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**IMPACT OF DIGITAL ECONOMY ON THE EMPLOYMENT:
EVIDENCE FROM ASEAN COUNTRIES**

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ABSTRACT

The digital economy is an economy based on digital computing technology. The digital economy is also known as the Internet Economy, New Economy, or Web Economy. Increasingly, "digital economies" are interconnected with traditional economies making clear takeovers more difficult. The digital economy has been identified as one of the growth engines that can strengthen the country's economy. With the digital economy in ASEAN, it can significantly improve the competitiveness of the global marketplace. ASEAN countries agree to make digital economics and electronic commerce or e-commerce as the future of the economy in Southeast Asia. However, this digital economy has an impact on the job. Generally there will be job opportunities and also retrenchment due to lack of expertise in technology. Other than that, other effects are broadband and the internet. Broadband plays a very important role in the digital economy. This is because it is a channel or online connection that makes the "digital economy" a reality. This study is aim to examine the impact of digital economy on employment in ASEAN countries. This study period is from 1997-2016 (20 years). This study focuses on the impact of digital economy on employment specifically in 10 ASEAN Countries (Malaysia, Indonesia, Thailand, Cambodia, Laos, Singapore, Brunei, Vietnam, Myanmar and Philippines). Each country is giving different impact because of the economy growths conditions itself. Panel data method has been used to is performed, Ordinary Least Square Regression, Fixed Effect Model, Random Effect Method, Hausman Test and Granger Causality Test to test the variables in this study. This study is using Eviews10. Based on the empirical findings, digital economy have significant effects on the variables that have been used. Broadband subscriptions give significant relationship. So we conclude that broadband subscriptions give a major impact to the digital economy on employment in ASEAN Countries. The study emphasizes in particular aspects relevant to employees and employers. Then the results of the research explain the impact of digital economy to the employment and how it related to the workers. It can also be used as a worker's preparation to go through the era of digital economy by looking at the relationship between the two and the consequences when one is neglected and ignored. In addition, impact of digital economy are also have been discussed to see the real reality of the digital economy in ASEAN countries.

Keywords: *ASEAN, Digital Economy, Employment, Fixed Effect, Random Effect, Panel Data*

ABSTRAK

Ekonomi digital adalah ekonomi yang berdasarkan teknologi pengkomputeran digital. Ekonomi digital juga dikenali sebagai Ekonomi Internet, Ekonomi Baru, atau Ekonomi Web. Ekonomi digital adalah berkait rapat dengan menjadikan ekonomi tradisional persempadanan kelihatan lebih jelas. Ekonomi digital telah dikenalpasti sebagai salah satu enjin pertumbuhan yang dapat memperkuat ekonomi negara. Dengan ekonomi digital di ASEAN, ia dapat meningkatkan daya saing pasaran global dengan ketara. Negara-negara ASEAN bersetuju untuk membuat ekonomi digital dan perdagangan elektronik atau e-dagang sebagai masa depan ekonomi di Asia Tenggara. Bagaimanapun, ekonomi digital ini mempunyai kesan ke atas pekerjaan itu. Secara amnya akan terdapat peluang pekerjaan dan juga pemberhentian kerana kekurangan kepakaran dalam teknologi. Selain itu, kesan lain adalah jalur lebar dan internet. Jalur lebar memainkan peranan yang sangat penting dalam ekonomi digital. ini kerana ia merupakan saluran atau sambungan dalam talian yang menjadikan "ekonomi digital" menjadi realiti. Kajian ini bertujuan untuk mengkaji kesan ekonomi digital terhadap pekerjaan di negara-negara ASEAN. Tempoh kajian ini adalah dari tahun 1997-2016 (20 tahun). Kajian ini memberi tumpuan kepada kesan ekonomi digital terhadap pekerjaan khususnya di 10 Negara ASEAN (Malaysia, Indonesia, Thailand, Kemboja, Laos, Singapura, Brunei, Vietnam, Myanmar dan Filipina). Setiap negara memberikan impak yang berbeza kerana keadaan pertumbuhan ekonomi itu sendiri. Data panel telah digunakan dengan menggunakan kaedah Ordinary Least Square Regression, Fixed Effect Model, Random Effect Method, Hausman Test dan Granger Causality Test untuk menguji pembolehubah dalam kajian ini. Kajian ini menggunakan Eviews10. Berdasarkan penemuan empirikal, ekonomi digital mempunyai kesan yang signifikan terhadap pembolehubah yang telah digunakan. Langganan jalur lebar memberikan hubungan yang signifikan. Oleh itu, kita menyimpulkan bahawa langganan jalur lebar memberi kesan besar kepada ekonomi digital mengenai pekerjaan di Negara-negara ASEAN. Kajian ini menekankan aspek tertentu yang berkaitan dengan pekerja dan majikan. Kemudian hasil penyelidikan menjelaskan kesan ekonomi digital kepada pekerjaan dan bagaimana ia berkaitan dengan pekerja. Ia juga boleh digunakan sebagai persediaan pekerja untuk melalui era ekonomi digital dengan melihat hubungan antara kedua-dua dan akibatnya apabila seseorang diabaikan dan diabaikan. Di samping itu, kesan ekonomi digital juga telah dibincangkan untuk melihat realiti sebenar ekonomi digital di negara-negara ASEAN..

Kata kunci: ASEAN, Ekonomi Digital, Data Panel, Pekerjaan, Fixed Effect, Random Effect

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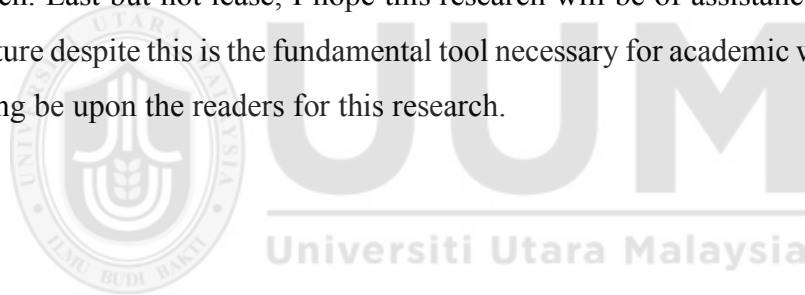


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Figure 2 : Theoretical Framework



LIST OF ABBREVIATIONS

TEMP	Total Employment
BROD	Broadband Subscriptions
WAS	Wages and Salary
GDP	Growth of Gross Domestic Product
USER	Internet Users



CHAPTER 1

INTRODUCTION

1.1 Background

The speedy growth in the economies of the East Asian and South-East Asian regions has happened in the last three decades. As stated by the World Bank (1993), the 23 economies of East Asia raised at a closer average rate than all other regions in the world over the 1965-90 periods. The High-Performing Asian Economies (HPAE) such as Japan, the 4 Asian Tigers (South Korea, Taiwan, Hong Kong and Singapore) and the 3 South-East Asian freshly industrializing economies (Indonesia, Thailand, and Malaysia), have grown-up at a rate more than twice as quick as the rest of East Asia since 1960. It has been recommended that the stages of economic development in these eight High-Performing Asian Economies (HPAE) go along flying geese pattern (Kwan, 1994), which started with the miraculous growth of the Japanese economy, followed by Hong Kong, South Korea and Taiwan, and more lately by some countries from South-East Asia. There have been some studies (for example, Young, 1992, 1995; Easterly, 1995; Fukuda and Toya, 1995) which have studied the economic growth of the 4 Asian Tigers. As there has been little research regarding the all countries in the South-East Asian region, this paper focuses on the all the countries of the Association of South-East Asian Nations (ASEAN).

ASEAN's strong and vibrant economy, favorable demographics, ICT investments, and ongoing economic integration have laid the foundation for the region to become a global leader in the digital economy. The 6 largest economies in ASEAN (Indonesia, Thailand, Malaysia, Singapore, Philippines, and Vietnam) contribute 99% of the total ASEAN GDP.

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APPENDIX A

DESCRIPTIVE ANALYSIS

Date: 06/07/18 Time: 14:27
Sample: 1997 2016

	TEMP	USER	WAS	BROAD	GDP
Mean	7.098043	0.984076	1.565190	5.133099	0.716010
Median	7.404339	1.234273	1.601516	5.305446	0.782958
Maximum	8.080395	1.908485	1.977724	6.970123	1.141261
Minimum	5.186295	-1.618629	0.732394	1.397940	-1.061996
Std. Dev.	0.734834	0.809834	0.299254	1.312200	0.323336
Skewness	-0.990753	-1.126709	-0.689645	-0.577871	-2.760933
Kurtosis	3.576151	3.616898	2.944262	2.509867	13.13388
Jarque-Bera Probability	24.84018 0.000004	31.84098 0.000000	11.11570 0.003857	9.193161 0.010086	776.9218 0.000000
Sum	993.7261	137.7707	219.1266	718.6338	100.2414



APPENDIX B

PANEL ORDINARY LEAST SQUARES

Dependent Variable: TEMP
Method: Panel Least Squares
Date: 06/07/18 Time: 14:28
Sample (adjusted): 1999 2016
Periods included: 18
Cross-sections included: 10
Total panel (unbalanced) observations: 140

Variable	Coefficient	Std. Error	t-Statistic	Prob.
USER	-0.267818	0.088858	-3.013986	0.0031
WAS	-0.851110	0.198401	-4.289851	0.0000
BROAD	0.182799	0.054912	3.328980	0.0011
GDP	0.366718	0.176195	2.081314	0.0393
C	7.492844	0.478172	15.66975	0.0000
R-squared	0.337012	Mean dependent var	7.098043	
Adjusted R-squared	0.317368	S.D. dependent var	0.734834	
S.E. of regression	0.607132	Akaike info criterion	1.874918	
Sum squared resid	49.76218	Schwarz criterion	1.979977	
Log likelihood	-126.2443	Hannan-Quinn criter.	1.917611	
F-statistic	17.15588	Durbin-Watson stat	0.054660	
Prob(F-statistic)	0.000000			



APPENDIX C

FIXED EFFECT MODEL

Dependent Variable: TEMP
 Method: Panel Least Squares
 Date: 06/07/18 Time: 14:31
 Sample (adjusted): 1999 2016
 Periods included: 18
 Cross-sections included: 10
 Total panel (unbalanced) observations: 140

Variable	Coefficient	Std. Error	t-Statistic	Prob.
USER	0.005991	0.006534	0.916915	0.3609
WAS	0.087435	0.021024	4.158761	0.0001
BROAD	0.032418	0.004667	6.946344	0.0000
GDP	-0.013896	0.007862	-1.767500	0.0796
C	6.798841	0.027650	245.8851	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.999081	Mean dependent var	7.098043
Adjusted R-squared	0.998986	S.D. dependent var	0.734834
S.E. of regression	0.023401	Akaike info criterion	-4.577401
Sum squared resid	0.069001	Schwarz criterion	-4.283237
Log likelihood	334.4181	Hannan-Quinn criter.	-4.457862
F-statistic	10533.35	Durbin-Watson stat	0.257007
Prob(F-statistic)	0.000000		




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APPENDIX D

RANDOM EFFECT MODEL

Dependent Variable: TEMP
 Method: Panel EGLS (Cross-section random effects)
 Date: 06/07/18 Time: 14:32
 Sample (adjusted): 1999 2016
 Periods included: 18
 Cross-sections included: 10
 Total panel (unbalanced) observations: 140
 Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
USER	0.005768	0.006533	0.882838	0.3789
WAS	0.086321	0.021015	4.107621	0.0001
BROAD	0.032650	0.004665	6.998696	0.0000
GDP	-0.013735	0.007862	-1.747129	0.0829
C	6.733028	0.245295	27.44866	0.0000

Effects Specification		S.D.	Rho
Cross-section random		0.770577	0.9991
Idiosyncratic random		0.023401	0.0009

Weighted Statistics			
R-squared	0.738587	Mean dependent var	0.057068
Adjusted R-squared	0.730841	S.D. dependent var	0.045368
S.E. of regression	0.023539	Sum squared resid	0.074802
F-statistic	95.35584	Durbin-Watson stat	0.237222
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	-0.031695	Mean dependent var	7.098043
Sum squared resid	77.43633	Durbin-Watson stat	0.000229

APPENDIX E

HAUSMAN TEST

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	5.544835	4	0.2358

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
USER	0.005991	0.005768	0.000000	0.0694
WAS	0.087435	0.086321	0.000000	0.0744
BROAD	0.032418	0.032650	0.000000	0.0698
GDP	-0.013896	-0.013735	0.000000	0.0285

Cross-section random effects test equation:

Dependent Variable: TEMP
Method: Panel Least Squares
Date: 06/07/18 Time: 14:33
Sample (adjusted): 1999 2016
Periods included: 18
Cross-sections included: 10
Total panel (unbalanced) observations: 140

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.798841	0.027650	245.8851	0.0000
USER	0.005991	0.006534	0.916915	0.3609
WAS	0.087435	0.021024	4.158761	0.0001
BROAD	0.032418	0.004667	6.946344	0.0000
GDP	-0.013896	0.007862	-1.767500	0.0796

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.999081	Mean dependent var	7.098043
Adjusted R-squared	0.998986	S.D. dependent var	0.734834
S.E. of regression	0.023401	Akaike info criterion	-4.577401
Sum squared resid	0.069001	Schwarz criterion	-4.283237
Log likelihood	334.4181	Hannan-Quinn criter.	-4.457862
F-statistic	10533.35	Durbin-Watson stat	0.257007
Prob(F-statistic)	0.000000		

APPENDIX F

GRANGER CAUSALITY TEST

Pairwise Granger Causality Tests
 Date: 06/07/18 Time: 14:34
 Sample: 1997 2016
 Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
BROAD does not Granger Cause TEMP TEMP does not Granger Cause BROAD	126	3.22230 0.88643	0.0433 0.4148
GDP does not Granger Cause TEMP TEMP does not Granger Cause GDP	148	2.95041 8.08957	0.0555 0.0005
USER does not Granger Cause TEMP TEMP does not Granger Cause USER	175	1.28980 0.11423	0.2780 0.8921
WAS does not Granger Cause TEMP TEMP does not Granger Cause WAS	180	3.05431 4.11453	0.0497 0.0179
GDP does not Granger Cause BROAD BROAD does not Granger Cause GDP	109	7.84498 1.93356	0.0007 0.1498
USER does not Granger Cause BROAD BROAD does not Granger Cause USER	126	3.32397 0.71362	0.0393 0.4919
WAS does not Granger Cause BROAD BROAD does not Granger Cause WAS	126	2.55972 0.28900	0.0815 0.7495
USER does not Granger Cause GDP GDP does not Granger Cause USER	146	1.64853 4.32455	0.1960 0.0150
WAS does not Granger Cause GDP GDP does not Granger Cause WAS	148	10.6293 0.87189	5.E-05 0.4204
WAS does not Granger Cause USER USER does not Granger Cause WAS	175	2.13630 0.12629	0.1213 0.8814