

The Impact of ICT on Economic Growth

-Analysis on 11 Trans-Pacific Partnership Negotiating Countries-

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Abstract

Nowadays, Information and Communication Technology (ICT) is necessary for not only our lives, but for development for every country. In this research, eleven Trans-Pacific Strategic Economic Partnership Agreement (TPP) negotiating countries are investigated by using a linear regression model for the years 2000-2013. Each country is investigated first, and after that there will be investigation of pooled data. Since there were not sufficient research done for ICT impact on economic growth in TPP countries, this paper will partially cover the works for unexplored areas.

The research will start with a description about the specific reason why ICT would be the topic. The research will continue with explanations about interesting terms related to ICT and a broad description of TPP. Lastly, we will look at the ICT situations in each of the eleven countries—member countries of TPP and countries in negotiation. After the introduction, several literature reviews will be done, and a more detailed objective and value-added look into this research are explained. The model and method used to conduct this research are introduced, and estimated results are given. Next, the actual results and analysis are given. Finally, the conclusion discusses future suggestions and ideas in regards to ICT.

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OUTLINE

- I. Objective & Value-Added
- II. Introduction
- III. Model & Method
- IV. Results
- V. Concluding Remarks

OBJECTIVE & VALUE-ADDED

- ◆ **Objective**
Examine the economic impact of ICT
in 11 TPP countries from years 2000-2013
- ◆ **Value-Added**
 - Countries to investigate
 - Addition of different variables from the prior research

INTRODUCTION: THE HOT TOPIC ICT

◆ World Development Report 2016 Concept Note
Topic: Internet's impact on economic growth, on social and economic opportunity, and on the efficiency of public service delivery

Year	Improved water	Improved sanitation	Secondary school	Mobile phone	Television	Radio/Internet
2000	85	75	65	55	45	35
2005	88	78	68	58	48	38
2010	90	80	70	60	50	40
2014	92	82	72	62	52	42

Source: World Bank, World Development Indicators, International Telecommunication Union

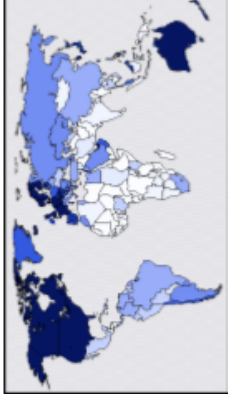
INTRODUCTION: ICT DIFFUSION

◆ **Internet Diffusion**

- Developed Countries 78%
- Developing Countries 32%

◆ **Internet Utilization Ratio**

- Europe 3/4
- North & South America 2/3
- Asia Pacific Ocean region 1/3
- Africa 1/5



Source : International Telecommunication Union (ITU) 2012

INTRODUCTION: TPP

◆ **What is Trans-Pacific Strategic Economic Partnership Agreement (TPP)?**
a high standard, comprehensive regional free trade agreement (FTA)

◆ **21 Fields in Negotiation**

Market Access for Goods	Temporary Entry
Rule of Origin	Financial Service
Trade Facilitation	Telecommunications
Sanitary and Phytosanitary Standards (SPS)	Electronic-Commerce
Technical Barriers to Trade (TBT)	Investment
Trade Remedies (Safeguard)	Environment
Government Purchasing	Labor
Intellectual Property	Institutional Issues
Competition Policy	Conflict Resolution
Cross-Border Service	Cooperation
	Cross-Cutting Issues

Source: Ministry of Economy, Trade and Industry (METI), 2013

INTRODUCTION: COUNTRIES TO INVESTIGATE

◆ **11 TPP Negotiating Countries**

- Australia
- Canada
- Chile
- Japan
- Malaysia
- Mexico
- New Zealand
- Peru
- Singapore
- United States
- Vietnam

■ Negotiating

■ Interested

■ Potential Negotiating Countries

Source: Wikipedia

MODEL & METHOD

① **Linear Regression Model for Each Country**

$$Growth_{it} = b_0 + b_1 Growth_{it-1} + b_2 Educ_{it} + b_3 (G)_{it} + b_4 \left(\frac{FDI}{GDP}\right) + b_5 (IU)_{it} + b_6 (MS)_{it} + b_7 (HTEX) + b_8 (ICTEx) + b_9 (ICTIm) + \epsilon_{it}$$

② **Linear Regression Model for Pooled Data**

$$Growth_{it} = b_0 + b_1 (G)_{it} + b_2 \left(\frac{FDI}{GDP}\right) + b_3 (IU)_{it} + b_4 (MS)_{it} + b_5 (HTEX) + b_6 (ICTEx) + b_7 (ICTIm) + b_8 Z_i + b_9 (Tec_i) + \epsilon_{it}$$

MODEL & METHOD

◆ Definition of Variables

i: countries
t: time
yit: GDP per capita growth
educ: education (preprimary, primary, or secondary)
G: population growth rate
FDI/GDP: foreign direct investment as percent of GDP
IU: internet users (per 100 people)
MS: mobile cellular subscriptions (per 100 people)
HTEEx: high-technology exports (% of manufactured exports)
ICTEx: ICT goods exports (% of total goods exports)
ICTIm: ICT goods imports (% total goods imports)

Z: developed or not (dummy)

<Data Source: World Development Indicators>

RESULTS

Results by Country

Variable	Australia	New Zealand	Japan	United States	Canada
Y _{t-1}	++	(-)	(-)	-	(-)
Educ(Pre)	(+)	N/A	(-)	++	(-)
Educ(Prim)	++	(-)	(+)	-	(+)
Educ(Sec)	N/A	(+)	N/A	N/A	N/A
G	(-)	(-)	(+)	(+)	(+)
FDI/GDP	(+)	(-)	(+)	(+)	(+)
IU	(-)	(-)	(+)	+	+
MS	+	(+)	(+)	++	+
HTEEx	+	(-)	(-)	++	(-)
ICTEx	(-)	(-)	(-)	++	(+)
ICTIm	(-)	(+)	(-)	-	(-)

Variable	Malaysia	Mexico	Peru	Singapore	Vietnam
Y _{t-1}	(-)	(-)	(-)	(-)	(-)
Educ(Pre)	(+)	(+)	(-)	N/A	(-)
Educ(Prim)	(+)	(+)	(-)	N/A	(-)
Educ(Sec)	(-)	N/A	++	N/A	N/A
G	(-)	++	++	(-)	++
FDI/GDP	++	++	++	(-)	(+)
IU	(-)	(-)	(-)	(-)	(+)
MS	(-)	(+)	(+)	(+)	(-)
HTEEx	+	(-)	(+)	(-)	(+)
ICTEx	(-)	(-)	++	(+)	(+)
ICTIm	(+)	(+)	(+)	(+)	+

RESULTS

• Double signs : absolute value of t Stat was 2 or more

• Single sign : t Stat was somewhat suffice (absolute value 1.7—1.99)

• Signs in parentheses: t Stat was not adequate

Variable	t Stat
G	---
FDI/GDP	++
IU	(-)
MS	++
HTEEx	---
ICTIm	++
Tech	(+)
Z (dummy)	(-)

Results for Group of Developed Countries / Developing Countries

variable	t Stat
G	(-)
FDI/GDP	(+)
IU	(-)
MS	(-)
HTEEx	(-)
ICTIm	(+)
Tech	(-)

CONCLUDING REMARKS

- ◆ ICT related variables have both positive and negative impact on TPP negotiating countries
- (+) High-technology exports, ICT goods imports
- (-) Internet users, ICT goods exports
- ◆ Developed countries are no longer in the stage that relies on ICT impact
- Developing/emerging countries had more active and positive reactions

CONCLUDING REMARKS

- ◆ Developed countries have to be deliberate when making an investment in developing/emerging countries
- ◆ When thinking of the liberalization of trade, which country to be first is important
- The prior countries should be the semi-developed countries: **Mexico, Malaysia, and Singapore**

REFERENCES

- Alessandra Colecchia (2002) "ICT Investment and Economic Growth in the 1990s: Is the United States a Unique Case? A Comparative Study of Nine OECD Countries"
- Colin Scott (2012) "Does broadband internet access actually spur economic growth?"
- Isaac Mbiti, David N. Weil (2011) "Mobile Banking: The Impact of M-Pesa in Kenya"
- ICT Global Trend (viewed December, 2015) (<https://www.itimc.or.jp/icta/index.html>)
- ITU (2012, 2014) (<http://www.itu.int/net4/itu-d/ict/eve/>)
- ITU (2012) "The Impact of Broadband on the Economy", Broadband Series
- Maximo Torero, Joachim von Braun (2006) "Information and Communication Technologies for Development and Poverty Reduction-The Potential of Telecommunications"
- Ministry of Internal Affairs and Communications (2015) (<http://www.soumu.go.jp/e-ict/index.html>)

REFERENCES

- Mona Farid Badran (2012) "The Impact of Broadband Infrastructure on Economic Growth in Some Arab and Emerging Countries", Topics in Middle Eastern and African Economies vol. 14, September 2012
- McKinsey Global Institute's Report (2013) "Lions go digital: The internet's transformative potential in Africa" (http://www.mckinsey.com/insights/high_tech_telecoms_internet/lions_go_digital_the_internets_transformative_potential_in_africa)
- Nazrul Islam (1995) "Growth Empirics: A Panel Data Approach"
- Olga Morawczynski, Ojelanki Ngwenyama (2007) "Unraveling the Impact of Investments in ICT, Education and Health on Development: An Analysis of Archival Data of Five West African Countries Using Regression Splines"
- Olga Morawczynski, Ojelanki Ngwenyama, Felix Billore, Francis K. Andoh-Baidoo (2006) "Is There a Relationship Between ICT, Health, Education, and Development? An Empirical Analysis of Five West African Countries from 1997-2003"

REFERENCES

- Rouben Indjikian, Donald S. Siegel (2005) "The Impact of Investment in IT on Economic Performance: Implications for Developing Countries"
- Sanjeev Dewan, Dale Ganley, Kenneth L. Kraemer (2005) "Across the Digital Divide: A Cross-Country Multi-Technology Analysis of the Determinants of IT Penetration"
- Susanna Wolf (2001) "Determinants and Impact of ICT use for African SMEs: Implications for Rural South Africa"
- William H. Lehr, Carlos A. Osorio, Sharon E. Gillett, Marvin A. Sirbu (2005) "Measuring Broadband's Economic Impact"
- WDI (2014) "World Development Report 2016 Concept Note"
- Wikipedia (viewed November, 2015) "Trans-Pacific Strategic Economic Partnership Agreement" (<https://ja.wikipedia.org/wiki/%E7%92%80%E5%A4%AA%E5%89%B3%E6%B4%8B%E6%88%A6%E7%9A%84%E7%B5%8C%E6%B8%88%E9%80%A3%E6%90%BA%E5%8D%94%E5%AE%9A>)