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Department of Economics
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The Effect of Elections on Economic Growth: Results from a Natural Experiment in Indonesia

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Abstract

Does democracy increase economic growth? Previous literature tends to find a positive effect but does also suffer from possible endogeneity problems: democratization is typically not random and might be affected by factors that also have an impact on economic growth. This paper narrows down the question to empirically estimating the causal effect of local elections on local economic growth in Indonesia by using a quasi-experimental research method. The first direct elections of district leaders in Indonesia were performed in a staggered manner, and decided such that the year of election is exogenous. Thus, growth in districts that have had their first elections of district heads can be compared with growth in districts that have not had a direct election, which more specifically is performed by using a difference-in-difference approach. Our estimations show no general effect of local elections on economic growth. The result is robust to various robustness tests and is supported by data that show small effects of elections on governance.

Keywords: democracy; elections; growth; Indonesia; natural experiment

JEL codes: H11; O10; O43

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I. Introduction

The effect of democracy on income and economic growth is uncertain. On the one hand, elections might build better institutions and improve governance, which in turn should increase growth. There are, on the other hand, instances where democracy leads to local elite capture, that local elites gain undue influence with adverse effects for the local community (Bardhan 2002; Acemoglu and Robinson 2008; United Nations Human Development Programme 2010: 70). Previous empirical papers that try to estimate the general effect of democracy on economic growth tend to find a positive effect. One limitation with these cross-country studies is that they capture correlations between democracy and economic growth rather than a causal effect. Hence, further empirically studies on democracy and economic growth seem warranted, an area that this paper contributes to.

Our focus is on how one aspect of democracy, direct elections of local leaders, affects economic growth. We contribute to the literature by using a quasi-experimental research method, i.e. a “natural experiment” approach. Direct elections of local leaders in Indonesia were introduced in a staggered manner: the first elections took place in different years in different districts. The year of the first local direct election of a district head depended on when the incumbent district leader’s term was due, which in turn depended on when district leaders had been installed by the former authoritarian regime. As a result, the year of the local election is exogenous; combined with annual data on Indonesian districts’ GDP and other economic variables, this allows for difference-in-difference estimations. We are therefore able to compare the growth rates of districts that have had direct elections of local leaders against those of districts that have not yet had such elections.

We contrast direct elections of district leaders to indirect appointments, as opposed to previous research that examines democracy on a national level. We discern two main benefits with our method. Firstly, by examining a specific change in the institutional framework, we avoid the need to define democracy, but capture the essential feature of elections.² Secondly, the research method overcomes econometric difficulties arising in cross-country studies, which will be discussed below.

Most theoretical work on democracy and growth starts out from a principal-agent model (e.g. Xu 2011: 1106; Bardhan 2002: 190-192; Przeworski and Limongi 1993: 58). The electorate is the principal that, via election, charges the government – the agent – with executing specific tasks. The essential feature is that citizens have the ability to select and monitor the government. A better economic environment will emerge if elections decrease the incentives or ability of the government to create regulations in search of rents. This type of arguments can be extended to corruption in general: elected governments have lower ability and incentives to engage in corruption (Keefer 2009: 889). Hence, it is often expected that elections will reduce corruption and rent-seeking and enhance economic growth (e.g Barro 1996: 2; Shleifer and Vishny 1993).

However, the view that elections reduce corruption is not undisputed. For instance, Bardhan (2002) and Bardhan and Mookherjee (2006) question this function of accountability in developing democracies because their political systems are prone to local-level elitecapture. Keefer (2009: 902, 904) specifies that capture can happen in new democracies through the use of pre-democratic patron-client networks to mobilize voter support. Finally, “median-voter” models show that elections can lead

² Many studies emphasize the difficulties of categorizing regimes in to democracy and autocracy (see e.g. Przeworski and Limongi 1993, and Persson and Tabellini 2006).

to more income redistribution, less capital accumulation, and lower economic growth (Alesina and Rodrik 1994; Persson and Tabellini 1994).

The effect of democracy on economic growth has previously been empirically evaluated through the comparison of growth in autocratic and democratic countries. Recent papers examine the issue using fixed-effects methodologies, which improve upon earlier studies by controlling for time-invariant country characteristics. Rodrik and Wacziarg (2005), Persson and Tabellini (2006), Papaioannou and Siourounis (2008) and Acemoglu et al. (2014) are examples of this line of research and all show a positive correlation between democracy and economic growth. Acemoglu et al. (2008) approach the issue of democracy and growth by instead examining whether high incomes lead to democracy. They find no such effect and conclude that the observed effect therefore goes from democracy to high incomes.³

The main problem with interpreting fixed-effect estimates as causal effects is that they are based on countries that change regime, from autocratic to democratic or vice versa, and those countries might differ from countries that do not change regime in aspects that also affect economic growth. In other words, it is not necessarily a random process that makes some countries democratize: it might, for instance, happen because of a large economic crisis, as happened in Indonesia in 1998, but also because high economic growth and improved living standards increase the demand for democracy, as in Taiwan and South Korea in the 1980s. In these examples, one can argue that the causality went from economic recession to democracy (Indonesia), and from high economic growth to democracy (Taiwan, South Korea). There could also be instances where some other factor affects both the change from autocracy to

³ A related literature finds that direct democratic decision-making principles lead to allocations of resources more in tune with citizens' preferences (Olken 2010; Beath, Christia, and Enikolopov 2013; Hinnerich and Pettersson-Lidbom 2014). Martinez-Bravo et al. (2012) find that elections lead to higher expenditure on public goods and more redistribution of income.

democracy and economic growth. One example could be improved education and literacy rates, which might both affect the demand for democracy and result in higher economic growth.

Acemoglu et al. (2014) approach the endogeneity problem by including lagged GDP in the estimations and using an instrumental variable (IV) strategy in which democratization is assumed to spread within regions but without having a regional growth effect. Their estimations show a positive and statistically significant effect of democracy on economic growth.

As discussed above, we will approach the issue of democracy and economic growth in a different manner: by using a natural experiment approach. However, our approach also differs in some other important respects, which will need to be taken in to account when we compare our study with previous work. Most importantly, previous theoretical and empirical contributions to date concern national democracy, rather than democracy at a subnational level. It is of course possible that the effects of national and local democracy differ from one another. One posited difference is that local democratic systems are thought to be more responsive than national ones because it is easier for citizens to attain information about the local government's performance. Citizens can, for instance, directly experience whether the district official demands bribes, whereas the effect of a specific national trade policy is harder to disentangle (Xu 2011: 1079; Bardhan 2002: 190-191).

We compare economic growth in districts with and without directly elected leaders. A first glance at economic growth in Indonesia shows that it differs substantially between districts. The average growth rate in Indonesian districts between 2003 and 2007 was 5.3 percent with a standard deviation of 1.7 percent. Moreover, average growth ranged between a low of 0.6 percent in Kurtai Kartanegara

and a high of 18.8 percent in Kutai Timur. Interestingly, both these districts are located in the same province (East Kalimantan) and share some characteristics in terms of, for example, geography, which indicates that other factors, including governance, might affect growth.

The main question is whether local direct elections cause growth rates to change. Our results show quite clearly that there is no general effect of elections on economic growth: districts governed by a directly elected leader have about the same growth rate as districts without a directly elected leader. Our results are stable under alternative specifications and measurements. For instance, the results are similar in more and less developed regions, are not affected by alternative definitions of the growth variable, and are insensitive to changes in the time period being studied. The results suggest that local elections have had limited impact on governance, which is confirmed when we examine various indications of governance in districts with and without elections. More precisely, districts where there have been direct elections do not score more highly than districts without elections when we examine an array of different governance variables such as the business environment, infrastructure, licensing, and security.

The paper proceeds as follows. We start with a discussion of elections and governance in Indonesia. We continue with a discussion on the empirical approach, followed by the econometric results, a closer look at governance in Indonesia, and a concluding section.

II. The Setting

A. Background

The highly centralized authoritarian Indonesian regime of President Suharto came to an end with the Asian economic crisis of 1997/98. Widespread public protests and demonstrations lead to a transition towards a democratic political system, and the first free elections were held in 1999.

The democratization has, by and large, been successful and elections are widely perceived as competitive and free from ballot tampering (Erb and Sulistiyanto 2009; World Bank 2009: 5-6). Moreover, a multitude of parties has emerged since the fall of the autocratic regime, the civil society is vibrant, and the media is free (Erb and Sulistiyanto 2009: 7, 15; Praktikno 2009: 62; Freedom House 2012; World Bank 2009; Buehler 2010: 283). Elections at all levels of government are considered relatively free and fair (Praktikno 2009: 53; Freedom House 2012). The voter turnout in the local elections is 73 percent on average, which is high by international standards (Schiller 2009: 157).

Indonesia has a three-tiered government structure with elections at a national, provincial, and district level. There are elected assemblies at all three levels and also elected leaders: president, governor, and district leader. The direct election of leaders decided upon in late 2004 and introduced in 2005 transformed the previous local governance system.⁴ Indirect elections of district heads were in place between 1999 and 2005. Under indirect election a local parliament was elected, which in turn

⁴ Law No. 32/2004.

elected a local district head.⁵ The system of indirect elections was not working well. Accusations of money politics within district polities were common during the period. Specifically, it was claimed that district leaders bought their positions from the local parliaments (DPRDs). The core of the problem was the great autonomy and power of the district head in relation to the local parliament (see discussion below). The widespread corruption was one of the main reasons why the direct election of district leaders was introduced in 2005 (Buehler 2010: 270; Sulistiyanto and Erb 2009: 3, 18; Schiller 2009: 149).

All types of elections are performed in five-year cycles. The only exception consists of districts that were scheduled to have their elections between December 2004 and April 2005, whose elections were delayed to June 2005 (Pratikno 2009: 56).

The factor that determined when the first election of a district head was held was the time at which the incumbent district head's term was due, which in turn was determined by when the previous district head was installed by the former regime. Hence, direct elections can be considered exogenous. We will use districts with elections in 2005 as our treatment group and districts with elections in 2008 or later as our control group. However, some districts have been split into two or more new districts and it is less clear that elections in these districts are exogenous. We will discuss this issue in some detail in Section III.C.

B. Do Direct Elections Change the Political Setting?

The introduction of direct elections will not necessarily have an impact on either the choice of leaders or governance. It might be the case that local elites continue to

⁵ Before 1999, President Suharto, sometimes on the advice of the district parliaments, personally appointed district heads. The typical district head was a Javanese member of the Golkar (ruling) party with a background in the military ranks.

govern undisturbed by the changes. This tendency might be fueled by some of the requirements for being allowed to run for elections in Indonesia. For instance, candidacy has to be supported by a party or a coalition of parties that has gained at least 15 percent of the vote or 15 percent of the seats in the previous DPRD election.⁶ This requirement has been argued to lead to money politics in the form of prospective district heads buying their nominations from parties, although the problem seems to be less serious than that in the previous system of indirect elections (Buehler 2010: 271; Sulistiyanto and Erb 2009: 8). Another requirement for nomination in the local elections is that the candidate must hold at least a senior high school degree, which excludes large parts of the population (Buehler 2010: 273).

These restrictions notwithstanding, there are strong indications that the direct elections have had an impact on the changes in leadership. More specifically, we have collected the names of the districts heads for the period from 2001 to 2007, which we have used to calculate the share of incumbents that have remained in power over that time. There was a change of district head in 51 percent of the districts that had direct elections in 2005.⁷

Hence, the direct elections of district heads seem to have enabled a change in leadership. Buehler (2010: 273-275) confirms that the local elections have instilled competition, although mostly among elites. Moreover, Buehler (2009: 117-9) and Mietzner (2011: 133-136) suggest that, although wealth is a necessary requirement for a prospective district head (the buying of the DPRD, campaign advertising etc.), it is not sufficient: they both highlight that local knowledge and attachment is the

⁶ According to Law No 32/2004, which changed in July 2008 to Law No 12/2008, allowing independent candidates (Buehler 2010: 271).

⁷ This is a conservative estimate. Names in Indonesia change frequently in terms of spelling and the boundaries of words. We took all similar-looking names to indicate no change. For example, in 2005, “Drs. Makmur Syahputra, Sh” was district head in district Aceh Singkil, whereas in 2006 “H. Makmur Syah Putra, Sh, Mm” was district head, which we counted as indicating the same person.

determining factor for success in local elections. Buehler (2009: 116) states that the parties' demands for money for nomination "act as early blockers or facilitators by default", and that this only "skims off candidates early in the electoral process". Many case studies underline personal characteristics, and not party affiliation, as important for voters' choice of district head (e.g. Sulistiyanto and Erb 2009: 12, 16, 20; Pratikno 2009: 70). Sulistiyanto and Erb (2009: 20) argue that, in the cases where incumbents have been re-elected, it is because they have performed well.

C. Can a District Leader Make a Difference?

Indonesia has changed from one of the world's most centralized countries to one of the world's most decentralized (World Bank 2009: xvi; Buehler 2010: 268). A major fiscal decentralization took place in 2001 as a result of the democratization efforts after the fall of President Suharto. The district level became responsible for everything except "security and defense, foreign policy, justice, religious affairs and monetary policy", which is the responsibility of the national government (Mboi 2009: 44). Obligatory responsibilities at the local level include such areas as health, education, public works, agriculture, industry and trade, transport and communications (World Bank 2007: 113).⁸ In the decentralization process, agencies and personnel were transferred from central- and provincial- to district-level control, and the districts accounted for 69 percent of all civil servants employed in 2004 (Schiller 2009: 148; World Bank 2007: 17, 113).

Most power at the district level is in the hands of the district leader, who sets the priorities for the budget, including the levels and types of spending, and is

⁸ According to Law No. 22/1999, implemented in January 2001, and later replaced by Law No. 32/2004.

responsible for its execution. Moreover, the ultimate power rests with the district leader in cases of disputes between the district leader and the DPRD (Niazi, 2012).

The district level has also gained the financial means needed to perform its new responsibilities. The World Bank (2007: 112) judges that “most regions now have enough resources to make a real difference for the lives of their citizens”, and that Indonesia’s level of fiscal decentralization is “higher than the OECD average and higher than any other East Asian country except China” (2007: xv). By law, the central government has to transfer at least 22.5 percent of domestic revenue to the districts (Buehler 2010: 268).⁹ The districts can issue regulations, including taxes and charges, but have to gain the approval of the Ministry of Home Affairs and/or the provincial government (World Bank 2007: 125; Niazi 2012: 396).¹⁰ District revenues mainly come from three sources: 56 percent of total district revenue in 2005 came from grants ¹¹, 23 percent came from shared revenue, and 9 percent came from own-source taxes and charges. The grants are transferred from the central government to the districts, and have an equalization component. Shared revenue mainly comprises property and income taxes, which are administered at the central level and transferred back to the districts, and natural resource revenues (World Bank 2007: 116, 119-20). Own-source taxes are mostly levied on electricity, hotels, and restaurants, and own-source charges consist primarily of fees charged on health clinics, building permits, and public markets (World Bank 2007: 123-4). The districts have full discretion over their use of those revenues, with the exception of some special purpose grants.¹²

In 2005, 26 percent of total public spending was conducted at the district level, 7 percent at the provincial level and 67 percent at the central level (World Bank 2007:

⁹ According to Law No 25/1999, implemented January 2001, and later replaced by Law No 33/2004.

¹⁰ Law No 32/2004.

¹¹ DAU (*Dana Alokasi Umum*).

¹² DAK (*Dana Alokasi Khusus*), which made up 3.2 percent of the districts’ revenues in 2005.

155). The district accounted for more than 50 percent of the total expenditure in many areas. For example, it accounted for 78 percent of total expenditure on education, 60 percent of health expenditure, and 51 percent of trade expenditure. Expenditure on infrastructure and agriculture was more equally divided between the three levels, although the district share was still the highest. Expenditure related to mining and defense is typically not conducted by the district level (World Bank 2007: 117).

The provincial-level government performs functions that affect more than one district and also some coordination of the districts (Mboi 2009: 45; World Bank 2007: 113, 115). It should evaluate and approve the districts' budget and tax regulation (World Bank 2007: 128; Niazi 2012: 392, 396; Pratikno 2009: 57). However, Niazi (2012: 396) states that those powers do “not seem to have been widely or strategically used, in part because of [the] lack of capacities” of the provincial authorities to “quickly review (in the short time frames provided by the law) and change the budgets”.

D. Does Governance Differ between Districts?

The above discussion shows that the districts have a large amount of autonomy and power in shaping their economic policies. An important question is whether this autonomy is reflected in differences in observed policies. There are several case studies that indeed show large differences between Indonesian districts in terms of policies and governance. For instance, Von Luebke (2009) examines governance in several Indonesian districts and finds substantial differences in the quality of governance. As an illustrative example, a business license that it takes two days for someone to obtain in Yogyakarta takes 20 days in Medan. In line with this, Niazi (2012: 397) argues that around 10-15 percent of regional governments have

developed strong and effective leadership with good policies since the decentralization. At the other extreme are a significant number of districts plagued by poor governance, corruption, and money politics. Moreover, KPPOD (2008) surveyed the business climate in 234 Indonesian districts in 2007. The report claimed that there were strikingly large differences in the business climate and in the quality of economic governance.

Other papers find that local institutions differ across Indonesia, and that this explains differences in economic outcomes.¹³ For instance, Burgess et al. (2012) find institutional changes at the district level in Indonesia to affect economic behavior: in their case that the division of districts increases deforestation. Similarly, Olken (2007) finds institutions to affect the business climate (corruption) in Indonesia. Moreover, Skoufias et al. (2011) show that both revenues and expenditure increased in 2006 due to local elections, which the authors interpret as showing improved accountability. Another study, that of Sjahrir et al. (2013), finds evidence of discretionary budget spending – which the authors suggest is, in effect, corruption – increasing due to direct elections in Indonesia. Valsecchi (2013) also finds support for increased corruption after the introduction of direct elections at the district level. Hence, previous studies suggest that changes in governance might be taking place after local elections but it is less clear whether governance is improving or deteriorating and whether it affects economic growth. We will continue to examine both issue in more detail below.

¹³ On a related note, Martinez-Bravo (2014) examines the effects of local institutions on political outcomes. She finds that appointed village heads are more likely than elected village heads to induce villagers to vote for the district ruler's party.

III. Empirical Approach

A. Data

The Ministry of Home Affairs in Indonesia provided us with the dates of district elections between 2005 and 2012, and data on when new districts were formed between 1999 and 2011. Data on Gross Regional Domestic Product (GRDP), in constant prices and per capita at the district level, between 2003 and 2010, is from Statistics Indonesia (BPS).

Indonesian districts have subdivided at a high pace in the decentralization process, increasing from 336 districts in 1999 to 491 in 2012. Thus, an essential data source is a dataset from Statistics Indonesia that enables the conversion of districts between different years. We will use this conversion key to aggregate growth in newly formed districts back to the original ones. Another source of data that we use is McCulloch's dataset (2011), which, for instance, includes GRDP for 2001 and 2002.

The data were trimmed by removing the ten observations with the highest economic growth rates and the ten with the lowest (about 2 percent of all observations).¹⁴ A more detailed specification of the data sources can be found in Appendix A, and the definitions of variables and districts in Appendix B.

B. Specification of Treatment Status

The first election of a district leader is the “treatment” of interest and the effect is the difference in growth rates. Thus, the difference-in-difference estimation compares the differences in growth rates before and after elections in the districts that had local elections, to the districts that had no elections.

¹⁴ Excluding these observations had no major impact on the results.

The main benefit of our research methodology is the exogenous assignment of elections, which allows us to make a causal interpretation of the relationship between elections and growth. As previously discussed, elections were implemented in different years in different districts in a staggered manner. The year in which a district held its election was determined by the end of term of the incumbent, indirectly elected, district leader, which in turn was dependent on when district heads had been appointed under the previous regime. Consequently, the strict exogeneity assumption underlying the difference-in-difference method is satisfied.

--Table 1 about here--

The staggered manner in which the local elections have been held is shown in Table 1. There were 491 Indonesian districts in 2012. About 46 percent of them, or 225 districts, held their first direct election of the district head in 2005. The figures for 2006 and 2007 were 16 and 8 percent respectively. A relatively large number of districts, 127 districts or 26 percent of the total number, held their first election in 2008. At the end of 2008, about 96 percent of all districts had had their first election. The last three districts to have elections did so in 2012.

--Table 2 about here--

As previously mentioned, our treatment group is the districts that held local elections in 2005 and the control group is the districts that held local elections in 2008 or later. The districts that held local elections in 2006 and 2007 are not included in the

analysis. This definition allows us to estimate the effects of the elections, for the treatment group, two years later.

The baseline population of districts is presented in Table 2. The number of districts differs slightly from that in Table 1 as the district borders used are from 2003 and not 2009: the older are the district borders, the fewer districts there are because of the increase in districts when old districts split. There were 434 districts in 2003. The 99 districts that held elections in either 2006 or 2007 are, as mentioned above, excluded from the proceeding analysis. Moreover, 12 districts are excluded since their treatment status is unclear or because they belong to the capital Jakarta, which has a special governance system. Unclear treatment status occurs when the data are collapsed down to the 2003 district borders and the district in question has since split, with the resultant subdistricts holding elections in different years and thus belonging to different treatment groups.

We end up with a sample of 323 districts, 202 belonging to the treatment group and 121 to the control group.

C. Discussion on the Sample of Districts and on Exogeneity

Indonesian districts have subdivided, or split, at a high pace since the fall of the Suharto regime. We will use the term “child” district to denote that part of an old district that has been given a new district administration, and has thus “been created” in the decentralization process, and the term “parent” district to denote that part of the old district that has retained its district administration in the split.

One can reasonably assume that districts that split are different from districts that do not split. For example, it is highlighted in the literature that districts that split

have larger resource endowments, which could influence the districts' growth rates (Fitriani, Hofman, and Kaiser 2005).

Moreover, before local elections were implemented, child districts were assigned a "caretaker district leader" by the Ministry of Home Affairs, which in turn determined the date of the unelected or indirectly elected leader's end of term and consequently the year of the local election (Skoufias et al. 2011: 7-8). Furthermore, the time frame for installing governments in new districts varies, and it is possible that factors determining these variations influence the economy as well. The conclusion is that treatment assignment might be endogenous for the child districts.

This is also supported by the result presented in Table 3. As previously stated, we have a sample of 323 districts, including some districts that have split. There should be no systematic difference in characteristics between the various treatment groups if treatment is randomly assigned. The first row in Table 3 indicates that the balance between groups is skewed: districts that have experienced splits are to a higher degree included in the "deleted" group – districts that held local elections in 2006 or 2007. The second row in Table 3 shows that this imbalance is caused by the child districts being in the deleted group to a higher extent. Thus, it looks as if the child districts changed their "election schedule", rendering treatment assignment endogenous. Table 3 also shows that parent districts are evenly distributed across groups, indicating that the parent districts of subdivisions did not change their "election schedule".

--Table 3 about here--

To summarize, the year of the election is exogenous for all districts except for the child districts. Thus, two different set-ups will be used, estimations on a population excluding the child districts, and estimations on all districts controlling for the child districts. The first approach limits our ability to generalize the results, because districts that split have different characteristics from districts that do not split. This population consists of 232 districts, of which 133 are treated and 99 form our control group. The second approach is to use the whole population of districts and control for whether a district is a child district, which has the drawback of possibly violating the strict exogeneity assumption. As previously mentioned, this group consists of 323 districts, 202 in the treatment group and 121 in the control group.

Thus, the two different approaches are complementary to each other and, together, will hopefully allow us to draw general conclusions.

D. *Difference-in-Difference Estimations*

We will base our analysis on the following expression:

$$Y_{tis} = a + \gamma * Treatment_i + \delta * Aftertreatment_{ti} + \sum_{t=2}^T \lambda * Year(t)_i + \epsilon_{tis}$$

Y is the growth rate of constant GRDP. Subindex i denotes district, t denotes time, and s denotes whether the district belongs to the treatment or the control group. The variable *Treatment* takes the value 1 if the district is treated, i.e. held a local election in 2005, and zero otherwise. *Aftertreatment* takes the value 1 if the observation occurs after treatment: if the district held elections in 2005 and the observation is from later than 2005. The parameter of interest is δ , the Difference-in-Difference estimator,

which estimates the effect of elections on growth. $Year(t)$ refers to the year dummies. A dummy variable for child districts is added to the estimations on the whole population of districts. Standard errors are clustered at the district level, to control for possible serially correlated residuals within districts.

Our estimates might be sensitive to the choice of years included and we therefore use different specifications. More precisely, we perform the following estimations: growth in 2007 compared to growth in 2004; 2006-2007 compared to 2004; 2007 compared to 2003-2004; 2006-2007 compared to 2003-2004; and 2006-2007 compared to 2002-2004.

One weakness with the specifications described above is that the time span might be too short to find a growth effect of elections. The effect is measured two years after local elections are held, but one can argue that it takes longer for the economy to react to better or worse policies implemented as a result of local elections. We therefore include additional estimations where we examine growth in the period 2002-2010. The main drawback is that the control group itself get treated, i.e. the control districts have local elections in 2008 or later, making a comparison between the treatment and control group confounded by the inclusion of later years, namely 2008 to 2010. The main advantage is that this specification examines the growth effect up to five years after the election. Moreover, the results will be unbiased under the reasonable assumption that it will take equal time for elections to have a growth effect in the treatment and control districts.

Finally, the estimations using time periods prior to 2003 are based on district borders from 1999, and therefore include fewer observations.

E. Interpretation

In the theoretical framework underlying much of the thinking about democracy, the effects are usually divided into a selection effect and an accountability effect. The former arises since citizens taking part in elections have the possibility to choose a high-quality leader, whereas the latter arises since citizens affect the leaders' behavior while in office because of the desire for re-election. As the announcement of direct elections was made in late 2004 the incumbent leaders did not have much time to react. However, the district leaders in our control group had from 2004 until 2008 to prepare for their elections. We are therefore likely to capture only the selection effect, the populace choice of quality of leadership, when we compare the treatment and control group. The accountability effect should be in operation for both the treatment districts with their elected leaders and the control districts with their unelected leaders.

F. Balance

To verify that the treatment and control districts do not differ in any important respect requires detailed information on district characteristics. The rich data in McCulloch (2011) allows us to perform such a comparison. Table C1 in Appendix C shows the comparison of more than 50 district characteristics in the treatment and control groups. The variables are from 2000-2003, hence before the treatment in 2005. We divide the variables into four broad groups: general characteristics, social characteristics, governance characteristics, and economic characteristics.

The comparison shows a large similarity between the control and treatment groups: almost all variables are balanced. Religious fragmentation is an exception to the similarity between the treatment and control districts: there are more

fractionalized districts in the treatment group. However, religious fragmentation is fairly time-invariant and controlled for in the difference-in-difference estimation.

A more interesting exception is that the two measures of investment, foreign direct investment (FDI) and domestic investment, are significantly higher in the control group. Higher growth from high levels of investment might bias the results and we will therefore run robustness estimations in which investment is included.

It would be unfortunate if the years of elections in the districts followed a geographic distribution since geographic factors are also likely to affect economic growth. Figure 1 shows the geographic distribution of our treatment and control districts. Fortunately, it seems from the map that the districts in the two groups are evenly distributed throughout the archipelago.

--Figure 1 about here--

G. The parallel trend assumption

The parallel trend assumption needs to be fulfilled for identification in the difference-in-difference estimation framework. The assumption states that the treatment and the control group must have had parallel trends in the outcome variable before the treatment takes place.

Figure 2 shows the economic growth rates in our treatment and control groups for the dependent variables used in the result section. The parallel trend assumption seems fulfilled: economic growth is similar in the two groups before 2005.¹⁵

¹⁵ Note that the control group in Figure 2 contains districts that have elections in 2008 or later. See Section IIID for a discussion on this issue.

Moreover, growth seems to be similar in the treatment and control groups from 2007 onwards. However, some of the measures of growth suggest that it is higher in the treatment districts in 2006, i.e. one year after the elections.

--Figure 2 about here--

IV. Econometric Results

A. Baseline Results

Our base estimations on elections and growth are shown in Table 4. The estimations differ in the time span used to compare growth before and after elections. We estimate both a sample of districts from which we exclude child districts, and a sample of all districts; in the latter case, we include a dummy variable for the child district. The difference-in-difference coefficients show the effect of elections on economic growth and economic growth per capita, respectively.

The results show no effect of local elections on economic growth. The coefficient is positive for elections in most estimations but only statistically significant when GRDP per capita growth is compared between 2006-2007 and 2004. The coefficient for child districts is statistically significant in some but not all estimations, making it difficult to conclude that child districts differ from other districts in terms of economic growth.

One of the specifications is displayed graphically in Figures 3 and 4. The graphs show the distribution of the difference in GRDP per capita growth rates between 2007 and 2004 for the treatment and control groups, excluding and including

the child districts. The distributions are centered around zero. We have included the vertical dotted black lines to illustrate the cut-off points for outliers.

--Table 4 about here--

B. Alternative Dependent Variable

Indonesia is an oil-producing country and oil is concentrated in relatively few districts, mainly in East Kalimantan and the province of Riau on Sumatra. Volatility in oil prices will affect measured production and potentially bias our results. We therefore run our estimations with non-oil GRDP and non-oil GRDP per capita in Table 5. This alternative measure of economic growth has no major impact on the results. Elections have a positive and statistically significant effect when we compare GRDP growth in 2007 against 2004 and GRDP per capita growth in 2006-2007 against 2004, but the result is fragile to changes in the time period and to the inclusion or exclusion of child districts.

--Table 5 about here--

The Indonesian statistical bureau has offices collecting data in all districts. However, measuring local-level GDP is not without problems and, moreover, the quality of the staff responsible for doing so might differ between districts. It is therefore possible that GDP at a regional level might be measured with errors. This would bias our results, at least if the measurement errors within districts varied over time. As a robustness check, Table 6 therefore shows estimations with consumption

expenditure per capita as the dependent variable.¹⁶ Such information is collected in household surveys, which have been conducted for many years in Indonesia, with a standardized method. Hence, it is possible that household consumption is a more adequate measure of the economy than district-level GDP figures.

Our results remain robust when we use consumption: the coefficients for elections are never statistically significant and do not change our previous result.

--Table 6 about here--

C. Heterogeneous Effects

Elections could have different effects in more advanced parts of the country than in others. Pepinsky and Wihardja (2011: 18-19) argue that the effect of local democracy depends on initial socioeconomic conditions and leads to either a virtuous or a vicious cycle. Citizens might have better access to information in some districts, for instance because of a higher literacy rate, and would consequently be better able to hold their local government responsible when local elections were implemented. Other districts might lack those favorable conditions, and be more prone to corruption and local elite capture. We therefore follow previous studies on regional development in Indonesia and divide our sample into districts on Java and Bali – the more developed districts – and those outside of Bali and Java – that are less developed (Skoufias et al. 2011; McCulloch and Malesky 2010).

Table 7 shows the effect of elections on growth in Java and Bali and in the other regions. The coefficients are mostly positive but never statistically significant. Including the child districts in the estimations does not change the results (not

¹⁶ Data on consumption come from Statistics Indonesia and are found in McCulloch (2011: 11, 14).

shown). Hence, there is no effect of elections on economic growth, even when we control for the level of development.

--Table 7 about here--

D. Robustness Checks

A related issue is that economic growth rates might be correlated between neighboring provinces. This will not affect our estimates if the correlation is time-invariant. However, we also tried specifications where the standard errors were clustered at the province level, in order to allow for some spatial correlation between neighboring districts. The results, again, did not show any robust positive effect of democratization on economic growth: elections had a positive and statistically significant effect only in a very few specifications and were in most specifications not statistically significant.¹⁷

We continue, in Table 8, by controlling for domestic investment and FDI. It was seen above that investment was higher in the control districts. Thus, by controlling for investment, we essentially examine whether the effect of local elections on growth in the previous estimations was due to lower investment in districts with elections.¹⁸ All coefficients are positive, but only the coefficient for GRDP per capita growth in the specification for 2006-2007 compared to 2004 is statistically significant. Finally, the lack of a positive growth effect of investment might be due to a high correlation between investment and the year dummies.

¹⁷ The results are available upon request.

¹⁸ It should be noted that it is not obvious that one should control for investment since it can be argued to be endogenous to the political system.

--Table 8 about here--

We present some placebo regressions in Appendix C, Table C2. Those specifications show that no effect exists if one assumes that treatment took place in 2003 or 2004, which is in line with our overall result.

V. Governance

We continue by examining whether there is any difference in a set of governance variables between the treatment and control groups, to verify the consistency of the previous results. The effect of local elections on growth is supposed to occur via the channel of better governance, and consequently it is interesting to look at whether this channel is in operation. McCulloch (2011) and McCulloch and Malesky (2010) surveyed various governance indicators in 2007. A fortunate aspect of the survey is that it was designed to measure governance aspects related to economic growth, and targeted such areas that are under local government control (McCulloch and Malesky 2010: 10-11). Moreover, the survey was conducted in early 2007, roughly two years after the local elections had been held in the treatment group, but before the control group had held any elections.

It is not possible to make any more rigorous estimation on the effect of local elections on governance since we only have data for one year. Hence, the data only allow us to compare means between the treatment and control groups for the governance variables. This is insufficient for us to make any conclusions about the causality between elections and governance, but it can serve as a rough indication of whether our previous results could be due to a lack of differences in governance.

There are 61 different variables in Table 9, measuring different aspects of governance. These variables are also aggregated into nine broader categories covering access to information, business development programs, infrastructure, integrity, interactions with the business community, land issues, licensing, security, and transaction costs. It is worth getting back, at this point, to the previously discussed issue of how long it will take for a new local head to have an impact on economic policies. Some of the variables included here, improved infrastructure for example, are likely to take time to implement, and even longer to have an impact on economic growth. Most of the other variables, however, capture policies that are concerned with the general business climate, and which it should be possible to change in a relatively short period of time.

All variables have been normalized on a scale from 1-100, in such a way that 1 indicates the worst-performing district and 100 indicates the best-performing district. Hence, a higher value indicates better performance on the given variable, even if the variable name may indicate the contrary.¹⁹

Most indicators are not statistically different between treatment and control districts. However, in the cases where there is a significant difference, it is almost exclusively the case that the control group obtained higher scores than the treatment group. For instance, the control districts have significantly better performance on the variables relating to licensing and infrastructure. The comparison of means for the “licensing index” indicates that the average score of the control districts is 62, whereas the average of the treatment districts is 59. The corresponding figures for infrastructure are 71 for the control group and 64 for the treatment group.

¹⁹ For more information about the variables please see McCulloch and Malesky (2010) and McCulloch (2011).

There are only two variables for which the treatment group scores more highly than the control group. The first is “actions of the local government do not increase business uncertainty”, for which the treatment group scores 56 and the control group 51. The second is “existence of a communication forum”, which captures one aspect of interaction between the local government and the local business community, and for which the treatment group scores 35 and the control group 30.

In summary, this result is consistent with our earlier finding of an insignificant effect of local direct elections on growth, since the channel of better governance, which is assumed to lead to higher growth, does not appear to be present in Indonesia.

--Table 9 about here--

VI. Concluding Remarks

The issue of how democracy affects economic growth has received a great deal of interest. We have approached this issue by examining the effect of local elections on local economic growth in Indonesia. There have been large differences in economic growth between Indonesian districts and there are also several case studies that suggest that governance differs between districts. However, our results do not find any evidence that these differences are caused by differences in the degree of democracy: there is no general effect of direct local elections on local economic growth in Indonesia. There is a statistically significant and positive effect of elections in some estimations but the result is very fragile to changes in the specifications. The interpretation is that citizens do not choose higher-quality persons as district heads than those appointed in an indirect way through the local parliament.

The lack of a growth effect suggests that local governance is not affected by local elections in Indonesia. This is confirmed when we compare many different indicators of governance in districts with and without elections. Governance is rather similar in the two groups of districts and, when there are significant differences, the situation is often better in the districts, without direct elections. Districts with direct elections receive better scores than districts without direct elections in only 2 out of the 61 variables capturing various aspects of governance.

There are obvious limitations on the generalizability of our results to a general effect of elections on economic growth. The most important limitations are that the growth effect of national elections might differ from that of local elections, and that it might take a longer time period than the one we are able to examine before the effect on growth emerges. These limitations notwithstanding, we do believe that our paper complements the existing literature in some important respects. Most importantly, our approach has enabled us to overcome the problem of endogeneity, which is likely to have plagued previous studies, and thereby allow us to estimate a causal effect of elections on economic growth.

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Table 1. Distribution of year in which local election was held for the first time, 2009 district borders used

Year of local election	2005	2006	2007	2008	2009	2010	2011	2012	Total
Number of districts	225	79	41	127	1	11	4	3	491
Percentage of total	46%	16%	8%	26%	0%	2%	1%	1%	100%

Table 2. Baseline Population, 2003 district borders used

Number of districts		434
Deleted, election year 2006 or 2007		- 99
Deleted, unclear treatment status		- 12
<hr/>		
Total population	=	323
Treatment		+ 202
Control		+ 121

Table 3. Districts that split, and the child and parent districts within groups, 2003 district borders used

Variable	Groups			P-value for equality across groups
	Treatment	Control	Deleted	
Dummy for split (ie. child or parent)	0.5792	0.4298	0.6364	0.0045
Dummy for child	0.3416	0.1818	0.4141	0.0005
Dummy for parent	0.2376	0.2479	0.2222	0.9055

The P-value in the last column is for the F-test of equality of variable means across all three groups.

Table 4. Growth in districts with and without elections

	2007 compared to 2004		2006-2007 compared to 2004		2007 compared to 2003-2004		2006-2007 compared to 2003-2004		2006-2007 compared to 2002-2004		2006-2010 compared to 2002-2004	
	No Child	Whole pop	No Child	Whole pop	No Child	Whole pop	No Child	Whole pop	No Child	Whole pop	No Child	Whole pop
GRDP												
Diff-in-diff	0.00701 (0.00492)	0.00197 (0.00518)	0.00634 (0.00707)	0.00462 (0.00614)	0.000482 (0.00187)	-0.0000501 (0.00194)	0.000736 (0.00273)	0.000510 (0.00266)	0.000665 (0.00264)	0.000192 (0.00260)	0.00159 (0.00184)	-0.00014 (0.00206)
Child district		0.00494 (0.00467)		0.0124* (0.00676)		0.0149** (0.00680)		0.0159* (0.00907)		0.0171* (0.00909)		0.0128* (0.00742)
Prob of F-test (1)		0.569		0.180		0.0830		0.212		0.172		0.204
# obs	464	599	681	859	615	648	814	858	1,020	1,075	1845	1944
GRDP per capita												
Diff-in-diff	0.00274 (0.00357)	0.00295 (0.00458)	0.00758 (0.00563)	0.0113* (0.00601)	0.000785 (0.00334)	0.000359 (0.00324)	0.00618 (0.00481)	0.00460 (0.00468)	0.00575 (0.00426)	0.00338 (0.00425)	0.00261 (0.00276)	-0.000142 (0.003)
Child district		0.000294 (0.00395)		-0.00658 (0.00521)		-0.00850 (0.00591)		-0.0137*** (0.00512)		-0.00886 (0.00690)		-0.00752 (0.00509)
Prob of F-test (1)		0.690		0.109		0.349		0.0184		0.350		0.323
# obs	463	596	686	859	615	648	813	857	1,020	1,076	1847	1947
# districts	232	322	232	322	207	219	207	219	207	219	207	219
Border year	2003	2003	2003	2003	1999	1999	1999	1999	1999	1999	1999	1999

Note: Standard errors in parentheses. *, **, and *** are significance at the 10, 5, and 1 percent level respectively.

(1) refers to F-test of joint significance of the diff-in-diff coefficient and child dummy coefficient being equal to zero

Table 5. Growth (excluding oil) in districts with and without elections

	2007 compared to 2004		2006-2007 compared to 2004		2007 compared to 2003-2004		2006-2007 compared to 2003-2004		2006-2007 compared to 2002-2004		2006-2010 compared to 2002-2004	
	No Child	Whole pop	No Child	Whole pop	No Child	Whole pop	No Child	Whole pop	No Child	Whole pop	No Child	Whole pop
GRDP excluding oil												
Diff-in-diff estimate	0.00857* (0.00495)	0.00213 (0.00518)	0.00751 (0.00758)	0.00394 (0.00647)	0.000650 (0.00194)	0.0000266 (0.00200)	0.00285 (0.00330)	0.00239 (0.00316)	0.00341 (0.00317)	0.00315 (0.00303)	0.00270 (0.00189)	0.00123 (0.00208)
Child district		0.00579 (0.00460)		0.0137** (0.00666)		0.0183*** (0.00693)		0.0185** (0.00935)		0.0167* (0.00986)		0.0142* (0.00741)
Prob of F-test (1)		0.447		0.121		0.0276		0.102		0.124		0.0666
# obs	464	599	682	858	616	648	816	858	1,021	1,075	1,846	1,945
GRDP per capita excluding oil												
Diff-in-diff estimate	0.00423 (0.00354)	0.00307 (0.00458)	0.00914 (0.00566)	0.0117* (0.00600)	0.00150 (0.00331)	0.00108 (0.00319)	0.00457 (0.00540)	0.00294 (0.00524)	0.00456 (0.00494)	0.00228 (0.00487)	0.00190 (0.00286)	-0.000685 (0.00308)
Child district		0.00116 (0.00375)		-0.00818* (0.00449)		-0.00694 (0.00599)		-0.0124** (0.00556)		-0.00828 (0.00694)		-0.00566 (0.00467)
Prob of F-test (1)		0.526		0.0679		0.460		0.0734		0.455		0.440
# obs	463	596	686	858	614	647	814	857	1,021	1,076	1,848	1,948
# districts	232	323	232	323	207	219	207	219	207	219	207	219
Border year	2003	2003	2003	2003	1999	1999	1999	1999	1999	1999	1999	1999

Note: Standard errors in parentheses. *, **, and *** are significance at the 10, 5, and 1 percent level respectively.

(1) refers to F-test of joint significance of the diff-in-diff coefficient and child dummy coefficient being equal to zero

Table 6. Robustness Check

	2007 compared to 2004		2006-2007 compared to 2004		2007 compared to 2003-2004		2006-2007 compared to 2003-2004		2006-2007 compared to 2002-2004	
	No Child	Whole pop	No Child	Whole pop	No Child	Whole pop	No Child	Whole pop	No Child	Whole pop
Expenditure per capita										
Diff-in-diff estimate	-0.0180 (0.0157)	-0.0170 (0.0154)	-0.00695 (0.0145)	-0.00636 (0.0141)	-0.00349 (0.0117)	-0.00561 (0.0119)	0.00757 (0.0103)	0.00520 (0.0102)	0.00570 (0.00929)	0.00499 (0.00918)
Child district		-0.000347 (0.0203)		0.00593 (0.0117)		0.0282 (0.0172)		0.0262* (0.0139)		0.0196* (0.0103)
Prob of F-test (1)		0.544		0.797		0.244		0.138		0.126
# obs	410	432	610	642	613	645	813	855	1,012	1,064
# districts	207	219	207	219	207	219	207	219	207	219
Border year	1999	1999	1999	1999	1999	1999	1999	1999	1999	1999

Note: Standard errors in parentheses. *, **, and *** are significance at the 10, 5, and 1 percent level respectively.

(1) refers to F-test of joint significance of the diff-in-diff coefficient and child dummy coefficient being equal to zero

Table 7. Growth in districts with and without elections and by different development levels

	2007 compared to 2004		2006-2007 compared to 2004		2007 compared to 2003-2004		2006-2007 compared to 2003-2004		2006-2007 compared to 2002-2004		2006-2010 compared to 2002-2004	
	Java, Bali	Other	Java, Bali	Other	Java, Bali	Other	Java, Bali	Other	Java, Bali	Other	Java, Bali	Other
GRDP												
Diff-in-diff estimate	0.00301 (0.00272)	0.00941 (0.00789)	0.00449 (0.00495)	0.00865 (0.0110)	0.00330 (0.00229)	-0.00168 (0.00281)	0.00278 (0.00464)	-0.000461 (0.00330)	0.00192 (0.00468)	0.000254 (0.00297)	0.00340 (0.00270)	0.0000232 (0.00248)
GRDP per capita												
Diff-in-diff estimate	0.00256 (0.00413)	0.00293 (0.00515)	0.00540 (0.00849)	0.00964 (0.00737)	0.00152 (0.00438)	0.0000822 (0.00491)	0.00499 (0.00737)	0.00924 (0.00633)	0.00494 (0.00660)	0.00859 (0.00546)	0.00262 (0.00412)	0.00261 (0.00377)
# obs	174, 174	290, 289	256, 258	425, 428	269, 270	346, 345	353, 345	461, 459	443, 444	577, 576	801, 803	1044, 1044
# districts	87	145	87	145	90	117	90	117	90	117	90	117
Border year	2003	2003	2003	2003	1999	1999	1999	1999	1999	1999	1999	1999

Note: Standard errors in parentheses. *, **, and *** are significance at the 10, 5, and 1 percent level respectively

Table 8. Growth in districts with and without elections. Controlling for investment

	2007 compared to 2004	2006-2007 compared to 2004	2007 compared to 2003-2004	2006-2007 compared to 2003-2004
GRDP				
Diff-in-diff estimate	0.00394 (0.00267)	0.00316 (0.00346)	0.00230 (0.00257)	0.00232 (0.00349)
Growth in FDI	0.000565*** (0.000182)	-0.00001 (4.46e-05)	0.000265** (0.000121)	-0.00000943 (4.41e-05)
Growth in domestic investment	0.0000268 (0.000459)	-0.000150 (0.000120)	0.000213 (0.000365)	-0.000133 (0.000118)
GRDP per capita				
Diff-in-diff estimate	0.00703 (0.00442)	0.0127** (0.00610)	0.00101 (0.00425)	0.00732 (0.00592)
Growth in FDI	0.000687*** (0.000240)	-0.0000896 (5.79e-05)	0.000791** (0.000346)	-0.0000773 (5.83e-05)
Growth in domestic investment	-0.000369 (0.000595)	-0.000433*** (0.000143)	-6.38e-05 (0.000565)	-0.000400*** (0.000142)
# obs	268, 270	439, 440	386, 389	557, 559
# districts	153	179	153	179
Border year	1999	1999	1999	1999

Note: Standard errors in parentheses. *, **, and *** are significance at the 10, 5, and 1 percent level respectively

Table 9. Comparison of Governance Characteristics in Treatment and Control Group, 1999 district border used

Variable	Population excl. child districts		
	Mean of Treatment	Mean of Control	P-value*
Access to Information Index	47.3835	46.9857	0.8181
Ever tried to access government information	14.6758	14.8859	0.9272
Overall impact of access to information on firm activities	80.0911	78.6054	0.6276
Business Development Programs Index	42.2360	41.0289	0.5473
Average share of firms saying 6 programs exist	30.4384	28.9508	0.5855
Average share of firms participating in 6 programs	34.3160	33.3354	0.7568
Average satisfaction with the programs	66.6743	67.4144	0.8061
Overall impact of business development programs on firm activities	37.5154	34.4149	0.3850
Infrastructure Index	64.4202	71.3220	0.0004
Evaluation of quality of roads	55.5132	59.4325	0.0799
Evaluation of quality of street lighting	67.1536	70.6353	0.2012
Evaluation of quality of local water supply	63.9286	67.1282	0.2818
Evaluation of quality of electricity	65.8537	74.1816	0.0004
Evaluation of quality of telephone	62.3158	63.4209	0.6192
Log time to fix roads	42.5405	49.6406	0.0184
Log time to fix street lighting	66.9028	74.0667	0.0052
Log time to fix local water supply	68.1421	75.7289	0.0141
Log time to fix electricity	84.5943	92.3831	0.0041
Log time to fix telephone	79.5713	84.5864	0.0735
Ownership of a generator	63.5738	70.5044	0.0390
Frequency of blackouts	82.7473	91.4696	0.0021
Overall impact of infrastructure on firm activities	53.2030	62.0601	0.0131
Integrity Index	56.8994	56.1623	0.6907
District head's understanding of business issues	53.0163	53.8084	0.7781
Local officials appointed based on relevant skills	52.9411	55.6522	0.3112
District head takes strong action against corruption	58.1815	55.6228	0.3251
District head (doesn't) take corrupt actions himself	42.5479	39.7922	0.2576
District head is a strong leader	51.1622	49.4138	0.5522
Overall impact of the capacity and integrity of the district head on firm activities	83.5470	82.6842	0.7350
Interaction between Local Government and Businesses Index	54.9808	53.5609	0.3738
Existence of a communication forum	35.1287	30.4056	0.0895
Composite of: does the leader try to solve business problems; do the solutions meet your expectations; do the officials follow up	51.3178	51.7826	0.8635
Actions of the local government do not increase business costs	66.9454	63.5393	0.1454
Actions of local government do not increase business uncertainty	55.7429	51.1192	0.0893
Overall impact of issues associated with interaction on firm activities	72.7089	72.8598	0.9587

Land Index	70.0053	71.9791	0.2545
Weeks to get a land certificate	73.7669	77.0812	0.2644
Ease of getting land	43.8105	45.7408	0.5656
Infrequency of eviction in this area	78.2108	78.5043	0.9314
Infrequency of land conflict	79.8830	82.2889	0.3527
Overall constraint of land issues and legal uncertainty on firm activities	74.3551	76.2802	0.4729
Licensing Index	59.3906	61.7131	0.0931
Percentage of firms that have a TDP**	45.8187	49.1504	0.3025
Average of: ease of getting a TDP and mean days to get a TDP	73.3175	75.6025	0.1522
-of which			
ease of getting TDP	58.7185	62.0178	0.1207
mean days to get TDP	87.9164	89.1872	0.4319
Average of: cost of TDP and whether cost bothers them	79.9934	85.1424	0.0251
-of which			
cost of TDP	89.6803	94.0187	0.0186
whether cost bothers them	71.1555	76.2661	0.1421
Combined score of three measures of efficiency of licensing	52.2617	52.9110	0.8261
-of which			
business licensing is carried out in an efficient manner	51.5532	54.5684	0.2383
business licensing is free of illegal collections	56.2699	54.8029	0.6726
business licensing is free of collusion with officials	48.9620	49.3616	0.9061
Percentage of firms that say there is a complaint mechanism	29.5870	30.2586	0.8548
Overall constraint of licensing on firm activities	75.3655	77.2136	0.5032
Security Index	60.8261	59.8688	0.6186
Composite opinion of how police handle cases	48.1902	48.2955	0.9681
Quality of the police in dealing with worker demonstrations	46.8573	48.3919	0.5076
Overall constraint of security on firm activities	75.3791	73.3422	0.5181
Transaction Costs Index	67.4260	66.9895	0.8387
How much does paying user charges bother the firm	64.5330	66.2704	0.6376
Existence of user charges on the distribution of goods	66.6497	64.4591	0.5714
Composite of: existence of voluntary donations and how much they bother you	63.5834	62.6658	0.6889
-of which:			
Incidence of paying donations	52.0981	45.9010	0.1271
Donation impact of firm performance	75.0687	79.4307	0.0958
Security payments to the police	71.4951	70.0634	0.6663
Overall constraint of transaction costs on firm activities	70.7579	71.4889	0.8118

Note: *The P-value is for the t-test of equality of variable means across groups.**TDP= business license.
Source: The variables are from McCulloch's dataset (2011). The table is essentially a replica of McCulloch and Malesky's Table 2 (2010: 15), but uses a division between treatment and control districts.

Figure 1. The distribution of treatment and control districts in Indonesia

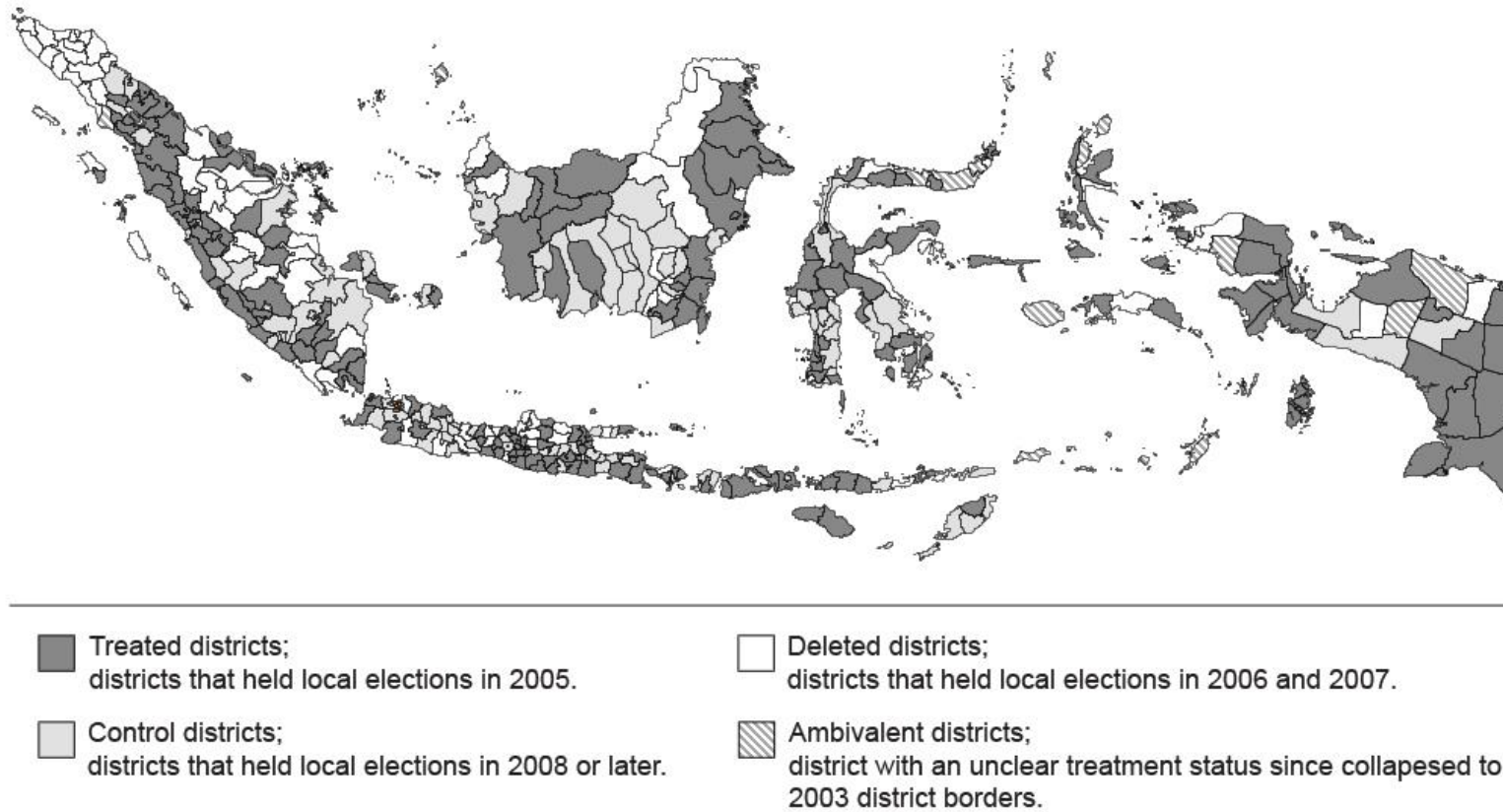


Figure 2. Economic growth in treatment and control districts 2002-2010

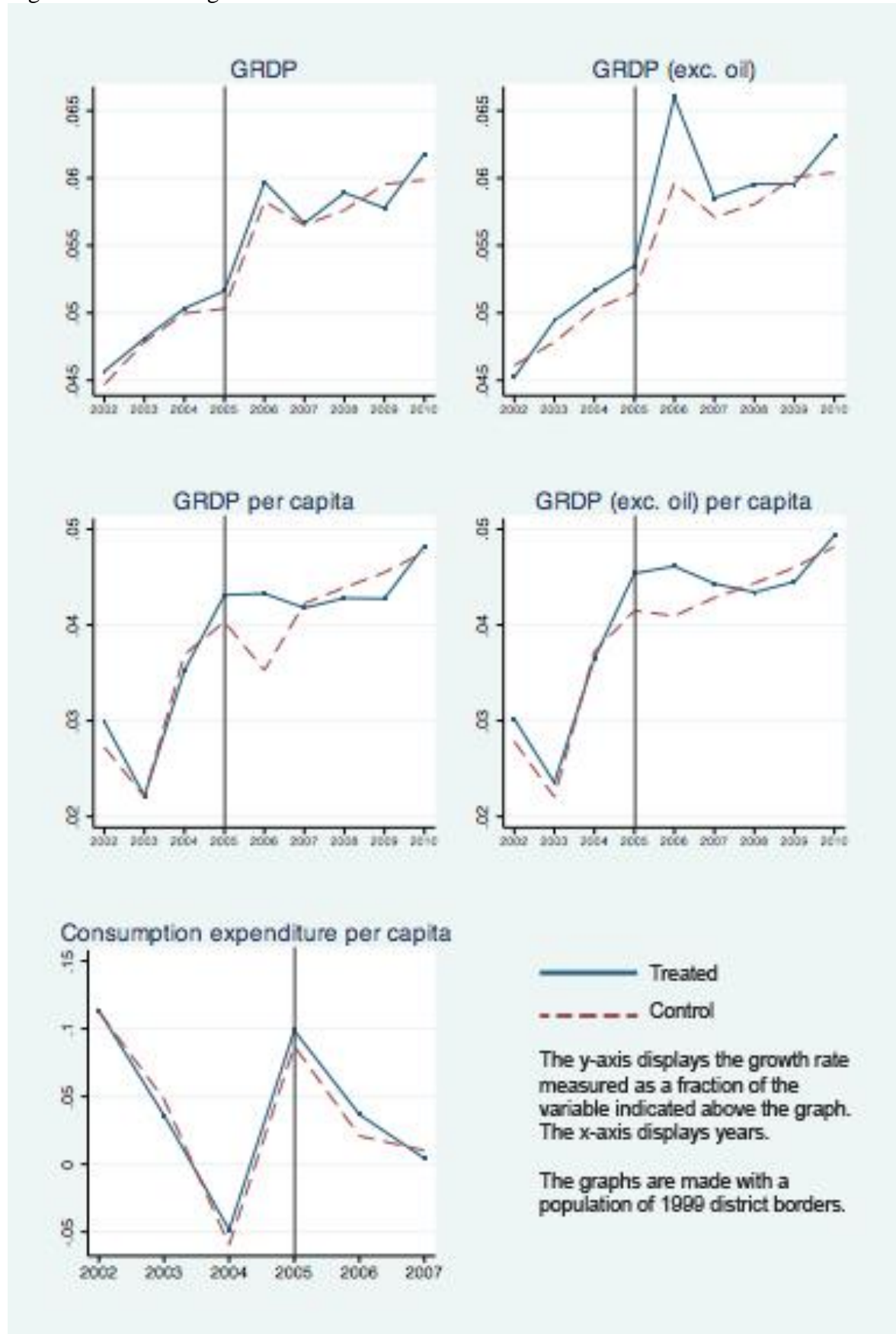


Figure 3. Distribution of difference in GRDP per capita growth 2007-2004 in treatment and control districts, excluding child districts

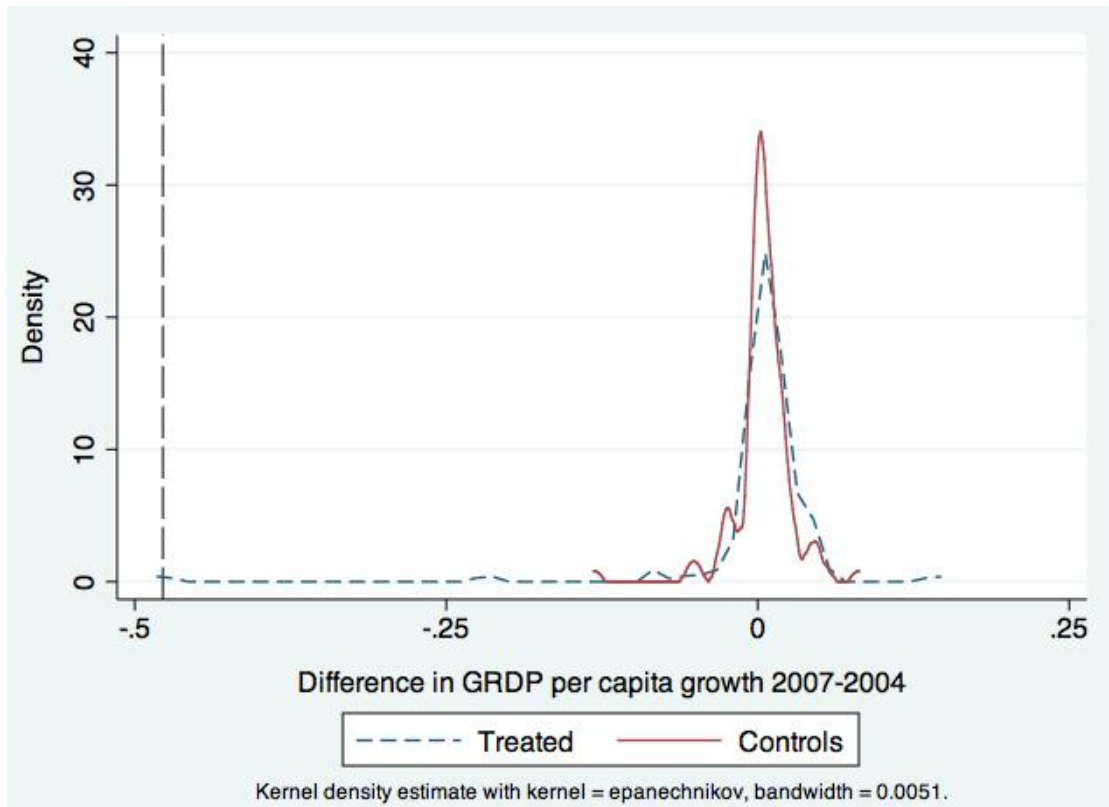
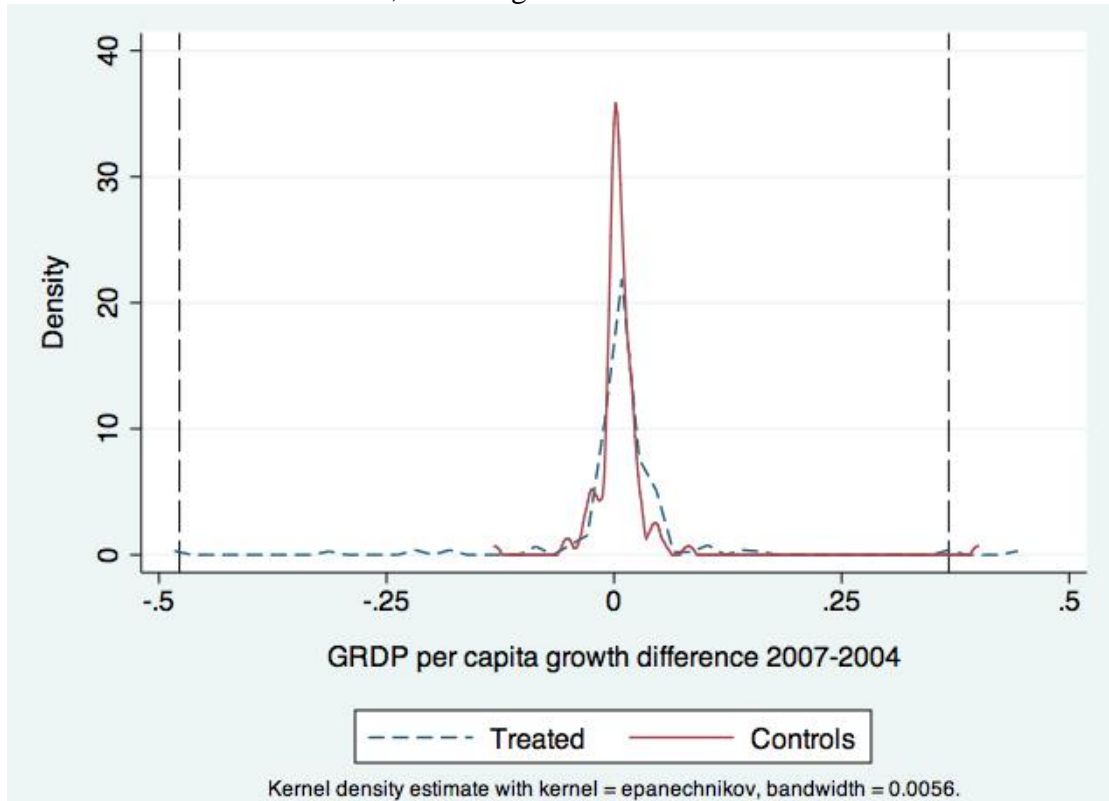


Figure 4. Distribution of difference in GRDP per capita growth 2007-2004 in treatment and control districts, including child districts



Appendix A

Specification of data sources

1. Data on local elections

Indonesian Ministry of Home Affairs

2. GRDP data

Statistics Indonesia, *Badan Pusat Statistik* (BPS)

- “Gross Regional Domestic Product of Regencies/Municipalities in Indonesia 2006-2010”
- “Gross Regional Domestic Product of Regencies/Municipalities in Indonesia 2003-2007”

3. Data on when new districts are formed

Indonesian Ministry of Home Affairs

4. Conversion between districts in different years

Statistics Indonesia, *Badan Pusat Statistik* (BPS)

- “Master File Kabupaten 1993-2002”
- “Master File Kabupaten 2003-2009”

Downloaded 2012-04-20 from:

www.bps.go.id

5. McCulloch, N., 2011 b. “The Indonesian Sub-National Growth and Governance Dataset.”

Downloaded 2012-03-15 from:

www.ids.ac.uk/idsproject/measuring-the-impact-of-better-local-governance-in-indonesia

Appendix B. Definition of variables

Variable	Concern
Year of local election	The year of election is measured as the first year a geographical area held local elections, even though a subsequent election might have been held in the same geographical area later because a new district was created. Furthermore, in the few cases when the first and second rounds of elections were held in different years, the year of the first round of elections is recorded.
Year of district's borders	The year of district's borders refers to when the parliament passed the law to create the district. Different sources are not congruent and the approach taken is to follow BPS's dataset "Master File Kabupaten".
Dummy of split	Districts may experience many splits, or subdivide into more than two districts. The dummy of district splits is calculated as 1 if any part of the measured district experienced one or many splits.

Appendix C

Table C1. Descriptive Statistics and Balance, 1999 district border used

Variable	Treatment group		Delete group		Control group		P-value for equality across all 3 groups	P-value for equality across treatment and control group
	Mean	Standard error	Mean	Standard error	Mean	Standard error		
General characteristics								
Dummy for split (own source)	0.2975	0.0417	0.2708	0.0648	0.1977	0.0432	0.2672	0.1058
Distance district to province's capital	125.8611	12.0088	97.3514	12.6312	100.7132	10.0590	0.1749	0.1309
Distance district to the capital Jakarta	1015.1310	59.7371	926.1877	89.8845	824.9090	65.3734	0.1057	0.0353
Total district revenue, billion (SIKD)	239	16	229	17	231	13	0.8947	0.7236
Total district revenue per capita, billion	594347	55919	566047	97262	485100	35693	0.3647	0.1353
Social characteristics								
Population (BPS)	607015.3000	45864.2800	650056.4000	75369.7600	715679.9000	67896.8400	0.3802	0.1702
Population (Susenas)	597070.2000	45122.5700	711965.6000	88422.7800	709826.6000	67437.1400	0.2767	0.1502
Poverty headcount (BPS)	21.2553	1.0171	21.6289	1.4463	20.1867	1.1811	0.7042	0.4953
Real average annual per capita expenditure (Susenas)	1917723.0000	46532.3800	1909841.0000	102831.1000	1917091.0000	59656.0600	0.9969	0.9932
Urbanization (Susenas)	0.3850	0.0299	0.3933	0.0517	0.4635	0.0358	0.2200	0.0934
People in primary school age 7-12 years (Susenas)	74475.9800	5545.2330	92688.6800	12001.7000	90423.8000	9255.1340	0.1996	0.1196
People in primary school age 7-12 year (share of population)	0.1291	0.0022	0.1284	0.0034	0.1272	0.0022	0.8390	0.5591
Share of people ever being in primary school per total population (Susenas)	0.4447	0.0078	0.4591	0.0193	0.4487	0.0104	0.7192	0.7521
Unemployment rate (Susenas)	0.0387	0.0023	0.0436	0.0046	0.0464	0.0033	0.1348	0.0481

Ethno-linguistic Fragmentation Index, 2000 (Census)	0.4168	0.0315	0.3475	0.0468	0.3807	0.0354	0.4503	0.4540
Religion Fragmentation Index, 2000 (Census)	0.2042	0.0206	0.1010	0.0219	0.1405	0.0181	0.0040	0.0294
Number of Telephone Subscribers, 2000 (PODES)	7596.6050	1421.9880	5612.1520	924.8616	12699.1900	2640.0390	0.0523	0.0710
Telephone access per household, 2000 (PODES)	0.0634	0.0076	0.0590	0.0111	0.0828	0.0100	0.1805	0.1168
Road Quality: 1 good - 4 worst, 2000 (PODES)	1.4470	0.0329	1.4240	0.0473	1.4353	0.0409	0.9283	0.8219
Number of villages with asphalt roads, 2000 (PODES)	109.4561	6.8740	129.1739	13.0705	108.4353	9.0785	0.3066	0.9273
Governance characteristics								
Number of corruption cases covered by media, 2004 (ICW)	1.6053	0.1281	1.5909	0.2247	1.6176	0.1463	0.9938	0.9492
KPPOD score: Institution, 2002 (KPPOD)	0.0523	0.0021	0.0569	0.0031	0.0531	0.0022	0.5675	0.7736
KPPOD score: Social, 2002 (KPPOD)	0.0548	0.0027	0.0601	0.0054	0.0538	0.0031	0.5849	0.8224
KPPOD score: Economic, 2002 (KPPOD)	0.0336	0.0018	0.0332	0.0040	0.0278	0.0019	0.0805	0.0273
KPPOD score: Labor, 2002 (KPPOD)	0.0290	0.0019	0.0236	0.0030	0.0273	0.0018	0.3505	0.5244
KPPOD score: Infrastructure, 2002 (KPPOD)	0.0270	0.0012	0.0271	0.0022	0.0279	0.0011	0.8459	0.5750
Economic characteristics								
Real income, GRDP, billion (BPS)	3460	536	3540	808	3530	438	0.9941	0.9277
Real income, GRDP, without oil & gas, billion (BPS)	3040	470	2870	684	3450	433	0.7511	0.5410
Real income, GRDP, 2003, billion (Own source)	3758.5950	575.1361	3993.0710	934.7727	3869.6200	479.9517	0.9706	0.8888
Real income per capita, GRDP, 2003, thousand (Own source)	5784	562	6001	1043	5832	822	0.9831	0.9609
Sectoral breakdown of GRDP, billion (BPS):								
Agriculture	714	60	768	96	681	73	0.7729	0.7264
Mining, Quarrying, Oil & Gas Manufacturing	529	256	725	375	154	59	0.3457	0.2450
Non Oil & Gas Manufacturing	696	172	833	563	1070	266	0.5816	0.2150
Electricity, Gas & Water Supply	38	10	30	12	53	14	0.4701	0.3702
Construction	172	39	135	22	142	17	0.7074	0.5308
Trade, Restaurant & Hotel	654	144	560	98	753	105	0.6867	0.6091
Transportation and Communication	216	47	157	24	228	38	0.6212	0.8450
Financial Services	153	35	100	15	145	19	0.5568	0.8545
Services	304	38	267	30	316	33	0.7284	0.8163
Sectoral breakdown of GRDP (BPS):								

Share of agriculture to total GRDP	0.3264	0.0165	0.3336	0.0273	0.2996	0.0221	0.5118	0.3231
Share of mining to total GRDP	0.0542	0.0134	0.0684	0.0257	0.0478	0.0130	0.7379	0.7466
Share of non oil & gas manufacturing to total GRDP	0.1420	0.0114	0.1212	0.0205	0.1615	0.0179	0.2872	0.3390
Share of electricity to total GRDP	0.0082	0.0007	0.0077	0.0011	0.0104	0.0011	0.1159	0.0816
Share of construction to total GRDP	0.0544	0.0031	0.0571	0.0058	0.0491	0.0030	0.3459	0.2348
Share of trade to total GRDP	0.1721	0.0068	0.1825	0.0104	0.1990	0.0092	0.0521	0.0171
Share of transportation to total GRDP	0.0674	0.0051	0.0655	0.0080	0.0686	0.0059	0.9528	0.8785
Share of financial service to total GRDP	0.0462	0.0028	0.0412	0.0042	0.0473	0.0030	0.4975	0.7782
Share of service to total GRDP	0.1304	0.0058	0.1256	0.0103	0.1216	0.0064	0.6156	0.3146
Value of FDI Realization, 2003, million US\$ (Bkpm)	141.7713	19.1694	142.1575	45.2559	340.4000	46.1630	0.0000	0.0000
- as percentage of current district GDP	0.0062	0.0010	0.0041	0.0011	0.0106	0.0015	0.0032	0.0128
Value of domestic direct investment realization, 2003, billion (Bkpm)	435.6108	57.5547	489.5483	131.4359	894.4226	122.2585	0.0009	0.0003
- as share of current district GDP	0.1413	0.0187	0.1050	0.0210	0.2058	0.0313	0.0405	0.0646

Note: A specific variable refers to the value 2001 unless otherwise stated. The number of observation is between 94 and 292. The P-value in the last columns is for a F-test of equality of variable means across groups.

Source: McCulloch (2011). Abbreviations within parentheses after each variable identify other specific sources.

Table C2. Placebo regressions

	Treatment=2003				Treatment=2004			
	2005 compared to 2002		2004-2007 compared to 2002		2006 compared to 2003		2005-2007 compared to 2002-2003	
	No Child	Whole pop	No Child	Whole pop	No Child	Whole pop	No Child	Whole pop
GRDP								
Diff-in-diff	0.00133 (0.00236)	0.0000243 (0.00275)	0.000402 (0.00239)	-0.000457 (0.00269)	0.000442 (0.00486)	0.00110 (0.00486)	0.000624 (0.00235)	0.000207 (0.00243)
Child district		0.0164 (0.0135)		0.0170 (0.0116)		0.0151 (0.00948)		0.0144 (0.00894)
Prob of F-test (1)		0.474		0.343		0.284		0.275
# obs	412	434	1,023	1,079	402	423	1,020	1,075
GRDP per capita								
Diff-in-diff	0.00234 (0.00516)	0.0000648 (0.00541)	0.00221 (0.00296)	-0.000545 (0.00353)	0.00982 (0.00906)	0.00887 (0.00888)	0.00369 (0.00390)	0.00217 (0.00402)
Child district		0.00683 (0.0163)		-0.00154 (0.00915)		-0.0324*** (0.00676)		-0.0113 (0.00744)
Prob of F-test (1)		0.915		0.970		0.0000132		0.278
# obs	414	437	1,026	1,083	399	420	1,020	1,076
# districts	207	219	207	219	206	218	207	219
Border year	1999	1999	1999	1999	1999	1999	1999	1999

Note: Standard errors in parentheses. *, **, and *** are significance at the 10, 5, and 1 percent level respectively

(1) refers to F-test of joint significance of the diff-in-diff coefficient and child dummy coefficient being equal to zero