

Articles

How to Escape the Middle-Income Trap: Lessons for the ODA Policy

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Despite the effort of official development assistance (ODA) since 1948, most of the countries experience decreasing marginal returns in the economic growth, resulting in middle-income trap. In the perspective that there must be an alternative ODA policy target to neo-classical economic theory, this study examines the configurations of economic and institutional factors that help the escape of middle-income trap. Previous middle-income trap studies investigated the slowdown of economic growth as a consequence of low total factor productivity and showed limited interest on institutional factors. Moreover, such studies based on regression could not draw the synergy of various factors. This study employed fuzzy-set qualitative comparative analysis to identify the combinations of economic and institutional factors that improve or reduce the possibility of the escape. The results suggest that while the overwhelming importance of total factor productivity still remains, configuration of institutional factors such as rule of law, property rights, anti-corruption, democratic institution is necessary to achieve the full escape of middle-income trap. The findings imply the need for not only financial aid but also institutional support for the developing countries to overcome the middle-income trap.

Introduction

South Korea is considered the most successful case in the history of official development assistance (ODA). After the Korean War in 1953, Korea was one of the least developed countries in the world with a GDP of \$67 per capita and is estimated to have received approximately \$128 billion in aid from 1945 to 1999 (Lim, 2014). In 2000, Korea was officially excluded from the list of Organization for Economic Co-operation and Development's (OECD) recipient countries. By joining the OECD Development Assistance Committee (DAC) in 2010, Korea became the first of the least developed countries to become a donor country. Finally, in 2021, the United Nations Conference on Trade and Development (UNCTAD) promoted Korea's status from a developing country to an advanced country.

However, unlike Korea, most countries experience difficulties in escaping the middle-income trap. Gill et al. (2007) introduced the concept of the middle-income trap and noted that the main cause of preventing middle-income countries to transfer to high income is stagnant economic growth. As middle-income countries go through economic development, various problems such as increasing labor cost, pressure on free trade and universal welfare pile up and cause stagnant economic growth. Gill et al. (2007) ar-

gue that these problems cannot be solved by the existing mechanisms within countries. After Gill et al. (2007), several more definitions of the middle-income trap were introduced (Aiyar et al., 2018; Bulman et al., 2017; Eichengreen et al., 2011, 2013; Felipe et al., 2012). While consensus regarding the definition has not been reached, 'stagnant economic growth at the level of middle-income for long period of time' is widely accepted as the middle-income trap.

While Korea is not the only country that has escaped the trap, it is the first country among the group of escapees that once belonged to the least developed countries. However, it is also necessary to examine why there have been no more cases like Korea since the DAC was established in 1961. Since Korea's success story is an unusual case, it is crucial to determine whether the current ODA policies have been appropriate. In particular, the cases of economic growth wherein low-income countries transform into middle-income countries have become common. In contrast, most of the countries have not been able to advance from the middle-income to high-income. While current ODA policies may be effective for the low-income countries, the existence of the middle-income trap suggests a fundamental limitation to their usefulness.

As a result, there has been a lot of discussion over the importance of institutional quality (Admassu, 2020; Aiyar

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et al., 2018; Brown, 2019; Bulman et al., 2017; S. H. Lee & Im, 2015; Nanda, 2006; Sachs, 2019; World Bank, 2007), but the current ODA policies still focus on providing capital based on neoclassical economic growth theory. Even the UN and OECD define the official development assistance as resource flow. While the new trend of millennium development goals (MDGs) and sustainable development goals (SDGs) focus on specific topics, such as poverty and the environment, they are not significantly different from funding aid and building infrastructure. Most of donor countries follow the guideline of UNSDG and design ODA policy accordingly. However, among 434 UNSDG indicators,¹ only 55 (12.7%) indicators are related to institutional quality. In details, the indicators are related to statistical capability (22), legislation of and compliance with human rights (6), whether the countries are following the international or national guideline (6), and number of local governments and seats in parliaments (5). The rest of 16 indicators are the most related to legislation and application of administrative or institutional frameworks but all of them are related to monitoring targets such as gender equality, water supply and regulation of fishing. In other words, there are no indicators that deal with institutional factors such as government effectiveness, corruption, property rights or economic rules which are the key factors that promote economic activity.

To overcome the middle-income trap, a different approach must be introduced rather than the simple additional input of capital and labor. Thus, this paper adopts rational choice institutionalism, which criticize the neoclassical economic growth logic and emphasizes the importance of institutions in economic growth. Therefore, this paper seeks to figure out whether configurations of economic and institutional factors improve the possibility of escape from the middle-income trap.

Literature Review

The Current ODA Policies as Financing

According to OECD's DAC, ODA is defined as government aid designed to promote the economic development and welfare of developing countries. Although it is hard to capture the starting point of ODA, the Marshall Plan, introduced after World War II, is recognized as the first ODA (Lancaster, 2007). Early ODA showed different aspects depending on the donor countries' purposes. In the case of the United States, the ODA was implemented in close connection with the defense strategy as a way to win the competition with the Soviet Union, while France and the United Kingdom utilized ODA to maintain ties with old colonial countries (C. Lee, 2011). In contrast, Japan's ODA had the characteristic of providing reparative aid to countries affected by the Pacific War (Watanabe, 2005). This form of

ODA was mainly financing, including grants, loans, debt relief, credits, and foreign investment (Hynes & Scott, 2013). However, as the Oil Crisis, Latin American Economic Crisis, and Asian Economic Crisis continued from the 1970s to the 1990s, more countries failed to repay their debts. Consequently, the importance of market principles and effectiveness were highlighted. The International Monetary Fund (IMF) and the World Bank adopted structural adjustment programs, which advocate the reduction of government intervention in financial sectors, currency value stabilization, maintaining an international balance of payments, and inflation to ensure that loans could be reimbursed (C. Lee, 2011; Stein, 1998; World Bank, 2007).

Despite the introduction of structural adjustment programs, economic reform in many countries failed, and accordingly, donor countries concluded that without good governance, the sustainable development of less-developed countries would not be feasible (Nanda, 2006). However, the World Bank conceptualized the term "good governance" as an indication of "the manner in which power and authority are exercised for development in the management of economic and social resources" (Nanda, 2006; World Bank, 1992, p. 1). While good governance could be extended to include concepts such as the rule of law, corruption, and other institutional factors, the main focus is still framed as an effective use of financial aid to improve economic development. Thanks to the MDGs and SDGs, the target of ODA has changed from financial self-sustainability to achieving the absolute level of certain targets such as basic education and provision of clean water (Severino & Ray, 2009). Nevertheless, achieving the targets also require financial aid. What matters is how financial aid could be actually implemented for ODA's original purpose.

The problem is that financial aid is most of time misused because of recipients' dysfunctional governance and corruption (Admassu, 2020; Sachs, 2019). Without institutional developments, no matter how much financial aid is provided, the financial forms of ODA will be mostly wasted because of lack of institutional capabilities (Admassu, 2020; Burnside & Dollar, 2004). Thus, this study introduces an alternative target for ODA, i.e., institutions. ODA policies should aim not only to provide financing for specific targets, but also to offer institutional support that fosters sustainable development in recipient countries.

Neoclassical Growth Theory

Belief that financial aid would help the economic growth of the developing countries lies on the neoclassical growth theory. Starting from Solow model (Solow, 1956), Romer (1986) and Lucas (1988) developed the endogenous growth theory which became the basis of neoclassical growth theory. Among the total factor productivity (TFP), capital, and labor in the growth product function of Solow model, the

¹ The UNSDG consists of 17 goals, 169 targets, and 244 indicators. Some indicators overlap in other targets. The author downloaded the data through UNSDG Open-API and counted duplicate indicators if the target is different.

main purpose of the ODA policies is to increase TFP and capital (Admassu, 2020; Kharas & Kohli, 2011; Severino & Ray, 2009). Previous studies based on the neoclassical growth theory introduced the “reverse-U-shaped hypothesis” (Kuznets, 1955) or the “catching-up industrialization” model (Ohno, 2009). They suggest early marginal diminishing returns as a reason for why countries stuck in the middle-income trap. Recently Eichengreen et al. (2011, 2013) analyzed middle-income trap countries and showed that TFP explains 85% of the stagnation of economic growth in the middle-income countries. However, studies based on neoclassical economies are limited in that it cannot explain the rest of countries which are still trapped in the middle income. It is challenging to draw general lessons within the framework of neoclassical growth theory. Therefore, factors that have been considered exogenous must be taken in to disclose the further causes of the middle-income trap.

Rational Choice Institutionalism

While the neoclassical growth theory considers the institution as exogenous, the rational choice institutionalism assumes the institution as endogenous and that it affects human behavior (Hall & Taylor, 1996). In the rational choice institutionalism, individuals seek to maximize their individual utility. However, maximizing individual utility by multiple individuals inevitably harms the utility of others, therefore achieving Pareto optimal is impossible. To overcome this matter, an entities or group of people legislate rules and regulations. The utility of the individuals is higher than when there were no rules, and also, the utility of individuals who abide by the rules tend to be higher than those who do not (R. Choi & Guk, 2006). Based on this logic, Buchanan (1987), Coase (1960), North (1990), and Olson (1993) developed the property rights theory, the transaction cost theory, and the public choice theory, all of which became the basis of rational choice institutionalism.

Coase (1960) refers to property rights as a bundle of rights. It includes the right to use, dispose, trade and transfer the property, along with the right to generate profits with the property. When property rights are secured, individuals expect that their choice and decision about the property and the bundle of rights in it will work as it is (B. Choi, 2006). Then property rights motivate individuals to maximize their profits. In other words, limited property rights would demotivate the incentive to maximize their profits which would result in economic downturn.

While the property right is about protection of individual assets, the transaction cost is about the information an individual use. Transaction cost is derived from the information asymmetry and incurs an additional cost in the process of searching information, identifying real market value, negotiation and entering into contracts (Dahlman, 1979). There will be no market exchange if these costs exceed the benefits of market exchange (Coase, 1960). In other words, if the transaction cost equals zero, negotiations can increase the value of social production and the efficiency of resource allocation while it is implausible if the transaction cost is too high (Coase, 1994). Although Coase criticized excessive regulations and policies carried out by

governments, he consents to the fact that there must be detailed rules and regulations to reduce the transaction cost (Coase, 1987). If a government keeps the transaction cost low by stable rules and regulations, people compete and invest where they can reduce transaction costs (Kasper et al., 2012). Unlike the perfectly competitive market, in the real world, transaction costs exist in every transaction (B. Choi, 2006; Coase, 1960). Anything that is related to information cause the transaction cost. Not only negotiation between fruit price but insurance, brands and even franchise restaurants are result of transaction cost and would not exist or their market value would have much smaller without transaction cost. That is, the transaction cost is like two sides of a coin. When it is high, it hampers the efficiency of resource allocation, but when it is low, it works as a catalyst for competition. Such competition is denoted as the process of discovering knowledge (Hayek, 1968) or the process of knowledge generation (Pejovich, 1998). As a result, the transaction cost generates new knowledge in a form of specialization and innovation.

In the 21st century, states are the main actors in charge of legislation that deal with the property rights and the transaction costs. Therefore, the political system of a state becomes an important factor in the rational choice institutionalism. In some cases, states leave the inefficient property rights behind, because getting taxes by giving exclusive rights and preferential treatment is greater than taxes based on efficiently secured property rights while some states do not (North, 1987). As such, recent studies show contradicting results about whether the difference between democratic and authoritarian states affects the economic growth (North, 1987). This is because the high-level autonomy of political elites in authoritarianism and the low-level autonomy in democracy have both positive and negative effects on economic growth (North, 1987). The authoritarian governments may act as a benevolent state and legislate or conduct beneficial regulations. On the other hand, without checks and balance system as in democracy, limited resources can be misused and abused (North, 1990). Moreover, Olsen (1993) noted that because dictators usually are short-sighted, they infringe property rights which would result in negative effect on economic growth in the long run.

The public choice theory suggests that the corruption affects economic growth and whether the corruption is grease or sand the wheels of growth has been an issue (Tullock, 1975). Before further elaboration of corruption's role as grease or sand, we should look at how corruption occurs. The public choice theory assumes that not only ordinary individuals but also public officials such as bureaucrats and politicians act as ‘Homo Economicus’ which means that they behave according to its private interest (Buchanan, 1991). The public officials perceive the bribe as a rent, and as ‘Homo Economicus’, they will take account the possibility of being captured for corruption, the level of punishment for corruption and how much they can gain if not captured. All being considered, if the public officials decide the gain is larger than the loss, they will manifest rent-seeking behavior (Buchanan & Tullock, 1960).

Back to corruption as grease or sand issue, unlike common sense, there are arguments that corruption helps the economic growth by reducing the transaction cost (Acemoglu & Verdier, 2000; Mauro, 1995). Let's assume that it takes a year to get a business approval from a government and if the company bribes a public official, it takes only a month. The company would be willing to pay the cost if the bribe is lower than marginal benefits which would facilitate economic growth. However, Tullock (1975) argued that "lock-in" problem must be considered. Initially, it seems that corruption reduces the transaction cost. But as the bribe contract starts to work, the competition to get the official position intensifies because the occupants of the position have access to an additional income, which is the bribe (Murphy et al., 2009). The occupant who paid for the position has an incentive to seek higher returns and increase the bribe cost, which in turn raises the transaction cost, and this cycle locks in corruption (Munger, 2019). Without anti-corruption activities to regulate and punish the corrupt acts, the "lock-in" cycle continues. As a result, corruption as a sand is widely accepted, and it has been empirically proved (Méon & Sekkat, 2005; North et al., 2009).

Related Studies of Middle-Income Trap

Previous middle-income trap studies elaborated the relationship between economic factors and growth stagnation based on the neoclassical growth model and revealed that 85% of growth slow down can be explained by TFP and political change did not affect economic growth (Eichengreen et al., 2013). Additionally, some studies explained the causes of economic stagnation by adding institutional factors, such as world governance indicators (Aiyar et al., 2018; Bulman et al., 2017). Particularly, Aiyar et al. (2018) included Rule of Law Index, Size of Government Index, and Regulation Index from the Fraser Institute and found that they guard against economic slowdowns in middle-income countries. However, these studies have so far been centered on regression analysis, which means that there were limitations in grasping the effects of various variable configurations on economic growth. Escaping the trap may require a configuration of variables rather than one factor alone. This article attempts to overcome the limitations of preceding studies by employing fuzzy-set qualitative comparative analysis (fs/QCA) and answer two research questions. The first research question is "Which causal configurations help countries escape from the middle-income trap?" To verify whether the configurations actually helped escape the trap, there should be an answer to the second research question, "Did the countries reach these configurations when they escape the middle-income trap?"

Data and Methodology

Data

In fs/QCA, outcome set is a dependent variable. For analysis, GDP per capita (GDPPC) from Penn World Tables (Feenstra et al., 2015) is used for the outcome set of fs/QCA and an absolute standard was applied to verify whether countries were once in the middle-income trap or not.² According to the criteria of World Bank, GDPPC from \$1,000 to \$12,500 (PPP, 2011) is classified as middle-income and GDPPC of \$12,500 is the cross point that decides whether the countries escape from the trap or not. Felipe et al. (2012) defined a country which stayed in a middle-income for more than 28 years as middle-income trap. Following the practice of previous study, I classified the countries as middle-income trap if the countries were in the middle-income range more than 28 years in between 1950 and 2017, while the 10-years average of oil exports is accounted for less than 30% of total exports. Consequently, 45 countries were classified as middle-income trap countries. There are countries like South Korea and Portugal which used to be in the range of middle income, but escaped.

Causal conditions refer to a set of variables that are believed to have an impact on the outcome set. The causal conditions are TFP (T), anti-corruption index (C), rule of law index (R) and polity index (P). TFP from Penn World Tables (Feenstra et al., 2015) is used to represent the economic factor for economic growth. Although TFP, capital and labor represent the factors in neoclassical growth theory, capital and labor are excluded from the analysis because the correlation between the GDP and labor, as well as GDP and capital are 0.94 and 0.99 respectively and statistically significant.

Following three are the institutional factors. Corruption Index from Varieties of Democracy (V-DEM)³ captures the level of corruption. To facilitate interpretation of the results, I recalculated the anti-corruption index by subtracting the Corruption Index, which ranges from 0 to 1, from 1. A higher value on the anti-corruption index indicates a lower likelihood of corruption. The rule of law index ranging from 0 to 10, is the mean score of the Legal System and Property Rights Index, and Regulation Index provided by the Fraser Institute.⁴ Legal System and Property Rights Index measures the protection of individuals and their rightfully acquired property while Regulation Index captures how regulations restrict entry into markets and interfere the freedom to engage in voluntary exchange. The higher the level of rule of law index, the better the property rights and the rule of law. As a polity index, I used the Polity Score from Integrated Network for Societal Conflict Research (IN-SCR)⁵ which represents the level of democracy. It ranges from -10 to 10 where -10 means most autocratic and 10

2 Groningen Growth and Development Centre, University of Groningen (website), <https://www.rug.nl/ggdc/productivity/pwt/>, (accessed 1 April 2022).

3 Varieties of Democracy (website), <https://www.v-dem.net/data/the-v-dem-dataset/>, (accessed 1 April 2022).

4 Fraser Institute (website), <https://www.fraserinstitute.org/economic-freedom/dataset>, (accessed 1 April 2022).

Table 1. Descriptive Statistics (year=2017)

Variable	Mean	Median	SD	Min	Max
GDPPC	12,231	11142	8733	1404	37725
TFP (T)	0.538	0.544	0.202	0.1760	1.144
Anti-Corruption Index (C)	0.489	0.477	0.234	0.144	0.935
Rule of Law Index (R)	5.998	5.984	0.715	4.306	7.390
Polity Index (P)	5.444	8.000	5.199	-9	10

means most democratic. [Table 1](#) presents the variables and descriptive statistics of year 2017.

Method

The fs/QCA method was introduced and constructed by Ragin (2000, 2008), and has been further developed upon in Rihux's (2003, 2006) and Kvist's (2006) research. Based on Boolean algebra, the fs/QCA considers that the same outcome may have different causes, investigating the causal complexity (P. Kim et al., 2022). Since fs/QCA takes the configurational approach and propose a mixture of attributes for the outcome within small sample sizes (Ragin, 2008; Kim et al., 2020), fs/QCA fits for the purpose of this study. There are three steps for the fs/QCA. The first step of fs/QCA is "calibration," which is the process of transforming raw data into a fuzzy-score ranging 0 to 1. To convert the raw data into continuous fuzzy score, a researcher needs to select three fixed anchors. The anchors are full membership (fuzzy score=0.95), full non-membership (fuzzy score=0.05), and crossover point (fuzzy score=0.5). The crossover point works as a separator that divides the full membership and the full non-membership. For example, if the fuzzy score of GDPPC is between full-membership and crossover point, then the country is considered to escape the middle-income trap. For causal conditions, I use maximum value, minimum value and average of each index for full membership, full non-membership, and crossover point. For the outcome set, maximum value and minimum value are used for full membership and full non-membership while \$12,500 is used for the crossover point because \$12,500 is the criterion that determines whether the country escaped from the trap. The result of the calibration is presented in [Table 2](#).

The second step is the "operation" of a fuzzy score. The operation uses Boolean algebra, and consists of union, intersection, and negation. In fs/QCA, each is expressed as 'logic or', 'logic and' and 'negation' respectively. The third step involves the "evaluation" of a set membership of necessary and sufficient conditions (Ragin, 2008). The evaluation of a necessary and sufficient conditions provides truth table analysis. It answers the first research question: which factor configurations help countries escape from the middle-income trap? For the truth table analysis, I used

2017 data. Then, I will check the robustness of the truth table analysis and answer the second research question, "Did the country have sufficient causal conditions when it escaped from the middle-income trap?" The robustness checks show what were the causal configurations of countries at the time of escape. For this, I calibrated the data of 1990, 2000, 2010, and 2017.

Results and Analysis

Evaluation of the Necessary and Sufficient Conditions

The causal condition is the necessary condition for an outcome if the outcome Y is a subset of a causal condition (Ragin, 2008). The relationship between the outcome set Y and the causal condition X is evaluated in terms of their consistency and coverage. The consistency assesses the extent to which causal conditions are usually sufficient to cause the presence or absence of the outcome (Paykani et al., 2018; Ragin, 2008). If a consistency is 0.8, then it indicates that the causal conditions identified in the analysis accurately predict the presence or absence of the outcome in 80% of the cases. According to Ragin (2000), if the consistency is above 0.8, the condition is described as 'almost always', while a consistency of above 0.65 is 'usually' and above 0.5 is 'more often than not'. On the other hand, the coverage assesses the extent to which the sufficient condition covers the outcome set (Ragin, 2008; Schneider & Wagemann, 2010). Thus, if a coverage is 0.8 then it means that causal conditions identified in the analysis account for 80% of the real observations.

As Ragin (2000) recommended, I set the verification criterion of consistency as 0.8. In regard to the consistency, analysis shows that TFP (0.875), rule of law index (0.825), and the polity index (0.864) are 'almost always' required to escape the trap, while the anti-corruption index (0.719) is 'usually' required ([Table 3](#)).

Next, the causal condition is sufficient condition if the causal condition X is a subset of the outcome Y (Ragin, 2008). I used the same verification criterion at 0.8. Sufficient condition evaluation shows which configurations of causal conditions (causal configurations) are sufficient conditions to escape from the trap. If a country has a fuzzy score of four causal conditions more than 0.5, then it is ex-

5 Integrated Network for Social Conflict Research (website), <http://www.systemicpeace.org/inscrdata.html>, (accessed 1 April 2022).

Table 2. Calibration of Raw Score into Fuzzy Score (year=2017)

Country	Continent	GDPPC	TFP	Anti-Corruption	Rule of Law	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
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
Sierra Leone	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

Table 3. Evaluation of the Necessary Condition

	TFP	Anti-corruption	Rule of Law	Polity
Consistency	0.875	0.719	0.825	0.864

Table 4. Evaluation of the Sufficient Condition

	T*C*R*P	T*R*P	T*C*P	T*C*R	T*R	T*P	T*C
Consistency	0.912	0.889	0.867	0.862	0.838	0.830	0.827
Coverage	0.569	0.679	0.619	0.603	0.732	0.788	0.654

Table 5. Causal Configurations that Improve GDPPC

Model		GDPPC = f(TFP, Anti-Corruption, Rule of Law, Polity)		
Complex Solution		raw coverage	unique coverage	Consistency
Model 1	T*C*R	0.603	0.0049	0.862
Model 2	T*C*P	0.619	0.0448	0.867
Model 3	T*R*P	0.679	0.0836	0.889
Model 4	T*~C*~R*~P	0.319	0.0492	0.814
Solution coverage		0.813		
Solution consistency		0.824		

pressed as T*C*R*P while if only the rule of law index is lower than 0.5 then T*C*~R*P.

The sufficient condition consistency evaluation shows that seven cases passed the consistency criterion (Table 4). Accordingly, the configurations are T*C*R*P, T*R*P, T*C*P, T*C*R, T*R, T*P, and T*C. The result indicates that each individual causal condition is not a sufficient condition to escape from the trap. Rather, the configurations like T*C*R*P, T*C*P, T*C*R, T*P, and T*C are sufficient to help the escape. It should be noted that all seven cases that passed the consistency verification criterion hold TFP. Thus, as argued in previous studies, the significance of TFP is consistent according to the fuzzy-set analysis.

Truth Table Analysis

The truth table analysis minimizes sufficient conditions in Table 4 and shows the consistency and the coverage of minimized sufficient conditions (Schneider & Wagemann, 2012). In this process, four causal configurations are found (Table 5). The total coverage of the four models is 0.813. In other words, four models as a whole can explain 81.3% of the countries that escaped from the trap. The coverage of Models 1, 2, 3, and 4 are 60.3 percent, 61.9 percent, 67.9 percent, and 31.9 percent, respectively.

Specifically, the causal configuration of Model 1 is high TFP, anti-corruption index, and rule of law index which means that the fuzzy score of three causal conditions are more than 0.5. The Model 2 is high TFP, anti-corruption index, and polity index, while Model 3 is high TFP, rule of law index, and polity index. Finally, Model 4 is when only TFP is high and the remaining three causal conditions are less

than 0.5. Model 4 is relatively exceptional case in a sense that only Turkey is the real case.

Based on the results, TFP is an essential causal condition to escape from the trap. In some cases, high TFP alone can increase the possibility of escape, however, considering that it alone has a low explanation rate at 31.9% and that there is only one real case, Turkey, it is quite difficult to conclude that TFP is the only tool to increase the GDPPC. Thus, to achieve higher GDPPC, TFP must be accompanied by more than two other causal conditions.

On the other hand, fs/QCA can figure out which causal configurations reduce GDPPC. Thus, I conducted the truth table analysis again with the negation of the outcome set (~GDPPC), which means GDPPC of \$12,500 or less. The causal configurations that reduce the outcome are presented in Table 6. Models with more than 50% explanatory power were Model 5 (~C*~R), Model 6 (~R*P), Model 7 (~C*P), and Model 8 (~T*P). Model 5 indicates that, if the anti-corruption index and rule of law index are low regardless of TFP and polity index, the possibility of escape is low. Model 6 is low rule of law index and high polity index, Model 7 is low anti-corruption index and high polity index and Model 8 is low TFP and high polity index. Models 6 to 8 show that high polity index with low TFP, rule of law index or anti-corruption index decreases the GDPPC.

The summary of analysis results are as follows. First, TFP was included in all four models that improve GDPPC. This shows that, as argued in neoclassical economics, improving TFP is crucial to escape the trap. Second, although TFP is necessary in any case, to improve the probability of escape, causal configurations of TFP and institutional factors are required. This is clearer when compared to the results

Table 6. Configurations of Causal Conditions that Reduce GDPPC

Model		\sim GDPPC = f(TFP, Anti-Corruption, Rule of Law, Polity)		
Complex solution		Raw coverage	Unique coverage	Consistency
Model 5	$\sim C^* \sim R$	0.578494	0.058074	0.876277
Model 6	$\sim R^* P$	0.56613	0.0153615	0.870893
Model 7	$\sim C^* P$	0.530161	0.0104908	0.804434
Model 8	$\sim T^* P$	0.626452	0.0157362	0.906233

of the truth table analysis that reduce GDPPC. Three out of the four models with more than 50% explanatory power were found to reduce the possibility of escape due to their low rule of law index or anti-corruption index. Third, the results of the polity index are controversial. The polity index showed asymmetric results that it was causal condition of both improving and reducing GDPPC.

Robustness Checks

The earlier analysis is based on year 2017. If the analysis is correct, countries should belong to the identified sufficient conditions in the above when they escaped. To check the robustness of the truth table analysis, I calibrated the past data and put together which countries belonged to which configurations. Due to data availability, only the data of year 1990, 2000, 2010, and 2017 are used. [Table 7](#) presents where the countries belong to which configuration in 2017. The GDPPC fuzzy scores of 0.5 or above are highlighted.

To see the countries that escaped from the middle-income trap, only the countries that have escaped (GDPPC fuzzy score of 0.5 or more) at least once, are selected. [Table 8](#) presents the countries with a GDPPC fuzzy score of 0.7 or higher. The escape year for countries with the fuzzy score of over 0.7 are relatively faster than those with a score under 0.7. Another feature is that they seem to be fully escaped from the trap. The growth rate (7y) is the seven-year average annual economic growth rate. The growth rate of South Korea and Portugal is low, but their GDPPC is already high. Also, since the growth rate of other countries remain high at more than 3 percent, they are remote from turning back to the middle-income trap.

Except South Korea and Malaysia, all countries are fit in Model 1 to Model 4. Even South Korea and Malaysia showed the trend of high TFP and two other institutional factors after they escaped. The other notable country is Turkey. Although Turkey was at $T^* \sim C^* \sim R^* \sim P$ in 2017, it went through $T^* C^* R^* P$ and $T^* C^* \sim R^* P$ right before and after its escape. It implies that institutional factors were influential during the escape.

[Table 9](#) presents the countries with a fuzzy score between 0.5 and 0.7. The countries in [Table 9](#) escaped the middle-income trap more recently than those with a fuzzy score of 0.7 or higher. In each escape year, five out of the nine countries experienced $T^* C^* R^* P$ and $T^* C^* \sim R^* P$, while China, Brazil, and Thailand are not consistent with the truth table analysis. Thailand, in particular, was classified

as a country with low TFP from 1990 to 2017, with other institutional factors fluctuating but generally remaining low.

In case of Argentina and Brazil, although more than five years have passed since the escape, the fuzzy scores of GDPPC remain low at 0.62 and 0.55. Moreover, the GDP growth rate of two countries are less than 1 percent thus, it is doubtful that they will be able to maintain the status as escapee in the future. On the other hand, China and Sri Lanka show the opposite characteristics. They escaped in 2016 and 2017 and are showing high economic growth rate at 7.44% and 5.5% respectively hence, they are relatively free from the risk of turning back to the trap.

Discussion

The findings suggest that the configurations of causal conditions that increase the possibility of escape are those that include TFP and two or more other institutional factors. While the overwhelming importance of TFP has been acknowledged in this study as in previous studies (Eichengreen et al., 2013; Kharas & Kohli, 2011), it is also found that TFP alone is difficult to achieve high GDPPC and could only explain 31% of the cases. As a solution, the results suggest that TFP with two other institutional factors such as $T^* C^* R$, $T^* C^* P$, and $T^* R^* P$ would increase the possibility of escape from the middle-income trap.

On the other hand, the causal configurations that lower GDPPC are where there are poorly developed rule of law or highly corrupted governments. This is related to the previous result, which shows that to increase the possibility of escape, not only TFP but also the improvement of institutional quality must be accompanied together. In contrast, the fs/QCA provided controversial results regarding the political system. Both truth table analysis showed that a high polity index is one of the causal conditions which means that high polity index is a cause of both high and low GDPPC. This is consistent with the ideas of North (1987).

Through the robustness checks, I could confirm sufficient causal configurations. In most of the countries, TFP with two or more institutional factors were found to be high at the time of escape. There are few exceptions, especially four countries with a fuzzy score of 0.7 or less which were not consistent with the truth table analysis.

The results of this study have implications on the ODA policy. Financial aid has been and is the most significant tool but development of other institutional factors must be carried out together. The UNSDGs has expanded the scope of ODA by focusing on targets such as poverty, sanitation, gender, and the environment. By doing so, the aim of the

Table 7. Countries Sorted by Causal Conditions and Fuzzy Scores (year=2017)

Terms	Country	GDPPC	TFP	Anti-Corruption	Rule of Law	Polity
T*C*R*P	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
	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
T*~C*R*P	Bulgaria	0.71	0.74	0.31	0.76	0.91
	Mauritius	0.77	0.79	0.36	0.92	0.95
	Romania	0.82	0.76	0.36	0.86	0.91
T*C*~R*P	Tunisia	0.39	0.6	0.87	0.42	0.74
	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*R*~P	Jordan	0.27	0.74	0.54	0.67	0.15
	Malaysia	0.83	0.6	0.57	0.92	0.48
T*~C*~R*~P	Ivory Coast	0.08	0.68	0.44	0.27	0.43
	Turkey	0.84	0.95	0.09	0.21	0.12
T*~C*R*~P	Swaziland	0.21	0.6	0.45	0.67	0.05
T*~C*~R*P	Guatemala	0.2	0.64	0.08	0.25	0.84
	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
~T*C*R*P	Jamaica	0.22	0.16	0.86	0.77	0.91
	South Africa	0.48	0.49	0.73	0.58	0.91
~T*C*~R*P	Benin	0.05	0.11	0.74	0.22	0.74
	Senegal	0.07	0.36	0.78	0.13	0.74
	India	0.16	0.32	0.54	0.47	0.91
~T*C*R*~P	Rwanda	0.05	0.07	0.78	0.95	0.15
	Tanzania	0.06	0.09	0.52	0.69	0.38
	Morocco	0.23	0.44	0.59	0.7	0.12
	China	0.52	0.22	0.51	0.52	0.07
~T*~C*R*P	Lesotho	0.07	0.21	0.47	0.7	0.84
	Mongolia	0.47	0.18	0.26	0.83	0.95
~T*~C*~R*~P	Togo	0.05	0.05	0.06	0.43	0.18
	Zimbabwe	0.05	0.06	0.09	0.26	0.43
	Mauritania	0.07	0.11	0.05	0.23	0.18
	Thailand	0.62	0.37	0.07	0.4	0.15
~T*~C*~R*P	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
	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

Table 8. Escape Countries (Fuzzy Score of GDPPC > 0.7)

Country	1990	2000	2010	2017	2017 GDP	Growth Rate (7y)	Escape year
South Korea	~T*C*R*P	T*C*R*P	T*C*R*P	T*C*R*P	37,725.1	2.51%	1991
Portugal	T*C*R*P	T*C*R*P	T*C*R*P	T*C*R*P	26,953.5	-0.50%	1988
Chile	~T*C*R*P	T*C*R*P	T*C*R*P	T*C*R*P	24,024.4	3.71%	2004
Uruguay	T*C*R*P	T*C*R*P	T*C*R*P	T*C*R*P	20,607.5	3.62%	2008
Malaysia	~T*C*R*P	~T*C*R*~P	T*~C*R*P	T*C*R*~P	26,000.6	4.11%	1996, 1999
Romania	~T*C*~R*P	~T*~C*R*P	T*~C*R*P	T*~C*R*P	25,262.1	6.70%	2007
Mauritius	T*~C*R*P	T*C*R*P	T*C*R*P	T*~C*R*P	22,656.9	7.21%	1995
Bulgaria	T*C*R*P	T*C*R*P	T*C*R*P	T*~C*R*P	20,026.9	4.35%	2010
Panama	T*~C*R*P	T*~C*R*P	T*C*~R*P	T*~C*~R*P	22,421.9	7.49%	2008
Turkey	T*C*R*P	T*C*~R*P	T*C*~R*P	T*~C*~R*~P	26,649.9	7.05%	2005

Note. The highlight indicates the nearest year from the escape year.

Table 9. Escape Countries (0.5 ≤ Fuzzy Score of GDPOC < 0.7)

Country	1990	2000	2010	2017	2017 GDP	Growth rate(7y)	Escape year
Costa Rica	T*C*R*P	T*C*R*P	T*C*R*P	T*C*R*P	16,272.2	3.71%	2010
Botswana	T*C*R*P	T*C*R*P	T*C*R*P	T*C*R*P	16,235.7	3.70%	2005
Argentina	~T*~C*~R*P	T*C*~R*P	T*C*~R*P	T*C*~R*P	16,771.4	0.65%	1996, 2005
Sri Lanka	~T*C*~R*P	T*C*~R*~P	T*C*~R*~P	T*C*~R*P	12,512.7	7.44%	2017
Mexico	T*~C*R*~P	T*C*~R*P	T*~C*~R*P	T*~C*~R*P	18,360.4	3.36%	1993, 1999
Dominican Republic	T*~C*R*P	T*~C*R*P	T*~C*~R*P	T*~C*~R*P	14,683.9	4.53%	2014
China	~T*C*~R*~P	~T*C*~R*~P	~T*C*R*~P	~T*C*R*~P	13,051.3	5.50%	2016
Brazil	~T*~C*R*P	T*C*~R*P	~T*C*~R*P	~T*~C*~R*P	14,108.9	0.51%	2010
Thailand	~T*~C*R*P	~T*~C*R*P	~T*~C*R*~P	~T*~C*~R*~P	16,675.2	3.89%	2010

Note. The highlight indicates the nearest year from the escape year.

ODA fortunately has changed from financial self-sustainability to achieving specific level of targets (Severino & Ray, 2009). However, the main tools of ODA still remain as financial aid and targets of SDGs do not cover the institutional developments. Thus, when huge amount of unconditional aid is provided, the recipient countries have no incentive to improve institutional quality (S. H. Lee & Im, 2015). If the institutional capabilities of recipient countries continue to remain low, their development can only be sustainable with the help of advanced countries, not on their own.

International organizations recognize the importance of institutional factors, and the need for various tools to support them (Nanda, 2006; Weiss, 2000; World Bank, 1992). Nevertheless, there have been very few noticeable attempts because the demand for institutional change may challenge the sovereignty of recipient countries. Since the Peace of Westphalia, sovereignty has become a core element of a country and the UN prohibits its member countries from

undertaking any public policy actions that may affect the sovereignty of another country (Weiss, 2000).

Therefore, attempts to improve the institutional factors must be initiated from donor countries. The sovereignty issue is also a problem in bilateral or multilateral ODA, but there is room for flexibility. The donor countries cannot force the recipient countries in regard to institutional factors, but there are indirect ways to do so. The donor countries may require the recipient countries to legislate particular property rights, regulations, and punishment of corrupt act to receive financial aid. This type of aid is often referred to as conditional aid. The Millennium Challenge Corporation in US and European Union implement aid programs that provide grants to developing countries that meet certain criteria related to governance performance (Brown, 2019; World Bank, 2007). Also, International Development Association of World Bank provides aid to low-income countries that meet certain criteria related to institutional quality including control of corruption,

government effectiveness and rule of law. However, according to OECD, the conditional aid only accounted for 12.4% in 2019. Moreover, the conditions may be anchored to other criteria such as health and education, or tied to the purchase of goods and services. Thus, the conditional aid that only related to institutional quality will be lower. Alternative method would be educational ODA to train public officials of recipient countries. Nevertheless, the educational ODA is focused on the basic education. In case of Korea, 95% of educational ODA is focused on general education such as building school infrastructure and vocational training, primary and secondary education, while education for foreign public officials is rare (Y. H. Kim, 2015). The potential of both conditional aid and educational ODA received very little attention. If the direct approach to improve institutional quality is challenging, conditional aid and educational ODA on public officials would enhance institutional capabilities.

In addition, goal setting plays a critical role in public administration. Specific goals contribute to the improvement of organizational performance in that they instill a sense of purpose in the members of organization and motivate them to make continuous attention and effort to achieve the goals (Rainey, 2014). As aforementioned, UNSDGs serve as goals for ODA policies in each country. However, among the 434 indicators of UNSDGs, there are none that are related to institutional quality such as property rights, control of corruption or government effectiveness. If setting specific goal is limited because of sovereignty issue, setting ambiguous goal would provide room for a wider range of political support (Chun & Rainey, 2005). International organizations must be cautious because the impacts of their

decisions are as large as the number of their members. Nonetheless, there must be at least a nominal goal that aims for the institutional quality and they should pursue for incremental changes. Otherwise, there will be less incentives for both the donor and recipient countries to make efforts to improve institutional quality.

A few limitations of this article should be noted. Although fs/QCA is a useful method to find out the configurations of causal conditions, the number of variables must be kept small, otherwise causal configurations would be too many. Thus, important variables such as foreign direct investment, government size, trade share, and political stability are excluded for concise analysis. Such variables must be dealt together in the future research. Moreover, due to the limitations of fuzzy-set analysis, circumstances such as financial crisis, natural disaster, and war could not be controlled. The future research needs to consider reviewing these variables and circumstances. Alternatively, researchers can select the best fit countries based on truth table analysis, and conduct in-depth study.

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