IMPACT OF FINTECH ON THE ECONOMIC GROWTH: EVIDENCE FROM SELECTED COUNTRIES

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ABSTRACT

Fintech or financial technology is a mix of two words between financial and technology and can be literally defined as the usage of technology to convey financial responses in the financial segment. Previously for the past of two decades, the continuing application and dispersion of the Internet and online business also advancement in information technology (IT) have fundamentally modified the global economy activity. The motivation of the study is to investigate an individual impact that mobile cellular as proxy for Fintech contributed to the growth of economy as logicality of the technology as far as changing the way economic activity is composed recommends that mobile telecommunications has highlights of what is mentioned to be a general useful technology. Furthermore, the significance use of Fintech in the economy might affected the other macroeconomic variables such as the availability of labor force due to technological advancements that bringing down the cost for machinery and equipment as compared to labor cost, which motivated the business to change from human labor to capital. Hence, this study aim to disentangle the two possible relationship, that is the relationship of Fintech and the economic growth and the relationship between Fintech with other macroeconomic variables. This study examines the relationship between Fintech and economic growth through several econometric analyses by using the panel data of nineteen selected countries for year 1988-2015. In this study, a general production function is employed in which gross domestic product (GDP) is used to represent economic growth and mobile cellular subscriptions to represents Fintech. There are also other variables such as total population and energy consumption used as independent variables. In order to answer the objectives of the study, the method to be employed are Panel Ordinary Least Squares (POLS) which to estimate how dependent variable reacts when there is an increase in independent variables, Granger causality test is to determine the direction of causality between all variables and panel ARDL model is perform to determine whether there is the long-run relationship between financial technology (Fintech) and the growth. The finding of the study is consistent the Schumpeter theory that highlight the importance of technological development to boost the economic growth. Based on empirical findings, there is exist a long relationship between Fintech and the economic growth. Besides, the estimated result show that other independent variables such as energy consumption exists bidirectional causality with Fintech in the long run, meanwhile it exists unidirectional causality relationship between population and Fintech in the long run. In addition, the empirical evidence based on ARDL showed that Fintech has long-run relationship with economic growth. The long-run relationship exist between Fintech and the economy growth highlighted that it would be the government's role to enhance the population productivity by encourage to engage in online transaction as it has opportunity in improving and growing the economy. The government should invest in Fintech companies that provide such technological advancement as it would be interesting in adopting the Fintech across the countries.

Keywords: economic growth, fintech, granger causality test, panel ARDL, panel OLS, Schumpeter theory

ABSTRAK

Fintech atau teknologi kewangan adalah gabungan dua perkataan antara kewangan dan teknologi dan boleh secara literalnya ditakrifkan sebagai penggunaan teknologi untuk menyampaikan tindak balas kewangan dalam segmen kewangan. Semenjak dua dekad yang lalu, penerapan dan penyebaran Internet dan perniagaan dalam talian yang berterusan serta kemajuan dalam teknologi maklumat (IT) telah mengubah secara amnya aktiviti ekonomi global. Motivasi kajian ini adalah untuk menyiasat impak individu bahawa selular mudah alih sebagai proksi untuk Fintech menyumbang kepada pertumbuhan ekonomi, logiknya teknologi sehinggalah mengubah cara aktiviti ekonomi disusun mengesyorkan bahawa telekomunikasi mudah alih mempunyai kemunculan dari apa yang disebutkan sebagai teknologi berguna yang umum. Tambahan pula, penggunaan Fintech yang penting dalam ekonomi mungkin menjejaskan pembolehubah makroekonomi lain seperti ketersediaan tenaga buruh disebabkan oleh kemajuan teknologi yang menurunkan kos untuk jentera dan peralatan berbanding dengan kos buruh, yang memotivasi perniagaan untuk berubah dari tenaga buruh ke modal. Oleh itu, kajian ini bertujuan untuk menguraikan dua hubungan yang mungkin, iaitu hubungan Fintech dan pertumbuhan ekonomi dan hubungan antara Fintech dengan pembolehubah makroekonomi lain. Kajian ini mengkaji hubungan antara teknologi kewangan (Fintech) dan pertumbuhan ekonomi melalui beberapa analisis ekonomi dengan menggunakan data panel dari sembilan belas negara terpilih untuk tahun 1988-2015. Dalam kajian ini, fungsi pengeluaran umum digunakan di mana keluaran dalam negara kasar (KDNK) digunakan untuk mewakili pertumbuhan ekonomi dan langganan selular mudah alih untuk mewakili teknologi kewangan (Fintech). Terdapat juga pembolehubah lain seperti jumlah penduduk dan penggunaan tenaga yang digunakan sebagai pembolehubah bebas. Untuk menjawab objektif dalam kajian ini, ujian-ujian telah dijalankan termasuk Panel Ordinary Least Square (POLS) untuk menganggarkan bagaimana pemboleh ubah yang bergantung kepada tindak balas apabila terdapat peningkatan pembolehubah bebas, Granger causality ujian untuk menentukan arah sebab akibat antara semua pembolehubah dan panel ARDL model adalah melaksanakan untuk menentukan sama ada terdapat hubungan jangka panjang antara Fintech dan pertumbuhan. Penemuan kajian ini selaras dengan Schumpeter teori yang menekankan pentingnya pembangunan teknologi untuk meningkatkan pertumbuhan ekonomi. Berdasarkan penemuan empirikal, terdapat hubungan panjang antara Fintech dan pertumbuhan ekonomi. Di samping itu, hasil yang dianggarkan menunjukkan bahawa pemboleh ubah bebas yang lain seperti penggunaan tenaga wujud sebab kaitan dua arah dengan Fintech dalam jangka masa panjang, manakala wujud hubungan satu arah di antara populasi dengan Fintech dalam jangka panjang. Di samping itu, bukti empirikal berdasarkan ARDL menunjukkan bahawa Fintech mempunyai hubungan jangka panjang dengan pertumbuhan ekonomi. Hubungan jangka panjang wujud antara Fintech dan pertumbuhan ekonomi menekankan bahawa ia akan menjadi peranan kerajaan untuk meningkatkan produktiviti penduduk dengan menggalakkan untuk terlibat dalam urus niaga dalam talian kerana ia mempunyai peluang untuk meningkatkan dan mengembangkan ekonomi. Kerajaan perlu melabur dalam syarikat-syarikat Fintech yang menyediakan kemajuan teknologi seperti ia akan menjadi menarik dalam menerima pakai Fintech di seluruh negara.

Kata kunci: pertumbuhan ekonomi, fintech, granger causality ujian, panel ARDL, panel OLS, Schumpeter teori

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller
APF	Annual Production Function
ARDL	Autoregressive Distributed Lag
CEE	Central and Eastern Europe
Fintech	Financial technology
ICT	Information and communication technology
IT	Information technology
GDP	Gross Domestic product
GLS	Generalized Least Square
GMM	Generalised Method of Moments
MENA	Middle East and North Africa
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Square
PMG	Pooled Mean Group
PP	Phillips-Perron
R&D	Research and Development
SADC	Southern African Development Community
SLS	Stage Least Square
SMS	Short message
TFP	Total Factor Productivity
TFPG	Total Factor Productivity Growth
US	United States of America
VC	Venture capital

CHAPTER 1
INTRODUCTION

1.1 Introduction

Nowadays, information and innovation in communication become the focus point of most countries in the world as such these advancement has successfully penetrated the market of both developing and developed countries. Previously for the past of two decades, the continuing application and dispersion of the Internet and online business also advancement in information technology (IT) have fundamentally modified the global economy activity. Technology is not a new phenomenon in this modern world. It keep changing ever since it have been established in order to cater needs of changing in consumer behaviour which demanded technology advances in the palm of their one hand. It is hard to resist with the fact that millions of people throughout the world use technology such as Internet in their daily activities, for example to conduct research or using online banking to purchase things online. Combination the advancement of technology with the Internet create a good business platform for a firm in order to compete in the competition environment.

Presently, the world is experiencing the new industry that well known as Fourth Industrial Revolution or Industry 4.0 in which mostly all are affected including government, public and private institutions in transforming their current framework to a new technology advancement at their workplace (Caruso, 2017). As such, there is a need to understand theoretically the relationship between financial technology and economic growth as technology represent pictures and potentials in the future.

The contents of the thesis is for internal user only

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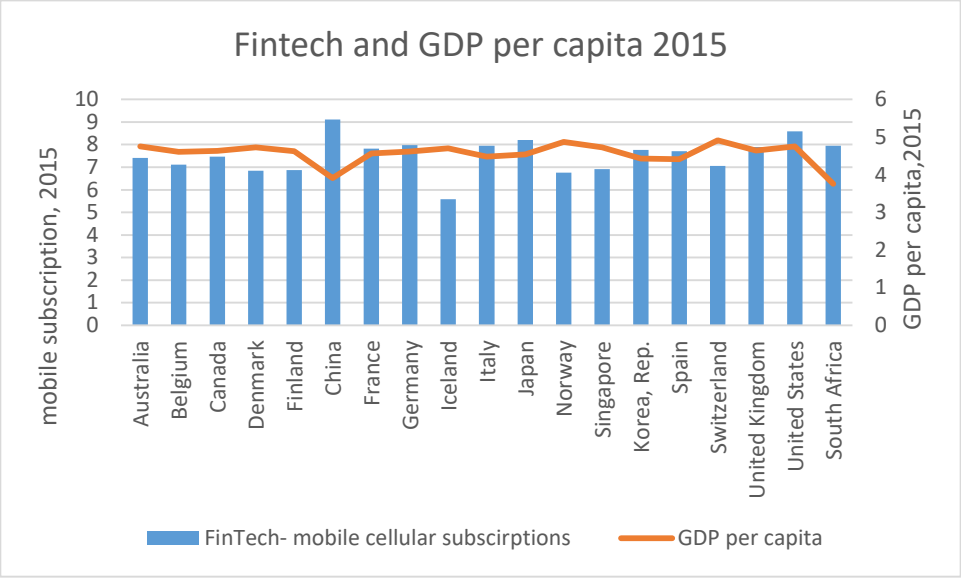
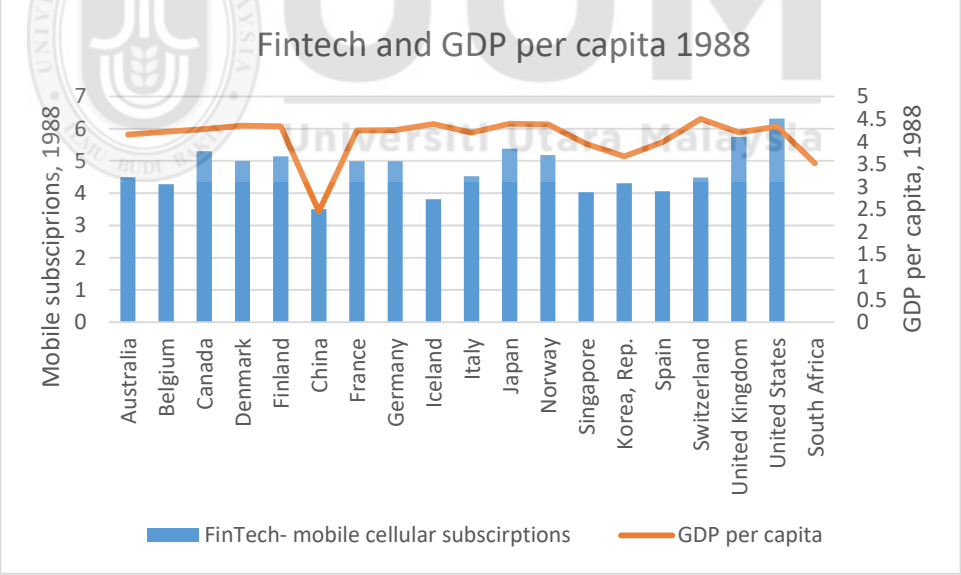
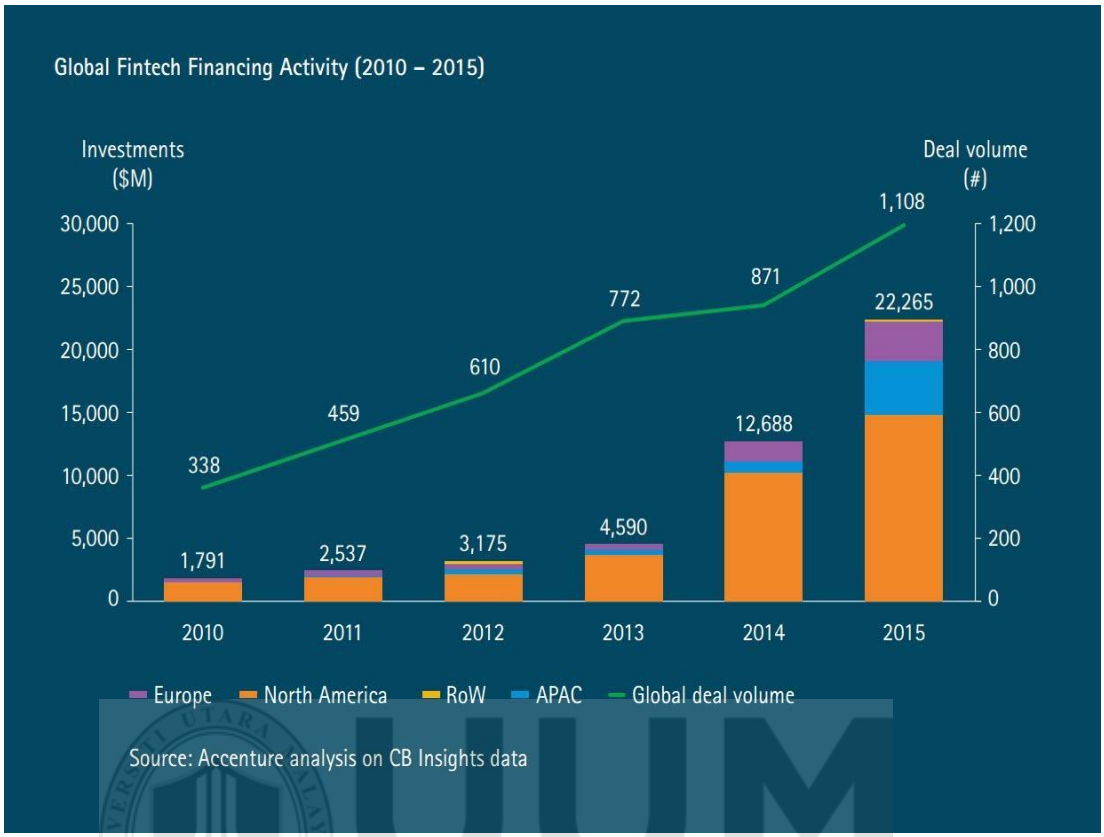
APPENDICES

APPENDIX A

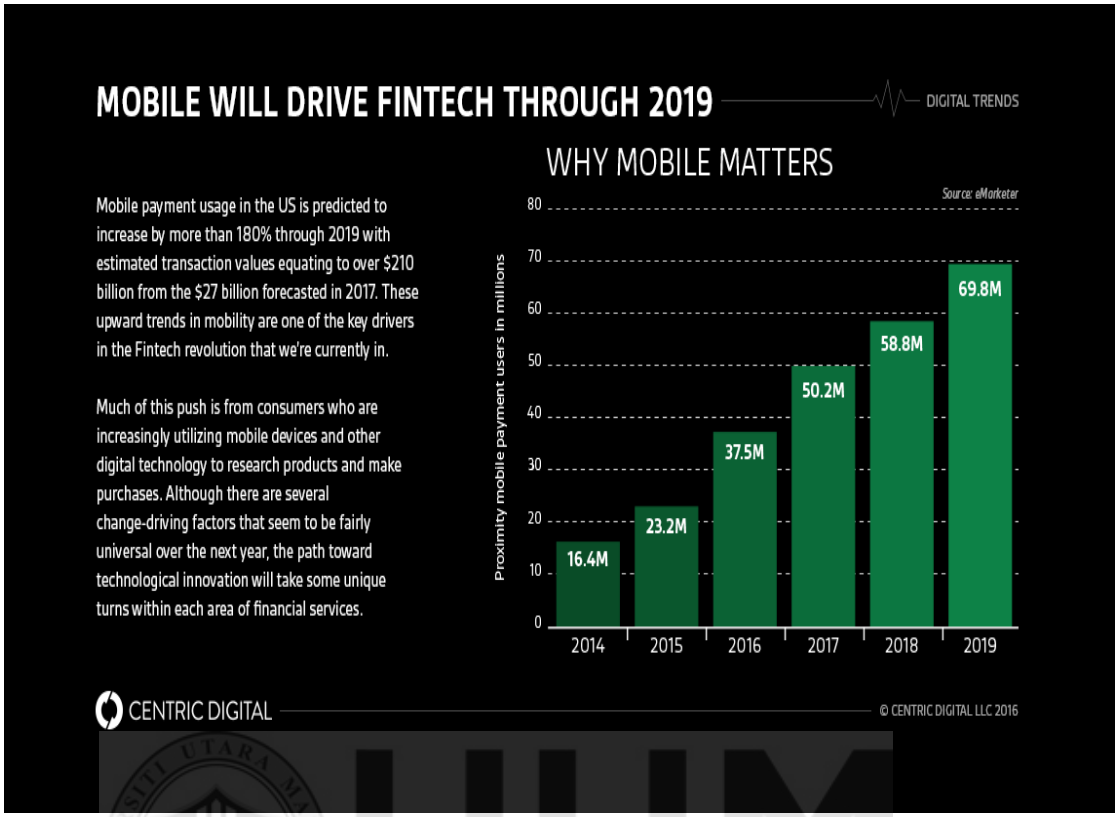




APPENDIX B



APPENDIX C



APPENDIX D

Dependent Variable: LOG_GDP
Method: Panel Least Squares
Date: 04/15/18 Time: 16:34
Sample: 1988 2015
Periods included: 28
Cross-sections included: 19
Total panel (unbalanced) observations: 531

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.252933	0.326445	9.964723	0.0000
CAPITAL	-0.013836	0.001964	-7.043503	0.0000
LOG_ENERGY	0.522315	0.066787	7.820597	0.0000
LOG_FINTECH	0.127796	0.011970	10.67603	0.0000
LOG_POP	-0.221321	0.020249	-10.92999	0.0000
R_D	0.172137	0.016543	10.40569	0.0000

R-squared	0.682095	Mean dependent var	4.373289
Adjusted R-squared	0.679067	S.D. dependent var	0.416438
S.E. of regression	0.235916	Akaike info criterion	-0.039446
Sum squared resid	29.21961	Schwarz criterion	0.008856
Log likelihood	16.47294	Hannan-Quinn criter.	-0.020541
F-statistic	225.2875	Durbin-Watson stat	0.054429
Prob(F-statistic)	0.000000		

APPENDIX E

Null Hypothesis:	Obs	F-Statistic	Prob.
CAPITAL does not Granger Cause GDP	494	1.37938	0.2527
GDP does not Granger Cause CAPITAL		16.3855	1.E-07***
ENERGY does not Granger Cause GDP	494	2.13295	0.1196
GDP does not Granger Cause ENERGY		13.2067	3.E-06***
FINTECH does not Granger Cause GDP	493	3.76993	0.0237*
GDP does not Granger Cause FINTECH		15.4853	3.E-07***
POP does not Granger Cause GDP	494	1.50018	0.2241
GDP does not Granger Cause POP		14.6249	7.E-07***
R_D does not Granger Cause GDP	494	2.80640	0.0614*
GDP does not Granger Cause R_D		5.62137	0.0039***
ENERGY does not Granger Cause CAPITAL	494	3.92314	0.0204*
CAPITAL does not Granger Cause ENERGY		17.0266	7.E-08***
FINTECH does not Granger Cause CAPITAL	493	2.18665	0.1134
CAPITAL does not Granger Cause FINTECH		0.25555	0.7746
POP does not Granger Cause CAPITAL	494	1.92540	0.1469
CAPITAL does not Granger Cause POP		3.84097	0.0221*
R_D does not Granger Cause CAPITAL	494	1.35318	0.2594
CAPITAL does not Granger Cause R_D		3.66429	0.0263*
FINTECH does not Granger Cause ENERGY	493	10.6737	3.E-05***
ENERGY does not Granger Cause FINTECH		14.5165	8.E-07***
POP does not Granger Cause ENERGY	494	2.40959	0.0909*
ENERGY does not Granger Cause POP		0.05880	0.9429
R_D does not Granger Cause ENERGY	494	1.11833	0.3277
ENERGY does not Granger Cause R_D		1.40614	0.2461
POP does not Granger Cause FINTECH	493	46.0338	5.E-19***
FINTECH does not Granger Cause POP		0.69642	0.4989
R_D does not Granger Cause FINTECH	493	4.43066	0.0124*
FINTECH does not Granger Cause R_D		0.16052	0.8517
R_D does not Granger Cause POP	494	3.12575	0.0448*
POP does not Granger Cause R_D		1.46410	0.2323

APPENDIX F

Dependent Variable: LOG_GDP

Method: Cross-sectional Fixed Model

Date: 04/15/18 Time: 16:47

Sample: 1988 2015

Periods included: 28

Cross-sections included: 19

Total panel (unbalanced) observations: 531

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-12.87291	1.366158	-9.422713	0.0000
CAPITAL	0.012069	0.001407	8.580733	0.0000
LOG_ENERGY	0.370349	0.073578	5.033402	0.0000
LOG_FINTECH	0.073717	0.006701	11.00123	0.0000
LOG_POP	2.020592	0.183987	10.98225	0.0000
R_D	0.080809	0.013583	5.949407	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.953339	Mean dependent var	4.373289
Adjusted R-squared	0.951222	S.D. dependent var	0.416438
S.E. of regression	0.091974	Akaike info criterion	-1.890484
Sum squared resid	4.288796	Schwarz criterion	-1.697274
Log likelihood	525.9234	Hannan-Quinn criter.	-1.814864
F-statistic	450.3697	Durbin-Watson stat	0.254521
Prob(F-statistic)	0.000000		

APPENDIX G

Dependent Variable: D(LOG_GDP)
Method: ARDL
Date: 04/15/18 Time: 17:36
Sample: 1990 2015
Included observations: 493
Maximum dependent lags: 2 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (2 lags, automatic): LOG_ENERGY LOG_FINTECH LOG_POP R_D
Fixed regressors: C @TREND
Number of models evalulated: 4
Selected Model: ARDL(2, 2, 2, 2, 2)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Long Run Equation				
LOG_ENERGY	4.208595	0.306417	13.73484	0.0000
LOG_FINTECH	-0.291736	0.023379	-12.47858	0.0000
LOG_POP	3.882663	1.772804	2.190125	0.0293
R_D	0.215000	0.050926	4.221800	0.0000
Short Run Equation				
COINTEQ01	-0.266049	0.055872	-4.761758	0.0000
D(LOG_GDP(-1))	0.048658	0.060672	0.801980	0.4232
D(LOG_ENERGY)	-0.327483	0.214116	-1.529462	0.1272
D(LOG_ENERGY(-1))	-0.222492	0.220635	-1.008416	0.3141
D(LOG_FINTECH)	0.062602	0.044977	1.391878	0.1650
D(LOG_FINTECH(-1))	-0.006718	0.038852	-0.172908	0.8628
D(LOG_POP)	11.84867	8.706943	1.360830	0.1746
D(LOG_POP(-1))	-26.10372	11.72353	-2.226610	0.0267
D(R_D)	-0.111603	0.034936	-3.194534	0.0016
D(R_D(-1))	-0.092160	0.028313	-3.255089	0.0013
C	-10.02022	2.048919	-4.890489	0.0000
@TREND	0.003800	0.002569	1.479153	0.1402

Mean dependent var	0.017211	S.D. dependent var	0.043481
S.E. of regression	0.031786	Akaike info criterion	-3.655828
Sum squared resid	0.302097	Schwarz criterion	-1.788135
Log likelihood	1202.622	Hannan-Quinn criter.	-2.924844

*Note: p-values and any subsequent tests do not account for model selection.