ISSN: 2454-6186 | DOI: 10.47772/IJRISS

Special Issue |Volume VIII Issue XIX December 2024

Unemployment and the Digital Economy in Malaysia: Unlocking the Potential of ICT for Sustainable Development

Asmawi Hashim[1*], Norasibah Abdul Jalil[2], Ruzimas Ayu Razali[3], Emilda Hashim[4], Norimah Rambeli[5]

[1,2,4,5]Lecturer, Faculty of management and Economics, Universiti Pendidikan Sultan Idris

[3]Lecturer, Department of Commerce, Politeknik Sultan Azlan Shah

***Corresponding Author**

DOI: https://dx.doi.org/10.47772/IJRISS.2024.ICAME2416

Received: 06 December 2024; Accepted: 14 December 2024; Published: 25 December 2024

ABSTRACT

With an emphasis on the ICT industry, this study examines how Malaysia's unemployment rate is influenced by the digital economy. It explores the relationship between unemployment and key digital economy metrics, such as the ICT sector's GDP contribution, foreign direct investment (FDI) in ICT, and mobile and broadband subscriptions, using Okun's Law as a framework. The study specifically analyzes how FDI in ICT affects the sector's growth and its role in reducing unemployment. The Auto-Regressive Distributed Lag (ARDL) model was applied to data from Q1 2010 to Q1 2023 to assess both short- and long-term dynamics.An F-statistic of 24.3024 confirms a significant long-term relationship between the variables, indicating a co-integrating association. The error correction model (ECM) coefficient of -2.1327 suggests that the unemployment rate adjusts at a pace of 2.13% toward equilibrium. These results highlight the crucial role of the ICT sector in reducing unemployment, particularly through its GDP contribution, broadband access, and FDI inflows.This study provides valuable insights for policymakers, contributing to Malaysia's development goals and aligning with the Sustainable Development Goals (SDGs).

Keywords: Unemployment, Digital economy, GDP, ARDL, SDGs

INTRODUCTION

In economic studies, unemployment is a subject that is always important. Everyone who has an interest in their nation's economic well-being—academics, legislators, politicians, and the general public—discusses it. According to the 1940 official definition of unemployment, which Card (2011) cites, a person who is able to work and actively looking for work but is unable to find employment is considered unemployed. Nonetheless, surveys of people 10 years of age and older were carried out in 1880 to gauge the length of unemployed, marking the beginning of attempts to quantify unemployment. The foundation of today's understanding of unemployment was not established until 1940, when the present concept of the labor force—which clearly links unemployment to active job seeking—was cemented.

One tool for assessing the labor market is the unemployment rate, which shows the percentage of the work force that is jobless. Malaysia's unemployment rate has been erratic over the past 11 years, with a recent upward trend, according to the World Bank Group. Following the worldwide trend, Malaysia has to face the harsh reality of its unemployment rate as a developing nation. With a 2.9 percent unemployment rate in 2014, this nation benefited from the lowest rate ever. On the other hand, this economic indicator showed a significant increase between 2019 and 2021. Malaysia's jobless rate skyrocketed to 4.5 percent in 2019 from 3.3 percent the year before. When the unemployment rate reached 4.6% in 2021, the tendency continued to increase.

ISSN: 2454-6186 | DOI: 10.47772/IJRISS
Special Issue |Volume VIII Issue XIX December 2024

The process of transforming all forms of information, including text, audio, photos, video, and other data from many sources, into a digital language is known as digitalization (Machekhina, 2017). Information and communication technology (ICT) facilitate such a procedure. Broadband, the Internet, cell phones, and fixed phones are powerful examples of this technology. Muro et al. (2017) defined digitalization as the transformation of business operations through the use of digital technologies and data from an economic standpoint. The digital economy is created when the traditional economy takes advantage of technical advancements, which leads to the exchange of new products and the creation of new markets and business models. Additionally, integrating developing technologies with the analog and digital worlds is a fantastic method to enhance company operations, data availability, and customer interactions (Eling & Lehman, 2017).

The creation of the Multimedia Super Corridor (MSC) in 1996 marked a significant turning point in Malaysia's information and communications technology development. The Malaysia Digital Economy Corporation is the organization in charge of overseeing it (MDEC). The MSC, as proposed by fourth Malaysian Prime Minister Tun Mahathir, is a key component of the nation's transition to an information and communication technology (ICT)-driven, knowledge-based economic model. MSC first worked with central-southern Selangor, including Petronas Towers in Kuala Lumpur and Kuala Lumpur International Airport in Sepang. The areas inside the MSC's boundaries are acknowledged as special economic zones that play vital roles in supporting Malaysia's economy. In 2022, the government made the decision to improve MSC's position and rebrand it as Malaysia Digital. In order to assess the growth of Malaysia's digital economy, this study selected a few metrics from the G20 Toolkit for Measuring the Digital Economy. The subsections that follow provide an analysis of certain indicators.

A study by Ndubuisi, Otioma, and Tetteh (2021) offers evidence that digital expansion has a positive impact on employment. The study's results, which were obtained by applying the Fixed-Effects Method (FEM), show that workers in the service sector profit from the beneficial contributions that digital infrastructure makes. Nonetheless, the effects must be considered in addition to controllable factors like corruption. This illustrates how important national institutions are to the economy of SSA nations. Furthermore, the study discovered that even while education is important, the regression in this study showed that digital development may have a significant impact on low educational levels. This was demonstrated by the study's emphasis on the potential for significant influence. Briefly said, the study's conclusions demonstrate that ICT (information and communication technology) has the potential to improve inclusion and reduce inequality in the African labor market.

Abbasabadi and Soleimani (2021) investigated how much unemployment is impacted by technical advancements. The authors used the Ordinary Least Square Method (OLS) and Generalized Least Squares (GLS) to analyze unemployment statistics for 154 countries in 2016. The variables covered were rather extensive due to the study methodologies' ability to complete the research. Using a few variables, the study examines the connection between unemployment and digital technologies. "Pillar 9: Technologies Readiness" is one of the variables that was created using a few survey questions. After that, the weight was split in half, with half going to "technological adoption" and the other half to "ICT use." One of the results showed that while "Technological Readiness" increased, so did unemployment in these 154 countries.

Ng (2017) conducted a study that examined the potential for technology adoption to jeopardize employment in Malaysia. Using the International Labor Organization's 2016 methodology, he discovered that, twenty years from now, almost 54 percent of Malaysian occupations were at high danger of being replaced by technology. The results were consistent with those of Koh & Manuel (2020), who claimed that in Malaysia, highly repetitive tasks account for almost half of working hours and can thus be automated. It turns into the element that increases the likelihood that digital development would replace jobs in Malaysia.

According to Wang, J et all (2024), employment was severely affected by the COVID-19 pandemic, making it difficult to raise the labor share. Nonetheless, the digital economy's recent growth has significantly increased

ISSN: 2454-6186 | DOI: 10.47772/IJRISS
Special Issue |Volume VIII Issue XIX December 2024

productivity and spurred economic prosperity. This poses a crucial query: is it possible for the expansion of the digital economy to increase labor share, lower income inequality, and improve labor productivity? Examining the fundamental mechanisms at work, this research investigates how labor share is affected by digital economic progress. According to our research, the digital economy may change the way jobs are structured, which would raise the labor share. However, different industries experience this influence to varying degrees. Additionally, from the standpoint of an industrial chain, the digital economy has produced technology spillover effects that are advantageous to both upstream and downstream industries. Given these results, it is imperative to keep promoting the expansion of the digital economy in order to mitigate any future adverse effects on the labor share.

The digital economy is changing employment trends by moving away from traditional structures and toward creative work paradigms in the context of the rapid progress of Internet technologies. Using micro-level data from the China Family Panel Survey (CFPS) from 2016 to 2020 and macro-level digital economy indicators, this study reveals that the digital economy not only improves employment quality but also encourages the development of new employment models. It emphasizes how the digital economy's ability to facilitate effective information sharing on online platforms helps match job seekers with opportunities that fit them, supporting the long-term development of these new employment paradigms. (Jin,X and Lyu,K (2024)

METHODOLOGY

Autoregressive Distributed Lag (ARDL), one of the econometric techniques that can analyze time series data, will be used in this study. This approach is useful for examining the relationship between the independent variables—the number of mobile cellular subscriptions (MOB), the number of broadband subscriptions (NBS), the contribution of ICT to the nation's gross domestic product (ICTGDP), and net flows of foreign direct investment in the ICT sector (ICTFDI)—and the dependent variable, unemployment (UNT).

The study employs a quantitative approach using an economics model called Auto-Regressive Distributed Lagged (ARDL) to accomplish its goals. Both short-term and long-term relationships can be estimated by this model. The dependent variable in an auto-regressive (AR) regression model regresses against its own lag, whereas a distributed lagged (DL) regression model incorporates both the present value and the explanatory variable's past value (lag). One or more lagged dependent variables among the explanatory variables make up an auto-regressive distributed lagged model.

The unit root test will be performed on the data. To make sure the variables can only be categorized as I(0) and I(1), it is strongly advised to complete this step. If any variable has been identified as I(2) data, this method should not be used any further. Considering pure random walk (none), random walk with drift/intercept, and random walk with drift and time trend, the ADF unit root test results were examined at the level and at first differencing (Hashim, A (2019). The ARDL model is executed as the third step. This process is essential since the results of the bound test and long-run relationship test, which come next, will be based on it. The next step is to use the Error Correction Model (ECM) technique to observe the short-term association. Diagnostic and normality tests will be used to evaluate the model's robustness. As a result, each step will be covered in greater detail in the study methods portion.

Since government agencies and other reliable organizations might be the only sources of information on the variables, secondary data analysis was selected. The data was gathered from a number of local sources, including the Ministry of Economy, the Department of Statistics, the Communications and Multimedia Commission, and Malaysia's Informative Data Centre. Furthermore, from the first quarter of 2010 to the first quarter of 2023, all data were gathered on a quarterly basis. Since the time series data might need more time, the included period can be considered one of the study's shortcomings. Nonetheless, a study can examine shorter time series data with at least 30 observations thanks to the methodology that was selected.

ISSN: 2454-6186 | DOI: 10.47772/IJRISS
Special Issue |Volume VIII Issue XIX December 2024

Equation 1 represents the general model for this investigation in a functional form. According to the equation, MOB stands for the number of mobile cellular subscriptions, NBS for the number of broadband subscriptions, UNT for unemployment, RICTGDP for real ICT gross domestic product, and RICTFDI for real ICT foreign direct investment. However, the model specification employed in the study is displayed in equation 2. The variables were notably in recorded form. Since the raw data was not normally distributed, the conversion to the linear logarithm was interpreted as the descriptive analysis.

$$UNT = f\ (RICTGDP, RICTFDI, MOB, NBS) \quad (1)$$

$$lnUNT_t = \beta_0 + \beta_1 lnRICTGDP_t + \beta_2 lnRICTFDI_t + \beta_3 lnMOB_t + \beta_4 lnNBS_t + \varepsilon_t \quad (2)$$

RESULTS AND DISCUSSION

To analyze the influence between all the variables formed by digital economy development and unemployment in Malaysia, this study applied the ARDL bounds testing proposed by Pesaran et al. (2001).

Table 1: Bound Test Result

F-statistics Value	Significance Level	Bound critical values (Unrestricted Constant and No Trend)	
		I(0)	I(1)
24.302424***	10%	2.45	3.52
	5%	2.86	4.01
	2.5%	3.25	4.49
	1%	3.74	5.06

The bound test result for the model used to investigate the co-integration between unemployment and the development factors of the digital economy is displayed in the table above. The critical value of the upper bound, I(1), has been compared with the F-statistics of the unrestricted ARDL. The F-statistics value was 24.3024, as can be shown, and it exceeded all upper bound values at every significance level. The value of the upper limit at a 5 percent significance level (4.01), however, should be the most crucial finding because the entire technique is consistent with this study at that level. This demonstrates that the null hypothesis, which postulates no long-term link between variables, may be rejected by the model. Therefore, there is a 95 percent chance that the alternative hypothesis—that there was a long-term relationship between the variables—can be accepted. In summary, the outcome demonstrated that the variables had long-term linkages and were co-integrating.

The identification of long-term partnerships can likewise be traced back to the prior process. One of the goals of this research is long-term estimation. The evaluation is significant since, from an economic standpoint, every element is subject to change. The long-term outcome is displayed in Table 2 below.

Table 2: Long-Run ARDL Estimation Model

Dependent Variable: Unemployment (UNT)				
Variable	Coefficient	Std. Error	T-statistics	Prob.
Constant	43.18099	7.833307	5.512485	0.0027 ***
RICTGDP	1.234062	0.086789	14.21917	0.0000 ***
RICTFDI	0.000920	0.017050	0.053973	0.9590
MOB	-2.865660	0.492760	-5.815527	0.0021 ***
NBS	-0.047599	0.016309	-2.918650	0.0331 **

ISSN: 2454-6186 | DOI: 10.47772/IJRISS
Special Issue |Volume VIII Issue XIX December 2024

The RICTGDP coefficient is negative over the long term. This is contrary to Okun's Law, which states that the quantity of labor in an economy determines the amount of output that may be generated. According to this test, the outcome indicates that a 1% increase in RICTGDP will result in a 1.23 percent increase in unemployment. Furthermore, because the probability value was 0.0000, the significance threshold also passed 95%. The length of the time series considered in this study may cause the outcome to differ even if the result is the opposite. A longer time series may be necessary for the estimation that satisfies Okun's law (Knottek II, 2013). Therefore, it is possible to vary the link between changes in output growth and unemployment with shorter time series data. The author also clarified that Okun's law's sensitivity to the business cycle could be the reason for its modifications. The recent shock that shrank and started the COVID-19 business cycle may be connected to this constraint.

Next indicator, unemployment and RICTFDI likewise exhibit a positive correlation. With a positive sign and a coefficient of 0.000920, it can be inferred that a 1 percent increase in unemployment will likewise result in an increase equal to the coefficient's value. The outcome, though, is hardly noteworthy. It is not unexpected that FDI has little effect on unemployment because other research on other nations or Malaysia has found the same thing (Johny et al., 2018; Nordin, 2017).

Both of the intended variables, nevertheless, were successful in demonstrating how the growth of the digital economy affects unemployment. Using this model, they were able to demonstrate how the growth of the digital economy can eventually lower unemployment. Regarding MOB, the decrease in unemployment is shown in the coefficient's negative sign. In other words, at a 95 percent confidence level, a 1 percent increase in MOB will reduce unemployment by up to 2.865660 percent. At a 95 percent confidence level, NBS also displayed an outstanding outcome. The long-term ARDL result indicates that a 1 percent rise in NBS can result in a 0.0475999 percent reduction in unemployment. The outcomes are consistent with those obtained by Mayer-Krahmer (1992) and Ebaidalla (2014).

The ECM value produced in the short-run estimation of ARDL should reflect how long it takes the model to attain equilibrium over the long term. Table 4.6 displays the result of the ECM derived from this model, which is -2.132684. Presumably, the relevant ECT parameter has a value between -1 and 0. However, if the coefficient of the lagged error correction term falls between -1 and -2, it produces muted fluctuations (Narayan & Smyth, 2006). The outcome then shows that, at a significance level of 5%, unemployment can reach a long-term equilibrium of nearly 2.13 percent. Since it was demonstrated that the short-term equilibrium could result in the long-run equilibrium, all of the estimated variables in this analysis—RICTGDP, RICTFDI, MOB, and NBS—have a major impact on unemployment, either in the short or long term.

CONCLUSION

The main conclusions of this study should be on the inverse association between Malaysian unemployment and MOB and NBS. The robustness and diagnostic tests validated the model's stability. Thus, these factors demonstrated that the growth of the digital economy effectively lowers unemployment. Thus, the development of the digital economy is probably going to be one of the primary drivers of Malaysia's economic expansion, according to this study. The policy recommendation would promote the Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development, which was created by the United Nations in 2012. All developed and developing nations, including Malaysia, adopted the vision as it was formulated by the UN. Improving the ICT industry is also very significant because it can be linked to certain objectives.

In summary, this study suggested a few strategies that could support ICT development, boost the growth of the digital economy, and lower unemployment. However, it is hoped that the strategies proposed in this study would help scholars and policymakers pay greater attention to the possible impact of the growth of the digital economy on unemployment. Policymakers and regulators rely on the data when modifying or improving the laws in order to address the unemployment problem and indirectly boost economic growth. Additionally, since

ISSN: 2454-6186 | DOI: 10.47772/IJRISS
Special Issue |Volume VIII Issue XIX December 2024

digital technology development has the potential to grow and play a significant role in Malaysia's economic growth, this study can assist foreign investors in looking for additional chances to invest in Malaysia.

ACKNOWLEDGMENTS

I want to sincerely thank each and every one of my co-authors for their invaluable advice, perceptive criticism, and unwavering support during the writing of this paper. Their knowledge and support were invaluable in getting this work done. I also extend my thanks to Faculty of Management and Economics and Universiti Pendidikan Sultan Idris as a support bodies for the funding which made this research possible. Special thanks to my family and friends for their unwavering support and encouragement.

REFERENCES

1. Abbasabadi, H. M., & Soleimani, M. (2021). Examining the effects of digital technology expansion on unemployment: A cross-sectional investigation. Technology in Society, 64, 9-13.
2. Card, D. (2011). Origins of the unemployment rate: The lasting legacy of measurement without theory. American Economic Review, 101(3), 552-557.
3. Ebaidalla, E. M. (2014, November). Effect of ICTs on youth unemployment in SubSaharan Africa: A panel data analysis. African Economic Conference on "Knowledge and Innovation for Africa's Transformation", Abidjan, Cote d'Ivoire, 1st-3rd.
4. Eling, M., & Lehmann, M. (2017). The impact of digitalization on the insurance value chain and the insurability of risks. The Geneva Papers on Risk and Insurance - Issues and Practice, 43(3), 359-396.
5. Hashim, A (2019) . Does Export Led Growth Hypothesis Hold Under World Crisis Recovery Regime in Malaysia? http://rwe.sciedupress.com. Research in World EconomyVol. 10, No. 5; Special Issue, 2019
6. Jing,X and Lyu K (2024). The impact of digital economy on emerging employment trends: Insights from the China Family Panel Survey (CFPS). Finance Research Letters.Volume 64, https://doi.org/10.1016/j.frl.2024.105418
7. Knotek II, E. S. (2007). How useful is Okun's law? Economic Review-Federal Reserve Bank of Kansas City, 92(4), 73.
8. Koh, E. H., & Manuel, N. (2020, February 17). Automation and adaptability: How Malaysia can navigate the future of work. McKinsey & Company. https://www.mckinsey.com/featured-insights/asia-pacific/automation-and-adaptability-how-malaysia-can-navigate-the-future-of-work.
9. Machekhina, O. N. (2017). Digitalization of education as a trend of its modernization and reforming. Revista Espacios, 38(40).
10. Mayer-Krahmer, F. (1992). The effects of new technologies on employment. Economics of Innovation and New Technology, 2, 131-149.
11. Muro, M., Liu, S., Whiton, J., & Kulkarni, S. (2017). Digitalization and the American workforce.
12. Ndubuisi, G., Otioma, C., & Tetteh, G. K. (2021). Digital infrastructure and employment in services: Evidence from Sub-Saharan African countries. Telecommunications Policy, 45(8), 1-19.
13. Ng, A. (2017). The times they are a-changin': Technology, employment, and the Malaysian economy. Khazanah Research Institute.
14. Wang,J et all (2024). Digital Economy, Employment Structure and Labor Share. 16(21), 9584; https://doi.org/10.3390/su16219584