Infrastructure and Inclusive Economic Growth in Decentralized Indonesia

Dwi Esti Kurniasih a

a Central Statistics Agency of Batu Municipality, East Java, Indonesia

INFORMASI ARTIKEL

ABSTRACT

This research investigates the impact of decentralization in the link between infrastructure and inclusive economic growth in Indonesia. It address the question of whether decentralization strengthens the relationship between infrastructure and inclusive economic growth or not. Structural Equation Modelling (SEM) analysis is applied to explain those relationship. Data were collected from several publications issued by Indonesian Central Statistics Agency (BPS). It contains both secondary data and the result of national survey from 2013 to 2017. The findings show that the effectiveness of decentralization in Indonesia is vary among regions. The result of the statistical test—PLS SEM—shows that the relevance between decentralization and inclusive economic growth is significant in Indonesia case and Sulawesi-Nusa Tenggara-Papua, but is insignificant in Sumatra, Java-Bali, and Kalimantan. While in the context of the relationship between infrastructure and inclusive economic growth, it was positively and significant in Sumatra and Kalimantan but insignificant in Indonesia case, Java-Bali, and Sulawesi-Nusa Tenggara-Papua. As the result of main hypotheses, this research conclude that decentralization does not matter yet in strengthen relationship between infrastructure and inclusive economic growth in Indonesia.

Keywords: decentralization, infrastructure, inclusive growth

INTISARI

Penelitian ini mencermati pengaruh desentralisasi pada hubungan antara infrastruktur dan pertumbuhan ekonomi inklusif di Indonesia, apakah memperkuat atau tidak. Analisis Structural Equation Modelling (SEM) digunakan untuk menjelaskan hubungan ketiga hal tersebut. Data untuk penelitian ini diperoleh dari berbagai publikasi yang dikeluarkan oleh Badan Pusat Statistik (BPS), baik data sekunder maupun hasil survei nasional dari 2013 sampai 2017. Hasil penelitian ini menunjukkan bahwa hubungan desentralisasi dan pertumbuhan ekonomi inklusif signifikan dalam konteks Indonesia secara keseluruhan dan secara spesifik daerah Sulawesi-Nusa Tenggara-Papua, tetapi tidak signifikan di Sumatera, Jawa-Bali dan Kalimantan. Sementara untuk infrastruktur dan pertumbuhan ekonomi inklusif, hasil penelitian ini menunjukkan hubungan yang positif dan signifikan di Sumatera dan Kalimantan namun tidak signifikan di Indonesia secara keseluruhan, Jawa-Bali, dan Sulawesi-Nusa Tenggara-Papua. Hasil hipotesis utama penelitian ini menyimpulkan bahwa desentralisasi tidak memperkuat hubungan antara infrastruktur dan pertumbuhan ekonomi inklusif di Indonesia.

Keywords: decentralization, infrastructure, inclusive growth
1. Introduction

It is becoming increasingly difficult to ignore the impact of infrastructure development upon the welfare of citizens in archipelagic country like Indonesia. World Development Report 1994, which focused on infrastructure, stressed that government, in addition to corporatizing and commercializing its operations, should also become more responsive to users, if it intends to provide infrastructure services effectively. International experts commonly suggest decentralizing infrastructure provision: that is assigning responsibility to lower levels of government to achieve better responsiveness. Because identifying local preferences is often easier for local or regional governments, a better match between demand for and supply of public services can be expected (Estache, 1995:1).

The enactment of the decentralization law in 1999 marked the start of decentralization in Indonesia. The main Law was ordered in 1999 and it was viable in 2001. It experienced the following modification three years after the fact, in 2004. After ten years, in 2014, it was overhauled again through the authorization of Law No. 23/2014 on Local Government. The updates got changes the dispersion of administrative capacities among the central and the provincial or district/municipal governments. This research assumes that in the context of Indonesia, decentralization is one of the potential variables linking the infrastructure and inclusive economic growth; especially when the development of infrastructure improved after the implementation of decentralization. Decentralization becomes an important moderating variable to test the link between infrastructure and inclusive economic growth.

This research investigates the role of decentralization in the link between infrastructure and inclusive economic growth in Indonesia. The main question of this study is: “Does decentralization matter in the delivery of better infrastructure that improve inclusive economic growth?” In this research, the question is further narrowed: Does infrastructure affect inclusive economic growth?; Does decentralization impact inclusive economic growth?; Does decentralization is moderating variable to influence of infrastructure on inclusive economic growth?

Such questions are important, especially in order to explain how infrastructure in Indonesia will provide the tangible intended outcomes for the people and how far decentralization influence those function. This study is intended to fill gaps in the literature especially in the context of the relationship between infrastructure and inclusive economic growth. Various studies have shown that the infrastructure has significant role in economic growth. Therefore, the study measured the effect of infrastructure on inclusive development is very interesting to do. In addition, other than measuring correlation between those two variables, far too little attention also has been paid to potential variables linking the two. In addressing those gap, in this paper I argue that decentralization is a potential moderating variable between infrastructure and inclusive economic growth. The presence of decentralization policy is assumed can improve the welfare of citizens through infrastructure development.

2. Theory

2.1 Infrastructure and Inclusive Economic Growth

Infrastructure is one of the important aspects of a country's economy. In an era of global competition, sustainable socio-economic development cannot be achieved without adequate infrastructure. The existence of adequate infrastructure to facilitate economic activity will increase the growth of the economy in general. It has been widely demonstrated in numerous previous studies such as the Prasetyo & Firdaus (2009) and Mustajab (2009).

From the perspective of the business community, the incompleteness of infrastructure is the second biggest obstacles to running a business (World Economic Forum in IDB, 2010). This is reinforced by the results of the study of cooperation between the Islamic Development Bank (IDB), Asian Development Bank (ADB) and the International Labor Organization (ILO). The study showed that the inadequacies and inequities of infrastructure is known as a major obstacle to economic growth (IDB, 2010). These findings further demonstrate the important role of infrastructure in the inclusiveness of economic growth in Indonesia.

If we compare Indonesia to several other Asian countries, the infrastructure in Indonesia appears relatively poor. Indonesia is still facing the problem of infrastructure inequality. One of them is reflected in the accessibility to electricity. Based on data from the National Socioeconomic Survey (Susenas), access to electricity reached 99.45 percent in Jakarta in 2016. However, the percentage of households that have used the source of electricity in Papua reached 39.79 percent. Even in rural Papua electricity is only accessible by only 21.89 per cent of households (BPS, 2017).

Hence, the achievement of inclusive growth dimension is affected by infrastructure development. Michael in ADB (2012), for example, found that the infrastructure can create jobs and economic activity. Spending on infrastructure can stimulate economic activity, improve economic opportunities, and ultimately creating jobs. Calderon & Serven (2004) also proves that the infrastructure has a significant positive impact on economic growth and significantly negative in inequality.

Research Gibson & Olivia (2009) proved that the quality of road infrastructure and electricity affect
employment and income from non-agricultural enterprises in rural communities in Indonesia. Lack of access to roads and electricity infrastructure and the low quality of infrastructure hamper rural household non-agricultural enterprises. Households tend to have non-agricultural enterprises and income under non-agricultural enterprises if they live in the more remote areas, have poor quality roads, no access to electricity, and often suffer from power outages.

Brenneman & Kerf (2002) in his research on "Infrastructure and Poverty Linkages: A Literature Review"; found that the infrastructure in transportation, telecommunications, and energy; gives a very strong impact on growth. Meanwhile, the construction of water and sanitation infrastructure has not been a significant impact. Meanwhile, a study conducted by Meliala (2012) discovered that by the execution of decentralization strategies, the administration accelerated the infrastructure improvement by expanding the designation spending plan for open going through consistently. It had been contended that expanding spending on infrastructure undertakings would give a better of living for residents, which would prompt the expanded efficiency and would subsequently upgrade economic growth.

2.2 Decentralization and Inclusive Economic Growth

There are at least two views on the extent to which decentralization relates to welfare. The first group of scholars argue that decentralization has a positive correlation with welfare, while the other group believes that decentralization has a negative correlation on welfare on both economic and human/social indicators. There is a body of literature that suggests there is positive direct causal relationship between decentralization and economic welfare or development (Sakata, 2002; Akai et al., 2004; Thiessen 2003; Iimi, 2005; Buser, 2011; Kuncoro, 2012; Szarowska, 2014). Kuncoro (2012) found that the local financial administration can make a favorable investment atmosphere to help the development of monetary activities, if the local governments center around offering open types of assistance, for example, the quality of infrastructure. This implies economic growth will be accomplished just if the local government has a limit with regards to apportioning the financial limit and responsibility to give public goods to its residents.

Iimi (2005) used data on 51 countries, for which the most recent macroeconomic information including the monetary consumption of local governments is accessible. So as to keep away from estimation mistakes because of the momentary monetary change, the dependent variable is the normal development pace of genuine GDP per capita more than five years from 1997 to 2001. Those research used Ordinary Least Squares (OLS) and Instrumental Variables (IV) techniques. It is discovered that there is a noteworthy positive connection between per capita development rate and monetary decentralization estimated by the local portion of the use to add up to government consumption. This discovering marks a hitting appear differently in relation to existing experimental work in this are. It very well may be presumed that, if concentrating on the most recent financial circumstance in the last 1990s, decentralization, especially on the monetary use side, is instrumental in advancing economic growth.

Sakata (2002) found that decentralization of expenditure has a positive effect on per capita GDP growth while income-side decentralization and subnational level fiscal autonomy indicators, measured by the share of own income in total revenue, have no significant impact. Many studies have to build hybrid indexes to capture all sides of revenue and expenditure. Iqbal, Ud Din, & Ghani (2013) found that while revenues of decentralization stimulates economic growth and expenditure slows it, the combination of both indices in a composite index has a positive effect on economic growth. From another point of view, Martinez-Vazquez & Timofeev (2010) revisited several measures of decentralization and found that combining those particular measures of decentralization into a single indicator leads to a lack of information. In this manner, the qualification of decentralization in a multivariate framework ought to enter regression analysis separately.

A few investigations center around the sectoral structure of open spending and find that decentralization coordinates public spending toward social goods, for example, health and education (Busemeyer, 2007; Faguget, 2004; Granado et al., 2005, 2012). Different examinations address the split of public spending between current consumption and investment. A portion of these examinations have discovered that decentralization will in general make local governments progressively energetic about expanding current consumptions (Alegre, 2010; De Mello, 2010; Grisorio & Prota, 2013; Rodríguez-Pose, Tijmstra, & Bwire, 2009).

The second view believes that decentralization has a negative impact on welfare. In light of similar investigation in Latin America, Africa, and Asia, Conyers (2007) and Robinson (2007) found that the near proof on value and effectiveness results of decentralization are extremely restricted and lopsided in inclusion, rendering the undertaking of speculation troublesome. The outcomes propose that the ramifications for value and effectiveness results are to a great extent contrary, with more unfortunate individuals and areas being hindrances by decentralization changes or getting a much lower portion of the subsequent advantages of improved service delivery.
Rodríguez-Pose (2011) likewise found a negative connection between monetary development and financial decentralization when the last was estimated by subnational use as a level of absolute national use, and when estimated by moves from different degrees of government as a level of all out subnational incomes and awards. Be that as it may, when decentralization was estimated rather by the level of expense income out of all out subnational incomes and grants, positive connections among’s decentralization and growth were come to.

Some empirical studies (Davoodi & Zou, 1998) found that decentralization effects are different in developed and developing countries: Decentralization has negative correlation on economic growth in developing countries, but decentralization and economic growth has no significance relation in developed countries.

Other than resulting the heterogenous findings, some researchers also using different statistical methods in analysing the data. Szarowska (2014) used the generalized method of moments (GMM). It is normally applied with regards to semiparametric models, where the parameter of intrigue is limited dimensional, while the full state of the distribution function of the data may not be known. GMM is common in assessing basic financial models. While Rodríguez-Pose (2011) used Ordinary Least Squares (OLS) to analyze the relationship between decentralization and economic growth in 21 Organization for Economic Co-operation and Development countries during the period between 1990 and 2005.

In regard to the previous discussions, this thesis takes the positive effects of decentralization arguments as the hypothesis by considering some doubtful views on decentralization’s contribution to the welfare hypothesis. The reason is the decentralized system will allow local government to have better decision-making control on the allocation based on local preferences, so that the productivity of the public sector (such as infrastructure, education and health) will be maximized. Decentralization will ensure the provision of public services that meet the needs of constituents in given jurisdictions. The existence of adequate public services will make the development will be more balanced between economic and social aspects. The balance between social and economic aspects is that in this study is called the inclusive economic growth.

3. Research Method

Structural Equation Modelling (SEM) analysis is applied to explain the relationship between decentralization, infrastructure and inclusive economic growth. The proposed hypothesis in this thesis presumes that decentralization has a moderating effect on infrastructure and inclusive economic growth. This is consistent with the literature review, which reveals that decentralization has a positive effect on inclusive economic growth (Sakata, 2002; Akai et al., 2004; Thiessen, 2003; Iimi, 2005; Buser, 2011; Kuncoro, 2012; Szarowska, 2014). The hypothesis is formally formulated as follows:

- **H1**: Infrastructure has a positive effect on inclusive economic growth
- **H2**: Decentralization has a positive effect on inclusive economic growth
- **H3**: Decentralization is a variable moderating effect of infrastructure on inclusive economic growth

Testing moderating variables in the SEM analysis is by applying the regression moderation. To be more details, testing moderating variables can be done by analyzing the model as follows:

![Figure 1 Model Analysis of Research Hypothesis (Moderation Variable Model)](Image)

Source: Analytical result, modified from Solimun (2007)

Interaction variable is a combination of a variable multiplying infrastructure indicators with indicators of decentralization variable. Interpretation of the results of the analysis refers to regression models.

Following to Hong (2011), this research adopted the measures of decentralization from three dimensions namely: fiscal, functional and personnel dimension. While for the infrastructure variable, this research referring framework from Pernia & Ali (2003) which holds that there is a positive correlation between infrastructure and welfare. Some empirical literatures have used different proxies to signify infrastructure. For instance, Maqin (2011) and Morimoto & Hope (2001) employed electricity supply as a proxy divulged the connection between electrical supply to poverty reduction. Furthermore, McKinley (2010) used access to proper sanitation to present the infrastructure development particularly related to the water supply. Tasrin (2011) used number of schools per resident to indicate the accessibility of the public to educational infrastructure. While Pohan & Halim (2014) employed ratio of basic health per resident as a proxy of health infrastructure.
As for inclusive development indicators this research employs data of common economic indicators, e.g. GDRP and Investment but also serve its social aspects of development which follows the method of Ramos, Ranieri, & Lammens (2013) that build Inclusiveness Index from three indicators, namely poverty, inequality, and labor force participation.

Decentralization will ensure the provision of public services that meet the needs of constituents in given jurisdictions. Decentralization system also allow local government to have better decision-making control on the allocation based on local preferences, so that the productivity of the public sector (such as infrastructure) will be maximized (Rondinelli, et al., 1989; Brenneman & Kerf, 2002; Oates, 2008; Meliala, 2012). While the role of infrastructure in welfare (Inclusive Economic Growth) improvement can occur through several ways such as underpinning growth, increasing economic opportunities, direct savings, improving education, supporting an effective government, improving health, direct impact on well-being, as well as fiscal impact if effectively coupled with pro-poor policies (Brenneman & Kerf, 2002).

In order to get more comprehensif findings, this research try to elaborate the analysis by dividing the provinces into four parts based on the geographical position in Indonesia. Those four groups of provinces divided based on islands that consists of Sumatera, Java-Bali, Kalimantan, and Sulawesi-Nusa Tenggara-Papua. The reason why it is imperative to find out the inequality in the western and eastern part of Indonesia is that according to Suryadarma, et al., (2006) in general, there are 2 (two) regional segregation in Indonesia, namely, Java and Bali versus outside Java and Bali and the Western Indonesia versus Eastern Indonesia. They further elaborated that the western areas in Indonesia is significantly more developed than the eastern part of Indonesia not only in the economic development but also infrastructure access.

### 2.3 Quality Criteria (Goodness of Fit)

The PLS-SEM test on the goodness of fit (GoF) is done by using the formula GoF = √(AVE x R²). The applied cut-off values are: weak (<0.10), medium (0.25 to 0.36), and strong (>0.36) (Wetzels et al., 2009; Thien & Razak, 2013).

| Case                   | GoF   |
|------------------------|-------|
| Indonesia              | 0.444 |
| Sumatera               | 0.518 |
| Java and Bali          | 0.582 |
| Kalimantan             | 0.498 |
| Sulawesi, Nusa Tenggara and Papua | 0.516 |

### Table 2 Goodness of Fit (GoF) Comparison

Source: Analytical result, 2019

### 4. Results and Discussion

The proposed hypothesis in this thesis presumes that decentralization has a moderating effect on infrastructure and inclusive economic growth. This is consistent with the literature review, which reveals that decentralization has a positive effect on inclusive economic growth (Sakata, 2002; Akai et al., 2004; Thiessen, 2003; Iimi, 2005; Buser, 2011; Kuncoro, 2012; Szarowska, 2014). It is due to the quality of information and the level of transparency in governance in the era of decentralization is better than the era of centralization.
The first hypothesis (H1) is "Infrastructure has positive effects on Inclusive Economic Growth", formally stated as H1: $\beta_n \geq 0$ / Ho1: $\beta_n < 0$. The relationship between infrastructure and inclusive economic growth are acceptable for Sumatra and Kalimantan. Path coefficients of the relationship between infrastructure and inclusive economic growth are small (Indonesia = 1.292; Java-Bali= 0.419; Sulawesi-NT-Papua = 1.190), T-statistics are below the cut-off value (Indonesia = 1.292; Java-Bali= 0.419; Sulawesi-NT-Papua = 1.190), and P-values are weak (Indonesia = 0.197; Java-Bali= 0.675; Sulawesi-NT-Papua = 0.235 ).

The second hypothesis (H2) is “Decentralization has a positive effect on Inclusive Economic Growth", or formally stated as H2: $\beta_n \geq 0$ / Ho2: $\beta_n < 0$. The relationship between decentralization on inclusive economic growth are acceptable for Indonesia and Sulawesi-Nusa Tenggara-Papua. Path coefficients of the relationship are large (Indonesia = 2.465; Sulawesi-Nusa Tenggara-Papua = 3.799); T-statistics are above the cut-off value (Indonesia = 2.465; Sulawesi-Nusa Tenggara-Papua = 3.799), and P-values are strong (Indonesia = 0.014; Sulawesi-Nusa Tenggara-Papua = 0.000). On the other hand, H1 is rejected in the cases of Sumatra, Java-Bali and Kalimantan. Path coefficients of the relationship are small (Sumatra = 0.307; Java-Bali = 1.523; Kalimantan = 0.502), T-statistics are below the cut-off value (Sumatra = 0.307; Java-Bali = 1.523; Kalimantan = 0.502), and P-values are weak (Sumatra = 0.759; Java-Bali = 0.128; Kalimantan = 0.616).

The main research question is indicated by H3, which states that "Decentralization is moderating variable between infrastructure and inclusive economic growth". To prove that the moderating variable affects all the models, the coefficient of direct path relationship (moderating effect - inclusive economic growth and infrastructure - inclusive economic growth) were compared. The proposed model assumes that the interaction between decentralization and infrastructure (moderating effect) was positively and significantly influential on relationship between infrastructure and inclusive economic growth. In other words, decentralization might play a moderating role between infrastructure and inclusive economic growth. To prove the theory, the coefficient of direct effect should be smaller than one of moderating effects.

This thesis has attempted to answer the research questions which were formally stated in the research hypothesis. Table 4 exhibits a comparison between the tests on the hypothesis for the model.

The first hypothesis (H1) is "Infrastructure has positive effects on Inclusive Economic Growth", formally stated as H1: $\beta_n \geq 0$ / Ho1: $\beta_n < 0$. The relationship between infrastructure and inclusive economic growth are acceptable for Sumatra and Kalimantan. Path coefficients of the relationship between infrastructure and inclusive economic growth are larger (Sumatra = 3.774; Kalimantan = 3.388), T-statistics are above the cut-off value (Sumatra = 3.774; Kalimantan = 3.388), and P-values are strong (Sumatra = 0.000; Kalimantan = 0.001). On the other hand, H2 is rejected for Indonesia, Java-Bali and Sulawesi-Nusa Tenggara-Papua. Path coefficients of the relationship between infrastructure and inclusive economic growth are small (Indonesia = 1.292 ; Java-Bali= 0.419; Sulawesi-NT-Papua = 1.190), T-statistics are below the cut-off value (Indonesia = 1.292 ; Java-Bali= 0.419; Sulawesi-NT-Papua = 1.190), and P-values are weak (Indonesia = 0.197 ; Java-Bali= 0.675; Sulawesi-NT-Papua = 0.235 ).

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other words, when interaction between decentralization variables and infrastructure variables are introduced into the model, its impact on inclusive economic growth remains insignificant.

Those findings resulted some interesting facts, especially in term of effectiveness of decentralization in Indonesia. Second hypotheses stated that “Decentralization has a positive effect on inclusive economic growth (welfare)”. These hypotheses was accepted in Indonesia case and Sulawesi-Nusa Tenggara-Papua case, but it was rejected in other cases. It is broadly known that decentralization policies have an impact on the distribution of earnings improvement in various parts of Indonesia. Sulawesi, Nusa Tenggara and Papua, including areas that benefited greatly from the increase in the General Allocation Fund. In Papua more than half the local authorities receive an increase of 100 per cent or even more. Furthermore, regional spending is an important instrument to boost the economy, especially for areas that lack of private investment. Arham (2014) found that the decentralization policy in Sulawesi affect on local economic structure changes. Economic performance is progressing in various autonomous regions in Sulawesi region. The increase in per capita income tends to shift the sector’s activities, from the primary sector to the secondary and tertiary sectors.

In terms of inclusive growth, although still in the low human development status, Papua, including one of the three provinces with the most rapid advancement of human development for the period 2016 to 2017, which amounted to 1.79 percent. Two other provinces are West Papua (1.25 percent), and West Nusa Tenggara (1.17 percent). The progress of human development in Papua and West Papua is driven by the dimensions of decent living standards, while in West Nusa Tenggara more due to the improvement of educational dimension and decent living standards (BPS, 2017).

For the first hypothesis where infrastructure has a positive effect on inclusive economic growth (welfare), the hypothesis can be accepted in Sumatra and Kalimantan. Expansion and accelerated development of basic infrastructure continues to be boosted lately, have a positive impact on urban development throughout Sumatra and Kalimantan. According to research of Knight Frank (2017) there are three cities that have great potential to be the center of growth in the region of Sumatra and Kalimantan. The three cities also 'heaven' for the growth of the four sub-sectors of commercial property to grow rapidly. The three cities are Medan that controls the region of Sumatra, Balikpapan on Kalimantan area, and Batam for Riau Islands.

Third hypotheses is the only hypotheses that resulted in similar findings across regions. It stated that decentralization doesn’t significantly strengthen the relationship between infrastructure and inclusive economic growth (welfare) in Indonesia. It indicate that decentralization doesn’t matter yet in improving infrastructure equality in Indonesia. Furthermore, since this research used the term of inclusive growth as indicators, there are possibilities that infrastructure development has been done by government in Indonesia was not touched yet the aspect of inclusive growth such as dimensions of human development index, investment, labor and poverty.

5. Conclusion

This study shows that the effectiveness of decentralization in Indonesia is vary among regions. The result of the statistical test—PLS SEM—shows that the relevance between decentralization and inclusive economic growth is significant in Indonesia case and Sulawesi-Nusa Tenggara-Papua region, but is insignificant in Sumatra, Java-Bali, and Kalimantan.

While in the context of the relationship between infrastructure and inclusive economic growth, it was positively and significant in Sumatra and Kalimantan regions but insignificant in Indonesia case, Java-Bali, and Sulawesi-Nusa Tenggara-Papua regions.

As the main question is “does decentralization matter in the delivery of better infrastructure that improve inclusive economic growth?”, it can be answered through the finding of third hypotheses of this research. These hypotheses is the only hypotheses that resulted similar findings across cases (Indonesia, Sumatra, Java-Bali, Kalimantan, Sulawesi-Nusa Tenggara-Papua). Thus, it can be concluded that in Indonesia, decentralization has no moderating effect between infrastructure and inclusive economic growth. To sum up, decentralization does not matter yet in strengthen relationship between infrastructure and inclusive economic growth in Indonesia.

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