CHAPTER I
INTRODUCTION

1.1 Problem Identification

Technological and scientific advancements have a substantial impact on the innovation process, which can help accelerate and improve the creation of a good or service. These advancements also have a wide range of implications that can both improve and establish new systems and improve and fix existing problems. And it is critical in the business sector. With the start of the twenty-first century, there has been major progress in digital solutions and linkages across various industries, including economics, engineering, healthcare, and other areas; innovation is essential to new economic growth.

According to an estimation made by the research group of the Department of Social, Science, and Technology, and Cultural Statistics of the National Bureau of Statistics on China's innovation index (2021), the country's innovation index increased by 6.4% from the previous year to 242.6 in 2020 (assuming 2005 as 100). and results showed that in 2020, China's innovation ability and level continued to improve, the innovation environment continued to be optimized, the innovation input continued to increase, the innovation output grew rapidly, and the innovation results were further demonstrated.

And innovation is the primary generator of economic prosperity for a country. Study Using panel data from 1960 to 1988, Gittleman and Wolff (1995) verified the link between R&D, which acts as a measure of innovation, and economic growth, demonstrating that R&D activity considerably impacts economic growth in industrialized countries. In contrast, using panel data analysis from 30 developing nations, Samimi and Alerasoul (2009) suggest that R&D does not contribute to economic growth in poor countries.

As a result, the author wishes to look at the interaction of patent and grant applications as an indication of innovation on economic growth so that it can be used as a substitute for comparing industrialized and developing countries.

Recent advances in economic processes, creativity, and the patent regime are inextricably linked to the growing use of patents to protect ideas by businesses and government research organizations. When a new wave of innovation emerges due to advances in science and technology, particularly in biotechnology and information and communication technologies (ICT), the innovation process for individual companies becomes less focused and more reliant on interactions between a global network of government and non - governmental organizations.

Currently, inventive performance is a crucial aspect in defining a country's competitiveness and advancement. Furthermore, innovation is critical in addressing market transitions from local and regional to world-scale markets. Because the invention is the foundation of innovation, patents can be used to safeguard innovations, which are one-of-a-kind technical solutions. Patents protect the rights of inventors whose innovations are genuinely unique and commercially successful by granting inventors legal ownership of the commercial use of their concepts.

The study conducted by Hasan and Tucci (2010) stated that countries with the highest quality have better economies. Additionally, a rise in the number of patents in a country generates an increase in the country's economic growth. In general, industrialized countries with high patent quality, such as the U.s, U.k., China, Germany, Japan, and others, have high patent quality. The huge number of worldwide publications also maintains the high quality of patents. Of course, it will assist them in improving the quality of technology and creativity in their country, as well as generating new ideas and technologies that will aid in resolving economic difficulties.

OCED (2007) conducted a data-driven review of the subject. In terms of economic success and inventiveness, patents have become increasingly crucial. Between 1992 and 2002, the number of applications submitted in European, Japan, and the United States increased by more than 40%. However, according to WIPO statistics (2019), a significant drop in submissions in China was the major cause of the drop in the global total. 2019 the Chinese Patent Office received around 141,300 fewer applications than in 2018. In 2019, Japan got significantly fewer applications,

with -5,598, the Russian Federation with -2,446, and the United Kingdom with 1,691. Residents filed 2.2 million as 69.2% of the 3.2 million applications filed worldwide in 2019, while non-residents filed the remaining million, 30.8%. Due mostly to a decline in resident registrations in China, the resident share fell from 71.5% in 2018 to 69.2% in 2019. With the exception of 2002, 2009, and 2019, when they declined by 0.9%, 3.8%, and 3%, respectively, the long-term trend shows patent applications increasing globally every year since 1995.

According to recent economic growth theories, another primary catalyst of productivity and economic growth is developing a new range of innovative products or business models due to continuous research and innovation. Any effort to promote innovation should be prioritized.

Schumpeter (1939) proposed a relationship between economic growth and innovation, arguing that competitiveness through invention and education was critical to ensure economic growth and empirical research backed this view (Aghion, Bloom, Blundell, Griffith, and Howitt, 2005). Thus, according to Schumpeter, investment-driven innovation is a driver of economic growth. Profit estimations, in turn, drive investment. As a result, if a country wants to encourage economic growth, It needs to figure out how to activate investor profit estimations. Then, in his concept of endogenous growth, Romer (1986) argues that economic growth can be defined endogenously and driven by the efforts of agents to increase profits while considering the components associated with entrepreneurship by modelling the discovery process.

Grossman and Helpman (1991) and Romer (1990) state that in studies of endogenous growth, government support for innovation functions as a key element in improving optimal levels of innovation through research and development. The differences between Schumpeterian and Romer's models are based on how they understand innovation and what causes it to fail.

Most economists believe technological innovation is essential to economic growth and human well-being. Negative cultural attitudes toward technology, as well as its negative consequences, can risk gaining these advantages. Policies that

reflect this perspective (and discourage innovation) end up causing economic stagnation, reduced economic dynamism, and lower living standards.

Developed countries that already stated before that their superiority in technology can be achieved that fast, but they need more investment and more concern in their innovation and technology by increasing their consideration on research and education. Investing in research and education will create publications or new patents and finally increase that country's innovation and technology performance. And to create a good quality patent, the country should develop the quality of their companies or firms, so they can create a new patent to create technologies such *as software, OS (Operation System), etc*. Other competitors like from big companies in China, Huawei, Xiaomi and a big company in Korea, Samsung. Also, in automotive, companies in Japan like Toyota, Mitsubishi and Honda produce especially for Southeast Asian region. The success of these countries in market competition in industry technology shows that developing countries, like Southeast Asian countries, can have the same potential as developed countries.

However, the expected positive relationship between innovation and economic growth that the above perception indicates is something other than an empirical pattern. Many debates centre on whether innovations can be transferred from their inventors to their recipients. It is typical in neo-classical thinking to believe that these recipients are developing countries that merely adopt the innovations produced by developed countries for their benefit. Much discussion has been over how well they have converted this into actual economic progress.

Nevertheless, further studies are needed to address innovation and its effect on economic growth, as only in some contexts has this topic been discussed. Therefore, another question remains by using the extended Law, S. H., Sarmidi, T., & Goh, L. T. (2020), where human capital, physical capital, and population growth can also be indicators that affect economic growth. Furthermore, this research investigates the relative value of indigenous and foreign inventions in determining economic progress. Finally, his research looks on the role of institutional quality in

influencing the influence of innovation on the relationship between economic growth and innovation.

The studies are based on 15 developed and 15 developing nations, with participating countries chosen from the Global Innovation Index (GII) dataset in 2022, ranked with country type ordered and comprehensive variable data in each year.

The Global Innovation Index (GII) Score from 2018 to 2022

Table 1.1

Developed Countries					
Country	**2018**	**2019**	**2020**	**2021**	**2022**
Australia	52	50.3	48.4	48.3	47.1
Austria	51.3	50.9	50.1	50.9	50.2
Canada	53	53.9	52.3	53.1	50.8
Denmark	58.4	58.4	57.5	57.3	55.9
Finland	59.6	59.8	57	58.4	56.9
France	54.4	54.2	53.7	55	55
Germany	58	58.2	56.5	57.3	57.2
Hong Kong	54.6	55.5	54.2	53.7	51.8
Japan	55	54.7	52.7	54.5	53.6
South Korea	56.6	56.6	56.1	59.3	57.8
Netherlands	63.3	61.4	58.8	58.6	58.0
Singapore	59.8	58.4	56.6	57.8	57.3
Sweden	63.1	63.7	62.5	63.1	61.6
UK	60.1	61.3	59.8	59.8	59.7
US	59.8	61.7	60.6	61.3	61.8

Source*: globalinnovationindex.org (2022)*

Table 1.2

Developing Countries					
Country	**2018**	**2019**	**2020**	**2021**	**2022**
Argentina	30.7	31.9	28.3	29.8	28.6
Bulgaria	42.6	40.3	40	42.4	39.5
Chile	37.8	36.6	33.9	35.1	34
China	53.1	54.8	53.3	54.8	55.3
Greece	38.9	38.9	36.8	36.3	34.5
Hungary	44.9	44.5	41.5	42.7	39.8

India	35.2	36.6	35.6	36.4	36.6
Malaysia	43	42.7	42.4	41.9	38.7
Mexico	35.3	36.1	33.6	34.5	31.0
Philippines	31.6	36.2	35.2	35.3	30.7
Poland	41.7	41.3	40.0	39.9	37.5
Romania	37.6	36.8	36	35.6	34.1
Russia	37.9	37.6	35.6	36.6	34.3
Thailand	38	38.6	36.7	37.2	34.9
Viet Nam	37.9	38.8	37.1	37	34.3

Source*: globalinnovationindex.org (2022)*

The Global Innovation Index (GII) is a comprehensive instrument for ranking and evaluating countries' innovation performance around the world. The index, created in partnership with Cornell University and INSEAD, evaluates different aspects of innovation, such as institutions, human capital, research, infrastructure, market sophistication, and business sophistication. As show from the table, almost all the developing countries GII score are relatively around 30s – 40s, except China. while developed having the scores above 45s.

Rankings of the Philippines' innovation index, which improved from 73rd in 2018 to 54th in 2019, indicate that the nation's innovation ecosystem is strong and has been moving in the right direction. However, the innovation output subindex still needs to be improved. and in the income group shows a strength While the Australia innovation index score fell from 52 to 47,1 from 2018 to 2022 show a weakness in income group but performs better in innovation inputs than innovation outputs in the last 5 years. And also, the innovation index score of Argentina its fell in last 5 years from 30,7 to 28,6, but in ranking has shown a variable performance over the years, reflecting both strengths and challenges within its innovation ecosystem. . The nation has shown investment in R&D, a sizable research talent pool, and successful innovation outputs. However, aspects such as infrastructure, business environment, and innovation efficiency offer potential for development.

Human capital can play a role in Countries' regional development. Innovation and Economic Growth also can be influenced by human capital. The

larger the number of human resources available in the construction sector, the higher the production volume, increasing the growth rate of innovation and economic growth. The study intends to address the question, "What is the impact of innovation on a country's economic growth from 2000 to 2019?"

Based on the above background, the author, as a student of the Economics Study Program, is interested in conducting research with the title:

" The Impact of Innovation on Economic Growth: Evidence from Developed and Developing Countries"

1.2 Research Problem

Empirical studies indicate that using R&D as an indicator of innovation does not affect some Countries. Several studies show that R&D can influence economic growth in developed countries rather than in developing countries. By using different indicators can be helpful for comparing the effect of innovation for both types of countries. Therefore, analyzing the positive and negative effects of patent applications and granting patents as innovation indicators for economic growth in developed and developing countries is necessary.

Based on the background outlined above, the formulation of the problem in this research is as follows:

a. How much does innovation affect economic growth in developed and developing countries?

b. Between the factor that influences the nexus between economic growth and innovation, what factors have more influence?

1.3 Research Objectives

In general, this thesis serves two objectives: First, it empirically examines the impact of innovation on developed and developing countries economic growth. Second, based on the findings, it proposes policies to show whether other factors influencing innovation performance help boost economic growth.

1.4 Research Aims

a. For the next researcher and reader:

This research is expected to be used as information and reference material for subsequent research about innovation and its effects on economic growth, which takes the same title as research material.

b. For the government or economic department:

This analysis and knowledge presented would be another viewpoint or recommendation as to what the government wants to resolve the neglects and problems of the economic outlook in deciding to concern their step to innovation for their countries.

1.5 Systematic Writing

The following is the systematic writing of this study:

CHAPTER I: Introduction

This chapter consists of four sub-chapter: background, research objectives, research advantages, and systematic writing.

CHAPTER II: Literature Review

This chapter contains theories and previous research related to the topic discussed in this study.

CHAPTER III: Research and Methodology

This chapter discusses the theoretical framework of the research data, data sources, research models, variable definitions, and methodologies utilized in data analysis.

CHAPTER IV: Empirical Results and Analysis

This chapter is a discussion section that contains the results of the research process. In this section, a discussion of the results of the research problems described above is explained.

CHAPTER V: Conclusion

This chapter is the concluding part. It presents conclusions from the research results that have been obtained, along with suggestions that can be used for further research.