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Explaining the Regional Heterogeneity of Poverty: Evidence from Decentralized Indonesia

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The SMERU Research Institute and National Team for the Acceleration of Poverty Reduction (TNP2K)

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ABSTRACT

Explaining the Regional Heterogeneity of Poverty: Evidence from Decentralized Indonesia[i]

Sudarno Sumarto[ii], Marc Vothknecht[iii], and Laura Wijaya[iv]

This study presents evidence from Indonesia on how the country's recent periods of economic growth have contributed to poverty reduction at the regional level, with a particular emphasis on the role of decentralization. Over the past decade Indonesia has made significant progress in reducing poverty, from 23% of the population in 1999 to less than 12% in 2013. However, substantial differences in regional poverty are observed. In this paper, we discuss the factors that drive the evolution of poverty in a decentralized Indonesia, and relate *kabupaten* (district) performance in poverty reduction to a wide range of social, economic, and political characteristics within the area. The study finds gross domestic product (GDP) per capita to be one of the major driving forces behind the decline in regional poverty. Additionally, results from a panel data analysis covering the period of 2005 to 2010 show that poverty has decreased in particular in those *kabupaten* with (i) a larger share of local leaders with secondary education; (ii) a higher average educational attainment; (iii) an established local office for the coordination of poverty reduction initiatives (TKPKD); (iv) a higher share of fiscal revenues; and (v) a higher share of urban population. Furthermore, there appears to be a positive link between regional inequality and poverty, suggesting that a successful poverty reduction strategy requires both economic growth and sound social policies.

Keywords: poverty, decentralization, economic growth, Indonesia.

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[iii]European Commission. The views expressed in this chapter are those of the author and do not represent the views of the European Commission."

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

I. INTRODUCTION

Over the past decade Indonesia has made significant progress in reducing poverty. Based on official statistics produced by Statistics Indonesia (BPS), the poverty rate in Indonesia fell from 23.4% in 1999 to 11.37% in 2013. Viewed from any angle, this decrease is a tremendous achievement. However, this success story at the national level masks the existence of substantial regional differences. This paper focuses on this regional heterogeneity in poverty indicators, and relates *kabupaten* (district) performance in reducing poverty to the characteristics of the decentralization process, initiated in Indonesia after the 1997 Asian financial crisis.

Decentralization involves the shifting of fiscal, political and administrative responsibilities from higher to lower levels of government and is expected to foster economic development and poverty reduction, if implemented within a comprehensive framework (World Bank, 2013). Though around the world, countries, particularly those that are developing, have undertaken decentralization, the speed at which they have engaged in this process has varied. Generally, large countries such as China, India, and Brazil have adopted a more gradual approach in their reform for decentralization, whereas smaller countries more often chose a more radical, "Big Bang", approach. Counter to this trend, Indonesia undertook the latter approach, made even more radical and given its vast geography, population, and cultural diversity (Hofman and Kaiser, 2002).

Decentralization in Indonesia was initiated by the governance reforms advocated by the International Monetary Fund (IMF) and the World Bank in combination with the financial assistance provided to the country following the Asian financial crisis (Green, 2005). Coupled with a simultaneous transformation into a democracy after the fall of Suharto in 1998, the decentralization process in Indonesia occurred with minimum preparation. By 1999, administrative and fiscal decentralization laws granted broad autonomy to the country's regions for all but a few areas of responsibility explicitly reserved for the central government—including defense, security, justice, foreign affairs, fiscal and monetary affairs, as well as religious affairs (World Bank, 2006). Subsequent laws expanded the responsibilities and functions of *kabupaten* governments while those of the central and provincial governments have been reduced (Sumarto, Suryahadi, and Arifianto, 2004). Notably, political decentralization through a 2004 law introduced local direct elections while tightening central control over local budget and PAD decisions (World Bank, 2006).

As a result of this fast-paced decentralization process, the Indonesian system lacks key institutional requirements for an effective management of the process, notably the absence of performance measures and an effective framework of constraints, as reflected in the shortcomings of the central government's system of controls over local governments (World Bank 2006). Moreover, the division of responsibilities between the different levels of government is still unclear, clouding the accountability required to improve service delivery. An additional challenge stems from a uniform implementation of decentralization, which may not sufficiently accommodate regional differences. With a country as diverse as Indonesia, this can be an issue as each region differs in local government capacity and available resources. These factors undoubtedly have an effect, not only on the implementation of the national poverty reduction strategy, but also on the development of local poverty reduction initiatives.

A review of experiences in 19 countries conducted by Jütting, Corsi, and Stockmayer (2005) finds that decentralization has actually led toimprovements in poverty reduction in only one-thirdof the cases. The authors argue that lower middle income countries, which have literacy

rates above 80%, and whose political process is relatively open, are more likely to experience decreases in poverty following the adoption of decentralization measures. Overall, this study concludes that the decentralization process is more likely to have a positive impact on poverty if there is adequate commitment from the central government, if the involved actors have the financial and technical capacity, and if checks and balances are established at a local level to prevent rent-seeking and corruption.

In this paper, we aim to uncover the factors associated with differing performances between *kabupaten* in reducing poverty. Through an analysis of a *kabupaten*-level panel dataset with annual observations for the period 2005 to 2010, we find support for the argument that the heterogeneity in poverty levels across *kabupaten* is associated with the heterogeneity in local governments' resources and capacity. More specifically, poverty appears to have decreased more in *kabupaten* with (i) an established a local office for the coordination of poverty reduction initiatives (TKPKD); (ii) a higher share of fiscal revenues; (iii) a higher average educational attainment; (iv) a larger share of local leaders with secondary education; and (v) a higher share of urban population.

The remainder of the paper is organized as follows. Section 2 describes the observed heterogeneity in poverty across Indonesian regions between 2005 and 2010; section 3 discusses the factors that are likely to be associated with different levels of poverty reduction at the local level. Section 4 and 5 present respectively the data and estimation strategy, and the results. Section 6 offers concluding remarks.

II. OBSERVED HETEROGENEITY IN REGIONAL POVERTY

Indonesia has made significant strides in steadily reducing poverty since the Asian Financial Crisis. This result has been achieved through a combination of high economic growth and the implementation of poverty reduction programs by the Government in the past decade. However, a different picture emerges when looking at growth and poverty levels across Indonesian provinces and *kabupaten* (Hill, 1996, 2002; Tadjoeddin, Suharyo, and Mishra, 2001; ADB, 2001; Asra, 2000). Hill (2002) finds that the variance in poverty levels is increasing instead of converging. This is a cause of concern as an increase in inequality across *kabupaten* can bring social and political unrest, thereby reducing the impact of the central government's overall poverty reduction strategy.

At the provincial level, large disparities in the poverty headcount ratio can be observed. Today, densely populated provinces such as Jakarta (3.7%) and Bali (4.0%), have lower poverty levels than provinces in the eastern part of Indonesia such as Papua (30.7%) and West Papua (27.0%). Further disaggregating the heterogeneity in poverty, Figure 1 shows the poverty headcount at *kabupaten* level for 2005, the starting year of this paper's empirical analysis. The highest incidence of poverty is observed in eastern Indonesia, in particular for the provinces of Papua (especially in the highland *kabupaten*) and West Papua, Maluku, and East Nusa Tenggara (NTT). In addition, there are large regional variations, with pockets of poverty also observed in richer Java and Sumatra. In fact, the absolute number of poor people is highest in Java, given its high population density

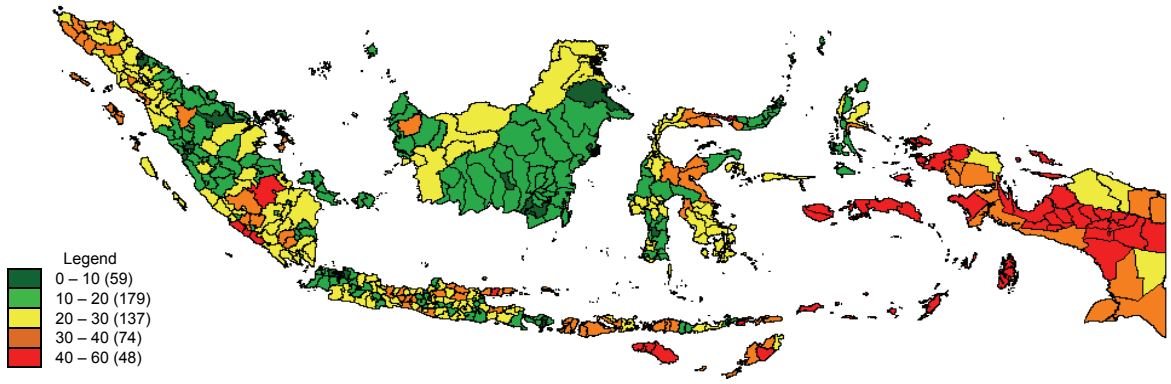

Figure 1. Poverty headcount at the *kabupaten* level, 2005

A similar picture emerges when considering the severity of poverty, as measured by the poverty gap (Figure 2), with the highest poverty gap in the eastern part of the country. This geographic concentration of poverty can be due to geographic poverty traps (Jalan and Ravallion, 2002; Bloom, Canning, and Sevilla, 2003).

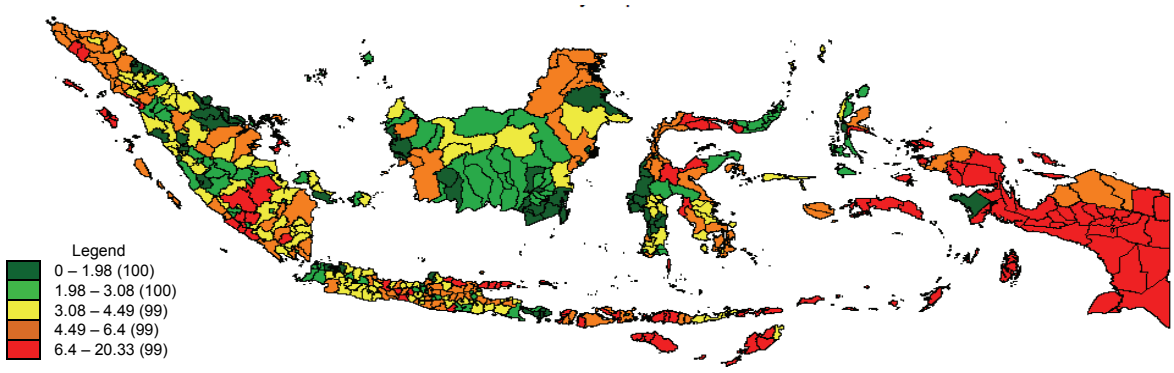

Figure 2. Poverty gap at the *kabupaten* level, 2005

Finally, Figure 3 maps the absolute changes in the poverty headcount ratio between 2005 and 2010. Reflecting the trend towards convergence in poverty rates, regions with initial higher levels of poverty tend to experience a larger decrease in poverty. However, substantial heterogeneity remains in poverty levels and trends both across and within regions.

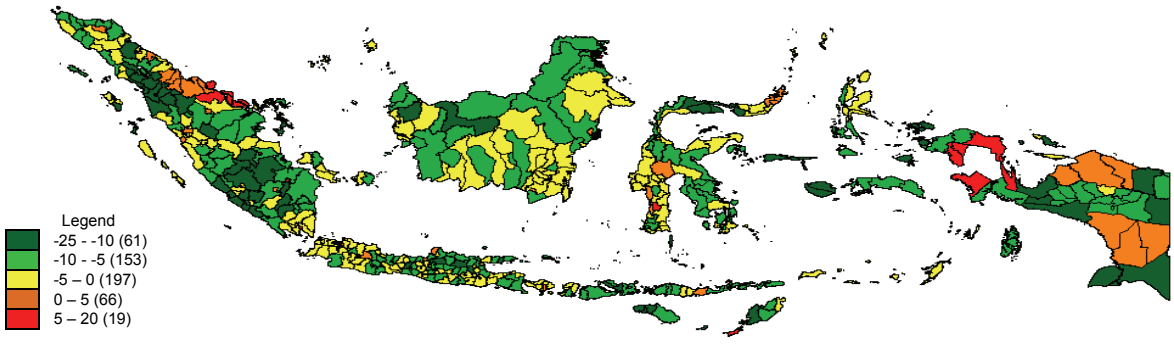

Figure 3. Change in the poverty headcount at the *kabupaten* level, 2005–2010

III. REVIEW OF THE DETERMINANTS OF REGIONAL PERFORMANCES IN REDUCING POVERTY

Poverty reduction efforts require the availability of public income, but also the adequate use of this income to fund public services, as well as the possibility for citizens to participate in social, economic, and political decisions at the local, regional, and national levels (Sumarto, Suryahadi, and Arifianto, 2004). A priori, poverty reduction efforts can be supported or undermined by decentralization. In this section, we examine the factors associated with the heterogeneity in poverty levels, in the context of the decentralization that has been implemented in Indonesia for over a decade. First, we consider *kabupaten* governments' capacities to generate income, their fiscal capability, as well as their ability to deliver services. Second, we discuss general governance aspects, and a recent institutional innovation introduced to enhance the capacity of local governments to implement poverty reduction policies.

3.1 Income Generation Capacity at the Local Level

Under the decentralization laws, *kabupaten* governments are given the legal authority to impose taxes and user service charges (*retribusi)* (ADB, 2010) as a source of income. Local revenue (*pendapatan asli daerah*, PAD) refers to the income generated directly by local governments through taxes and user service charges. The amount of PAD collected varies according to the ability of each *kabupaten* to generate income, which in turn affects local governments' ability to provide services and poverty reduction initiatives for the population. On average, PAD represents 7% of *kabupaten* income; whereas the main source of income is still transfers from the central government, as discussed in the next section.

In practice, however, local taxation is not currently formulated with incentives for development. A report from the University of Sydney finds that local governments have been harming the investment climate with complex and problematic regulations that often overlap with national regulations (Aten, 2011; Butt and Parsons, 2012). Between 2002 and 2009, the Ministry of Home Affairs has cancelled 1,887 local regulations. Further, in 2010 over 3,000 local regulations were revised and 407 found problematic. This figure continues to increase; in 2011, the Ministry revised 9,000 local regulations and found 351 problematic cases (Aten, 2011). Law No. 28/2009 on Regional Taxes and User Service Charges is argued to have failed to prevent counterproductive taxes that local governments have put in place to collect revenue, rather than to achieve policy objectives (Aten, 2011). This has discouraged investors at a time when Indonesia is in need of funding for its long-term development goals. The possibility for local governments to collect their own revenue must therefore be accompanied by rigorous and more efficient monitoring and control mechanisms from the central government, in order to prevent local taxation from creating distortions that discourage investment and economic activity.

Lastly, the new fiscal framework also allows regions to keep a given share of the revenues generated from the natural resources in their areas (World Bank, 2003). *Kabupaten* income is therefore affected by the presence of natural resources, with areas that are rich in natural resources being able to generate more income, which might increase inequalities between areas.

3.2 Local Government Fiscal Capability

Local government budgets (Anggaran Pendapatan dan Belanja Daerah, APBD) can be divided into two categories, the part that is generated from each *kabupaten*, PAD (as discussed above), and the part that comes from the central government (see below). Local governments remain largely dependent on the central government to fund their expenditures. In 2011, for example, the Ministry of Finance estimated that the central government accounted for 91% of all revenue collected and 64% of direct spending by districts.

The central government distributes unconditional block funds (*dana alokasi umum* or DAU) to the regions using a formula accounting for both needs and economic potential DAU are the main mechanism through which the central government provides funds to finance provincial and *kabupaten* government expenditures in Indonesia (Shah, Qibthiyyah, and Dita, 2012). In addition, in an attempt to reduce inequalities between regions, poorer provinces and *kabupaten* are eligible for additional grants from the central government. These include specific allocation funds (*dana alokasi khusus* or DAK), Special Autonomy grants for Aceh, Papua and West Papua, adjustment compensation funds (*dana penyesuaian* or DP), and regional incentive funds (*dana insentif daerah* or DID) and grants (*hibah*) (Shah, Qibthiyyah, and Dita, 2012). DAK are intended to influence local government spending on areas of national priority, and account for 6% of central transfers and fund 5% of subnational expenditures. While DP provide special ad hoc assistance. According to Ministry of Finance and World Bank estimates for 2009, DAU represent the main source of revenue for local governments with a share of 49% of total revenues; while 18% come from DAK and only 17% from PAD.

According to the World Bank (2011), the current system used for funding transfers is inadequate in reducing inequalities between regions as its allocation mechanisms insufficiently differentiate between the needs and challenges in different areas. An additional problem with DAU is that under its current allocation mechanism, *kabupaten* have incentives to split off into new regions (Harjowiryono, 2011), which is known as *pemekaran*. Indeed, the wrong incentives are given by Indonesia's grant disbursement mechanism: "two new *kabupaten* get effectively twice as much as the larger old *kabupaten* from which they were formed" (Fitriani, Hofman, and Kaiser, 2005). Table 1 shows that between 2001 and 2011, while the number of new *kabupaten* has slightly more than doubled in South Kalimantan, the amount of DAU received has been multiplied by more than five. Thus, it is unsurprising that over the past decade, the number of provinces in Indonesia has increased from 26 to 33 and the number of *kabupaten* from 290 to 497. This is largely due to vertical coalitions of politicians at the provincial and local levels (Kimura, 2007).

Table 1. *Kabupaten* Splits and Central Government Transfers in South Kalimantan and Yogyakarta

Province	Number of *Kabupaten*/*Kota* in 2001	Number of *Kabupaten*/*Kota* in 2011	Total DAU for *Kabupaten* in 2001 (billion Rp)	Total DAU for *Kabupaten* in 2011 (billion Rp)	Percentage Change in DAU: 2001–2011
South Kalimantan	6	14	0.9	5.5	528 %
Yogyakarta	5	5	0.9	2.7	216 %

Source: Harjowiryono, 2011; Shah, Qibthiyyah, and Dita, 2012.

The increasing number of *kabupaten* has led to a notable increase in civil servant spending for the central government (see below). Furthermore, it is more difficult to monitor a larger number of *kabupaten*. A study from SMERU shows that financial accountability appears to be decreased with *pemekaran*; there is no consolidated record of the total amount spent in all provinces and *kabupaten* (Isdijoso, 2012).

3.3 Public Service Delivery Performance

Service delivery improves in decentralized settings if citizen participation and public sector accountability go hand-in-hand with the decentralization of decision-making for public services (Huther and Shah, 1998). However, decentralization policy initiatives are often undertaken without paying enough attention to improvements in service delivery (Robinson, 2007). The World Bank (2005) argues that one of the main problems that affect public service delivery is the lack of capacity of local governments to exercise responsibility over the services they are expected to provide. This lack of capacity can be divided into two main categories: fiscal and technical. Fiscal capabilities relates to the ability of local governments to raise revenue, while technical capacity relates to local governments' ability to manage and allocate their resources.

Fiscal capacity affects the provision of services at the local level, which mostly relates to the ability of local governments to complement the funds received by the central government for improved services. In the health sector for instance, although central government spending has doubled between 2007 and 2013, health insurance coverage, even for the poor, is not universal. Local governments complement the national health insurance for the poor program (Jaminan Kesehatan Masyarakat, Jamkesmas) with a locally funded health insurance (Jaminan Kesehatan Daerah, Jamkesda), for poor households not covered by *Jamkesmas*. The coverage of *Jamkesda* varies from region to region according to budget constraints, with some areas, such as Jakarta and Bali, approaching universal coverage for the poor and other areas still failing to cover a large part of this population. In the education sector, Kabupaten Bandung in West Java spent nearly Rp250 million in addition to funds provided by the central government in 2008, while Kabupaten Mamuju Utara in West Sulawesi allocated less than Rp40 million for education in the same year. These different levels of *kabupaten* spending are likely to lead to different outcomes for the populations of different areas, although there is a mismatch between spending from local government and service delivery outcomes (World Bank, 2011).

In addition to a different fiscal capacity for local spending, there are also large inequalities in terms of technical capacity across regions. As a result, for instance, sectoral allocation decisions are not always aligned with service delivery needs. Due to their lack of capacity, local governments often remain largely dependent on the central government, not only for funding but also for the implementation of infrastructure projects. In the infrastructure sector, for instance, which is key to develop access to markets, off-farm employment and social services (Balisacan, Pernia, and Asra, 2002), local governments' lack of technical capacity in carrying out large-scale projects has led to insufficient progress in terms of access to roads, telecommunication, and even electricity. About two-thirds of the villages in the country, particularly in eastern Indonesia, still have no access to telecommunication networks (Aswicahyono and Friawan, 2008). Similarly, electricity access remains low, with wide disparities across provinces. Over 70 million Indonesians (over 20% of the population) still do not have access to electricity.

In addition, local governments' performance in delivering public services to their constituents is further hindered by the absence of transparent lines of authority and clear accountability for

policy implementation. As per Heywood and Harahap (2009), there has been little increase in the potential for discretion at the *kabupaten* level in managing public funds for health. They argue that this is likely to be an important reason for the lack of improvement in publicly funded health services. Key decisions regarding the amount and use of funds are still made by the central government, and as a result no one is held accountable for the performance of the sectors—the *kabupaten* government blames the central government, and vice versa, leaving no actor accountable to the population. The World Bank (2003b) has expressed concerns that the maintenance of some existing infrastructure projects has suffered a downturn due to unclear assignment of government responsibilities and shortcomings in intergovernmental fiscal transfers.

Lastly, spending on services is increasingly crowded out by significant amounts spent on local government apparatus. According to 2011 estimates from the National Secretariat of the Indonesian Forum for Budget Transparency (Seknas Fitra), 298 out of 491 *kabupaten* spent over 50% of their total budget on wage expenditures. In 2012, this number increased to 302 out of 491 *kabupaten* spending over 50% of their total budget on wages. This is an inefficient use of funds as less is allocated to improving public services and poverty reduction efforts with sustainable and multiplier effects.

3.4 Governance Aspects of Decentralization

Good governance has been shown to be crucial for achieving better public service management and delivery, enhancing economic growth, as well as increasing economic, political, and social opportunities for the poor (Sumarto, Suryahadi, and Arifianto, 2004; Blaxhall, 2000; Eid, 2000; Gupta, Davoodi, and Tiongson, 2000). In the context of decentralization, Crook and Sverrisson (2001) show that it has positive effects only in countries with well-established public participation schemes, where local governments apply the principles of good governance and where there are functioning checks and balances mechanisms from both the central government and the general public. According to the World Bank (2006), decentralization in Indonesia took place in the absence of a comprehensive policy framework. The Indonesian system therefore lacks some of the requirements in terms of governance for an effective management of the decentralization process, which can have unintended consequences, among which the most harmful for poverty reduction are violence and conflict.

Political decentralization is regarded as a way of diffusing social and political tensions and ensuring local cultural and political autonomy (Bardhan, 2002). McLaughlin and Perdana (2010) find low levels of reported electoral conflict and conflict stemming from the abuse of local power in Indonesia, and conclude that decentralization has not brought a notable increase in violence, with few locations in Indonesia suffering from high levels of ethnic or religious conflict. However, there is a link between administrative decentralization and conflict. The International Crisis Group argues that in some areas conflict is a by-product of the *pemekaran* process, especially when decisions are made without public consultation (ICG, 2005). In West Sulawesi, for example, conflict erupted over the formation of the new district of Mamasa, with some members of the community supporting the administrative changes and others bitterly opposing them. The report argues that the Mamasa incident is an example of what can happen when there is no clear procedure to resolve disputes in the *pemekaran* process. An open democratic procedure is therefore needed to reduce the probability of conflict occurring.

Further, Murshed and Tadjoeddin (2008) find that the probability of routine violence is higher in *kabupaten* where local public spending is lower. Despite the uniform implementation of fiscal decentralization, experiences at the subnational vary and overall decentralization has led to an increase in inequalities, with 80% of shared taxes and natural resource-based revenues accruing to the richest 20% of the *kabupaten*.

3.5 *Kabupaten* Institutional Capacity for Poverty Reduction

In 2005 a presidential regulation was issued to encourage *kabupaten* governments to establish Local Coordinating Teams for Poverty Reduction (Tim Koordinasi Penanggulangan Kemiskinan Daerah, TKPKD) with the objective of overseeing and coordinating the design and implementation of local poverty reduction strategies. The main responsibilities of TKPKDs include the management and development of local poverty indicators, the development of a poverty information system, and the establishment of an early warning system on poverty issues. With these responsibilities, members of TKPKDs include the *bupati* or *walikota* (head of the *kabupaten* or *kota* [city]), technical local government departments (*dinas*) such as that of health, education, community empowerment, and the *kabupaten* BPS offices. The distribution map of TKPKD offices across *kabupaten* is given in Figure 4.

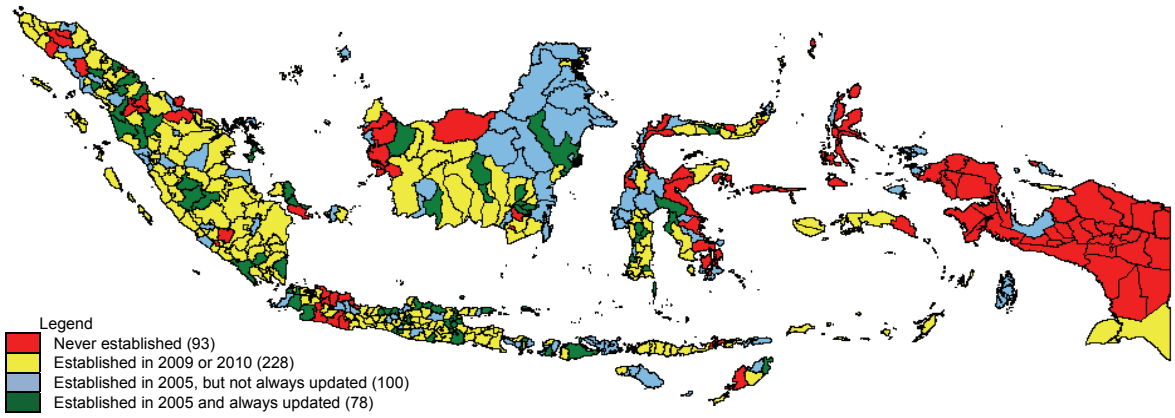

Figure 4. Distribution of TKPKD offices across *kabupaten*

Several challenges exist in utilizing TKPKD as a tool for poverty reduction. First, as of 2010 about 20% of *kabupaten* had not established a TKPKD; of which nearly half of are located in the eastern part of the country. In addition, the degree by which existing TKPKD are institutionalized varies widely across *kabupaten*.

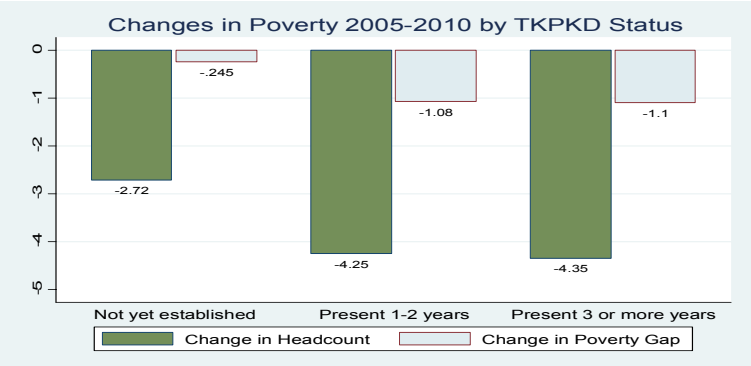

Figure 5. TKPKD and poverty reduction
Source: Authors' calculation.

The success of TKPKD in contributing to local poverty reduction efforts depends on a number of intertwined factors. First, the support from the local elite, especially from the *bupati* or *walikota* and from members of local parliaments, is crucial in fostering the role of TKPKDs. Second, funds for the operational costs of TKPKDs are often limited, regardless of the fiscal capacity of local governments. Third, local governments and therefore TKPKDs have varying capacities for program planning and budgeting, and the presidential regulation does not address how local governments can increase their capacity. Between 2005 and 2010, several regulations have been issued, reforming the composition and role of TKPKDs. In 2010, the National Team for the Acceleration of Poverty Reduction (TNP2K) was established to coordinate and oversee the national poverty reduction strategy, similar to the TKPKDs in the *kabupaten*.

TNP2K is also in charge of supporting and developing the capacity of TKPKDs, in order to foster their institutionalization and enhance their ability to plan and implement local poverty reduction programs and policies. However, there is a high local government staff turnover, which causes difficulties in maintaining a focal point for mainstreaming poverty reduction initiatives. Some local governments, like in Central Java Province or Kabupaten Indramayu, understand the importance of continuity, and issue regulations to minimize the rotation of civil servants across local government departments.

IV. DATA AND ESTIMATION STRATEGY

In examining differences in poverty reduction at a subnational level, Balisacan, Pernia, and Asra (2002) highlight several advantages of using Indonesia as a case study. First, Indonesia is highly diverse in terms of its geography, institutional attributes and economic performance. This diversity allows for critical assessment of the influence of economy-wide policies and initial" conditions in 2005, including institutions and geographic attributes related to poverty. Second, cross-sectional and time series data is available at subnational units (province and *kabupaten*), which allows for the analysis of the determinants of growth and poverty reduction at the *kabupaten* level. In contrast to Baliscan, Pernia, and Asra (2002) who examined Indonesia in the 1990s, this paper will utilize mainly consistent *kabupaten*-level data for the period of 2005 to 2009 to uncover trends that will help explain the socioeconomic heterogeneity across Indonesia.

4.1 Data Sources

In order to empirically assess the determinants of poverty in Indonesia, we use a *kabupaten*-level panel dataset with annual observations for the period of 2005 to 2010. Table A1 in the appendix provides an overview of the data sources, the time period for which the various variables are available, and, where applicable, problematic aspects of the data as well as adjustments that we have made in response to these problems. A general challenge in constructing the database arises from Indonesia's post-Suharto decentralization legislation and the related formation of new *kabupaten*. This process, known as *pemekaran*, led to an increase in the number of *kabupaten* from 440 in 2005, to 497 in 2010. We therefore realign the data to match the 2005 *kabupaten* borders in order to achieve a uniform data set throughout the 440 *kabupaten*.

4.2 Descriptive Statistics

Table 2 presents descriptive statistics. Besides the mean, maximum, and minimum values, the standard deviation is decomposed into its between and within components, that is, (i) the variation across *kabupaten* in a given year (*between*); and (ii) the variation within *kabupaten* over time (*within*). Some of the structural *kabupaten* characteristics we are interested in do not vary substantially over the sample period (education, demographics, infrastructure, institutional quality), which restricts our econometric options. Before turning to the regression analysis, we take a closer look at the regional and local heterogeneities in poverty levels and trends.

Table 2. Descriptive Statistics *Kabupaten*-Level Panel Data Set, 2005–2010

	Variable	n	Mean	Min	Max	Standard Deviation		
						Overall	*Between*	*Within*
Social Factors	Poverty head count	2640	18.44	2.1	63.5	10.52	10.07	3.08
	Poverty gap	2640	3.38	0.0	22.3	2.74	2.47	1.20
	Gini coefficient (based on household consumption)	2640	27.07	13.1	62.0	4.45	3.29	2.99
	Average years of education	2640	7.64	4.5	12.9	1.08	1.03	0.34
	Share of population with primary education	2640	0.816	0.18	0.93	0.076	0.074	0.017
	Share of population with junior secondary education	2640	0.394	0.04	0.72	0.117	0.114	0.027
Economic Factors	Real GDP, per capita	2640	0.858	0.06	20.91	1.380	1.371	0.163
	Agriculture, share of GDP	2640	0.323	0.00	0.85	0.188	0.187	0.023
	Mining, share of GDP	2640	0.068	0.00	0.95	0.160	0.159	0.017
	Share of workers in agriculture	2640	0.482	0.00	1.00	0.251	0.250	0.025
	Share of workers in mining	2640	0.017	0.00	0.37	0.036	0.036	0.007
	Unemployment rate, total	1760	0.073	0.00	0.22	0.039	0.036	0.014
	Underemployment rate, total	1760	0.357	0.07	0.91	0.130	0.122	0.046
	Annual growth rate of GDP per capita	2640	0.062	-0.40	0.87	0.043	0.022	0.037
	Total fiscal revenues, per capita	2604	0.244	0.01	3.20	0.315	0.300	0.098
	Total fiscal revenues, as share of GDP	2604	0.444	0.01	5.45	0.560	0.543	0.136
Demographic Factors	Total population	2640	5.05	0.1	41.1	5.74	5.74	0.01
	Population density	2640	10.65	0.0	205.0	24.97	25.00	0.02
	Share of urban population	2640	0.351	0	1	0.319	0.319	0.000
	Ethnic diversity (more than 1 ethnicity, village survey or Podes)	2640	0.734	0.07	1	0.232	0.222	0.067
Other Factors	Share of villages with asphalt main road	2640	0.636	0	1	0.284	0.279	0.055
	Primary health care facility easy to reach	2640	0.944	0	1	0.107	0.095	0.051
	Police station easy to reach	2640	0.848	0	1	0.188	0.178	0.061
	Share of village heads with no secondary education	2640	0.099	0	1	0.157	0.150	0.049
	Recent history of large-scale extended violence	2640	0.232	0	1	0.422	0.422	0.000

Table 3. Provincial Overview: Poverty in 2005 and 2010—Headcount and Poverty Gap

Province	*Poverty Head Count*			*Poverty Gap*		
	2005	*2010*	*Change*	*2005*	*2010*	*Change*
Nanggroe Aceh Darussalam	28.2	23.4	-4.8	5.3	4.2	-1.1
North Sumatra	17.6	14.4	-3.2	3.1	2.3	-0.7
West Sumatra	13.7	11.6	-2.1	2.2	1.8	-0.4
Riau	15.7	13.1	-2.6	3.1	2.4	-0.7
Jambi	14.7	10.6	-4.1	2.2	1.5	-0.7
South Sumatra	25.0	18.2	-6.8	4.5	3.0	-1.5
Bengkulu	26.1	20.0	-6.1	4.7	3.5	-1.2
Lampung	24.3	21.3	-3.0	4.8	3.8	-1.0
Bangka-Belitung Islands	13.4	9.8	-3.5	2.7	1.4	-1.3
Riau Islands	13.4	11.3	-2.1	2.9	1.9	-1.0
DKI Jakarta	4.8	5.4	0.6	0.8	0.9	0.1
West Java	16.1	14.3	-1.8	3.1	2.2	-0.9
Central Java	24.4	19.4	-4.9	4.5	3.3	-1.2
DI Yogyakarta	21.6	18.3	-3.3	4.4	2.6	-1.7
East Java	23.6	17.7	-5.9	4.5	2.9	-1.6
Banten	11.7	10.5	-1.2	2.0	1.7	-0.3
Bali	8.4	7.3	-1.2	1.2	1.1	-0.1
West Nusa Tenggara	30.0	25.1	-5.0	5.9	4.5	-1.5
East Nusa Tenggara	32.3	25.7	-6.7	7.0	4.9	-2.0
West Kalimantan	17.3	11.5	-5.9	3.0	1.8	-1.2
Central Kalimantan	14.1	10.0	-4.1	2.1	1.6	-0.6
South Kalimantan	9.0	7.6	-1.4	1.5	1.1	-0.4
East Kalimantan	13.3	11.1	-2.2	2.8	2.1	-0.7
North Sulawesi	11.8	12.7	0.9	2.1	2.1	0.0
Central Sulawesi	25.8	21.1	-4.7	5.1	4.0	-1.1
South Sulawesi	16.3	14.0	-2.3	2.8	2.3	-0.4
Southeast Sulawesi	24.7	20.0	-4.7	4.7	3.4	-1.3
Gorontalo	34.9	19.9	-15.0	7.8	3.4	-4.4
West Sulawesi	20.7	17.8	-2.9	0.0	2.8	2.8
Maluku	37.6	31.8	-5.8	8.4	7.0	-1.4
North Maluku	17.3	12.8	-4.6	2.7	2.2	-0.5
West Papua	41.3	40.8	-0.4	8.1	11.9	3.8
Papua	46.6	38.3	-8.3	12.9	9.2	-3.6
National Level	*21.1*	*16.9*	*-4.2*	*4.0*	*2.8*	*-1.2*

Table 3 provides a provincial-level overview of the poverty headcount and the poverty gap in 2005 and 2010, respectively. On average, the incidence of poverty has decreased by 4.2 percentage points from 21.1% in 2005 to 16.9% in 2010; in the same period, the poverty gap was reduced from 4.0 to 2.8. At the provincial level, however, there are substantial variations. For instance, all provinces (with the exception of West Papua) with poverty rates above 30% in 2005 were able to reduce poverty by at least five percentage points, with the highest reduction in poverty observed for the province of Gorontalo. The absolute reductions in poverty tend to be lowest for provinces with lower levels of poverty in 2005. The underlying trend of convergence in poverty levels is confirmed when plotting changes in the poverty

headcount and poverty gap respectively against the 2005 levels of these indicators for the 440 *kabupaten* in the sample (see Figures 6 and 7 respectively). While an overall negative correlation between the initial levels of poverty and the changes over time is observed, the graphs also illustrate substantial deviations from this general trend and hence point to diverging local experiences across the archipelago.

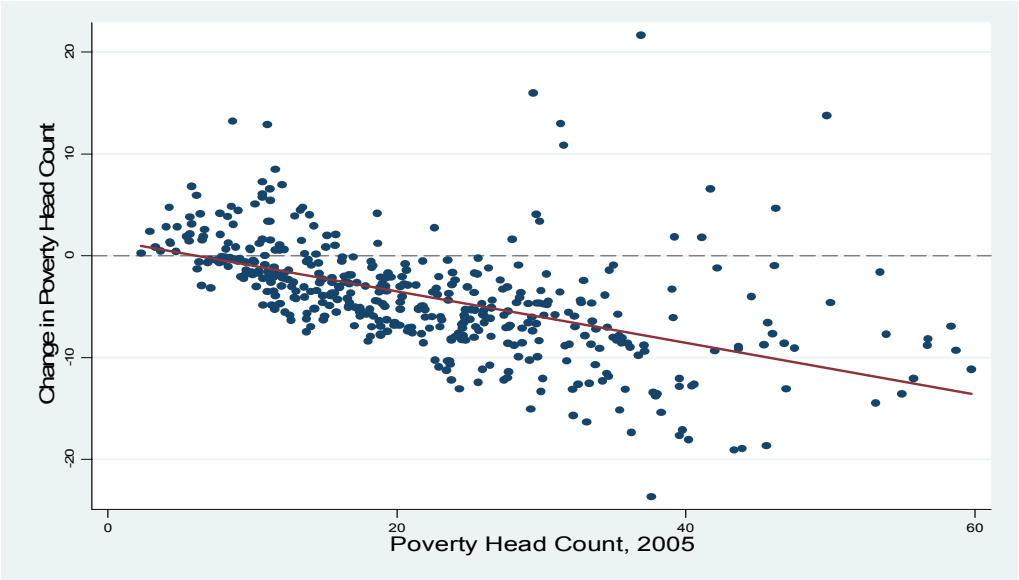

Figure 6. Convergence in poverty rates—poverty headcount

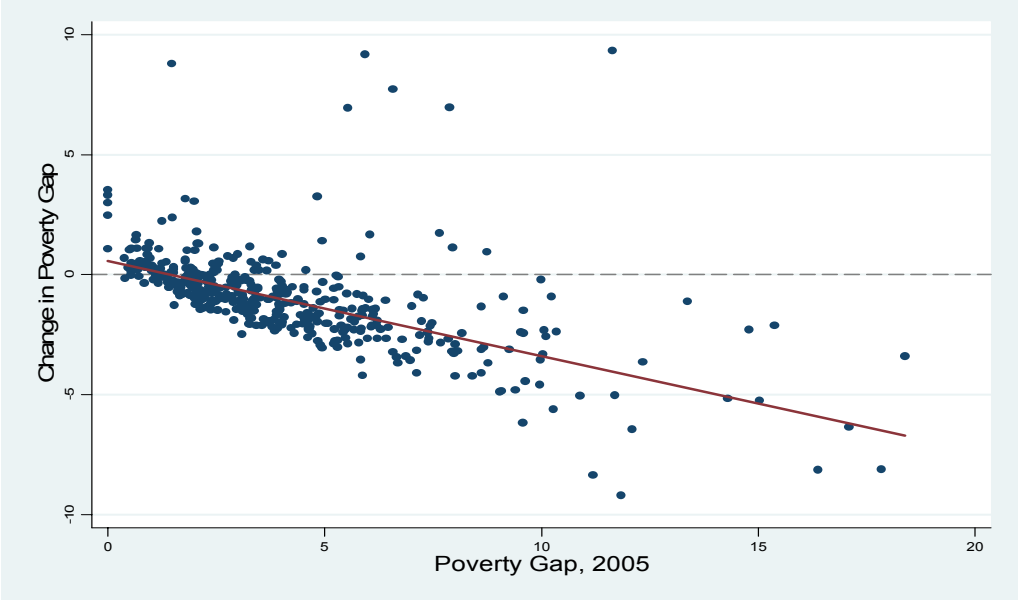

Figure 7. Convergence in poverty rates—poverty gap

Table A2 in the appendix further shows that there are substantial correlations between some of the socioeconomic control variables. This implies a choice to be made on the inclusion of the most relevant correlates of poverty to avoid potential issues of multicollinearity. In particular, we do not include measures of labor market participation and local infrastructure, which are highly correlated with per capita GDP and with the share of urban population.

4.3 Econometric Approach

In order to exploit the longitudinal dimension of the dataset, we run panel regression models on poverty incidence and severity, respectively. As a number of our control variables show relatively low variation over the 2005–2010 sample period,[1] a Random Effects (RE) model is applied at first. The RE model allows us to account for unobserved *kabupaten* heterogeneity that might affect poverty levels beyond the observable explanatory factors and, at the same time, to include the control variables which either exhibit low variation over time or are time-invariant. The flexibility of the RE model relies on the rather strong assumption of orthogonality between the *kabupaten*-specific random effect and the explanatory variables. For comparison and robustness, we therefore also run fixed effects (FE) models using a reduced set of time-varying control variables. The introduction of fixed effects allows capturing *kabupaten*-specific underlying cultural values, as well as other time-invariant or long-term, slowly changing determinants of poverty. Note that we forego the inclusion of time (year) dummies for this analysis. In capturing the overall positive development in Indonesia in recent years, time dummies absorb substantial parts of the variation in poverty in our sample. We are mainly interested in identifying general correlations between poverty and socioeconomic conditions, which we at least partly eliminate through the introduction of time dummies.

Lastly, we estimate standard ordinary least squares (OLS) regressions on the absolute changes in the poverty headcount and the poverty gap between 2005 and 2010, controlling for initial conditions in 2005 as well as changes in explanatory factors over this period. As the observations within *kabupaten* are likely to be interdependent over time, we cluster the standard errors at *kabupaten* level to allow for such intragroup correlation.

Given the complex and often reciprocal links between poverty and other socioeconomic conditions, it is important to note that we do not claim to provide causal explanations, but rather aim to describe the relationship between the local environment and the prevalence of poverty. The analysis aims to further our understanding of the factors related to local poverty (reduction) in a decentralized Indonesia.

V. RESULTS

Table 4 presents the main regression results at *kabupaten* level for both random and fixed effect models. We use a balanced panel of 434 *kabupaten* over the six-year period of 2005 to 2010.[2] In regression (1) on the poverty headcount, we only include a core set of control variables. The incidence of poverty is found lower in *kabupaten* (i) with higher GDP per capita (ii) with a higher share of fiscal revenues; (iii) with a higher average educational attainment; (iv) with a larger share of local leaders with completed secondary education (as a proxy for the quality of local governance); and (v) with a higher share of urban population.

[1]See intra-*kabupaten* standard deviations reported in Table 2.

[2]The six *kabupaten* of the Special Capital Region (DKI) of Jakarta are excluded, given its distinct characteristics and the lack of data on fiscal revenues.

Table 4. Regression Results: The Determinants of Poverty at the *Kabupaten* Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Poverty Headcount				Poverty Gap		Change HC	Change Gap
	RE	RE	RE	FE	RE	FE	OLS	OLS
Real GDP per capita (w/o mining)	-0.80 (0.307)	-0.72 (0.331)	-0.77 (0.150)	-0.37 (0.696)	-0.06 (0.590)	-0.10 (0.758)	-0.05 (0.753)	0.03 (0.677)
Fiscal revenues, as share of GDP	-1.99*** (0.004)	-2.63*** (0.000)	-3.54*** (0.000)	-4.99*** (0.000)	-0.97*** (0.000)	-2.01*** (0.000)	1.97*** (0.002)	0.90*** (0.000)
Education: av. years of schooling	-2.10*** (0.000)	-2.05*** (0.000)	-2.03*** (0.000)	-1.99*** (0.000)	-0.34*** (0.000)	-0.33*** (0.003)	-0.06 (0.868)	-0.10 (0.482)
Village heads w/o secondary education	11.81*** (0.000)	10.13*** (0.000)	7.77*** (0.004)	6.56** (0.027)	1.15 (0.306)	-0.49 (0.719)	5.30** (0.012)	0.62 (0.452)
Share of urban population	-8.90*** (0.000)	-4.02 (0.227)	-4.30 (0.128)		-1.29* (0.099)		3.29*** (0.010)	-0.22 (0.643)
TKPKD active for 1-2 years[a]	-1.35*** (0.000)	-1.30*** (0.000)	-1.13*** (0.000)	-1.35*** (0.000)	-0.16** (0.026)	-0.32*** (0.001)	-0.91 (0.169)	-0.18 (0.494)
TKPKD active for more than 3 years	-3.89*** (0.000)	-3.70*** (0.000)	-3.43*** (0.000)	-3.79*** (0.000)	-0.66*** (0.000)	-0.92*** (0.000)	-1.61** (0.017)	-0.41 (0.121)
Agriculture as share of GDP		8.61 (0.156)	9.09* (0.085)	11.27 (0.205)	1.27 (0.339)	1.36 (0.745)		
Mining as share of GDP		1.97 (0.642)	4.52 (0.229)	10.91* (0.091)	0.77 (0.385)	2.95 (0.293)		
Gini coefficient		0.05* (0.069)	0.04 (0.132)	0.03 (0.234)	0.07*** (0.000)	0.06*** (0.000)	0.05 (0.442)	0.06** (0.022)
Recent history of large-scale violence		6.24*** (0.000)	4.44*** (0.000)		1.05*** (0.000)		0.52 (0.470)	0.27 (0.333)
Region: Sumatra[a]			-2.51*** (0.002)		-0.35* (0.055)		-0.30 (0.609)	-0.09 (0.689)
Region: Kalimantan[a]			-10.87*** (0.000)		-2.06*** (0.000)		-2.87*** (0.001)	-1.12*** (0.001)
Region: NTT & NTB[a]			2.08 (0.187)		0.74** (0.027)		1.15 (0.168)	0.39 (0.227)
Region: Sulawesi[a]			-2.38** (0.023)		-0.39* (0.091)		0.51 (0.494)	-0.04 (0.878)
Region: Moluccas[a]			1.89 (0.569)		1.50* (0.072)		-0.10 (0.944)	0.78 (0.163)
Region: Papua[a]			14.81*** (0.000)		5.80*** (0.000)		3.64** (0.011)	2.99*** (0.000)
Poverty HC (7) /Gap (8)in 2005							-0.36*** (0.000)	-0.62*** (0.000)
Share fiscal revenues Change 2005–2010							0.50 (0.589)	-0.50 (0.161)
Gini coefficient Change 2005–-2010							0.07 (0.208)	0.11*** (0.000)
Constant	39.26*** (0.000)	31.95*** (0.000)	33.90*** (0.000)	31.70*** (0.000)	4.41*** (0.000)	5.12*** (0.007)	1.51 (0.593)	0.73 (0.485)
Year Dummies	No	No	No	No	No	No	No	No
Observations	2598	2598	2598	2598	2598	2598	434	434
Pseudo-R^2 / Adj. R^2 (7)–(8)	0.286	0.300	0.309	0.314	0.128	0.145	0.468	0.516

Note: P-values in parentheses. Standard errors clustered at *kabupaten* level.
*significant at 10%.
**significant at 5%.
***significant at 1%.
[a]Reference category: Java and Bali.

While an expected negative effect of education on poverty is uncontroversial, there are different views on the poverty consequences of urbanization. The newer, more optimistic view is summarized by Whiting and Unwin (2009), who note that, "greater urbanization in low income countries is an essential component of economic development and from this perspective is both inevitable and desirable", and also clearly evident in the World Development Report 2009 (World Bank, 2009).

Kabupaten with a relatively larger public budget (compared to the size of the local economy) appear to have slightly lower levels of poverty, and this effect appears independent of the quality of local governments (when using educational attainment of local leaders as a proxy). All else equal, an increase of the average years of schooling by one year is estimated to be correlated with a 2.1 percentage point lower poverty rate. On average, poverty levels are found to be about nine percentage points higher in rural *kabupaten*, reflecting a substantial rural-urban divide.

In order to assess the correlation of the presence of TKPKD offices with poverty levels, we include two dummy variables indicating (i) the presence of a TKPKD office for one to two years; and (ii) the presence of TKPKD for at least three years. Compared to *kabupaten* where no TKPKD office has been established yet, poverty is found more than one percentage point lower in *kabupaten* with a TKPKD office for at least one year. In addition, the correlation with poverty incidence increases with the duration in which a TKPKD office has been established, *kabupaten* with a TKPKD office for at least three years have a poverty incidence lower by nearly four percentage points, compared to *kabupaten* with no TKPKD office.

We then extend the list of control variables with additional economic factors (regression 2). Again the incidence of poverty is found lower in *kabupaten* with higher GDP per capita, albeit being statistically insignificant. The importance of the mining sector is not found to be correlated with poverty incidence. Likewise, the share of agriculture in *kabupaten* GDP is not significantly correlated with poverty, which is likely to be due the fact the share of urban population accounts for the predominance of the agricultural sector in the *kabupaten* economy.

All else equal, poverty incidence appears slightly higher in *kabupaten* with higher rates of inequality. This finding is consistent as the poverty reduction effect of growth increases with regional output, but only will increase at a decreasing rate due to the nonlinear tail effects of the distribution of income. Several recent studies have emphasized the importance of inequality in determining the responsiveness of poverty to output growth (e.g. Adams, 2004; Easterly, 2000; Ravallion, 1997). Based on the specification that the growth elasticity of poverty decreases with inequality, Ravallion (1997) econometrically tested the "growth-elasticity argument" that while low inequality helps the poor share in the benefits of growth it also exposes them to the costs of contraction. In essence, our results suggest that the poverty reduction effect of output growth may occur in part through inequality reduction effects.

Finally, a recent history of large-scale violence appears to be high and positively correlated with poverty incidence. Controlling for a wide range of socioeconomic control variables, the poverty headcount is estimated to be about six percentage points higher in provinces affected by large-scale violence in the early years of the country's political and economic transition. The direction of causality is unclear, as it cannot be ruled out that areas with (persistently) high levels of poverty might be particularly prone to violence, or that areas that experience high levels of violence have performed less well in reducing poverty. One set of theories stresses the role that political repression, or what are sometimes called "grievance" factors, play in driving regional conflicts. In this view, ethnic groups that experience discrimination should be

the most likely to organize armed insurrections against the state, and conflicts should be most likely to erupt in undemocratic states and those with pronounced social divisions. A second set of theories focuses on economic conditions as paramount, rather than political factors. In other words, in this view, rising poverty and falling incomes are the factors most likely to spark civil conflicts. This may either be because poverty breeds armed violence aimed at looting assets and natural resources, or alternatively because poor areas simply have limited institutional capacity to repress armed uprisings.

To ensure that our results are not driven by structural differences between major regions, we also introduce regional dummies (regression 3), with the islands of Java and Bali as the reference category. This also allows us to account for regional-specific characteristics that are constant over time, such as sociocultural norms or habits. The results for the other control variables appear mostly unchanged, suggesting that different degrees of poverty within regions are mainly related to the same factors that explain the overall heterogeneity in poverty at national level. Further, the regional dummies provide evidence on the overall spatial trends in poverty. While the interpretation of the coefficients is not straightforward, as the factors driving these regional differences are unknown, the strong coefficients observed in particular for Kalimantan (ceteris paribus, poverty levels are 11 percentage points lower as compared to Java/Bali) and Papua (ceteris paribus, poverty levels 14 percentage points higher as compared to Java/Bali) suggest that factors other than the socioeconomic conditions we control for considerably shape poverty outcomes in these regions.

The appropriateness of the RE model relative to the more restrictive fixed-effects (FE) model can be assessed using the Hausman specification test. The null hypothesis of consistent estimates from the RE model is rejected, which implies that the use of the FE model is more appropriate. We therefore assess the robustness of the findings on the determinants of the poverty headcount by estimating an FE model (regression 4). The time-invariant control variables (urbanization, conflict history, regional dummies) are excluded from the FE model, which focuses solely on the within-*kabupaten* evolution of poverty over time. The results from the RE estimations, which uses time-invariant control variables, in particular urban location and recent conflict history, provide a valuable complement to the FE estimates[3], and are largely confirmed. In particular, the incidence of poverty remains about four percentage points lower in *kabupaten* with a TKPKD office operating for at least three years. The negative correlation between fiscal revenues and poverty incidence also appears more strongly supported. The main difference with the RE results is that the share of mining in the GDP becomes significant, suggesting a higher poverty incidence by nearly 11 percentage points with the increase of the contribution of the mining sector to the *kabupaten* GDP.

Regressions (5) and (6) report the RE and FE results on the determinants of the poverty gap, respectively. Whereas the same control variables as for the poverty headcount analysis are included, we obtain a somewhat different picture of the determinants of the intensity of poverty. In line with expectations, higher inequality in consumption contributes to a higher poverty gap. The estimated effect is rather marginal though, with a change in the Gini coefficient by one standard deviation (4.45) leading to an increase of the poverty gap by 0.11 standard deviations.

Similar to the results for poverty incidence, rural areas and provinces with a recent history of conflict are generally more affected by severe poverty. Moreover, a relatively high level of fiscal revenues compared to the size of the economy is linked to lower levels of poverty depth,

[3]The same holds for the regressions on the poverty gap; the Hausman test confirms the suitability of the FE model.

with a standard deviation (0.55) increase in the share of fiscal revenues leading to a decrease of the poverty gap by 0.2 standard deviations. The existence of a TKPKD office also reduces poverty severity. However, the difference between the offices established for one to two years and those established for at least three years is smaller than was the case for poverty incidence. Finally, poverty severity is found to be uncorrelated with the educational achievements of local leaders, whereas the average schooling years have a negative and significant correlation with lower poverty severity.

Lastly, we consider the absolute changes in *kabupaten*-level poverty (headcount and gap) between 2005 and 2010 (regressions 7 and 8) and assess the factors that explain the recent changes in poverty indicators. We estimate standard OLS regressions and include the core control variables used in previous regressions, both in levels (2005 values) and in the form of changes over this period, where appropriate. Some general trends appear to hold for both the poverty headcount and the poverty gap. The phenomenon of converging poverty levels is strongly confirmed by the significantly negative coefficients associated with the 2005 baseline levels of poverty. The higher the poverty headcount and the poverty gap in 2005, the larger the reduction in these measures observed between 2005 and 2010. Beyond the socioeconomic factors controlled for, *kabupaten* in Kalimantan appear particularly successful in reducing poverty, while the opposite is observed for the Papua provinces. The reduction of the incidence of poverty is found more prominent in urban areas, whereas no such relation is observed for the poverty gap. Similarly, the existence of TKPKD offices is linked to larger decreases in the poverty headcount (1.6 percentage points in *kabupaten* with offices operating for at least three years), but not the poverty gap. Reductions in the poverty gap seem more contingent on income distribution and low levels of consumption inequality.

Surprisingly, a higher initial share of fiscal revenues appears to be linked to less success in poverty reduction. Further investigation into the role of fiscal revenues for poverty reduction reveals this correlation to be nonlinear in nature. Up to a moderate level of fiscal revenues, a relatively larger public budget contributes to the reduction of poverty; however, *kabupaten* in which fiscal revenues represent 50% or more of the size of the local economy seem to have been less successful in mitigating poverty over the 2005 to 2010 period (results not reported).

VI. CONCLUSION

In this paper, we consider the heterogeneity in the evolution of poverty over time across Indonesian *kabupaten* in the context of the fast decentralization that has been implemented since the Asian financial crisis. Our econometrics results suggest that the different experiences of *kabupaten* in reducing poverty between 2005 and 2010 is related to the local GDP per capita, the availability of resources to fund public expenditures, the effectiveness of service delivery, the quality of governance, and the institutional capacity to implement poverty reduction policies of *kabupaten*. Furthermore, regional heterogeneity in poverty across Indonesia appears to be related to the level of education, existence of conflict, and degree of urbanization.

We find poverty incidence to be lower in *kabupaten* with higher GDP per capita output, higher average educational attainment, a larger share of local leaders with secondary education and a higher degree of urbanization. Regional output per capita was a major factor behind falling poverty, with inequality, nevertheless, having a statistically significant effect on poverty across

all *kabupaten* in Indonesia. There appears to be a positive link between inequality and poverty, suggesting that a successful poverty reduction strategy requires both economic growth and a sound redistribution policy.

Our finding is consistent with previous studies which have generally revealed that GDP per capita as an important means for reducing poverty. This result is especially true when income distributions are relatively stable over time, as output per capita has the general effect of raising incomes for all members of society, including the poor. On average, poverty levels are generally found around 14 percentage points higher in rural *kabupaten*, reflecting a substantial rural-urban divide. The share of fiscal revenues in *kabupaten* GDP has a significant negative correlation with poverty incidence and severity. *Kabupaten* institutional capacity in carrying out poverty reduction initiatives appears to be a strong and consistent predictor for the evolution of poverty over time. Compared to *kabupaten* where no TKPKD office has been established yet, poverty is found significantly lower in *kabupaten* with active TKPKD offices. As we expected, the positive correlation with poverty reduction increases over time, with a four percentage point lower poverty headcount in *kabupaten* where a TKPKD office has been active for at least three years.

In addition, substantially higher poverty incidence and severity is found in *kabupaten* with a recent history of large-scale violence, although the direction of causality remains to be established. Poverty reduction in Indonesia therefore appears to be confronted with several challenges related to the decentralization process. The main challenge is the limited capacity and resources of local governments to develop and implement a poverty reduction strategy, and to provide good public services. Secondly, decentralization in Indonesia occurred too quickly and therefore lacked a comprehensive policy framework. The positive correlation of the establishment of TKPKD offices suggests that there are opportunities to reverse trends and address institutional barriers to effective decentralization. Using a similar model as the TKPKD, a more comprehensive policy framework which contributes to clarify the lines of responsibilities and accountability in the delivery of public services can, for instance, be developed and implemented to support the reduction of poverty at a similar pace across the country.

In summary, the principle message that emerges from the study is that that regional output, poverty reduction, and income distribution are strongly interrelated, so a successful development strategy requires effective, region-specific combinations of growth and distribution policies. Rapid and sustainable regional economic output is viewed as the primary vehicle for poverty reduction. The fundamental proposition is that if poor and lagging *kabupaten* in Indonesia increase their economic output rapidly enough and their income distributions are not unusually skewed against the poor, poverty reduction should occur.

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APPENDICES

APPENDIX 1

Table A1. Data Sources and Problematic Issues

Variable	Source	Years Available	Comments / Problematic Aspects
RGDP (*kabupaten*-level GDP data)	BPS	2005–2010	---
Unemployment/ underemployment, Workers per sector	National Labor Force Survey (Sakernas) (July)	2007–2010	Representative at *kabupaten* level from 2007 onwards; disaggregation by sex and/or age not possible.
Workers per sector	Sakernas (July)	2005–2010	Disaggregation by sector may not be representative for small *kabupaten*.
Fiscal revenues	Regional Financial Information System (SIKD), Finance Ministry	2005–2010	Data is missing entirely for Jakarta, as there is only one budget for DKI (no *kabupaten* budgets).
Household expenditure, poverty rates, inequality, average years of education, enrolment rates	National Socioeconomic Survey (Susenas)	2005–2010	Data for Papua and Aceh missing in 2005 (2004–2006 average used instead). 2008 data not suitable for panel analysis (2007–2009 average used instead).
Population figures	Susenas	2005–2010	Structural break in 2008; 2006 baseline figures used instead. Disaggregation by age (e.g. share of young population) problematic.
Local Coordinating Team for Poverty Reduction (TKPKD)	TNP2K (National Team for the Acceleration of Poverty Reduction)	2005–2011	---
Local infrastructure (roads, public services) and institutions (village head education level, police stations and security posts), ethnic diversity	Village Census (Podes) BPS	2005, 2008	---

APPENDIX 2

Table A2. Correlations Between Selected Variables

	Pov. HC	*Pov. Gap*	*GDP pc*	*TKPKD*	*Agricult.*	*Mining*	*Fiscal pc*	*% Fiscal*	*Unempl.*	*Undere.*	*Gini*	*Years Ed.*	*Urban*	*Ethnic D.*	*Asphalt*
Poverty gap	0.89	1.00													
GDP per capita	-0.17	-0.08	1.00												
TKPKD, years since establishment	-0.20	-0.19	0.07	1.00											
Agriculture, share of GDP	0.47	0.33	-0.38	-0.08	1.00										
Mining, share of GDP	-0.02	0.02	0.39	0.00	-0.22	1.00									
Fiscal revenues pc	0.28	0.34	0.22	0.01	0.07	0.22	1.00								
Fiscal revenues as % GDP	0.51	0.48	-0.16	-0.12	0.36	-0.11	0.63	1.00							
Unemployment rate, total	-0.31	-0.24	0.24	-0.02	-0.59	0.01	-0.10	-0.24	1.00						
Underemployment rate, total	0.37	0.28	-0.29	-0.06	0.65	0.08	0.08	0.27	-0.54	1.00					
Gini coefficient	-0.10	0.05	0.19	0.03	-0.32	-0.05	0.04	-0.02	0.20	-0.24	1.00				
Average years of education	-0.47	-0.33	0.24	0.13	-0.65	-0.12	-0.06	-0.26	0.52	-0.59	0.31	1.00			
Share of urban population	-0.50	-0.37	0.27	0.09	-0.79	-0.13	-0.17	-0.32	0.62	-0.74	0.35	0.78	1.00		
Ethnic diversity	-0.48	-0.40	0.21	0.11	-0.31	0.09	-0.04	-0.22	0.29	-0.32	0.16	0.34	0.38	1.00	
Asphalt main road	-0.47	-0.42	0.06	0.12	-0.56	-0.22	-0.36	-0.42	0.39	-0.47	0.15	0.56	0.67	0.22	1.00
Heads with no sec. education	0.50	0.54	0.03	-0.14	0.27	0.17	0.55	0.59	-0.19	0.17	0.01	-0.33	-0.33	-0.26	-0.56

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