Spatial Patterns of Inequality and Governance in Decentralising Indonesia, 1999-2014

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Abstract

This paper presents the dynamic relationship between inequality and the quality of local governance at the district level, including a search for the main driving forces and spatial patterns of changes in this relationship. To this aim, we search for a systematic relationship between inequality and a set of governance indicators across districts throughout Indonesia. We find that the relationship between inequality and institutional quality is not straightforward, depending on which indicator we use as a proxy for the institutional variable. In contrast, we find that the relationship between inequality and governance is straightforward: good local governance is associated with low inequality at the district level. If we test for reverse causality, we find mixed evidence on the role of inequality as the determinant of local institutional quality. Reverse causality between inequality and governance is found when we use the service delivery index as a proxy for the governance variable: low inequality will improve local governance

Keywords: Inequality, regional development, Indonesia, economic growth, governance

INTRODUCTION

In recent years, economic development in Indonesia has been characterized by high economic growth as well as a rapid increase in overall income inequality. It is to be noted, however, that inequality in Indonesia (measured by the Gini ratio) used to be exceptionally low and relatively stable for a long period as compared to ASEAN and emerging countries. In short, over the past fifteen years, income dynamics in Indonesia have featured swift income expansion among top earners, and a declining growth rate among the lower income group, while the middle class has experienced relative income growth stability. Moreover, the relationship between income per capita and income inequality is ambiguous, i.e. high income per capita is not necessarily followed by high inequality and vice versa.

Since Indonesia began a process of decentralization in 2001, followed by direct election of the president as well as local heads throughout Indonesia in 2004, the role of more than five hundred districts in the governance process is increasing. This motivates us to study in this paper how governance quality in Indonesia is affecting inequality dynamics and how inequality dynamics affect the quality of governance. We are inspired by Chong and Gradstein (2007) to search for a systematic relationship between inequality and a set of governance indicators across districts throughout Indonesia. We replicate their model for the Indonesian context, including some modifications. We construct Gini coefficients as proxy for income inequality from the National Socioeconomic Survey (SUSENAS) Consumption module. As a robustness check, we also use alternative measures of income inequality, such as the income share ratio of the top to the bottom quintile as well as the Theil index.

In this paper, we use the term governance in a broad meaning, covering the quality of institutions as presented in the governance index as well as budget efficiency. We aim to empirically establish the main driving forces of changes in the relationship between local

governance quality and inequality. We use economic conditions and urban population as control variables.

We employ a GMM-system estimator as our empirical strategy and focus on the dynamic relationship between inequality and governance to test the following hypotheses: (i) whether inequality is low if institutions are strong, (ii) whether income inequality is low if governance is good, (iii) whether institutions are strong if inequality is low, and (iv) whether governance is good if inequality is low. If budget is spent efficiently in terms of high disbursement and good administration due to strong institutions, income inequality is hypothesized to be stable or low. It is our aim that the paper will contribute to our understanding of the mechanisms that determine how governance affects inequality and vice versa, especially in the Indonesian context.

DATA SOURCE

We use secondary data from various sources and levels such as Central Bureau Statistics Indonesia (BPS) for household and village level, Audit Board Indonesia (BPK), Ministry of Finance, and Regional Autonomy Watch (KPPOD) for the district level. The ratio of the top to the bottom quintile of the population (P90/P10), Gini coefficient and Theil index are used as proxies for income inequality from the SUSENAS Consumption module, starting from 1999 until 2014. We calculate those variables from total household expenditure at the household level and aggregate to the district level. A lower ratio of the top to the bottom, or Gini or Theil, means lower inequality.

Similarly, we use audit results and disbursement rates of the government budget as a proxy for the institution. Audit result is issued annually from 2005 until 2014 by Audit Board of the Republic of Indonesia (BPK-RI). It measures the compliance of the government institutions in administering their expenditure and program implementation, ranging from -1 (best) to -4 (worst). It means higher audit result showing better budget administration and program implementation, and thus better institutions. Disbursement rate of government budget is a percentage of total expenditure realisation to its plan in the local budget (APBD) provided by the Ministry of Finance from 2002 to 2014. It shows how effective the local government in spending its budget based on its plan. A high disbursement rate could be perceived as a better capacity of local governments to absorb money as they planned.

We also use local regulation index and service delivery index as a proxy for governance. Local regulation index measures the perception of businesses to local regulation on business climates. The higher index means the local government has a higher ability to respond what matters to local businesses (better governance). This index is extracted from governance survey and investment climate survey conducted by Regional Autonomy Watch (KPPOD) from 2001 until 2011. The coverage survey area varies in each round.

Governance can also be measured through government outcomes such as roads, electricity, education, health, access to sanitation, and water. We construct service delivery index with equal weight consisting of those six variables as follows: percentage of village with asphalt road, percentage of households with electricity, percentage of population above 30 years old with senior high school diploma, percentage of birth attended by certified health workers, percentage of households with access to sanitation and percentage of households with access to clean water. These variables are calculated from Potential Village (PODES) at the village level, except the percentage of birth calculated from the SUSENAS core module at the household level from 1999 until 2014, and then aggregated at the district level. The higher service delivery index means better governance.

Further, we use several control variables such as economic condition and urban population. They are per capita GRDP in log form, share of agriculture to total GRDP, share of manufacturing to total GRDP, share of mining and quarrying to total GRDP, and share of population living in urban areas to total population. Those are available at the district in figures issued by the Indonesian Central Statistics Bureau (BPS) from 1999 to 2014. Summary statistics of the above operational variables can be found on Annex 1.

We limit the number of districts by excluding Aceh, Maluku, Papua and West Papua due to data availability. These four provinces were conflict areas in 1990s, so many districts were not surveyed by BPS in particular years. In addition, since decentralisation in 2001, there have been many new districts established, from less than 300 in 2000 to about 500 districts in 2014. We recode new districts back to the parent districts using the year 2000 as a reference to maintain data completeness as long as possible. Thus, in total we have 242 districts throughout Indonesia to analyse the pattern of inequality and governance. The list of districts is presented in Annex 2.

ESTIMATION MODEL

In this section we discuss the estimation model inspired by Chong and Gradstein (2007) for empirical analysis. To search for systematic causality between inequality and Institution and its reverse causality, we estimate inequality, institution, and governance with set of control variables. Our dependent variable for normal causality is inequality=ineq2, defined as ratio of the top to the bottom quintile of the population (P90/P10). In this draft, we only use ratio P90/P10. We use institution and governance as explanatory variables and each of these variables has two operational variables:

Institution	= audit, defined as audit result for government institution
	= distotexp, defined as disbursement rate of total expenditure government budget
Governance	= perda, defined as local regulation index
	= sdi, defined as service delivery index

Moreover, we assume that changes in inequality and institution take longer time, so initial condition of those variables could be perceived as endowment factors that affect the causality between the inequality and institution and vice versa. Good initial condition of institution and or governance will lower inequality. Hence, we include the following initial conditions as our explanatory variables:

Inequality	= ineq2_99, defined as ratio of the top to the bottom quintile of the population (P90/P10) in year 1999
Institution	= audit05, defined as audit result of government institution in year 2005
	= distotexp02, defined as disbursement rate of total expenditure government budget in year 2002

On the other hand, we use the above explanatory variables as our dependent variables to test reverse causality. We also use set of control variables for both normal and reverse causality as follows:

Economy	= lgrdpcap_oil, defined as per capita GRDP with oil
	= shr_agr_i, defined as share agriculture to total GRDP with oil
	= shr_man_i, defined as share manufacture to total GRDP with oil

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$\qquad$ = shr_mng_i, defined as share mining and quarrying to total GRDP with oil

Urban $\qquad$ = shr_urban, defined as share population living in urban areas to total population

We run regressions using the estimation method OLS and GMM with several specifications. It is expected that those variables have a negative relationship with inequality: lower inequality is determined by better institutions as well as better governance. More specifically, we test the following hypotheses:

1. A negative relationship between inequality and institutions: low inequality is determined by good institutions.
2. A negative relationship between inequality and governance: low inequality is determined by good governance.

Reverse Causality:

3. A negative relationship between institutions and inequality: low inequality will improve institutions.
4. A negative relationship between governance and inequality: Low inequality will improve governance.

RESULTS AND DISCUSSION

This section will discuss our preliminary results of normal causality between inequality and governance and its reverse causality. A summary of the main findings is presented in Table 1.

Normal Causality

Inequality and Institution

The first hypothesis is to test the relationship between inequality and institutions: low inequality is determined by good institutions (negative relationship). From our regression results, the relationship between inequality and institution is not straight forward. It depends on which indicator we use as proxy of institution variable. We also use the initial condition of the institution as our instrument variables in some specifications.

Inequality and institution has positive relationship: good institution will increase inequality. This finding is shown from various specifications when we use audit result as proxy of institution. Most of our results are statistically significant (Model 1a, 1e, 2a, 3d, 4a, except 3a and 6a). Regression output can be seen on Annex 3. Better administration implies better institution which leads to attract more firms to do business in that area and more people to work with higher salary. Hence, the gap between the rich and the poor become higher and thus inequality increases. Note: audit results do not measure the quality of spending or program, merely focus on administrative aspect.

Inequality and institution has negative relationship: good institution will decrease inequality. This finding is shown from various specifications when we use disbursement rate of government budget as proxy of institution but none of them are statistically significant (Model 1a, 1e, 3a, 3d, 4a, 6a). Disbursement rate measures the budget efficiency or in other word how the capacity of local government in spending its budget based on its plan. We expect that higher disbursement rate will increase budget efficiency on government program to lower inequality. Since the results are statistically not significant, higher disbursement rate is relatively weak relationship in decreasing inequality.

Inequality and Governance

The second hypothesis is to test the relationship between inequality and governance: low inequality is determined by good governance (a negative relationship). From our regression results, the relationship between inequality and governance is straightforward despite some specifications showing a positive relationship but not statistically significant. We also use the initial condition of governance as our instrument variables in some specifications.

Inequality and governance have a negative relationship: good (higher) governance will reduce inequality when we use service delivery index and local regulation index as a proxy of the governance variable. All coefficients of the service delivery index in these models (Model 1a, 1e, 2a, 3a, 3d, 4a, 6a) are statistically significant except Model 1e (Annex 3). We calculate the service delivery index based on five indicators, namely education attainment, skilled birth attendant, road infrastructure, and electricity, access to clean water and sanitation which represents the government outcome. We expect a higher index of service delivery will lead to better governance and thus it will lower inequality.

However, we also found that the coefficient of local regulation index is positive indicating the better governance will increase inequality. Unlike the previous indicator, none of these coefficients are statistically significant. Since all the coefficient of local regulation index is statistically not significant and its p-value is high, we conclude that local regulation index has no relationship with inequality. Local regulation index is constructed by KPPOD as a sub-index of the governance index and investment climate index. We choose the local regulation index rather than the governance index as our proxy of governance variable because this sub-index is available in more than 150 districts throughout Indonesia.

Reverse Causality

Following Chong and Gradstein model (2007), we also search a reverse causality between inequality and institutions, and between inequality and governance. We do regressions with the same specifications by switching inequality as the dependent variable into the explanatory variable, and both institution and governance variables as the independent ones. We also use the initial condition of inequality as an instrument variable in some specifications. Detailed specification can be found on Annex 3.

Institution and Inequality

Our third hypothesis is to test the relationship between institution and inequality: low inequality will improve institution (negative relationship). From our regression results, the relationship is mixed. Some specifications resulted positive relationship with inequality and others are negative.

If we use audit as a proxy of institution, we expect that the lower inequality will improve the audit result or negative relationship. Our results show a positive relationship (Model 1b, 1f, 1g, 4b, and 5b) and a negative relationship for Model 2b. The latter is not statistically significant. These results are consistent with the first result, where a good institution will increase inequality. Similar arguments with a positive relationship between inequality and institutions could also support this finding. If higher inequality is a result of more economic activities where more good people with higher salaries and more firms operate in that area, the demand for better institutions will increase and thus the positive relationship between institutions and inequality is revealed. These results suggest that there is reverse causality

between inequality and institutions if we use audit as a proxy of institutions, but this positive relationship is the opposite direction.

If we use the disbursement rate of the government budget as a proxy of the institution, we expect that the lower inequality will improve the disbursement rate or negative relationship. Our results also show mixed findings: negative coefficients for Model 1h and 1j and a positive coefficient for Model 5d. The latter is not statistically significant and high p-value so we ignore this result. These results indicate that lower inequality will improve the capacity of local governments to spend their budget. This suggests that there is reverse causality between inequality and institutions if we use the disbursement rate as a proxy for institutions.

Governance and Inequality
The fourth hypothesis is to test the relationship between governance and inequality: low inequality will improve governance (negative relationship).

If we use service delivery index as proxy of governance, we expect that the lower inequality will increase service delivery index (negative relationship). From our regression results, the relationship is also straight forward (Model 1d, 2c, 3c, 5c, 6b) and all the coefficients are statistically significant except Model 6b. These results suggest that service delivery index has strong negative relationship with inequality which is consistent with the previous result of higher service delivery index will lower inequality. Thus, we conclude there is reverse causality between inequality and governance if we use service delivery index as proxy of governance variable.

Table 1: Summary of Regression Results

Normal causality	Model	Reverse Causality	Model
Better institution determines lower inequality (negative relationship)		Lower inequality determines better institution (negative relationship)	
• Higher inequality is determined by higher audit results (positive relationship)	1a**, 1e**, 2a**, 3a, 4a*, 6a	• Better audit results is determined by higher inequality (positive relationship)	1b**, 1f***, 1g**, 2b(-), 4b**, 5b,
• Lower inequality is determined by higher disbursement rate of government budget (negative relationship)	1a, 1e, 2a***, 3a, 3d, 4a, 6a	• Higher disbursement rate of government budget is determined by lower inequality (negative relationship)	1h**, 1j
Lower inequality is determined by better governance (negative relationship)		Better governance is determined by lower inequality (negative relationship)	
• Lower inequality is determined by higher service delivery index (negative relationship)	1a***, 1e, 2a***, 3a***, 3d***,	• Higher service delivery index is determined by lower inequality (negative relationship)	1d***, 2c*, 3c***, 5c***, 6b

	4a***, 6a***		
• Lower inequality is determined by higher local regulation index (negative relationship)	1a, 1e, 2a (+), 3a, 3d, 4a, 6a(+)	• Higher local regulation index is determined by lower inequality (negative relationship)	1c, 3b(+), 4c, 5a

Note: *** p<0.01, **p<0.05, *p<0.1

If we use the local regulation index as a proxy of governance, we expect that the lower inequality will increase the local regulation index (a negative relationship). From our regression results, the relationship is straightforward (Model 1c, 4c, and 5a) except Model 3b. However, none of those coefficients are statistically significant, and low p-value. So, the variable of local regulation index has a weak relationship with inequality.

In Figures 1-8 below, we provide scatter plots of our key predicted variables. The results can be summarised as follows: if we see the relationship between institution and income per capita (typical Acemoglu), it shows a different direction depending on what kind of variable we use as a proxy of institution. For instance, the relation between audit result as a proxy of the institution and income per capita is flat (Model 1g), while between the disbursement ratio of government budget and income per capita is negative (Model 1h). However, from the regression results, both show the consistent negative signs, which mean higher income per capita will lower the institution.

On the other hand, the relation between inequality and income per capita (typical Kuznet) is positive. It means higher income per capita will increase inequality (Figure 2a and Figure 2b). Figure 2b is derived from regression result of Kuznet model at district level.

The relation between institution and inequality as developed by Chong and Gradstein shows a different direction depending on which variable we use as a proxy of institution. If we use the audit result as a proxy of the institution, it is then positively related to inequality (Figure 3a). But, if we use the disbursement rate as a proxy of the institution, the relationship with inequality is negative as we expected (Figure 3b).

The relation between governance and inequality, as developed by Chong and Gradstein shows a different direction depending on which variable we use as a proxy of governance. If we use the local regulation index as a proxy of governance, the relationship with inequality is negative as we expected (Figure 6a). But if we use the service delivery index as a proxy of governance, it shows a positive relationship with inequality (Figure 6b). Since these scatter plots only depict the visualisation of data distribution between the predicted variable and one explanatory variable, those figures show different directions with regression results where both indicators have a negative relationship with inequality (Table 1). Detailed results of our regression analysis are presented in Annex 3.

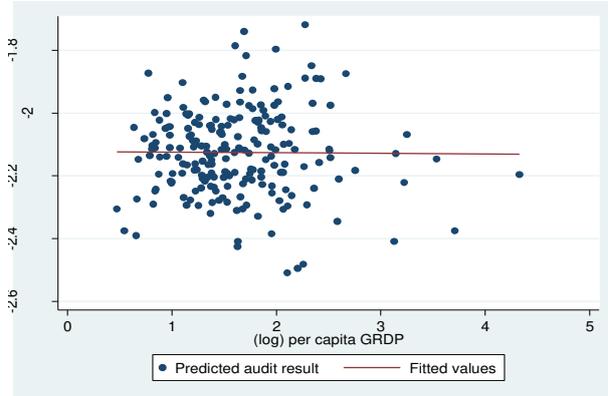Figure 1a: Institution and per capita GRDP

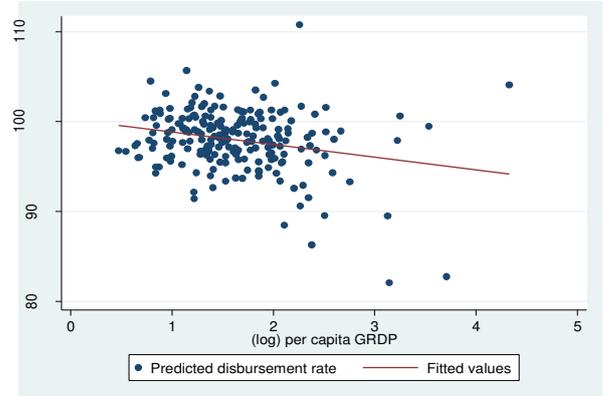Figure 1b: Institution and per capita GRDP

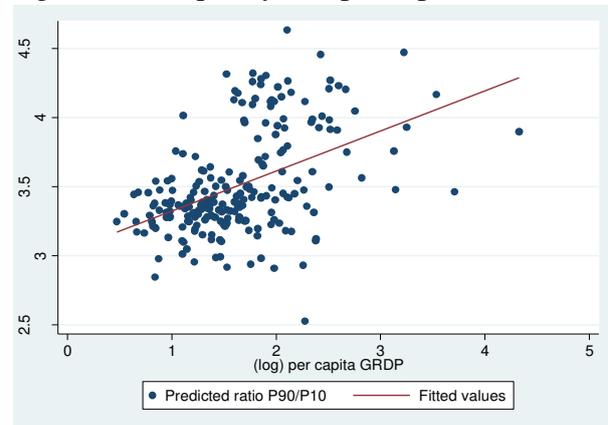

Figure 2a: Inequality and per capita GRDP

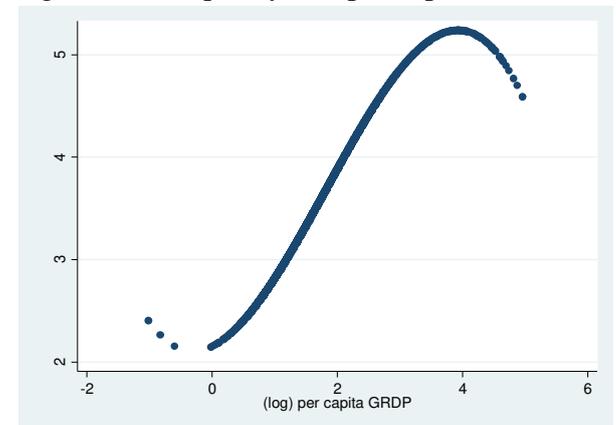Figure 2b: Inequality and per capita GRDP

Figure 3a: Institution (audit result) and inequality
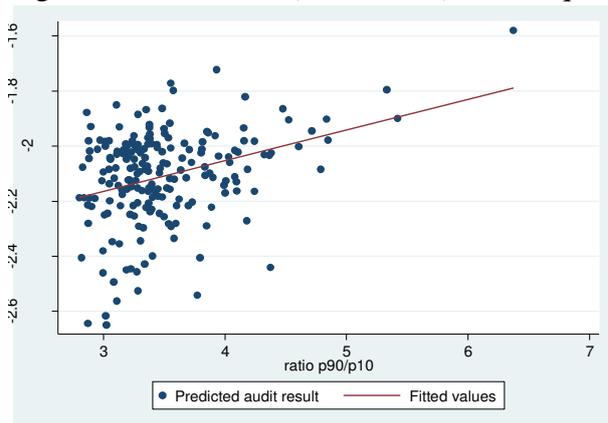

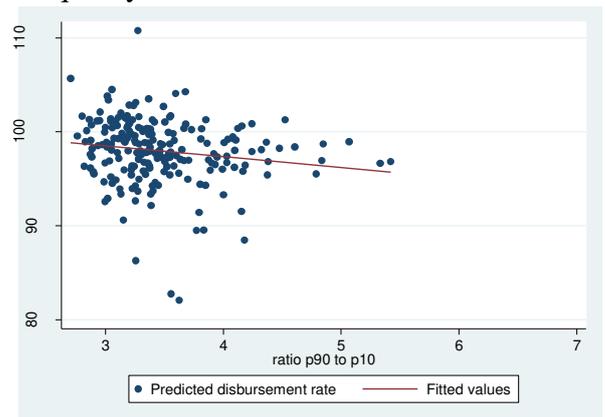Figure 3b: Institution (disbursement rate) and inequality

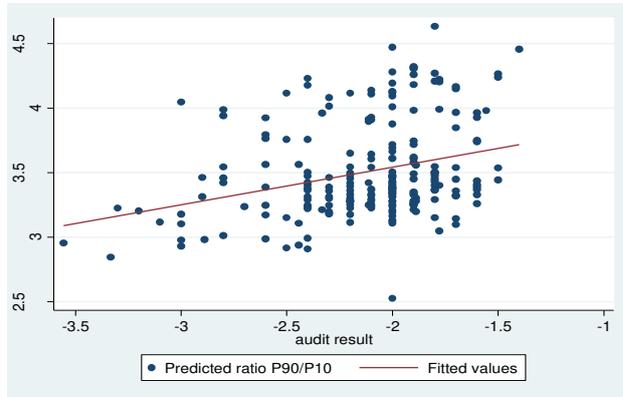Figure 4: Reverse Causality Inequality and institution (audit result)

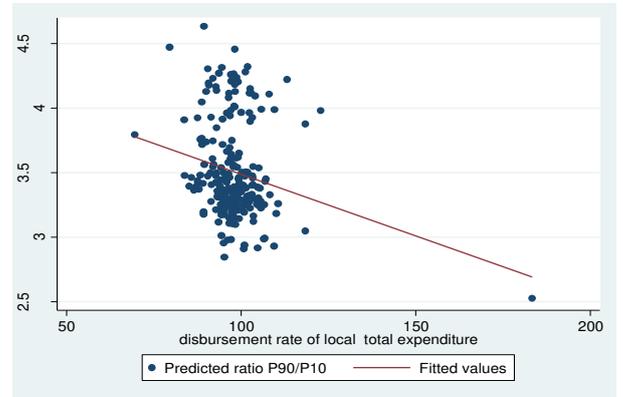Figure 5: Reverse Causality Inequality and institution (disbursement rate)

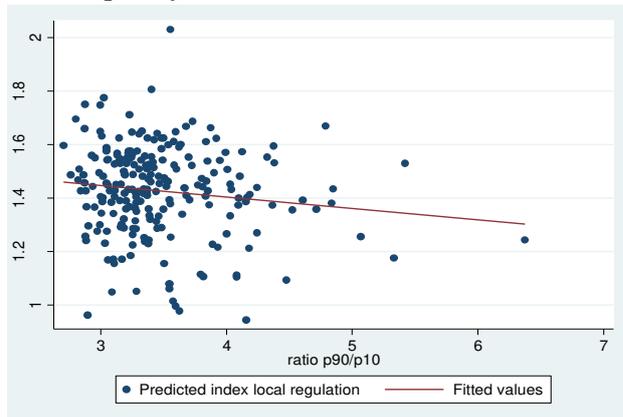Figure 6a: Governance (local regulation index) and inequality

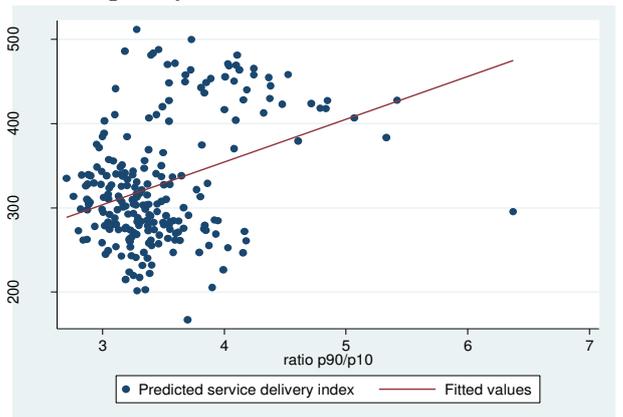Figure 6b: Governance (service delivery index) and inequality

Figure 7: Reverse Causality Inequality and Governance (local regulation index)
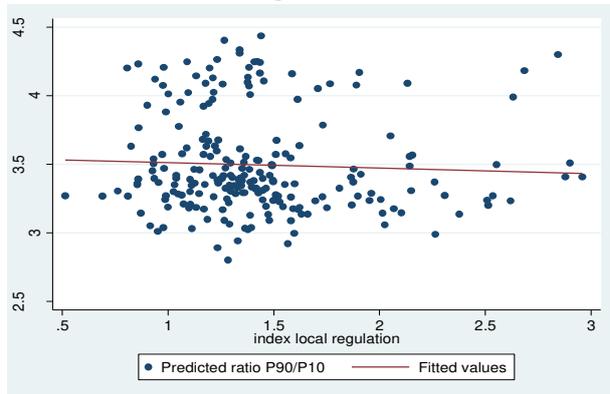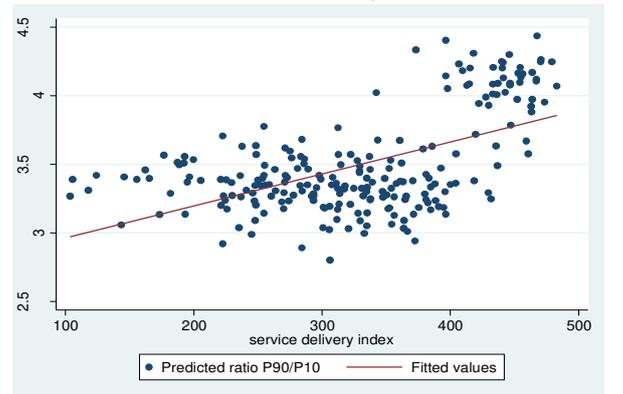

Figure 8: Reverse Causality Inequality and Governance (service delivery index)

CONCLUSIONS

In this paper we studied the dynamic relationship between inequality and the quality of local governance at the district level, including a search for the main driving forces and spatial patterns of changes in this relationship. In recent years, economic development in Indonesia is characterised by high economic growth as well as a rapid increase of overall income inequality. Since Indonesia began a process of decentralisation in 2001, followed by direct election of the president as well as local heads throughout Indonesia in 2004, the role of more than five hundred districts in the governance process is increasing. This motivated us to study in this paper how governance quality in Indonesia is affecting inequality dynamics and how inequality dynamics affect the quality of governance. We followed Chong and Gradstein (2007) to search for a systematic relationship between inequality and a set of governance indicators across districts throughout Indonesia. We use the term governance in a broad meaning, covering the quality of institutions as presented in the governance index as well as budget efficiency. We employ a GMM-system estimator as our empirical strategy and use economic conditions and urban population as control variables.   We found that the relationship between inequality and institutional quality is not straightforward but depends on which indicator we use as a proxy of the institutional variable. In contrast, we found that the relationship between inequality and governance is straightforward: good local governance is associated with low inequality at the district level. If we test for reverse quality, we found mixed evidence on the role of inequality as a determinant of local institutional quality. In contrast, we found evidence for reverse causality between inequality and governance: if we use the service delivery index as a proxy of our governance variable, we found that low inequality will improve local governance. We think these results will contribute to our understanding of the mechanisms that determine how governance affects inequality and vice versa, especially in the Indonesian context.

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