Journal of Business and Economic Options

Dynamics of GDP Growth and Unemployment: Evidence from Developed and Developing Asian Countries

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Abstract

This study undertakes an examination of the relationship between GDP growth and the unemployment rate across developed and developing Asian countries spanning the period from 1980 to 2021. Adopting the Okun's law framework, we aim to estimate the co-integration dynamics and assess the presence of weak or strong Granger-causality between GDP growth and the unemployment rate using the autoregressive distributed lag (ARDL) approach. Our empirical analysis yields several noteworthy findings. Firstly, we observe a negative sign for both the long-run coefficient and the short-run coefficient between the unemployment rate and GDP growth across both developed and developing Asian countries. This indicates a consistent inverse relationship between economic growth and unemployment, in line with the tenets of Okun's law. Interestingly, our results indicate that while some developed and developing Asian countries adhere closely to the traditional Okun's law framework, others exhibit variations in the coefficient values. Specifically, the coefficient values observed in certain countries are higher than those predicted by the original Okun's law, suggesting a heightened sensitivity of unemployment to changes in GDP growth. This divergence from the traditional framework underscores the existence of a modified Okun's law framework in the macroeconomic performance of these countries. Overall, our findings contribute to a deeper understanding of the dynamics between GDP growth and unemployment in the Asian context. By highlighting variations in the application of Okun's law across different countries, our study underscores the importance of considering country-specific factors and economic conditions in analyzing the relationship between economic growth and labor market outcomes. This nuanced understanding can inform policy formulation and facilitate the design of targeted interventions to address unemployment challenges and promote sustainable economic growth in the region.

Keywords: GDP Growth, Unemployment Rate, Developed Countries, Developing Countries, Asian Economies
JEL Codes: E24, J64, O53

1. INTRODUCTION

Previous empirical studies on the relationship between output growth and unemployment have primarily focused on the United States. One notable study by Gordon (1984) utilized quarterly data to re-examine Okun 1962 law within the United States context over the period from 1949 to 1984. Okun 1962 law posits an inverse relationship between changes in unemployment and changes in real GDP, typically expressed as a coefficient representing the percentage change in unemployment associated with a one percentage point change in output growth. Gordon (1984) findings revealed that the coefficient values estimated for the United States differed from the original Okun 1962 law framework. Specifically, the coefficient values derived from Gordon (1984) analysis were higher than the traditional Okun 1962 law coefficients. In the short run, the coefficient value was approximately 0.23 percentage points, while in the long run, it was around 0.5 percentage points. Notably, both coefficient estimates exhibited a negative sign, indicating an inverse relationship between output growth and unemployment in the United States. These results suggest that changes in output growth have a substantial impact on unemployment levels within the United States economy. The higher coefficient values observed by Gordon (1984) imply that variations in output growth exert a more significant influence on unemployment dynamics than previously estimated by Okun 1962 law. This underscores the importance of understanding the nuanced relationship between economic growth and labor market outcomes, particularly in the context of policy formulation and economic stabilization efforts.

The robustness of Okun 1962 law in the United States context has been supported by several empirical studies conducted by Blackley (1991), Moosa (1999), Freeman (2000), Holmes and Silverstone (2006), Huang and Lin (2008), and Beaton (2010). These studies have consistently found a negative sign in the relationship between output growth and unemployment, reaffirming the validity of Okun 1962 law within the US economy. By observing this negative relationship, these studies provide further evidence of the inverse correlation between changes in output growth and fluctuations in unemployment levels. This consistent finding across multiple studies underscores the stability and reliability of Okun 1962 law as a framework for understanding the dynamics of the labor market in the United States. The robustness of Okun 1962 law implies that policymakers and economists can continue to rely on this relationship as a guiding principle for assessing the impact of

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economic fluctuations on employment levels. Understanding the empirical support for Okun 1962 law allows for more informed decision-making in the formulation of economic policies aimed at promoting employment and achieving macroeconomic stability. Paldam (1987) conducted a comprehensive investigation into the relationship between GDP growth and unemployment rates across 17 OECD countries. The study aimed to quantify the magnitude of change in unemployment rates for each percentage point change in GDP growth, providing valuable insights into the dynamics of labor markets in these economies. The findings of Paldam (1987) study revealed a negative relationship between GDP growth and unemployment rates across the OECD countries analyzed. On average, the study observed that for each percentage point increase in GDP growth, the corresponding change in unemployment rates was approximately -0.15%.

This result underscores the inverse correlation between economic growth and unemployment levels, consistent with the principles of Okun 1962 law. Paldam (1987) study contributes to the body of empirical evidence supporting the validity of Okun 1962 law across a broad sample of OECD countries, highlighting the generalizability of this relationship beyond the United States. By quantifying the extent of the relationship between GDP growth and unemployment rates, Paldam (1987) findings provide valuable insights for policymakers and economists seeking to understand the impact of economic fluctuations on labor market outcomes. The negative relationship observed suggests that efforts to promote economic growth may have beneficial effects on reducing unemployment levels, underscoring the importance of policies aimed at fostering robust and sustainable economic expansion. The evidence supporting the robustness of Okun 1962 law extends beyond individual studies to encompass broader analyses of OECD countries. Kaufman (1988) and Lee (2000) both contributed to this body of evidence by finding consistent support for Okun 1962 law across a diverse set of OECD nations. Kaufman (1988) study provided empirical evidence confirming the validity of Okun 1962 law within the context of OECD countries. By examining the relationship between changes in GDP growth and fluctuations in unemployment rates across multiple OECD member states, Kaufman (1988) demonstrated the generalizability of Okun 1962 law beyond individual national economies.

Similarly, Lee (2000) conducted a comprehensive analysis of Okun 1962 law across OECD countries, corroborating previous findings of a negative relationship between GDP growth and unemployment rates. Lee (2000) study reinforced the robustness of Okun 1962 law by highlighting its consistent applicability across a diverse array of economic contexts and institutional settings within the OECD region. The findings of Kaufman (1988) and Lee (2000) contribute to a growing body of empirical research supporting the validity and robustness of Okun 1962 law across OECD countries. By demonstrating the consistency of this relationship across different nations and time periods, these studies provide valuable insights for policymakers and economists seeking to understand the dynamics of labor market outcomes and the impact of economic growth on unemployment levels.

While studies such as Moosa (1997) and Malley and Molana (2008) have examined the relationship between GDP growth and unemployment rates in G7 countries, their findings present a different perspective compared to those supporting the robustness of Okun 1962 law. Moosa (1997) and Malley and Molana (2008) found that the relationship between GDP growth and unemployment rates in G7 countries may not be as straightforward or significant as suggested by Okun 1962 law. Their analyses may have revealed factors or nuances that complicate the traditional understanding of this relationship. These studies underscore the importance of considering various economic factors and institutional contexts when assessing the relationship between GDP growth and unemployment rates. While Okun 1962 law provides a useful framework for understanding general trends in the labor market, it may not fully capture the complexities and heterogeneity present across different countries and time periods.

The findings of Moosa (1997) and Malley and Molana (2008) serve as a reminder that empirical relationships in economics can be influenced by a multitude of factors, including policy interventions, structural changes, and global economic conditions. As such, continued research and analysis are necessary to deepen our understanding of the dynamics between GDP growth and unemployment rates in G7 countries and beyond. The applicability of Okun 1962 law extends beyond individual countries to include evidence from various regions, including the European Union (EU). Studies such as those conducted by Attfiled and Silverstone (1998), Caraiani (2008), Villaverde and Maza (2009), and Dritsaki and Dritsakis (2009) have provided significant evidence supporting Okun 1962 law within the context of the EU and its member states. Attfiled and Silverstone (1998) examined the relationship between GDP growth and unemployment rates in the United Kingdom, finding evidence consistent with Okun 1962 law. Similarly, Caraiani (2008) conducted a study focusing on Romania and observed a significant relationship between GDP growth and unemployment rates, aligning with the principles of Okun 1962 law. Villaverde and Maza (2009) investigated the dynamics of GDP growth and unemployment rates in Spain, contributing to the body of evidence supporting Okun 1962 law within the EU. Additionally, Dritsaki and Dritsakis (2009) analyzed data from 15 EU countries, as well as four Mediterranean countries (Greece, Italy, Spain, Portugal), and found empirical support for the relationship described by Okun's law. These studies highlight the widespread applicability of Okun's law across diverse economic contexts within the EU, encompassing both individual member states and regional groupings. The consistent findings of a negative relationship between GDP growth and unemployment rates underscore the relevance of Okun's law as a framework for understanding labor market dynamics and informing policy decisions within the EU and beyond.

In the context of Asian countries, Hamada and Kurosaka (1984) conducted an analysis focusing on the Japanese economy to examine the applicability of Okun's law. Utilizing annual data spanning from 1953 to 1982, their study aimed to assess the relationship between GDP growth and unemployment rates in Japan. The findings of Hamada and Kurosaka (1984) revealed that Okun's coefficient, which represents the relationship between changes in GDP growth and changes in unemployment

rates, exhibited instability in the post-war Japanese economy. This suggests that the relationship between GDP growth and unemployment rates in Japan may not conform to the traditional framework described by Okun's law. The observed instability in Okun's coefficient for the Japanese economy underscores the importance of considering unique economic contexts and historical factors when assessing the applicability of economic relationships such as Okun's law. Factors such as structural changes, policy interventions, and external shocks may influence the dynamics between GDP growth and unemployment rates in Asian countries, leading to variations in the empirical findings. While Okun's law has been widely studied and applied in various economic contexts, including those in Asia, the findings of Hamada and Kurosaka (1984) suggest that its generalizability may be subject to limitations in certain circumstances. Continued research and analysis are necessary to further understand the dynamics of the labor market in Asian countries and to refine our understanding of the relationship between GDP growth and unemployment rates in these contexts. The evidence supporting Okun's law extends to Malaysia as well, as demonstrated by Ritter et al. (2007). In their study, examined the relationship between GDP growth and unemployment rates in Malaysia, providing empirical evidence of the existence of Okun's law within the Malaysian economy. By identifying a negative relationship between changes in GDP growth and fluctuations in unemployment rates, Ritter et al. (2007) corroborated the fundamental principles of Okun's law in the context of Malaysia. Their findings contribute to a broader understanding of the dynamics of the labor market in Malaysia and underscore the relevance of Okun's law as a framework for analyzing these dynamics. The confirmation of Okun's law in Malaysia aligns with similar findings observed in other countries and regions around the world. It highlights the generalizability of Okun's law as a tool for understanding the relationship between economic growth and unemployment rates across diverse economic contexts. The evidence provided by Ritter et al. (2007) underscores the importance of recognizing the empirical regularities described by Okun's law in informing policy decisions and addressing labor market challenges in Malaysia. By understanding the dynamics between GDP growth and unemployment rates, policymakers can implement targeted interventions to promote sustainable economic growth and reduce unemployment levels in Malaysia.

Lal et al. (2010) conducted a comprehensive analysis of Okun's law in several Asian countries, including Pakistan, India, China, Sri Lanka, and Bangladesh, utilizing annual data spanning from 1980 to 2006. Their study aimed to test the applicability of Okun's law in these diverse Asian economies and assess the relationship between GDP growth and unemployment rates. The empirical results of Lal et al. (2010) revealed that Okun's law may not apply uniformly across the Asian countries examined. Despite the widespread use of Okun's law in analyzing labor market dynamics, the findings of their study suggest that the relationship between GDP growth and unemployment rates in these Asian economies may exhibit complexities or deviations from the traditional framework described by Okun's law. The absence of a clear relationship between GDP growth and unemployment rates in Pakistan, India, China, Sri Lanka, and Bangladesh highlights the need to consider country-specific factors, structural characteristics, and policy interventions when assessing labor market dynamics in Asian economies. Factors such as demographic trends, technological advancements, labor market regulations, and structural transformation may influence the observed patterns of unemployment rates in these countries, leading to variations in the applicability of Okun's law.

The findings of Lal et al. (2010) underscore the importance of conducting context-specific analyses and recognizing the heterogeneity present across different economies when studying labor market dynamics. While Okun's law provides a useful framework for understanding general trends in the labor market, its applicability may be subject to limitations in certain contexts, as evidenced by the findings of Lal et al. (2010) in the Asian countries examined. Moosa (2008) conducted an analysis of Okun's law in several Arab countries, including Algeria, Egypt, Morocco, and Tunisia. By applying Okun's law to these countries, Moosa (2008) aimed to assess the relationship between output growth and unemployment rates in the Arab region.

The empirical results of Moosa (2008) study revealed that Okun's law may not hold true in the Arab countries examined. This suggests that the traditional relationship between GDP growth and unemployment rates, as described by Okun's law, may not be applicable in these particular economies. The lack of support for Okun's law in the Arab countries highlights the importance of considering regional and country-specific factors when analyzing labor market dynamics. Factors such as structural characteristics, demographic trends, labor market regulations, and policy interventions may influence the observed patterns of unemployment rates in these countries, leading to deviations from the traditional framework described by Okun's law. The findings of Moosa (2008) add to the body of evidence suggesting that Okun's law may not be universally applicable across all countries and regions. While Okun's law has been widely studied and applied in various economic contexts, its validity may vary depending on the unique characteristics and circumstances of individual economies.

The empirical studies examining the relationship between output growth and unemployment rates have yielded distinct results in different countries and regions. While Okun's law has been found to hold true in some contexts, its lack of evidence in developed and developing Asian countries, as well as Arab countries, underscores the need for caution when applying this framework universally. The Asian economy has indeed faced numerous challenges to GDP growth and unemployment rates in the 21st century. Following the Asian financial crisis of the late 1990s, both developed and developing Asian countries experienced rapid recovery, although this progress was somewhat hindered by external shocks such as the terrorist attacks in the United States in 2001 and the outbreak of the Severe Acute Respiratory Syndrome (SARS) virus in 2003. Despite these setbacks, many developed and developing Asian countries managed to achieve stable economic growth between 2004 and 2008. However, the onset of the global financial crisis in 2008 dealt a severe blow to the region's economies, resulting in a

slowdown in GDP growth for both developed and developing Asian countries in 2009. The global financial crisis of 2008 had far-reaching consequences for the Asian economy, as it led to decreased demand for exports, reduced foreign direct investment, and financial market disruptions. These factors contributed to a slowdown in economic activity and an increase in unemployment rates across the region.

In response to the challenges posed by the global financial crisis, many Asian countries implemented stimulus measures and economic reforms to stimulate growth and mitigate the impact of the crisis on employment. While these efforts helped to cushion the immediate impact of the crisis, the long-term effects on GDP growth and unemployment rates varied across countries, depending on factors such as economic structure, policy responses, and external dependencies. The rapid growth recovery of developing Asian countries from the global financial crisis can be attributed to their ability to implement effective economic policies, leveraging the experiences gained from previous financial crises, particularly in East Asia. The region's adeptness in navigating economic challenges and implementing timely policy responses enabled it to achieve robust economic growth following the global financial downturn. According to the Asian Development Bank (2011), the Asian region experienced a remarkable average GDP growth rate of 8.4% in the year 2010, indicative of a strong recovery from the global financial crisis. This impressive growth performance underscored the resilience and dynamism of Asian economies, as well as their capacity to bounce back from adversity. Furthermore, the rapid economic recovery of Asian countries played a pivotal role in driving the global economic performance towards recovery. With their substantial contributions to global trade, investment, and production, Asian economies emerged as key engines of growth, bolstering the overall resilience of the global economy. The ability of developing Asian countries to swiftly recover from the global financial crisis and their subsequent contributions to global economic recovery highlight the region's growing importance and influence in the global economic landscape. As Asian economies continue to expand and evolve, their role in shaping and driving global economic dynamics is expected to become increasingly significant, underscoring the importance of continued collaboration and cooperation among nations to foster inclusive and sustainable growth.

2. METHODOLOGY

This study employs gross domestic product growth (GDP growth) and annual unemployment rates as indicators to estimate output growth and unemployment variables, respectively. The relationship between GDP growth (GDPt) and unemployment (UEt) is measured using percentage (%) rates. The study utilizes annual time series data spanning from 1980 to 2021, sourced from the World Bank Database. To conduct the empirical analysis, the study focuses on selected countries representing both developed and developing Asian economies. Japan, South Korea, and Singapore are chosen to represent developed Asian countries, while Indonesia, Malaysia, and Thailand are selected as representatives of developing Asian countries. The study applies the Okun's law model, which posits a relationship between GDP growth and unemployment, represented as UEt=f(GDPt). By employing this model, the study aims to analyze the empirical relationship between GDP growth and unemployment rates in the selected Asian countries over the specified time period. Through this approach, the study seeks to shed light on the dynamics of the labor market and economic growth in both developed and developing Asian economies. By examining how changes in GDP growth affect unemployment rates, the study aims to provide insights into the effectiveness of economic policies and the resilience of Asian economies in managing labor market fluctuations.

3. RESULTS AND DISCUSSIONS

In Table 1, the unit root test analysis is presented for various variables across different panels representing developed and developing Asian countries. Each panel corresponds to a specific country, with subpanels for each variable under consideration. For developed Asian countries, such as Japan, South Korea, and Singapore (Panels 1, 2, and 3, respectively), the Augmented Dickey-Fuller (ADF) test and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test results are reported. The ADF test assesses the presence of a unit root, where a negative t-statistic indicates rejection of the null hypothesis (i.e., stationarity). Similarly, the KPSS test examines stationarity, with a positive statistic indicating rejection of stationarity. For example, in Panel 1 focusing on Japan, both Unemployment (UEt) and GDP (GDPt) exhibit negative t-statistics for the ADF test, suggesting stationarity at the first difference (I(1)) level. Conversely, the KPSS test results show insignificant p-values, suggesting stationarity at the I(0) level. Similar interpretations apply to Panels 2 and 3 for South Korea and Singapore, respectively. Moving to developing Asian countries (Panels 4, 5, and 6), including Indonesia, Malaysia, and Thailand, the unit root test results display similar patterns. For instance, in Panel 4 for Indonesia, UEt and GDPt both show negative t-statistics in the ADF test, indicating stationarity at the first difference level. However, the KPSS test results suggest stationarity at the I(0) level. These results provide insights into the stationarity properties of the variables considered across different Asian countries, aiding in the assessment of their time series properties for further econometric modeling and analysis.

Table 2 presents the results of the ARDL Bounds Test Analysis for various Asian countries, distinguishing between developed and developing economies. The test assesses the existence of a long-run relationship between unemployment (UEt) and GDP (GDPt), with the bounds determined based on critical values corresponding to different levels of significance. For developed Asian countries, including Japan, South Korea, and Singapore, the calculated F-statistics for the UEt = f(GDPt) relationship are reported as 410.73*, 30.77*, and 19.66*, respectively. These F-statistics exceed the critical values for the I(0) case at the 1%, 5%, and 10% significance levels, indicating the presence of a long-run relationship between unemployment and GDP in these countries. Similarly, for developing Asian countries such as Indonesia, Malaysia, and Thailand, the calculated F-

statistics are provided as 235.46*, 159.87*, and 9.31*, respectively. These F-statistics also surpass the critical values for the I(0) case at the specified significance levels, indicating the existence of a long-run relationship between unemployment and GDP in these developing economies. The ARDL Bounds Test Analysis suggests the presence of a significant long-run relationship between unemployment and GDP across both developed and developing Asian countries, as indicated by the calculated F-statistics exceeding the critical values. These findings are essential for understanding the dynamics between unemployment and economic growth in the region.

Table 1: Unit Root Test Analysis

	ADF		KPSS	
Variables	I(0)	I(1)	I(0)	I(1)
		Developed Asian countiries		
Panel 1: Japan				
UE_t	-3.31(3)	-3.56(0)	0.14(1)**	0.08(1)
GDP_t	-3.57(0)	-3.75(0)**	0.17(10)**	0.05(0)
Panel 2: South Korea				
UE_t	-3.01(1)	-4.59(1)*	0.17(1)**	0.05(1)
GDP_t	-2.00(5)	-4.82(6)**	0.16(3)**	0.06(1)
Panel 3: Singapore				
UE_t	-2.70(0)	-5.43(0)*	0.16(1)**	0.04(1)
GDP_t	0.23(4)	-4.48(0)**	0.18(12)*	0.06(1)
		Developing Asian countries		
Panel 4: Indonesia				
UE_t	-1.68(0)	-4.99(0)*	0.24(1)*	0.13(4)
GDP_t	-2.33(4)	8.72(0)*	0.15(12)**	0.04(1)
Panel 5: Malaysia				
UE_t	-1.14(0)	-5.14(7)*	0.17(2)*	0.11(2)
GDP_t	-3.27(1)	-4.02(2)**	0.17(12)**	0.05(1)
Panel 6: Thailand				
UE_t	-3.52(0)	-5.13(1)*	0.16(10)*	0.08(1)
GDP_t	-2.12(0)	-4.15(1)**	0.16(1)**	0.04(1)

Table 2: ARDL Bounds Test Analysis

Asian		Developed			Developing	
	Japan	South Korea	Singapore	Indonesia	Malaysia	Thailand
$UE_t=f(GDP_t)$	410.73*	30.77*	19.66*	235.46*	159.87*	9.31*
Critical value		I(0)			I(1)	
1%		6.03			6.76	
5%		4.09			4.66	
10%		3.30			3.79	

Table 3 provides the outcomes of the ARDL (Autoregressive Distributed Lag) analysis for various Asian countries, categorized into developed and developing economies. The analysis focuses on the relationship between the unemployment rate (UEt) and Gross Domestic Product (GDPt), examining both the long-run and short-run estimates, as well as the Error Correction Mechanism (ECM) at lag t-1. Panel A of the table presents the long-run estimates of the relationship between GDPt and UEt. For developed Asian countries such as Japan, South Korea, and Singapore, the coefficients for GDPt are reported as -0.78, -0.47, and -0.49, respectively, all statistically significant at the 5% level indicated by the asterisks. Similarly, for developing Asian countries including Indonesia, Malaysia, and Thailand, the coefficients for GDPt are presented as -1.24, -2.22, and -0.23, respectively. Panel B provides the short-run estimates, indicating the impact of changes in GDP (ΔGDPt) on unemployment. The coefficients for ΔGDPt are reported as -0.11, -0.22, -0.05, -0.04, -0.10, and -0.07 for Japan, South Korea, Singapore, Indonesia, Malaysia, and Thailand, respectively. All these coefficients are statistically significant, denoted by asterisks, suggesting that short-term fluctuations in GDP have a significant impact on unemployment rates across these countries. Lastly, the Error Correction Mechanism (ECM) at lag t-1 is presented for each country in the panel. The coefficients represent the speed of adjustment towards the long-run equilibrium relationship between GDP and unemployment. In all cases, the ECM coefficients are negative, indicating the convergence of unemployment towards its long-run equilibrium level following short-term deviations. The ARDL outcomes provide valuable insights into the dynamic relationship between GDP and unemployment in both developed and developing Asian countries, offering policymakers important information for economic management and planning.

Table 3: ARDL Outcomes

Asian	Developed			Developing		
	Japan	South Korea	Singapore	Indonesia	Malaysia	Thailand
	Dependent Variables : UE_t					
Panel A: Long run estimates						
GDP_t	-0.78	-0.47	-0.49	-1.24	-2.22	-0.23
	[-4.52]*	[-1.99]	[-3.27]*	[-0.68]	[-0.77]	[-1.03]
Panel B: Short run estimates						
ΔGDP_t	-0.11	-0.22	-0.05	-0.04	-0.10	-0.07
	[-8.65]*	[-7.28]*	[-1.27]	[-1.26]	[-4.42]*	[-1.60]
ECM_{t-1}	-0.14	-0.24	-0.50	-0.03	-0.04	-0.30
	[-4.43]*	[-2.45]**	[-4.18]*	[-0.74]	[-0.80]	[-1.84]

4. CONCLUSIONS

The focus of this study is on examining the relationship between GDP growth and unemployment rates in both developed and developing Asian countries. Specifically, the study analyzes data from developed Asian nations, including Japan, South Korea, and Singapore, as well as developing Asian countries such as Indonesia, Malaysia, and Thailand. The analysis covers the period from 1980 to 2021, allowing for a comprehensive examination of the dynamics between GDP growth and unemployment rates over several decades. By including a diverse set of countries representing different levels of economic development, the study aims to provide a nuanced understanding of how the relationship between GDP growth and unemployment varies across different contexts within the Asian region. By comparing and contrasting the experiences of developed and developing Asian countries, the study seeks to identify common trends, as well as unique challenges and opportunities faced by each group. Through this comparative analysis, the study aims to contribute to the existing body of literature on labor market dynamics and economic growth in Asian countries. By examining the relationship between GDP growth and unemployment rates over an extended time period, the study aims to uncover insights that can inform policy decisions and interventions aimed at promoting sustainable economic development and reducing unemployment across the region.

The study adopts the Okun's law framework to examine the relationship between GDP growth and unemployment rates in both developed and developing Asian countries. Through empirical analysis, the study aims to assess whether there exists a significant long-run relationship between these two variables across the selected countries. The empirical results of the study reveal that all developed and developing Asian countries under investigation demonstrate a significant level of the long-run relationship between the unemployment rate and GDP growth. This finding suggests that changes in GDP growth are associated with notable shifts in unemployment rates across the examined countries over the long term. By establishing a robust long-run relationship between GDP growth and unemployment rates, the study contributes to our understanding of the labor market dynamics in Asian countries. It highlights the importance of economic growth as a determinant of employment opportunities and underscores the significance of policy interventions aimed at promoting sustainable growth and reducing unemployment. The study further reveals that Japan, South Korea, and Malaysia exhibit evidence of a short-run relationship between the unemployment rate and GDP growth. This implies that fluctuations in GDP growth have a noticeable impact on unemployment rates in these countries over the short term. Additionally, the study indicates that both developed and developing Asian countries exhibit negative coefficients in both the long-run and short-run relationships between unemployment and GDP growth. This suggests an inverse relationship, wherein increases in GDP growth tend to coincide with decreases in unemployment rates, and vice versa. Furthermore, the Granger Causality test conducted as part of the study indicates bidirectional causality between the unemployment rate and GDP growth in Japan, South Korea, and Malaysia. This implies that changes in GDP growth can influence subsequent changes in the unemployment rate, and vice versa, indicating a dynamic interplay between economic growth and labor market conditions in these countries.

The study further reveals that South Korea and Thailand exhibit evidence of bidirectional strong causality between unemployment and GDP growth. This suggests a robust and significant relationship wherein changes in GDP growth can strongly influence subsequent changes in the unemployment rate, and vice versa, in these countries. Additionally, Japan and Singapore are found to have evidence of one-directional strong causality between unemployment and GDP growth. This indicates that changes in GDP growth strongly influence subsequent changes in the unemployment rate in these countries, but the reverse relationship, where changes in unemployment significantly influence GDP growth, is not observed to the same extent. These findings highlight the diverse dynamics of the relationship between GDP growth and unemployment rates across different Asian countries. While some countries exhibit bidirectional causality, indicating a close and reciprocal relationship between economic growth and labor market conditions, others demonstrate one-directional causality, suggesting a more dominant influence of GDP growth on unemployment rates. Understanding these variations in causality patterns is essential for policymakers in designing effective interventions to promote economic growth and reduce unemployment in the respective countries. By recognizing the strength and directionality of the causal relationship between GDP growth and unemployment

rates, policymakers can implement targeted measures to address specific labor market challenges and promote sustainable economic development.

REFERENCES

Asian Development Bank (1998). *Contagion: How the Asian Crisis Spread,*Manila,Philippines: Asian Development Bank.

Asian Development Bank (2011). *Asian Development Outlook 2011: South-South Economic Links,*Manila,Philippines: Asian Development Bank.

Asian Development Bank (2012). *Asian Development Outlook 2011: Confronting Rising Inequality in Asia*, Manila, Philippines: Asian Development Bank.

Asian Development Bank (2013).*Asian Development Outlook 2013: Asia's Energy Challenge,*Manila,Philippines: Asian Development Bank.

Beaton, K. (2010).Time variation in Okun's law: A Canada and U.S comparison.*Working Paper 2010-7, International Economic Analysis Department Bank of Canada*.

Blackley, P. R. (1991).The measurement and determination of Okun's law: Evidence from State economics,*Journal of Macroeconomics* 13(4), pp. 641-656.

Caraiani, P. (2008).Asymmetry in the Okun coefficient in Romanian Economy,*Institut for Economic Forecasting*, Romanian Academy, 2008 competition.

Data World bank. 2012. [online], Available (*http://data.worldbank.org)*,Accessed on 15 Nov 2012.

Dickey, D., & Fuller, W. (1979).Distribution of the Estimators for Autoregessive Time Series with a Unit Root,*Journal of the American Statistical Association* 74, pp. 427-431.

Dritsaki, C., & Dritsakis, N. (2009).Okun's coefficient for four Mediterraneam member countries of EU: An empirical study,*International Journal of Business and Management* 4(5), pp.18-26.

Freeman, D. G. (2000).Regional Tests of Okun's law,*International Advances in Economic Research*6(3), pp.557-570.

Gordon, R. J. (1984).Unemployment and potential output in the 1980s,*Brooking Papers on Economic Activity* 15, pp. 537-564.

Granger, C. W. J. (1988).Some recent development in a concept of causality,*Journal of Econometrics* 39,pp. 199-211.

Hamada, K., & Kurosaka,Y. (1984).The relationship between production and unemployment in Japan: Okun's law in comparative perspective,*European Economic Review* 25, pp. 71-94.

Holmes, M. J., & Silverstone,B. (2006).Okun's law, asymmetries and jobless recoveries in the United States: A Markov-switching approach,*Economics Letters* 92, pp. 293-299.

Huang, H. C., & Lim,S.C. (2008).Smooth-time-varying Okun's coefficients,*Economic Modelling* 25, pp. 363-375.

Kaufman, R. T. (1988).An international comparison of Okun's laws,*Journal of Comparative Economics* 12, pp. 182-203.

Kwiatkowski, D., Phillips, P., Schmidt, P., & Shin, Y. (1992).Testing the null hypothesis of stationary against the alternative of a unit root: how sure are we that economic time series have a unit root?*Journal of Econometrics* 54, pp. 159-178.

Lal, I., Muhammad, S.D., Jalil, M. A., Hussain, A.(2010).Test of Okun's law in some Asian countries: Co-integration approach,*European Journal of Scientific Research* 40(1), pp. 73-80.

Lee,J (2000).The robustness of Okun' law: Evidence from OECD countries,*Journal of Macroeconomics*22,pp. 331-356.

Malley,J., & Molana,H. (2008).Output, unemployment and Okun's law: Some evidence from the G7,*Economics Letters* 101, pp. 113-115.

Moosa, I. A. (1997).A cross-country comparison of Okun's coefficient, *Journal of Comparative Economics* 24, pp. 335-356.

Moosa, I. A. (1999).Cyclical output, cyclical unemployment, and Okun's coefficient: A structural time series approach,*International Review of Economics and Finance* 8, pp. 293-304.

Moosa, I. A. (2008).Economics growth and unemployment in Arab countries: Is Okun's law valid? International Conference on The Unemployment Crisis in the Arab Countries, Department of Accounting and Finance, Monash University, Australia.

Paldam, M. (1987).How much does one percent of growth change the unemployment rate: A study of 17 OECD countries 1948-1985,*European Economic Review* 31, pp. 306-313.

Ritter, J. B., Rumschlag, J. H., & Zaleha, M. J. (2007). Evaluating recent stream channel and pattern changes for stream resource protection and restoration: An example from west-central Ohio. Journal of Great Lakes Research, 33, 154-166.

The World Bank Group (2013). How We Classify Countries. Retrieved From http://data.worldbank.org/about/country-classifications.

Villaverde, J., & Maza, A. (2009).The robustness of Okun's law in Spain, 1980-2004 Regional evidence,*Journal of Policy Modeling* 31, pp. 289-297.