Fiscal Decentralisation and Economic Growth in Indonesia

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1. Introduction

Developing countries and developed countries have put attention to the implementation of fiscal decentralisation. The view that the central government are failed to bring sustainable growth is the reason behind (Oates, 1999). The proponents of fiscal decentralisation belief that fiscal decentralisation is an effective policy to increase efficiency in providing public goods. Local governments are considered closer to people and understand what is needed in public goods and services (Oates, 1999; Lin and Liu, 2000; Martinez-Vazquez and McNab, 2003). Therefore, fiscal decentralisation appears as a way to foster economic growth.

Meanwhile, fiscal decentralisation may have some negative effect, such as horizontal fiscal imbalances between local governments (Martinez-Vazquez and McNab, 2003), reduce regional competitiveness and some region would be left behind (Blöchligeri, Hansjörg et al., 2016). In fulfilling public goods and services, local governments expenditure is limited to their own territory. By this, the level of output is vary across regions because of both differences in preferences and costs (Oates, 1999).

The classical theory of fiscal decentralisation has not clearly demonstrated its relationship with economic growth. Therefore, researchers tried to make justifications both theoretically and empirically to find a...
potential relationship between fiscal decentralisation and economic growth. Starting from the growth model used by Barro, Davoodi and Zou (1998) tried to connect fiscal decentralisation and economic growth. They used the Cobb-Douglas production function which consists of private capital and public expenditure. This public expenditure is divided into three levels of government: federal, state and local government and financed mostly through taxes. Another approach used by Lin and Liu (2000) which used augmented Solow model stated that the growth rate of output per capita depends on two factors: (i) the growth rate of capital per capita, and; (ii) the rate of technological progress and differences in resource endowments and institutions.

Empirically, several studies have been carried out from a perspective between countries or specific only in one country. Using 46 countries panel data set, Davoodi and Zou (1998) examined this relationship and concluded that there is a negative relationship between fiscal decentralisation and economic growth. Meanwhile, Thiessen (2003) and Ligthart and van Oudheusden (2017) found evidence that the relationship was positive. Another study conducted by Gemmell et. al., (2013) which use 23 OECD countries concluded that decentralisation of expenditure showed lower economic growth and decentralisation of revenues resulted in higher growth.

For single country analysis, Akai and Sakata (2002) using state-level data in the United States found evidence that fiscal decentralisation promotes economic growth. The similar result also found in China (Lin and Liu, 2000), Nepal (Devkota, 2014), and Colombia (Lozano-Espitia and Julio, 2016). Another research by Nguyen and Anwar (2011) found that revenue decentralisation is associated positively but associated negatively with expenditure. This finding supported by Yushkov (2015) which revenue decentralisation is negatively related to economic growth in Russia. In the case of Indonesia, Swasono (2007) conclude that fiscal decentralisation has a negative effect on economic growth. Other research by Hendri (2015) and Siburian (2017) also found that revenue decentralisation and expenditure decentralisation are not able to encourage growth.

From the evidence described above, we conclude that the relationship between fiscal decentralisation and economic growth did not result in a consistent answer. Some concluded that it have a negative effect, while others found a positive effect. Aside from being different in conclusion, each researcher also used a variety of methods. Most of them use static panel data with fixed-effect (Lin and Liu, 2000; Akai and Sakata, 2002; Swasono, 2007; Hendri, 2015; Yushkov, 2015), while only Siburian (2017) that used dynamic panel data methods.

In this study, we investigate the relationship between fiscal decentralisation and economic growth and focus only on the Indonesian case. The main difference between this current study and the previous literature is in the previous studies almost entirely uses provincial aggregate data. In decentralisation view, grouping data into province is deemed inadequate. It is because the essence of decentralisation lies in the districts and municipalities. Hence, this study will employ disaggregated data: districts and municipalities. One of the advantages of using this dataset is that the measurement is more accurate than aggregate or macro level data (Baltagi, 2005). Furthermore, this study uses dynamic panel data that has not been widely used by previous studies, especially in Indonesia.

In addition, the adoption of a new law on regional taxes and regional levies, established in 2009, gives broader authority to local governments in terms of taxes and user charges in line with the increasing responsibility in providing public services. With the enactment of this regulation, there will be changes in the local governments budget structure, both on the revenue side and expenditure side.

2. Theory

2.1 Fiscal Decentralisation and Economic Growth

According to Musgrave (1959), the main objectives of the public sector are: (i) efficiency in the allocation of resources; (ii) income redistribution; (iii) macroeconomic stability. The first of these functions can be assigned to lower levels of government, and the latter two may be assigned to the central government level. In the first function, it may generate more efficiency because preferences are different between region and cost of production also vary across jurisdictions (Oates, 1999). On the other hand, this condition may hamper economic stability and furthermore can aggravate regional inequality (Canalea et al., 2004).

Rondinelli et al. (1983) classify decentralisation into four types. First, deconcentration, is the transfer of administrative authority or responsibility from central to lower governments. Second, delegation is the transfer of specific functions or responsibility outside regular structure and still controlled by central government. Third, privatisation, is the transfer of responsibilities to non-government controls. The last, devolution, is the form of sub-national unit of government, which the activities are separated and outside the direct control from central government. The last is the common form of decentralisation, and it has become chosen option for Indonesia (Seymour and Turner, 2002).

In Indonesia, since 2001, most of the central government authority was decentralised to two lower
tiers of governments: provinces; and districts and municipalities. This authority is not included the responsibility of defence, security, justice, foreign affairs, fiscal affairs, and religion which remain in the central government. Administrative decentralisation granted autonomy to provinces and districts/municipalities. But, the responsibility of providing basic public services mainly in the hands of district/municipalities governments. Decentralisation at the provincial level is in the deconcentration and devolution form. Provinces also considered as “the extended arm” of the central government. Districts operate in the devolution form and at the same government administration level. This transfer of authorities also followed by intergovernmental fiscal relations: revenue and expenditure side, but mostly affecting the expenditure side. Also, there is a substantial increase of intergovernmental transfer from central government to the districts/municipalities to secure the provision of basic public services (Kis-Katos and Sjahrr, 2017).

Linking fiscal decentralisation and economic growth has mainly three reasons: (i) efficiency in the allocation of resources to provide public goods; (ii) government policies that increase in per capita income; (iii) per capita growth is easier to measure and interpret than other indicators of economic performance (Zhang and Zou, 1998). But, the benefits of fiscal decentralisation for society and the relationship with economic growth are theoretically debatable. Fiscal decentralisation causes some weakness, which is still needs intervention from central government. In countries whose citizens have heterogeneous demand preferences, a decentralised system with adequate central government interventions is needed. This means to avoid the negative effects from ‘over’ or from ‘too limited’ decentralisation of lower level governments (Thiessen, 2003).

In their research for a justification, economists have analyzed and adopted various economic growth models, also applying various econometric techniques to confirm the link empirically. Theoretical endogenous growth models is the most common used to confirm this link and account for the potentially effects of government policies related to economic growth. However, there is no agreement on the theoretical model which is best for guiding empirical work on economic growth (Thiessen, 2003). Moreover, the theoretical models on the effects of fiscal decentralisation on economic growth are inadequate (Martinez-Vazquez and McNab, 2003).

The most common analytical framework that linking fiscal decentralisation to economic growth is a model by Davoodi and Zou (1998), which is a modified version of original Barro’s model. A Cobb-Douglass production function has two inputs which are private capital and public spending and divided by three levels of government: federal, state and local. Public expenditures are financed through taxes on output. Maximizing the utility function of a representative agent with respect to a dynamic constraint provides the solution: output growth rate depends on the shares of different levels of government in total public expenditure. From the model, it is also possible to calculate growth-maximizing shares of public spending (Davoodi and Zou, 1998; Xie, Zou and Davoodi, 1999; Cantarero and Gonzalez, 2009; Yushkov, 2015).

The augmented Solow model also provides the basis for econometric analysis. Lin and Liu (2000) stated that the growth rate of output per capita depends on two factors, which are the growth rate of capital per capita and the rate of technological progress. They also consider the differences in resource endowments and institutions across regions and over time. The rate of technological progress depends on two sets of variables. The first set includes fiscal decentralisation and the household responsibility system. In the second group of variables are those that capture regional differences in resource endowments. Fiscal capacity, defined as a 3-year moving average of per capita real gross domestic product; the per cent of the rural population and the total population; the relative importance of non-state-owned enterprises in the industrial sector, as measured by the share of non-state owned enterprises’ output in the total industrial output. For the cross-sectional study, Thiessen’s (2003) study aim is to measure the long-run effect of fiscal decentralisation on economic growth. He examines the associations between fiscal decentralisation and the basic components of economic growth (the total investment share in GDP and total factor productivity growth) to evaluate the channels by which fiscal decentralisation may affect economic growth.

Summing up the previous research, Baskaran et. al. (2016) identify four potential channels on the theoretical relationship between fiscal decentralisation and economic growth: (i) heterogeneity of preferences; (ii) market preservation, is that fiscal decentralisation increase competition between central and regional to improve market development and ultimately increase economic growth; (iii) structural change, related to positive effect of decentralisation during structural crises; and (iv) political innovation, is that fiscal decentralisation creates conditions for using regions as laboratories for economic experiments.

2.2 Measuring Fiscal Decentralisation

To find out the contribution of fiscal decentralisation to economic growth, a quantitative measure of fiscal decentralisation is needed. Researchers have reviewed these measurements in various literature. In general, fiscal decentralisation is defined as the delegation of authority related to decision making from the higher government to lower levels of government. In measuring fiscal decentralisation we must grasp the level of
authority that exists in the local government. However, to measure this authority quantitatively is a very challenging task (Akai and Sakata, 2002).

The most common method used to measure the level of authority is to use an accounting approach both from revenue and expenditure (Akai and Sakata, 2002; Swasono, 2007; Yushkov, 2015). However, this accounting approach does not result in accurate measurement of authority because local government expenditures can come from the central government that has been determined in advance. Authority is deemed decentralised when the regional government is given autonomy to explore sources of funds to finance its expenditure. Therefore, this autonomy should also be used as an indicator of fiscal decentralisation (Akai and Sakata, 2002).

Akai and Sakata (2002) proposed several indicators of fiscal decentralisation from various perspectives to obtain convincing results, which was motivated by the challenge of developing a single accurate measure. Those indicators are: i) revenue indicator, is defined as the ratio of local government revenue to total state and local government revenue, exclude grants from other governments; ii) production indicator, is defined as the ratio of local government expenditure to total state and local government expenditure including grants from other governments; iii) autonomy indicator, is defined as the ratio of local government’s own source revenue to its total revenue. This indicator is divided into two, which are revenue including grants and excluding grants; and iv) production-revenue indicator, which represents a decentralisation measure that incorporates both revenue shares and expenditure shares.

The ratio used by Akai and Sakata (2002) was further developed by Martinez-Vazquez and Timofeev (2010) which called as “composite ratio”. Martinez acknowledged that sometimes a single indicator is needed to show even if only at a glance, the trend of fiscal decentralisation. Although he also admitted that it is not possible to capture decentralisation from only one aspect, with the composite indicator, we can try to measure more than one aspect, not just one side of income or expenditure. This measurement basically is the combination from revenue and expenditure ratio. In this measure, the composite ratio will be larger if revenue decentralisation is higher, keep another constant. On the contrary, the composite ratio will be higher if expenditure decentralisation is higher, keep revenue decentralisation constant.

3. Research Method

The aim of this research is to investigate the effect of fiscal decentralisation on economic growth, but there is no single indicator that able to capture the complete pictures. This is the reason why each aspect should be measured separately. Following on previous works, this paper also employ both fiscal decentralisation measurements, revenue side and expenditure side. Expenditure decentralisation has been widely used to measure fiscal decentralisation as it measures the degree of local government responsibility in providing public goods. This measurement also important in Indonesia decentralisation since the intergovernmental transfer is decided by the central government and most of the taxing right stays on central government authority. For detailed explanation is as follows:

a) revenue indicator (rev_ind). This indicator is defined as the ratio of local government revenue to total central government and local governments revenue (Akai and Sakata, 2002);

b) autonomy indicator (auto_ind). This indicator is defined as local government’s own source revenue (OSR) to its total revenue. OSR is better reflect the degree of authority by local governments, since each local government collect this revenue on their own jurisdiction and use these sources to finance their expenditure (Swasono, 2007; Yushkov, 2015);

c) expenditure indicator (exp_ind). This indicator is defined as the shares of local government expenditure to total central government and local governments expenditure (Akai and Sakata, 2002; Swasono, 2007; Yushkov, 2015); and

d) revenue-expenditure indicator. This indicator incorporates both revenue and expenditure shares. Following Akai and Sakata (2002), this indicator is defined as the mean of revenue and expenditure expressed as \(rev_{ind} + \exp_{ind}/2\) (revexp_ind1). Another approach is ‘composite ratio’ by Martinez-Vazquez and Timofeev (2010) also employed in this paper. This ratio is expressed as \(rev_{ind}(1-exp_{ind})\) (revexp_ind2).

To prevent omitted variable bias, its measure is combined with the basic determinant of economic growth: the augmented Solow model, where the output is the function of capital, labour, and human capital (Mankiw et. al., 1992). The general equation is as follows:

\[
GRDP_{it} = \alpha + \beta_1 GRDP_{it-1} + \beta_2 DEC_{it} + \beta_3 Z_{it} + \theta_i + w_i + t + \epsilon_{it}
\]

where \(i\) and \(t\) represents individual district/municipal and year, respectively; \(GRDP_{it}\) describes gross regional domestic product (GRDP) per capita; \(GRDP_{it-1}\) describes the lagged value of GRDP per capita; \(DEC_{it}\) represents one of the indicators of fiscal decentralisation; \(Z_{it}\) is a set of independent variables affecting economic growth: gross regional fixed capital formation; population; and human development index as proxy for human capital; \(\theta_i\) are time-fixed effects; \(w_i\) are district/ municipal fixed effect;
\( w_{it} \) are district/ municipal-specific time trends; \( e_{it} \) is the error term. \( \alpha, \beta_1, \beta_2 \) and \( \beta_3 \) are the parameters to be estimated. Also, we use natural logarithm for all specifications.

This study used the Generalized Method of Moments (GMM) because we include lag of dependent variable on the right-hand side. Analysis using GMM require several model specification tests to provide valid and consistent results. This mean that the model does not have a serial correlation on the error, also the instruments used in the model are valid. The first test to assess the feasibility of the model is to look at the results of the values of AR(1) and AR(2) which are p-value values for first and second order autocorrelated disturbance. The test for AR(1) usually rejects the null hypothesis, but the important indicator is indicated by the value of AR(2). The next test is the Sargan test or Hansen test against overidentifying restriction, which tests valid for the overall instrument variables used by testing samples that are analogous to the control moment used. The null hypothesis of this test is that the instrument variables used are valid and distributed according to chi-square. The feasibility of the research model to estimate the model is if the chi-square probability value has a significance level greater than 1% or 5% or 10% then the instrument variable used is valid (Roodman, 2009).

In calculating indicators of fiscal decentralisation, we assume that Indonesia only consists of the central government and the districts/ municipalities. Here we ignore the role of the provincial governments because we do not have supporting data to disaggregate data on provincial revenues and expenditures and distribute it to the districts/ municipalities level.

For the purpose of empirical analysis, we collected data for districts and municipalities on 33 provinces among available 34 provinces. Here, we exclude DKI Jakarta because of its speciality, so that it cannot be compared directly with other districts or municipalities. Data on fiscal decentralisation (revenue decentralisation and expenditure decentralisation) for districts and municipalities are all taken from Directorate General of Fiscal Balance, Ministry of Finance. Data on national budget revenue and expenditure are taken from Directorate General of Budget, Ministry of Finance. Data of gross regional domestic product per capita, gross regional capital formation, population, and human development index are taken from Statistics Indonesia (Badan Pusat Statistik/ BPS). The overall period of the data is from 2010-2017, and the economic measure is in 2010 constant terms. However, this study use unbalanced panel data because the data is not available for all districts and municipalities and all variables in the intended years.

### 4. Results and Discussion

Table 1 only shows the regression results of the basic model of economic growth without any interest variable. Before interpreting the estimation results on the GMM model, as discussed above, the first thing to do is to test the feasibility of the GMM model that has three stages of testing. The first test is the unbiased model estimation test indicated by the value of the lag coefficient of the dependent variable is between pooled least-square (PLS) and fixed-effect models (FEM). The table shows the coefficient value of the lag of the dependent variable on the PLS is 0.9682 which is significant at 1%, and at the FEM of 0.6737 which is also significant at the level of 1%, while the results from different-GMM and GMM-systems show coefficients of 0.5735 and 0.9121, respectively.

Second, based on the output in table 1, the difference-GMM model shows that the p-value of AR(1) is 0.018, which shows a significant value. The analysis focuses on AR(2) where results in a p-value of 0.250. These results indicate that the different model of GMM is not significant, and it can be concluded that in this model, there is no serial autocorrelation in error. Meanwhile, in the system-GMM model yields p-value AR(1) of 0.062, which is significant at 10%, while the p-value in AR(2) is 0.216. In this model, it can also be concluded that there is no serial autocorrelation in error.

The third test is to test the validity of the instruments used in the model. The instrument is valid if the Hansen J test shows a value higher than the real level (1%, 5%, and 10%). The output results for the Hansen test on the difference-GMM model indicate that the p-value is 0.007. Based on this result, it can be concluded that the instruments used in the difference-GMM model are invalid. Whereas in the system-GMM model, the p-value is 0.109, which indicates that the instruments used in this model are valid.

### Table 1 Regression Results: Comparison of Basic Economic Growth

| Variables | PLS | FEM | DIFF-GMM | Sys-GMM |
|-----------|-----|-----|----------|---------|
| pdrcap-1  | 0.9682*** | 0.6737*** | 0.5735*** | 0.9121*** |
| (0.0033)  | (0.0195) | (0.01125) | (0.0248) |
| population| -0.0218*** | -0.1240*** | -0.2915*** | -0.4731* |
| (0.0030)  | (0.0468) | (0.0854) | (0.0249) |
| capital   | 0.0217*** | 0.1619*** | 0.2046*** | 0.0498* |
| (0.0030)  | (0.0168) | (0.0454) | (0.0268) |
| human     | 0.0021*** | 0.4703*** | 0.7044*** | 0.0542 |
| (0.0107)  | (0.0995) | (0.4037) | (0.0389) |
| constant  | 0.0913**  | -1.6943*** | 0.0472*  | -0.0365 |
| (0.0393)  | (0.4309) | (0.0250) | (0.0824) |

Source: Author’s calculation.

Reported figures are the estimated coefficients followed by their standard errors.

*,**,*** denote statistical significance at the 10%, 5% and 1% level of significance respectively.

| No of groups | 224 |
|--------------|-----|

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Based on the tests above, the model that can be interpreted is a model that there is no serial autocorrelation on errors and has a valid instrument. It is concluded that the difference-GMM model is not feasible because even though there is no serial autocorrelation in error, the instruments used is invalid. Meanwhile, the system-GMM model is the best model in this study because there is no serial autocorrelation in error and has a valid instrument.

Table 2 presents the results of dynamic data panel analysis. Columns 1 through 5 contain the results of the regressions for specifications with various fiscal decentralisation measures. The results show that the p-value of AR(1) are ranging from 0.059 to 0.061, which show a significant value, and the results of AR(2) are ranging from 0.200 to 0.215 which are insignificant in all specifications. These mean that there is no serial autocorrelation in error. Based on the test of the validity of the instruments, the Hansen J tests show different p-value. Columns 1, 2, and 5 show the p-value of 0.161, 0.144, and 0.161 respectively, which indicates that the instruments used in this model are valid. On the other hand, the remaining columns 3 and 4 show significant value which represent that the model are not valid.

The empirical findings can be explained as follows. The primary findings is that the estimated coefficient on fiscal decentralisation (β_2) is negative and statistically significant at 5% and 10% levels in regressions that include revenue indicator (rev_ind) and combination of revenue and expenditure indicator (revexp_ind2) which is “composite ratio”. This finding provides an evidence that fiscal decentralisation does not contribute to economic growth. It is worth mentioned that this finding contradict to theoretical prediction by Oates (2005, cited in Gemmell et al., 2013) but, this finding actually consistent with previous research in Indonesia (Hendri, 2015; Siburian, 2017).

Insignificant results of autonomy indocator (auto_ind) is found in regression (see column 2). This result is similar to previous research in United States by Akai and Sakata (2002), but opposite to study by Swasono (2007) which showed significant result. This difference is probably due to two things. First, the data used here covers data that describe recent conditions in Indonesia. On the contrary, the research conducted by Fauziah consists the period before and after decentralisation are fully implemented, which covers the period 1991 to 2005. Second, different method on calculating the measurement of fiscal decentralisation. Here we use total districts/municipalities and national revenue without the province as the denominator, unlike Fauziah that used total revenue of districts/municipalities and provinces, assuming that the province is an extension arm of the central government. The use of local own-source revenue seems difficult if used as a proxy for measuring fiscal decentralisation (Akai and Sakata 2002).

From table 2, it can also be explained regarding control variables even though here only use the basic economic growth variables. First, the lag of the dependent variable shows significant results in 1% of all specifications and has a coefficient value between the regression coefficient of PLS and FEM. Coefficient values below 1 indicate that the system is in a stable condition towards convergence. This provide evidence the hypothesis of conditional convergence where regions that have a low initial growth rate can accumulate their growth processes and are able to pursue areas that are initially advanced.

Second, the population coefficient value shows negative and significant at 5% in all model specifications. This implies that population growth has a negative impact
on economic growth. This condition confirms the findings by Headey and Hodge (2009) which stated that population growth in developing countries would have a negative impact on economic growth. Third, the estimated coefficient of capital formation shows positive and significant in 1% for all specifications. And finally, insignificant coefficient in proxy of human capital were expected to have positive effect.

5. Conclusion

This study examined the relationship between fiscal decentralisation and economic growth, focusing in Indonesia. Here, we use the latest data over the period 2010-2017. Generalised Method of Moments is used as estimation techniques. The estimations of the dynamic panel data results showed that fiscal decentralisation has a statistically negative effect on economic growth in Indonesia. This negative linkage occurred when revenue indicator, as measured by total local government revenue to total local government and national revenue, is used as a proxy for fiscal decentralisation. An alternative proxy which is “composite indicator” also gives estimation that fiscal decentralisation has a negative impact on economic growth. These findings are interesting because it is contradict to the predictions by Oates (2005, cited in Gemmell et al., 2013) where fiscal decentralisation could promote economic growth. One possibility causing this condition is due to the expansion of local governments in exploring revenue through OSR that could harm local investment which hamper economic growth.

This study also incorporates determinant of growth, which are capital formation, population, and human development. Only capital formation that results in a positive and significant effect on economic growth, while population gives a negative impact. Another results obtained is that the system is toward convergence, which is implied from the variable initial per capita of output.

Several policy implications can be derived from these findings. First, local governments should find alternative way to increase their revenue by focusing to non-taxes revenue. Second, investment is an important factor in driving economic growth, so it is appropriate for local governments to give more attention to this sector by improving infrastructures and ease of procedures.

Another thing is that this research is limited to the period used, which is very short that only covers from 2010 to 2017. This is due to the limitations of the control variables, especially the gross regional fixed capital formation data which has only been available since 2010. In addition, this study only uses basic economic growth as a control variable. Expansion of control variables such as political or institutional aspects is expected to produce more robust results.

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