



Master's Thesis in Public Policy

Factors and Types of the Middle–Income Trap A Fuzzy-set Qualitative Comparative Analysis

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Abstract

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This research investigates the factors and classify types that cause middle-income trap. The fuzzy-set qualitative comparative analysis (fs/QCA) allows researchers to interpret cross-country analyses that are difficult to generalize and explore questions obscured by fuzzy areas between qualitative and quantitative studies. In order to overcome the limitations of empirical analysis of the preceding studies, this study explains the level of escape through the fuzzy-set causal complexity analysis. Factors that used for this study are total factor productivity (T), anti-corruption index (C), economic institution indexes composed of legal system and property right index and regulation index (I), and Polity V (P). As a result, Causal conditions that improve escape level were found to be combinations of T and two other indexes among C, I and P. On the other hand, causal conditions that degrade escape level were found to be $\sim C*\sim I$, $\sim I*P$, $\sim C*P$, and $\sim T*P$. Simply put, swung dash

(~) stands for 'negation' and asterisk mark (*) stands for 'and'. For example, ~C*~I model shows that countries that are corrupted and do not have well established economic institutions are likely to fall in middle-income trap regardless of level of T or P. In summary, the importance of total factor productivity is overwhelming, however combination of institutional factors (C, I. P) is necessary to overcome the middle-income trap.

Keyword : middle-income trap, Neo-Institutional Economics, fuzzy-set qualitative comparative analysis, ideal type analysis

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Chapter 1. Introduction

1.1. Research Background

The concept of the middle-income trap was first introduced by Gill and Kharas (2007). Gill and Kharas (2007) noted that "stagnant economic growth is likely to prevent per capita income from being transferred to high income in the course of a country's development from small to medium income," and argued that the reason is that various problems accumulated in reaching the small to medium income level cannot be solved by existing economic development models or mechanisms. Since then, definitions and studies of the middle-income trap have been conducted by Felipe (2012), World Bank (2012), Eichengreen et al. (2011, 2013), Bulman et al. (2017), and Ayer et al. (2018). The definition of a middle-income trap has been agreed upon since the its start, but the previous studies define it as a situation that accompanies a long-lasting retention of per capita GDP at the level of middle-income countries.

While it seems that the middle-income trap deals with a new topic, the framework of the study does not deviate much from previous studies, which include the neoclassical economic growth theory and the neo-institutionalist perspective as the main factors. The neoclassical growth theory, which began as a gross product function of the Solow model (Solow, 1956), developed into an endogenous growth theory through Romer (1986) and Lucas (1988). The growth theory, which can explain the middle-income trap, is termed 'reverse-U-shaped hypothesis' (Kuznets, 1955) and also referred to as 'catching-up industrialization model (Ohno, 2009). These were studied to explain countries that had an early marginal diminishing return, as opposed to the existing economic growth theory. Eichengreen et al. (2011, 2013), who studied the middle-income trap countries, argued that countries that fall under

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the middle-income trap based on Hausmann, Pritchett, and Rodrik (2005) using symmetrical analysis of growth acceleration. According to them, 85% of the stagnant economic growth factors of middle-income countries can be explained with total factor productivity. However, a series of studies based on neoclassical economics has a limitation in that it is difficult to extract any general lessons, given that each country's political system, historical context, and institutions are considered exogeneous.

Since institutions were not recognized as independent factor in neoclassical economics, the emergence of neo-institutionalism in response to behavioralism has tried to address the previous shortcomings. In particular, behavioralism paid attention to informal institutions, power, behavior, ethnic specificity and cultural diversity that were considered exogeneous from existing institutionalism and sought to establish them as universal general theory (Kim, 2002). However, because of the individual countries' various response systems to major international issues, such as the oil crisis that occurred in the early 1970s, behavioralism faced limitations and was unable to fully explain the diversity by general theory. As a result, attempts to explain the institutional specificity and diversity of individual countries became the foundation of neoinstitutionalism. Although neo-institutionalism is referenced under single term, it has been divided into rational choice а institutionalism based on economics, political science-based historical institutionalism, and sociological-based sociological institutionalism. Three institutionalisms formed separate paths of theoretical development, thus the emphasis on approach, methodology and theoretical implication are very different (Jung et al. 2019).

The theoretical background of this study, rational choice institutionalism (neo-institutional economics), emerged during the 1980s (Hall and Taylor, 1996). Rational choice institutionalism regards the institution that was neglected in neoclassical economics as an important factor affecting human behavior. In rational choice

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theory, individuals seek to maximize individual utility, but in a society where multiple individuals exist, maximizing one person's utility cannot achieve Pareto optimal outcomes. For this purpose, it is the rules that are introduced, and the utility of those who follow the rules is higher than those who do not, and the rules occur and change spontaneously. Based on this logic, Coase (1960), Olson (1993) and North (1990) developed the theory of property rights, the theory of transaction costs, and the theory of rent-seeking, and these theories became the basis of neo-institutional economics.

While the main debate was whether growth rates were converging into stagnation, or offsetting marginal diminishing return due to other factors such as human capital, the neo-institutional on what institution induces productivity economics focuses improvements. The reason why people studying middle-income countries are interested in institutions other than capital, labor and technology, stem from the perspective of neo-institutional economics. North (1990) argued that Third World countries cannot escape poverty because institutional constraints that do not encourage productive activities reduce incentives for economic activities. Olson (1996) also argued that, as opposed to industrialized countries achieving potential growth rates, poor countries failed to introduce a structural incentive system that could maximize their productive forces, resulting in insufficient growth rates. After all, ensuring a series of processes that provide incentives for economic activities is the institutional method to insure potential growth rates.

The incentive system consists of rules that ensure ownership and perfect competition. The settlement of exclusive ownership is the basis of growth and progress because it induces integration of knowledge that is divided among multiple people (Hayek, 1968). In addition, where strong social capital based on a clear assignment of property rights is established, transaction costs are reduced, the market is enlarged, and the expansion of enterprises is accelerated, resulting in economic development (North, 1984). However, since the state is the ultimate decision maker in policing ownership and rules, national behavior also serves as a very important variable in terms of neo-institutionalism. The state may also play a role in lowering transaction costs and also provides public goods to maximize own interests by means of power and force. At the same time, the state exercises an inefficient ownership order, that is short-sighted control that indiscriminately suppresses the desire of production and investment to maximize its own interests (Alston and Mueller, 2005). Short-sighted control occurs especially when there is no or only insufficient institutional capability to check and balance state power. Thus, in order to maximize economic growth, not only property rights that protect ownership, but also the ability of the state to make rules and an institution to check and balance the state's coercion.

Previous studies were lacking in data, thus in the process of measuring the institution, indices of private property rights, state capacity, check and balance, etc. were measured in different ways depending on the theoretical background. Gastil (1983) and Barro (1991) used political stability as surrogate variable because there was no data that could directly measure private property rights, while Kormendi and Meguire (1985) used political freedom and civil liberties as surrogates for private property rights and contractual rights to demonstrate the relationship with economic growth. In addition, Rama (1993) analyzed the relationship between private property rights, rent-seeking and economic growth by utilizing the rent-seeking bill as data, and Knack and Keefer (1995) analyzed the relationship between the system and economic growth using the rule of law index, the repudiation of government index, the corruption index, and the quality of bureaucracy index in the International Country Risk Guide (ICRG) and Business Environment Risk Index (BERI) data.

Recently, the development of governance theory has led to studies between governance and economic growth. From an institutional perspective, governance means the enactment, application and enforcement of rules (Kjaer, 2004). Kauffmann,

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Kraay and Mastruzi (2007) developed World Governance Indicators (WGI) as an indicator of a country's governance level to measure government accountability, regulatory quality, political stability, rule of law, government effectiveness, and corruption control indexes. Gani (2011) used them to demonstrate the relationship between governance quality and economic growth.

In addition, North (1987) advocated the importance of state action from an institutional perspective. Since the state coercion is inevitable the neoclassical economics notes how a political system is established. As a result, research between democracy and economic growth has been actively carried out. Research on this is still widely debated, and according to Doucouligos and Ulubasoglu (2008), out of 84 articles that focused on the relationship between democracy and economic growth, 15 percent found a negative impact and 27 percent found a positive impact of democracy on economic growth, and 58 percent found no statistically significant relationship between the two.

The aforementioned neoclassical economic growth theory and neo-institutional studies are focused on research to explain what causes economic growth by expanding on the Solow Model' s analysis of the middle-income trap. Only recently did Ayer et al. (2018) conduct empirical research that included institutions such as rule of law, size of government, and market regulations as reasons for the economic growth of middle-income countries. Also, Eichengreen et al. (2011, 2013), and Bulman et al. (2017) included the Polity IV which measures the level of democracy as the explanatory factors to analyze the factors of economic growth. Other studies have focused on political and social factors such as inequality, corruption and education, but have failed to produce any more than a comparative analysis of descriptive statistics between the middle-income trap countries and its escapees.

Moreover, the middle-income trap study is experiencing difficulties in establishing a reference point. Glawe and Wagner (2016) conducted a literature survey of the middle-income trap studies, in which four bodies of literature set absolute standards for defining the middle-income trap by combining economic growth rates and the middle-income trap period, while six bodies of literature use relative standards, such as per capita income in the United States compared to per capita income in individual countries. The changes in the sample countries are significant depending on which standards are used. The relative standard of setting the U.S. per capita GDP used in many studies as a comparative standard presupposes that the transition from small to medium-income countries to high-income countries requires a substantially higher economic growth rate than that of the U.S. This causes countries such as Chile and Uruguay, which have entered high-income countries with low but steady economic growth, to be classified as middle-income countries if a relative standard is used.

1.2. Purpose of Research

The existing middle-income trap studies demonstrated the relationship between economic factors such as total factors productivity and growth stagnation in middle-income countries based on the neoclassical growth model (Eichengreen et al., 2011 and 2013). Also, the studies tried to explain the cause of economic stagnation in middle-income countries by adopting institutional factors such as political system, rule of law, and the size of government in the existing economic growth theory model (Bulman et al. 2017, Aiyar et al., 2015). Comparative analysis of the descriptive statistics of key indicators in the middle countries (Doner and Schneider, 2016; Tran, 2013) and a number of cases study of major regions or countries (Ohno, 2009; Lee and Narjoko, 2015; Khara and Kohli, 2011) were followed. In light of existing studies, in order to further analyze the problem of the middleincome trap, an in-depth analysis of countries who escaped the middle-income trap should be conducted. The current study therefore will focus on factors and contexts that allowed to escape

from the trap.

In particular, the purpose of this study is to derive the determinants of the escape level from the middle-income trap by utilizing the fuzzy-set qualitative comparative analysis. The fuzzy set qualitative comparative analysis (fs/QCA) allows quantitative comparisons of qualitative context through calibration and allows researchers to interpret cross-country analyses that are difficult to generalize in terms of data availability. Also, it allows researchers to explore questions obscured by fuzzy areas between qualitative and quantitative studies (Lee, 2018). Using the fs/QCA, this study will identify which combination of factors are the determinants of escape from the middle-income trap.

Prior to this, a reference point for classifying escape countries (escapees) is established to analyze them. The middle-income trap studies use different reference points depending on researchers, but the difference in classification by absolute and relative criteria is considerable.

In order to overcome the limitations of the empirical analysis of the preceding studies, this study first derives the standard for determining escape levels based on the absolute criteria of the World Bank, and calibrates them into fuzzy-set scores. Next, by deriving the necessary and sufficient conditions to explain the level of escape through the fuzzy-set causal complexity analysis, I will verify whether economic and institutional factors can explain the escape from the middle-income trap. Lastly, by using the fuzzyset ideal type analysis, I will analyze the types of escapees by time of escape and check the variations of types during each period (Period 1: 1990, Period 2: 2000, Period 3: 2010, Period 4: 2017).

1.3. Range of Research

The range of this research is divided into sample countries, time period, and index. The countries to be analyzed in this study are countries with a time period of more than 30 years at the middle-income level (\$1,000 to \$12,500) reflecting the criteria of the World Bank. In the case of oil-producing countries, they were excluded from the analysis because they relied on oil-producing exports for a significant portion of their economic growth, which could distort the results.

The periods of analysis are the 1990, 2000, 2010 and 2017. Since the purpose of the current study is to analyze the escape factors, analysis in the same year can distort the results. For example, South Korea escaped the middle-income trap in 1996. The country's economic freedom index rose to 7.59 in 2017 from 6.64 in 1996, while the corruption index fell to 0.107 in 2017 from 0.304 in 1996. If the time of the analysis is applied to all countries in the same year, it is likely that the indices of countries 10 to 20 years after the escape have improved further. To compensate for this matter, ideal type analysis is used to identify the combinations of causal sets that were important at the time of escape from the middle-income trap.

The causal conditions of the analysis are the level of economic institutions from the Economic Freedom indicator, the corruption index from V-DEM, the polity score from INSCR and total factor productivity from Penn World Tables V9.1. The causal condition is similar to independent variable in regression analysis. Economic Freedom consists of five indexes: (1) government scale; (2) legal system & property rights; (3) soundness; (4) trade freedom; and (5) regulation, and provides an economic freedom index that integrates them. Each index has a value of 0 to 10. In this study, the average of the two indices, legal system and property right, and regulation, was set as a level of economic institution. The corruption index for V-DEM has a value of 0 to 1 and is used as a surrogate variable for the effectiveness and ability of the country. The Polity score from INSCR is a combination of two indices: democ which is level of democracy that has a value from 0 to 10 and autoc which is the level of autocracy and has a value of 0 to -10. Thus, the polity score ranges from -10 to 10. Total factor productivity is from the Penn World Tables V9.1 and used as economic factor for escape while the other three indices used are institutional factors. The outcome, in other words dependent variable is per capita GDP, PPP (2011, \$) form Penn World Tables V9.1 and it represents the escape level from the middle-income trap.

1.4. Research Questions

This study attempts to analyze the relationship between economic and institutional factors with regard to escape from the middle-income trap. Moreover, the study tries to classify the combination of factors through ideal-type analysis to confirm that there are various approaches to the escape from the middle-income trap. Based on this, I want to draw out policy implications for middle-income countries. To this end, this study has two research questions.

First, what are the determinants of the escape level from the middle-income trap? To answer this question, the analysis date is set in 2017 and, verifies the necessary and sufficient conditions of the outcome which is the escape level from the middle-income trap. Through this, I would like to examine which factors explain the escape level and see if the variables used in the economic growth theory and neo-institutionalist studies have causal relationships with the outcome, and which combinations of factors constitute sufficient conditions for high escape levels.

Second, what are the ideal types to escape from the middle-

income trap and how do the types change before and after the escape? This study sets the factors that have an important impact on the escape from the middle-income trap such as total factor productivity, economic institutions, corruption index, and polity score. While the effects of each factor, based on the theoretical background, will be considerable on economic growth, previous studies have produced different results. It is due to the nature of the econometric model, that the coefficient of an independent variable is interpreted, ceteris paribus. To overcome such limitations, I will classify types characterized by four factors in four periods through Fuzzy-set ideal type analysis, and identify which types change along the periods.

Chapter 2. Literature Review

2.1. Theoretical Background

2.1.1 Neoclassical Economics

Due to the short history of the middle-income trap, the original theory, as well as the definition of middle-income trap, is insufficient. Therefore, it is necessary to understand the neoclassical growth theory, which is represented by the Solow model and widely used for empirical studies to analyze the middleincome trap. The Solow growth model is used as a framework for analyzing the impact of allocation between consumption and investment in production on capital accumulation and growth when technological advances are given externally (Solo, 1956). The aggregate production function of the Solow model is Y=AF (K.L), Y is the maximum output, A is the total factor productivity, and L and K, the production factors of a single economy, respectively, represent the total amount of labor and the total amount of capital.

<Figure 2-1> Aggregate Production Function of Solow Model



Divide the left and right sides of the gross domestic product function by L to obtain the y=f(k) function, which means per capita output by capital. This is illustrated in Figure 2-1, which shows the law of marginal diminishing return, which increases production but

decreases slope as per capita capital increases. Assuming the law of marginal diminishing returns, the growth of per capita production and per capita income eventually stagnates as one economy continues to grow, reaching steady-state. In this situation, growth is possible only with further technological progress. In the process, as the per capita income grows, the economic growth rate converges into certain low level.

The theory of economic growth has been elaborated by various scholars, starting with the empirical analysis of Solow as above. Romer (1986) demonstrated that the positive external effects caused by R&D play a significant role in offsetting marginal diminishing return, enabling continuous growth, while Lucas (1988) emphasized the role of human capital accumulation and learning effects, proving that improving the quality of human capital enables sustained growth. In this process, endogenous growth theory was embodied and technological advances were included as endogenous variables in the model in the form of R&D and human capital.

Recently, as the importance of the institution has been highlighted, empirical studies that include institutional factors have been actively conducted based on the Solow model. This study also aims to analyze the total factor productivity, which is a major factor in neoclassical economics, by setting it as an economic factor and including the major institutional factors that are noted in neoinstitutionalism.

2.1.2 Neo-Institutional Economics

Neo-Institutionalism is not an independent theoretical framework, but an organic sum of historical institutionalism, rational choice institutionalism (neo-institutional economics), and sociological institutionalism formed on the basis of different methodological attempts in different disciplines (Hall and Taylor, 1996). Neo-institutional economics is based on the theory of

rational choice in neoclassical economics, and includes theories of ownership, transaction costs, institutional changes, rent-seeking, etc. as key studies (Choi and Kook, 2006).

While neoclassical economics regards the institution as exogenous, the neoclassical economics assumes that the institution governs human perception and affects choice, and makes the institution itself the subject of analysis. Hayek (1982) who attempted a theoretical explanation of the institutions saw the formation of order as a spontaneous order based on evolutionary rationalism, and Popper (2013) named it a naive rationalism. Their common ideological basis is that the process in which a set of institutions are created is the result of rational decision-making based on an individual's value judgment and that value judgments can be explained by subjective profit-maximizing principles (Choi and Kook, 2006). Neo-institutionalism focuses on the cognitive aspects of humans and identifies the effects of game rules (systems) governing human interaction on human behavior. It is then interested in analyzing and understanding the political and economic processes and the impact of institutions and institutional changes on economic performance that are fed back to the plan through the learning process (Choi, 2006).

Neo-institutional economics is based on property right and transaction cost (North, 1990). The concept of property rights refers to a bundle of rights, such as the right to use property as well as the right to generate income, and the right to dispose, transfer and trade (Coase, 1960). The property rights include expectations that individual choices and decisions about 'how to use property' will work as a decision literally (Choi, 2006). When property rights are confirmed, the individual has a motive and incentive to maximize the individual's property. Conversely, the restriction of property rights means that the motivation for maximizing property disappears, which means diminishing transactions and markets, and decreasing economic growth. Thus, the basic function of property rights is to provide conditions for each economic entity to maximize its own interests without harming other economic players.

Transaction costs can be conceptualized as searching and information costs, negotiation and decision costs, confirmation and execution costs (Dahlman, 1979). The reason why neo-institutional economics pays attention to transaction costs is that transaction costs make transactions between individuals difficult and consequently hinder the use of property. Coase (1960) noted that adjusting economic behavior using the pricing system would incur transaction costs in the process of discovering prices, entering into contracts, and making the contract work, and that if these costs exceed the benefits of market exchange, no exchange activity would occur, and thus would not be expected to develop technology through production and division. However, due to these transaction costs, individuals or organizations compete and invest in higher gains by reducing transaction costs (Kasper and Street, 1988). This process of market competition is referred to as the process of knowledge generation (Pejovic, 1998), and the process of discovering knowledge (Hayek, 1968). Consequently, transaction costs play a role in generating new knowledge, which can be expressed as specialization, innovation, etc. in a perspective of economic growth. Therefore, the state should protect property rights while avoiding excessive intervention in transaction costs.

The state acts as an important variable in neo-institutional economics because the state is the main body in charge of property rights and transaction costs. The political system tends to form inefficient property rights, as it is greater for a leader to set up inefficient property rights, give some exclusive rights and benefit from taxes than to set up efficient property rights and gain from taxes while monitoring and supervising ordinary citizens (North, 1987). It is also true, however, that the guarantee of ownership and rights of conduct imposed by state power is inherently closely

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related to the nation's economic growth. Thus, the state should establish order through rule of law, avoid inefficient state intervention and consolidate the institutions of protecting individual property rights, and in this process, the state's measures must be predictable so that transaction costs do not increase and the market economy can be revitalized.

North (1987)'s view of the importance of state action eventually leads to the question of what political system the state has. There are conflicting opinions on political system and economic growth because of the fundamental differences between democracy and authoritarian regimes, namely the degree of autonomy in political elites. The autonomy of high-level political elites expressed in authoritarian regimes and the low-level autonomy found in democratic systems have both positive and negative effects in terms of driving economic growth. The high level of autonomy of political elites, which is needed to ensure a high level of investment and to be free from the public's immediate demand for consumer spending, is also a tentative threat in itself. Authoritarian of course, may pursue potentially beneficial governments, developmental policies, but at the same time they may become potential predators. Without checks on the exercise of power, as in a democratic system, various resources in society can be used and diverted at their own discretion (North, 1990). According to Olsen, most dictators generally argued that they would have short-sighted tendencies and infringe on individual rights to contracts and ownership, which in turn negatively affect economic growth in the long run (Olson, 1993). Therefore, the property rights, transaction costs, and state power are considerable factors that affects economic growth of a state. Thus, these factors are included in this research using surrogate variables that can represents those factors.

2.2. Economic Development of Middle-Income Countries

Studies based on neoclassical growth theory sought to highlight the qualitative aspects of technology and production factors as a source of growth and explain the overall trend of growth. However, the emergence of low-income and middle-income countries, where countries do not grow in the first place or only grow to a certain extent and stagnate, has led to the development of various economic growth models that focus on this phenomenon. First of all, there is Nelson's low-level Equilibrium trap as a theory of the poverty trap. It argued that rapid population growth in underdeveloped countries would hamper the increase in per capita income and that the pace of increase in investment and output must exceed the pace of population growth by investing large capital (Nelson, 1956). Next is Lewis' dual-sector model. This is a theory that deals with the process of underdeveloped countries getting out of the poverty trap, which is a theory that the relocation of labor resources to urban industrial sectors with very low marginal productivity leads to increased productivity, and this transition in the demographic structure continues for a long time until wages rise in earnest due to the depletion of surplus labor. There are two turning points in the Lewis hypothesis: the first turning point is that the shift of rural surplus labor to urban industry has occurred to some extent and wages have begun to rise in cities, but agricultural marginal labor productivity is still lower than average productivity, so agricultural wages are set as survival wages according to average productivity. The second turning point is called a 'commercialization point' when wages are collected because wages are determined not only by marginal labor productivity but also by the agricultural sector as wages continue to rise further and agricultural marginal labor productivity exceeds average productivity. The post-commercialization phase is the neoclassical uniformized market economy phase (Lewis, 1954). Thus, the section between the first and second turning points can be viewed

as the middle-income trap

Kuznets (1955) presented a counter-U-shaped hypothesis on the relationship between economic development and income distribution, which is in line with Lewis's dual-sector model. arguing that income distribution worsens until economic development reaches some extent and that income distribution improves thereafter due to rising wages. The reasons for the Ushaped model are as follows: In the early stages of economic development, an unbalanced development strategy creates an income gap between those who participate in the sectors where development takes place quickly and those who do not. Once development is made to a certain extent, the income distribution gap will be narrowed because of the shift to a balanced development strategy and the use of redistribution policies. The Kuznets model is basically the same kind of theory as the Lewis model, as it presupposes an early stage of unbalanced development and terminal stage of subsequent balanced development.

There is a study by Eckhout and Jovanovic (2007) as a theory that can be applied to the middle-income trap. By comparing the economic growth performance of each country before and after globalization, they found that a U-shaped relationship was established between the per capita income level and the long-term growth rate. This is because in advanced countries, the skills of workers are high, and in the process of globalization, many managerial jobs are created, and in the case of underdeveloped countries, many jobs of unskilled workers are created. Garrett (2004) explained that this was because rich countries would become richer by accelerating technological advances, while poorer countries would accelerate growth in manufacturing, while middleincome countries would not see much change.

Ohno (2009) presented a catching-up industrialization model by attributing the experience of East Asia. The first stage of economic take-off is the stage where sufficient foreign investment is made in light industry and electronic appliance assembly processes. Simple processing and trade industry is developed under the foreign investors, creating jobs and income, but with less value-added creation. The source of growth is agglomeration, and Vietnam is now at this stage. In the second stage, foreign investment is accumulated, and production expands, while supporting industry that leads the increase of domestic supply of parts and raw materials by foreign-invested companies and domestic companies, develops. However, wages and income are still low and main production process are led by foreigners. The source of growth is technology absorption. Malaysia and Thailand are now at this stage. The third step is to internalize technology and knowledge by accumulating human capital, thereby transforming locals into high-quality product exporters with strong competitiveness, replacing foreigners in all fields, including production, management, technology, design and marketing. The source of growth is creativity. Korea and Taiwan are at this stage. The fourth step is to have sufficient capabilities as a global leader in innovation and product design, which includes the United States, Japan and the EU. Between the second and third of the four stages, there is a glass ceiling that is difficult to pass, and it is the middleincome trap that cannot be overcome, which is due to a failure in improving human capital.

2.3. Middle-Income Trap

2.3.1 Definition

The World Bank divided middle-income countries into lowermiddle-income countries and upper-middle-income countries, with GDP ranging from \$1,000 to \$4,000 and \$4,000 to \$12,500 per capita, or GNI from \$1,026 to \$3,955 and \$3,956 to \$12,475 per capita.^①

On the other hand, the establishment of a clear concept of a middle-income trap has yet to be reached, but it tends to define a middle-income trap based on economic growth and the duration of its stay in a middle-income. GIll and Kharas (2007), who first developed the concept of a middle-income trap, said, "In the course of a country's economic development from middle-income to high income, it is highly likely that the country's past development models will not repeat or leave, resulting in stagnant or divergence in economic growth, and that per capita income will not exceed the high-income threshold. This is mainly because the problems that had accumulated until reaching the level of middle income have exploded intensively and the original growth mechanism and development model have failed to effectively cope with the systematic risks posed by it, resulting in significant changes in economic growth or a slowdown," and they named this situation a middle-income trap. After Gill and Kharas' study, studies on the middle-income trap began to gain momentum, and the studies are divided into two that use absolute standard or relative standard to decide whether a country escapes the trap or not.

Eichengreen et al. (2011, 2013), who used an absolute standard, defined slowdown in economic growth as follows. If the average economic growth rate is more than 3.5% over the seven years prior to a certain point t, and then the economic growth rate decreases more than 2%p after t, it is slowdown and if a country is in this situation it is in middle-income trap.

The Tran (2013) defined a country that has not been transferred to a high-income country for more than 50 years after entering a middle-income status, while Felipe, Abdon, and Kumar (2012) defined a country as suffering from a middle-income trap when it has been staying for 28 years between \$2,000 and \$7500, 14 years between \$7500 and \$11500, or more than 42 years

Inttps://www.worldbank.org/en/country/mic

between \$2,000 and \$11500. The following is a tabulation of studies using absolute standards, including those above.

Author	Definition	Middle <i>-</i> Income Range	Data	Period
Eichengreen et al. (2011)	Growth Slowdown (GS) $gt,t-n \ge 0.035,$ $gt,t+n - gt,t-n \ge 0.02,$ $yt \ge 10,000$ GS occurs typically between \$15,000-\$16,000	>\$10,000(200 5, international \$)	Penn World Tables 6.3	1957~2007
Eichengreen et al. (2013)	Growth Slowdown (GS) $gt,t-n \ge 0.035,$ $gt,t+n - gt,t-n \ge 0.02,$ $yt \ge 10,000$ GS occurs between \$10,000- \$11,000 and \$15,000-\$16,000	>\$10,000(200 5, international \$)	Penn World Tables 7.1	1957~2010
Felipe et al. (2012)	Above-Average Time Spent in the Middle-Income Range > 28 years in the LMIR (average growth rate of at least 4.7% to avoid MIT) > 14 years in the UMIR (average growth rate of at least 3.5% to avoid MIT)	\$2,000~\$11,7 50 (1990 PPP \$)	Maddison (2010), IMF Database (2011)	1950~2010
Aiyar et al. (2013)	Growth Slowdown (GS) the residual of country <i>i</i> at point <i>t</i> is "much" smaller than in the previous period $(t - 1)$ and also stays "much" smaller in the following period $(t + 1)$	\$2,000~\$15,0 00 (2005, international \$)	IMF staff calculation	1955~2009
Tran (2013)	Countries in middle-income range for more than 50 years	\$996~\$12,195 (GNI, current US\$)	World Bank calculation	1960~2008

<Table 2-1> Absolute Standard of Middle-Income Trap

Source: Glawe and Wagner (2016), added Tran (2013)

On the other hand, the World Bank (2012) and Bulman et al. (2017), which used relative standards, defined a country whose per capita GDP is 10% to 50% compared to per capita income of the United States in 1960 as a middle-income trap country. Woo et al. (2010) used per capita income in the United States to form the Catch-Up Index (CUI) and set the CUI at 20% to 55% as a middle-income. In later work, they defined middle-income trap if a country

is in CUI at 15% to 60% and the duration of its stay in the range is at least 50 years.

On the contrary, one research has been conducted to deny the existence of a middle-income trap. Im and Rosenblatt (2013) divided per capita GDP of the US into low, middle, high income countries which respectively represents the range, 15 to 30 percent, 30 to 45 percent, and 45 to 60 percent and used the transition matrix approach to analyze the number of countries moving from each income section to the next income section. According to this, it is difficult to support the thesis of the middle-income trap because the difference between a rise from a lower-middle-income to an upper-middle-income and upper-middle-income to high-income is not significant. The studies of middle-income traps using relative standards is shown in Table 2-2 below.

Author	Definition	Middle- Income Range	Data	Period
Woo et al. (2012)	Failed Catch-Up Process: Catch-Up-Index(CUI), comparison with the US income level 55% > CUI > 20% for a period > 50 years	15% <cui<60% (1990 PPP \$)</cui<60% 	Maddison (2010)	1~2008
World Bank (2012) Agénor et al. (2012)	Failed Catch-Up Process: ca. 5%-45% of the US per capita income for about 50 years	5%~45% of US GDP per capita	Maddison (2010)	1960~2008
Im and Rosenblatt (2013)	Failed Catch-Up Process: Two income groupings, each with three middle-income subgroups in % of the US PCI	15%~45% of US GDP per capita	World Develop ment Indicator s	1961~2011
Robertson and Ye (2013)	Time-series definition: Behavior of the difference $xi,t \equiv yi,t - yr,t$ condition for an MIT: long-term forecast of country's <i>i</i> per capita income relative to a reference country is (i) time invariant, and (ii) lies within in the middle-income range.	8%~38% of US GDP per capita	Penn World Tables 7.1	1960~2010

<Table 2-2> Relative Standard of Middle-Income Trap

Bulman et al. (2017)	5%-45% of the US per capita income for about 50 years	10%~50% of US GDP per capita	Penn World Tables 7.0	1960~2009
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Source: Glawe and Wagner (2016), added Bulman et al. (2017)

2.3.2 Studies of the Middle-Income Trap

Bulman et al. (2017) divided the national income classification into low, middle and high-income countries that respectively represents lower than 10 percent, 10 percent to 50 percent and more than 50 percent of US GDP per capita. According to the income levels of individual countries in Figure 2-1, 10 countries escaped from the middle-income trap, including Korea, Japan, and Singapore. Based on this, they compared descriptive statistics on macroeconomic indicators, political systems, inequality levels, and human capital levels of escapees and trap countries. They conducted a pooled OLS analysis that included median income countries and low-income countries as dummy variables. According to the report, the escapees had a relatively high level of industrial ratio and export orientation compared to the trap countries. On the other hand, inflation, Gini coefficient and dependency ratio remained relatively low, and the level of democracy and authoritarian regime had no significant impact.





2 2

Ayer et al. (2018) analyzed what level of GDP per capita is usually stagnant with the Probit model, and conducted empirical analysis including variables such as institutions, population, economic structure, and trade structure. After defining the economic slowdown, Ayer et al. (2018) designated middle-income countries as countries with per capita GDP of \$3,000 or more and experiencing economic slowdown. With regard to institutionalism, the legal system and property rights, government size and market regulation were found to be significant among the indicators of Economic Freedom.

Felipe et al. (2012) conducted an analysis with an approach that viewed the engine of middle-income countries as exports. In the study, middle-income countries were divided into lower-middleincome countries and upper-middle-income countries, and each was compared and analyzed with the export products of higherincome countries. The study found that the countries that transferred to higher-income countries were diversified and highly sophisticated regarding their respective products and services basket.

The regional studies of the middle-income trap include the study of Tran (2013). According to the article, the total factor productivity of ASEAN countries, the number of patents acquired, and the five institutional factors of Worldwide Governance Indicators are relatively lower than those of major East Asian countries and they argued that innovation policies are needed to overcome them. It also mentioned Vietnam that it is in the risk of early entry into the middle-income trap. Although Vietnam entered into middle-income in 2008, Vietnam's innovation policy (doi moi) did not lead to innovation of public enterprises and vitalization of the element market, and pointed out that the middle-income trap could occur relatively quickly. Quantitative studies of middle-income trap are shown in Table 2–3 below.

Author	Contents	Dependent Variable	Independent Variable
Eichengreen et al. (2011, 2013)	 Probit model empirical analysis of when economic slowdown occurs Target: 2005 per capita GDP > \$10,000 Slowdown occurs when GDP per capita is \$10,000 to \$11,000 and \$15,000 to \$16,000 	GDP Growth Rate (PPP, 2005)	GDP per cap, dependency ratio, consumption and investment (% of GDP), Gov' t expenditure, democracy index, inflation, exchange rate, economic crisis
Felipe et al. (2012)	 Calculate the average duration of stay in middle-income countries Target: low-middle-income and upper-middle-income countries Comparative analysis of export products of countries - Export products are diversified and sophisticated in countries with higher middle income 		Price of export products, total export, RCA
Im and Rosenblatt (2013)	 Use transition matrix approach Not supporting the existence of middle-income traps because the difference between the probability of going from the lower-middle-power to the higher-income-developed countries is not significant 		
Tran (2013)	 Comparative Analysis of Descriptive Statistics Case analysis on the possibility of Vietnam's early entry into the trap 		GNI per capita, R&D expenditure, n of patent, labor force with tertiary education, WGI, etc.
Doner and Schneider (2016)	- Correlation analysis between middle and high-income countries	GDP per capita (PPP, 2005)	N of R&D researchers and expenditure, average PISA, GINI, black market, FDI
Bulman · Eden · Nguyen (2017)	 Comparative analysis of descriptive statistics, such as major economic indicators and social indicators Pooed OLS regression analysis 	GDP Growth Rate (PPP, 2005)	GDP per capita, GINI, fertility rate, dependency ratio, democracy, population with tertiary education, inflation, etc.
Ayer et al. (2018)	 Probit model empirical analysis of when economic slowdown occurs Target: GDP per capita > \$3000, and with economic slowdown The institutional factors are significant 	GDP Growth Rate (PPP, 2005)	Rule of law, size of gov't, regulation, population, capital formation, debt, trade, economic crisis, industrial structure, etc.

<Table 2-3> Quantitative Studies of Middle-Income Trap

As a qualitative study of the middle-income trap, it seems that the case analysis based on Ohno (2009)'s catching-up industrialization model was first introduced. The study analyzed the success cases of Korea, Japan and Taiwan with important topics such as industrialization level, industrialization policy, policy formation process and political leadership to apply the catching-up industrialization model. Moreover, Ohno also warned ASEAN countries, especially Vietnam, the danger of the possibility of middle-income trap.

Kharas and Kohli (2011) compared Latin America with East Asian countries and argued that specialization of goods, improvement of total factor productivity and decentralization are the basis for escaping the middle-income trap, as in the case of Korea and Japan. It also argued that the social security system should support not only low-income households, but also middle income ones, to maximize potential economic growth and that political leadership plays an important role in a series of processes.

Lee and Narjoko (2015) presented strategies for ASEAN countries to escape from the middle-income trap, focusing on productivity, which is a component of innovation, and the degree of internationalization. According to them, trade, FDI, government policy, public institutions, infrastructure, and education systems interact with R&D and competitiveness of companies. As a result, they lead to product innovation, process innovation, marketing innovation, and organizational innovation. In case of ASEAN, foreign capital inflow and export-oriented industries should come first, especially through innovation. Qualitative studies of middle-income trap are shown in Table 2–4 below.

Author	Contents	Variables	
Ohno (2009)	 Catching-up industrialization model 	Industrialization, industrial	
	- case study of Korea, Japan, Taiwan	policy, leadership,	
	- Risk of middle-income trap in Vietnam	technocrat, foreign partner	

<Table 2-4> Qualitative Studies of Middle-Income Trap

Khara and Kohli (2011)	 Comparative study of Latin America and Eastern Asia (specialization, TFP are important) Expansion of social safety net is needed 	Specialization, total factor productivity, social safety net, leadership
Lee and Narjoko (2015)	 Focus on innovation, productivity, internationalization Innovation to increase R&D and export 	Innovation, productivity, internationalization, export, trade, FDI
Glawe and Wagner (2016)	- review of middle-income trap studies	

The empirical studies on the middle-income trap have made huge progress by Eichengreen (2011, 2013) and Ayer et al. (2018), which have selected and verified not only economic factors but also institutional ones that are significant to middle-income countries. However, in the field of qualitative research, there is still a lack of research that could have significant implications. Although discussions on the historical context of individual countries, the development of institutional and social policies that cannot be included in empirical research can proceed due to the nature of qualitative research, so far only general suggestions have been made to specific regional countries.

To overcome the above limitations, this study aims to verify the coverage of economic and institutional factors by using fs/QCA, and check the types of development of each country through ideal type analysis to discuss what historical context and institutional development a country experienced to escape the middle-income trap.

Chapter 3. Methodology

The study of the middle-income trap is mainly based on using probit models. As with other quantitative analysis econometric models, it is difficult to understand interactions of more than one variable because coefficient of independent variable is interpreted while other are controlled (ceteris paribus) Adding interaction variable also makes it difficult to determine whether the factors work together because the equation is not only complex but also difficult to interpret. On the other hand, the fuzzy-set qualitative comparative analysis includes the major variables as a set of causal conditions, so that after verifying the coverage and consistency of the set, a combination of those causal conditions can be created through an ideal type analysis to identify the type. This study included four variables that have been verified as important variables in the existing study as sets of causal conditions.

3.1. Sample Data

In this study, an absolute standard is applied to the sample countries. Countries in the range of \$1,000 to \$12,500 (GDP per cap, PPP, 2011) are considered middle-income countries and those with more than \$12,500 are classified to have escaped the middle-income trap. If the duration of the middle-income period is more than 30 years and average oil exports over the last 10 years are less than 30% of total exports, then the countries are included in the analysis.

Country	ISO3	Continent	Sub-continent	Period
Argentina	ARG	America	South America	50
Benin	BEN	Africa	Western Africa	59
Bulgaria	BGR	Europe	Eastern Europe	37
Brazil	BRA	America	South America	60

<Table 3-1> List of Countries Used for the Analysis

Botswana	BWA	Africa	Southern Africa	34
Chile	CHL	America	South America	54
China	CHN	Asia	Eastern Asia	62
Ivory Coast	CIV	Africa	Western Africa	58
Costa Rica	CRI	America	Central America	59
Dominican Republic	DOM	America	Caribbean	63
Guatemala	GTM	America	Central America	68
Honduras	HND	America	Central America	68
Indonesia	IDN	Asia	South-Eastern Asia	48
India	IND	Asia	Southern Asia	58
Jamaica	JAM	America	Caribbean	65
Jordan	JOR	Asia	Western Asia	64
Kenya	KEN	Africa	Eastern Africa	68
South Korea	KOR	Asia	Eastern Asia	38
Sri Lanka	LKA	Asia	Southern Asia	67
Lesotho	LSO	Africa	Southern Africa	54
Morocco	MAR	Africa	Northern Africa	68
Mexico	MEX	America	Central America	45
Mongolia	MNG	Asia	Eastern Asia	48
Mauritania	MRT	Africa	Western Africa	58
Mauritius	MUS	Africa	Eastern Africa	45
Malaysia	MYS	Asia	South-Eastern Asia	42
Namibia	NAM	Africa	Southern Africa	58
Nicaragua	NIC	America	Central America	68
Panama	PAN	America	Central America	57
Peru	PER	America	South America	68
Philippines	PHL	Asia	South-Eastern Asia	68
Portugal	PRT	Europe	Western Europe	38
Romania	ROU	Europe	Eastern Europe	47
Rwanda	RWA	Africa	Eastern Africa	31
Senegal	SEN	Africa	Western Africa	58
Sierra Leone	SLE	Africa	Western Africa	48
Swaziland	SWZ	Africa	Southern Africa	48
Togo	TGO	Africa	Western Africa	58
Thailand	THA	Asia	South-Eastern Asia	53
Tunisia	TUN	Africa	Northern Africa	58
Turkey	TUR	Asia	Western Asia	55
Tanzania	TZA	Africa	Eastern Africa	51
Uruguay	URY	America	South America	58
South Africa	ZAF	Africa	Southern Africa	68
Zimbabwe	ZWE	Africa	Eastern Africa	63
If a relative standard is used, large numbers of countries that have already entered high-income are classified as middle-income countries. On a relative standard basis, if a country whose GDP per capita compared to US GDP per capita has moved from a range of 5% to 45% in 1970 to more than 45% in 2017, the countries in the top square of Figure 3-1 will be classified as escape countries. Considering that Romania's GDP per capita compared to US GDP per capita is 44.9 percent (\$25,262), there is a problem with countries that have already entered high incomes being classified as middle-income countries, or countries that have not had a long period of middle-income, such as Ireland and Singapore.



<Figure 3-1> Relative Standard

Source: Penn World Tables Version 9.1

3.2. Fuzzy-set Qualitative Comparative Analysis

3.2.1 Introduction

Comparative studies between countries have progressed with a long history of methodological innovation (Tilly, 1984). The analysis method to be used in this study is the fuzzy-set qualitative analysis method, which is evaluated to have brought about an epochal transition in comparative social policy studies. The Fuzzyset qualitative comparative analysis has been initiated, constructed and developed by Ragin (2000, 2008), and has been further elaborated through research by Rihux (2003, 2006), and Kvist (2006). In addition, the methodological description of fs/QCA software has been developed due to research by Kent (2008), Schneider and Wageman (2010), and Wageman and Schneider (2010), led by Ragin (2009).

Ragin (1987) proposed a development beyond a case-based and variable-centric approach to combinatorial and comprehensive strategy research. That is QCA using Boolean as a mathematical basis. Ragin (2000) considers that QCA was developed by formalizing and expanding comparative case studies. In particular, it emphasizes that the set membership is an analytical tool to compare each case and clearly show the pattern of their similarities and differences. It is also believed that the use of QCA allows to see the configuration between cases, verify complex patterns of causality, and reconstruct populations based on those patterns. Therefore, it can be an alternative to existing cross-case analysis and also a theoretical basis for diversity-oriented research.

Later, Ragin (2000) published the fuzzy-set QCA, a qualitative comparative analysis that added the concept 'fuzzy', meaning ambiguity or blur. He emphasizes in three respects that the emergence of fuzzy-set qualitative comparative analysis is a paradigm shift in the new social science research method. First, homogeneity assumptions that support existing quantitative methodologies should be abandoned because they interfere with communication between ideas and evidence. Second, diversityoriented studies that can address the heterogeneity and differences of cases through an array of approaches to social phenomena are necessary, and third, fuzzy sets can fit well with theoretical concepts.

The actual process of the fuzzy-set qualitative comparative analysis is as follows. First, 'calibration' is the process of transition to a fuzzy-set score from raw data. Second, 'operation' of a fuzzy score using Boolean algebra. Third, 'evaluation' of a set membership of necessary and sufficient conditions. (Ragin, 2008).

The reason why this study uses Fuzzy-set qualitative comparative analysis as the main method of research is as follows. First, because this study seeks diversity between case-based research that pursues intensive complexity and variable-centered research that focuses on broad generalization. In short, the core philosophy of Fuzzy-set research is to pursue diversity-oriented research beyond variable-oriented and case-based strategies. Diversity should be understood in two contexts: one is diversity of type and the other is diversity of degree. First of all, variety of types is the kind of difference that comes from arranging composite properties as a difference in quality, while diversity in degree is the difference in degree to which it falls into one category as a difference in quantity (Ragin, 2000: 149). The fuzzy-set qualitative comparative analysis solves these two diversity problems, so it is a powerful analysis tool. However, although fs/QCA complement the shortcomings of the two traditional methods of research, it is true that the fs/QCA mainly takes advantage of the case-based approach while criticizing the variable-centered approach. For example, fs/QCA takes position such as the practical features of the casebased approach of understanding causality in a combination and heterogeneous manner by understanding cases as configuration. (Ragin, 2000: 39-40). Based on the above explanation, the reason why this study adopted fuzzy set qualitative comparative analysis as the main research method is because, among other things, the analysis targets of this study are not a small number of countries, but 45 medium-range cases. Because the analysis countries are not all homogeneous in terms of economic and political conditions, fs/QCA can simultaneously analyze differences in type and degree, by grasping disparate properties. And while this study utilizes indices that manipulate abstract concepts such as economic institution and corruption levels, it is intended to emphasize practical features of the case-based approach by pursuing diversity between variable-oriented and case-oriented studies, not just variable-oriented interpretations.

Second, the key to understanding a case in context and in configuration is to understand it as a mixture of the main attributes that make up the case (Ragin, 2000: 66). In other words, in fs/QCA, context issues are the core of the configurational approach to the case and can be understood as a mixture of attributes rather than individual variables determining the case. In addition, the main principle of configurational thinking is that as important factors change, the nature of the whole case may change qualitatively (Ragin, 2000: 70). For example, the total factor productivity, economic institution level, and corruption level, which are the explanatory variables of a country escaping from a middle-income trap, are not viewed individually, but rather as a types and configuration. Furthermore, each of these types builds aspects of cases, or ideal types. This study is to conduct a fuzzy set ideal type analysis because it is interested in the context of qualitative change in the context of how the trajectories of changes have been shown and the steps of escape countries through each aspect of cases created by the configuration of these cases.

Third, I agree with the argument that this study should avoid assumptions that simplify the causes of social phenomena as a single variable and that a research strategy is needed to allow causal complexity as much as possible to assess social diversity (Ragin, 2000:93). In short, assumptions should be avoided that a single cause is a necessary or sufficient condition of the result, or that simplify the nature of the causal relationship. In other words, causative conditions that result in a particular social the phenomenon mean a multiple-combined causal relationship in which two or more causes are combined to form a causal relationship (Ragin, 2000: 104). For example, escape level of a middle-income country is not caused by just one factor, but should be interpreted and understood as combinations of various factors. Also, dealing with cases as configuration is the highlight of the fuzzy set, and this study is to conduct a fuzzy-set multiple conjunctural causations analysis because it wants to understand the characteristics of each middle-income trap country in a configuration. Each case in the fs/QCA is described as a multiple affiliation, which can be interpreted as a configuration. In particular, this study would like to utilize the fact that linguistic implications can be projected for the corresponding numbers that make up a configuration beyond the limits that were interpreted only by the number as the regression coefficients in the variable-centered study. As such, this study conducts a fuzzy set multiple conjunctural causations analysis to avoid the interpretation of single variable as a causation of the outcome, but to interpret the outcome as cause of combinations or configurations of various conditions.

(1)Calibration

Membership in the classical crisp-set QCA, prior to the introduction of the fs/QCA is only explained by the 0 or 1 (dichotomy of existence or absence), but the fuzzy-set has the advantage of being able to give different values between 0 and 1 according to the properties of theories and cases. Therefore, these fuzzy-set memberships are considered to be of higher

measurement form than traditional ratio scales. This is because, when classified into the lowest-level measurement form, the crisp-set, the rank scale, the equidistant scale, and the ratio scale, the fuzzy membership has all the characteristics of the ratio scale but also has the maximum value (Ragin, 2000). The measurement of such fuzzy score can be made from the three-value fuzzy set to the continuous fuzzy set, and the explanation is as follows.

Crisp set	Three-Value Fu <i>zz</i> y	Five-Value Fuzzy Set	Seven-Value Fuzzy Set	Continuous Fuzzy Set
1=fully in	1=fully in	1=fully in	1=fully in	1=fully in
		0.75=more in	0.83=mostly but not fully in	numerical scores indicating that
than		than out	0.67=more or less in	degree of membership is more in than out (0.5 <x<1)< td=""></x<1)<>
	0.5=not fully 0.5=crossover; 0.5=cr out or fully in neither in nor out neither		0.5=crossover; neither in nor out	0.5=crossover; neither in nor out
		0.25=more out	0.33=more or less out	numerical scores indicating that
		than in	0.17=mostly but not fully out	degree of membership is more out than in(0 <x<0.5)< td=""></x<0.5)<>
0=fully out	0=fully out	0=fully out	0=fully out	0=fully out

<Table 3-2> Crisp versus Fuzzy Sets

Source: Ragin (2000: 156)

The Fuzzy Set qualitative comparison analysis then took a more mathematical approach, and Ragin (2008) presented the following mechanisms for verbal label and mathematical conversion by presenting 'mathematical transitions of verbal labels'.

<Table 3-3> Mathematical Translations of Verbal Label

Verbal label	Degree of membership	Associated odds	Log odds of full membership
Full membership	0.993	148.41	5.0
Threshold of full membership	0.953	20.09	3.0
Mostly in	0.881	7.39	2.0
More in than out	0.622	1.65	0.5

Crossover Point	0.500	1.00	0.0
More out than in	0.378	0.61	-0.5
Mostly out	0.119	0.14	-2.0
Threshold of full non-membership	0.047	0.05	-3.0
Full non- membership	0.007	0.01	-5.0

Source: Ragin (2008:88)

As can be seen in this table, fuzzy membership scores expressed in the degree of belonging have varying values between 0 and 1. The formula for switching from communist to log odds, and then finally to fuzzy points is as follows (Ragin, 2008). First, a natural logarithm is taken at the value of odds, the ratio of the probability that an event will not occur and will occur, to make logit. Then degree of membership that is equal to logistic function is fuzzy score.

Odds of membership

= (degree of membership) / [1-(degree of membership)]

The actual stage of transition to a fuzzy membership score can be described as follows. Ragin (2000) explains the calibration of fuzzy membership scores in six stages, with Phase 1 clarifying the calibration range, Phase 2 defining the fuzzy set, Phase 3 determining the type of fuzzy set appropriate for each concept, Phase 4 determining the likely range of fuzzy membership scores, Phase 5 confirming empirical evidence to determine the fuzzy membership scores, and Phase 6 transforming empirical evidence to score. Through these six phases, the raw score of the index is converted to the fuzzy score. In particular, three important fixed anchors must be selected in order to convert the origin score to a continuous fuzzy score, which is the full membership point (fuzzy score=0.95), full non-membership point (fuzzy score=0.05), and last crossover point (fuzzy score=0.5) that separates the full membership and the full non-membership. Therefore, the researchers should transform the raw scores in to fuzzy score that correspond to the three qualitative reference points.

(2) Operation

The Fuzzy-set operation borrows a Boolean algebra (Ragin, 2000: 171-176). The fuzzy-set operation is same as the three aggregation formulas used in Boolean algebra, consisting of a union, an intersection, and a complement. First, union is expressed as 'logic or' in the terms of fuzzy-set, and the basic law is the largest membership score of each set, and linguistic interpretation is that it belongs to set A, set B, or both. Next, intersection is expressed in terms of fuzzy-set as 'logic and', and the basic law is the minimum membership score of each set of fuzzy scores, and the linguistic interpretation is that it belongs to set A and also belongs to set B. Finally, the complement set is expressed as 'negation' in fuzzy-set terms, and the basic law is the score subtracted from 1 for each fuzzy score, and the linguistic interpretation is that it does not belong to set A.

(3) Evaluating set relations (Consistency and Coverage)

Ragin (2006) sets out two criteria, consistency and coverage, to validate the set relationship. While consistency assesses the extent of the result set necessarily agreeing to the causal conditions, the coverage assesses the extent to which the necessary conditions are parallel to the examples of results. More specifically, consistency verifies how much a researcher's theoretical arguments can be supported, and coverage explains the importance of empirical relevance. Thus, coverage verifies how the examples contained in the study can be explained by the researcher's theory. For example, if a correlation analysis shows a statistically significant but low correlation, it is more consistent but less 'coverage'. Therefore, the Fuzzy-set analysis provides consistency verification to verify the collective relationship, which is divided into the necessary condition consistency evaluation and sufficient condition consistency evaluation.

First, for consistency evaluation, benchmark should be selected. Ragin (2000: 109) noted that if the causal combinations are significantly greater than 0.8 the causal combinations can be claimed to be 'almost always'. It is also possible to verify the quasi-sufficiency of causal combinations using linguistic qualifiers such as 'more often than not (0.5), 'usually (0.65)' and 'almost always (0.8)' (Ragin, 2000).

If a particular cause must exist when a result occurs, then this cause is defined as a necessary. If the cause produces its own results, this is said to be a sufficient condition. Therefore, if Y results in a subset of the causal set X, the causal set may be called a necessary condition for the outcome set. Conversely, if the causal set X becomes a subset of the outcome set Y, the causal set can be called a sufficient condition for the outcome set.

3.2.2 Fuzzy-set Multiple Conjunctural Causations Analysis

The reason for implementing the fuzzy-set multiple conjunctural causation analysis is to answer the research question 'what are the determinants of the escape from middle-income trap?' The causal conditions used in this study are total factor productivity, anti-corruption index, economic institution level and Polity V index. The four individual indicators are those that have been verified through prior research as important variables that have a very high relationship with economic growth. In this study, we would like to confirm that total factor productivity, anticorruption index, and economic system level are the necessary conditions for determining level of escape, while polity index, which is highly contentious in many prior studies, is not a necessary condition for determining level of escape. Moreover, in order to escape from the middle-income trap, I will verify that it is not possible to escape from the middle-income trap with a single causal condition, but with a combination of causal conditions. In particular, this study is to verify that the combination of institutional variables, anti-corruption index, economic system level, and polity index, can be a cause for the improvement of the level of escape from the middle-income trap, even if the total factor productivity is low.

The variables used in this study were converted to continuous fuzzy scores because, due to the nature of continuous variables, loss of information is inevitable if converted to fuzzy scores in three, five and seven-value fuzzy-set. When calibrated to fuzzy score, the anchor of per capita GDP, PPP (2011, \$), which is outcome set was fixed at maximum value for full membership, \$12,500 for crossover point, and minimum value for full non-membership. The consecutive fuzzy set scores derived from this are shown in Table 3-4.

Fuzzy Score	Verbal Label	Variable	Country
0	Fully fail to escape	GDP per capita, PPP (2011, \$)	Rwanda, Benin, Sierral Leone, Togo, Zimbabwe, Tanzania, Senegal, Kenya, Lesotho, Mauritania, Ivory Coast
0~0.5	Relatively Fail to escape	full membership= maximum value, crossover point= \$12,500,	Honduras, Nicaragua, India, Guatemala, Swaziland, Philippines, Jamaica, Morocco, Jordan, Indonesia, Namibia, Tunisia, Peru, Mongolia, South Africa
0.5	Crossover	full non-membership= minimum value	Sri Lanka, China, Brazil, Dominican Republic

<Table 3-4> Continuous Fuzzy Score of Outcome Set

0.5~1	Relatively Escape	Botswana, Costa Rica, Thailand, Argentina, Mexico, Bulgaria, Uruguay, Panama, Mauritus, Chile, Malaysia, Turkey, Portugal
1	Fully Escape	South Korea

The causal condition consists of four indices. It includes total factor productivity used in neoclassical growth theory as economic factors and also include legal system and property rights and regulation indices provided by the Fraser Institute, corruption index provided by V-DEM and the Polity score of INSCR to verify the explanatory power of institutional factors.

<Table 3-5> Variables used for fs/QCA

Set	Variable	Definition	Source
Outcome	GDPcap	GDP per capita, PPP(2011, \$)	Penn World Table V9.1
	TFP	Total Factor Productivity	Penn World Table V9.1
Causal	AntiCorr	1-(Corruption Index)	V-DEM
	Institution	[Legal System & Property Right + Regulation] /2	Fraser Institute
	Polity	Polity Score	INSCR

The Economical Freedom Index of the Fraser Institute is an indicator of economic freedom, consisting of five indices: government scale, legal system & property rights, sound money, trade freedom, and regulation. It even provides sub-indices that make up each index and provides relatively long-term series data compared to other indicators, making it suitable for this study. Among the five indices, legal system & property rights and regulation indices were selected for the analysis. According to data description of Fraser Institute, legal system & property rights index consists of nine sub-indices (judicial independence, impartial courts, protection of property rights, military interference in rule of law and politics, integrity of the legal system, legal enforcement of contracts, regulatory restrictions on the sale of real property, reliability of police, business costs of crime). It indicates how effectively the protective functions of government are performed. Regulation index consists of three sub-indices (credit market regulations, labor market regulations, business regulations) and nine indicators under them. To get high rating in credit market regulations, a country should use a private banking system to allocate credit to private parties and refrain from controlling interest rates. For labor market regulations, a country must allow market forces to determine wages and establish the conditions of hiring and firing. Lastly, a country must allow markets to determine prices and refrain from regulatory activities that retard entry into business and increase the cost of producing products, in order to score high in business regulations). This study uses the average of legal system & property rights and regulation indices to represent the level of economic institution. Thus, higher economic institution means that property rights are protected, and transaction cost is reduced.²

V-Dem provides panel data from 1789 to the present and provides sub-indices such as independence of the judiciary and legislative branches, gender equality, and private property rights levels, as well as independent political and social indicators such as corruption index and legal order levels. Although Corruption Perception Index (CPI) is widely used in corruption studies, the time period provided by CPI is only from 2012 and it did not meet the time range of this study. Therefore, the Corruption Index provided by V-DEM is used because of long term series data. It consists of six sub-indices (legislative corrupt activities, judicial corruption decision, executive bribery and corrupt exchanges, executive embezzlement and theft, public sector corrupt exchanges, and public sector theft). In this study, corruption index indicates how efficiently state power is. For the convenience of the result

² <u>https://www.fraserinstitute.org/economic-freedom/approach</u>

analysis, anti-corruption index was calculated which is 1- (corruption index).

Polity IV is a sum of two indices, the democratic level of the political system and the degree of authoritarian government, with the level of the democratic system giving it a score of 10 points and the level of the authoritarian regime a score of -10 to zero. Thus, the range of polity score is from -10 to 10.

Considering the correlation, labor and capital variables assumed in Solow Model are excluded in this analysis. Using the data from Penn World Table V9.1, the correlation between real GDP (PPP, constant 2011), population, capital stock (PPP, constant 2011) and total factor productivity is shown in Table 3–6. Correlation coefficients between GDP and population and capital were 0.93 and 0.99 respectively and statistically significant under a significant level of 1%. However, correlation coefficients of total factor productivity between other three variables were low and statistically insignificant.

Variable	Real GDP	Population	Capital	TFP
Real GDP	1.0			
Population	0.9350***	1.0		
Capital	0.9908***	0.8896***	1.0	
TFP	-0.0731	-0.1315	0.5320	1.0

<Table 3-6> Correlation Analysis (1)

Note: Asterisks indicate significance at the 10%, 5% and 1% level.

The correlation of variables used for this study are shown in Table 3-7. The correlation coefficient between GDP per capita and total factor productivity was high at 0.7119 and statistically significant. Anti-corruption, and economic institution indexes were also statistically significant but relatively low at 0.3556 and 0.3637

respectively. Polity score was found to be insignificant.

Variable	GDP per capita	TFP	Anti- corruption	Economic Institution	Polity
GDP per	1.0				
capita	1.0				
TFP	0.7119***	1.0			
Anti-	0 3556**	0.2140	1.0		
corruption	0.0000***	0.2140	1.0		
Economic	0 3637**	0.1355**	0.5040***	1.0	
Institution	0.0007**	0.1000**	0.0040444	1.0	
Polity	0.2465	0.1189	0.2651*	0.0021	1.0

<Table 3-7> Correlation Analysis (2)

Note: Asterisks indicate significance at the 10%, 5% and 1% level.

3.2.3 Fuzzy-set Ideal Type Analysis

The reason for conducting fuzzy-set ideal type analysis is to answer the second research question, 'How types change in escape countries by each period?' To apply fuzzy-set ideal type analysis selection of variables for aspects of cases should precede based on theory. As stated in the section of theoretical background, the aspects of cases set up in this study consists of the total factor productivity selected as economic factors and the economic institution level, the anti-corruption index and the polity index selected as institutional factors. As a result, there are 2^4 (16) types consist of four factors. + means the fuzzy score is more than 0.5 and - means less than 0.5.

Cases	TFP	AntiCorr	Institution	Polity
T*C*I*P	+	+	+	+
T*C*I	+	+	+	_
T*C*P	+	+	_	+

<Table 3-8> Aspects of Cases for Fuzzy-set Ideal Type Analysis

T*I*P	+	_	+	+
C*I*P	_	+	+	+
T*C	+	+	_	_
T*I	+	-	+	_
T*P	+	-	_	+
C*I	_	+	+	_
I*P	_	_	+	+
C*P	_	+	_	+
Т	+	_	-	—
С	-	+	-	_
I	_	_	+	_
Р	-	-	-	+
none	_	_	_	_

Through the 16 ideal types derived by combining four factors, the types of individual countries can be classified. Through the analysis of fuzzy-set ideal type analysis, this study categorizes the countries into types according to four periods: 1990, 2000, 2010, and 2017. Since the analysis of fuzzy-set multiple conjunctural causation analysis is a type of cross-sectional analysis based on 2017, it is not possible to determine which combination of causal conditions individual countries belonged to at the time of escape from middle-income trap. By utilizing the time-by-time classification, this study tries to determine what combinations of causal conditions the countries belonged to at the time of escape and what types they would then converge into.

Chapter 4. Result and Analysis

4.1. Multiple Conjunctural Causations Analysis

4.1.1 Descriptive Statistics and Fuzzy-set Score

The outcome set is per capita GDP, PPP (2011, \$) and the causal set consists of total factor productivity, economic institution and anti-corruption index, and the base year is 2017. First of all, the per capita GDP, which is the outcome set, Korea is the highest at \$37,725 and continues in the order of Portugal, Turkey, and Malaysia. Rwanda is the lowest per capita GDP at \$1,948, followed by Benin, Zimbabwe and Sierra Leon. The lowest 11 countries are African countries while there is no single continent that has it itself on the highest. Of the 45 countries, 19 are classified as middle-income escape countries, there are five countries between 30 and 39, eight between 40 and 49, 17 between 50 and 59 and 15 between 60 and 69 years, with an average period of 55.4 years.

The variables of the causal set are as follows. Total factor productivity is highest in Turkey at 1.1439, followed by Mauritius, Panama, Romania, Jordan and Bulgaria, with the lowest being 0.1759 in Togo, followed by Zimbabwe, Rwanda, Sierra Leon and Tanzania. The lowest total factor productivity also consists of seven countries in Africa.

The anti-corruption level is Uruguay, highest with 0.95, followed by Chile, South Korea, Portugal and Botswana. The countries with the lowest levels of anti-corruption are the Dominican Republic at 0.05, followed by Mauritania. Honda, Togo and Thailand.

Looking at the level of economic institution, Rwanda is shown to have the highest level of economic institutions at 0.95, followed by Mauritus, Malaysia, Namibia and Botswana. The country with the lowest levels of economic institution is Sierra Leon at the bottom with 0.05, followed by Brazil, Argentina, Senegal and Benin. The raw scores of the indices for analysis of fs/QCA are shown in the following table.

Country	Continent	GDPcap	TFP	AntiCorr	Institution	Polity	years
Argentina	America	16771.4	0.733654	0.55	4.7977	9	50
Benin	Africa	1963.8	0.282808	0.645	5.28897	7	59
Botswana	Africa	16235.7	0.572679	0.858	6.90182	8	34
Brazil	America	14108.9	0.471531	0.329	4.4727	8	60
Bulgaria	Europe	20026.9	0.747123	0.396	6.53132	9	37
Chile	America	24024.4	0.722387	0.919	6.66378	10	54
China	Asia	13051.3	0.383774	0.492	6.03205	-7	62
Costa Rica	America	16272.2	0.671072	0.819	6.13108	10	59
Dominican Republic	America	14683.9	0.712645	0.144	5.38187	7	63
Guatemala	America	7473.34	0.652169	0.212	5.36864	8	68
Honduras	America	4523.24	0.344094	0.175	5.28718	7	68
India	Asia	6281.54	0.446328	0.512	5.93032	9	58
Indonesia	Asia	10841.7	0.434208	0.313	5.66164	9	48
Ivory Coast	Africa	3605.62	0.688556	0.462	5.43601	4	58
Jamaica	America	7713.82	0.335885	0.755	6.56209	9	65
Jordan	Asia	8736.36	0.749557	0.514	6.31701	-3	64
Kenya	Africa	2987.5	0.336299	0.256	5.96977	9	68
Lesotho	Africa	2999.39	0.377935	0.477	6.39374	8	54
Malaysia	Asia	26000.6	0.620221	0.533	7.1123	5	42
Mauritania	Africa	2998.25	0.289216	0.145	5.30574	-2	58
Mauritius	Africa	22656.9	0.811371	0.422	7.15602	10	45
Mexico	America	18360.4	0.645848	0.357	5.59534	8	45
Mongolia	Asia	12011.1	0.356656	0.37	6.72499	10	48
Morocco	Africa	8002.15	0.508442	0.54	6.39208	-4	68
Namibia	Africa	11142.1	0.64447	0.839	7.06309	6	58
Nicaragua	America	5360.22	0.398332	0.227	5.72973	6	68
Panama	America	22421.9	0.777215	0.452	5.98387	9	57
Peru	America	11905.3	0.543985	0.516	5.99486	9	68
Philippines	Asia	7628.83	0.505112	0.357	5.83276	8	68
Portugal	Europe	26953.5	0.60006	0.87	6.79472	10	38
Romania	Europe	25262.1	0.775876	0.424	6.83654	9	47
Rwanda	Africa	1948.49	0.234562	0.678	7.38951	-3	31
Senegal	Africa	3140.13	0.470906	0.681	4.90085	7	58
SierraLeone	Africa	1404.31	0.248373	0.207	4.30584	7	48
South Africa	Africa	12201.4	0.53321	0.64	6.14209	9	68
South Korea	Asia	37725.1	0.631685	0.889	6.79987	8	38
Sri Lanka	Asia	12512.7	0.719416	0.531	5.90493	6	67
Swaziland	Africa	7668.12	0.620978	0.465	6.33469	-9	48
Tanzania	Africa	2453.49	0.259968	0.501	6.36308	3	51
Thailand	Asia	16675.2	0.471801	0.188	5.78058	-3	53
Togo	Africa	1547.22	0.175976	0.18	5.8307	-2	58

<Table 4-1> Raw Score of Variables

Tunisia	Africa	10873.2	0.620882	0.771	5.82391	7	58
Turkey	Asia	26649.9	1.1439	0.219	5.26615	-4	55
Uruguay	America	20607.5	0.71841	0.935	5.99472	10	58
Zimbabwe	Africa	1977.84	0.212403	0.218	5.41961	4	63

The following are the descriptive statistics of the variables that are used for outcome set and causal set. The mean, median, standard deviation, minimum value, and maximum value are presented respectively.

Variable	mean	median	std	min	max
GDPcap	12230.87	11142.07	8732.96	1404.31	37725.07
TFP	0.5378218	0.5439848	0.2020287	0.1759760	1.1439042
AntiCorr	0.4885111	0.4770000	0.2341289	0.1440000	0.9350000
Institution	5.9979171	5.9838731	0.7151485	4.3058359	7.3895081
Polity	5.4444	8.0	5.19858	-9	10

<Table 4-2> Descriptive Statistics

As described in the methodology section, variables were calibrated into continuous fuzzy scores using three fixed anchors: maximum value, maximum value, and average of each index. The results of the calibration to the fuzzy score are as follows.

Country	Continent	GDPcap	TFP	AntiCorr	Institution	Polity
Argentina	America	0.62	0.72	0.6	0.11	0.91
Benin	Africa	0.05	0.11	0.74	0.22	0.74
Botswana	Africa	0.61	0.54	0.92	0.88	0.84
Brazil	America	0.55	0.37	0.2	0.06	0.84
Bulgaria	Europe	0.71	0.74	0.31	0.76	0.91
Chile	America	0.8	0.71	0.95	0.81	0.95
China	Asia	0.52	0.22	0.51	0.52	0.07
Costa Rica	America	0.61	0.66	0.9	0.57	0.95
Dominican Republic	America	0.56	0.7	0.05	0.25	0.74
Guatemala	America	0.2	0.64	0.08	0.25	0.84
Honduras	America	0.1	0.17	0.06	0.22	0.74
India	Asia	0.16	0.32	0.54	0.47	0.91
Indonesia	Asia	0.39	0.3	0.18	0.36	0.91

<Table 4-3> Calibration of Raw Score into Fuzzy Score

Ivory Coast	Africa	0.08	0.68	0.44	0.27	0.43
Jamaica	America	0.22	0.16	0.86	0.77	0.91
Jordan	Asia	0.27	0.74	0.54	0.67	0.15
Kenya	Africa	0.07	0.16	0.12	0.49	0.91
Lesotho	Africa	0.07	0.21	0.47	0.7	0.84
Malaysia	Asia	0.83	0.6	0.57	0.92	0.48
Mauritania	Africa	0.07	0.11	0.05	0.23	0.18
Mauritius	Africa	0.77	0.79	0.36	0.92	0.95
Mexico	America	0.67	0.63	0.24	0.33	0.84
Mongolia	Asia	0.47	0.18	0.26	0.83	0.95
Morocco	Africa	0.23	0.44	0.59	0.7	0.12
Namibia	Africa	0.41	0.63	0.91	0.91	0.59
Nicaragua	America	0.13	0.24	0.09	0.38	0.59
Panama	America	0.76	0.77	0.42	0.49	0.91
Peru	America	0.46	0.51	0.55	0.5	0.91
Philippines	Asia	0.21	0.43	0.24	0.43	0.84
Portugal	Europe	0.85	0.58	0.93	0.85	0.95
Romania	Europe	0.82	0.76	0.36	0.86	0.91
Rwanda	Africa	0.05	0.07	0.78	0.95	0.15
Senegal	Africa	0.07	0.36	0.78	0.13	0.74
SierraLeone	Africa	0.05	0.08	0.08	0.05	0.74
South Africa	Africa	0.48	0.49	0.73	0.58	0.91
South Korea	Asia	0.95	0.61	0.94	0.85	0.84
Sri Lanka	Asia	0.5	0.71	0.57	0.46	0.59
Swaziland	Africa	0.21	0.6	0.45	0.67	0.05
Tanzania	Africa	0.06	0.09	0.52	0.69	0.38
Thailand	Asia	0.62	0.37	0.07	0.4	0.15
Togo	Africa	0.05	0.05	0.06	0.43	0.18
Tunisia	Africa	0.39	0.6	0.87	0.42	0.74
Turkey	Asia	0.84	0.95	0.09	0.21	0.12
Uruguay	America	0.72	0.71	0.95	0.5	0.95
Zimbabwe	Africa	0.05	0.06	0.09	0.26	0.43

4.1.2 Evaluation of Necessary and Sufficient Conditions

When the outcome set Y is a subset of the causal set X, the causal set is called the necessary condition for the outcome set. Therefore, the necessary condition is that the membership score of the outcome set is lower than the membership score of the causal condition. In this study, the consistency verification criterion is set to 0.8. The analysis shows that total factor productivity, economic

institution, and polity index were almost always (almost always, 0.8 or higher) necessary to be part of a high set of escape levels, and that the anti-corruption index was usually (usually, 0.65 or higher). The coverage of each was identified as total factor productivity 0.779, anti-corruption index 0.623, economic institution 0.647, and polity index 0.531.

Necessary Condition	Consistency	benchmark	coverage
TFP	0.875478	0.8	0.779290
AntiCorr	0.719279	0.8	0.626546
Institution	0.825232	0.8	0.647664
Polity	0.864009	0.8	0.531229

<Table 4-4> Evaluation of Necessary Condition

In contrast to the necessary condition, if the causal set X becomes a subset of the outcome set Y, the causal set is called a sufficient condition for the outcome set. Therefore, the sufficient condition is that the membership score of the outcome set is higher than the membership score of the causal condition. In this study, the consistency verification criterion is set to 0.8.

terms	consistency	coverage	combined	cases
T*C*I*P	0.911636	0.569088	0.739138	7
T*I*P	0.888571	0.67941	0.803393	3
T*C*P	0.866973	0.619334	0.754843	4
T*C*I	0.861934	0.603496	0.741067	2
T*I	0.837601	0.732387	0.802808	1
T*P	0.830265	0.788094	0.823262	4
T*C	0.826658	0.653741	0.749812	0
C*I*P	0.799145	0.61278	0.69577	2
Т	0.77929	0.875478	0.804894	2

<Table 4-5> Evaluation of sufficient Condition

I*P	0.72957	0.741125	0.661259	2
C*I	0.71597	0.663572	0.604123	4
C*P	0.683352	0.663572	0.534168	3
Ι	0.647664	0.825232	0.480692	0
С	0.626546	0.719279	0.38865	0
Р	0.531229	0.864009	0.245928	7

As a result of the sufficient condition consistency evaluation, seven of the 16 arrays passed the consistency criterion. Accordingly, the configuration of the seven true causal combinations is T*C*I*P, T*I*P, T*C*P, T*C*I, T*I, T*P, and T*C, and through the laws of AND, OR and Negation of fuzzy set, the following can be encoded and interpreted: AND is expressed in multiplication (*), OR in addition (+), and Negation in swung dash(~).

High Escape Level= $T*C*I*P + T*\sim C*I*P + T*C*\sim I*P + T*C*\sim I*P + T*C*I*\sim P + T*\sim C*I*\sim P + T*\sim C*I*\sim P$

Through the evaluations of the necessary and sufficient conditions, the answer to this paper's research question, 'What are the causal sets that determine the escape of the middle-income trap?' can be found. The evaluation of the necessary condition has shown that total factor productivity, economic institution and polity index are almost always necessary for high escape level, and the anti-corruption index is usually a necessary condition for high escape level, which can be seen as a cause for determining escape levels. However, while the coverage of total factor productivity is high at 0.779, the anti-corruption index and economic institution are relatively low at 0.626 and 0.647, respectively, and the polity index' s explanation power is quite low at 0.53 level.

Sufficient conditions can be determined which of the causal set or combinations of causal sets to claim to have achieved a high level of escape. The sufficient condition evaluation results show that individual causal set are not sufficient to claim that they achieved high levels of escape, and that a combination of T*C*I*P, T*C*P, T*C*I, T*P, and T*C is sufficient to claim that they achieved high levels of escape when they were formed. Notable results show that total factor productivity is contained in all seven arrays that have passed the consistency verification criteria. The significance of total factor productivity, which has been argued quite consistently in prior studies, appears to be consistent in the Fuzzy Set analysis.

4.1.3 Truth Table

The truth table shows which configuration the individual countries belonged to, utilizing the fuzzy scores of the analyzed countries. The truth table of the causal group for the outcome set is as follows. Since there are four causal sets, there are $16(2^4)$ possible actual configurations. Researchers should determine at which level, the outcome set is to be 1 or 0. "If the cases of causal combinations are significantly greater than 0.8 then the causal combinations can claim that 'almost always' is sufficient," said Ragin (2000: 109). Specifically, consistency indicates that the causal conditions are a subset of the outcome conditions. Therefore, criterion in Ragin (2000) is accepted to determine whether the outcome set is to be 1 or 0. According to this criterion, if one or more cases exist and a configuration with a consistency value of 0.8 or higher is considered a high escape level, and that outcome set is expressed as 1 and the rest as 0. In addition to the outcome set of GDP caps, TFP, AntiCorr, Instrumentation, and Polity, which are causal sets, will be marked as 0 if the fuzzy set score is less than 0.5 and marked as 1 if higher than 0.5.

Terms	TFP	AntiCorr	Institution	Polity	GDPcap	cases	raw consist.
T*C*I*P	1	1	1	1	1	7	0.911636
T*~C*I*P	1	0	1	1	1	3	0.867304
T*C*~I*P	1	1	0	1	1	4	0.845316
T∗C*I*~P	1	1	1	0	1	2	0.819005
T*~C*~I*~P	1	0	0	0	1	2	0.81363
T*~C*I*~P	1	0	1	0	0	1	0.796243
T*~C*~I*P	1	0	0	1	0	4	0.786834
~T*C*I*P	0	1	1	1	0	2	0.785047
~T*C*~I*P	0	1	0	1	0	3	0.725322
~T*C*I*~P	0	1	1	0	0	4	0.701823
~T*~C*I*P	0	0	1	1	0	2	0.666667
~T*~C*~ I *~P	0	0	0	0	0	4	0.607103
~T*~C*~I*P	0	0	0	1	0	7	0.56766

<Table 4-6> Truth Table Analysis (1)

In this process, the combinations of causal conditions that cause high levels of escape are abbreviated into four models. In other words, the combination of causal conditions that increases escape levels can be found in four models. Coverage here means the total explanatory power of the analysis results that total coverage of four models is 81.3%, meaning that 81.3% of the high escape levels could be explained with these four models. By each model, the coverage is 60.3 percent, 61.9 percent, 67.9 percent and 31.9 percent, respectively.

Specifically, the first model shows a higher level of escape in countries with high levels of total factor productivity, anticorruption index and economic institution. Malaysia is the best-fit for the first model. The second model shows that the level of escape increases in countries with high total factor productivity, anti-corruption index and high polity index, and third model in countries with high total factor productivity, economic institution and polity index. The second model includes Argentina and the third model includes Romania. Finally, the fourth model shows an example of higher escape levels when only total factor productivity is high and the remaining three causal sets are all low. As it is a relatively exceptional case in which total factor productivity alone can improve escape levels, there is only one country, Turkey that corresponds to it. The T*C*I*P type, which covers all of Model 1 to Model 3, includes South Korea, Portugal, Chile, Costa Rica and Botswana.

Based on these analysis results, total factor productivity is an essential causal set for high escape level. In some cases, high total factor productivity alone increases the escape level, but considering that the explanation is low at 31.9%, and that the real case is only one in Turkey, it can be confirmed that it is quite difficult to raise the escape level only with total factor productivity. Thus, in order to achieve high escape levels, T*C*I, T*C*P, T*I*P, or total factor productivity combined with more than two other causal sets are necessary.

Model		GDPcap=f(TFP, AntiCorr, Inst	titution, Polity)	
Complex Solution		raw coverage	unique coverage	consistency	
Model 1	T*C*I	0.603496	0.00491536	0.861934	
Model 2	T*C*P	0.619334	0.0447842	0.866973	
Model 3	T*I*P	0.67941	0.0835609	0.888571	
Model 4	T*~C*~l*~P	0.319498	0.0491534	0.81363	
solution coverage		0.813217			
solution	consistency	0.824018			

<Table 4-7> Causal Conditions that improve Escape Level

Meanwhile, this study focused on whether the polity has an offset effect in improving escape levels. Thus, complement set of escape level(~GDPcap) which means that the per capita GDP of \$12,500 or less was set as an outcome set and the fuzzy set analysis was performed again with the same causal conditions. This shows the combination of causal conditions that degrade the escape level, and the analysis of the truth table on the combinations of

causal conditions is as follows. As with the previous analysis, the case number threshold was considered to be 1, excluding cases with zero, and only 1 was given if the consistency was 0.8 or higher.

Terms	TFP	AntiCorr	Institution	Polity	GDPcap	cases	raw consist.
~T*C*~I*P	0	1	0	1	1	3	0.988197
~T*~C*~I*P	0	0	0	1	1	7	0.977872
~T*~C*~I*~P	0	0	0	0	1	4	0.974473
T*~C*I*~P	1	0	1	0	1	1	0.953757
~T*C*I*~P	0	1	1	0	1	4	0.951823
~T*~C*I*P	0	0	1	1	1	2	0.949704
T∗C*I*~P	1	1	1	0	1	2	0.930618
T∗C∗~I*P	1	1	0	1	1	3	0.912854
T*~C*~I*~P	1	0	0	0	1	2	0.910987
T*~C*~I*P	1	0	0	1	1	4	0.910136
~T*C*I*P	0	1	1	1	1	2	0.9
T*~C*I*P	1	0	1	1	1	3	0.809979
T*C*I*P	1	1	1	1	0	6	0.748906

<Table 4-8> Truth Table Analysis (2)

In this process, the combinations of causal conditions that degrade escape levels are abbreviated, and eight models are presented as follows. The eight models have the explanatory power of 0.86% and consistency of 0.78% for combinations of causal conditions that degrade escape levels. Each model was analyzed to have an explanatory power of 57.8%, 56.6%, 40.1%, 53%, 62.6%, 27.8%, 29.4% and 43.8%. Models with more than 50% explanatory power are Model 1 (~C*~I), Model 2 (~I*P), Model 4 (~C*P), and Model 5 (\sim T*P). The first model is a country with a very low anticorruption index and a very low level of economic institution, and the best-fit countries are Zimbabwe and Togo. This means that if the anti-corruption index and economic institution level are very low regardless of total factor productivity and polity index, it could lower the level of escape. The second model is a country with a low level of economic institution and a high polity index, and the bestfit countries are Tunisia and India. The fourth model is a country

with a low anti-corruption index and a high polity index, and the best-fit countries are Swaziland and Honduras. Both the second and fourth models show that institutional factors can lower escape levels. In particular, a low level of economic institution and anti-corruption index can degrade the level of escape, and on the contrary, it is confirmed that high polity index may degrade the level of escape. The fifth model is a case of low total factor productivity and high polity index, with the best-fit countries are Rwanda, Tanzania, etc.

Mo	del	GDPcap = f(TFP, AntiCorr, Institution, Polity)				
Complex	Solution	raw coverage	unique coverage	consistency		
Model 1	~C*~I	0.578494	0.058074	0.876277		
Model 2	~ *P	0.56613	0.0153615	0.870893		
Model 3	T∗~C	0.401274	0	0.769396		
Model 4	~C*P	0.530161	0.0104908	0.804434		
Model 5	~T*P	0.626452	0.0157362	0.906233		
Model 6	T*l*~P	0.278007	0.00674403	0.935687		
Model 7	C*I*~P	0.294867	0.00112391	0.941388		
Model 8	~T*C*I	0.438741	0.438741 0 0.			
solution coverage		0.866242				
solution consistency		0.786662				

<Table 4-9> Causal Conditions that Degrade Escape Level

The meaning of these analysis results is summarized as follows. First, as a result of analyzing the outcome sets of causal conditions that improve the escape level, the total factor productivity is included in all four models. This shows that, as the neoclassical economics argues, improving total factor productivity is essential to escape the middle-income trap. Second, it is true that the importance of total factor productivity is overwhelming, but improving escape levels can be seen as a combination of multiple causal conditions rather than a single causal condition, namely, a combination of total factor productivity and institutional factors. This becomes clearer when you look at the results of the causal conditions that degrade the escape level. Three of the four models with more than 50 percent explanatory power were found to reduce escape levels due to low economic institution or anti-corruption index. Third, the political system produced controversial results, as in the arguments in the preceding study. In both the outcome sets of causal conditions that improve and degrade escape levels, the political system shows a defining relation with the outcome sets.

Terms	Country	GDPcap	TFP	AntiCorr	Institution	Polity
	Namibia	0.41	0.63	0.91	0.91	0.59
	Peru	0.46	0.51	0.55	0.5	0.91
	Botswana	0.61	0.54	0.92	0.88	0.84
	Costa Rica	0.61	0.66	0.9	0.57	0.95
I *C*I*F	Uruguay	0.72	0.71	0.95	0.5	0.95
	Chile	0.8	0.71	0.95	0.81	0.95
	Portugal	0.85	0.58	0.93	0.85	0.95
	South Korea	0.95	0.61	0.94	0.85	0.84
	Bulgaria	0.71	0.74	0.31	0.76	0.91
T*~C*I*P	Mauritius	0.77	0.79	0.36	0.92	0.95
	Romania	0.82	0.76	0.36	0.86	0.91
	Tunisia	0.39	0.6	0.87	0.42	0.74
T∗C∗~I*P	Sri Lanka	0.5	0.71	0.57	0.46	0.59
	Argentina	0.62	0.72	0.6	0.11	0.91
T∗C∗I∗~P	Jordan	0.27	0.74	0.54	0.67	0.15
I *C*I*~F	Malaysia	0.83	0.6	0.57	0.92	0.48
T*~C*~I*~P	Ivory Coast	0.08	0.68	0.44	0.27	0.43
1 0 1 1	Turkey	0.84	0.95	0.09	0.21	0.12
T*~C*I*~P	Swaziland	0.21	0.6	0.45	0.67	0.05
	Guatemala	0.2	0.64	0.08	0.25	0.84
T*~C*~I*P	Dominican Republic	0.56	0.7	0.05	0.25	0.74
	Mexico	0.67	0.63	0.24	0.33	0.84
	Panama	0.76	0.77	0.42	0.49	0.91
	Jamaica	0.22	0.16	0.86	0.77	0.91
~ I *C*I*P	South Africa	0.48	0.49	0.73	0.58	0.91
	Benin	0.05	0.11	0.74	0.22	0.74
~T*C*~I*P	Senegal	0.07	0.36	0.78	0.13	0.74
	India	0.16	0.32	0.54	0.47	0.91
	Rwanda	0.05	0.07	0.78	0.95	0.15
~ T∗C∗I∗~D	Tanzania	0.06	0.09	0.52	0.69	0.38
1 +C+1+-*F	Morocco	0.23	0.44	0.59	0.7	0.12
	China	0.52	0.22	0.51	0.52	0.07

<Table 4-10> List of Countries Sorted in Causal Conditions

	Lesotho	0.07	0.21	0.47	0.7	0.84
~ 1 *~0*1*F	Mongolia	0.47	0.18	0.26	0.83	0.95
	Togo	0.05	0.05	0.06	0.43	0.18
	Zimbabwe	0.05	0.06	0.09	0.26	0.43
~] *~(*~]*~F	Mauritania	0.07	0.11	0.05	0.23	0.18
	Thailand	0.62	0.37	0.07	0.4	0.15
	Sierra Leone	0.05	0.08	0.08	0.05	0.74
	Kenya	0.07	0.16	0.12	0.49	0.91
	Honduras	0.1	0.17	0.06	0.22	0.74
~T*~C*~I*P	Nicaragua	0.13	0.24	0.09	0.38	0.59
	Philippines	0.21	0.43	0.24	0.43	0.84
	Indonesia	0.39	0.3	0.18	0.36	0.91
	Brazil	0.55	0.37	0.2	0.06	0.84

4.2. Ideal Type Analysis

The four factors, which are total factor productivity, anticorruption index, economic institution and polity index used for fuzzy set ideal type analysis to check the type change of middleincome escape countries. The classification of 45 countries is carried out based on 1990 as first period, 2000 in the second period, 2010 in the third period, and 2017 in the fourth period. Due to missing values, Lesotho, Mongolia and Swaziland were excluded from the first and second periods of classification.

The following table shows the types of countries with a fuzzy score of 0.7 or higher among countries escaping from the middleincome trap. The escape time for countries over 0.7 is relatively faster than those under 0.7 and the type of escape can be found to be higher in three of the four factors except Malaysia and Turkey. Although Turkey is classified as T*~C*~I*~P in 2017 which means high total factor productivity with three low institutional factors, Turkey experienced T*C*I*P and T*C*~I*P before and after the escape, indicating that institutional factors played an important role in the escape. Growth Rate (7y) means an average annual economic growth rate of seven years. Given that the average annual economic growth rate of countries other than Korea and Portugal, which have already achieved high per capita GDP, is more than 3 percent, it is highly unlikely that they will return to the middle-income trap.

Country	1990	2000	2010	2017	2017 GDP	Growth Rate(7y)	Escape year
South Korea	~T*C*I*P	T*C*I*P	T*C*I*P	T*C*I*P	37725.1	2.51%	1991
Portugal	T*C*I*P	T*C*I*P	T*C*I*P	T*C*I*P	26953.5	-0.50%	1988
Chile	~T*C*I*P	T*C*I*P	T*C*I*P	T*C*I*P	24024.4	3.71%	2004
Uruguay	T*C*I*P	T*C*I*P	T*C*I*P	T*C*I*P	20607.5	3.62%	2008
Malaysia	~T*C*I*P	~T*C*I*~P	T*~C*I*P	T*C*I*~P	26000.6	4.11%	1996,1999
Romania	~T*C*~I*P	~T*~C*I*P	T*~C*I*P	T*~C*I*P	25262.1	6.70%	2007
Mauritus	T*~C*I*P	T*C*I*P	T*C*I*P	T*~C*I*P	22656.9	7.21%	1995
Bulgaria	T*C*I*P	T*C*I*P	T*C*I*P	T*~C*I*P	20026.9	4.35%	2010
Panama	T*~C*I*P	T*~C*I*P	T*C*~I*P	T*~C*~I*P	22421.9	7.49%	2008
Turkey	T*C*I*P	T*C*~I*P	T*C*~I*P	T*~C*~I*~P	26649.9	7.05%	2005

<Table 4-11>Escape Countries Ideal Types

(Fuzzy Score of per capita GDP > 0.7)

The following table shows the types of countries with a fuzzy score of 0.5 or more and less than 0.7 among the countries escaping from the middle-income trap. The corresponding countries are more recent than those with a fuzzy score of 0.7 or higher. Given the type of escape point, five of the nine countries are T*C*I*P and T*C*~I*P, while the other four are classified as having two or more factors, making it difficult to identify a distinct type classification compared to those countries with a fuzzy score of 0.7 or higher. Thailand, in particular, has been classified as a country with low total factor productivity from 1990 to 2017, with other factors fluctuating but generally remaining low.

Other notable countries are Sri Lanka, China, Argentina and Brazil. Sri Lanka and China are countries that escaped in 2017 and 2016, respectively. However, the average economic growth rate over the past seven years is 7.44 percent and 5.5 percent, respectively, relatively free from the risk of turning back to middle-income trap. Argentina and Brazil, on the other hand, have spent more than five years since the escape, but it is hard to conclude that they are free from the danger of a middle-income trap since the fuzzy scores of escape levels are still 0.62 and 0.55, respectively. Also, with the two countries' economic growth rates standing at less than 1 percent, it is unclear whether they will be able to escape the middle-income trap in the future.

Country	1990	2000	2010	2017	2017 GDP	Growth Rate(7y)	Escape year
Costa Rica	T*C*I*P	T*C*I*P	T*C*I*P	T*C*I*P	16272.2	3.71%	2010
Botswana	T*C*I*P	T*C*I*P	T*C*I*P	T*C*I*P	16235.7	3.70%	2005
Argentina	~T*~C*~I*P	T*C*∼I*P	T*C*∼I*P	T*C*∼I*P	16771.4	0.65%	1996, 2005
Sri Lanka	~T*C*~I*P	T*C*~I*~P	T*C*∼I*∼P	T*C*∼I*P	12512.7	7.44%	2017
Mexico	T*∼C*I*∼P	T*C*∼I*P	T*~C*~I*P	T*∼C*~I*P	18360.4	3.36%	1993, 1999
Dominican Republic	T*~C*I*P	T*~C*I*P	T*~C*~I*P	T*~C*~I*P	14683.9	4.53%	2014
China	~T*C*~I*~P	~T*C*~I*~P	~T*C*I*~P	~T*C*I*~P	13051.3	5.50%	2016
Brazil	~T*~C*I*P	T*C*∼I*P	~T*C*~I*P	~T*~C*~I*P	14108.9	0.51%	2010
Thailand	~T*~C*I*P	~T*~C*I*P	~T*~C*I*~P	~T*~C*~I*~P	16675.2	3.89%	2010

<Table 4-12>Escape Countries Ideal Types (0.5=<Fuzzy Score of per capita GDP<0.7)

Chapter 5. Conclusion

5.1. Implications

So far, this study has sought to analyze the relationship between escape levels and economic or institutional factors. First of all, previous studies have mainly attempted to analyze the relationship between economic growth and various factors empirically by including them in the model. However, with the limitations of the empirical model, the focus was on determining the significance of a single variable, and there was a limit in identifying interaction terms between two or more variables. In addition, case studies had limitations in generalization due to the general argument that innovation, productivity, leadership, etc. were important after analyzing with very few cases, such as Korea and Taiwan.

Therefore, based on this point, this study attempted to analyze the combinations of causal conditions determining the level of escape from a middle-income trap by conducting a fuzzy-set qualitative comparative analysis. I also wanted to determine what type the countries that escaped belonged to at the time of the escape and whether there were certain patterns in the type.

The conclusions of this study through analysis are as follows. First, as a result of the multiple conjunctural causations analysis, the combination of causal conditions that increases the escape level is the combination that includes total factor productivity, and includes two or more other institutional factors. While the overwhelming importance of total factor productivity has been seen in previous and present studies, total factor productivity alone is difficult to achieve sufficient conditions. As a solution, the result of analysis suggests that T*C*I, T*C*P, T*I*P models are consistent at more than 80% and explains the level of escape more than 60%.

Second, combination of causal conditions that degrade the level

of escape is where the economic institution or the anti-corruption index are low. This leads to the first conclusion, which shows that in order to raise the level of escape, total factor productivity must be accompanied by an improvement in the economic institution or anti-corruption index among institutional factors. On the other hand, the political system also shows controversial results in the analysis of fs/QCA. The analysis of the combination of causal conditions that increases the escape level showed that high Polity index is one of the causal conditions, while the analysis of the combination of causal conditions that degrade the escape level also showed that high Polity index is one of the causal conditions among the models that had high coverage.

Third, as a result of the ideal type analysis, it was not possible to confirm that the types of escape countries converge with a particular pattern. However, for countries with an escape level fuzzy score of 0.7 or higher, three or more of the four factors were found to be high at the time of escape. On the other hand, countries with a fuzzy score of 0.7 or less had difficulty specifying the type. As notable countries, Brazil and Argentina still have a low fuzzy score to conclude that they have fully escaped after more than five years since their escape, and it is hard to conclude that they are completely out of the middle–income trap since the average annual economic growth rate over the past seven years has been less than 1 percent.

The implications of this study could be applied to development policy of Korea. Among the countries that escaped from the middle-income trap, Korea was able to escape quickly at a fairly early time and completely escaped from the middle-income trap. Rather, Korea is being asked to transfer its development experience from numerous developing countries and international organizations because it is the only country in the world that has transformed from an aid recipient to an aid donor in half a century. Public funds and building infrastructure are easy way of helping developing countries. However, economic aid alone cannot make the developing countries to escape from middle-income trap. With the experience and resources, we have, Korean ODA should be made to educate public officials from developing countries and enable them to make institutional innovations in order to escape from middle-income trap.

5.2. Recommendations for future research

In this study, only four factors were selected for efficient analysis: total factor productivity, economic institution, corruption index, and polity index. However, as can be seen in the literature review, there are many important variables such as trade openness, level of industrialization, and foreign direct investment, but they were excluded for efficient analysis. Also, due to the limitations of fuzzy-set analysis, it has not been possible to control special situations such as economic crisis, conflicts and war. Subsequent studies need to consider reviewing these variables and including them in the model. If it is difficult to include in the model, an indepth study needs to be carried out by selecting several best-fit countries of major configurations or types and adding them as case studies.

Bibliography

- Agénor, P. R., Canuto, O., & Jelenic, M. (2012). Avoiding middle-income growth traps.
- Aiyar, S., Duval, R., Puy, D., Wu, Y., & Zhang, L. (2018). Growth slowdowns and the middle-income trap. Japan and the World Economy, 48, 22-37.
- Alston, L. J., & Mueller, B. (2005). Property Rights and the State. Handbook of New Institutional Economics. C. Ménard and MM Shirley. AA Dordrecht, The Netherlands.
- Barro, R. J. (1991). Economic growth in a cross section of countries. *The quarterly journal of economics*, *106*(2), 407–443.
- Bulman, D., Eden, M., & Nguyen, H. (2014). *Transitioning from lowincome growth to high-income growth: is there a middle income trap?*. The World Bank.
- Coase, R. H. (1960). The problem of social cost. In *Classic papers in natural resource economics* (pp. 87–137). Palgrave Macmillan, London.
- Dahlman, C. J. (1979). The problem of externality. *The journal of law and economics*, 22(1), 141–162.
- Doner, R. F., & Schneider, B. R. (2016). The middle-income trap: More politics than economics. *World Politics*, *68*(4), 608-644.
- Eeckhout, J., & Jovanovic, B. (2007). Occupational sorting and Development. *NBER working paper w13686*.
- Eichengreen, B., Park, D., & Shin, K. (2011). When fast growing economies slow down: international evidence and implications for the People's Republic of China. Asian Development Bank Economics Working Paper Series, (262).
- Eichengreen, B., Park, D., & Shin, K. (2013). *Growth slowdowns redux: New evidence on the middle-income trap* (No. w18673). National Bureau of Economic Research.
- Felipe, J., Abdon, A., & Kumar, U. (2012). Tracking the middle-income trap: What is it, who is in it, and why?. Levy Economics Institute, Working Paper, (715).
- Gani, A. (2011). Governance and growth in developing countries. *Journal* of *Economic Issues*, 45(1), 19–40.
- Garrett, G. (2004). Globalization's missing middle. Foreign Aff., 83, 84.
- Gastil, R. D. (1983). The comparative survey of freedom. *Freedom at issue*, 17.
- Gill, I. S., & Kharas, H. (Eds.). (2007). An East Asian renaissance: ideas

for economic growth. The World Bank.

- Glawe, L., & Wagner, H. (2016). The middle-income trap: Definitions, theories and countries concerned—A literature survey. *Comparative Economic Studies*, *58*(4), 507-538.
- Hall, P. A., & Taylor, R. C. (1996). Political science and the three new institutionalisms. *Political studies*, 44(5), 936-957.
- Hausmann, R., Pritchett, L., & Rodrik, D. (2005). Growth accelerations. *Journal of economic growth*, *10*(4), 303–329.
- Hayek, F. A. (1968). Competition as a discovery procedure.
- Hayek, F. A. (1982). Law, Legislation and Liberty: A New Statement of the Liberal Principles of Justice and Political Order. Routledge & Kegan Paul.
- Im, F. G., & Rosenblatt, D. (2013). Middle –income traps: a conceptual and empirical survey. The World Bank.
- Kharas, H., & Kohli, H. (2011). What is the middle income trap, why do countries fall into it, and how can it be avoided?. *Global Journal of Emerging Market Economies*, *3*(3), 281–289.
- Kaufmann, D., Kraay, A., & Mastruzzi, M. (2007). Measuring corruption: myths and realities.
- Kjaer, A. M. (2009). Governance and the urban bureaucracy. *Theories of urban politics*, *2*, 137–152.
- Knack, S., & Keefer, P. (1995). Institutions and economic performance: cross-country tests using alternative institutional measures. *Economics & Politics*, 7(3), 207–227.
- Kormendi, R. C., & Meguire, P. G. (1985). Macroeconomic determinants of growth: cross-country evidence. *Journal of Monetary* economics, 16(2), 141–163.
- Kuznets, S. (1955). Economic growth and income inequality. *The American* economic review, 45(1), 1–28.
- Kvist, J. (2006). Diversity, ideal types and fuzzy sets in comparative welfare state research. In *Innovative comparative methods for policy analysis* (pp. 167–184). Springer, Boston, MA.
- Lee, C., & Narjoko, D. (2015). Escaping the Middle-Income Trap in S outheast A sia: Micro Evidence on Innovation, Productivity, and Globalization. Asian Economic Policy Review, 10(1), 124-147.
- Lewis, W. A. (1954). Economic development with unlimited supplies of labour. *The manchester school*, 22(2), 139–191.
- Lucas, R. (1988). On the mechanics of development planning. *Journal of monetary economics*, 22(1), 3-42.
- Nelson, R. R. (1956). A theory of the low-level equilibrium trap in underdeveloped economies. *The American Economic*

Review, 46(5), 894-908.

- North, D. C. (1984). Transaction costs, institutions, and economic history. *Zeitschrift für die gesamte Staatswissenschaft/Journal of institutional and theoretical economics*, (H. 1), 7–17.
- North, D. C. (1987). Institutions, transaction costs and economic growth. *Economic inquiry*, 25(3), 419–428.
- North, D. C. (1990). A transaction cost theory of politics. *Journal of theoretical politics*, 2(4), 355–367.
- Ohno, K. (2009). Avoiding the middle-income trap: renovating industrial policy formulation in Vietnam. *ASEANEconomic Bulletin*, 25-43.
- Olson, M. (1993). Dictatorship, democracy, and development. *American* political science review, 87(3), 567–576.
- Pejovich, S. (1998). *Economic analysis of institutions and systems* (Vol. 33). Springer Science & Business Media.
- Popper, K. R., & Gombrich, E. H. (2013). *The open society and its enemies*. Princeton University Press.
- Ragin, C. C. (2000). Fuzzy-set social science. University of Chicago Press.
 (2008). Redesigning social inquiry: Fuzzy sets and beyond. University of Chicago Press.
 - (2009). Qualitative comparative analysis using fuzzy sets (fsQCA). *Configurational comparative methods: Qualitative comparative analysis (QCA) and related techniques, 51,* 87–121.
- Rama, M. (1993). Empirical investment equations for developing countries. *Striving for growth after adjustment: The role of capital formation*, 107-143.
- Rihoux, B. (2003). Bridging the gap between the qualitative and quantitative worlds? A retrospective and prospective view on qualitative comparative analysis. Field Methods, 15(4):351-365.
 - (2006). Qualitative comparative analysis (QCA) and related systematic comparative methods. International Sociology, 21(5): 679–706.
- Robertson, P. E., & Ye, L. (2013). On the existence of a middle income trap. *Available at SSRN 2227776*.
- Romer, P. M. (1986). Increasing returns and long-run growth. Journal of political economy, 94(5), 1002–1037.
- Schneider, C. Q., & Wagemann, C. (2010). Standards of good practice in qualitative comparative analysis (QCA) and fuzzysets. *Comparative Sociology*, 9(3), 397-418.
 - _____ (2010). Qualitative comparative analysis (QCA) and fuzzy-sets: Agenda for a research approach and a data analysis technique. *Comparative Sociology*, 9(3), 376-396.
- Solow, R. M. (1956). A contribution to the theory of economic growth. *The quarterly journal of economics*, 70(1), 65–94.
- Tilly, C. (1984). *Big structures, large processes, huge comparisons*. Russell Sage Foundation.
- Tran, V. T. (2013). The middle-income trap: Issues for members of the Association of Southeast Asian Nations.
- Woo, W. T., Lu, M., & Sachs, J. D. (Eds.). (2012). A new economic growth engine for China: Escaping the middle-income trap by not doing more of the same. World Scientific.
- World Bank and Development Research Center of the State Council (PRC), 2012, *China 2030: Building a Modern, Harmonious and Creative High-Income Society*, Washington D.C.: The World Bank.
- 김종성. (2002). 신제도주의의 행정학적 함의: 역사적 신제도주의를 중심으 로. *사회과학연구*, 13, 59-82.
- 이승윤. (2018). 실업안전망 국제비교연구: 실업보험, 사회부조, 적극적노동시장 정책의 제도조합과 유형화. *한국사회정책*, 25(1), 345-375.
- 정정길, 최종원, 이시원, 정준금, & 정광호. (2019). 정책학원론, 대명출판사.
- 최낙관, & 국영희. (2006). 신제도주의와 신제도주의 경제학 (NIE) 에 대한 이 론적 검토. *한국자치행정학보, 20*(2), 123-142.
- 최병선. (2006). 신제도경제학에서 본 규제이론과 정책: 이견과 확장. 행정논총 (Korean Journal of Public Administration), 44.

요약(국문초록)

본 연구는 중진국 함정을 발생시키는 요인을 조사하고 유형을 분석한 연구이며, 이를 위해 퍼지셋 질적비교연구를 활용했다. 퍼지셋 질적비교 연구는 일반화하기 어려운 국가 간 분석을 해석하고 정성 연구와 정량 연구 사이의 퍼지 영역에 가려진 문제를 탐구할 수 있도록 하는 연구방 법이다. 이 연구는 선행 연구의 경험적 분석의 한계를 극복하기 위해 퍼 지셋 결합요인 분석을 통한 탈출 수준을 설명한다. 본 연구에 사용된 변 수는 총요소생산성(T), 반부패지수(C), 법제도와 재산권지수·규제지수(I), Polity V(P) 이다. 그 결과 탈출수준을 향상시키는 인과조건은 T와 C, I, P 중 2가지 지수의 조합으로 밝혀졌다. 반면 탈출 수준을 떨어뜨리는 인과 조건은 ~C*~I, ~I*P, ~C*P, ~T*P로 나타났다. 퍼지셋 분석에서 물결표시 (~)는 '부정'을 의미하고 별표(*)는 '그리고'를 의미한다. 예를 들어 ~C*~~ 모델은 부패하고 경제제도가 잘 구축되지 않은 국가의 경우 T나 P의 수 준에 관계없이 중간소득 함정에 빠지기 쉽다는 것을 보여준다. 연구결과 를 요약하면, 총요소생산성은 탈수준을 향상시키는 모형에 모두 포함되 기 때문에 매우 중요하다고 볼 수 있지만, 총요소생산성과 함께 제도적 요인(C. I, P) 중 2개 이상이 조합되어야 중산층 함정을 극복할 수 있는 것으로 확인되었다.

Keywords: 중진국함정, 신제도주의, 퍼지셋 질적비교연구, 이상형 분석 학번: 2018-23480

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