Tirtosuharto, Darius

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DOES FISCAL DECENTRALIZATION HELP INDONESIA AVOID THE MIDDLE-INCOME TRAP?

Darius Tirtosuharto

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Darius Tirtosuharto is an economist at the Economic Assessment Group, Department of Economic and Monetary Policy, Bank Indonesia.

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Please contact the authors for information about this paper.

Email: dtirtosuharto@bi.go.id

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Asian Development Bank Institute
Kasumigaseki Building, 8th Floor
3-2-5 Kasumigaseki, Chiyoda-ku
Tokyo 100-6008, Japan

Tel: +81-3-3593-5500
Fax: +81-3-3593-5571
URL: www.adbi.org
E-mail: info@adbi.org

Abstract

This paper focuses on the impact of fiscal decentralization on the efficiency of fiscal resources at the regional level that will improve the probability of Indonesia avoiding the middle-income trap. From a development standpoint, the implementation of decentralization is not only aimed at increasing fiscal capacity and efficiency, but also at enhancing institutional quality at the local level to support economic growth. A nonparametric method of data envelopment analysis (DEA) is utilized to measure the fiscal efficiency scores of state governments. In the second stage of empirical analysis, a Tobit panel model is constructed to find key factors that affect state fiscal efficiency in Indonesia. The finding of this study confirms that the degree of fiscal decentralization is the key determinant of state fiscal efficiency. Hence, despite the positive impact of fiscal decentralization in Indonesia, the expansion of the state's fiscal spending has caused some degree of inefficiency due to a growing corruption and rent seeking. This could jeopardize the speed and extent of development in the Indonesian regions and also the transition into high-income countries.

Keywords: fiscal decentralization, institutional development, public expenditure

JEL Classification: H30, H72, R50

Contents

1. INTRODUCTION

The implementation of decentralization has elevated the pivotal role of local governments in managing regional development. Supporting higher growth and development at the regional level relies on various initiatives and strategies of local governments, particularly in providing incentive structures and by strengthening institutions. These include the utilization of public capital to support private sector development and stimulate economic activities in the regions. The effectiveness of this strategy is still being debated in light of the inefficiency of government institutions. Yet, in many developing countries, public capital is still a critical element in accelerating growth and at the same time sustaining development in many new decentralized regions.

Predominant amongst the roles of local governments in a decentralized system is the responsibility and capability in managing fiscal resources. Fiscal decentralization has transferred the fiscal responsibility to subnational governments based on the premise that local governments are more efficient in allocating fiscal resources than the central government due to the closer relations with local constituents (Bird and Wallich 1993; Oates 1993). However, due to differences in the political and socioeconomic landscape between regions, the net fiscal incentives from the implementation of fiscal decentralization differ from one region to another. Consequently, the impact of fiscal decentralization on regional growth also varies and thus it is crucial to identify determining factors that affect fiscal efficiency at the local government level in order to focus on specific policies.

A paper by the World Bank in commemoration of the tenth anniversary of the term "middle-income trap" first being introduced in 2006 highlights the importance of the institutional aspect of governments. Gill and Kharas (2015) argued that one of the main challenges faced by many middle-income countries now is how to manage the distribution of growth benefits at all levels. This is considered the key to escaping the middle-income trap, primarily through better and more efficient public service delivery (health, education, low-cost housing) as an enabler of economic development, particularly in the manufacturing sector. Following the Solow growth model, which emphasizes physical and human capital accumulation, improving the skills of a pool of cheap labor in most middle-income countries would trigger the higher growth that is necessary to move up the ladder and become a high-income country.

In reviewing the concept of fiscal efficiency as an indication of the effectiveness and responsiveness of local government institutions, primarily in public service delivery, the major issue is how to measure and reveal its factor determinants.[1] A lack of reliable data and methodology, along with many inconsistent policies and development strategies, has created a challenge in measuring fiscal efficiency. Accordingly, it is not a simple task to assess the performance of state governments using comparable measures.

[1] In the literature, the efficiency of government institutions has generally been assessed through the size of the government and public services delivery. It is commonly assumed that bigger governments are bad since they are less efficient. The efficiency of governments is also measured through the cost structure associated with public services delivery. According to Tiebout's hypothesis, people are concerned about net fiscal benefits, comparing the quality of public services and taxes that are levied to provide those services.

One approach to evaluating fiscal efficiency is by analyzing part of the fiscal expenditure side. Most of the definitions in fiscal expenditure are uniform across regions for accounting purposes and they have an embedded utility maximization based on the preferences and priorities in satisfying public welfare. The key assumption is that local governments face budget constraints in allocating their choices or preferences for spending. Thus, under a rational expectation theory, local governments are to maximize the utilization of fiscal resources to benefit their respective regions. Therefore, allocation of fiscal expenditure becomes a proxy of institutional quality of local governments.

Another factor that determines the efficiency of state governments in allocating their fiscal expenditure is the degree of fiscal decentralization, following the argument that decentralization will improve the efficiency levels of local governments due to their ability to identify the priorities and needs of their respective regions (Bardhan 2002). If it is confirmed that a higher degree of fiscal decentralization will lead to higher fiscal efficiency, then there is a probability that decentralized middle-income countries will migrate faster to high-income countries.

With the growing concern over the implementation and policy of decentralization in developing countries, this study of fiscal efficiency becomes vital to avert further waste in resources and disparities between decentralized regions. More importantly, the findings will contribute to policy discussion on the impact of fiscal decentralization in preventing Indonesia from falling into the middle-income trap as suggested by several parties within international organizations.

This empirical study focuses on measuring state fiscal efficiency in Indonesia and revealing its factor determinants. The empirical analysis consists of a two-stage analysis. A nonparametric data envelopment analysis (DEA) is utilized to calculate the fiscal efficiency scores of state (provincial) governments in Indonesia, while a Tobit panel data model is constructed to analyze the determining factors of state fiscal efficiency. This study uses regional fiscal data from 1996 to 2005, which include approximately five years before and after the implementation of decentralization in Indonesia, which began in 2001.

2. INSTITUTIONAL SETTING AND DEVELOPMENT IN ASIA

Only a few Asian countries have managed to escape the middle-income trap since the 1960s, and from those countries, three (Japan, the Republic of Korea, and Taipei,China) were initially set up as a centralized government system before making the transition to a decentralized government system.[2] Although it has not been proven whether institutions play a major role in the transition to a high-income country, the dynamics of insitutional setting and development, particularly in Japan; the Republic of Korea; and Taipei,China shows the same pattern. Following the global wave of liberalization in the 1990s, those three countries, together with other Asia Pasific countries, began to decentralize their system of government. Decentralization was seen as a means to liberalize the political and economic aspects of the governance system.

[2] The others are island countries (Singapore and Hong Kong, China) that adopt a centralized government system.

In general, there are three phenomena that can describe the process of decentralization worldwide (Huang 2009): (1) comprehensive big-bang political-economic devolution (Indonesia, South Africa); (2) comprehensive political devolution and eneven or partial economic devolution (Brazil, India); (3) limited political devolution with more significant administrative and economic devolution (PRC). The differences in the background of decentralization may affect the outcomes both in political and economic aspects, which to a certain degree will also affect the stages of economic development. Japan's transition to a decentralized system of government did not begin with, and was not followed by, a shift in political ideology. On the other hand, decentralization was part of a democratic transition in Indonesia, the Republic of Korea, and Taipei,China.

Countries also experience different stages of systemic change in decentralization, which is in line with the challenges faced in improving the institutional quality of local governments. There are primarily four stages of decentralization as measured by the degree of systemic change (Fritzen and Lim 2006): (1) The first stage is bureaucracy reform, which is considered the hardest as it changes not only the system, but also the people within the system; (2) the second stage is fiscal efficiency, which is considered the riskiest since it will affect the effectiveness of policy or program implementation; (3) the third stage is democratizaton, which is quite critical for a country in the long term due to potential friction; (4) the fourth stage is market-preserving decentralization, which is considered the optimal condition in which the decentralized system of government manages to support a sustainable market mechanism.

Early on, the characteristics of a centralized system of government could still be seen in the local government system in Japan. In order to supervise local governments, two systems of government operations were formed. Under the Agency Delegated Function System, the authority of local government was limited (Ikawa 2008). A central government minister or prefectural governor had the authority to supervise local governments under their jurisdiction. Since the 1980s, several studies have promoted the revision of the decentralization law by offering to reform the authority of local governments. The Omnibus Decentralization Law was finally enacted in 1999, and under this law, the intervention (control) by central government was curtailed and local governments had more authority over local revenue sources.

Among other considerations in reforming the relationship between central and local governments in Japan, the following points were considered important (Ikawa 2008): (1) A centralized system of government that prioritizes uniformity and efficiency in governing is effective when a country is in the catch-up stages of development; (2) it is necessary to promote decentralization in order to be competitive in a dynamic global society.

The Republic of Korea also experienced a similar transition from a centralized to a decentralized system of government. But despite the strong control by the central government, residents and civic organizations at the local level pushed for decentralization reform, particularly from a political perspective. One of the reasons for a strong state-led system of government was to ensure the direction of industrialization in the Republic of Korea during the 1960s to 1980s (Park 2013). Under this strong state-led system of government, the authoritarian regime abolished the law that mandated a certain degree of decentralization and implemented a "command and control" system of intergovernmental relations. The democratization reform after 1987 brought about a sociopolitical movement by local civil societies, which mainly focused on the practice of democracy at the local level. This became the embryo for decentralization reform later in the 1990s.

Despite a push for the implementation of local democracy, decentralization reform was delayed until the financial crisis hit in 1998. Under the agreement with the IMF, the Republic of Korea government agreed to implement public sector reform, which was directed towards a more market economy. This reform was also oriented to strengthen the role of local governance as a means to gain competitiveness and a speedy recovery for the economy. The shifting into a democracy system in the Republic of Korea has been proven to be relatively successful. After the implementation of post-crisis decentralization, most local governments focused on economic development and innovation. This is the reason for the continuing economic progress that eventually brought the Republic of Korea out of the middle-income trap after the 1998 crisis.[3]

For almost 50 years, Taipei,China followed a central state system of government due to the unique setting of its political institutions. Not until the enactment of the Law on Local Governments System in 1999 was decentralization finally implemented in order to improve the local public service provisions. Similarly to the case of the Republic of Korea, local governments played a significant role in improving public services after acquiring more authority in managing local revenue sources. Health and education are the two key sectors of public services that local governments have mainly prioritized.

Due to differences in the characteristics and complexity of each Asian economy, the impact of decentralization could vary. The experiences of the three Asian countries that managed to become high-income countries show that the key is to achieve a market condition that preserves decentralization through administrative (bureaucratic) and fiscal reform. Japan, the Republic of Korea, and Taipei,China have been quite successful in implementing bureaucratic and fiscal reform along with democratization. The systemic changes in these countries were carried sequentially and also through better planning and preparation. Even in the case of the Republic of Korea, local democracy flourished before the financial crisis hit in 1998, which became the trigger for further democratic reform. In the case of Indonesia, the bureaucratic and fiscal reform along with democratization took place in the same period following the 1998 crisis, which resulted in a lack of preparation for improving the capacity and capability of local institutions.

3. FISCAL DECENTRALIZATION AND THE MIDDLE-INCOME TRAP

The theoretical arguments of decentralization are primarily based on allocative efficiency, which suggests that local governments should have better knowledge about the needs in their respective regions. Local governments also have an advantage in the process of planning and executing policies with broader citizen participation (Maddick 1963). Rationally, local governments are more capable and credible in terms of delivering public goods in a more efficient and innovative way than the central government, which does not have presence at the local level (Jin et al. 2001; Azis 2003).[4] Thus, decentralization has the potential to improve efficiency due to the ability of local governments to strategically mobilize and allocate resources. It has also been argued that decentralization increases competitiveness among local governments and

[3] Despite the expansion of the degree of fiscal decentralization, central government transfers are still relatively dominant in the Republic of Korea. The degree of fiscal autonomy in local governments was even decreased from 1991 to 2005.

[4] Another key aspect of decentralization in supporting democracy is transparency and accountability, in which citizens have a role in preserving good governance. In a democratic system, local district elections provide a means for citizens to give their opinion.

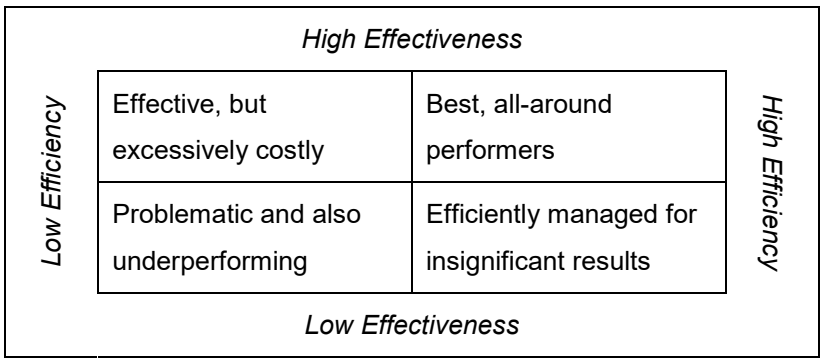
could potentially limit the size of the public sector, which would lead to increased productivity (Gill et al. 2002).

Fiscal decentralization is defined as the mechanism of expenditure and revenue allocation within an intergovernmental finance system that ensures efficient delivery of public services (Rao 2003), while the degree of fiscal decentralization, which is commonly used to measure the extent of decentralization, is defined as the share of subnational spending/revenue over total government spending/revenue (Oates 1993; Davoodi and Zou 1998; Woller and Phillips 1998; Ebel and Yilmaz 2003).

Based on the premise of allocative efficiency, fiscal decentralization potentially supports efficiency in the local economy and also promotes intergovernmental competition (Bardhan 2002). This implies that local governments should optimize the utilization of limited fiscal resources to satisfy public welfare. An excessive spending or a mismatch in expenditure assignments may hurt economic growth and regional development (Davoodi and Zou 1998; Devarajan et al. 1996. Misallocation of fiscal resources is also influenced by the extent of rent seeking and corruption activities (Prud'homme 1995).

Theoretically, efficiency focuses on the relationship between inputs and outputs, which is also applied to measure the efficiency of fiscal allocation.[5] Hence, the term "efficiency" is quite different from effectiveness. In efficiency, the idea is to utilize minimum resources to produce optimum outputs, while effectiveness refers to the extent to which allocated resources could produce positive results or targets. Both efficiency and effectiveness in fiscal allocation are crucial for local governments due to limited fiscal resources.

Figure 1: Efficiency and Effectiveness Matrix



Note: Adopted from the Performance Management Best Practice (Shim 2003).

High efficiency and high effectiveness is the ideal combination from the performance matrix above. The second best situation is the case where the allocation of resources produces a highly effective, but very costly, outcome. The third best scenario is the situation where the allocation of resources is efficient, but the types of resources that are being allocated are not productive or effective. Finally, the worst circumstances are when allocation of resources is neither efficient nor produces a positive outcome. In the context of fiscal decentralization, the choices made by local governments over four combinations of resource allocation and the decision to limit nonproductive allocation will ultimately affect development and economic growth.

[5] Neoclassical theory argues that organizations are not always efficient, which is consistent with the theory of X-inefficiency (Leibenstein 1996) that argues that organizations do not necessarily operate at the optimum level.

The expected result from the implementation of fiscal decentralization is that state governments will have higher efficiency levels following the basic premise of decentralization. In the democratic system, the incentive for state governments to allocate resources efficiently to support development in their respective region is also partly due to the ability of people to vote in the ballot during the election. This represents a referendum on the success and failure of state governments. Hence, the problem that persists in many developing countries is the lack of transparency and accountability.

To date, there has only been limited literature on the relation between fiscal decentralization and the middle-income trap, particularly on identifying the role of state governments. Gill and Kharas (2015) specifically state that policy options to escape the middle-income trap are better formulated through democratic and decentralized government. The effectiveness and responsiveness of the local governments is a concern due to the speed of implementing policies into actions that will also affect the speed of moving the ladder of development. Thus, it is critical to be able to measure the level of efficiency and effectiveness of state governments as part of an effort to promote good governance.

Another paper by Woo (2009) and Asia Foundation (Burke et al. 2014) stresses the need to have a correct institutional setup to avoid the middle-income trap. Burke et al. (2014) argue that decentralized economic policymaking will promote investment initiatives and induce growth competition among local governments. Specifically related to fiscal decentralization, an independent fiscal base (revenues) will allow local governments to respond promptly to infrastructure bottlenecks, which are a crucial issue in most middle-income countries. Woo (2009) also supports reforms and policy action so that further decentralization that could offer more effective incentives, higher accountability, and strict monitoring of the public service delivery.

4. MEASURING FISCAL EFFICIENCY

Measuring the fiscal efficiency of local governments employs a two-stage method to calculate the fiscal efficiency scores and a Tobit panel data model to analyze the determinants of state fiscal efficiency. The first stage uses the application of DEA to construct a measure of the technical efficiency of local governments. Similar method was also used by Herrera and Pang (2005) to measure the efficiency of public spending using cross-country data of developing countries. In the second-stage analysis, a Tobit panel data regression is utilized to reveal factors that determine fiscal efficiency.

In general, two analytical methods are commonly used to measure comparative performance in terms of technical efficiency. The first is the parametric technique, which utilizes statistical regression analysis with single input-multiple outputs or single output-multiple inputs. Simple ordinary least squares (OLS) regression can be used to estimate performance levels in the parametric models. Hence, the major limitation of the parametric model is the risk of dealing with inaccurate specifications since it is necessary to have few assumptions or hypotheses before running OLS regression.

To overcome the limitation of the standard parametric model with OLS regression in measuring technical efficiency, the other option is to utilize the stochastic frontier (SF) model. The SF model is oriented towards an efficiency frontier instead of focusing on a central tendency. Unlike the parametric model, the SF model allows for inefficiency. The standard error in the SF model is composed of normally distributed random errors and inefficiency parameters. In the SF model, the measurement is directed toward

average efficiency rather than the standard concept of efficiency level over inputs for a number of given outputs. One of the issues with the SF model is the unknown size of the random error within the observed output, which can potentially result in the inaccuracy of the efficiency ratio.

The second analytical method is to use the nonparametric DEA technique, which constructs an efficient production frontier from a number of observed inputs and outputs. In constructing the efficient production frontier, it is assumed that all observed inputs and outputs operate with the same production function. An efficient production frontier represents the optimum efficiency from the model. All units on the frontier curve, also known as "envelope," are assumed to be fully efficient and given the highest efficiency score of 1.

Performance is comparatively measured in terms of efficiency with references to a set of units that are compared among each other. In this study, the analytical framework of the DEA model aims to measure the relative performance of state (provincial) governments in decision making units (DMUs). Below is the analogy diagram that represents the function of state governments as the DMU within the decentralization framework:

Each unit of assessment or DMU has control over the decision to transform inputs into outputs in order to produce technical efficiency. In addition, DEA also allows some discretion under certain conditions in which the model could control inputs or outputs to find the optimum level of efficiency. Hence, the DEA model in this study is based on an input-oriented model in which inputs are controlled as they reflect the capability of state governments in maximizing fiscal resources. As in many other countries, state governments in Indonesia face budget constraints and therefore they should optimize the limited amount of public spending as the input in order to produce public goods that will impact economic growth.

Following Farrell (1957), technical efficiency is defined as a condition in which for a set of inputs, an optimum quantity of outputs is produced, or when given a set of outputs, an optimum quantity of inputs is needed. The technical efficiency of a DMU is calculated as the ratio of output produced to input consumed.

Technical Efficiency = Σ weighted outputs / Σ weighted inputs

The traditional DEA model developed by Charnes, Cooper, and Rhodes (Farrell 1957) is constructed under the assumption of constant return to scale (CRS) where an increase in inputs consumed would lead to a proportional increase in outputs produced. Hence, not all DMUs in this study operate optimally as assumed in the CRS and therefore the variable return to scale (VRS) assumption ought to be used.

The linear programming of the DEA model with the CRS assumption is as follows:

$$\underset{\mu,v}{Max}\theta_0 = \sum_r \mu_{r0} y_{r0} \Big/ \sum_i v_{i0} x_{i0} \qquad (1)$$

Subject to:

$$\sum_r \mu_{rk} y_{rk} / \sum_i v_{ik} x_{ik} \leq 1 \text{ for all } k\text{-}1,2,\ldots j \quad (2)$$

$$\mu_{r0} \geq 0 \quad (3)$$

$$v_{i0} \geq 0 \quad (4)$$

The description of each parameter:

θ_0: efficiency score of DMU_0;

j: number of DMUs;

r: number of outputs used by the DMUs;

i: number of inputs generated by the DMUs;

Y_k: vector of outputs *r* used by DMU_k;

X_k: vector of inputs *i* used by DMU_k;

μ and v vector of multipliers respectively set on Y_k and X_k where

μ_r, v_i = the respective weights for output *r* and for input *i*.

The model determines that for each DMU_0 the optimal set of input weights $\{v_{i0}\}_{i-1}$ and output weights $\{\mu_{r0}\}_{r-1}$ that maximize its efficiency score is θ_0.

Given the time-dependent setting of panel data that will be used, the DEA model in this analysis is structured under a dynamic operation rather than a static condition. For that purpose, window analysis technique is used to validate the consistency of the efficiency scores over time. Window analysis in this study include 26 DMUs (*n*), 10 observed years (*k*), and a 3-year window length (*p*), which produces eight-window analysis (*w*) with associated DMUs under observation (see Appendix for a sample of the window analysis application).

The first input variable is state capital expenditure, which is considered productive spending to finance public capital investment projects such as roads, ports, and utilities.[6] The model uses a 1-year lag for capital expenditure since public capital investment projects typically do not have an immediate impact on the economy. The second input variable is current expenditure, which is mainly state spending on operating costs including rent, wages, and other expenses to cover government operations.[7]

Following the DEA model for regional analysis developed by Stimson, Stough, and Roberts (2002), the outcome of state expenditure is gross regional domestic product (GRDP) as the total output of all economic activities that are influenced by state spending and state own-source revenues.[8] Despite the fact that state expenditures are a small fraction of GRDP in general, the impact of state spending on GRDP varies depending on the structure and size of region's economy. It also depends on the extent

[6] This spending excludes the mandated special allocation funds from the central government.

[7] Due to the population imbalances between regions, normalization of state spending using per capita numbers does not depict the true fiscal capacity of a region. Hence, all the numbers used in the DEA model are adjusted for inflation as a means to normalize both input and output variables.

[8] In determining the input and output variables to be used in the DEA model, a Granger causality test is utilized to identify the causal relationship between the input and output variables.

of region's trickle-down effect from government spendings. State own-source revenues are the second output that comprise of local taxes, fees, and charges. It also includes profits generated by State Owned Enterprises (SOE) such as banks and public utilities companies owned by state governments.

Table 1: Descriptive Analysis of Input-Output Variables
(Rp million)

	Pre-Decentralization (1996–2000), n = 130				Post-Decentralization (2001—2005), n = 130			
Variable	**Mean**	**St. D.**	**Min**	**Max**	**Mean**	**St. D.**	**Min**	**Max**
Capital Expenditure	149,159	192,605	36,907	1,229,105	504,412	1,470,387	14,432	15,800,000
Current Expenditure	301,708	540,725	27,850	3,826,516	971,035	1,462,443	61,741	9,041,520
Revenue	175,441	386,940	9,841	2,668,535	678,847	1,210,385	15,667	7,597,868
GRDP	31,920,834	40,832,564	2,101,872	189,075,401	68,283,175	70,797,332	2,954,380	436,251,000

Table 2: Relative Fiscal Efficiency Scores

	DMUs (States/Provinces)	Pre-Crisis 1996	Crisis 1997–1998	Decentralization 2001–2005
Western Region	Nanggroe Aceh	0.7873	0.7439	0.5937
	North Sumatra	0.7956	0.7257	0.8436
	West Sumatra	1.0000	0.8681	0.8270
	Riau	0.9511	0.9165	0.7107
	Jambi	1.0000	0.9655	0.8288
	South Sumatra	0.8947	0.8119	0.7646
	Bengkulu	1.0000	0.9507	0.9230
	Lampung	0.9042	0.8568	0.8177
	DKI Jakarta	1.0000	1.0000	0.9715
	West Java	0.8641	0.9153	0.9555
	Central Java	1.0000	0.7665	0.9396
	Di Yogyakarta	1.0000	0.9813	0.8837
	East Java	0.8238	0.8001	0.9928
	Bali	1.0000	0.8467	0.8226
Eastern Region	West Nusa Tenggara	0.9581	0.6939	0.6918
	East Nusa Tenggara	0.8915	0.8453	0.8046
	West Kalimantan	0.9474	0.7422	0.6524
	Central Kalimantan	0.7103	0.9361	0.8975
	South Kalimantan	0.8547	0.7618	0.8748
	East Kalimantan	0.7911	0.8596	0.8172
	North Sulawesi	0.8824	0.9505	0.8698
	Central Sulawesi	0.7767	0.9653	0.9145
	South Sulawesi	0.9382	0.9847	0.8808
	Southeast Sulawesi	1.0000	0.8763	0.8309
	Maluku	0.8725	0.8610	0.7513
	Papua	0.7505	0.6705	0.5757
		0.8998	0.8575	0.8245

Table 2 shows the average fiscal efficiency scores of the 26 state governments for three periods during the time of observation.[9] State fiscal efficiency scores declined most noticeably following the financial crisis in 1997. However, aggregate fiscal efficiency scores were at the lowest level after the implementation of decentralization in 2001. This indicates that state governments in Indonesia were not well prepared to manage a sudden increase in fiscal resources at the early stage of decentralization, which could also be an impact from the 1998 economic crisis. Hence, this was not quite an issue in the case of the Republic of Korea that also implemented a larger degree of decentralization following the 1998 economic crisis.

At the disaggregated regional level, fiscal efficiency scores vary between stable and conflict regions. Conflict states such as Aceh, Papua, and Maluku recorded a significant decline in the levels of fiscal efficiency due to the disruption in the governing function caused by separatist movements in a post-crisis period. With the exception of Maluku, conflict arised in those states due to the unequal revenue-sharing schemes from the exploration of natural resources.

Despite a windfall of profit sharing from the exploration of natural resources, the levels of fiscal efficiency in rich resource regions such as Riau and East Kalimantan are at the lower end of the scale. A rapid expansion of fiscal resources without sound management may actually lead to higher levels of fiscal inefficiency due to increased unproductive spending.

The majority of states in the Java region, with the exception of West Java and East Java provinces, experienced a modest decline in the levels of fiscal efficiency after the 1998 crisis. In comparison with the majority of eastern regions, the levels of state fiscal efficiency in the western regions have been relatively higher, which could be driven by the better capacity and capability of the institutions, the quality of the leaders and supporting infrastructure. Various programs have been provided by international donors to assist the implementation of fiscal decentralization in Indonesia, particularly in the eastern region. Besides the technical assistance with fiscal management, the assistance programs have also focused on improving good governance through better transparency and accountability.

Among the various problems with the implementation of decentralization in Indonesia, the lack of institutional integrity is the major one. Decentralization has established a new powerful institution in the regions where local leaders became a “local king,” thereby making rent seeking and corruption practices widespread due to a lack of oversight, particularly at the beginning of the decentralization era. Accordingly, limited fiscal resources may serve well when sound institutional arrangements to support decentralization, such as rule of law and an oversight mechanism, have not been well established.

The greater constraint on the region’s fiscal resources during the economic crisis could be due to lower own-source revenues and transfers from the central government.[10] This will eventually force state governments to manage the allocation of fiscal resources more responsibly, particularly when state governments are also required by law to balance their budget, although this means that state governments will limit their spendings during a crisis period, which would not help to speed up the recovery process.

[9] For consistency in this study, data from 26 newly formed states were merged into their initial jurisdiction before the current formation. A complete result of fiscal efficiency scores for the 10-year period of observation is provided in the Appendix.

[10] The majority of states still depend on transfers from the central government to close their budget gap and fund the mandated spending since they are not permitted to issue debt through bond issuance.

5. DETERMINANTS OF STATE FISCAL EFFICIENCY USING TOBIT MODEL

The second stage of the empirical analysis is to examine fiscal indicators that determine the fiscal efficiency levels of state governments in Indonesia. With a skewed distribution of the fiscal efficiency scores from the DEA analysis, a Tobit panel data regression is used in this study to identify the determinant factors of fiscal efficiency. The Tobit model is a maximum likelihood random-effect model that operates under a nonnegative dependent variable. This model enables fiscal efficiency scores to be constrained within the range of 0 and 1.

The Tobit model is expressed as the level of y_{it} (efficiency scores) in terms of an underlying latent (unobservable) variable y_{it}^* as the dependent variable:

$$y_{it}^* = ß_0 + ß_1 x_{it} + \varepsilon_{it} \quad (7)$$

$$y_{it} = ß_0 + ß_1 x_{it} + \varepsilon_{it} \quad \text{if } y_{it}^* > 0, \text{ and} \quad (8)$$

$$y_{it} = 0 \quad \text{if } y_{it}^* \leq 1$$

The error term (ε_{it}) in the efficiency distribution of the Tobit model where y_{it}^* is a latent variable is assumed to be independent and identically distributed (normal distribution) with a function of $N(0,\sigma^2)$ where σ^2 is the variance. $\varepsilon_{it,}$ $x_{it,}$ and ß are unknown parameters of the explanatory variables. The maximum likelihood estimation (MLE) is used to estimate ß and σ.

The standard estimation for the likelihood function (L) for the censored normal distribution is as follows:

$$log\ L = \sum_{y_{it} > 0} -\frac{1}{2}\left[log(2\pi) + log\sigma^2 \frac{(y_{it} - (y_{it} - \beta x_{it})^2}{\sigma^2} \right] + \sum_{y_{it} = 0}\left[1 - F\left(\frac{\beta x_{it}}{\sigma} \right) \right] \quad (9)$$

The estimated coefficients in the Tobit model represent the marginal effect of x_{it} on y_{it}^*. To determine the expected marginal effect of x_{it} on y_{it} , the following equation is calculated in the Tobit model:

$$E\ \left[y_{it} | y_{it} > 0 \ \right] = \beta_0 + \beta_1 x_{it} + \sigma \left[\frac{\varphi(\beta_0 + \beta_1 x_{it})/\sigma}{\Phi(\beta_0 + \beta_1 x_{it})/\sigma} \right] \quad (10)$$

In this study, there are four key variables that are likely to influence the fiscal efficiency scores of state governments:

- Degree of fiscal decentralization is defined as a share of state expenditures over total government spendings. A higher share of state expenditures represents a higher degree of fiscal decentralization.
- Ratio of capital expenditure is defined as a share of state capital expenditure over total state spending. Capital expenditures are both capital improvements and new capital investment projects.

- Ratio of operating costs is defined as a share of state operating costs over total state spending. They are direct and indirect spending associated with operating costs. Spending on goods and services is direct, while wages are considered indirect spending.
- Ratio of revenue independence is defined as a share of taxes, charges, and fees independently collected by state governments. A higher ratio of revenue independence implies either a higher portion of state own-source revenues or a decrease in central government transfers.

The results of the Tobit panel data regression with a period of analysis between 1996 and 2005 are shown in Table 3. In the Tobit model, the magnitude of likelihood for each determinant factor is measured by the marginal effect of each factor. A negative sign of the marginal effect indicates that the factor variable has a reverse propensity with a higher fiscal efficiency level. The odds ratio's confidence level in the model is determined by the *z-ratio*.

Table 3: Determinants of State Fiscal Efficiency in Indonesia, 1996–2005

Dependent Var:			
n = 260 Obs (26 States)	**Fiscal Efficiency**		
Independent Var.	**Coefficients**	**z-ratio**	**Marginal**
Fiscal Decentralization	0.79	2.94*	0.72
Ratio of Capital Expenditure	–0.07	–2.64*	–0.06
Ratio of Operating Costs	–0.09	–2.82*	–0.08
Ratio of Revenue Independence	0.04	2.96*	0.04
Lagging States Dummy	0.01	1.00	0.01
Per Capita Spending	–0.20	–2.77*	–0.19
Constant	0.86	36.39*	
Log Likelihood	139.78		
R-squared	0.21		
Wald chi2	74.20		

Note: * The point estimate is significant at the 1% level.

Fiscal decentralization is identified as the factor with the highest marginal effect that influences the levels of fiscal efficiency more than other factors. As the sign of the marginal effect is positive, the argument that fiscal decentralization is likely to provide incentives to allocate fiscal resources more efficiently can be supported. This finding supports the reasoning behind further enhancing fiscal decentralization in Indonesia, which was initially motivated to maintain national unity and prevent failing states, rather than to improve the quality of local government institutions.

On the other hand, the findings from the Tobit panel model indicate that a higher ratio of capital expenditure is likely to lower fiscal efficiency. A higher ratio of operating costs and per capita spending is also associated with lower levels of fiscal efficiency. This finding is in line with the phenomenon of rising corruption and rent seeking activities at the regional level after the implementation of fiscal decentralization. An increase in state government spending tends to escalate waste spending and therefore constrains the potential regional outputs as the level of development is far from optimum.

The inefficiencies of current expenditures to cover operating costs are proven to be higher than those of capital spending, which implies that there has been more waste spending and markup from the acquisition of goods and services, whereas the capital spending inefficiency is more likely related to the rent-seeking activities in land acquisition, permits, and construction. One way for state governments to implement fiscal efficiency is by pursuing cost reduction programs without sacrificing the need for basic public services. Hence, these efficiencies are more likely to occur under budget constraint conditions, such as in a period of crisis.

The findings suggest that fiscal efficiency associated with a higher degree of fiscal decentralization is driven from the revenue side. As evidenced by the model, states that can generate their own revenues independently from the central government transfers are likely to have a significantly higher fiscal efficiency level. Higher revenue independence implies that state governments are more capable of fulfilling their responsibility and allocating fiscal resources in a productive and efficient manner. Hence, there is also a risk when states excessively generate their own revenues through additional taxes, charges, or fees since this potentially has a negative impact on trade and investment.

The lagging state dummy variable shows no significance in the regression, which indicates that fiscal efficiency levels are not necessarily affected by the level of economic (scale) and resource (structure) capacity as initially predicted. This means that a number of lagging regions actually have a sound institutional quality that enables them to manage fiscal resources properly. Another factor is the quality of leaders in the leading and lagging regions that are relatively not significantly different.

In order to test whether the determining factors of state fiscal efficiency changed after the implementation of fiscal decentralization in 2001, a separate panel data is constructed for each of the periods from 1996 to 2000 and 2001 to 2005. The results are shown in Tables 4 and 5. In the post-decentralization period, there is a significantly higher probability of a positive effect from a larger fiscal decentralization on the fiscal efficiency level. This finding strengthens even further the claim that allowing a larger degree of fiscal decentralization will improve the efficiency of state governments, which potentially support Indonesia's effort to reach high-income status. Thus, to some extent, the decision to implement the new decentralization law in 2001 was well justified. Hence, in the long term, the key is to speed up improving the quality of institutions in light of the global competition.

In the post-decentralization panel, the sign of capital expenditure ratio turns negative, which indicates that a higher ratio of capital expenditure is more likely to lower fiscal efficiency. This finding confirms the presumption that decentralization in Indonesia has increased corruption and rent-seeking activities associated with capital spending. Capital spending is more prone to corruption and rent-seeking practices due to the local government's discretion in awarding contracts. In addition, there is also a lack of oversight and transparency in local government projects due to limited resources and capacity. In the old regime, which was more centralized, the majority of the decision-making over capital project developments was in the hands of central government.

Looking at the coefficient of variable operating cost ratio and per capita spending that is only significant in the post-decentralization period, it can be concluded that inefficiency in state government spending associated with a higher ratio of operating costs and per capita spending is more likely to take place after the expansion of fiscal decentralization.

Table 4. Determinants of State Fiscal Efficiency in Indonesia, 1996–2000

Dependent Var: n = 130 Obs (26 States)	Fiscal Efficiency		
Independent Var.	**Coefficients**	**z-ratio**	**Marginal**
Fiscal Decentralization	0.35	2.09**	0.22
Ratio of Capital Expenditure	0.34	3.96*	0.31
Ratio of Operating Cost	–0.09	–0.89	–0.08
Ratio of Revenue Independence	0.06	2.75*	0.05
Lagging states Dummy	–0.03	–1.37	–0.03
Per capita Spending	0.06	0.20	0.05
Constant	0.71	13.01*	
Log Likelihood	77.19		
R-squared	0.21		
Wald chi2	37.79		

Note: * The point estimate is significant at the 1% level.

Table 5: Determinants of State Fiscal Efficiency in Indonesia, 2001–2005

Dependent Var: n = 130 Obs (26 States)	Fiscal Efficiency		
Independent Var.	**Coefficients**	**z-ratio**	**Marginal**
Fiscal Decentralization	0.86	2.87*	0.82
Ratio of Capital Expenditure	–0.10	–3.96*	–0.09
Ratio of Operating Cost	–0.06	–1.83***	–0.05
Ratio of Revenue Independence	0.14	1.95**	0.03
Lagging states Dummy	0.02	0.86	0.02
Per capita Spending	–0.25	–3.24*	–0.24
Constant	0.74	21.28*	
Log Likelihood	88.26		
R-squared	0.46		
Wald chi2	99.93		

Note: * The point estimate is significant at the 1% level.
** The point estimate is significant at the 5% level.
*** The point estimate is significant at the 10% level.

The variable revenue independence ratio is significant in both panel regressions. Hence, the likelihood of a larger revenue independence positively affecting the fiscal efficiency level is more than doubled in the post-decentralization period as state governments were able to raise their own source of financing through taxation. One factor to consider is the fact that the new decentralization law controls the type of taxes that state and local governments can issue. The law also limits the maximum rate for specific taxes in order to prevent excessive taxation.

The results of the empirical analysis have confirmed the potential benefits and risks of fiscal decentralization. Therefore, the benefits and risks of fiscal decentralization should be considered in determining challenges in migrating to a high-income country. So far,

risks have been identified on the expenditure side and therefore clarity and consistency in implementing the rule of law is crucial in order to prevent misallocation of spending. Further enhancement of fiscal decentralization is necessary but it should be accompanied by a commitment to eradicate any corruption and rent-seeking activities.

The findings of this paper also imply that a centralized control over capital projects in the short term might actually lower the extent of inefficiency that takes place in the decentralized system of government. However, it will be a challenge to reverse back to the centralized system as it may face resistance from local governments and the public.

6. CONCLUSION

The degree of fiscal decentralization is the dominant factor in determining state fiscal efficiency. This finding indicates that awarding a larger responsibility to state governments to manage their fiscal resources, despite the considerable political and economic risks, is well justified. More importantly, this also serves the purpose of more efficient public service delivery that will boost development in the Indonesian regions. Related to that, the effectiveness and responsiveness of state government institutions is also considered the key factor that will determine the speed of reform and migration of Indonesia to a high-income country.

Despite the positive impact of fiscal decentralization in Indonesia, the expansion of the state's fiscal spending has caused some degree of inefficiency due to a growing waste spending, corruption, and rent seeking. This could jeopardize the economic development in the Indonesian regions. On the other hand, by granting a higher revenue independence, state governments are more compelled to improve their capacity and capabilities in boasting revenue collections. This means streamlining the process of tax collection to increase efficiency and designating favorable tax rates in order to achieve the revenue target. In regard to the high inefficiencies in the current expenditures, which are associated with the costs of government operations, it is necessary to provide clear guidelines on spending allocation and also make efforts to strengthen the rule of law associated with misallocation of government spending.

In sum, while enhancing fiscal decentralization by giving more roles to the local government in managing their own finance is key, it is more crucial to give commitment to the eradication of corruption and rent-seeking activities. As lessons learned from Indonesia's experience with decentralization, the following policies should be considered as guidance to minimize the risks of a slower path in migrating to high-income countries while expanding the degree of fiscal decentralization.

- Increase the capacity of local bureaucrats to plan a government budget that prioritizes the most needed and productive public services in order to support economic development and accelerate the migration to a high-income country.
- Support a good governance policy that ensures oversight, transparency, and accountability. This also means enforcing the corruption law and committing to uphold the rule of law consistently without any political intervention.
- Optimize technology to strengthen fiscal monitoring and contract procurement. It is also necessary to create a benchmark (standard) for each item of government spending with some variations in the cost of logistics.

REFERENCES

Azis, I.J. 2003. “Concepts and Practice of Decentralization: Some Notes on the Case of Indonesia,” Paper presented at the Policy Dialogue on Empowering Women in Autonomy and Decentralization Processes, United Nations, New York.

Bardhan, P. 2002. “Decentralization of Governance and Development,” *Journal of Economic Perspectives* 16 (4): 185–205.

Bird, R. and C. Wallich. 1993. “Fiscal Decentralization and Intergovernmental Relations in Transition Economics: Toward a Systematic Framework of Analysis,” *Policy Research Working Paper No. 1122,* World Bank.

Burke, A., V. Kanapathy, H. Hazri, P. Phongpaichit, and P. Benyaapikul. 2014. “Middle Income Trap: Economic Myth, Political Reality,” Asia Foundation.

Ebel, R. and S. Yilmaz. 2003. “Fiscal Decentralization in Developing Countries: Is It Happening? How Do We Know?” *World Bank Policy Research Working Paper No. 2809.*

Davoodi, H. and H.F. Zou. 1998. “Fiscal Decentralization and Economic Growth: A Cross-Country Study,” *Journal of Urban Economics* 43 (2): 244–257.

Devarajan, H., V. Swaroop, and H.F. Zou. 1996. “The composition of public expenditure and economic growth,” *Journal of Monetary Economics* 37: 313–344.

Farrell, M.J. 1957. “The Measurement of Productive Efficiency,” *Journal of the Royal Statistical Society* 120 (3): 253–290.

Fritzen, P. and P.W. Lim. 2006. *Problems and Prospects of Decentralization in Developing Countries*. LKY School of Public Policy, National University of Singapore.

Gill, C., E. Roberto, P. Padro, and R. Manuel. 2002. “Decentralization and Regional Economic Disparities,” Tyne, England: Center for Urban & Regional Development Studies.

Gill I.S. and H. Kharas. 2015. “The Middle-Income Trap Turns Ten,” *Working Paper Series No. 7403*, World Bank.

Herrera, S. and G. Pang. 2005. “Efficiency of Public Spending in Developing Countries: An Efficiency Frontier Approach,” *Working Paper Series No. 3645*, World Bank.

Huang, X.M. 2009. *Politics in Pacific Asia*. New York: Palgrave Macmillan.

Ikawa, H. 2008. “*15 Years of Decentralization Reform in Japan,”* Up-to-date Documents on Local Autonomy in Japan No. 4, Tokyo: CLAIR and COSLOG.

Jin, H.H., Y.Y. Qian, and B.R. Weingast. 2001. *Regional Decentralization and Fiscal Incentives: Federalism, Chinese Style*. The Center for Research on Economic Development and Policy Reform, Stanford, CA.

Leibenstein, H. 1996. “Fiscal Allocative Efficiency vs. X-Efficiency,” *American Economic Review* 56 (3): 392–415.

Maddick, H. 1963. *Democracy, Decentralization and Development*. London, England: Asia Publishing House.

Oates, W.E. 1993. “Fiscal Decentralization and Economic Development,” *National Tax Journal* 46 (2): 237–243.

Park, S.C. 2013. “Decentralization Reform under the Economic Crisis in South Korea”. Korea Polytechnic University. http://www.kanagawa-u.ac.jp/att/10505 _02344_010.pdf (accessed 11 April 2017).

Prud’homme, R. 1995. “The Dangers of Decentralizations,” *World Bank Research Observer* 10 (2): 201–220.

Ramanathan, R. 2003. *An Introduction to Data Envelopment Analysis: A Tool for Performance Measurement.* Beverly Hills, California: Sage Publications.

Rao, P.K. 2003. *Development Finance*. Berlin, Germany: Springer.

Shim, Wonsik. 2003. "Applying DEA Technique to Library Evaluation in Academic Research Libraries,” Library Trends, Winter 2003.

Stimson, R.J., R.R. Stough and B.H. Roberts. 2002. *Regional Economic Development*, Berlin, Germany: Springer.

Woller, G.M. and K. Phillips. 1998. “Fiscal Decentralization and LDC Growth: An Empirical Investigation,” *Journal of Development Studies* 34: 138–148.

Woo, W.T. (2009). Getting Malaysia Out of the Middle-Income Trap. University of California, Davis.

APPENDIX 1: SAMPLE OF WINDOW ANALYSIS FOR ACEH[11]

States	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Nanggroe Aceh	78.73%	73.91%	72.36%							
		75.52%	74.06%	70.16%						
			75.80%	71.82%	74.14%					
				73.62%	77.46%	63.13%				
					78.03%	63.22%	58.17%			
						68.65%	65.18%	56.54%		
							52.63%	56.99%	57.99%	
								56.99%	57.99%	58.34%
Mean	0.7873	0.7472	0.7407	0.7187	0.7654	0.6500	0.5866	0.5684	0.5799	0.5834

[11] Refer to Ramanathan (2003) for more details on DEA and window analysis theories and applications.

APPENDIX 2: FISCAL EFFICIENCY SCORES OF 26 STATES IN INDONESIA BETWEEN 1996 AND 2005

INPUT Indicators: (1) Capital Expenditure, (2) Current Expenditure
OUTPUT Indicators: (1) State Government Revenue (2) Private Investments

DMUs (States/Provinces)	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
DI Aceh	0.787	0.747	0.740	0.718	0.765	0.650	0.586	0.568	0.579	0.583
North Sumatra	0.795	0.749	0.702	0.736	0.837	0.838	0.910	0.991	0.894	0.702
West Sumatra	1	0.879	0.857	0.819	0.870	0.794	0.839	0.836	0.834	0.830
Riau	0.951	1	0.832	0.782	1	0.719	0.725	0.756	0.687	0.664
Jambi	1	1	0.930	0.928	0.909	0.971	0.818	0.805	0.769	0.779
South Sumatra	0.894	0.819	0.803	0.741	0.807	0.733	0.774	0.840	0.724	0.749
Bengkulu	1	0.958	0.943	0.903	0.988	1	0.978	0.745	0.898	0.992
Lampung	0.904	0.851	0.861	0.795	0.813	0.833	0.798	0.797	0.827	0.831
DKI Jakarta	1	1	1	1	0.995	1	1	0.888	0.969	1
West Java	0.864	1	0.830	1	0.877	0.960	0.969	0.868	0.978	1
Central Java	1	0.764	0.768	0.751	0.734	0.975	0.899	0.862	0.960	1
DI Yogyakarta	1	0.980	0.981	1	0.907	0.956	0.955	0.849	0.827	0.829
East Java	0.823	0.814	0.785	0.968	0.943	1	0.996	1	0.967	1
Bali	1	0.858	0.835	0.774	0.810	0.798	0.788	0.905	0.777	0.843
West Nusa Tenggara	0.958	0.692	0.695	0.718	0.812	0.716	0.751	0.685	0.622	0.683
East Nusa Tenggara	0.891	0.834	0.856	0.725	0.776	0.769	0.789	0.805	0.822	0.836
West Kalimantan	0.947	0.754	0.729	0.635	0.660	0.598	0.682	0.658	0.628	0.693
Central Kalimantan	0.710	0.872	1	0.824	0.868	1	0.745	0.790	1	0.951
South Kalimantan	0.854	0.779	0.744	0.826	0.864	0.912	0.923	0.853	0.852	0.831
East Kalimantan	0.791	0.899	0.819	0.751	0.698	0.797	0.846	0.844	0.830	0.767
North Sulawesi	0.882	0.963	0.937	0.849	0.877	0.989	0.805	0.735	1	0.818
Central Sulawesi	0.776	1	0.930	1	1	0.738	0.918	0.915	1	1
South Sulawesi	0.938	0.969	1	0.857	1	0.955	0.758	1	0.885	0.805
Southeast Sulawesi	1	0.884	0.868	0.794	0.852	0.912	0.773	0.780	0.868	0.819
Maluku	0.872	0.877	0.844	0.837	0.824	0.794	0.788	0.661	0.792	0.720
Papua	0.750	0.661	0.679	0.654	0.627	0.684	0.542	0.537	0.551	0.562

Note: Efficiency scores are within the range of 0 to 1 with 1 being the most efficient.