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The Causal Effect of Local Elections on Economic Growth - Using a Natural Experiment in Indonesia

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Abstract

Does democracy increase economic growth? This thesis has narrowed down the question to empirically estimating the causal effect of local elections of district heads on economic growth in Indonesia by using a quasi-experimental research method, or “natural experiment” approach. In Indonesia the first elections of district heads were performed in a staggered manner, and decided such that the year of election is as good as exogenous, or random. Thus, the districts that held their first elections in 2005 can be compared with the districts that held their first elections in 2008 or later, which more specifically is performed by using difference-in-difference estimation. The research methodology is innovative and more reliable than previous attempts to capture the causal effect of democracy on growth. The empirical assessment indicates an insignificant effect of local elections on economic growth, except for a significant and positive effect of local elections on growth for the districts of the two more economically- advanced islands, Java and Bali. The main reason behind the insignificant result presented is thought to be heterogeneous effects, that districts react differently to local elections dependent on initial characteristics. However, a limitation is that the time horizon investigated is the effect on growth rates three to five years after elections. Hopefully the results can serve as a reference case for other developing countries, and guide ongoing reform initiatives in Indonesia.

Keywords: democracy, local elections, growth, developing country, empirical

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Table of Contents

1. Introduction	1
2. Indonesia: placing local election in a context	4
2.1. A snapshot of Indonesia	4
2.2. A democratic transition topped-up with large-scale decentralization	4
2.3. Local election of district heads	5
2.4. Short description of government structure	5
3. Theoretical and empirical contributions	7
3.1. Theory	7
3.1.1. Voice	7
3.1.2. Exit	9
3.2. Previous empirical research	9
3.2.1. Cross-country research	9
3.2.2. Subnational research and case studies	11
3.3. Conclusion of theoretical and empirical review	12
4. Method and Data	13
4.1. Short description and evaluation of method	13
4.2. Data	14
4.4. Specification of treatment status	15
4.5. Discussion surrounding defining the population and exogeneity	16
4.6. Population for comparison of governance characteristics	18
4.7. Econometric specification	18
5. Results	21
5.1. Balance	21
5.2. The parallel trend assumption	22
5.3. Difference-in-Difference estimation	25
5.6. Comparison of governance characteristics	32
6. Conclusion	35
7. References	39
Appendix A	42
Section A1. Specification of data sources	42
Section A2. Choices of concern in defining variables	43
Section A3. Presentation of the four different specifications	43
Appendix B	44

1. Introduction

This thesis empirically estimates the effect of local elections on district economic growth in Indonesia by using a quasi-experimental research method, i.e. a “natural experiment” approach.

Is democracy beneficial for growth? Democracy as a concept is part of a wider political, economic and social landscape and hence confounding factors prevent giving any clear answer. Democracy is thought to be an antidote for much of the pain in the world, specifically poverty and corruption. Democracy is promoted at an international level, through indirect normative stands such as the endorsement of the right to self-determination by the UN Declaration of Human Rights, to direct policy such as the prerequisite for EU candidate countries to be democratic (United Nations 1948, Article 21(3) and European Commission).

The debate of the effect of democracy on income and economic growth is ongoing. It is easy to conclude that most developed western countries are democracies. It seems to suggest that democracy and income go hand in hand. But, non-democratic China is at present considered a growth-miracle. Another example is non-democratic Singapore, today one of the world’s richest countries. Does democracy cause higher growth rates? Most empirical cross-country research suffers from econometric problems ¹. One of them relates to the question of causality; do countries have higher growth rates because they are democratic, or are higher growth rates, or income, a factor behind whether a country becomes democratic? With a suitable natural experiment the question about causality can be entangled. This thesis does exactly that by using a “natural experiment”- context present at district-level in Indonesia, and hence, does not suffer from the same econometric problems. Thus, this thesis adds an investigation into the causal effect of local elections on district growth to the present body of research. A “natural experiment” of democracy can by necessity only arise at local level, and consequently the concept of democracy is more narrowly investigated as local elections in this thesis.

In the last 20 years, academia and policy-makers have focused on institutions. Elections appear to be one solution to build better institutions, to improve governance, which in turn should increase growth ². However, the experience in the field also includes instances of local elite capture, that local elites gain power with adverse effects for the local community (United Nations Human Development Programme 2010, p.70, Bradhan

¹ See eg. Przeworski and Limongi 1993, Barro 1996, Mulligan et al 2004, Persson and Tabellini 2006, Acemoglu et al 2008.

² For a recent overview of the research field of institutions and economic growth see Helpman (2008).

2002). With this focus, donor countries and international organizations have explicitly stated capacity building at local level as objectives for enhancing governance. For example, Swedish official development aid is currently being channeled to strengthen local democracy (Swedish International Centre for Local Democracy). Hence, investigating and nuancing this picture carries interesting policy implications.

A related aspect is that subnational government might not be as important for growth as national ones, as many growth-enhancing policies are mainly allocated on a national level, such as national stability, property rights and rule of law. Further investigation into the importance of subnational government will undoubtedly add to our understanding.

Indonesia provides a good context for testing the effects of local elections on economic growth since local elections were introduced in a randomized way. Local elections were held for the first time in different years in different districts as part of Indonesia's decentralization process. The year of local election is dependent on when the incumbent district head's term was due, which in turn is dependent on when district heads historically had been installed by the former authoritarian regime. Thus, the year of local election is stated to be exogenous, or as good as random (Burgess et al 2011, Skoufias et al 2011). This, combined with the richness of annual data on district level, allows for difference-in-difference estimation, which in essence captures the causal effect by comparing growth rates between districts that had local elections earlier against the districts that had none until later.

One limitation of the present research design is that the time-span measured might be too short. At most, the effect of local elections on growth can be estimated five years after implementation. Therefore it should be beneficial for further research to focus on other outcome variables, such as effects in healthcare and education, which also is interesting in its own right. Additionally, this thesis is delimited to focusing on estimating which effect is present and not on explaining why a specific effect arises. However, a very limited part of this thesis is a simple comparison of governance characteristics between the districts that had election earlier and the ones that had them later. This is performed because the main theoretical channel of the effect of local election on growth, at least in the short run, is assumed to go via decreased corruption and rent-seeking. A further delimitation is that no comparison between Indonesia and other countries is performed.

The results hopefully can shed light on the usefulness of local election, especially in developing countries, by using Indonesia as a reference. A result from one country, such as Indonesia, is hard to generalize, but the present methodology overcomes econometric problems that limit the value of the results of cross-country studies. Addition-

ally, the evaluation of local elections in Indonesia enlightens questions surrounding the country's search for the right democratic balance, in the presence of corruption and an authoritarian past.

The thesis proceeds as follows. Firstly, a description of Indonesia places local elections in context, and additionally tries to provide a quick understanding of the country in general. Then, theoretical and previous empirical contributions of the effect of democracy on growth are reviewed. Thirdly, the research methodology and related aspects are presented. A presentation of the result and a discussion binding the thesis together concludes.

2. Indonesia: placing local election in a context

2.1. A snapshot of Indonesia

Indonesia is a vast country in South-East Asia consisting of 18 000 islands spanning four time zones. It has approximately 230 million inhabitants and as of 2011 has the status of a middle-income country (Utrikespolitiska Institutet 2012, U.S. Department of State 2010, p.1). Approximately one fourth of the population live in poverty, and many more are vulnerable to falling into this category (Utrikesdepartementet 2011, p.13, The World Bank 2009, p.7-8). The heterogeneity of the population, both along linguistic, ethnic and religious lines, is one of the country's hallmarks. Most sources state that around 400 languages are spoken. Another distinguishing feature is Indonesia's pervasive corruption, which usually places the country low in cross-country rankings (Utrikespolitiska Institutet 2012, The World Bank 2009, p. XVII, 70). Economic activity is highly concentrated in the economic centers of the two populous islands Java and Bali. Disparities between those islands, and the more poverty-ridden regions towards the east are large. Some areas of Indonesia possess considerable reserves of natural resources, most notably oil and gas. Indonesia is at present considered to have large economic potential (Utrikespolitiska Institutet 2012, Burgess et al 2011, McCulloch and Malesky 2010, The World Bank 2009, p. 10-11, 45).

2.2. A democratic transition topped-up with large-scale decentralization

Indonesia gained its independence from the Netherlands in 1949, after the Second World War. Successful economic reforms were implemented by a highly centralized regime, which was halted by the Asian economic crisis of 1997/98. Protests prompted a transition towards a democratic political system, and the first national, provincial and local parliamentary elections were held 1999. One can suggest that the democratic transformation was blessed by the consent of the pre-democratic elite, which thus retained some of its former influence. Elections are considered competitive and without tampering with ballots (Utrikespolitiska Institutet 2012, Skoufias et al 2011, Erb and Sulistiyanto 2009, The World Bank 2009, p.5-6).

A large-scale decentralization process was also initiated in the wake of the economic crisis of 1997/98, which is in sharp contrast to the previous centralized governance system. Extensive responsibilities and authorities were assigned to district level, starting from 2001. The responsibility of the main part of service delivery was devolved to districts,

as for example, local road building and regulation of the local economy. Transfers of funds from the central government to district ones also increased, and today approximately 30 percent of the central budget is directly transferred to districts, to be used at their discretion. Districts have the power to tax, but are heavily reliant on central transfers (Burgess et al 2011, Skoufias et al 2011, McCulloch and Malesky 2010, Fitrani et al 2005). Many authors suggest that the reason for decentralizing towards district level, as opposed to provincial level, was to stave off separatist tendencies from various regions since districts, as opposed to provinces, are too small units for such demands to be feasible (Fitrani et al 2005, Hull 1999, Niessen 1999). Larger potential benefits existed, and still exist, from the creation of new districts in form of more transfers from the central government and the establishment of new political posts. Therefore, districts have split at an unprecedented rate, from 336 districts in 1999 to 491 districts in 2012. Most districts have subdivided outside Java, the main island (Burgess et al 2011, Skoufias et al 2011, McCulloch and Malesky 2010, Fitrani et al 2005).

2.3. Local election of district heads

After the initial decentralization process accusations of money politics within district polities were commonplace. Specifically, districts leaders are stated to have bought their positions from districts parliaments (DPRDs), as an indirect election system was in place. As a response, direct elections of district heads were enacted in 2004, combined with a review of the laws regulating local autonomy. The national government decided that starting from 2005 elections of district leaders should be held in a staggered manner. Incumbent district heads' end of term was to decide when the first local election was held to replace him/her. The end of term of those district leaders was in turn dependent on when the district heads had been appointed under the previous regime. Before the regime fall district heads had in effect been picked centrally, but in practice been chosen in managed elections in the DPRDs with a list of candidates chosen by the Ministry of Home Affairs. With the reform of elections, candidates to become district head had to be endorsed by parties that received 15 percent of votes in the previous DPRD elections until 2008, when this requirement was dropped. It had allegedly led to money politics, specifically the buying of nominations. In 2012 the last newly- created districts held elections for the position as district head for the first time. The view of abundant money politics is still reverberating (Burgess et al 2011, Skoufias et al 2011, Erb and Sulistiyanto 2009, Mietzner 2007).

2.4. Short description of government structure

Indonesia has a three-tiered government structure; national, provincial and local/district level. Indirect elections of leaders at all governmental levels were performed until

2004, when direct elections were enacted, thus improving the Indonesian governmental system to a more clear-cut presidential one. Considerable powers have continuously been allocated to the executive branch (Erb and Sulistiyanto 2009). All types of elections are performed in five-years cycles. Elections for parliaments at all three levels were first held in 1999. Direct elections of presidents were implemented from 2004. The year a presidential election is held no other elections, such as for district heads, are performed. Elections for governor are held in different years for different provinces, starting from 2005, and sometimes take place in the same year as election for district heads (Utrikespolitiska Institutet 2012, Skoufias et al 2011).

3. Theoretical and empirical contributions

Most theoretical and empirical contributions to date concern national democracy, as opposed to subnational, local, democracy. The foremost difference is that a local democratic system includes many jurisdictions, which allows citizens to compare the performance of leaders, as well as to move between various leaders' reign.

Inevitably, democracy is a phenomenon embedded in the rest of society, which makes it hard to define, measure and compare. Authors question if the concept of different regime types, democracy and autocracy, catch the relevant aspects both theoretically (Przeworski and Limongi 1993) and empirically (Persson and Tabellini 2006).

3.1. Theory

The theoretical linkages of how democracy affects economic growth are categorized alongside Hirschman's concepts of voice and exit (1970). Voice is a process whereby citizens affect the ruler by expressing their views and exit is a process whereby citizens affect the ruler by moving from a specific jurisdiction. The processes are thus complementary to each other.

3.1.1. Voice

Voice is nearly synonymous with the concept of accountability. Economists usually model a democratic system as a principal-agent model (for example in Xu 2011, p.1106, Bardhan 2002, p. 190-192, Przeworski and Limongi 1993, p. 58). The electorate is the principal that via election charges the government, the agent, with executing specific tasks. The incentives of the ruler will thus change according to the electorate's preferences (for example in Skoufias et al 2011, p.11, Barro 1996, p. 2, Przeworski and Limongi 1993, p. 55). The agency problem, that citizens cannot perfectly monitor and sanction the behavior of the government, is crucial. Relating to the present discussion, a local democratic system is thought to be more responsive than a national one because citizens easier attain information about the local government's performance³. An example would be that citizens directly can observe the availability of a local health clinic or the performance of a local school, whereas the effect of a specific national trade policy is harder to entangle. Underlying this train of thought is that the functioning of accountability systems works better when the cost of attaining information is lower for citizens,

³ The importance of local information is partly formalized by Oates (1972), one of the fathers of the research branch fiscal federalism within decentralization research, who stipulated the decentralization theorem, that local knowledge of cost-structures and preferences yield more efficient public good provision.

which also depends on initial factors, such as if the literacy rate is high in a polity (for example in Skoufias et al 2011, p.11, Xu 2011, p.1079, Pepinsky and Wihardja 2010, p.18, Bardhan 2002, p.190-191).

However, a country need not be a democracy for the concept of voice to function, even though leaders are thought to be more responsive in democracies. In an autocracy the ruler's policies are confined by the threat of the population to revolt and overturn the ruler (for example in Muligan et al 2004, p.54).

The proceeding links between democracy and growth are mentioned under the heading "voice", since this is a prerequisite for them to function. Accountability is stated to decrease corruption and rent-seeking within a polity, which in turn is thought to lead to higher economic activity. This is an often-quoted mechanism both in literature concerned with democracy and decentralization (for example in Barro 1996, p.2 and Skoufias et al 2011, p. 2,10). It is thought that policy-makers create unnecessary regulation to be able to collect bribes, with adverse effect for the economy. If local democracy, as opposed to a "local government" assigned by a higher governmental level, decreases the incentives for the local government to create regulation in search of rents, this would create a better economic environment. This argument can further be extended to corruption in general (Keefer 2009, p. 889). Bradhan problematize this view of the function of accountability because, especially in young or developing democracies, the political system is prone to local-level capture, that local elites gain undue influence (2002, p.192). Keefer argues that capture happens in democracies through the ease of using pre-democratic patron-client networks for mobilizing voter support (2009, p. 902, 904).

The discussion in literature investigating the effects of national-level democracy on economic growth is mainly focused on three links. Firstly, the implementation of democracy is stated to lead to more redistribution, because the median voter is poorer than the average citizens, which in turn can lead to fewer incentives for capital accumulation and thereby limit growth. Secondly, better protection of property rights is thought to arise in a democracy, although this claim is hotly debated, which in turn would lead to higher growth rates (for example in Przeworski and Limongi 1993). Thirdly and lastly, a democratic system is thought to lead to more stability since it provides a framework for changing regime, as opposed to autocracies, and stability in turn would be growth-enhancing (for example in Persson and Tabellini 2006). At least two of the channels are relevant on a subnational level, since redistributive policies and protection of property rights often, at least partly, are implemented on a local level and hence can be affected by local accountability.

3.1.2. Exit

Because most literature on democracy and growth relates to a national system, it does not mention any process similar to exit, which instead originates from literature concerned with decentralization. Exit is related to the famous Tiebout hypothesis, which underlies the research branch of fiscal federalism, and states that people move to jurisdictions which best match their preferences for public goods. In other words, people have the possibility to constrain abuse by the ability of “voting with ones feet” (Tiebout 1956). Thus this process functions even in an autocracy, if one assumes that the leader is rent-maximizing and for creating rents needs economic activity performed by a certain number of people.

Besley and Case (1995) argue that a multitude of jurisdictions allows for policy competition (“yardstick competition”) that many jurisdictions act as a framework for experimentation and learning, which yields more beneficial outcomes. In a democratic system, policy competition would enable citizens to compare the performance of leaders of various jurisdictions, thus providing them with information. For example, if district A implements an innovative approach to vaccination which limits child-mortality, the voters and leaders of district B can observe this success, and the voters of district B would demand the same policy of their district leaders. But, policy competition in a non-democratic framework would also provide information to people, and confine the ruler’s behavior according to the previously mentioned mechanisms of moving (and revolting). Underlying this mechanism is that the economic characteristics of the jurisdictions are similar, so leaders cannot blame their performance on jurisdiction-specific factors, such as difference in funds, natural resources or industry competitiveness.

3.2. Previous empirical research

Empirical research on the effect of democracy on economic growth is nearly exclusively done on a cross-country basis. This overview is presented according to the nature of methodology followed.

3.2.1. Cross-country research

Firstly, simple ordinary least square (OLS) regressions only provide correlations between democracy and growth, and cannot be interpreted as causality. Correlation, in this context, is that democratic countries also have higher growth rates, or vice versa, but they do not provide any information about whether democracy causes this result. The main reason is omitted variable bias, arising, for example, because there is some omitted factor that increase the propensity of countries to be both democratic and to grow, or because countries choose to be democratic because it provides them with greater

growth rates (Acemoglu et al 2008, p. 809, Przeworski and Limongi 1993, p.63-64).

It seems to be concluded that a strong correlation between growth or income (the stock variable of accumulated growth) and democracy exists, which is fairly intuitive if one thinks about that most developed countries are western democracies (Persson and Tabellini 2009, p. 88-89, Acemoglu et al 2008, p. 808-9). This result can be nuanced by Barro's finding of a non-linear relationship between democracy and growth; at low levels of political freedoms growth is increased, but growth decreases when moderate levels of political freedoms are already established (1996). Mulligan et al's (2004) finding that democracy is uncorrelated with policies such as educational spending and openness to trade, policies that are thought to contribute to economic growth, has been interpreted as evidence of the contrary. However, this interpretation subsume that countries achieve economic growth by the use of similar policies.

The next generation of research investigates the question at hand by fixed-effects methods, and can either be interpreted as correlations or causation. The main problem of interpreting fixed-effects estimates as causality is that they only are based on countries that change regime, and those countries can have specific characteristics. A great benefit of using fixed-effects estimations is that time-invariant country characteristics are controlled for, and thus are a large part of omitted variable bias removed (Angrist and Pischke 2008, p.165-168).

Persson and Tabellini (2006) show empirical results that democracy leads to higher growth by using difference-in-difference estimation, a type of fixed-effect method. They nuance the picture by providing support for that their finding is driven by that countries that implement economic liberalization before democratization grow, a result drawn on Giavazzi and Tabellini (2005). Furthermore, presidential democracies do, as opposed to parliamentary democracies, grow, which is congruent with the above finding as all countries that implemented economic liberalization before democratization became presidential democracies. Acemoglu et al (2008) research the reverse question, namely how income affects democracy, and find no correlation between income and democracy by using panel data and fixed-effects. They interpret their result as causation, that higher income does not lead to democracy, and conclude that the correlations observed between income and democracy are due to critical junctions in history.

To summarize, the effect of national democracy is difficult to estimate either because one cannot control for all relevant factors using OLS estimates or because one only estimates on a sample of countries that change regime using fixed-effects methods. However, research and case studies of local democracy yield more fruitful results, presented below.

3.2.2. Subnational research and case studies

Before proceeding to research using natural experiments, it is relevant to highlight one paper as the main theoretical channel between local democracy and growth is thought to go via better governance. McCulloch and Malesky (2010) investigate the effect of corruption and rent-seeking on economic growth in Indonesia by OLS regressions, with the same econometric problems as mentioned above. Nonetheless, their underlying survey is valuable and used in this thesis. McCulloch and Malesky (2010) find scant evidence of significant correlations between governance and growth in the Indonesian context.

The next line of research takes advantage of natural experiments. Skoufias et al (2011) have developed the research methodology that Burgess et al (2011) and this thesis use. The main difference between the cross-country research using fixed-effects methods and this development is that the former is based on endogenous selection into democracy, whereas the latter is based on exogenous variation of local elections. Thus, all subnational units implement local election in a random fashion and hence, the results can be interpreted as causation. The main drawback of using a quasi-experimental approach is that the results only are as good as the context of the “natural experiment”- setting.

Skoufias et al (2011) and Burgess et al (2011) estimate the effect of local elections in Indonesia on local expenditures and deforestation respectively, and as both papers have implications for the research question at hand the results are presented. Skoufias et al (2011) find that local elections yield higher expenditures and higher share of own revenues, which the authors interpret as better accountability. One limitation of this study is that the effect only is measured for the Indonesian districts that did not split in the decentralization process, and since they have specific characteristics the result can be hard to generalize. Burgess et al (2011) find that local elections increase illegal logging from two years leading up to the election year and decrease illegal logging in the election year, not to be picked up thereafter. In addition, there is evidence of an increase in legal logging after the election. One can suggest that this is consistent with the presence of elite capture before elections, and better accountability afterwards. Furthermore, Burgess et al (2011) base their estimations on the sample of all Indonesian districts.

Since quantitative research on local democracy is scarce, some case studies related to decentralization, where local elections, or the absence of them, are a key ingredient, are also presented. Two examples are much discussed in the literature, Russia and China. The common narrative is that the political decentralization implemented in Russia in the 1990's led to capture by local elites with adverse effects for society. One can question if the implementation of local elections affected outcomes, but nevertheless elections of governors were suspended in 2004 (Zhuravskaya 2007, Blanchard and Sleifer 2001).

On the other hand, Xu (2011), in line with Blanchard and Sleifer (2001), accredits the explosive growth in China to competition between various regions arising because of an economically decentralized governmental structure. Xu argues that in China competition arises between district government officials since promotion within the Chinese governmental hierarchy is based on the GDP (Gross Domestic Product) growth performance of the district. Xu further argues that this is possible since most Chinese jurisdictions are similar. Bradhan (2002) and Zhuravskaya (2007) point out that this subsumes that the center acts as a benevolent dictator and thereby is an unlikely explanation, which Xu counters with the argument that the Chinese Communist Party has to achieve high growth rates to legitimize its ideology. Taken together, the narratives provide a picture of the importance of looking at the governmental official's incentives.

3.3. Conclusion of theoretical and empirical review

The channel from the theoretical review of the effect on democracy on growth that is most relevant on a local level, at least in the short run, is the limiting effect of elections on corruption and rent-seeking, which is assumed to lead to higher growth. When one takes the processes of revolting and moving into account the scope of improvement from implementing local elections can be more limited, since citizens have some sway over the leader's behavior before democracy. Furthermore, policy competition is one channel that might amplify the process of voice. It poses that the national growth rate would be higher compared to the case of its absence. Economic growth in this thesis is compared between districts, and therefore does not capture the growth-effect from policy competition as this should raise the growth rates across all districts. Thus, the research methodology isolates the theoretical channel of voice.

Regarding the previous empirical research, this thesis develops the research methodology to answer the question of how democracy affects economic growth by applying the natural experiment setting in Indonesia to the question at hand.

4. Method and Data

4.1. Short description and evaluation of method

The evaluation of election of district leaders' influence on district-level GDP (Gross Regional Domestic Product, GRDP) is conducted by using difference-in-difference estimation. By analogy to a medical experiment, this statistical approach uses a "treatment" and "control" group and measures the effect of treatment as the outcome before and after the actual treatment is given to the "treatment" group, while comparing with the "control" group. Translated to the current research question the election of district leaders for the first time is the "treatment" of interest and the effect is the difference in growth rate of GRDP per capita in constant prices. Thus, the difference-in-difference estimation compares the difference in growth rates before and after elections in the districts that actually had local elections, while comparing with the districts that had no elections until later.

The main benefit of the research methodology is the exogenous assignment of elections in the "natural experiment"-setting, discussed below. Other benefits are that using difference-in-difference estimation controls for time effects, such as exogenous shocks affecting the growth rate, because one uses a "control" group and that district-level time-invariant variables, which most likely affect the growth rate, are controlled for because one uses the variation in growth rates over time within each district ("within variation") for the estimates. The benefits combined allow the estimates of the effect of local election on growth to gain a causal interpretation.

The fortunate unfolding of events in Indonesia assigned different years of elections to districts in a manner as good as random. Skoufias et al. (2011) report that in which year a district election was conducted is dependent on when leaders historically had been appointed under the previous authoritarian regime, and can thus be viewed as exogenous. Skoufias et al. state to have shown that at which time point different districts held elections is independent on a multitude of factors, such as the growth rate of constant GRDP per capita, the share of asphalt road in the district and district splits (2011, p.8-9). Consequently, the strict exogeneity assumption underlying the difference-in-difference method is satisfied, or more specifically the residuals in a specified regression are unrelated to independent variables, in this case the year of election, in any time period (Angrist and Pischke 2009, p. 222). In the part "Discussion surrounding defining the population and exogeneity" in this chapter, it is shown that the strict exogeneity assumption only is fulfilled for a population excluding the "child" districts. The term "child" district is

used to denote the part of an old district that was given a new district administration, and thus “was created” in the decentralization process, and the term “parent” district is used to denote the part of an old district that retained its district administration in a split. The strict exogeneity assumption is not fulfilled for “child” districts because the year of election for them is dependent on when the district was created, which is highly endogenous.

The current research design is innovative and a more reliable way to estimate the impact of elections than previous methods. Cross-country research into the effect of democracy that uses the OLS regression framework violates the exogeneity assumption, which leads to biased estimates, and therefore only measures correlations and not causation. The exogeneity assumption states that the residuals should be unrelated to any independent variables (Angrist and Pischke 2009, p. 52-59). Related to the present context, countries that “choose” to be democratic might also have a greater growth potential, and hence the residual would contain a factor of this lesser or greater “growth potential” which biases the estimates of democracy. In contrast, in a natural experiment setting, such as the present case, observations that implement elections are stated to be as good as randomly selected, and thus the (strict) exogeneity assumption is fulfilled. The main benefit of the current set-up is therefore that it provides a more reliable way of estimating the impact of democracy on growth than previous methods. The main drawback is that the results might be hard to generalize, as they are based on one country only and on local level. On the other hand, because cross-country comparisons of democracy generally violate the exogeneity assumption, there might not be a more credible alternative.

4.2. Data

The data on when district elections were held between 2005-2012 was received from the Ministry of Home Affairs in Indonesia. Data on GRDP in current prices, GRDP at constant prices and GRDP per capita in current prices at district-level between 2003-2010 was received from Statistics Indonesia (BPS). Thus, the data of the outcome variable GRDP per capita in constant prices is calculated from this source. The GRDP variables are also reported for all sectors excluding oil and gas, a division used in this analysis. Data on when new districts were formed between 1999-2011 was also received from the Ministry of Home Affairs.

As Indonesian districts have subdivided at a high pace, from 336 districts in 1999 to 491 in 2012, an essential data source is a dataset from Statistics Indonesia that allows for conversion of the population of districts between different years. Another source of data used is McCulloch’s dataset (2011 b), which is a rich dataset measured in 1999-

year district borders, and includes the same GRDP data as described above for 2001 and 2002.

Furthermore, the aforementioned dataset contains a set of governance variables, which is used to verify the result of the difference-in-difference estimation by making a simple comparison of means between the “treatment” and “control” group. McCulloch performed a survey named the “Local Economic Governance Survey” in cooperation with the Asia Foundation and KPPOD (2011 a, 2011b, McCulloch and Malesky 2010). The latter is an Indonesian non-governmental organization created to monitor the impact of decentralization on the business sector. A random sample of 243 districts was drawn and a total of 12 187 firms were surveyed, generating variables representative at district level. In each district the population of firms was stratified according to size (10-19, 20-99 and 100+ employees) and sector (production, trade and services). Thus, the survey is representative of all non-primary private sector firms with 10 employees or more. Furthermore, the survey includes both perception based- measurements and numerical ones. For example, both the perceived ease of obtaining a business license and the number of weeks to obtain one is reported (McCulloch and Malesky 2010, p. 4, 11). The survey and governance variables constitute a small part of this thesis, and hence the interested reader can consult the paper McCulloch and Malesky (2010) and McCulloch (2011 a), the documentation accompanying the dataset McCulloch (2011 b), for more information.

A more detailed specification of the data sources is found in Appendix A, Section A1. Furthermore, some choices taken, concerning how to define variables and/or collapsing districts backwards in time, are specified in Appendix A, Section A2.

4.4. Specification of treatment status

Table 1. Distribution of at which year local election is 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
Percent of total	46%	16%	8%	26%	0%	2%	1%	1%	100%

The staggered manner of local elections is shown in Table 1 and leads to the proceeding definition of a “treatment” and “control” group. The “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

deleted from the analysis altogether. This definition allows for estimating the effect of election for the “treatment” group after three years, 2008, and under the assumption of a time lag after five years, 2010, the latest year for which data are available. Descriptive statistics for the “treatment” and “control” group is presented in Appendix B, table B1.

Table 2. Baseline Population, 2003 district borders used

Actual number of districts	434
Treatment	+ 202
Control	+ 121
Deleted, election year 2006 or 2007	- 99
Deleted, unclear treatment status	- 12
Total population	= 323

The baseline population is presented in Table 2. The number of districts differs slightly from Table 1 as the base year chosen is 2003 district borders. This base year is chosen to allow for as many observation as possible since difference-in-difference estimation relies on the variation of data between different years for the same observation (“within variation”). The total population is 323 districts of which 202 districts belong to the “treatment” group and 121 districts belong to the “control” group. Districts that held elections in either 2006 or 2007 are deleted from the proceeding analysis, and amount to 99 districts. Furthermore, when collapsed to 2003 district borders the treatment status of certain districts is unclear because the “parent” district has split and the subsequent “child” districts hold election in different years, thus belonging to different treatment groups. Only 12 districts have to be deleted because of this reason, but it could have amounted to a large potential complication⁴. Furthermore, the six districts that constitute Jakarta, the capital, have been excluded from all analysis because of their special governance system.

4.5. Discussion surrounding defining the population and exogeneity

One can reasonably assume that districts that split and districts that do not split in the decentralization process are different. For example, it is highlighted in the literature that district that split have more resource endowments and are more heterogeneous, which should influence the growth rate (Fitriani et al 2005). Thus, one would wish to have a population of as many of the districts that split as possible.

⁴ This problem is very limited because “child” districts that once were one “parent” district have a tendency to have elections within similar time frames. The potential complication is further mitigated because a moratorium on creation of new districts was in place 2004-2006, leading the situation described to incur for a few districts.

Even if it is possible to estimate on a population of all districts, Skoufias et al only perform analysis on the districts that did not split. They estimate the effect of local government spending, which is affected by different practices of creating new district administrations for various districts that split, and hence they argue that their exclusion of the “child” districts isolates the effect of election (2011, p. 8). On the other hand, Burgess et al include the whole set of Indonesian district in their analysis (2011, p. 24).

One can suspect that treatment status is not random depending on if districts have experienced splits or not. There might exist factors influencing the date of creation of new “child” districts, rendering this endogenous, which in turn decides the latter’s date of election. Before local elections were implemented, “child” districts were assigned a “caretaker district head” upon creation by the Ministry of Home Affairs, which in turn decides the date of the unelected leader’s end of term and consequently the year a local election was held (Skoufias et al 2011, p.7-8). What is more, the time frame of implementing new district governments varies, and it is most likely that factors deciding these variations influence the economy as well. The conclusion is that treatment assignment is endogenous for the “child” districts.

This is also supported by the result presented in Table 3. If treatment is randomly assigned there should be no difference in characteristics between various treatment groups, more than by coincidence. This is usually referred to as “balance”. The result in Table 3 indicates that the balance between groups is skewed in regard to the experience of split (method relies on Angrist and Pischke 2009, p. 18-19). Districts that have experienced splits are to a lesser degree included in the “control” group, the districts that held local elections in 2008 or later. However, the experience of split is balanced for a population of only the districts that never split and the districts that are “parent” districts, as indicated in Table 3. The “parent” district of a subdivision supposedly did not change its “election schedule” that makes up the exogenous variation in the treatment assignment.

Table 3. Comparison of the mean of the experience of split within groups, 2003 district borders used

Population	Groups			P-value for equality across groups
	Treatment	Control	Deleted	
Whole population	0.5792	0.4298	0.6364	0.0045
Only non-split and “parent” districts	0.2797	0.2247	0.3208	0.4355

The P-value in the last column is for the F-test of equality of variable means across all three groups. The variable compared is a dummy variable indicating experience of a split, that the district concerned either is a “parent” or a “child” district.

To summarize, the year of election is exogenous for all districts excluding the “child” districts. Thus, two different set-ups will be used, estimation on a population excluding the “child” districts and estimation on all districts controlling for the “child” districts. The first approach leads to a lack of ability to generalize the results, because districts that split or not have different characteristics. This population consists of 232 districts of which 133 districts are treated and 99 districts function as controls. The second approach is to use the whole population of districts and control for if a district is a “child” district, with the purpose of rendering the treatment with the same status as being random, but this can violate the strict exogeneity assumption. Thus, the two different approaches are complementary to each other.

4.6. Population for comparison of governance characteristics

The comparison of governance indicators between “treated” districts and “control” districts is only performed for a population excluding “child” districts, in total 150 observations of which 64 districts are “controls” and 86 districts are “treated”. The number of observations is small because only districts that both have a clear treatment status when collapsed backwards in time and are one of the 243 districts of McCulloch’s survey are included (2011 a, 2011 b, McCulloch and Malesky 2010). Also, in this overlap only 4 districts are “child” districts, and consequently so little variation is added by using the whole population so this is deemed fruitless.

4.7. Econometric specification

The difference-in-difference estimation controls for fixed effects, which in the current framework means that time-invariant district-level variables are controlled for. Thus, compared to an OLS-estimation framework there is no need to add additional independent variables. The baseline econometric specification used is chosen because one can easily estimate the Difference-in-Difference estimator from it by using OLS. It is as follows;

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

Y is the growth rate of constant GRDP per capita, constant GRDP or another outcome variable. Subindex i denotes district, t denotes time, and s denotes if the district belongs to the “treatment” or “control” group. The variable “Treatment” takes the value 1 if the district is treated, i.e. held local election in 2005, and zero otherwise. The variables “Year(t)” are year dummies. The variable “Aftertreatment” takes the value 1 if it is after treatment, namely if the district held elections in 2005 and it is after 2005. The

parameter of interest is δ , the Difference-in-Difference estimator, which estimates the effect of elections on growth. Covariates are simply added to this baseline specification. Thus, for estimation on the whole population of districts a dummy for if a district is a “child” district or not is added (specification relies on Angrist and Pischke 2009, p. 233-234, 243).

Four different specifications of the difference-in-difference estimator are used. The difference between them is which years are included in the estimation. Difference-in-difference estimation is based on an implicit comparison of averages, and thus which year that is included in the analysis will constitute which years that are included in the implicit comparison of averages. An illustration of this is presented in Table 4, which also serves as a simple explanation of the difference-in-difference estimation technique. The four different specifications, together with comments, are presented in Appendix A, Section A3.

Table 4. Conceptual breakdown of a Difference-in-Difference estimate

Mean of growth rate of constant GRDP			
	After= 2008	Before= 2004 and 2005	Change After-Before
Treatment	0.0592	0.0490	0.0103
Control	0.0552	0.0505	0.0047
Difference-in-Difference estimate:			0.005619

In the “treatment” group the first difference (0.0103) is formed by taking the average growth rate after election (0.0592) and subtracting the average growth rate before elections (0.0490), and equivalently for the “control” group. The second difference (0.005619), hence the name of the method, is formed by taking the first difference in the “treatment” group (0.0103) and subtracting the first difference in the “control” group (0.0047). In Table 6, column 5, the same difference-in-difference estimate is presented. The years included in this illustration are 2004, 2005 and 2008, but it could equally well have been others.

Since Bertrand, Duflo and Mullainathan (2004) pointed out that many studies use invalid standard errors for the Difference-in-Difference estimator the debate of how to estimate correct standard errors is ongoing. The heart of the matter is that the standard errors delivered by the OLS estimation does not take into account that the residuals neither are correlated over time between individuals (serial correlation) nor correlated within the same individual (intragroup correlation). The standard errors reported in the results section are clustered on district-level, so it is taken into account that the residuals are serially correlated within each district, but it ignores the serial correlation between districts. This is deemed a commonly applied solution in this specific context, but the

debate of how to achieve correct standard errors is still ongoing⁵ (Angrist and Pischke 2009, p. 237, 308-310, 315-323).

For additional information of the Difference-in-Difference method please see an excellent description in Imbens and Wooldridge (2008, p. 64-68) and for more technical details consult Angrist and Pischke (2009).

In addition to the population of districts and the econometric specification used additional estimations are performed using 1999 district borders. This allows for using the rich dataset provided by McCulloch (2011 b), and thus, for example, testing the balance of treatment assignment on many covariates and the difference-in-difference estimation with longer time series, but the number of observations is smaller.

⁵ An additional note is that the standard errors are not corrected for spatial correlation, that the residuals might be correlated over space between districts, which might introduce bias. How to calculate standard errors in the presence of spatial correlation in a difference-in-difference framework is not solved in a standardized way and hence is considered to be outside the scope of this thesis.

5. Results

5.1. Balance

If a treatment is randomly assigned, various characteristics should be balanced between groups, i.e. there should be no difference in characteristics between groups more than by coincidence. The balance of various variables in the “treatment” and “control” group is presented in Appendix B, table B1, and indicates that most variables are balanced, with two exceptions. Firstly, the notable and interesting one, is that the mean of two measures of investment, the realization of foreign direct investment (FDI) and domestic direct investment, are significantly different between groups. This result is displayed in Graph 1 and in Graph 2, which both show that investment is higher in the “control” group, the districts that had local elections in 2008 or later. The implications are that the year of election is randomly assigned only if one controls for investment (method rely on Angrist and Pischke 2009, p. 18-19).

However, investment is not controlled for in the analysis for the two reasons below. First of all, the amount of investment is dependent on investors’ expectations about the future. Relating to this case, political instability surrounding the outcome of elections may dampen investment. Thus, the difference in investment between groups previous to treatment can be viewed as an anticipatory effect of treatment. If this is the case in reality, the difference between groups relating to investment can be taken as proof of the importance of local elections. Secondly, higher investment should theoretically contribute to higher growth rate and if investment is controlled for one take away an important channel of how the political climate affects the growth rate. In essence, controlling for investment would have taken away a part of the causal effect of local elections on growth ⁶.

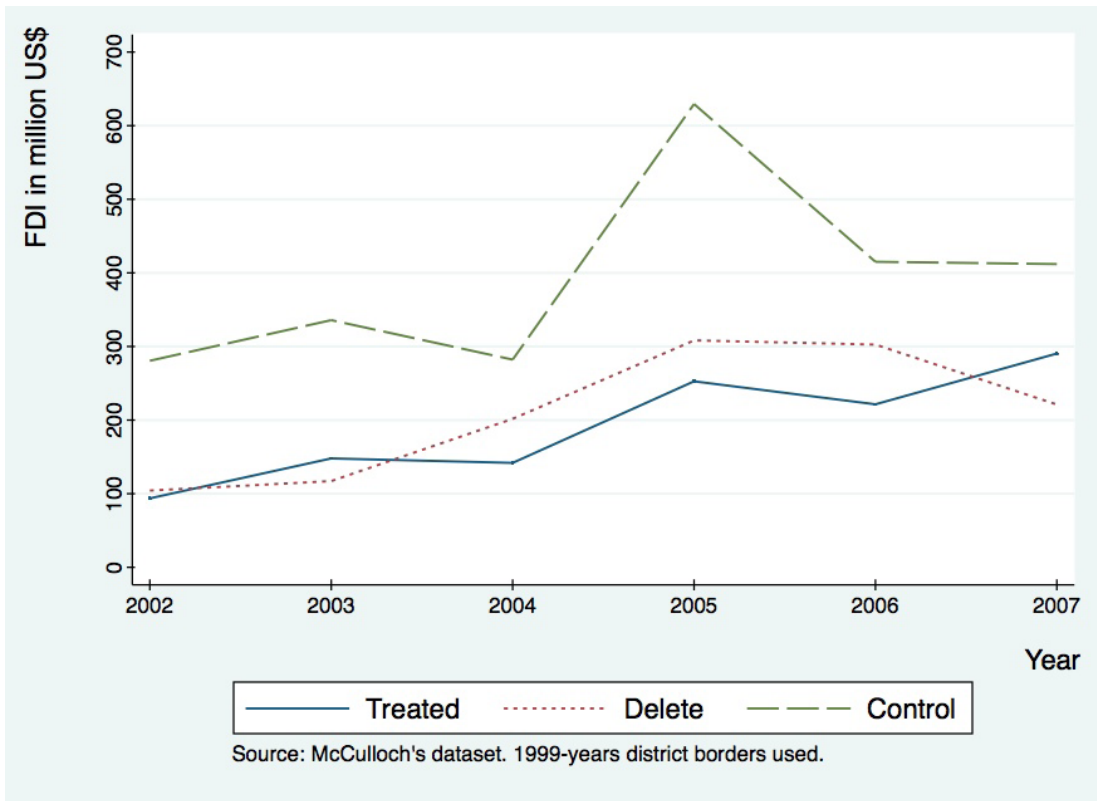
The second exception is worrying as it is that religious fragmentation significantly differs between groups, which might question that the assignment is as good as random ⁷. However, since Skoufias et al (2011) have documented the properties of local elections, and found them exogenous, and most variables in this analysis show no difference between groups, this significance can have arisen by coincidence. (Furthermore, religious fragmentation is considered to be fairly fixed and thus time-invariant and controlled for in the difference-difference estimation.) To summarize, the year of local election is analyzed as being as good as random.

⁶ The insignificant treatment effect latter presented in this section has also been confirmed by using the same set-up but including the level of investment, although the inclusion of investment can violate the strict exogeneity assumption.

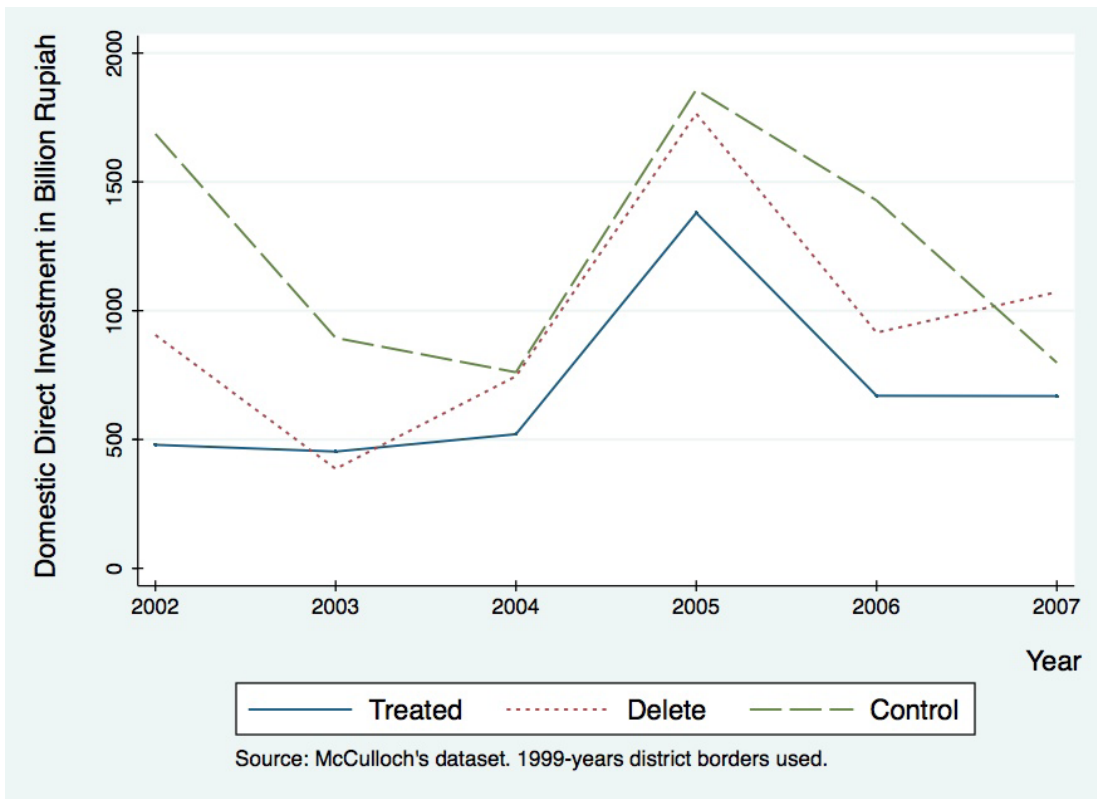
⁷ Actually, more variables differ, but not with equally strong significance.

5.2. The parallel trend assumption

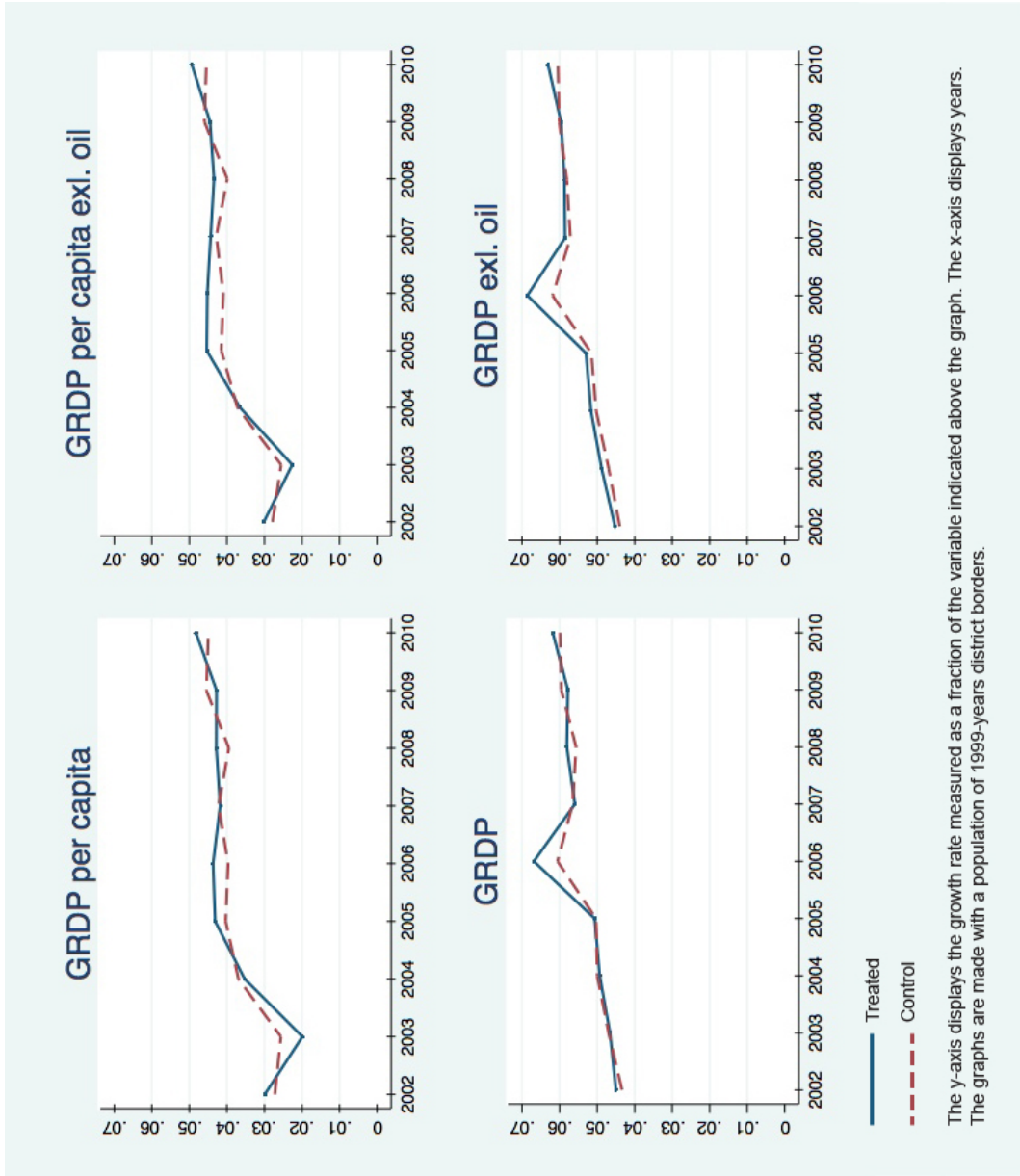
The parallel trend assumption needs to be fulfilled for identification in the difference-in-difference estimation framework. The assumption states that the “treatment” and the “control” group must have had parallel trends in the outcome variable before treatment takes place. It is important to note that this means that the growth rates on average should be parallel between the two groups, not parallel between each and every district. The parallel trend assumption is fulfilled for the purpose of this analysis, which can be seen graphically in Graph 3-6 (Angrist and Pischke 2009, p. 230-231).



Graph 1. Foreign direct investment, FDI.



Graph 2. Domestic direct investment.



Graph 3-6. *The fulfillment of the parallel trend assumption.*

5.3. Difference-in-Difference estimation

The overall conclusion is that no significant effect of local election can be found on constant GRDP per capita and constant GRDP by a multitude of different specifications. A positive but insignificant treatment effect is indicated by difference-in-difference estimation covering years 2004-2008, 2004-2010 and for 2004-2005 combined with 2009-2010⁸. In general, the robustness of a difference-in-difference estimation increases with the years covered, and therefore the results of the longest time series available with the help of McCulloch's dataset (2011 b) is presented in Table 5. In this table, the difference-in-difference estimates are clearly positive and insignificant.

The results of the difference-in-difference estimation based on the years 2004-2005 combined with 2008 are presented in Table 6. The first reason for the validity of the results of this specification, as opposed to the others, is that it may take time for the election to have an effect, and thus inclusion of 2006 and 2007 will render the estimate insignificant. The second reason 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 more confounded by the inclusion of later years, namely 2009 and 2010.

From Table 6, it is once more inferred that local elections have a positive but insignificant effect on GRDP per capita. However, local election has a significant effect on GRDP, i.e. without per capita, for the population of districts that never split and "parent" districts, at a 10%-significance level. The difference-in-difference estimate indicates that the growth rate of GRDP is 0.5 percent higher because of district elections for those districts. Nevertheless, in the specification that includes all districts and controls for "child" districts the treatment effect is insignificant for constant GRDP. One possible explanation is that the inclusion of a dummy variable for "child" district dilutes the effect of treatment, since "child" districts themselves have higher growth rates, but a joint hypothesis test is insignificant⁹.

Indonesia is very heterogeneous country, and the islands Java and Bali stand out as the more economically- advanced regions. To divide the analysis into two parts, of districts outside and inside Java and Bali, is implicitly a simple test of the effect of election is similar regardless of if the districts initially are more or less "developed", i.e. have different levels of GRDP. The results are that the effect of local elections on GRDP per

⁸ The result has also been confirmed with longer time series using McCulloch's dataset (2011 b), allowing for inclusion of year 2002 and 2003 in various specifications but with fewer observations.

⁹ The p-value for the joint hypothesis test of the difference-in-difference estimate and the dummy estimate for "child" districts is 0.2393 for GRDP and 0.3610 for GRDP excl. oil.

capita and GRDP outside Java and Bali is insignificant, and the effect of local elections on GRDP per capita is insignificant inside Java and Bali, whereas the effect of local elections on GRDP is significant inside Java and Bali for almost all specifications ¹⁰. Inside Java and Bali 49 districts belong to the “treatment” group and 40 districts belong to the “control” group, measured in 2003 district borders. An illustration of this result is presented in Table 7 (for the same specification as in Table 5, namely 2002-2010) and in Table 8 (for the same specification as in Table 6, namely 2004-2005 combined with 2008). In Table 7, the difference-in-difference estimate indicates that GRDP growth inside Java and Bali increases between 0.7-0.9 percent for the various specifications at 5%-significance level. In Table 8, GRDP growth inside Java and Bali is significant at a 10%-significance level and the coefficient indicates a nearly 1 percent effect of local election on GRDP growth. To clarify, Table 7 and 8 illustrate well that the significant effect is retained for GRDP in almost all specifications, but also appears for GRDP excluding oil and gas for various others. This result indicates that the districts inside Java and Bali drive the previous finding, in Table 6, of a significant effect of local elections on GRDP excluding “child” districts. In line with this is also the fact that most districts split outside of Java. The conclusion of an insignificant treatment effect can thus be nuanced with an exception of a significant, and positive, effect of local elections on GRDP growth for the districts of Java and Bali.

Why does the significance of GRDP growth differs for districts inside and outside Java and Bali? One explanation is that people in the more developed districts of Java and Bali can easier hold local governments accountable because of better information (for example higher ability to read newspapers), whereas the people in districts outside Java and Bali have more varying possibilities to demand accountability. However, this explanation is not congruent with GRDP per capita being insignificant in both cases. But, why do the results between GRDP per capita and GRDP differ for the districts of Java and Bali? One reason can be that the population figures from Statistic Indonesia carry measurement errors which make it harder to distinguish any possible effect on GRDP per capita. By extension, this line of reasoning would suggest that there exists a significant effect of local election on GRDP per capita- growth in the districts of Java and Bali, which is to jump to conclusions. Another reason for the difference in effects on GRDP per capita and GRDP is based on the theoretical channel of exit; local elections can influence GRDP by making people move to districts that are better managed. If people actually move GRDP per capita would be insignificant whereas GRDP would be significant, which is the result found for the districts of Java and Bali. One speculative way of reasoning to give strength to this explanation is that those regions are “engines

¹⁰ Again the results have been cross-checked by using longer time series from McCulloch's dataset (2011 b) and the results are confirmed.

of growth” which can more easily attract people, also from outside of those regions. The accounts of measurement errors and the theoretical link of exit, or moving, can thus explain why the significance of GRDP growth differs between districts inside and outside Java and Bali and why the insignificance of GRDP per capita growth is the same in both cases. The tentative reason is that the possibilities for the population of Java and Bali to hold their local governments accountable is less varying, and stronger, than for the districts outside Java and Bali, which in turn could lead to higher growth rates.

However, this is not to forget that the results presented above, a positive and insignificant effect of elections, are the general results presented by this analysis. The effect of local election on growth is insignificant for most estimates of all Indonesian districts, for example as in Table 5. The result is again replicated in Table 6, except that the effect of local elections on GRDP growth is significant for a population excluding “child” districts, which is nuanced to be driven by the districts of Java and Bali.

Table 5. Difference-in-Difference estimates: year 2002-2010, 1999 district border used

Dependent Model/Population	GRDP per capita		GRDP per capita excl. oil		GRDP		GRDP excl. oil	
	Non-split/Parent	Whole pop	Non-split/Parent	Whole pop	Non-split/Parent	Whole pop	Non-split/Parent	Whole pop
Diff-in-Diff estimate	0.0035 (0.0033)	0.0019 (0.0033)	0.0032 (0.0032)	0.0016 (0.0032)	0.0028 (0.0022)	0.0014 (0.0023)	0.0022 (0.0022)	0.0007 (0.0023)
	0.294	0.571	0.311	0.610	0.207	0.528	0.299	0.777
Dummy: "child" district		-0.0130* (0.0069)		-0.0100 (0.0064)		0.0078 (0.0063)		0.0122* (0.0063)
		0.061		0.118		0.222		0.053
# obs	1858	1961	1858	1958	1857	1960	1854	1955
# districts	207	219	207	219	207	219	207	219

Clustered standard errors at district-level within parentheses. P-values are reported below the standard errors within parentheses. * indicates significance at 10%-level.
Econometric Specifications: Year 2002-2010

$$\text{Non-split/Parent: } Y_{tjs} = a + \gamma * \text{Treatment}_i + \delta * \text{Aftertreatment}_{it} + \sum_{2003}^{2010} \lambda_t * \text{Year}(t) + \epsilon_{tjs}$$

$$\text{Whole pop: } Y_{tjs} = a + \gamma * \text{Treatment}_i + \delta * \text{Aftertreatment}_{it} + \sum_{2003}^{2010} \lambda_t * \text{Year}(t) + B * \text{Dummy} \text{ "Child" district} + \epsilon_{tjs}$$

Table 6. Difference-in-Difference estimates: year 2004, 2005 and 2008, 2003 district border used

Dependent Model/Population	GRDP per capita		GRDP per capita excl. oil		GRDP		GRDP excl. oil	
	Non-split/Parent	Whole pop	Non-split/Parent	Whole pop	Non-split/Parent	Whole pop	Non-split/Parent	Whole pop
Diff-in-Diff estimate	0.0032 (0.0035)	0.0034 (0.0047)	0.0027 (0.0035)	0.0036 (0.0049)	0.0056* (0.0029)	0.0043 (0.0034)	0.0051* (0.0029)	0.0028 (0.0033)
	0.354	0.463	0.439	0.461	0.052	0.207	0.077	0.398
Dummy: "child" district								
		0.0018 (0.0043)		0.0015 (0.0047)		0.0049 (0.0048)		0.0046 (0.0046)
		0.669		0.75		0.315		0.315
# obs	695	872	695	873	696	875	696	875
# districts	232	323	232	323	232	323	232	323

Clustered standard errors at district-level within parentheses. P-values are reported below the standard errors within parentheses. * indicates significance at 10%-level.
Econometric Specifications: Year 2004-2005 combined with 2008

Non-split/Parent: $Y_{tjs} = a + \gamma * Treatment_{jt} + \delta * Aftertreatment_{jt} + \lambda_1 * Dummy2005 + \lambda_2 * Dummy2008 + \epsilon_{tjs}$

Whole pop: $Y_{tjs} = a + \gamma * Treatment_{jt} + \delta * Aftertreatment_{jt} + \lambda_1 * Dummy2005 + \lambda_2 * Dummy2008 + B * Dummy "Child" district + \epsilon_{tjs}$

Table 7. Difference-in-Difference estimates: Divided for districts outside and inside Java and Bali 1, 1999 district border used

Dependent Model/Population	GRDP per capita			GRDP per capita excl. oil			GRDP			GRDP excl. oil		
	Non-split/ Parent	Whole pop	Non-split/ Parent	Whole pop	Non-split/ Parent	Whole pop	Non-split/ Parent	Whole pop	Non-split/ Parent	Whole pop	Non-split/ Parent	Whole pop
Districts outside Java and Bali												
Diff-in-Diff estimate	0.0041 (0.0046)	0.0023 (0.0047)	0.0045 (0.0045)	0.0027 (0.0046)	-0.0021 (0.0029)	-0.0036 (0.0031)	-0.0021 (0.0030)	-0.0042 (0.0035)				
	0.382	0.622	0.318	0.560	0.475	0.247	0.471	0.225				
Dummy: "child" district		-0.0111 (0.0085)		-0.0077 (0.0078)		0.0049 (0.0077)		0.0102 (0.0076)				
		0.190		0.325		0.522		0.182				
# obs	1049	1134	1047	1131	1050	1135	1047	1130				
# districts	117	127	117	127	117	127	117	127				
Districts inside Java and Bali												
Diff-in-Diff estimate	0.0031 (0.0049)	0.0019 (0.0049)	0.0019 (0.0047)	0.0008 (0.0047)	0.0090** (0.0035)	0.0080** (0.0035)	0.0078** (0.0033)	0.0068** (0.0033)				
	0.527	0.697	0.681	0.872	0.012	0.023	0.021	0.042				
Dummy: "child" district		-0.0154*** (0.0052)		-0.0162*** (0.0051)		0.0126*** (0.0027)		0.0118*** (0.0027)				
		0.004		0.002		0.000		0.000				
# obs	809	827	809	827	807	825	807	825				
# districts	90	92	90	92	90	92	90	92				

Clustered standard errors at district-level within parentheses. P-values are reported below the standard errors within parentheses. * indicates significance at 10%-level ** indicates significance at 5%-level *** indicates significance at 1%-level.

Econometric Specifications: Year 2002-2010

$$\text{Non-split/Parent: } Y_{tfs} = a + \gamma * \text{Treatment}_{tj} + \delta * \text{Aftertreatment}_{tj} + \sum_{2003}^{2010} \lambda_t * \text{Year}(t) + \epsilon_{tfs}$$

$$\text{Whole pop: } Y_{tfs} = a + \gamma * \text{Treatment}_{tj} + \delta * \text{Aftertreatment}_{tj} + \sum_{2003}^{2010} \lambda_t * \text{Year}(t) + B * \text{Dummy} \text{ "Child" district} + \epsilon_{tfs}$$

Table 8. Difference-in-Difference estimates: Divided for districts outside and inside Java and Bali 2, 2003 district border used

Dependent Model/Population	GRDP per capita			GRDP per capita exl. oil			GRDP			GRDP exl. oil		
	Non-split/ Parent	Whole pop	Non-split/ Parent	Whole pop	Non-split/ Parent	Whole pop	Non-split/ Parent	Whole pop	Non-split/ Parent	Whole pop	Non-split/ Parent	Whole pop
Districts outside Java and Bali												
Diff-in-Diff estimate	0.0017 (0.0046)	0.0025 (0.0063)	0.0021 (0.0047)	0.0035 (0.0067)	0.0027 (0.0033)	0.0011 (0.0042)	0.0031 (0.0033)	0.0002 (0.0040)				
	0.707	0.699	0.656	0.597	0.414	0.800	0.354	0.969				
Dummy: "child" district		0.0034 (0.0047)		0.0026 (0.0051)		0.0024 (0.0051)		0.0018 (0.0049)				
		0.463		0.614		0.631		0.711				
# obs	434	605	434	606	435	608	435	608				
# districts	145	234	145	234	145	234	145	234				

Districts inside Java and Bali

Diff-in-Diff estimate	0.0050 (0.0050)	0.0046 (0.0050)	0.0030 (0.0048)	0.0026 (0.0047)	0.0099* (0.0051)	0.0095* (0.0050)	0.0078 (0.0049)	0.0075 (0.0048)				
	0.318	0.354	0.534	0.582	0.054	0.057	0.117	0.123				
Dummy: "child" district		-0.0038 (0.0032)		-0.0039 (0.0034)		0.0077 (0.0079)		0.0075 (0.0076)				
		0.246		0.256		0.333		0.323				
# obs	261	267	261	267	261	267	261	267				
# districts	87	89	87	89	87	89	87	89				

Clustered standard errors at district-level within parentheses. P-values are reported below the standard errors within parentheses. * indicates significance at 10%-level.
Econometric Specifications: Year 2004-2005 combined with 2008

$$\text{Non-split/Parent: } Y_{tjs} = a + \gamma^* \text{Treatment}_{tj} + \delta^* \text{Aftertreatment}_{tj} + \lambda_1^* \text{Dummy2005} + \lambda_2^* \text{Dummy2008} + \varepsilon_{tjs}$$

$$\text{Whole pop: } Y_{tjs} = a + \gamma^* \text{Treatment}_{tj} + \delta^* \text{Aftertreatment}_{tj} + \lambda_1^* \text{Dummy2005} + \lambda_2^* \text{Dummy2008} + B^* \text{Dummy}^{\text{"Child" district}} + \varepsilon_{tjs}$$

5.6. Comparison of governance characteristics

The effect of local election on growth is supposed to go via the channel of decreased corruption and rent-seeking, and consequently it is interesting to see if there is any difference between the “treatment” and “control” group on such variables. Such an analysis can verify the consistency of the previous results. Fortunately, McCulloch (2011 a, 2011 b, McCulloch and Malesky 2010) performed a survey of various governance indicators year 2007, which allows for a simple comparison of means of those variables between the groups. Luckily, year 2007 is the best imaginable year to compare, since it is two years after local elections are held in the “treatment” group, but the “control” group has not yet had any elections. Because only one time point exists, it is not possible to estimate any effect of local elections. However, since the districts in essence were randomly assigned into treatment, one can suspect that any differences in governance variables are due to local elections, or the absence of them. Another 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 governments’ control, with some exceptions (McCulloch and Malesky 2010, p.10-11).

The result of a simple comparison of means between the “treatment” and “control” group for the governance variables is displayed in Table 9. All variables have been normalized on a scale from 1-100, in such a way that 1 measures the performance of the worst performing district and 100 measures the performance of the best performing district. To clarify, all variables have been transformed so a higher value indicates better performance on the given variable, even if the variable name may indicate the contrary. From the various governance characteristics, indexes are calculated as averages of their components (McCulloch and Malesky 2010, p.17, McCulloch 2011 a, p. 17-8). For more information about the variables, please see McCulloch and Malesky (2010) and McCulloch (2011 a).

Overall, most variables are insignificant. The “control” districts have significantly better performance on the variables relating to licensing. The comparison of means for the “Licensing Index” indicates that the average of the “control” districts is 62 percent along the scale running from worst performing district to best performing district, whereas the average of the “treatment” districts is 59 percent. Variables measuring the perception of corruption are mostly insignificantly better in the “treatment” group¹¹. The variable “Action of local government do not increase business uncertainty” is significant and

¹¹ Specifically; “District head take strong action against corruption”, “District head (doesn’t) take corrupt action themselves”, “Action of local government do not increase business cost”, “Business licensing is free of illegal collections”, “Incidence of paying donations” and “Security payments to the police”.

indicates that that the average of the “treatment” districts is 56 percent along the scale running from worst performing district to best performing district, whereas the average of the “control” districts is 51 percent. To conclude, the result is not clear-cut. One can suspect that expectations in the “treatment” group are higher because of promises made in election campaigns, and thus might the groups be difficult to compare. Nevertheless, the result indicates that “control” districts have better licensing systems, which suggests that local elections do not lead to improved performance in this area.

That the comparison is performed on a population excluding “child” district and is based on a small number of observations implies that the results are less representative. With this consideration in mind, the preceding analysis seems not to give support to the thought that local elections lead to decreased corruption and rent-seeking. But, please note, the comparison of means does not take difference on governance characteristics before elections into account, and thus is the interpretation speculative. To conclude, the result is consistent with the previous finding of an insignificant effect of local election on growth, since the channel of decreased corruption and rent-seeking, which is assumed to lead to higher growth, do not appear to be present in the Indonesian case.

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

The variables are from McCulloch's dataset (2011 b). In the table McCulloch's indexes for each of the area is presented in bold after which follows components of each index. The table is essentially a replica of McCulloch and Malesky's Table 2 (2010, p. 15), with some omissions but use a division between "treated" and "controls".

Variable	Population excl. "child" districts		
	Mean of Treated	Mean of Controls	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
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 themselves	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	83.547	82.6842	0.735
Interaction between local government and businesses- Index	54.9808	53.5609	0.3738
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
Licensing Index	59.3906	61.7131	0.0931
Percentage of firms that have a license (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	52.911	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	48.962	49.3616	0.9061
Overall constraint of licensing on firm activities	75.3655	77.2136	0.5032
Transaction Costs Index	67.426	66.9895	0.8387
How much does paying user charges bother the firm	64.533	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	45.901	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

*The P-value in the last column is for the t-test of equality of variable means across groups.

6. Conclusion

Democracy is often touted as a method to achieve not only economic growth, but also welfare for the people. The experience in Indonesia shows that the result is not as clear-cut as historical cases of the developed economies suggest and accordingly as the theoretical models developed to explain those trajectories imply. The evaluation of the Indonesian experience is valuable as it provides a reference point for other developing countries.

The decentralization process in Indonesia was initiated in the wake of the Asian economic crisis of 1997/98, and is characterized by its quick implementation and extensive range of functions assigned to district-level. The Indonesian context provides an excellent ground to evaluate the effect of local elections on the economy because of the extensive responsibilities assigned to districts. Furthermore, local elections of district leaders were implemented for the first time from 2005 as a remedy to the tendency of money politics within the local polities. This allows for an interesting analysis because local elections often are touted as a solution for, precisely, corrupt societies.

One distinguishes no significant effect of elections of district leaders on economic growth in Indonesia. This result means that neither a positive effect nor a negative effect on growth is found by using difference-in-difference estimation. In the terminology of a medical experiment this method is a comparison of the effect of treatment between the “treatment” and “control” group. Translated to the current set-up the “treatment” group is the districts that held local elections in 2005 and the “control” group is the districts that did not hold local elections until 2008 or later. The difference-in-difference technique compares the difference in growth rates before and after local elections between the “treatment” and “control” group. The estimates gain a causal interpretation because the year of local elections of district heads is exogenously assigned, the effects of exogenous shocks to the growth rate are controlled for by the use of a “control” group and time-invariant district characteristics, such as resource endowment and population heterogeneity, are controlled for by comparing growth rates within each district (“within variation”).

The main difference to be highlighted between most theoretical accounts of democracy and Indonesia’s experience is heterogeneous effects, that some districts benefit from local elections whereas others are worse off. This constitutes an important explanation for the insignificant results presented. That the effect of local elections on GRDP growth, without per capita, is positive and significant for the districts of Java and Bali also indicates heterogeneous effects. A consensus in the literature on the experience of

the Indonesian implementation of decentralization is that it has led to money politics and local elite capture in some districts, but has been a success in others. Pepinsky and Wihardja argue that the heterogeneity in effects of local democracy, within the broader framework of decentralization, is dependent on initial socioeconomic conditions and leads to either a virtuous or vicious cycle in each district (2010, p.18-19). In some districts might the citizens have better access to information, because of initial characteristics such as a higher literacy rate, and consequently can they hold their local government responsible when local elections is implemented. Other districts might lack those initial characteristics, and are more prone to corruption and local elite capture. This explanation also fits the difference in result between districts outside and inside Java and Bali, as those two islands are the more “developed” arguably the citizens can with lesser cost access information, enhancing their capabilities of demanding accountability, which in turn is assumed to lead to higher growth rates.

Pepinsky and Wihardja argue, in line with the theoretical accounts of voice, that the key distinguishing feature behind the heterogeneous effects is the citizens’ possibility to hold local government responsible (2010). However, the explanation can be extended. I suggest that the reason behind the difference between theoretical models of democracy and the result on the ground is that theory implicitly assumes that voters hold local governments responsible for the prevailing situation. An electorate used to fending for themselves in their own communities might not see the local government, a structure imposed from the national level, as theirs. Intertwined with this idea of government responsibility is the question if the citizens pay tax or not, in a wider sense such as user charges and day work. Arguably, citizens that do not pay taxes do not hold the government responsible for delivering results, or in more literary terms, there exists no social contract. Untaxed citizens may see offerings by various candidates in a local election as just a benefit, with no costs attached. Thus, corruption and money politics can become rampant. The proposed heterogeneous effects of local democracy therefore could be dependent on how the citizens are taxed by the government, in a wider sense.

Apart from heterogeneous effects, the main reason behind the insignificant result is thought to be that the time span measured is too short. The “core” research design measures the effect three years after local elections are held, namely 2008, but one can argue that the effect of democracy has a longer time horizon. Secondly, other specifications of the difference-in-difference estimate measure the effect five years after implementation of local election, namely 2010, but the “natural experiment”- setting is no longer clear as the “control” group then has had local elections itself. Nonetheless, under the assumption of a time lag in the effect of local elections those results are valuable. However, no significant difference of governance characteristics was found

for the districts that held local elections earlier and later, which point to heterogeneous effects as the main explanation.

The reason behind the proposed time lag is that it is thought to take time for the economy, measured as GRDP, to react to better or worse policies enacted because of local elections. Especially, the case is strengthened as the policies enacted on district level concern areas such as schooling and health care that theoretically should take longer time to have an effect. That Skoufias et al (2011) find a significant effect of local elections on budgetary discipline and Burgess et al (2011) find a significant effect of local elections on deforestation in Indonesia support this line of reasoning.

A complication is that one reasonably can argue that there should be an anticipatory effect in in the Indonesian context, unelected incumbent district leaders should have reacted to the mere “threat” of a future election and therefore have changed their behavior and policies accordingly. Which discount rate those unelected leaders could have used is naturally unknown, and most likely different dependent on the heterogeneous effects discussed above. This anticipatory effect would counteract an effect of a time lag. That the value of investment is different between “treatment” and “control” districts before elections take place supports this thought.

Another aspect of the time frame in the current research design is the assumed objection that democracy takes time to be fully implemented which needs to be nuanced. Under the assumption that it is the whole political system that undergoes a transformation towards democracy, one can reasonably assume that it takes time for democracy to “deepen”. However, the current research is on how local elections affect the economy. Local elections are thought to be “closer” to the citizens, i.e. in the principal-agent model often used to explain voter and government behavior the monitoring and information costs are lower, and therefore a local democratic system is thought to be more responsive. Thus, one can expect local elections to have a quicker effect than national ones.

The third and last explanation for the lack of an effect of local democracy is that the national level might be more important than the subnational one for creating growth-enhancing policies. For example, one can assume that monetary policy and trade policy, both allocated at the national level, greatly influence the economy. This would mean that creating growth by the method of local democracy is limited. A complication for this interpretation is that the growth-effect of policy competition not is measured as it poses a higher growth rate across all districts and consequently can only be measured at a national level, but nonetheless is the source of growth at district level. Another similar reason behind the insignificant result is that the direct election of district heads might

be less important than the implementation of election of district parliaments.

The policy implications are that one cannot expect short-run effects on economic growth from the implementation of local election, and moreover that the effect of local elections most likely are heterogeneous across districts.

Future research could take advantage of the research designed developed. At the outset of this research project it was not clear which time-dimensions it was possible to test from the unfolding of events on the ground, but more informed choices could be made. If the main reason for the insignificant result is that the time frame in the current research set-up is too short alternative outcome variables can be tested that theoretically should influence economic growth in a shorter time span. A suggestion of suitable outcome variables would be the percent of children enrolled in school or national exam results to approximated human capital, and measures of the value of investment to approximated physical capital, all available at district level in Indonesia. Furthermore, future research can try to find the differentiating factor behind the proposed heterogeneous effects, which would have interesting policy implications. The current research design provides a comparatively beneficial way of measuring the effect of local elections on various outcome variables, because the unfolding of events in Indonesia provides a “natural experiment”, which promises to yield interesting results.

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Appendix A

Section A1. 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”

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

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

Section A2. Choices of concern in defining variables

Table A2. Choices of concern in defining 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 be held in the same geographical area after because a new district was created. Furthermore, in the few cases when the years differ between first and second round election, the year of first round election is recorded.
Year of districts borders	The year of districts borders referred to when the parliament passed 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 to more than two districts. The dummy of district splits is calculated as any part of the measured district that experienced one or many splits.

Section A3. Presentation of the four different specifications

The four different specifications are presented below. In addition, estimations are performed with prolonged time series using McCulloch's dataset (2011 b), which adds year 2002 and 2003, but the way of reasoning is equivalent.

- Year 2004-2008 Represents the basic difference-in-difference estimation because 2008 is the latest year one can measure an effect while the "control" group still has not had local elections.
- Year 2004-2010 Represents an extended specification; under the assumption of a time lag in the effect of local elections the implicit comparison with the "control" group is still valid.
- Year 2004-2005 combined with 2008 Represents yet another extended specification; under the assumption of a three year time lag in the effect the estimate can be diluted by the inclusion of year 2006 and 2007 and thus those years are excluded from the specification.
- Year 2004-2005 combined with 2009-2010 Represents the last specification; under the assumption of a four-five year lag in the effect the estimate can be diluted by the inclusion of year 2006, 2007 and 2008.

Appendix B

Table B1. Descriptive Statistics and Balance, 1999 district border used

A specific variable refer to the value 2001 unless otherwise stated. The number of observation is 94-292. The source is McCulloch's dataset (2011 b) except for indicated exceptions and the abbreviations within parenthesis after each variable indicates the specific source.

Whole population

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 "child" district (Own source)	0.0833	0.0241	0.3425	0.0559	0.0115	0.0115	0.0000	0.0222
Dummy for split (Own source)	0.3561	0.0418	0.5205	0.0589	0.2069	0.0437	0.0002	0.0180
Distance district to Province's Capital	129.4988	12.4432	145.5043	18.4399	105.6563	11.1037	0.1751	0.1815
Distance district to the capital Jakarta	1015.2470	59.7884	1062.2590	77.3361	853.0356	70.4737	0.1039	0.0834
Total District Revenue, billion (SIKD)	236	15	226	16	231	13	0.8865	0.8067
Social characteristics								
Population (BPS)	586020.0000	43284.5700	491178.6000	56252.9700	708599.2000	67484.3700	0.0371	0.1102
Population (Susenas)	578502.5000	42522.0100	518552.4000	65307.4100	702309.9000	67079.9600	0.0970	0.1027
Poverty headcount (BPS)	21.4168	1.0175	22.5348	1.2427	20.5432	1.2206	0.5427	0.5851
Real Average annual per capita expenditure (Susenas)	1935890.0000	45390.5800	1974966.0000	98580.1500	1922507.0000	59214.6200	0.8638	0.8561
Population in Urban Area (Susenas)	233753.7000	31096.1200	169967.4000	26932.8600	341619.5000	50144.0900	0.0168	0.0549
People in primary school age 7-12 years (Susenas)	72445.0700	5214.1890	68490.0200	8689.5470	89484.2100	9196.2610	0.1270	0.0849
Share people ever/being in primary school per total population (Susenas)	0.4415	0.0076	0.4669	0.0139	0.4475	0.0103	0.2252	0.6314
Unemployed population (Susenas)	10502.8000	1170.0650	9962.9330	1562.2930	15066.4600	2029.5110	0.0536	0.0382
Ethno-linguistic Fragmentation Index, 2000 (Census)	0.4385	0.0298	0.4526	0.0385	0.3816	0.0350	0.3453	0.2252
Religion Fragmentation Index, 2000 (Census)	0.2030	0.0193	0.1640	0.0230	0.1421	0.0179	0.0817	0.0318
Number of Telefon Subscriber, 2000 (PODES)	7792.2620	1385.8690	5176.3830	777.8037	12580.3700	2611.8640	0.0307	0.0824
Telephone access per household, 2000 (PODES)	0.0677	0.0077	0.0536	0.0092	0.0835	0.0099	0.1053	0.2049

Road Quality: 1 good - 4 worst, 2000 (PODES)	1.4770	0.0338	1.5384	0.0517	1.4438	0.0413	0.3372	0.5335
Number of villages with asphalt road, 2000 (PODES)	104.7967	6.5845	124.2295	11.0291	107.3372	9.0393	0.2785	0.8162
Governance characteristics								
Number of Corruption Case Covered by Media, 2004 (ICW)	1.5714	0.1188	1.5385	0.1940	1.6176	0.1463	0.9369	0.8049
KPPOD Score: Institution, 2002 (KPPOD)	0.0518	0.0021	0.0580	0.0029	0.0531	0.0022	0.3296	0.6562
KPPOD Score: Social, 2002 (KPPOD)	0.0540	0.0027	0.0609	0.0047	0.0538	0.0031	0.4269	0.9744
KPPOD Score: Economic, 2002 (KPPOD)	0.0333	0.0017	0.0347	0.0039	0.0278	0.0019	0.0684	0.035
KPPOD Score: Labor, 2002 (KPPOD)	0.0287	0.0018	0.0239	0.0030	0.0273	0.0018	0.3923	0.5774
KPPOD Score: Infrastructure, 2002 (KPPOD)	0.0266	0.0012	0.0279	0.0023	0.0279	0.0011	0.7128	0.4409
Economic characteristics								
Real Income, GRDP, billion (BPS)	3400	495	3520	699	3650	450	0.9450	0.7266
Real Income, GRDP, without oil & gas, billion (BPS)	3000	435	2430	505	3580	446	0.2936	0.3755
Real Income, GRDP, 2003, billion (Own source)	3704.1340	531.5612	3838.1830	755.4094	3991.0020	489.6855	0.9373	0.7085
Real Income per capita, GRDP, 2003, thousand (Own source)	6197	618	10200	3294	7192	1584	0.2577	0.5060
Sectoral breakdown of GRDP, billion (BPS):								
Agriculture	690	57	648	70	675	72	0.9027	0.8673
Mining, Quarrying, Oil & Gas Manufacturing	574	242	1150	473	330	185	0.2062	0.4750
Non Oil & Gas Manufacturing	688	161	795	414	1060	264	0.5660	0.2024
Electricity, Gas & Water Supply	41	11	21	8	52	14	0.2184	0.5280
Construction	165	36	111	17	141	17	0.4543	0.6026
Trade, Restaurant & Hotel	626	133	424	69	746	104	0.2335	0.5150
Transportation and Communication	209	44	121	18	226	38	0.1984	0.7745
Financial Services	145	32	84	15	143	18	0.2736	0.9764
Services	288	35	198	23	313	33	0.0763	0.6247
Sectoral breakdown of GRDP, (BPS):								
Share of agriculture to total GRDP	0.3185	0.0163	0.3633	0.0237	0.2963	0.0221	0.0957	0.4104
Share of mining to total GRDP	0.0695	0.0154	0.1122	0.0272	0.0596	0.0174	0.1769	0.6799
Share of non oil & gas manufacturing to total GRDP	0.1422	0.0115	0.1148	0.0175	0.1596	0.0178	0.1575	0.3881
Share of electricity to total GRDP	0.0090	0.0010	0.0058	0.0008	0.0103	0.0011	0.0165	0.3860
Share of construction to total GRDP	0.0542	0.0030	0.0506	0.0044	0.0486	0.0030	0.4577	0.2044

Share of trade to total GRDP	0.1703	0.0068	0.1603	0.0095	0.1969	0.0093	0.0117	0.0194
Share of transportation to total GRDP	0.0668	0.0048	0.0559	0.0059	0.0679	0.0059	0.2917	0.8861
Share of financial service to total GRDP	0.0447	0.0027	0.0341	0.0032	0.0468	0.0030	0.0141	0.6126
Share of service to total GRDP	0.1275	0.0058	0.1061	0.0081	0.1203	0.0065	0.0820	0.4130
Value of FDI Realization, 2003, million US\$ (Bkpm)	147.9358	20.0805	117.1107	32.7264	335.7932	45.7588	0.0000	0.0000
Value of Domestic Direct Investment Realization, 2003, billion (Bkpm)	453.1484	60.8813	386.0848	85.8170	894.4226	122.2585	0.0002	0.0000

Population exl. "child" districts

	Treatment group			Delete group			Control group			P-value for equality across Treatment and Control group
	Mean	Standard error		Mean	Standard error		Mean	Standard error		
Dummy for "child" district (Own source)	-	-	-	-	-	-	-	-	-	-
Dummy for split (Own source)	0.2975	0.0417	0.2708	0.0648	0.1977	0.0432	0.2672	0.1058	0.1309	0.0353
Distance district to Province's Capital	125.8611	12.0088	97.3514	12.6312	100.7132	10.0590	0.1749	0.1309	0.0353	0.7236
Distance district to the capital Jakarta	1015.1310	59.7371	926.1877	89.8845	824.9090	65.3734	0.1057	0.0353	0.7236	0.0353
Total District Revenue, billion (SIKD)	239	16	229	17	231	13	0.8947	0.7236	0.0353	0.7236

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
Population in Urban Area (Susenas)	237935.7000	32772.6400	240567.6000	36337.1400	345250.8000	50597.3900	0.1215	0.0643
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
Share 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
Unemployed population (Susenas)	10557.2800	1231.7130	13807.3400	2189.4650	15215.5900	2047.6980	0.0990	0.0406
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 Telefon Subscriber, 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 road, 2000 (PODES)	109.4561	6.8740	129.1739	13.0705	108.4353	9.0785	0.3066	0.9273
Governance characteristics								
Number of Corruption Case 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	340.4	46.163	0.0000	0.0000
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

The P-value in the latest columns is for a F-test of equality of variable means across groups.

