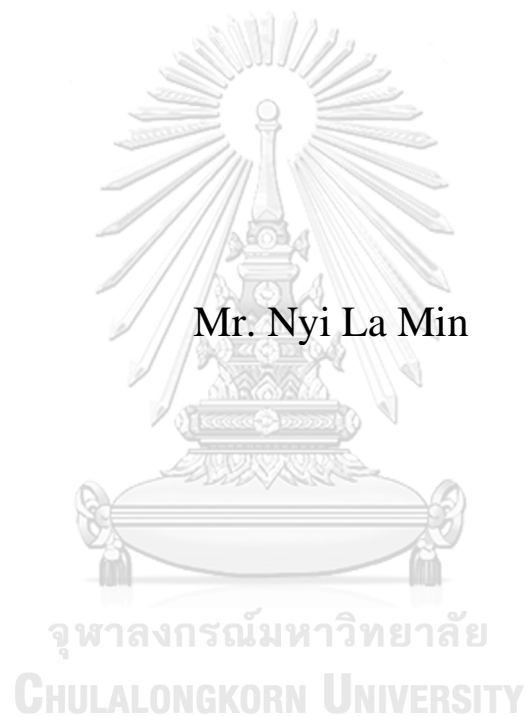


The effect of ICT infrastructure on inward FDI in APEC
countries



Mr. Nyi La Min

An Independent Study Submitted in Partial Fulfillment of the
Requirements
for the Degree of Master of Arts in Applied Economics
Field of Study of Applied Economics
FACULTY OF ECONOMICS
Chulalongkorn University
Academic Year 2022
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ผลกระทบของโครงสร้างพื้นฐานด้าน ICT
ต่อการลงทุน โดยตรงจากต่างประเทศในประเทศไทย



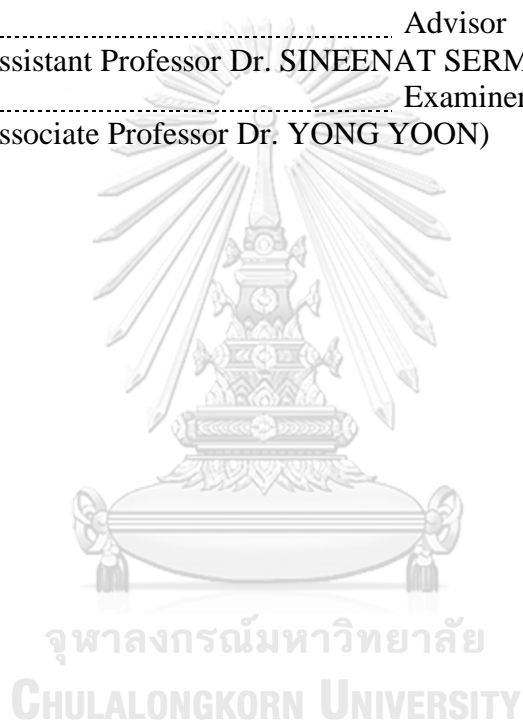
สารนิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาศิลปศาสตรมหาบัณฑิต
สาขาวิชาเศรษฐศาสตร์ประยุกต์ สาขาวิชาเศรษฐศาสตร์ประยุกต์
คณะเศรษฐศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2565
ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

Independent Study Title The effect of ICT infrastructure on inward FDI in APEC countries
By Mr. Nyi La Min
Field of Study Applied Economics
Thesis Advisor Assistant Professor Dr. SINEENAT SERMCHEEP

Accepted by the FACULTY OF ECONOMICS, Chulalongkorn University in
Partial Fulfillment of the Requirement for the Master of Arts

INDEPENDENT STUDY COMMITTEE

..... Chairman
(Associate Professor Dr. JUNE CHAROENSEANG)
..... Advisor
(Assistant Professor Dr. SINEENAT SERMCHEEP)
..... Examiner
(Associate Professor Dr. YONG YOON)



นายิ ตา มิน : ผลกระทบของโครงสร้างพื้นฐานด้าน ICT

ต่อการลงทุนโดยตรงจากต่างประเทศในประเทศสมาชิกเอเปค. (The effect of ICT infrastructure on inward FDI in APEC countries) อ.ที่ปรึกษาหลัก : สินีนาฏ เสริมชีพ

การศึกษานี้มีวัตถุประสงค์เพื่อศึกษาผลกระทบของโครงสร้างพื้นฐานด้านเทคโนโลยีสารสนเทศและการสื่อสาร (ICT) ต่อการลงทุนโดยตรงจากต่างประเทศ (FDI) ในเขตเศรษฐกิจในความร่วมมือทางเศรษฐกิจในเอเชีย-แปซิฟิก (APEC) โดยใช้ข้อมูลจาก 20 เขตเศรษฐกิจเอเปคในช่วงปี 2548-2563 ตัวชี้วัดของปัจจัยที่เกี่ยวข้องกับไอซีที ประกอบด้วย การสมัครใช้บริการโทรศัพท์ การสมัครใช้บริการโทรศัพท์มือถือ การสมัครบริการบรอดแบนด์ และผู้ใช้อินเทอร์เน็ตถูกนำมาใช้เพื่อวัดระดับของโครงสร้างพื้นฐานด้านไอซีที ใช้วิธีการวิเคราะห์ห้องค้ประกอบหลัก (PCA) เพื่อแปลงตัวชี้วัดสี่ตัวของโครงสร้างพื้นฐานด้านไอซีทีเป็นดัชนีโครงสร้างพื้นฐานด้านไอซีที การศึกษานี้ใช้แบบจำลอง Fixed-effect

เพื่อตรวจสอบผลกระทบของโครงสร้างพื้นฐานด้านไอซีทีต่อการลงทุนโดยตรงจากต่างประเทศในประเทศสมาชิกเอเปค

ผลการวิจัยแสดงให้เห็นว่าโครงสร้างพื้นฐานด้านไอซีทีที่มีผลเชิงบวกอย่างมีนัยสำคัญต่อการลงทุนโดยตรงจากต่างประเทศในเขตเศรษฐกิจในเอเปค นอกจากนี้ ยังพบว่าตัวแปรควบคุม เช่น เศรษฐกิจดิจิทัล ซึ่งวัดจากสัดส่วนการส่งออกและนำเข้าบริการที่ส่งมอบทางดิจิทัลต่อการส่งออกและนำเข้าทั้งหมด GDP การเปิดกว้างทางเศรษฐกิจ และกำลังแรงงาน มีผลเชิงบวกอย่างมีนัยสำคัญต่อการลงทุนโดยตรงจากต่างประเทศ อย่างไรก็ตาม อัตราแลกเปลี่ยนและอัตราเงินเฟ้อมีผลกระทบในทางลบต่อการลงทุนโดยตรงจากต่างประเทศในประเทศสมาชิกเอเปค

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CHULALONGKORN UNIVERSITY

สาขาวิชา เศรษฐศาสตร์ประยุกต์
ปีการศึกษา 2565

ลายมือชื่อนิสิต
ลายมือชื่อ อ.ที่ปรึกษาหลัก

6584053029 : MAJOR APPLIED ECONOMICS

KEYWORD ICT infrastructure/inward FDI/APEC countries

D:

Nyi La Min : The effect of ICT infrastructure on inward FDI in APEC countries. Advisor: Asst. Prof. Dr. SINEENAT SERMCHEEP

The objective of this study is to examine the effect of information and communication technology (ICT) infrastructure on inward foreign direct investment (FDI) in the Asia-Pacific Economic Cooperation (APEC) region by using panel data from 20 APEC economies over the 2005-2020 period. Various indicators of ICT-related factors, including number fixed telephone subscriptions, mobile cellular subscriptions, broadband subscriptions, and internet users have been used to measure the level of ICT infrastructure development. Principal component analysis (PCA) method is used to transform four indicators of ICT infrastructure together into an ICT infrastructure index. The study uses fixed-effects model to investigate the effect of ICT infrastructure on inward FDI in APEC countries.

The results show that ICT infrastructure has a significant and positive effect on inward FDI in APEC economies. In addition, it is observed that control variables such as the digital economy measuring by share of exports and imports of digitally deliverable services on total exports and imports, GDP, economic openness, and labor force, have significantly positive effect on inward FDI. However, exchange rate and inflation have a negative impact on inward FDI in APEC countries.



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CHULALONGKORN UNIVERSITY

Field of Study: Applied Economics

Student's Signature

Academic Year: 2022

Advisor's Signature

Year:

.....

ACKNOWLEDGEMENTS

I would like to express my deepest appreciation to all the people who have supported me throughout this journey. First and foremost, I am indebted to my advisor, Assistant Professor Dr. Sineenat Sermcheep, for her constant encouragement, constructive feedback, and invaluable mentorship. She has been a source of inspiration and motivation for me to pursue this research topic. I would also like to thank the examination committee, Associate Professor Dr. June Charoenseang and Associate Professor Dr. Yong Yoon, for their careful evaluation and insightful suggestions that improved the quality of this work.

I would like to convey my sincere gratitude to my loving family and partner. They have always been there for me with their unconditional love, understanding, and support. They have given me the strength and courage to overcome any challenges and difficulties that I faced along the way. Lastly, I want to acknowledge my classmates who have been more than friends to me. They have shared their knowledge, experience, and ideas with me and helped me grow as a researcher and a person.

Nyi La Min

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Chapter 1

Introduction

1.1 Significance of the Study

Global information and communication technology (ICT) integration enables developing nations to adopt innovations made by rich ones, boosting productivity and hastening economic progress. It is projected that the emergence of the information-based economy, fueled by the broad use of ICTs, would result in large productivity improvements and strengthen economic expansion (Dimelis & Papaioannou, 2010). The advancement of ICT provides developing nations with substantial prospects for advancement by overcoming historical and geographical constraints. It enables these countries to engage in economic activity and international commerce more efficiently than their developed counterparts. A strong ICT infrastructure has the potential to restructure global linkages, boost competitiveness, and extend socioeconomic development chances. Individuals, organizations, and governments may use ICT tools to establish a globally linked network. Emerging countries must have advanced communications networks to compete in global markets and attract international investment (Bon et al., 2016).

The enhancement of information and communication technology (ICT) is crucial not only for attracting international investment but also for driving innovation and productivity in various other sectors of the economy. The ICT sector has a significant impact on the agri-food sector, as it enables better communication, market transparency, and value co-creation between consumers and agribusiness managers

(Zhang & Berghäll, 2021). The ICT sector facilitates the adoption of e-Health and m-Health service modes, which can improve access, quality, and affordability of health care, especially during the COVID-19 pandemic (Shao et al., 2022). The ICT sector facilitates the resilience and recovery of the e-commerce and e-business sector, especially during the COVID-19 pandemic, as it enables online shopping as a safe and convenient alternative to traditional shopping, and supports the growth of new markets such as fresh food e-commerce (Zou & Cheshmehzangi, 2022).

The advancement of ICT provides developing nations with substantial prospects for advancement by overcoming historical and geographical constraints. It enables these countries to engage in economic activity and international commerce more efficiently than their developed counterparts. A strong ICT infrastructure and resources have the potential to restructure global linkages, boost competitiveness, and extend socioeconomic development chances. Individuals, organizations, and governments may use ICT tools to establish a globally linked network. Therefore, investing in information and communication technology (ICT) can help developing and emerging nations catch up to advanced economies and foster economic growth by attracting foreign investment (Sinha & Sengupta, 2022). While many scholars from various focuses and perspectives have examined the determinants of foreign direct investment in terms of factor conditions (Suh & Boggs, 2011), little attention has been paid to the effect of ICT infrastructure on inward FDI comparing developed and emerging markets.

APEC is a regional grouping of Asia-Pacific economies comprised of 21 economies. In 2018, 2.9 billion people were living in APEC, which made up 40% of

the total 6.6 billion people in the globe. The combined GDP of the APEC member countries increased US\$ 19 trillion in 1989 to US\$ 46.9 trillion in 2018. A total of 21 nations that make up around 60% of the world's GDP and 48% of its trade are members of the APEC, a regional economic summit (APEC, 2021). In order to encourage inclusive and sustainable growth, APEC works to advance free trade and economic integration throughout the Asia-Pacific region. APEC also has several programs and projects to enhance its members' ICT infrastructure and resources, including the APEC Digital Opportunity Center, the APEC Telecommunications and Information Working Group, and the APEC Cross-Border E-Commerce Facilitation Framework.

As a result, this study aims to explore how ICT infrastructure and resources affect inbound FDI in APEC nations, adding to the body of knowledge on FDI determinants by emphasizing ICT infrastructure as a key element. Second, it will offer empirical data on the connection between ICT indicators and inward foreign direct investment in APEC nations, a large and diverse region with varying degrees of development and ICT readiness, providing useful information for APEC policymakers and stakeholders to enhance their ICT infrastructure and FDI attractiveness. In order to invest in ICT infrastructure and draw inward FDI, governments and companies will need to have a better understanding of the link between that infrastructure and inward FDI.

1.2 Objective of the Study

To examine the effect of ICT infrastructure on inward FDI in APEC economies.

1.3 Scope of the Study

This study examines ICT-related factors influencing FDI inflows in 20 APEC member economies using annual data from 2005 – 2020, highlighting the importance of information and communication technology (ICT) infrastructure and resources in promoting inward FDI in APEC economies and also the different between those APEC economies in emerging group and developed group.

There are several reasons why I choose to research the influence of ICT infrastructure and resources on inbound FDI in APEC nations, and the following information will be summarized:

1. The importance of ICT infrastructure and resources in attracting FDI is growing. Firms must have access to high-speed internet, dependable telephony, and competent staff to compete effectively in today's worldwide market. As a result, APEC economies with excellent ICT infrastructure and resources are more likely to attract FDI.
2. Increasing research indicates a beneficial association between ICT and FDI. According to studies, ICT may increase productivity, creativity, and commerce, all of which can make a country more appealing to foreign investors.
3. APEC is a one-of-a-kind region with a diversified set of economies. As a result, it is an intriguing case study for investigating the link between ICT, FDI, and economic development.

1.4 Contribution

There have also been many earlier studies, particularly examining the link between ICT and inbound FDI in various countries. However, as this research article discusses, there is not enough to investigate more about ICT-related aspects and their association with FDI in APEC economies. This study attempts to summarize and focus on the impact of ICT infrastructure and resources on inbound FDI in the APEC area. An analysis of developed and emerging markets will also be included to determine how many elements from which nations are more susceptible to inbound FDI in APEC economies. The descriptive and econometric analysis demonstrates which ICT determinant has the most impact on FDI and which conventional component is still significant in attracting inbound FDI in APEC.

This study contributes to current research in a variety of ways. It will deliver a more regional analysis of the linkage between ICT drivers and inbound FDI. Furthermore, the results of this study will show whether having ICT infrastructure and resources positively influences FDI in the APEC area. If this relationship is proven to be true, it means that countries should think about making policies to develop and improve their ICT capabilities.

1.5 Organization Structure

The remainder of this document is managed as follows. The following sections discuss the history of ICT development, the characteristics of inbound FDI, and FDI in APEC. Section 3 presents a review of prior research investigating the drivers of inward FDI. Section 4 introduces the estimating models, data sources and a conceptual framework that aids in understanding ICT-related and conventional

variables influencing FDI inflows in the APEC area. The fifth section provides the study's empirical findings, while the sixth chapter finishes with some policy implications and future directions.



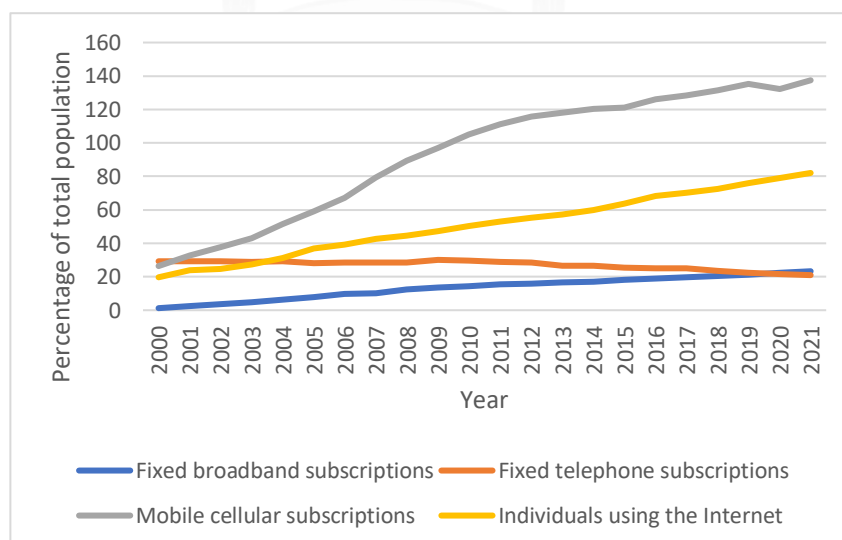
Chapter 2

Overview of ICT Development and FDI Characteristics in the APEC Region

2.1 Information and Communication Technology in the APEC Region

Over the last decade, the Asia-Pacific region has been a forerunner in ICT adoption, with industrialized countries dominating in major ICT metrics. Seven nations in the area (Japan, Hong Kong, China, the Republic of Korea, Australia, New Zealand, and Singapore) are in the top 20 in the world in terms of ICT readiness (Schwab, 2019). According to the UNCTAD Business-to-Consumer E-Commerce Index, Japan, New Zealand, and the Republic of Korea are among the top ten economies in e-commerce preparedness (UNCTAD, 2020). The Republic of Korea, Singapore, and Australia are the world's top three e-government leaders, according to (Knowledgebase, 2014).

Figure 1: ICT Development in APEC Region, 2000-2021



Source: World Development Indicators database

Figure 1 depicts the overall advancement of ICT in Asia-Pacific nations. From 2000 to 2021, the indicator of mobile cellular subscriptions per 100 persons and the population using the internet per 100 persons, which serve as a gauge of ICT expansion, showed a noticeable rising trend. However, it is worth mentioning that the rate of ICT growth has slowed marginally since 2011 compared to previous eras.

2.2 ICT Development and FDI

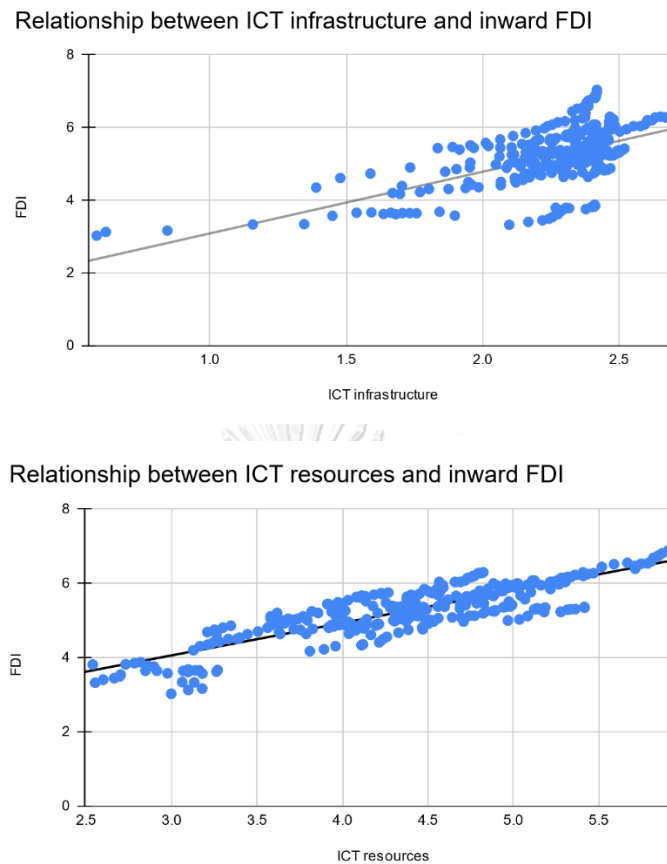
Technology has played a critical role in the financial industry throughout the last decades, beginning with the introduction of credit cards in the 1950s to ease cashless transactions and the introduction of ATMs in the 1960s, which replaced conventional bank tellers. The advent of the Internet and e-commerce models in the 1990s followed the introduction of computerized stock trading in the 1970s. ICT development changed financial services once again in the early twenty-first century, utilizing technology such as mobile internet, big data, cloud computing, and blockchain. Today, several communication technologies have altered trade and banking, including digital wallets, payment applications, mobile banking, mobile trading, robo-advisor sites, and peer-to-peer lending platforms (Bon et al., 2016).

ICT has a strong direct and indirect influence on FDI inflows. It directly impacts FDI inflows and acts as a predictor of FDI. Furthermore, ICT indirectly influences FDI inflows through its impact on other drivers like innovation and entrepreneurship. Sophisticated ICT infrastructure also boosts a country's attractiveness, encouraging export-oriented FDI inflows. Developing countries may embrace innovations from industrialized countries by enhancing ICT, encouraging economic development, productivity, and efficiency. A sophisticated ICT

infrastructure supports export logistics and increases a country's appeal to foreign investors for FDI inflows. Furthermore, the proliferation of ICT and extensive internet use enhances transparency, decreases corruption, and removes barriers to FDI inflows into the host country (Sinha & Sengupta, 2022). The rise of the information-based economy during the last 25 years, fueled by the advancement of ICTs, has expedited FDI inflows and boosted economic growth in emerging countries (Dimelis & Papaioannou, 2010).

Due to their potential for development, particularly when compared to other stagnating economic sectors, digital trade and the digital economy have attracted much attention. Between 2006 and 2016, the digital economy in the US expanded rapidly, outpacing the 1.5% growth rate of the entire economy with an average annual growth rate of 5.6 percent (Nicholson & Noonan, 2017). Information and communication technology (ICT) has shown a considerable growth tendency, according to UNCTAD's 2017 World Investment Report. The survey claims that between 2010 and 2015, the number of ICT businesses included among the top 100 international enterprises more than quadrupled. These businesses achieved impressive asset growth of 65% as well as growth in operating revenues and personnel numbers of about 30%. However, other top 100 international companies displayed flat patterns throughout the same period. Therefore, the developing digital economy is becoming a higher priority for policymakers, which has resulted in the addition of important "e-commerce" or "digital trade" chapters in trade agreements (Azmeah & Foster, 2016). Digital services' increasing economic significance has sparked talks about data as the "new oil" and the formation of industrial policy proponents who promote data nationalism, technical sovereignty, or protectionist policies (Aaronson, 2019).

Figure 2: Relationship between inward FDI and ICT indicators of the APEC



Source: Calculated by the author using data from UNCTADstat

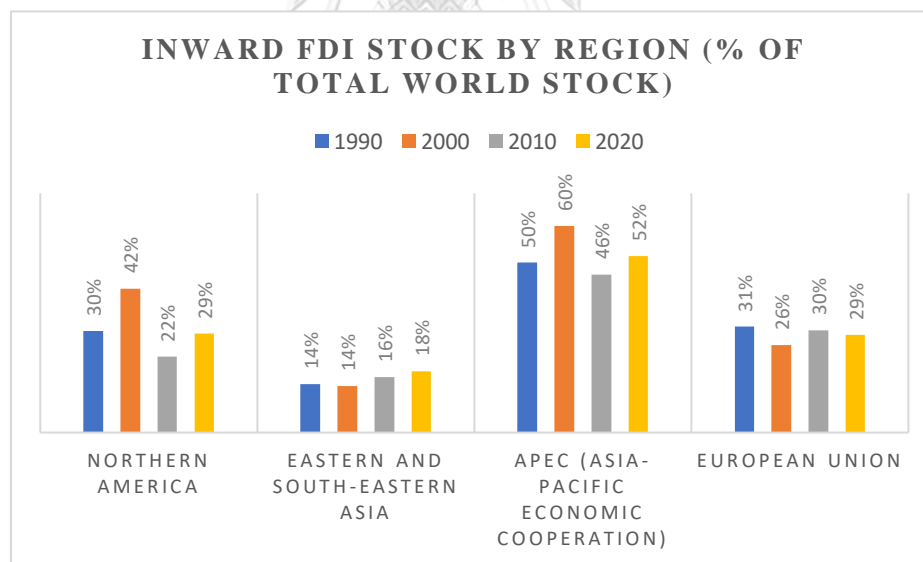
The association between ICT indicators and inbound foreign direct investment is positive and, on the rise, according to the analysis of two graphs illustrating the APEC area supported by Figure 2. This implies that more ICT infrastructure adoption and development within the APEC area helps the region attract more foreign direct investment. The second graph similarly shows a positive and rising association between ICT resources and inbound FDI within the APEC area. This demonstrates that nations within this region with robust ICT resources are more likely to attract larger amounts of FDI. These findings highlight the major contribution of ICT

infrastructure and resources to the growth of foreign direct investment within the APEC area.

2.3 Characteristics of Inward FDI to APEC Countries

Global FDI inflows peaked during the 2008-2009 financial crisis but have subsequently fallen. Compared to the previous year, there was a 2% and a 23% reduction in 2016 and 2017, respectively. The downward trend persisted in the first quarter of 2018, with wealthy nations suffering the most. On the other hand, developing economies were less damaged by the global financial crisis, and their proportion of worldwide FDI inflows surpassed that of developed ones in 2012.

Figure 3: Inward FDI Stock by Region (% of total world stock)

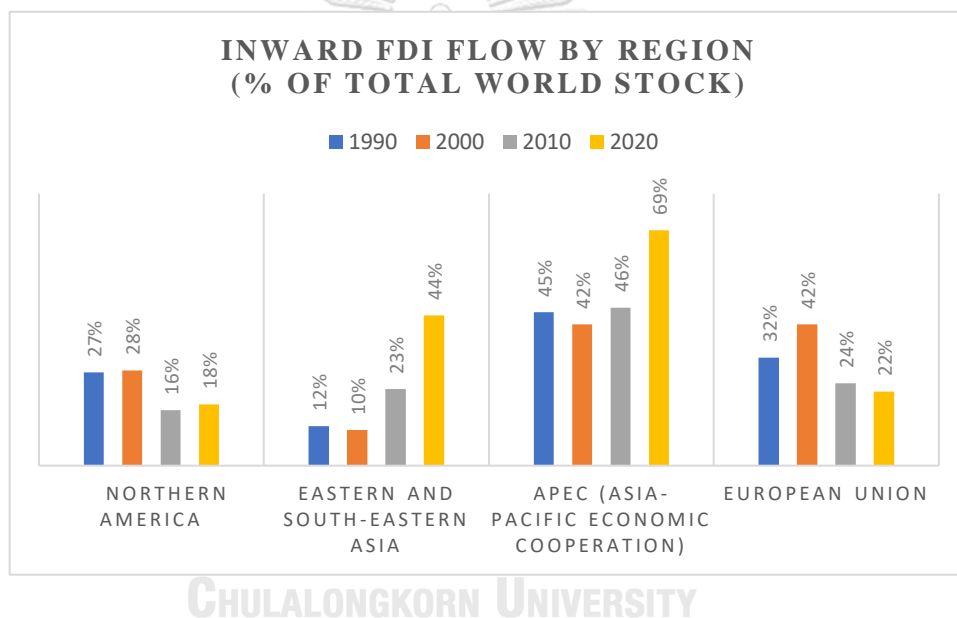


Source: Calculated by the author using data from UNCTADstat

APEC nations have historically been large beneficiaries of FDI, with their proportion of world inbound FDI stock peaking at more than 60% in 2000 and falling to almost 50% by 2020. Between 1990 and 2020, the APEC area had a considerable

increase in cumulative FDI stock, averaging 10.4 percent each year. The East and Southeast Asia area, which is home to more than half of APEC members, has grown increasingly appealing for international investment. While the European Union (EU) and North America's FDI shares have decreased slightly, the East and Southeast Asia region's share of total inbound FDI stock has increased from 13.7 percent in 1990 to 17.3 percent in 2020.

Figure 4: Inward FDI Flow by Region (% of total world stock)



Source: Calculated by the author using data from UNCTADstat

FDI inflows have increased significantly in the APEC area, notably in East and Southeast Asia. APEC economies will contribute over 68 percent of global FDI inflows in 2020, up from less than 50 percent in 2010. Although North America and the EU continue to have a bigger pool of cumulative FDI, the East, and Southeast Asia area is rapidly catching up. In fact, the area was one of the top investment destinations in 2020, accounting for almost 43 percent of worldwide FDI inflows.

Even before the COVID-19 outbreak, the East and Southeast Asia area had eclipsed North America and the EU in terms of FDI inflows, with China and Southeast Asian economies such as Singapore, Indonesia, and Vietnam leading the way. This points to an increasing trend of investment in the East and Southeast Asia areas.

Moreover, since its establishment in 1989, APEC has been committed to supporting “free and open trade and investment” across the region. APEC’s investment liberalization and facilitation activities have encouraged cross-border investment among its member states. However, there has been little research on the existence, structure, and causes of APEC financial links. Gaining a better understanding of these characteristics will help to prioritize the post-APEC Investment Facilitation Action Plan (IFAP) and shape future agendas for regional economic integration (REI) and the aims of free and open trade and investment (FOTI).

Chapter 3

Literature Review

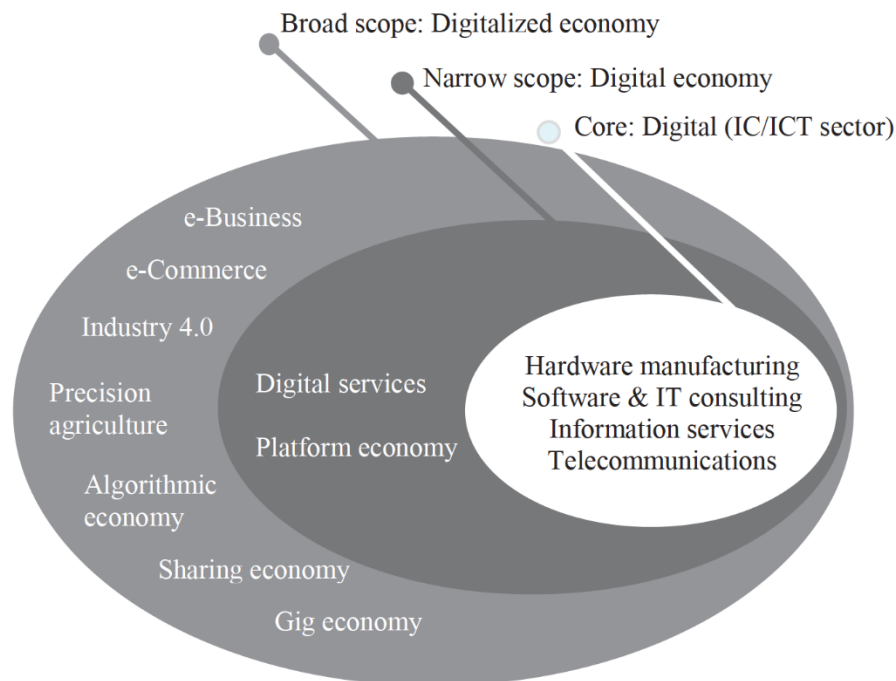
3.1 ICT and Digital Economy

ICT includes a wide range of technologies such as landlines, cellphones, mobile communication, computing, and Internet access. However, their relevance to economic growth may not be equal. General Purpose Technology, which encompasses ICT, has the potential to dramatically extend the variety of potential ideas and advances (Carlaw & Lipsey, 2002). This growth offers countless possibilities for lucrative capital investment, triggering a chain reaction of new opportunities that can last for lengthy periods of time, even decades or centuries. ICT is designated as a General-Purpose Technology because it has the potential to influence the economy through a variety of spillovers and technical complementarities. However, the prospective influence of various areas of ICT may differ. Computing power and Internet connectivity, both of which have the potential to include additional types of communications, are predicted to generate higher marginal returns (Stanley et al., 2018).

The fourth industrial revolution is beginning to take shape as a result of technological developments that are changing manufacturing processes. This transition heavily relies on the digital economy. There are several interpretations, but no definition that is accepted by everyone. UNCTAD (2019) offers a conceptual framework for the digital economy that is made up of three parts: the Core layer, the

Narrow Scope (Digital economy), and the Broad Scope (Digitalised Economy). This framework is depicted in Figure 5.

Figure 5: The Digital Economy Structure



Source: UNCTAD (2019)

The ICT industry, which includes hardware, software, information services, and telecommunications, is at the center of the digital economy. Infrastructure such as fiber optic cables, broadband networks, mobile and satellite communications, databases, cloud computing, and different hardware and software are all included in this. The expansion of the digital economy into digital services and platforms makes it possible for companies to create and offer software applications and services. This extensive digital economy links consumers, governmental bodies, and organizations globally through e-business, e-commerce, industry 4.0, and the sharing economy. The

expansion of the core and middle layers fuels national economic growth (Mai et al., 2021).

A country that is very developed in ICT infrastructure has the advantage of being able to access robust connectivity, reliable internet access, and advanced technological capabilities that enable efficient communication, and rapid dissemination of information. With a solid foundation in information and communication technology, businesses can leverage digital platforms to offer a wide range of products and services globally, transcending geographical boundaries. When a country possesses a highly developed ICT infrastructure, it becomes capable of actively participating in the trade of digitally deliverable products and services, leading to the establishment of a thriving digital economy (Sarangi & Pradhan, 2020).

3.2 Importance of Information Technology

In 1956, the significance of technology was recognized as one of the conventional growth factors, alongside labor and capital (Solow, 1956). He explained that labor and capital alone could not provide economic growth in any nation and that technical advancement, under the assumption of a constant return to scale and declining returns for each input, is the primary driver of growth. Moreover, numerous studies on the relationship between ICT and economic growth have been done during the past 20 years, and the majority of research supported the contribution of ICT to economic expansion (Ishida, 2015; Pradhan et al., 2017).

Technology is considered as an endogenous component in the growth model, and human capital is a critical aspect in production in this paradigm, as capital

accumulation leads to the accumulation of knowledge and theory, both of which are required for economic progress (Romer, 1990). Unlike classic growth theories, Romer's model implies growing returns on new ideas and recognizes the necessity for some monopolistic power to cover the expenses of developing new knowledge. Furthermore, the model highlights that technology increases long-term investment returns (Maré, 2004).

Numerous studies have been done during the 1990s to assess the influence of technology on productivity (Chun & Nadiri, 2008; Hitt & Brynjolfsson, 1996) and economic development (Jorgenson & Stiroh, 1995; Papaioannou & Dimelis, 2007; Pohjola, 2001). The findings of this research differ between industrialized countries and medium or low-income countries. While ICT has a favorable and large influence on productivity in wealthy countries, the impact is less obvious in most middle and low-income countries. Overall, ICT investment may affect economic growth through a variety of ways, including boosting information flow, expanding markets, enhancing efficiency, raising productivity, and attracting new capital and foreign direct investment.

3.3 Effect of ICT on FDI

There has been an increase in studies over the last two decades on the link between ICT investment and FDI particularly in developing nations. These studies largely study the role of ICT as a factor affecting investment location decisions, either directly or indirectly, by analyzing its influence on other factors of investment. This research looks at how ICT may be used to promote and attract FDI.

Several studies imply that ICT may help attract FDI by leveraging the adoption of new ICT instruments, including internet users, internet hosts, and mobile phones. These technologies lower search costs and enable “just-in-time” management methods, resulting in lower production costs, more competitiveness, higher productivity, and, eventually, larger FDI inflows (Choi, 2003; Gani & Sharma, 2003). ICT has increased productivity and FDI by shortening the time lag between demand and production and providing direct and continuous linkages between producers and customers (OECD, 2008). The prevalence of positive network externalities, found in both developed and developing nations, demonstrates that new internet users add to the aggregate value of all users, resulting in a drop in cost per user. However, in many developing nations, the negligible effect of ICT investment on FDI might be linked to unfavorable network externalities. These arise when the growing number of users strains available connections, resulting in internet congestion (Ko, 2007).

The ICT revolution has altered global trade patterns, which have altered FDI trends and patterns globally. Due to the information technology revolution and technological advancements in communication allow the division of the product into two or more steps in different locations and have reduced the cost of transportation in the trade of parts and components (Jones & Kierzkowski, 2001). By making vertical and horizontal investments, MNCs became a dominant force in international commerce by the middle of the 1990s. They also choose where to localize new branches of their various businesses depending on local competitive advantages. The growth of ICT significantly lowers the expenses of connecting services and makes it easier for separate branches operating in various nations to communicate with one another. As a result, growing ICT use fosters vertical FDI and strengthens ties

between industrialized and developing nations (Broadman, 2006). On the other hand, an increase in ICT investments also has an impact on horizontal FDI, taking advantage of the breadth of the market in the host country, especially in the big markets to produce manufacturers and services, where growing ICT is used to manage the supply chain (Addison & Heshmati, 2003).

ICT indirectly influences FDI through a variety of different variables. The extension of ICT infrastructure and the elimination of negative externalities associated with ICT tools can have a favorable influence on both domestic and export markets, making them more appealing for export oriented FDI. Furthermore, the rise of the internet has increased openness, which is critical for good governance and the reduction of corruption that have a substantial impact on FDI. Transparent power distribution and property rights protection in democratic countries reduce FDI risk and boost their capacity to attract FDI, particularly in emerging countries (Soper et al., 2012). Although a lot of studies have suggested that ICT has a significant causal relationship with FDI, the causal relationship between ICT and FDI is not clear in developing countries (Fakher, 2016).

3.4 FDI Motives: Advanced Economy MNEs and EMNEs

Why companies participate in FDI is one of the most important topics in global business. John Dunning's four-way classification of FDI motivations is considered to be the "classic" taxonomy (Dunning, 1993). FDI motivations may be categorized using John Dunning's four-way categorization. Those that are interested in natural resources make investments abroad to get access to certain resources, such as labor, technology, and managerial skills, which are either scarcer or more

expensive in their nation. To access new markets or diversify their business beyond exporting, market hunters travel abroad. Efficiency hunters strive to maximize operations by taking advantage of economies of scale, scope, or various factor endowments across nations. On the other side, those that seek strategic assets concentrate on building upon or acquiring existing competitive advantages in order to succeed over the long run.

Even though Dunning (1993) examined many FDI motivations, the four-way categorization is the framework that has been most extensively used to distinguish between various FDI activities. The model has been a cornerstone in describing FDI operations due to its usability and capacity to distill complicated ideas into simple notions. However, the global economy's increasing complexity makes this classification's capacity for explanation more difficult to use.

3.5 Determinants of FDI Inflows in Previous Literature

Neoclassical trade theory suggests that factor mobility can replace cross-border trade in products. When manufacturing inputs like labor and capital can move around with ease and at cheap cost, they tend to scatter geographically to cut down on transportation costs. Additionally important to how businesses react to trade restrictions is factor mobility. Foreign direct investment (FDI) may be encouraged to start a business in the protected nation when high tariffs are established, but capital mobility is permitted. This makes it possible for foreign companies to keep selling their goods in that market without being charged taxes. The study of international economics also acknowledges the interdependence of certain factor flows, such as the

link between a goods trade deficit and the requirement for financing from capital inflows from outside (Mundell, 1957).

In the late 1980s and early 1990s, the “new” trade theory recognized the importance of factor flows and the conflicting pressures of reducing transportation costs. It focused on the benefits of scale economies, agglomeration economies, and access to sizable markets, all of which promote the concentration of economic activity within a single supplier. This supplier uses trade to interact with the global market rather than depending on FDI and domestic manufacturing (Krugman, 1992). The newer trade theory predicted that multinational corporations would take control of international economic activity as nations grow more comparable in terms of size, factor endowments, and technical efficiency. This is because they are able to export the specialized goods and services that are particular to their own businesses (Markusen, 1995). Despite the lack of empirical evidence on information flows, the modern trade theory’s emphasis on producer services highlighted a possible link between information flows communicating firm-specific services and factor flows (Mueller & Grindal, 2019). Furthermore, Markusen (1995) forecasted for the expansion of multinational corporations in industrialized nations including an assumption that a physical presence in other markets was necessary. This need is less important in the digital economy, though, because there is no longer a requirement to physically operate in other countries in order to export numerous firm-specific assets and services.

According to several scholars, the expansion of the digital economy has impeded FDI. The expansion of the digital economy has enabled small and medium-

sized enterprises (SMEs) to get quick access to global markets via online marketplaces such as eBay and Amazon without establishing a permanent presence in the host nation and incurring FDI location fees (Eden, 2016). Small and medium-sized enterprises are more likely to internationalize if they acquire business services via internet platforms, as opposed to acquiring them internally. The rise of the digital economy has decreased the desire of SMEs to engage in FDI (Hui et al., 2016). In addition, major multinational firms can get access to global markets via exporting and OEM relationships without making significant foreign investments (Rangan & Sengul, 2009). Digital technology advancements allow multinational corporations to engage in worldwide transactions without a physical presence, which might result in a drop in foreign direct investment (Banalieva & Dhanaraj, 2019).

Even though foreign direct investment (FDI) can be used for a variety of objectives, including market expansion, resource acquisition, operational efficiency, and acquisition of strategic assets (Dunning, 1993), the existing body of literature has largely focused on explaining export-oriented investments that take place during the mature stages of the product cycle (Vernon, 1992). Industrialized-country corporations use foreign direct investment (FDI) to set up manufacturing facilities in host nations when they are facing a loss of comparative advantage (Kojima, 1978). Low labor costs, government incentives for local manufacturing, and the advantages of product specialization and concentration are only a few of the elements that affect the choice of a host nation for export-oriented investments (Dunning, 1993). Additionally, Dunning (1993) notes that characteristics including a sizable market, available resources, good political and economic conditions, and strategic relevance are essential for luring outside investment. Moreover, multinational companies

(MNCs) relocate certain industrial operations to developing nations to benefit from the abundance of trained and low-wage workers there (Fröbel et al., 1980).

GDP-related metrics are important gauges of a country's infrastructure quality and are key drivers of foreign investment in less developed countries. Models of the factors influencing foreign investment inflows commonly incorporate GDP, and these models typically provide meaningful findings (Woodward & Rolfe, 1993). The rate of GDP growth may also be interpreted as an indicator of the home market's future potential, and the GDP per capita can be used to gauge the economic progress of the host nation. Through its relationship with infrastructure growth, it could have an impact on FDI (Green & Cunningham, 1975) .

Foreign investment is also influenced by a nation's currency rate. Although evidence to support this theory is few, it is often believed that governments may draw foreign investment by depreciating their currency. In addition to taking exchange rates into account, scholars have utilized the inflation rate as a stand-in for monetary stability, macroeconomic stability, and associated economic strength. Foreign investments that are focused on exports might benefit from monetary stability (Woodward & Rolfe, 1993).

Other variables that have been proposed as having an impact on foreign investment inflows include the availability of basic infrastructure, transportation, and communication systems, local taxes, limits on foreign exchange, and charges on imported components (Loree & Guisinger, 1995). There is still a general lack of agreement among academics on the factors that affect the volume and distribution of foreign investment globally, despite numerous studies, and more study is necessary to

come to a consensus and get a better knowledge of the issue. The last 15 years have seen dramatic technological changes, including the growth of ICT, the growth rate of the internet users, the widespread adoption of mobile phones, and factors related to the digital economy. As a result, now is a particularly good time to examine the role of information and communications technology.

3.6 Four Primary Reasons for Participating in FDI

According to pertinent literature, multinational investors participate in FDI for four primary reasons (Dunning, 1993; Dunning & Lundan, 2008; Fung et al., 2009):

Market seeking

Market-seeking investments are motivated by market size, market growth, and per capita income of the host nation. Market-seeking FDI is used by companies to take advantage of high-growth markets, increase their market share, and build a strong presence in foreign markets. By entering new markets, businesses can meet local needs, take advantage of economies of scale, and get an edge over their competitors. Therefore, when the local market is extremely competitive, and supply exceeds demand, domestic enterprises are driven to seek new markets in host nations with larger market sizes, greater growth rates, and a sizable number of prospective consumers with higher incomes. So, market-seeking FDI is drawn to economies with increased demand.

Resource seeking

The pursuit of natural resources is founded on the internalization principle, which proposes that companies create subsidiaries in host nations to save transaction

costs. This hypothesis provides an avenue for investment for corporations interested in acquiring natural resources from APEC member nations. Companies engage in resource-seeking activity when they go overseas to get resources that are unavailable or more expensive to obtain locally. These resources may include physical resources such as minerals and agricultural goods, as well as variables such as cheap and specialized labor, technical skills, and enhanced infrastructure. Overall, resource-seeking actions are motivated by a desire to access and effectively utilize these resources. This motive is particularly concerned with enterprises' natural resource endowments. Countries with substantial resources would attract resource-seeking FDI, particularly if the resource constitutes a significant portion of the production.

Efficiency seeking

The term "efficiency-seeking" refers to when companies invest abroad in order to take advantage of different factor endowments, market structures, political and legal factors, and host countries' economic environment factors in order to achieve cooperation and economies of scale, which will enhance the overall operation of the company. The product life cycle theory and the international production compromise theory show that the desire to get benefits from investment factors is a macro-level concern. In the growth and maturity stages of a product, production technology has the most impact on FDI. But when the economy is bad, the size of overseas markets and the cost of making things become important factors that affect foreign direct investment. As the life cycle of a product changes, the international production compromise theory explains most of the things that affect global direct investment. In developed countries, for example, it is common to set up production processes that

require a lot of capital. On the other hand, production processes that require a lot of work are often done in developing countries where wages are lower. This strategic use of resources lets companies improve their operational efficiency and cost-effectiveness, which makes them more competitive in the global market.

Strategic asset seeking

Strategic assets are intangible resources that have to do with the company's technology and essential expertise (Dunning, 1993). Its goals include creating a strong base for corporate operations in the host nation, acquiring well-known brands, and developing crucial organizational skills, including managerial knowledge and marketing competency. Purchasing assets from other businesses is frequently used to achieve these goals. This might entail getting access to new technology, information, skilled labor, well-known brands, existing distribution networks, or experience in particular fields. Companies may increase their competitiveness, strengthen their management skills, and run more effectively locally and abroad by obtaining these assets. By adopting a strategic asset-seeking FDI approach in the current global landscape, businesses may harness the potential of well-established ICT resources that provide a competitive advantage, allowing them to innovate, adapt, and succeed in the dynamic and always-changing digital business environment.

Chapter 4

Research Methodology

4.1 Conceptual Framework

In order to establish the conceptual framework, this study concentrates on the relationship between seven factors and FDI inflows based on these four investment drivers and prior research. These factors are information and communication technology (ICT) infrastructure, digital economy representing the economic activities driven by the application of ICT resources, market size, economic environment, infrastructure, financial environment, and political environment.

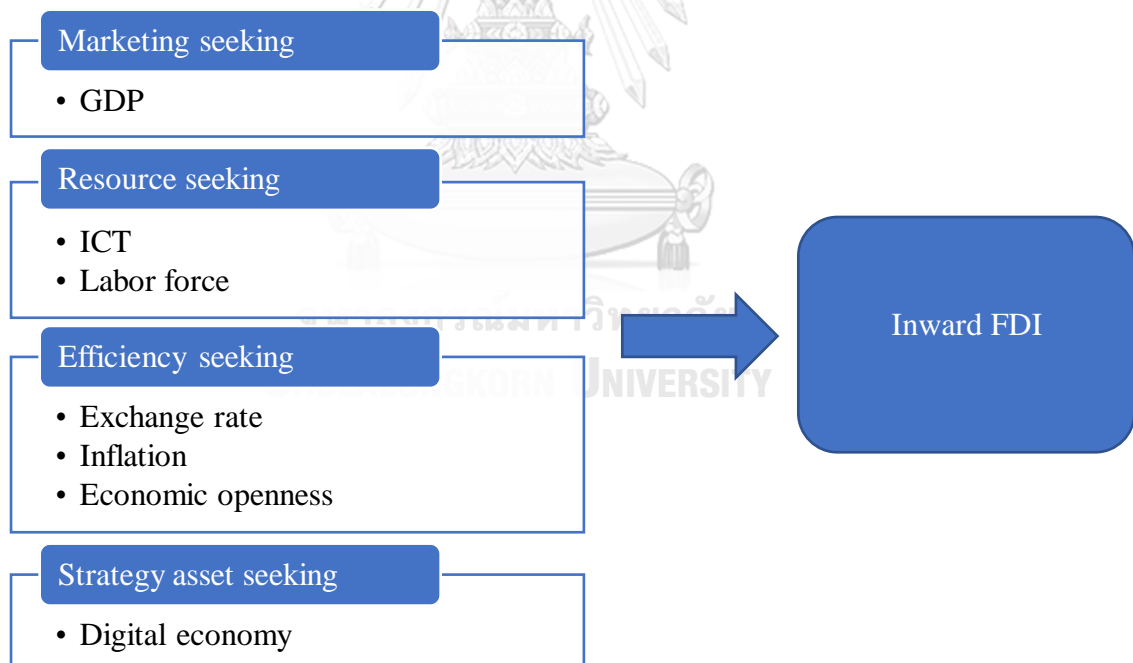


Figure 6: Conceptual framework

Hypothesis

Information and communication technology

Hypothesis 1: Based on the literature such as Choi (2003), Gani and Sharma (2003) and Ko (2007), this study anticipated a favorable relationship between the development of ICT infrastructure and FDI inflows, especially in developing nations. In industrialized nations with established ICT infrastructure, a positive correlation is also anticipated, but other variables are likely to have a stronger impact on foreign investment flows. Therefore, foreign investment inflows are favorably correlated with ICT infrastructure in developing and developed countries (+).

Digital economy

Hypothesis 2: The digital economy has increased market borders, allowing for more expansive production and consumption patterns. It has stimulated innovation output on both the supply and demand sides, hence contributing to company growth (Xiao et al., 2018). Moreover, the digital economy has geographical spillover effects on the resource allocation of technology firms, fostering collaborative innovation among businesses (Li & Jian, 2022). Thus, foreign investment inflows in emerging and developed markets favorably correlate with the digital economy (+).

Market size

Hypothesis 3: A market with a higher GDP often draws more foreign investment because of the larger market and opportunity for economies of scale. GDP is especially true of production meant for the home market. It may not always apply to

foreign investment focused on exports. Therefore, investments in Singapore that are focused on exports may experience economies of scale as they aim to serve a worldwide, or at least international, market. However, investments in Singapore that are focused on the domestic market are less likely to experience economies of scale (Green & Cunningham, 1975). Thus, GDP has a favorable relationship with inward FDI in emerging economies (+).

Economic openness

Hypothesis 4: Markets that are open to international competition and have fewer investment restrictions are more likely to attract foreign enterprises. Greater foreign investment is encouraged by investment openness, but it may be discouraged by a closed capital account (Yang et al., 2000). So, in developed and emerging nations, economic openness positively correlates with foreign investment inflows (+).

Exchange rate

Hypothesis 5: The impact of weak currencies on foreign investment might vary. Due to advantageous exchange rates and inexpensive pricing, global corporations may discover investment possibilities in nations with weak currencies. A weak currency can, however, also be an indication of instability and deter international investment. For instance, after Mexico's peso crisis, there was a fall in global investment. Generally, a weaker currency inhibits foreign direct investment (FDI) in developing economies, but it might boost FDI in industrialized countries since investors frequently have more faith in such markets. Therefore, currency weakness enhances

inward FDI in industrialized nations but diminishes FDI inflows into developing markets (-).

Labor force

Hypothesis 6: The relationship between the labor force and FDI attraction is favorable, according to economic theory and practice in both developed and developing countries. Increased productivity, creativity, and efficiency are essential for economic progress, and they are all influenced by a large, educated workforce. Foreign investors are also attracted to nations with a diversified labor population because it gives them access to a pool of skilled workers who can help them build and run businesses in their host nations. So, in the APEC region, the labor force positively correlates with foreign investment inflows (+).

Inflation rate

Hypothesis 7: High inflation can be a sign of an unstable economy and uncertainty, which makes it less appealing to investors. High inflation is an indication of economic instability and might increase the risk of foreign investment. Additionally, it shows the internal economic tension, which explains the government's and central bank's inability to balance the budget and control the money supply. Therefore, the host country's higher and more variable inflation rate makes it less alluring to foreign investors and may reduce FDI inflows (-).

4.2 Data

Data for this analysis are derived from World Development Indicators (WDI), United Nations Conference on Trade, and international financial statistics. This paper excludes Taipei data from the model due to a lack of data availability in databases. The analysis was based on data from APEC countries ($n = 20$) over the period 2005-2020, and the total number of entries in the sample will be 165 per country. Table 1 shows both the developed and emerging countries included in the data.

Table 1: List of Countries in the Analysis

Total countries	Country name
Emerging countries (n=12)	Brunei Darussalam, Chile, China, Indonesia, Malaysia, Mexico, Papua New Guinea, Peru, the Philippines, Russia, Thailand, and Vietnam
Developed countries (n=8)	Australia, Canada, Hong Kong (China), Japan, New Zealand, Singapore, South Korea, and the United States

4.3 Methodology

This paper examines the effect of ICT on FDI inflow in APEC economies using principal component analysis (PCA) and panel data fixed effect model. The data dimension is reduced using a PCA, and an ICT compound index is estimated. The population's use of the internet, mobile phone subscriptions, broadband subscriptions, and landlines were the factors used to create the ICT index. As demonstrated in table 3, a PCA is run to reduce the data's dimension. The finding demonstrates primary component one's eigenvalue being much larger than the others. That finding

demonstrates that the first key factor explains for roughly 70% of the disparity in the data for ICT. Then, the study created ICT index to simplify the complexity in high-dimensional data while retaining trends and patterns. As is obvious from their definitions, the measurements take into account both ICT infrastructure and penetration.

Table 2: Principal Component Analysis of ICT Index

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	2.798	2.000	0.700	0.700
Comp2	0.798	0.506	0.200	0.899
Comp3	0.292	0.181	0.073	0.972
Comp4	0.112	.	0.028	1.000

In this panel data analysis, the Hausman test is used to decide whether the fixed effects or the random effects is more appropriate. In this case, it shows that the fixed effects model is more consistent. Therefore, the fixed effect vce technique for panel data is used because it deals with autocorrelation and unobserved heterogeneity, two prevalent problems. It decreases bias by controlling for unobserved variables and including entity-fixed effects. In order to account for autocorrelation, it also employs a strong variance-covariance estimator, resulting in precise standard errors. Using time-fixed effects, this technique also enables the estimation of the impacts of time-varying variables. Annual data used in this paper is based on secondary sources from 2005 – 2020. The dependent variable is an inflow of FDI in APEC countries in a million USD. In this study, the leading independent variables are ICT infrastructure that will be defined as a composite variable of four indicators: individuals using the internet, telephone subscriptions, mobile phone subscribers, and broadband subscribers, and digital economy that will describe the economic system supported by

ICT resources. The independent variables expected to determine FDI inflow are selected based on past existing studies and the availability of data for the chosen period. Thus, the relationship can be specified as follow:

$$\begin{aligned} \log IFDI_{it} = & \beta_0 + \beta_1 ICT_{it} + \beta_2 DE_{it} + \beta_3 (\log GDP)_{it} + \beta_4 (EO)_{it} + \beta_5 LF_{it} \\ & + \beta_6 ER_{it} + \beta_7 IR_{it} + \varepsilon_{it} \end{aligned}$$

where IFDI = Inward Foreign direct investment, ICT = ICT infrastructure, DE= Digital Economy, GDP = Gross domestic product, EO = Economic openness, LF = Labor force (% of the population), ER = Exchange rate, IR = Inflation rate, subscript I stands for the individual countries of APEC members economies, and subscript t stands for the time. Table 2 summarizes the measurements, units, and data sources for all the variables in this study. Furthermore, we provide brief explanations or theories for each variable in the research methodology section.

Table 3: Definitions of variables, expected sign, and data sources.

Variable	Measurement	Expected Sign	Data source
Dependent Variable			
FDI	Inward foreign direct investment stock (log-transformed)		UNCTADstat
Independent Variable			
ICT	Composite variable composed of ICT-related indicators using principal component analysis (PCA)	+	ITU
BB	Broadband	+	ITU
TEL	Telephone	+	ITU
MBL	Mobile	+	ITU
INT	Internetuser	+	ITU
DE (Digital Economy)	The sum of exports and imports of digitally deliverable services (% of total exports and imports)	+	UNCTADstat
GDP (Gross domestic product)	GDP (Millions of USD) (log-transformed)	+	WDI
EO (Economic openness)	The sum of exports and imports of goods and services, measured as a share of GDP (% of GDP)	+	WDI
LF (Labor force)	Total labor force (log-transformed)	+	International Financial Statistics
ER (Exchange rate)	Exchange rate (US\$ TO Local currency)	-	WDI
INF (Inflation rate)	Consumer price index reflects the annual percentage change in the cost	-	UNCTADstat

Chapter 5

Empirical Results

5.1 Results

This analysis uses panel data from 20 APEC countries during 2005-2020 to examine the effect of ICT infrastructure and resources on inward FDI. The results show that R-Squared in each model does not differ and have a value of around 0.85. Table 3 shows the association between the determinants of inward FDI in a sample of the APEC countries. No variables in our model violate the common cut-off thresholds of multicollinearity measures (The range of tolerance value = [-0.3587, 0.7959]).

Considering each model, the results indicate that each of them has main factors which significantly impact FDI inflow in the APEC region, namely, ICT, digital economy, GDP, economic openness, labor force, exchange rate, and inflation.

Three different analyses are shown to compare the results, one for the APEC countries sample, one for the developed countries of APEC, and one for the developing countries sample of APEC between 2005 and 2020. Moreover, the results also compare four ICT indicators and the composite ICT index to assess their impact on FDI attraction.

Table 4: Results

Dependent variable: Inward foreign direct investment

VARIABLES	APEC		Developing economies in APEC		Developed economies in APEC	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
BB	-0.00195 (0.00711)		0.00643 (0.00848)		-0.00366 (0.00762)	
TEL	0.00250 (0.00478)		0.00823 (0.00526)		0.00162 (0.00736)	
MOB	0.00417*** (0.00117)		0.00506*** (0.00102)		0.00101 (0.00147)	
INT	0.00431 (0.00339)		0.00126 (0.00369)		0.0195** (0.00581)	
ICT		0.243*** (0.0569)		0.276*** (0.0410)		0.226** (0.0877)
DE	3.290*** (0.623)	3.385*** (0.713)	2.978*** (0.588)	3.209*** (0.620)	3.368** (0.976)	4.607*** (1.277)
l_GDP	0.688*** (0.115)	0.703*** (0.138)	0.687*** (0.104)	0.699*** (0.125)	0.497 (0.334)	0.560 (0.349)
EO	0.00258* (0.00126)	0.00296** (0.00132)	0.00451*** (0.00129)	0.00490*** (0.00128)	0.00201 (0.00156)	0.00215 (0.00201)
ER	-0.395 (0.534)	-0.253 (0.444)	-2.731** (1.038)	-2.943** (0.954)	0.262 (0.585)	-0.288 (0.590)
LF	0.469 (0.397)	0.721* (0.359)	0.265 (0.462)	0.371 (0.362)	0.328 (1.230)	0.431 (0.981)
INF	-0.00952 (0.00650)	-0.0130** (0.00528)	-0.0151** (0.00560)	-0.0151*** (0.00478)	0.0171 (0.0188)	0.0117 (0.0212)
Constant	-15.43** (5.779)	-19.50*** (4.682)	-12.06* (6.662)	-13.51*** (3.709)	-8.525 (14.55)	-10.29 (13.87)
Observations	308	308	181	181	127	127
R-squared	0.867	0.862	0.912	0.909	0.811	0.784
Number of country_id	20	20	12	12	8	8
Robust standard errors in parentheses						
*** p<0.01, ** p<0.05, * p<0.1						

The coefficient of ICT infrastructure variable is positive and significant for developed and developing countries. The APEC economies, therefore, support H1. Moreover, ICT has slightly more impact on inward FDI in developing countries than in developed countries. Increases of 1 unit in ICT in developed and developing countries will increase inward FDI growth by 23.7% and 27.1%, respectively. This study contends that the expansion of ICT is a crucial factor in attracting inward FDI. In addition, ICT development improves understanding of spillover effects and increases access to retaining foreign investors in the host countries.

According to the result, the coefficients of the primary term of the digital economy on FDI in the APEC region and emerging markets of APEC are significantly positive at the 1% significance level. The coefficients of the developed countries are significantly positive at the 5% level. Despite a positive association between the digital economy and FDI being observed in both established and emerging nations, the influence of the digital economy on inbound FDI is greater in developed markets. Therefore, developed markets, which have already built-up ICT infrastructure and digital economy resources, increase not only national productivity but also particularly influence inward foreign investment.

The findings indicate that GDP significantly influences FDI inflows in the APEC region, and regression results appear to be consistent with reviews in previous literature (Cheng & Ma, 2007; Kolstad & Wiig, 2012). Economists typically gauged economic advancement using the Gross Domestic Product (GDP). Due to favorable economic conditions, the country has had great success luring FDI with rising GDP. Contrarily, it will be challenging to draw FDI when the nation's GDP is stagnant or

declining. GDP is a simple-to-follow metric of economic health from a strictly numerical perspective. Hence, the growth of a country's GDP typically indicates the existence of a prospective market and an opportunity for investment. As a result, investors favor investing in nations where the GDP is increasing.

According to the analysis above, economic openness helps the APEC community draw in foreign direct investment. It is the same as other related literature (Bass et al., 1977; Contractor, 1990; Woodward & Rolfe, 1993). Gaining inward FDI is significantly influenced by the degree of economic openness. Since they offer favorable circumstances for investment, more open and unrestricted markets frequently draw more attention from foreign businesses. Conversely, markets may deter foreign investment if they have closed capital accounts and stricter investment regulations.

The findings indicate that, in contrast to industrialized nations, the hypothesis of APEC and developed markets embraced the exchange rate concept. Generally, devaluation of the home country's currency enables investors to make more investments with the same amount of money since devaluation is a straightforward strategy for luring FDI. But it should be remembered that countries with strong governments, vibrant economies, and stable currencies will typically attract foreign investment. To induce investment money from overseas investors, maintaining currency stability is crucial. Otherwise, the possibility of losing money on exchange rates due to currency depreciation can discourage foreign investors.

The result indicates that the labor force has positive impact on FDI inflow in APEC economies with a significance level of 10%. These results are consistent with

economic theory and practice. However, a sufficient and diverse labor population is desirable in nations where labor-intensive projects are encouraged as a source of sustained FDI inflows. On the other hand, if labor supply grows without improving labor quality, FDI may eventually drop. As countries understand that using unskilled labor is no longer a competitive advantage, they must shift away from using it to favor skilled labor if they want to draw FDI. For APEC members to attract FDI and adapt to shifting market demands and technological trends, the growth model must be upgraded, and human resource training must be improved.

Regarding inflation rates (Hypothesis 7), we predict that inflation has a negative relationship with inward FDI. Compared to other similar kinds of literature, the results are the same. Since inflation can be a sign of both high demand and poor economic management, its effects on inbound foreign investment are complicated. Although moderate inflation may be preferred for luring investment, further research is required to identify the ideal inflation rate that encourages inward foreign investment.

5.2 Discussion

The results of this study are consistent with the previous literature (Fakher, 2016; Samir & Mefteh, 2020; Tang & Trevino, 2010) for the whole APEC region and for the developing countries as we mentioned. However, the results for the developed countries are not significant for GDP, economic openness, exchange rate, labor force and inflation. In this analysis, it was observed that the value of inward FDI stock exhibits greater volatility and persistence compared to net FDI inflows. This volatility can lead to increased variability in the estimated coefficients and result in statistically

insignificant values for the independent variable. To address this issue, the inclusion of lagged dependent variable adds a dynamic nature to the analysis, capturing the time-dependent relationship. In addition, we recommend employing instrumental variables that incorporate the lag of both the dependent and independent variables to address endogeneity concern.



Chapter 6

Conclusion and Policy Recommendation

6.1 Conclusion

This study has investigated the relationship of ICT infrastructure and resources on FDI inflows in APEC economies by looking at new variables related to communications infrastructure in addition to other well-known elements. The paper has aimed to identify ICT-related factors as new determinants that influence the inflow of FDI in APEC and find policy implications for attracting foreign investment and promoting the ICT sector in the future. We have employed the panel data fixed effect (vce) method based on annual time series data and examined it for 2005 – 2020. ICT-related factors and traditional factors influencing FDI are incorporated to create the equation.

The main findings are that ICT factors, digital economy reflecting on digitally deliverable services, GDP, economic openness, exchange rate changes, labor force in host countries, and inflation rate have significant impact on FDI inflows in the APEC region. This suggested that increasing of inflation rate may deter inflows of FDI to the host countries. In contrast, the rise in ICT, digital economy, GDP, exchange rate, and total labor force can attract FDI inflows into the region.

The significance of ICT infrastructure and digital economy development in attempts to attract foreign investment for enhanced economic growth has revolutionized the current global system. According to the literature, prior studies on the connection between ICT and FDI have mostly focused on developed nations while

yielding insignificant results in developing nations. To fill this knowledge gap, research needs to be done on how ICT influences FDI in developed and developing nations to better understand the possible effects and examine the particular dynamics of ICT and FDI in various settings. By filling in this gap, the study intends to advance our knowledge of the factors influencing FDI inflows and the role of ICT in influencing investment patterns by offering insights into the interaction between ICT and FDI in developed and developing nations. In addition, the study argues that it is important to consider not only ICT-related indicators but also digital economy-related factors.

Finally, this study supports the significance of ICT infrastructure and resources and how to use it to attract and keep investors. It also draws attention to the need for more research into the specific investor groups for whom communications infrastructure is most important, the crucial components of communications infrastructure, and the numerous ways businesses use it.

6.2 Policy Recommendation

Based on the empirical result, policy measures should focus on enhancing ICT infrastructure to attract inward FDI in developed countries. This suggests that they should prioritize the growth of the digital economy and the installation of cutting-edge ICT infrastructure top priority if they want to draw in more FDI. The same recommendation applies to policymakers in developing nations. Developing countries should prioritize the development and enhancement of their ICT infrastructure and resources that promote digital economy within the countries to attract and benefit from increased foreign direct investment. Recognizing the digital economy's potential

to drive growth, innovation, and efficiency, developing nations must also catch up with it and incorporate it into their economic operations. Overall, APEC countries should prioritize embracing digital technology and advanced ICT infrastructure and resources in order to increase their competitiveness, increase market access, and open up new doors for socioeconomic development.

At the same time, other factors namely GDP, economic openness, currency rate, labor force, and inflation, remain the determinants of FDI. The findings were noteworthy and consistent with the theoretical research. All of these factors are still dominant factors inducing FDI to APEC economies in the model. Therefore, it is crucial for policy makers to consider and incorporate these factors when formulating strategies to attract FDI in APEC economies.

6.3 Limitations

This research makes use of secondary data from several worldwide sources. Although contemporary empirical approaches and econometric techniques offer great accuracy for the study of the ICT industry and FDI, this research encountered significant data availability restrictions outside the research's control and scope. The short period of the sample and the exclusion of Taiwan from the APEC economies are other drawbacks of this work.

6.4 Suggestion for Further Study

Future studies in this area may address these unresolved issues. In addition, further research is needed to gain a better understanding of the distinctions between emerging and developed markets. We advocate the significance of taking into account

bilateral FDI while analyzing the connection between ICT and FDI. The factors that are driving such investment are very different in developed and emerging markets, highlighting the need for a comprehensive study specific to each setting. In conclusion, future researchers should focus on bringing in more countries, considering other macroeconomic or market-related factors mentioned in the previous literature, and taking a wider cross-sectional approach to links between observed series to conduct a robust study.



Appendix

Appendix 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
l IFDI	320	12.041	1.776	6.974	16.196
Broadband	314	16.511	12.579	.042	43.066
Telephone	317	26.584	17.974	.867	61.153
Internetuser	319	57.435	27.506	1.15	96.505
Mobile	320	108.578	43.501	1.154	291.499
ICT	312	.327	.869	-1.687	4.056
DE	315	.086	.056	.008	.369
l GDP	320	26.92	1.78	22.306	30.694
EO	320	87.758	82.769	11.297	419.501
LF	320	16.774	1.797	12.073	20.476
ER	320	.313	.349	0	1.035
INF	320	3.1	2.942	-1.353	23.115

Appendix 2: Pairwise Correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) ICT	1.000						
(2) DE	0.036	1.000					
(3) l_GDP	0.043	0.086	1.000				
(4) EO	0.528	-0.027	-0.281	1.000			
(5) ER	-0.158	0.427	-0.003	-0.063	1.000		
(6) LF	-0.151	-0.129	0.796	-0.359	-0.384	1.000	
(7) INF	-0.148	-0.256	-0.100	-0.016	-0.305	0.211	1.000

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จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

VITA

NAME	Nyi La Min
DATE OF BIRTH	27 May 1995
PLACE OF BIRTH	Myanmar
INSTITUTIONS ATTENDED	University of Technology (Yatanarpon Cyber City)
HOME ADDRESS	Maubin, Ayeyarwaddy, Myanmar



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