ASEAN's economic diversity. Future research addressing these aspects can offer deeper insights into the dynamics of economic diversification to provide a more comprehensive understanding of the issue and inform effective policy interventions.

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## APPENDIX

### Appendix 1 : Descriptive Statistics

```
. sum UNEM UNMALE UNFEMALE UNYOUTH EDIAVARAGE INFLATION logpop FDIGDP EDUGDP IQ dummy_2020_2021
```

Variable	Obs	Mean	Std. dev.	Min	Max
UNEM	138	3.026442	1.855609	.14	8.06
UNMALE	138	2.884775	1.706919	.112	6.947
UNFEMALE	138	3.254558	2.15206	.172	10.043
UNYOUTH	138	8.864123	5.680172	.38	26.379
EDIAVARAGE	138	103.6888	9.594754	87.43642	128.4152
INFLATION	138	3.283114	3.194074	-1.241718	24.09685
logpop	138	7.586605	.5598253	6.605077	8.440124
FDIGDP	138	6.505365	7.699256	-2.75744	32.69116
EDUGDP	136	3.313803	1.207056	1.414	7.65793
IQ	138	-1.01e-09	1.000002	-1.163604	2.190127
dummy_2~2021	138	.0869565	.2827978	0	1

### Appendix 2 : Multicollinearity Test

```
. vif
```

Variable	VIF	1/VIF
IQ	8.66	0.115432
EDIAVARAGE	6.11	0.163693
FDIGDP	4.35	0.229981
logpop	3.65	0.273945
EDUGDP	1.71	0.586407
INFLATION	1.29	0.776944
Mean VIF	4.29	

### Appendix 3 : Heteroscedasticity Test

```
. xttest3
```

Modified Wald test for groupwise heteroskedasticity  
in fixed effect regression model

H0:  $\sigma(i)^2 = \sigma^2$  for all i

chi2 (6) = 327.77  
Prob>chi2 = 0.0000

## Appendix 4 : Autocorrelation Test

```
. xtserial UNEM EDIAVARAGE INFLATION logpop FDIGDP EDUGDP IQ

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F( 1,      5) =    71.941
    Prob > F =    0.0004
```

## Appendix 5 : Hausman Test

Test of H0: Difference in coefficients not systematic

```
chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
        = 128.39
Prob > chi2 = 0.0000
(V_b-V_B is not positive definite)
```

## Appendix 6 : Driscoll and Kray Estimation

```
. xtsccl UNEM EDIAVARAGE INFLATION logpop FDIGDP EDUGDP IQ dummy_2020_2021, fe

Regression with Driscoll-Kraay standard errors   Number of obs   =   136
Method: Fixed-effects regression                 Number of groups =    6
Group variable (i): NO                           F( 7, 5)        =   11.14
maximum lag: 2                                   Prob > F         =   0.0087
                                                within R-squared =   0.4320
```

UNEM	Drisc/Kraay					[95% conf. interval]	
	Coefficient	std. err.	t	P> t			
EDIAVARAGE	-.1275758	.0216192	-5.90	0.002	-.1831497	-.0720018	
INFLATION	.0214303	.0183434	1.17	0.295	-.0257228	.0685834	
logpop	-5.7623	1.712099	-3.37	0.020	-10.16339	-1.36121	
FDIGDP	-.0126074	.0099308	-1.27	0.260	-.0381352	.0129204	
EDUGDP	-.0583539	.0910091	-0.64	0.550	-.2923002	.1755925	
IQ	-1.652616	.3668904	-4.50	0.006	-2.595738	-.709494	
dummy_2020_2021	.3852033	.0952569	4.04	0.010	.1403378	.6300689	
_cons	60.11475	13.16058	4.57	0.006	26.2844	93.94509	

. xtsc UNMALE EDIAVARAGE INFLATION logpop FDIGDP EDUGDP IQ dummy\_2020\_2021, fe

```

Regression with Driscoll-Kraay standard errors   Number of obs   =   136
Method: Fixed-effects regression                 Number of groups =    6
Group variable (i): NO                          F( 7, 5)        =  17.64
maximum lag: 2                                  Prob > F         =  0.0030
                                                within R-squared =  0.4463

```

UNMALE	Drisc/Kraay		t	P> t	[95% conf. interval]	
	Coefficient	std. err.				
EDIAVARAGE	-.1431464	.0229966	-6.22	0.002	-.2022611	-.0840317
INFLATION	.0120176	.0146856	0.82	0.450	-.025733	.0497682
logpop	-4.451081	1.749303	-2.54	0.052	-8.947807	.0456443
FDIGDP	-.0038506	.0089391	-0.43	0.685	-.0268294	.0191282
EDUGDP	-.0400071	.0956145	-0.42	0.693	-.2857919	.2057777
IQ	-.8559727	.2140876	-4.00	0.010	-1.406302	-.3056432
dummy_2020_2021	.4247792	.0888785	4.78	0.005	.1963098	.6532486
_cons	51.5509	12.78152	4.03	0.010	18.69495	84.40685

. xtsc UNFEMALE EDIAVARAGE INFLATION logpop FDIGDP EDUGDP IQ dummy\_2020\_2021, fe

```

Regression with Driscoll-Kraay standard errors   Number of obs   =   136
Method: Fixed-effects regression                 Number of groups =    6
Group variable (i): NO                          F( 7, 5)        =  13.29
maximum lag: 2                                  Prob > F         =  0.0058
                                                within R-squared =  0.4103

```

UNFEMALE	Drisc/Kraay		t	P> t	[95% conf. interval]	
	Coefficient	std. err.				
EDIAVARAGE	-.107603	.0285388	-3.77	0.013	-.1809642	-.0342417
INFLATION	.0400275	.0278171	1.44	0.210	-.0314787	.1115337
logpop	-7.881829	1.918021	-4.11	0.009	-12.81226	-2.9514
FDIGDP	-.0235407	.0139926	-1.68	0.153	-.0595099	.0124285
EDUGDP	-.0774966	.0958586	-0.81	0.456	-.3239091	.1689159
IQ	-3.023949	.6626172	-4.56	0.006	-4.727261	-1.320637
dummy_2020_2021	.3276223	.114292	2.87	0.035	.0338253	.6214194
_cons	74.42886	15.16851	4.91	0.004	35.43696	113.4208

