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Out of Communal Land: Clientelism through Delegation of Agricultural Tenancy Contracts

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Abstract

Do local institutions influence the nature of political clientelistic exchange? We find a positive answer in the context of a village institution prevalent in Java since the Dutch colonial rule, where democratically elected village heads receive usufruct rights over a piece of communal village land (bengkok land) as a compensation for their service in lieu of salary. To formulate how limited-term private ownership of bengkok land promotes clientelism, we model a timely delegation of agricultural tenancy contracts to villagers-cum-voters as an incumbent re-election strategy. Based on a household survey fielded in 2018 across 130 villages in Java, Indonesia, we find that the chances of a bengkok plot being rented out increase by 6 percentage points as the time of the next election becomes closer by one year, and sharecropping is preferred to a fixed-rental contract as the election approaches. The empirical results are statistically significant and remain largely unchanged against a series of robustness checks. We also find suggestive evidence of short-term efficiency loss from clientelistic politics over bengkok land.

Keywords: *tanah bengkok*, political budget cycle, clientelism, agricultural tenancy, electoral competition, Indonesia.

JEL codes: D72, H77, H83, O17, O18

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1. Introduction

Political clientelism is generally understood as a *quid pro quo* exchange of citizens' votes for benefits from politicians (Kitschelt and Wilkinson, 2007; Hicken, 2011; Bardhan and Mookherjee, 2020).[1] The nature and size of clientelism vary across countries as they adapt to different levels of democracies and autocracies. While a vast literature documents that clientelism subverts the functionality of democracy through higher levels of rent-seeking especially in low- and middle-income countries,[2] the existing knowledge is limited on how local institutions influence the nature of clientelistic exchange and the channels through which clientelism conditions economic development.

We study clientelism and its welfare consequences in the context of a unique village institution prevalent in Java, Indonesia, where democratically elected village heads and other officials receive usufruct rights over a piece of communal village land (known as *tanah bengkok*, hereinafter, bengkok land) as compensation for their service to the village in lieu of salary.[3] Bengkok land plays a pivotal role in the political economy of village politics in Java. While Indonesian government's recent initiatives to legitimize a uniform salary system for village leaders reflect a conservative view of villages as the lowest level of the state administration (Antlov et al., 2016), the village heads (especially in villages with large bengkok plots) view bengkok land as part of the self-governing communities and beneficial for community development and village welfare. The feudal nature of the village government in Java continued since the colonial period as the elected village heads often pursued economic interests like landlords. Village elections follow a six-year cycle and the incumbent village heads utilize bengkok land until the end of their tenure. Re-election motives and fixed-term private ownership of bengkok land command its utilisation for amassing political support. At the same time, stiff competition over access to bengkok land makes patronage

[1] The other key elements of clientelistic exchange are hierarchy and iteration (Hicken, 2011).
[2] See Bardhan and Mookherjee (2000), Wantchekon (2003), Keefer (2006) and Kitschelt and Wilkinson (2007).
[3] The institution of *tanah bengkok* was legally codified under the Dutch colonial rule, but there are disputes over its origin. According to many scholars (Moertono, 1968; Soetrisno, 1993; Tjondronegoro, 2013), an old system of appanage land from the precolonial Javanese kingdom predates the *tanah bengkok* institution (see Section 2). Starting from the period of Dutch colonial rule, this institution has been in place until now because the village governance in Java is largely viewed in economic terms and the goal has always been to keep the central budget for village administration low (Mortimer, 1974).

through the landlord-tenant relationship an integral part of clientelistic exchange (Kammen, 2003).[4]

In this paper, we argue that the means of clientelistic exchange is shaped by strategic delegation of agricultural tenancy contracts over bengkok land. We define and measure clientelistic exchange based on the nature and frequency of tenancy contracts over time akin to the notion of political budget cycles (Persson and Tabellini, 2003; Brender and Drazen, 2007).[5]

To expound the mechanisms of clientelistic exchange, we build a theoretical model in the spirit of political budget cycles over bengkok land. In a two-period framework, the village head acts as the landlord and hires tenants on either a fixed rental or sharecropping basis in each period, and the election takes place after the second period. The present quality of the land is assumed to be inversely related to the level of raw material used in the past, which at equilibrium results in a larger amount of raw material uses under a fixed rental contract.[6] Our model predicts that an incumbent village head, driven by a re-election motive, delegates more tenancy contracts as the next village election approaches. Moreover, sharecropping contracts are preferred over fixed rental contracts to preserve the quality of land if the incumbent foresees higher chances of re-election.[7]

Fielded in 2018 across 130 Javanese villages in Central and East Java, our novel household survey data[8] is applied to test if (1) the number of the total tenancy contracts on bengkok plots increases and (2) sharecropping as a share of total land tenancy contracts over bengkok plots increases as the election approaches. We utilise the variation in the time to the election across villages to examine the causal link between tenancy contracts and political budget cycles. The village level characteristics are highly exogenous to the time to the election, and as such do not confound this causal channel. After controlling for plot-level and household-level characteristics, the OLS estimates suggest that the chance of a bengkok plot

[4] In the context of Indonesian politics, many researchers view patronage through material benefits distributed by politicians as a subset of clientelism broadly defined as the power relationship (Aspinall and Sukmajati, 2016). The 1979 reform transformed the role of a village head from a mere community leader to an agent of the state (Antlov, 1994; 2004; Maurer 1994), and a broker between the state and the rural community (Aspinall, 2014).
[5] Political budget cycles are prevalent in less-developed countries (Shi and Svensson, 2006).
[6] Applying a similar model, Roy and Serfes (2001) show that a fixed rental contract is always offered in the second period whereas a sharecropping (fixed rental) contract is offered in the first period if the landlord is less (more) myopic than the tenant.
[7] In Indonesian village politics, it is a common practice to buy votes through direct cash payments to prospective voters in the days leading up to an election. The nature of this type of vote buying is typically a once-off and does not necessarily take the form of clientelistic exchange (Aspinall, 2014; Muhtadi, 2018), which we study in this paper.
[8] We collected data at the village, household, and agricultural plot levels covering more than 1,800 households that were sampled either from landlord or tenant populations. See Kurosaki et al. (2020) for further details.

being rented out (either fixed rental or sharecropping) increases by 6 percentage points as the time of the next election becomes closer by one year, and sharecropping as the share of bengkok land tenancy contracts exhibit a U-shaped relationship as the election approaches. These empirical results are statistically significant and placebo tests confirm that the outcomes with bengkok plots do not hold on private plots.

We examined several factors including the dynasty of influential village-head families, newly formed or split villages, decentralization and more autonomy at the district level as potential threats to our baseline results. These factors could weaken the iterative process between the management of tenancy contracts on bengkok plots and political budget cycles. In addition, we ran different parametrisation of time until the next election using time fixed effects, probit model instead of OLS, and the addition of a range of village-level controls in the main model specification. The results remain robust and statistically significant after controlling for all these events. Moreover, we find sharecropped bengkok plots less productive compared to fixed rental bengkok plots in terms of rice yield per hectare,[9] suggesting that clientelistic politics over bengkok land is less efficient in terms of agricultural productivity, at least in the short run. Taken together, the role of tenancy contracts in clientelistic exchange in bengkok villages appears robust.

The key contribution of this study lies in the creation of new knowledge on the role of local institutions in political clientelistic exchange in the context of bengkok land villages in Java, Indonesia. The three main implications of the study are as follows. First, the outcomes of this study suggest that the clientelist enforcement problem has been historically mitigated through delegation of tenancy contracts out of communal village land. The *quid pro quo* nature of clientelistic exchange in the absence of monitoring leads to such enforcement problem as both parties may not follow through on their promises (Kitschelt and Wilkinson, 2007; Robinson and Verdier, 2003). To this extent, tenancy contracts over bengkok land satisfy all three components of clientelistic exchange proposed by Hicken (2011), contingency or reciprocity, hierarchy or unequal power between the village head and the tenants, and an iteration where the relationship is not expected to be one-off.

Second, in our study bengkok tenants serve as political brokers to garner support from voters and play the role of intermediaries between the incumbent village head and the villagers (Bardhan and Mookherjee, 2020). In densely populated Java, the village heads have

[9] Rice cultivation is the primary source of income from bengkok land in our study area. In some other areas, there exist other income-generating channels out of bengkok land (e.g., sugarcane production), which are outside the scope of this study.

limited opportunities to interact with each villager, which justifies the choice of the incumbent village head to mobilise bengkok tenants for the purpose of re-election.

Third, the outcomes on agricultural productivity suggests that even though clientelistic politics are less efficient in the short-term, the prospects of the long-term welfare gain increase through preserving the quality of land. The net welfare gain depends on the relative strength of the short-term and long-term effects.

Our study mainly contributes to the broad strands of literature on elite capture[10] and democratic consolidation. It is widely documented that democratic consolidation is achieved through clientelism and elite capture.[11] The redistributive gains from bengkok land are associated with democratic consolidation where the village heads remain an important component of the hierarchical structure of state bureaucracy (Maurer, 1994).[12] The wealthiest households in a village who have resources to contest for a village election, often become the village head and control their use rights over bengkok land (Booth, 2012; Mortimer, 1974). The prize of victory in the village election is access to land (Maurer, 1994; Kammen, 2003; Antlov, 2004), and through an iterative process of the renewal of tenancy contracts, the outputs from cultivation of bengkok land is repeatedly shared between the tenant and the village head.[13]

This study also contributes to the field of research on the political economy of Indonesia. Studies on the patronage and clientelism in Indonesia have largely focused on national, provincial and district legislatures and executive elections (Aspinall and Sukmajati, 2016; Martinez-Bravo, 2014; Martinez-Bravo et al., 2017; Dell and Olken, 2020). At the same time, attention has mostly been paid to vote-buying through non-clientelist exchange, primarily in the form of retail vote-buying (Muhtadi, 2018). The current study provides evidence on clientelism rooted in the use of communal land in village politics. Despite a voluminous literature on the political economy of Indonesia,[14] only Lim (2019) provides a

[10] See Nunn (2012) for a comprehensive survey on this topic.
[11] See Bardhan and Mookherjee (2020, 2012, 2000); Baland and Robinson (2008); Persson and Zhuravskaya (2011); Robinson and Verdier (2002); Dal Bo and Di Tella (2003); Wantchekon (2003); Acemoglu and Robinson (2006); Dal Bo (2007); Baland and Robinson (2008); among others.
[12] In Java, the rural areas of each province are successively divided into districts, sub-districts and villages. Villages thus constitute the smallest unit of territorial administration in the rural area of Java.
[13] The unique features of bengkok land dub the village as *de jure* landlord and the village head as *de jure* tenant of bengkok land. The village head on the other hand acts as the *de facto* landlord, who use her authority for political manipulation and private economic gain.
[14] See Fisman (2001); Olken (2009, 2006); Skoufias et al. (2014); Martinez-Bravo (2014); Martinez-Bravo et al. (2017); Lim (2019); Alatas et al. (2019); Dell and Olken (2020), among others.

systematic empirical study of bengkok land.[15] In two respects, our study differs from Lim (2019). First, Lim (2019) examines the long-term impact of bengkok land institutions on productivity and poverty reduction whereas we explore the relationship between land tenancy contract choices and the political budget cycles over bengkok land. Second, our survey covers 130 villages with bengkok land spread across 13 districts in Central and East Java, compared to the two districts studied by Lim (2019). The unavailability of systematic data on bengkok land[16] has bottlenecked in-depth research on this historic institution that takes the centre stage in the political economy in Javanese villages. To the best of our knowledge, this is the first large-scale empirical study performed on bengkok land.

Three caveats are in order, all of which are not addressed in this study due to the lack of detailed data. Firstly, clientelistic politics in the present context benefits only voters-cum-tenants at the expenses of other voters. However, in the standard models of political budget cycles, manipulation of fiscal aggregates (increases in deficits and expenditures or cuts in taxes) to buy votes benefits all citizens (Persson and Tabellini, 2003; Brender and Drazen, 2007).[17] Secondly, as we have limited data on electoral outcomes, we do not examine the direct relationship between clientelistic exchange and the electoral outcomes for tenants and landlords involved in bengkok tenancy. Thirdly, while we explicitly model clientelistic exchange as the vote-buying strategy, a widespread practice in legislative and executive elections at the national, provincial and district level in Indonesia is retail vote-buying through direct cash payments to potential voters on the day of the election (Hadiz, 2010; Aspinall and Sukmajati, 2016). Candidates sometimes also engage in pork-barrel politics, offering publicly funded programs or small projects to targeted groups (Aspinall and Rohman, 2017).

We organise the rest of the paper in the following manner. Section 2 provides a brief history of bengkok land touching upon its origin and geographic spread and electoral

[15] Despite government initiatives to repel the bengkok land institution in favor of uniform salary for the village heads (Antlov et al., 2016), this century-old institution is still prevalent in large parts of Java and plays a central role in the political economy of village administration in Java.

[16] Scattered ethnographic studies, agricultural surveys (Antlov, 1994; Maurer, 1994; Hart, 1986; Kano, 1977; White and Wiradi, 1979, among others) and intermittent census figures have so far been the only sources available on bengkok land. The available resources from the Village Potential Statistics (PODES), conducted in line with the implementations of the Population Census, Agriculture Census and Economic Census in Indonesia, do not provide detailed information on the distribution of bengkok land among different administrators, either.

[17] The literature on political business cycles (Nordhaus, 1975; Rogoff and Sibert, 1988; Rogoff, 1990 and Persson and Tabellini, 1990) precedes the literature on political budget cycles. Brender and Drazen (2007) argue that the lack of convincing evidence on political business cycles led researchers to shift their attention to political budget cycles.

competition for bengkok land. In section 3, we build a simple theoretical model on tenancy contracts and political cycles in a village administrative system characterised by bengkok land. Section 4 describes the data and discusses the empirical results, which is followed by a concluding section.

2. The political economy of Bengkok land - A brief history

2.1. The origin and geography

While disputes remain about its origin (Moertono, 1968; Soetrisno, 1993), according to some scholars (Tjondronegoro, 2013), an old system of appanage land from the precolonial Javanese kingdom predates the bengkok land institution, which was legally codified under the Dutch colonial rule. In 1866, the Dutch colonial government decided to give the village heads official land in lieu of salary, which proved to be an inexpensive and convenient means of administration and cooperation with the local economy. In 1906, the provision for the election of a village head was constituted by law, which also designated the revenue given to the village heads and other village officials (Kano, 1994). At that time, the village heads and other village officials also enjoyed various labour services by the villagers. While labour service practices were gradually abolished (Kano, 1994), the bengkok land system continued, predominantly in the central and eastern parts of Java.

In the absence of systematic data, we resort to scattered ethnographic pieces of evidence and census figures to describe the size and distribution of bengkok land in Java. According to the 1883 colonial statistics, bengkok land occupied 13.9% of total farmland in Java excluding Batavia, Yogyakarta, Surakarta and Madura. The percentage was reduced to 5.9% in 1932 and the similar figure for the whole Java in 1932 was 6.0%.[18] Looking at the absolute size, however, the same data source shows that the farmland classified as bengkok increased from 340,000 ha in 1882 to 360,000 ha in 1932 in Java excluding Batavia, Yogyakarta, Surakarta and Madura.[19]

[18] Data sources: *Koloniaal Verslag van 1883* [Nederl. (Oost-) lndie.], Appendix P. for the 1882 value and *Indisch Verslag 1934 - II, Statistisch Jaaroverzicht van Nederlandsch-Indië*, for the 1932 values. We appreciate the help from Pierre van der Eng for obtaining these numbers.

[19] We converted the acreage in "bouw" using 0.71 ha per bouw into the numbers in hectares.

Collecting information from an Indonesian Law book, Kammen (2003) reports that bengkok land is found in the former Cirebon Residency of West Java, and in the entire region of Central Java and East Java. Other independent research reports also support this geographic spread of Bengkok land, with more extensive spread of bengkok land in riverine areas than in highland areas (Kano, 1977; Hefner, 1990; Booth and Sundrum, 1981). Kano (1977, p.31) estimates the size of bengkok plots to be between 5 to 15% of the available communal land in the village during the colonial era. The unequal distribution of bengkok land was also partly due to the local customs at various places, which influenced the terms and conditions of the reward that village heads and other village officials enjoyed against their services (Kano, 1994).

Since independence, there have been several attempts to create a more equitable distribution of bengkok land across Java, including reclassifying communal land as bengkok land or even allocating funds available at the district level to purchase additional land for villages (Soetrisno, 1993; Kurosaki, et al., 2020). Kano (1994), surveying 500 villages in Java in 1990, concludes that the percentage of bengkok land in the village land remain virtually unchanged between 1903 and 1990. Data from PODES shows that in 2000 bengkok land is concentrated in Central Java, Yogyakarta and East Java (Appendix 1A).

2.2. Electoral competition over bengkok land

In both the colonial and post-colonial era, to keep the central budget for village administration low, villages were mostly autonomous and village heads had authority to levy various fees/taxes and could summon villagers to work on building or maintaining public infrastructure (Antlov, 2004; Kammen, 2003). While village heads had always been elected from local people at least since the early 19th century (Hüsken, 1994), the position enabled them to accumulate wealth. The main source of this wealth was bengkok land, often the most fertile pieces of land in the village, which was of immense value in densely populated Java (Maurer, 1994).

The access to resources allowed village heads to accumulate wealth that was passed on to their children. At the same time, the position of power and access to bengkok land allowed them to provide patronage to sharecroppers and farm labourers who could be mobilised for various purposes, including winning the election. Standing for a village election in Java is an expensive affair, and candidates must invest significant financial and political resources to be competitive. This may explain why, while village heads have always been

elected, electoral competition has often stayed between a small number of families with long histories in village administration. This is true even after the introduction of the term limit in 1979. Maurer (1994), observing village elections in Java in 1990, found that many village heads and candidates were from the fifth or sixth generation of village administrators.

Studying widespread protests during village elections in Java during the tumultuous years of political transformations in 1997-1999, Kammen (2003) argues that the protests over village elections portrays the competition within the village to gain greater control over community assets and collective resources. In 1998, more than 6250 village elections that were scheduled to be held in 1999 were postponed when Soeharto stepped down from power. This had two immediate effects. On the one hand, a huge administration cost to meet the formal logistics including the formation of electoral committees, scheduling the election date and selecting candidates became a sunk cost. On the other hand, selected candidates incurred considerable campaigning costs in the quest of becoming an elected village head.[20]

As a predictable response, the suspension of village elections led to social and political unrest, often escalating to outright violence in central Java. This is supported by appendix 1B, which shows more frequent incidents of electoral protests in regions with a higher density of villages with substantial bengkok land. The high correlation between villages with bengkok land (appendix 1A) and protests over village elections (appendix 1B) is not a mere coincidence; rather, it points to the fierce electoral competition in the village where the prize of electoral victory was much-coveted access to bengkok land. The protests over village elections became intensified as the proportion of bengkok plot to the size of the village land increased. This refers to a direct relationship between the size of bengkok land and election competition in a village. Villages with large and productive bengkok land typically have a long list of potential candidates.[21] Conversely, less fertile and smaller tracts of bengkok land attract fewer candidates.[22]

[20] The cost of running a village election campaigns in Central Java in 2018 was between Rp 100 million to Rp 400 million ($ 7,500 - $27,500) (Berencschoft et al, 2021; Lim, 2019). As a comparison, the annual salary of a village head outside their additional income from bengkok land is around $2,000 - $ 3,000.

[21] Large bengkok land is often also seen as a potential source of conflict during election. In preparation for the 2019 election in 116 of villages in the Kudus district, Central Java, the police chief used the size of bengkok land to map villages most vulnerable to conflicts (Tribun Jateng, 2019).

[22] In 2019, for example there were shortages of candidates running for village head elections in a few villages where bengkok land was considered too small. In 28 out of 216 villages in Temanggung District, Central Java, to circumvent the rule requiring at least two candidates for the election, the main candidates enlisted their spouses to run against them. The small size of bengkok land was cited as the reason why there was a low interest in the position (Kedaulatan Rakyat Yogyakara, 2019; Kompas, 2019).

During the 1980s and the 1990s there were sporadic attempts to replace the bengkok land institution with a fixed salary for village heads. However, in most parts these were half-hearted efforts that failed to make any significant impact (Kammen, 2003). A stronger threat came much later, in 2014, as part of the new Village Law. As part of the implementation of the new law, the government started consolidating village funds (*dana desa*) to support the salaries of village administrators (Lewis, 2015). Following the law, Government Regulation 43 was passed, which governs village assets so that village administrators will be paid from village budget. The regulation made concrete suggestions to abolish the bengkok land institution, and instead for village heads and other village officials to receive a stipulated monthly salary (*penghasilan tetap*), various allowances (*tunjangan*) and medical benefits (*jaminan kesehatan*) from the financial resources available at the subdistrict level (*dana perimbangan*) (Kano, 2017).

The new regulation received strong reactions from villages. Throughout the first few months of 2015 there were a number of public demonstrations involving dozens and sometimes hundreds of village administrators from Central and East Java, who travelled to the presidential palace in Jakarta, to retain bengkok as part of the salary of village administrators.[23] Under pressure from the villages, in June 2015, Government Regulation 47 was enacted to retain the status of bengkok land as an additional means of support for village administrators, over and above their paid salary.[24] This clearly marked a victory for the villages. Districts in Central and East Java issued legislation to formalise this. However, around this time, some districts decided to get rid of bengkok land.[25]

Village heads had sources other than bengkok land to generate income. As the chief administrator of the village, village heads were often involved in most development projects and welfare programs. Village heads served as state clients (Antlov, 2004) and had close connections with the bureaucracy and officials at higher levels. These close connections enabled some village heads to channel part of these funds[26] for private use. In addition, from land transactions, rental agreements, issuing building permits, registration of marriages,

[23] See for example, Radar Yogya (2015), Merdeka (2020) and CNN (2015).

[24] In a number of public speeches, President Joko Widodo ensured that village heads and officials can continue to manage bengkok land (Tempo, 2015).

[25] At the time of our survey in 2018, three out of thirteen districts that were initially identified as core regions of the bengkok land institution had just implemented district laws to abolish bengkok land (Kurosaki et al., 2020).

[26] Village revenues typically come from three main sources: (i) village own-source revenues including village land, some of which is used as bengkok (not contributing to the village revenues directly), sometimes constituting up to 90 percent of village own income, (ii) transfers from the district under revenue sharing and grant, and (iii) since 2015, the newly instituted village funds (Lewis, 2015). The proportions of village own-source revenue out of all village revenues vary widely, from 1/20 for villages with less resources to up to 1/10.

divorces, birth and deaths – these routine village affairs all needed the approval and signature of the village head against a fee. The fee for such activities varied and was often left at the discretion of the village head, which also provided heads with an opportunity for rent seeking. Furthermore, village heads often served outside interests by coercing villagers to sell or rent land to outsiders, often followed by the illegal sale of village property and private land of the villagers (Fauzi, 1995; Aspinall and Rohman, 2017; Ito, 2011). Under the Village Law of 2014, which prevailed at the time of our survey, and with the large increase in the village budget, it is not surprising that the position of village heads continues to be attractive and heavily contested.

3. Theory

We work with a village level framework combining agricultural tenancy choices and probabilistic voting. Our model differs from the standard models of electoral competition in several ways. The public good in our model enters indirectly in the form of community protection that villagers receive from the village head.[27] For this reason, we do not consider the role of tax and government budget to finance public goods and instead assume that they are provided by the village head through resources from bengkok land. The direct benefit from bengkok land comes in the form of private income that only a contract holder or tenant receives. It is noteworthy to mention that our model of the political budget cycle only concerns villages where bengkok land is available. The electoral process of selecting a village head also exists in Javanese villages that do not possess bengkok land, and in such cases the village heads receive a salary instead of gaining access to bengkok land.[28]

Appendix 2 provides a detailed description of the theoretical model. Sections A2.1 and A2.2 provide the preliminaries. In section A2.1, we describe the model assumptions and timing of the events. In our framework, the village head acts as a landlord who employs tenants for two periods by offering them a contract in each period, and the election takes

[27] This is supported by an ethnographic study that documents the emergence of another form of social cleavages where voters equally cared for the protection of village assets when they saw an outsider, with vested interest in the village land, was trying to take control of the village resources (Kammen, 2003). The outsiders could be anybody from private developers to a state official of a higher rank. Thus, the mobilisation of resources (access to land in particular) created tensions within the village, as well as between the village and the outsiders.

[28] For example, Martinez-Bravo (2014) compared the elected and the appointed village heads to study if different systems of selecting the village heads affect the level of incentives for district-level officials to influence the voters.

place after the second period. Section A2.2 presents a modified version of the tenancy choice model of Roy and Serfes (2001). In a similar two-period set-up, with no uncertainty and asymmetric information of any kind, Roy and Serfes (2001) derive a tenancy contract mechanism. Based on the assumptions that the present quality of the land is inversely related to the level of raw material used in the past and the amount of raw material used increases as the type of tenancy contract changes from sharecropping to fixed rental, Roy and Serfes (2001) show that a fixed rental contract is always offered in the second period whereas a sharecropping (fixed rental) contract is offered in the first period if the landlord is less (more) myopic than the tenant.[29]

Section A2.3 presents a simple model of electoral competition between the incumbent and the challenger without a political cycle motive. The two parties announce their electoral platforms before the realisation of political parameters. It characterises the decisive voter and determinants of the incumbent's winning probability. Finally, in section A2.4 we introduce the case of an incumbent village head having a strong motivation for re-election so that she utilises any strategy of vote buying, which is central to this paper. We extend the Roy and Serfes model to incorporate hiring of additional tenants on bengkok plots in the second period, and the provision of village elections after the second period using a standard probabilistic voting model. In the case of electoral competition without a vote-buying strategy, we reach equilibrium tenancy contracts, as in Roy and Serfes (2001).

The role of clientelism in the village-level political budget cycle is best understood in the case of the electoral competition with a vote-buying strategy with the help of the following propositions.

Proposition 1. *An increase in the number of the total tenancy contracts improves the chances of incumbent re-election.*

Proof: See section A2.4.2 (Appendix 2).

Proposition 2. *New tenancy contracts as the time to an election becomes shorter are more likely to be sharecropping.*

Proof: See section A2.4.2 (Appendix 2).

An opportunist incumbent village head, as derived from our theory, increases the number of the total tenancy contracts on bengkok land in pursuit of garnering a larger vote bank for re-election. Moreover, new tenancy contracts are more likely to be sharecropping, as

[29] A similar mechanism of the advantage of sharecropping in preserving the fertility of land is discussed by Dubois (2002) using a different theoretical model. Dubois (2002) also tested the implication of his model to Philippine data and found the results consistent with it.

opposed to the case of electoral competition with no vote-buying strategy, when the election approaches. The second theoretical proposition is based on the premise that an opportunist village head gives more weight to preserving the quality of land foreseeing a higher probability of winning the election again, which makes the equilibrium contract choice to be sharecropping as opposed to fixed rental as the election time becomes nearer.

Based on the above two propositions, we empirically test the following hypotheses: (H1) the number of total tenancy contracts on bengkok plots increases as the time to an election becomes shorter, and (H2) the share of bengkok land tenancy contracts under sharecropping first decreases and then increases as the election time approaches, i.e., a U-shaped relationship between the share of sharecropping tenancy contracts and the time to the election.

The second hypothesis integrates two mechanisms. The theory discussed in A2.2 predicts that across all bengkok plots that are rented out in period 1, the percentage of sharecropping contracts declines in period 2, while the theory discussed in section A2.4 predicts that bengkok plots that are newly rented out in period 2 are more likely to be under sharecropping. As our empirical setting has a six year political cycle, as explained in the next section, we expect the first mechanism to dominate when the time of the election is far away while the second mechanism to dominate when the election approaches.

4. Empirical findings

4.1. Empirical strategy

As our dataset is cross-sectional, we cannot test these hypotheses directly. Instead, we examine whether two measures of Y (the dummy variable for a bengkok plot under tenancy for H1 and the dummy variable for a leased bengkok plot under sharecropping for H2) are correlated with X (the time till the election) as predicted by the theory. Note that the second hypothesis is tested conditional on a bengkok plot being rented out, which is examined in the first hypothesis.

It is possible that village level variables that affect the tenancy choice through other mechanisms (not modelled in our theoretical model) are correlated with X but omitted from our empirical model. In the standard tenancy theories in agricultural development economics,

type and quality of the farmland, tenants' liquidity constraint and risk aversion, landlords' risk aversion, relative positions of landlord-tenant wealth status and comparative advantages, market access for output and input among others are pointed out as important correlates of tenancy choice (Otsuka, 2007). We therefore run regressions using X (and its transformations) as the main explanatory variables, but with control variables such as characteristics of plots and landlord or tenant households. Village-level controls will be added in the robustness check.

Despite our finding of strong empirical support to H1 and H2 in the baseline model, it is possible that X can capture something else due to its correlation with some unobservable village-level characteristics that affect tenancy choices in general. To check this possibility, we run placebo tests using private land plots owned by private landlords, some (or all) of which is rented out to tenants either on a fixed rental or sharecropping contract.[30] For these plots, we can calculate two dummy variables of Y' (the dummy variable for a private plot under tenancy and the dummy variable for a leased private plot under sharecropping). As these plots are not directly affected by the political budget cycle, we expect no correlation between Y' and X, as far as X correctly captures the political factor.

Finally, we conduct several robustness checks. In addition to standard robustness checks with respect to the specification of empirical variables and functional forms, we use three sources of information on bengkok plots allocated to village heads. In our main analysis, we use plot-level information collected from sample landlord households. As robustness checks, we also use village-level information collected from village administrators and plot-level information collected from sample tenant households.

4.2. Data

For the empirical analysis, we use survey data, administered in February-April 2018 in two provinces of Central Java and East Java, where the bengkok institution is more prevalent, and both provinces were under the same Dutch colonial rule. From government statistics, we first selected a total of 13 rural districts (*kabupaten*)[31] where the bengkok land institution is

[30] In our dataset, some of bengkok landlords also own private farmland (Kurosaki et al., 2020). How the tenancy management of these private plots responds to the political cycle factor is highly complicated, beyond the scope of this paper. We thus do not use information on these private plots.

[31] In Indonesia, districts are classified into two types: *kabupaten* districts, which mostly prevail in rural areas and the majority of its villages are known as *desa* where village heads are directly elected, and *kota* districts, which mostly prevail in urban areas and the majority of its villages are known as *kelurahan* where village heads are appointed by the district mayor. Martinez-Bravo (2014) utilises the difference between *desa* and *kelurahan* to

prevalent and the main crop is paddy, ten districts from the eastern part of Central Java and three districts from the western part of East Java. From each district, two sub-districts (*kecamatan*) were selected. The selection of sub-districts was based on the farmland characteristics. Within each district, using the most recent agricultural statistics, we excluded sub-districts where the area of the dry farmland is larger than that of the wet farmland. From the remaining sub-districts, we randomly selected two sub-districts. A total of 26 sub-districts spread across 13 districts are shown in Appendix 3. A comparison with Appendix 1A suggests that our study villages were chosen from Javanese regions with a higher frequency of villages with substantial bengkok land.

The purpose of the survey was to collect detailed information on bengkok land at three levels: village, household, and agricultural plot. The survey covered 130 villages and more than 1,800 households that were randomly sampled from both landlord and tenant populations in the study villages. See Kurosaki et al. (2020) for details of the survey design and distribution of key variables regarding the management of bengkok land.

The main explanatory variable is X (the time to the next election). We had to exclude three villages where the incumbent village heads were ineligible for further elections due to the term limit. The distribution of X is shown in Figure 1. Its mean (S.D.) is 1.6 years (1.3 years) ranging from the minimum of 0.25 year (i.e., 3 months) to the maximum of 5.75 years (5 years and 9 months). Its median is 1.25 years (i.e., 1 year and 3 months).

To calculate the dependent variables, we mainly use the plot-level information in the landlord household data. This dataset contains information on 2,500 plots owned by 930 sample landlords. The sample landlords fall under one of the three exclusive categories: pure bengkok landlords without any private farmland, landowning bengkok landlords and pure private landlords (Kurosaki et al., 2020). For the main analysis, from the first two groups of bengkok landlords in eligible villages, we exclude bengkok landlords who are not village heads themselves. This is to identify the subset of bengkok plots that are under the direct influence of the political cycle. We have 273 plots available for the main analysis. Two dummy variables are compiled: Y_1, the dummy variable for the bengkok plot under lease (either on a fixed rental or sharecropping basis), and Y_2, the dummy variable for the leased bengkok plot under sharecropping. The mean of Y_1 is 0.857 (n=273) and the mean of Y_2 conditional on Y_1=1 is 0.440 (n=234).

identify the impact of elections in Indonesian local politics. Our survey covered *desa* villages in *kabupaten* districts.

For the placebo test we employ private plots owned by pure private landlords, who reside in villages administered by eligible village heads. We have 735 plots falling in this category. The mean of Y'_1 is 0.839 (n=735) and the mean of Y'_2 conditional on Y'_1=1 is 0.588 (n=617).

As control variables, we employ plot characteristics (dummy variables for unirrigated lowland plot, upland plot and size larger than 1ha), landlords' characteristics (age, years of education and asset index score[32]), tenants' characteristics (age, years of education and asset index score) and village characteristics (total area of the village, population to farmland ratio, number of factories and distance to the district capital city).

4.3. Time until the next election and village characteristics

Bivariate correlation coefficients between X and ten village-level variables are shown in Table 1. None of the ten coefficients is statistically significant at the 1% level and only one is statistically significant at the 5% level (number of factories in the village).

Table 1 also shows the regression results with X as the dependent variable and the ten village-level variables as explanatory variables. No variable has a statistically significant coefficient. Furthermore, the F-test for no slopes shows the overall insignificance of the regression model and R^2 is very low. As several of the ten explanatory variables are highly correlated, we also estimated a parsimonious version excluding mutually correlated variables (last column of Table 1), which confirms the previous result. Therefore, village-level observables do not have explanatory power for X.

We thus conclude that our measure of X (years until the next election of the village head) is highly exogenous to village-level characteristics. This justifies our main specification with plot and household characteristics and the specification with village-level controls as a robustness check.

4.4. Effect of the political cycle on tenancy choice

[32] "Asset index score" is the predicted value of the first principal component, aggregating 13 dummy variables for the household ownership of TV, satellite disc, refrigerator, LPG tube, air conditioner, mobile phone, computer, tablet, pump, generator, vehicle, boat and motorcycle (the loading coefficients, all positive, were estimated from the pooled sample of both tenant and landlord households).

4.4.1 Main results

The actual values of Y are plotted on X in appendix 4A, which suggests that the probability of a bengkok plot being rented out increases as the time of election draws nearer. As shown in column (1) of Table 2, the OLS regression coefficient on the linear term of X is -0.064 and statistically significant at the 10% level even with controls at the plot and household level. As shown in column (2) of Table 2, the coefficient on the quadratic term is insignificant. By imposing the restriction that the quadratic coefficient is zero, the model (2) turns into the model (1). Different combinations of control variables show that the coefficient is estimated robustly at around -0.06, implying that the probability increases by 6 percentage points when the election becomes closer by one year. Thus, H1 is supported.

As shown in appendix 4B, the probability of a leased bengkok plot under sharecropping first decreases and then increases as the time of election draws nearer (U-shaped relation). As shown in column (4) of Table 2, the quadratic model is supported against the linear model with coefficient of -0.35 on the linear term and 0.07 on the quadratic term, where both are statistically significant at the 5% level. Different combinations of control variables show that the coefficients are estimated robustly at approximately -0.3 on the linear term and 0.07 on the quadratic term. Thus, H2 is supported. Based on specification (4), the U-shape has the minimum at approximately $X = 2.5$ (i.e., 2 years and 6 months until the next election). From Table 2, we notice that control variables have much larger explanatory power on Y_2 (sharecropping vs. fixed rental) than on Y_1 (renting out vs. own cultivation). This implies that the choice between sharecropping and fixed rental is affected not only by the political cycle but also by standard sets of variables discussed in the land tenancy literature (Otsuka, 2007), the details of which are reported in appendix 5.

Instead of using linear and quadratic terms of X, we can characterise the time effects using a set of dummy variables in the spirit of time fixed effects. Appendix 6 shows the fitted effects of the time dummies on the lease probability. Similarly, appendix 7 shows the fitted effects of the time dummies on the sharecropping probability given that the plot is leased. Regardless of the way in which we define the time fixed effects, both H1 and H2 are supported from these figures as well.

4.4.2. Placebo tests

If our interpretation that X (the time until the next election) represents the political factor that is related to clientelism and specifically to bengkok plots, we do not expect to find similar relations when we examine private plots owned by pure private landlords (those who are not allocated any bengkok land). As shown in appendix 8A, the probability of a bengkok plot being rented out is almost flat regardless of the time until the next election. As shown in column (1) of Table 3, the OLS regression coefficient on the linear term of X is statistically insignificant. We thus conclude that the pattern similar to H1 does not exist on private plots (placebo test has been passed).

As shown in appendix 8B, the probability of a leased bengkok plot being under sharecropping has a slightly positive slope but is not showing a U-shaped relationship. As shown in column (3) of Table 3, the linear model has an insignificant coefficient on X. In sharp contrast to Table 2, the quadratic model has insignificant coefficients on both linear and quadratic terms in Table 3. This is robustly supported when the list of controls is permuted. We thus conclude that the pattern like H2 does not exist on private plots.

4.4.3. Robustness checks

We start with village level data for testing H2 (for H1, we have very little variation as the average of the dependent variable is very close to 1). Out of 130 villages, 11 villages were dropped because either the village head was ineligible for re-election, or the village head had not yet received the bengkok plots at the time of our survey, or the village head self-cultivated all of the bengkok plots. The information is not at the plot level, so we cannot control for plot-level characteristics. The dependent variable is a dummy variable for the village head to rent out some or all of bengkok plots to sharecropping, which has a mean of 0.395 (n=119).

As shown in appendix 9A, village-level data also show the U-shaped relationship. Column (2) of Table 4 shows that the quadratic model is supported against the linear model with a coefficient of -0.38 on the linear term and 0.07 on the quadratic term, both of which are statistically significant at the 1% level. Thus, H2 is supported from this alternative data source.

We can use plot-level data collected from the tenant household survey. However, because of the sampling design, we cannot test H1 (H1 is on plots owned by landlords, which were, by construction, collected in the landlord household survey). On the other hand, we can

still test H2 for bengkok plots using data on rented-in plots by sample tenant households. In the tenant household survey, we collected information on 2,652 plots managed by 913 tenant households. Out of these 2,652 plots, 724 plots were bengkok plots rented-in from village administrators. Out of these 724 plots, we exclude those in ineligible villages and those allocated to village officials other than the village head. As a result, we have 132 bengkok plots, for which the average of sharecropping dummy is 0.333.

As shown in appendix 9B, tenant household data also show the U-shaped relationship, although some irregularity occurs when the election is very close. Column (4) of Table 4 shows that the quadratic model is supported against the linear model with a coefficient of -0.30 on the linear term and 0.05 on the quadratic term, both of which are statistically significant at the 5% level. The coefficient estimates for these two parameters remain highly stable when we churn the list of controls. Thus, H2 is supported from the data reported by sample tenants as well. It should be noted that about one half of these tenants' plots overlap with the plot-level data collected in the landlord household survey (matched tenant-landlord data). Therefore, the analysis in columns (3) and (4) of Table 4 is not wholly independent of the analysis in columns (3) and (4) of Table 2. Due to the small number of observations, we do not attempt an analysis using the matched data.

Regarding different specifications, we already discussed the robustness when we employed a different parametrisation of X using time fixed effects (appendix 6 and 7). The results were similar when the monthly thresholds defining the year dummies were changed (i.e., whether the equality is put on the upper or lower threshold, or the treatment of large values of X for which the number of observations is small). The results based on probit specifications are highly similar to those of the OLS results (appendix 10A). The addition of village-level controls did not change the results, either (appendix 10B, panel B1). The robustness against the inclusion of village-level variables is especially important as our main variable of interest is defined at the village level. Furthermore, the process of decentralization introduced in 2001 transferred much decision making and responsibility from central government to the district level. This arguably created greater variation in regulations and policies between districts as districts have more discretion in how to provide public services including how to finance them (Hofman and Kaiser, 2004; Lewis and Smoke, 2014). Since villages are closely tied with districts, we re-estimated our baseline models with district fixed effects, and the results remain largely unchanged (appendix 10B, panel B2).

We perform two additional robustness checks. To contest in a village election in Java candidates invest significant financial and political resources (Maurer, 1994). For this reason,

electoral competition has often stayed between a small number of families with long histories in village administration. As an indirect way to test if such family dynasty affects the political competition, we firstly re-estimate the model including village heads who are ineligible for the next election (Appendix 11C, panel C1). The results remain unchanged, which suggests that even if the current head is ineligible to stand in the next election, bengkok land is still managed with re-election motive so that the leadership duties can be passed on to the next generation. The 2001 decentralization had created strong tendency to create new districts, driven by historical and ethnic considerations, but also due to fiscal incentives (Hofman and Kaiser, 2004). Because clientelism and political competition in a newly formed or split village could be different, we secondly check if the existence of such possibilities undermines our main results. The results remain unchanged after dropping villages that were likely to be newly formed or split[33] (Appendix 11C, panel C2). Combining the two robustness checks, the inclusion of villages where heads are ineligible for the next election in this restricted sample also yields qualitatively the same results (Appendix 11C, panel C3). Overall, both H1 and H2 receive robust empirical support.

4.5. Tenancy choice and agricultural productivity

As the last subsection on empirics, we provide some evidence on the welfare effects of clientelistic politics over bengkok land. In the literature, patterns of resource allocation consistent with clientelism are examined to understand their implications for welfare (Bardhan et al., 2020). For instance, public expenditure on infrastructure across Indian states is low despite a large demand for infrastructure services, which as Khemani (2015) argues, could be because infrastructure projects are not well-suited for clientelism.

In our theoretical model of land tenancy contracts, an opportunist village head offers sharecropping as an equilibrium contract choice in the second period as she gives more weight to preserving the quality of land, foreseeing a higher probability of winning the election again (the second hypothesis in the theoretical model). We test the validity of this theoretical argument by comparing the rice yield (ton per hectare) between sharecropped and

[33] In our survey, we did not collect the information directly. As we collected the information on the change in geographical size since 2007, we use the dummy variable for the area change experience as an imperfect proxy for the status of newly formed or split villages. The proxy is incomplete as it includes villages that experienced area changes for different reasons and it excludes villages that were newly formed or split before 2007.

fixed rental bengkok plots. After controlling for plot-level, household-level and village-level characteristics, we find robust and statistically significant empirical evidence that sharecropped bengkok plots are less productive than fixed rental bengkok plots (appendix 11). This supports our theoretical construct that clientelistic politics over bengkok land is less efficient in terms of agricultural productivity.

On the other hand, clientelistic politics could enhance the prospects of future welfare gain by preserving the quality of land as our theory predicts. Tenants newly hired in the last period before the election gain incomes irrespective of the type of tenancy contracts in comparison to the state without tenancy on bengkok plots. Despite an income loss in the current period in comparison to the fixed rental case, sharecroppers on bengkok land can foresee an income gain in the future as the quality of land in the current period is restored. We consider it a positive externality in the long run. However, it is beyond the scope of this study to provide empirical support on how future-income prospects generate welfare gains for the villagers. The net welfare gain depends on the relative strength of the positive and negative externalities arising from clientelistic politics associated with bengkok land.

To conclude, the redistributive gains from bengkok land are closely associated with clientelism and democratic consolidation at the village level. The prize of victory in the village election is access to land (Maurer, 1994; Kammen, 2003; Antlov, 2004; Aspinall and Rohman, 2017), and the elected village heads pursue similar economic interests as landlords. While the village head mobilises bengkok tenants for private gains, the tenants could also serve as political brokers, and as such, play an important role in overcoming monitoring and enforcement problems (Bardhan and Mookherjee, 2020). This reciprocal relationship helps mitigate the clientelist enforcement problem in this unique political institution.

5. Conclusion

This paper argues for and provides empirical support to strategic delegation of agricultural tenancy contracts borne out of communal village land as the means of clientelistic exchange in the context of the historic bengkok land institution in Java, Indonesia. A unique feature of bengkok land allows it to grant usufruct rights to village heads over a parcel of village land in lieu of salary. We build a theoretical model to motivate the discussion of tenancy arrangements as part of the political budget cycles associated with the electoral competition

in a village. Empirical support comes from a novel household level survey administered in 2018 across 130 Javanese villages in Central and East Java.

This study brings out novel insights regarding the role of local institutions in formulating the nature of clientelistic exchange in village politics. We show how the process of clientelistic exchange through agricultural tenancy contracts over bengkok land is linked to democratic consolidation and its possible welfare consequences for the villagers in the short- and long-term. The welfare implications of this study have direct bearings on the recent attempts by the Indonesian government to replace the bengkok land institution with a system of fixed salary for the village heads. In 2014, after the new Village Law was passed, the government started consolidating village funds to support the salaries of village administrators (Lewis, 2015). However, the new 2014 regulation received strong opposition from the village officials, which forced the government in June 2015 to eventually retain the status of bengkok land as a means of supporting them, over and above their paid salary.

References

Acemoglu, Daron and Robinson, James (2006). *Economic Origins of Dictatorship and Democracy*, Cambridge: Cambridge University Press.

Alatas, Vivi, Banerjee, Abhijit, Hanna, Rema, Purnamasari, Ririn and Wai-Poi, Matthew (2019). 'Does elite capture matter? Local elites and targeted welfare programs in Indonesia', *AEA Papers & Proceedings*, 109 (5), pp.334–339.

Antlöv, Hans (1994). 'Village leaders and the New Order', in (H. Antlöv and S. Cederroth, eds.), *Leadership on Java: Gentle Hints, Authoritarian Rule*, pp.97-118, Richmond, Surrey: Curzon Press.

Antlöv, Hans (2004). 'National elections, local issues: The 1997 and 1999 national elections in a village in Java', in (H. Antlöv and S. Cederroth, eds.), *Elections in Indonesia: The New Order and Beyond*, pp.111-137, London: Routledge Curzon.

Antlöv, H., A. Wetterberg and L. Dharmawan (2016). Village Governance, Community Life and the New Village Law in Indonesia. *Bulletin of Indonesian Economic Studies* 52(2): 161–83.

Aspinall, Edward (2014). 'When brokers betray: Social networks and electoral politics in Indonesia', *Critical Asian Studies*, 46 (4), pp.545–570.

Aspinall, Edward and Sukmajati, M. (eds.) (2016). *Electoral Dynamics in Indonesia: Money Politics, Patronage and Clientelism at the Grassroots,* Singapore: National University of Singapore Press.

Aspinall, Edward and Rohman, Noor (2017). 'Village head elections in Java: Money politics and brokerage in the remaking of Indonesia's rural elite', *Journal of Southeast Asian Studies*, 48 (1), pp.31-52.

Baland, Jean-Marie and Robinson, James A. (2008). 'Land and power: Theory and evidence from Chile', *American Economic Review*, 98 (5), pp.1737–1765.

Bardhan, Pranab K. and Mookherjee, Dilip (2000). 'Capture and governance at local and national levels', *American Economic Review*, 90 (2), pp.135–139.

Bardhan, Pranab K. and Mookherjee, Dilip (2012). 'Political clientelism-cum-capture: Theory and evidence from West Bengal', working paper, Institute for Economic Development, Boston University.

Bardhan, Pranab and Mookherjee, Dilip (2020). 'Clientelist politics and economic development: An overview', in (J-M. Baland, F. Borguignon, J-P Platteau and T. Verdier, eds.), *The Handbook of Economic Development and Institutions,* Princeton and Oxford: Princeton University Press.

Bardhan, Pranab, Mitra, Sandip, Mookherjee, Dilip and Nath, Anusha (2020). *How Do Voters Respond to Welfare vis-à-vis Public Good Programs? An Empirical Test for Clientelism*, Federal Reserve Bank of Minneapolis Staff Report 605.

Berenschot, Ward, Wigke Capri, and Devy Dhian (2021). *A quiet revolution?*
Village head elections and the democratization of rural Indonesia, Critical Asian Studies, 53:1, 126-146, DOI: 10.1080/14672715.2021.1871852

Booth, Anne and Sundrum, R. S. (1981). 'Income distribution', in (A. Booth and P. MacCaulay, eds.), *The Indonesian Economy during the Soeharto Era*, Kuala Lumpur: Oxford University Press.

Booth, Anne (2012). 'The performance of the Indonesian agricultural sector: Twelve questions and some tentative answers," in (A. Booth, C. Manning and T. K. Wee, eds.), *Land, Livelihood, the Economy and the Environment in Indonesia: Essays in Honor of Joan Hardjono*, Jakarta: Yayasam Pustaka Obor Indonesia.

Brender, Adi and Drazen, Allan (2007). 'Why is economic policy different in new democracies? Affecting attitudes about democracy', National Bureau of Economic Research Working Paper 13457.

CNN (2015). 'Tuntut Hak Tanah Bengkok, Ratusan Kepala Desa Demo Jokowi', May 25, "https://www.cnnindonesia.com/nasional/20150527115945-20-55979/tuntut-hak-tanah-bengkok-ratusan-kepala-desa-demo-jokowi"

Dal Bo, Ernesto and Di Tella, Rafael (2003). 'Capture by threat', *Journal of Political Economy*, 111 (5), pp.1123–1154.

Dal Bo, Ernesto (2007). 'Bribing voters', *American Journal of Political Science*, 51 (4), pp.789-903.

Dell, Melissa and Olken, Benjamin A. (2020). 'The development effects of the extractive colonial economy: The Dutch Cultivation System in Java', *Review of Economic Studies*, 87 (1), pp.164-203.

Dubois, Pierre. (2002) "Moral hazard, land fertility and sharecropping in a rural area of the Philippines," Journal of Development Economics 68(1) June: 35-64.

Fauzi, Noer (1995). 'Transformasi Agraria dan Kesajahteraan Kaum Tani', in (U. Hariadi and Masruchah, eds.), *Tanah, Rakyat and Demokrasi (Land, People, and Democracy)*, Yogyakarta: Forum LSM-LPSM, 1995.

Fisman, Raymond (2001). 'Estimating the value of political connections', *American Economic Review*, 91 (4), pp.1095-1102.

Hadiz, Vedi R. (2010). *Localising Power in Post-Authoritarian Indonesia: A Southeast Asia Perspective,* Stanford: Stanford University Press.

Hart, Gillian (1986). *Power, Labor and Livelihood: Processes of Change in Rural Java*, London: The University of California Press.

Hefner, Robert W. (1990). *The Political Economy of Mountain Java: An Interpretive History*, Berkeley: The University of California Press.

Hicken, Allen (2011). 'Clientelism', *Annual Review of Political Science*, 14, pp.289-310.

Hofman, Bert and Kai Kaiser, 2004. "The Making of the 'Big Bang' and its Aftermath: A Political Economy Perspective," Chapters, in: James Alm & Jorge Martinez-Vazquez & Sri Mulyani Indrawati (ed.), *Reforming Intergovernmental Fiscal Relations and the Rebuilding of Indonesi*a, Chapter 2, Edward Elgar Publishing.

Husken, Frans (1994). 'Village elections in Central Java: State control or local democracy?' in (H. Antlöv and S. Cederroth, eds.), *Leadership on Java: Gentle Hints, Authoritarian Rule*, Surrey: Curzon Press.

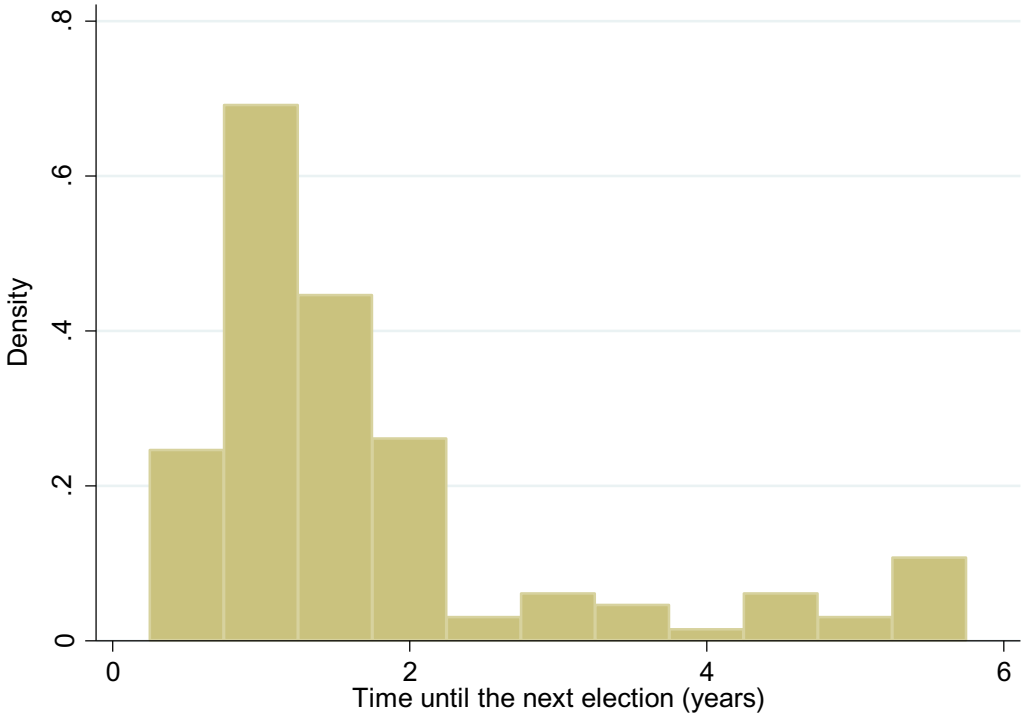
Ito, Takeshi (2011). 'Historicizing the power of civil society: A perspective from decentralization in Indonesia', *Journal of Peasant Studies*, 38 (2), pp.413–33.

Kammen, Douglas (2003). 'Pilkades: Democracy, village elections, and protest in Indonesia', in (J. T. Siegel and A. R. Kahin, eds.), *Southeast Asia over Three Generations: Essays Presented to Benedict R. O'G. Anderson*, Ithaca, NY: Cornell University Press.

Kano, Hiroyoshi (1977). *Land Tenure System and the Desa Community in Nineteenth Century Java*, Special paper no. 5, Tokyo: Institute of Developing Economies.
Kano, Hiroyoshi (1994). *Economic Transformation of a Central Java Village: 85 Years of District Comal*, Tokyo: University of Tokyo Press (in Japanese).
Kano, Hiroyoshi (2017). 'The Village Law of 2014 and reforms in village governance', *Indonesia Newsletter*, No.94, pp.44-59 (in Japanese).
Kedaulatan Rakyat Yogyakarta (2019). '28 Suami Istri Bertarung di Pilkades Temanggung', https://www.krjogja.com/berita-lokal/jateng/kedu/28-suami-istri-bertarung-di-pilkades-temanggung/
Kitschelt, Herbert and Wilkinson, Steven L. (2007). *Patrons, Clients and Policies: Patterns of Democratic Accountability and Political Competition*, Cambridge and New York: Cambridge University Press.
Khemani, Stuti (2015). 'Buying votes versus supplying public services', *Journal of Development Economics*, 117, pp.84–93.
Kompas (2019). 'Tidak ada pendaftar calon Kades, desa ini batal gelar Pilkades', https://regional.kompas.com/read/2019/11/28/10182951/tidak-ada-pendaftar-calon-kades-desa-ini-batal-gelar-pilkades
Kurosaki, Takashi, Paul, Saumik and Witoelar, Firman (2020). 'Access to land and tenancy practices on tanah bengkok: Evidence from Java, Indonesia', IZA DP 13597, August 2020. IZA Institute of Labor Economics.
Lewis, Blane D. (2015). 'Decentralising to villages in Indonesia: Money (and other) mistakes', *Public Admin. Dev*., 35, pp.347– 359.
Lewis, B.D. and Smoke, P. (2017), 'Intergovernmental Fiscal Transfers and Local Incentives and Responses: The Case of Indonesia'. *Fiscal Studies*, 38: 111-139.
Lim, Gedeon (2019). 'Why pay the chief? Land rents and political selection in Indonesia', Job Market Paper, Boston University, December 2019.
Martinez-Bravo, Monica (2014). 'The role of local officials in new democracies: Evidence from Indonesia', *American Economic Review*, 104 (4), pp.1244-1287.
Martinez-Bravo, Monica, Mukherjee, Priya and Stegmann, Andreas (2017). 'The non-democratic roots of elite capture: Evidence from Soeharto mayors in Indonesia', *Econometrica*, 85 (6), pp.1991-2010.
Maurer, Jean-Luc (1994). 'Pamong Desa or Raja Desa? Wealth, status and power of village officials', in (H. Antlöv and S. Cederroth, eds.), *Leadership on Java: Gentle Hints, Authoritarian Rule*, pp.97-118, Richmond, Surrey: Curzon Press.
Merdeka (2020). 'Puluhan pamong desa demonstrasi tuntut Undang Undang Desa direvisi', April 16, https://www.merdeka.com/peristiwa/puluhan-pamong-desa-demonstrasi-tuntut-undang-undang-desa-direvisi.html
Moertono, Soemarsaid (1968). *State and State craft in Old Java: A Study of Later Mataram Period, Sixteenth to Nineteenth Century*, Ithaca, NY: Cornell Modern Indonesia Project.
Mortimer, Rex (1974). *Indonesian Communism under Sukarno: Ideology and Politics, 1959-1965*, Ithaca, NY: Cornell University Press.
Muhtadi, Burhanuddin (2018). 'A third of Indonesian voters bribed during election: How and why," *The Conversation*, https://theconversation.com/a-third-of-indonesian-voters-bribed-during-election-how-and-why-100166.

Nordhaus, William D. (1975). 'The political business cycle', *Review of Economic Studies*, 42 (2), pp.169–90.
Nunn, Nathan (2012). 'Culture and the historical process', *Economic History of Developing Regions*, 27 (S1), pp.108-126.
Olken, Benjamin (2006). 'Corruption and the costs of redistribution: Micro evidence from Indonesia', *Journal of Public Economics*, 90 (4-5), pp.853-870.
Olken, Benjamin (2009). 'Do TV and radio destroy social capital? Evidence from Indonesian villages', *American Economic Journal: Applied Economics*, 1 (4), pp.1-35.
Otsuka, Keijiro (2007). 'Efficiency and equity effects of land markets', in (R. Evenson and P. Pingali, eds.), *Handbook of Agricultural Economics, Volume 3*, pp.2671-2703, North-Holland: Elsevier.
Persson, Torsten and Tabellini, Guido (1990). *Macroeconomic Policy, Credibility, and Politics*. London: Harwood Academic.
Persson, Torsten and Tabellini, Guido (2003). *The Economic Effects of Constitutions*, Munich Lectures in Economics, Cambridge: MIT Press.
Persson, Petra and Zhuravskaya, Ekaterina (2011). 'Elite capture in the absence of democracy: Evidence from backgrounds of Chinese provincial leaders', unpublished.
Radar Yogya (2015). 'PPDI Magelang: Sepakat Usulkan Revisi PP soal Desa', February 23, https://radarjogja.jawapos.com/2015/02/23/ppdi-magelang-sepakat-usulkan-revisi-pp-soal-desa/
Robinson, James and Verdier, Thierry (2013). 'The political economy of clientelism', *Scandivanian Journal of Economics*, 115 (2), pp.260-291.
Rogoff, Kenneth and Sibert, Anne (1988). 'Elections and macroeconomic policy cycles', *Review of Economic Studies*, 55 (1), pp.1–16.
Rogoff, Kenneth (1990). 'Equilibrium political budget cycles', *American Economic Review*, 80 (1), pp.21–36.
Roy, Jaideep and Serfes, Konstantinos (2001). 'Intertemporal discounting and tenurial contracts', *Journal of Development Economics*, 64 (2), pp.417-436.
Shi, Min and Svensson, Jakob (2006). 'Political budget cycles: Do they differ across countries and why?' *Journal of Public Economics*, 90 (8-9), pp.1367–89.
Skoufias, Emmanuel, Narayan, Ambar, Dasgupta, Basab and Kaiser, Kai (2014). 'Electoral accountability and local government spending in Indonesia: Dataset', Policy Research Working Paper No. 6782, World Bank.
Soetrisno, Loekman (1993). *The Transformation of the Function and Role of the Lurah in Java: A Historical Perspective: 1950-1967*, Yogyakarta: Penerbit Aditya Media.
Tempo (2015). 'Jokowi: Tanah Bengkok Jadi Hak Kepala Desa', December 28, https://koran.tempo.co/read/berita-utama-jateng/390149/jokowi-tanah-bengkok-jadi-hak-kepala-desa?
Tjondronegoro, Sediono M.P. (2013). 'An agricultural development legacy unrealized by five presidents 1966-2014', *Masyarakat Indonesia*, 39 (2).
Tribun Jateng (2019). 'Kapolres Kudus Sebut Desa Rawan Bisa Dilihat Dari Luasan Lahan Bengkok - Pemetaan Jelang Pilkades', https://jateng.tribunnews.com/2019/09/26/kapolres-kudus-sebut-desa-rawan-bisa-dilihat-dari-luasan-lahan-bengkok-pemetaan-jelang-pilkades
Wantchekon, Leonard (2003). 'Clientelism and voting behavior', *World Politics*, 55, pp.399-422.
White, Benjamin and Wiradi, Gunawan (1979). 'Pola-polapenguasan Tanah di DAD cimanuk Dulu dan Sekarang: Beberapa Catalan Sementara', *Prisma* 9, September 1979, pp.47-48.

Figure 1. Distribution of the time until the next election of the village head



Note: *n*=127.

Table 1. Time until the next election and village characteristics

	Summary statistics		Bivariate correlation w/ *X* (months until next election)		Multiple regression (OLS) w/ *X* as the dependent variable					
					Full list of explanatory variables			Parsimonious specification		
Village characteristics	Mean	Std.Dev.	Coeff.	p-value	Coeff.		Std.Error	Coeff.		Std.Error
Total land (1000 ha)	0.33	0.21	0.086	0.338	-0.442		1.361	0.353		0.572
Total farmland (1000 ha)	0.23	0.17	0.120	0.179	1.929		1.987			
Population (1000 persons)	4.15	2.54	0.021	0.813	0.015		0.095			
Population/farmland	21.32	12.50	-0.067	0.456	-0.002		0.018	0.0003		0.010
Number of factories	1.48	1.19	-0.178	0.046	-0.164		0.104	-0.182		0.102
Distance to bus terminal (km)	6.64	7.24	0.053	0.556	0.004		0.018	0.005		0.017
Distance to post office (km)	3.62	2.61	-0.002	0.987	-0.009		0.047	-0.007		0.047
Distance to district capital city (km)	20.54	12.13	-0.001	0.988	0.001		0.010	-0.0003		0.010
Total bengkok land (ha)	28.17	28.24	0.126	0.158	-0.008		0.010	0.005		0.004
Bengkok/farmland	0.15	0.16	0.117	0.189	2.373		1.812			
Intercept					1.335	**	0.535	1.597	***	0.502
F-stat for zero slope					0.86			0.90		
p-value (Prob > F)					0.571			0.510		
R-squared					0.069			0.050		

Notes: The number of observations is 127 (3 villages whose head is ineligible for re-election are excluded). Mean (Std.Dev.) of *X* is 1.6 years (1.3 years). Significance levels of ** (5%) and *** (1%) appear for the regression results. In the parsimonious specification, explanatory variables that are highly correlated with another explanatory variable (using 0.2 or -0.2 of correlation coefficient as the cut-off) are excluded.

Table 2. Probability of renting-out/sharecropping and the time until the next election (bengkok plots of village heads in eligible villages)

	OLS regression with the dependent variable:			
	Dummy for the bengkok plot to be rented-out		Dummy for the rented-out bengkok plot to be under sharecropping	
	(1)	(2)	(3)	(4)
X (years until the next election)	-0.064 *	-0.021	0.032	-0.350 **
	(0.036)	(0.082)	(0.054)	(0.158)
X^2		-0.008		0.071 **
		(0.018)		(0.028)
Number of observations	273	273	234	234
Mean of the dependent variable	0.857	0.857	0.440	0.440
F-stat for zero slope	1.03	0.96	4.06	7.53
p-value (Prob > F)	0.414	0.471	0.001	0.000
R-squared	0.065	0.066	0.207	0.278

Notes: The observations in columns (1) and (2) are bengkok plots of village heads who are eligible to run for the next elections. The observations in columns (3) and (4) are bengkok plots of eligible village heads that are rented out. Linear probability model is estimated by OLS. Village-clustered standard errors are in parenthesis, with significance levels of * (10%), ** (5%), and *** (1%). In addition to X and X^2, plot characteristics (dummy variables for unirrigated lowland plot, upland plot, and the size larger than 1ha) and landlords' characteristics (age, years of education, and asset index score) are also included as explanatory variables. See Appendix 5 for the full regressions results for specification (1) and (4). Full regression results for other specifications are available from the authors on request.

Table 3. Probability of renting-out/sharecropping and the time until the next election

(placebo: private plots of private landlords in eligible villages)

	OLS regression with the dependent variable:			
	Dummy for the plot to be rented-out		Dummy for the rented-out plot to be under sharecropping	
	(1)	(2)	(3)	(4)
X (years until the next election)	0.008	-0.006	0.025	0.028
	(0.015)	(0.058)	(0.023)	(0.109)
X^2		0.002		-0.001
		(0.010)		(0.018)
Number of observations	735	735	617	617
Mean of the dependent variable	0.839	0.839	0.588	0.588
F-stat for zero slope	0.85	0.76	10.95	9.60
p-value (Prob > F)	0.547	0.636	0.000	0.000
R-squared	0.012	0.012	0.121	0.121

Notes: The observations in columns (1) and (2) are private plots of private landlords in the eligible villages. The observations in columns (3) and (4) are private plots that are rented out. Linear probability model is estimated by OLS. Village-clustered standard errors are in parenthesis, with no coefficients significant at 10% or less. Plot characteristics (dummy variables for unirrigated lowland plot, upland plot, and the size larger than 1ha) and landlords' characteristics (age, years of education, and asset index score) are also included as explanatory variables. Full regression results are available from the authors on request.

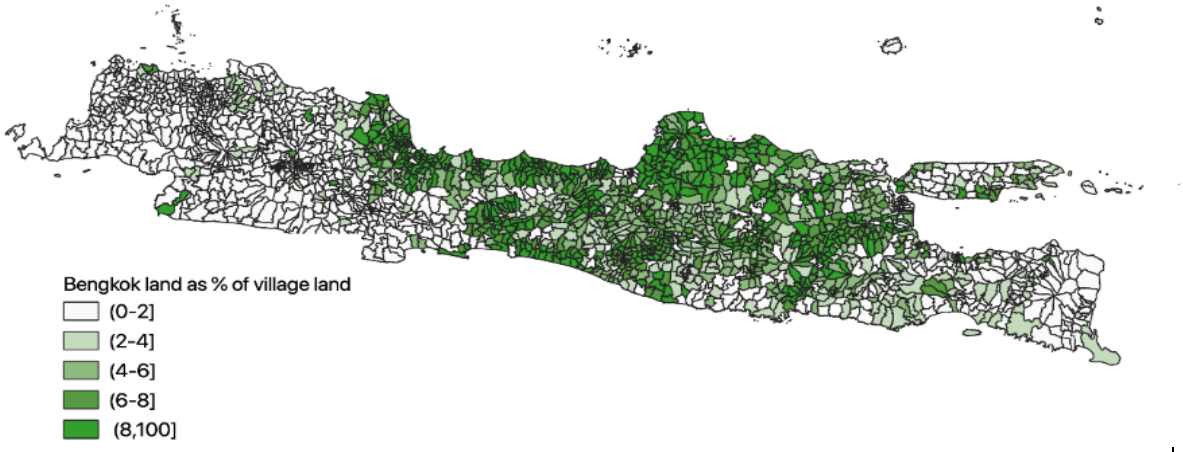
Table 4. Probability of sharecropping and the time until the next election using different datasets

	OLS regression with the dummy for the rented-out bengkok plot to be under sharecropping as the dependent variable			
	Village data		Tenants' plot data	
	(1)	(2)	(3)	(4)
X (years until the next election)	0.023	-0.382 ***	-0.015	-0.302 **
	(0.042)	(0.134)	(0.037)	(0.144)
X^2		0.071 ***		0.053 **
		(0.028)		(0.025)
Number of observations	119	119	132	132
Mean of the dependent variable	0.395	0.395	0.333	0.333
F-stat for zero slope	1.26	4.25	5.89	7.13
p-value (Prob > F)	0.292	0.003	0.000	0.000
R-squared	0.031	0.099	0.131	0.168

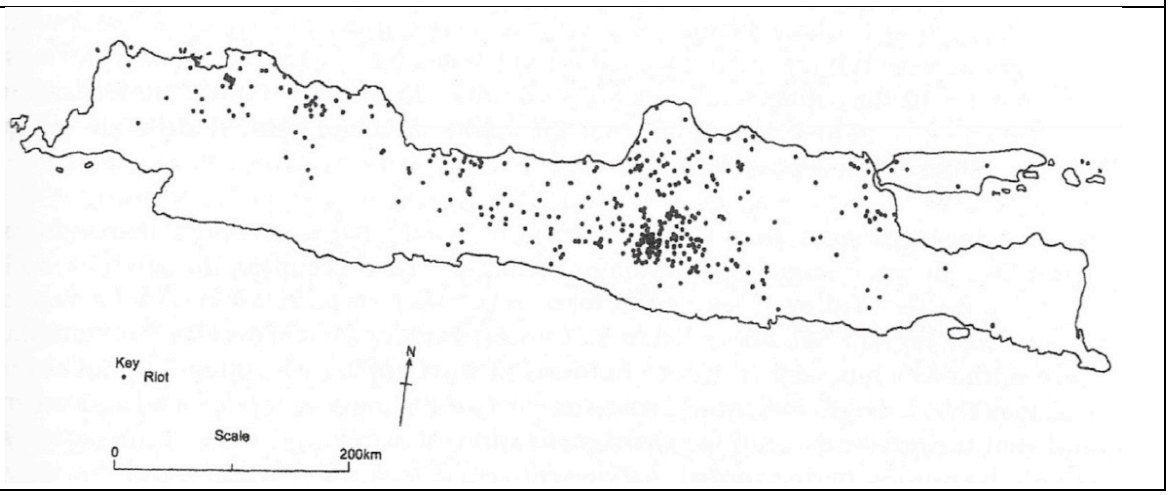
Notes: The observations in columns (1) and (2) are village level data excluding villages where the village heads are not eligible for the next elections, the village heads self-cultivate the bengkok land, or the village heads have not been allocated bengkok plots at the time of the survey. The observations in column (3) and (4) are bengkok plots that are rented in by the sample tenants. Linear probability model is estimated by OLS. Robust standard errors ((1) and (2)) or village-clustered standard errors ((3) and (4)) are in parenthesis, with significance levels of * (10%), ** (5%), and *** (1%). For (1) and (2), landlords' characteristics (age and years of education) are included; for (3) and (4), plot characteristics (dummy variables for unirrigated lowland plot, upland plot, and the size larger than 1ha) and tenants' characteristics (age, years of education, and asset index score) are also included as explanatory variables. Full regression results are available from the authors on request.

Appendix 1. Locations of villages with bengkok land and village electoral protests

A. Location of villages with bengkok land



B. Locations of political unrest / electoral protests



Note: This map shows the percentage of bengkok land in the total area of each village, averaged at the sub-district level.

Source: Drawn from the information in PODES 2000; Kammen (2003)

Appendix 2. Theoretical model

A2.1. Model assumptions and timing of the events

- The players: (1) incumbent village head, (2) the challenger in the village head election, and (3) voters including potential pool of tenants. Contract choices on bengkok land are determined between the tenants and the incumbent village head, who acts as the *de facto* landlord of bengkok land.[34]

- The village election takes place every other period. We denote the first period (the period after the previous election) as $t = 1$, and the second period (the period right before the next election) as $t = 2$.

- The size of bengkok land is denoted as B, which is the number of plots with the same acreage and subject to the same production technology. B is fixed in a village. At the beginning of $t = 1$, the incumbent is allocated B plots of bengkok land from the village. She rents out B_R plots to tenants and keeps $B - B_R$ plots for herself to cultivate.[35]

- The production technology of each plot is characterised by $Y_t = q_t f(x_t)$, where Y_t is the gross value of the output, q_t is the quality of land, $f(x_t)$ is a per plot production function that satisfies $f(0) = 0$, $f'(.) > 0$ and $f''(.) < 0$, and x_t is the amount of production inputs (fertilisers, pesticides, casual labour, etc.) whose price is exogenously given by $\overline{w}$. The quality of land in period $t = 1$, q_1, is exogenously given. In contrast, the quality of land in period $t = 2$, q_2, depends on the level of input used in period $t = 1$, i.e., $q_2 = q_2(x_1)$. The quality of land deteriorates with the amount of raw materials used, but at an increasing rate so that $q'(.) < 0$ and $q''(.) < 0$. We assume no role of asymmetric information of any kind. As a result, the tenant's effort level does not play any role in our model.

- Each tenancy contract decision is taken either over two periods, or over one period. The subjective intertemporal discount factor for the tenant and the incumbent village head (bengkok landlord) are denoted as δ_T and δ_I, respectively, which are fixed for each agent but may vary across different agents ($0 < \delta_T, \delta_I < 1$). When $\delta_T > \delta_I$ holds, it implies that the tenant voter cares about the future more than the incumbent village head, but the opposite may hold as well.

[34] Bengkok land is owned by the village. Therefore, the village is the *de jure* landlord and the incumbent village head is the *de jure* tenant. However, as it is legal and common for village administrators to rent out bengkok land to others, which is subletting in the strict sense, we call this arrangement as the land rental arrangement and call the incumbent the *de facto* landlord of the bengkok land.

[35] As is similar for private land transactions, when the new village head obtains several bengkok plots, it is natural for her to keep a portion of them for self-cultivation to assess the quality of new land. As simplification of this, we assume that she allocates an exogenously fixed portion of bengkok plots for this purpose in period 1. Endogenising B_R is left for future research.

- The electoral platform consists of indirect benefits outside bengkok transactions and tenancy contract offers on bengkok plots. Let us denote the fraction of total output attributable to the tenant as s_t, and the lumpsum amount of rent payment to the bengkok landlord as r_t. Due to institutional constraints, s_t cannot be larger than 1 and cannot be negative. $s_t = 1$ implies a fixed rental contract, and $0 < s_t < 1$ implies a sharecropping contract. Each contract is renewed annually but for the incumbent, she can announce at the beginning of $t = 1$, her electoral platform, which includes a set of all possible tenancy contracts for both periods (s_1, r_1, s_2, r_2) and hires tenants.

- At the beginning of period $t = 2$, the incumbent updates her suitability as the village head and the probability of re-election. Based on this, she decides whether to contest in the election or not. If she decides not to contest in the election, then she maintains her electoral platform as announced at the beginning of period $t = 1$ without any change. If she decides to contest the election, then she amends her electoral platform by renting out some or all her own-cultivated bengkok plots, $B - B_R$, as a vote-buying strategy.

- At the beginning of period $t = 2$, the incumbent and the challenger simultaneously and non-cooperatively announce their electoral platforms (in case of the incumbent, the bengkok tenancy portion has already been announced so that she additionally announces indirect benefits outside bengkok transactions). At this moment, the candidates know the distributions of political support parameters, but not their realised values. At the end of period $t = 2$, the actual values of political parameters are realised. The village election takes place and the winner is decided.

A2.2. Tenancy choice and discount factors

The structure of the equilibrium tenancy choice conditions closely follows the model of Roy and Serfes (2001). For simplicity, we start with the case in which the discount factor is homogeneous among the potential tenants so that the landlord offers a single set of contracts to the homogenous tenants. Heterogeneity in the discount factor is introduced at the end of this subsection.

A2.2.1. Intertemporal preference of the tenant

At the beginning of period $t = 2$, the optimisation problem for a representative tenant voter becomes:

$$\max_{x_2} \quad {\pi_2}^B = s_2 q_2(x_1) f(x_2) - \overline{w} x_2 - r_2, \qquad \text{(A1)}$$

where $\overline{w}$ are the constant unit prices of the raw materials. Let ${x_2}^*$ be the solution to equation A1. Given this outcome, the tenant voter maximises the optimisation problem over two periods, which at the beginning of period 1 looks as:

$$\max_{x_1} \ \pi_1{}^B = [s_1 q_1 f(x_1) - \overline{w} x_1 - r_1] + \delta_T [s_2 q_2(x_1) f(x_2{}^*) - \overline{w} x_2 - r_2] \qquad \text{(A2)}$$

Consider $x_1{}^*$ be the solution to equation A2.

A2.2.2. Intertemporal preference of the landlord (incumbent village head)

Given the full information about potential tenants, the incumbent village head solves the following problem for the optimal contract offer for one candidate of the tenants:

$$\max_{(s_1, r_1, s_2, r_2)} \ \pi = (1 - s_1) q_1 f(x_1{}^*) + r_1 + \delta_I [(1 - s_2) q_2(x_1{}^*) f(x_2{}^*) + r_2] \qquad \text{(A3)}$$

subject to (i) $s_1 q_1 f(x_1{}^*) - \overline{w} x_1{}^* - r_1 \geq \overline{U}$
and (ii) $s_2 q_2(x_1{}^*) f(x_2{}^*) - \overline{w} x_2{}^* - r_2 \geq \overline{U}$

The participatory constraints are separately defined for both periods as there is a possibility of contract renewal or the tenant running away at the beginning of period 2.

The incumbent village head cares about the quality of land so that the payoff from bengkok land is maximised over two periods. The re-election concerns take the central stage after period $t = 1$, which we discuss later. In equation A3, $\overline{U}$ represents the reservation utility of the tenant if he does not work on bengkok land.

As shown by Roy and Serfes (2001) who use a similar mathematical model of 2-period tenancy choice, our model also predicts that

A. Sharecropping contract is offered in period 1 if $\delta_T < \delta_I$.
B. Fixed rental contract is offered in period 1 if $\delta_T \geq \delta_I$.
C. Fixed rental contract is always offered in period 2.

Unlike the setting adopted by Roy and Serfes (2001), whose model is for a single pair of landlord-tenant, our setting has a pool of potential tenants from which the incumbent employs her tenant(s). In period 1, the incumbent employs B_R tenants and in period 2, she additionally employs tenants up to B-B_R. We now discuss how matching is realised with equilibrium contract parameters.

Regardless of the type of the tenant, the first-order conditions (FOCs) for his optimal production decision are given by

$$s_2 q_2(x_1) f'(x_2) = \overline{w} \qquad \text{(A4)}$$

and

$$s_1 q_1 f(x_1) = \overline{w} - \delta_T s_2 q_2'(x_1) f(x_2) \qquad \text{(A5)}$$

As these FOCs do not depend on fixed rent parameters, r_1 and r_2, the incumbent chooses their levels to satisfy the participation constraint as equality, leaving the tenant at his reservation utility level. Therefore, in equilibrium, we will have

$$s_1 q_1 f(x_1) - \overline{w} x_1 - r_1 = \overline{U} \qquad \text{(A6)}$$

and

$$s_2 q_2(x_1) f(x_2) - \overline{w} x_2 - r_2 = \overline{U} \qquad \text{(A7)}$$

We now assume that the potential tenant-cum-voters belong to one of the two types with different levels of discount factor, ${\delta_T}^L < \delta_I < {\delta_T}^H$ (superscript *L* corresponds to a low-discount-factor tenant and superscript *H* corresponds to a high-discount-factor tenant). We assume that the per-period reservation utility is the same for the two types. Given these assumptions, we characterise the FOCs separately for the two types.

Case 1. ${\delta_T}^L < \delta_I$ (tenants are more myopic than the incumbent village head)

In this case, the optimal contract is sharecropping in period 1 ($0 < {s_1}^{*L} < 1$) and fixed rental in period 2 (${s_2}^{*L} = 1$). Adding these to tenants' FOCs appended with the landlord's FOC for the optimal s_1, the resulting equilibrium is characterised by:

$${s_1}^{*L} = \frac{\overline{w} - {\delta_T}^L q_2'({x_1}^{*L}) f({x_2}^{*L})}{\overline{w} - {\delta_I}^L q_2'({x_1}^{*L}) f({x_2}^{*L})} \qquad \text{(A8)}$$

$${r_1}^{*L} = {s_1}^{*L} q_1 f({x_1}^{*L}) - \overline{w} {x_1}^{*L} - \overline{U} \qquad \text{(A6')}$$

$${r_2}^{*L} = q_2({x_1}^{*L}) f({x_2}^{*L}) - \overline{w} {x_2}^{*L} - \overline{U} \qquad \text{(A7')}$$

$$q_2({x_1}^{*L})\, f'({x_2}^{*L}) = \overline{w} \qquad \text{(A4')}$$

$${s_1}^{*L} q_1 f'({x_1}^{*L}) = \overline{w} - {\delta_T}^L q_2'({x_1}^{*L}) f({x_2}^{*L}) \qquad \text{(A5')}$$

Solving these five equations for five unknowns of ${s_1}^{*L}$, ${x_1}^{*L}$, ${x_2}^{*L}$, ${r_1}^{*L}$, and ${r_2}^{*L}$, we completely characterise the contract and the resulting production on this bengkok plot (${s_2}^{*L} = 1$).

Case 2. $\delta_I < {\delta_T}^H$ (tenants are less myopic than the incumbent village head)

In this case, the optimal contract is fixed rental in both periods *(*${s_1}^{*H} = {s_2}^{*H} = 1$). Adding these to tenants' FOCs, the resulting equilibrium is characterised by:

$${r_1}^{*H} = q_1 f({x_1}^{*H}) - \overline{w} {x_1}^{*H} - \overline{U} \qquad \text{(A6'')}$$

$${r_2}^{*H} = q_2({x_1}^{*H}) f({x_2}^{*H}) - \overline{w} {x_2}^{*H} - \overline{U} \qquad \text{(A7'')}$$

$$q_2({x_1}^{*H})\, f'({x_2}^{*H}) = \overline{w} \qquad \text{(A4'')}$$

$$q_1 f'({x_1}^{*H}) = \overline{w} - {\delta_T}^H q_2'({x_1}^{*H}) f({x_2}^{*H}) \qquad \text{(A5'')}$$

Solving these four equations for four unknowns of ${x_1}^{*H}$, ${x_2}^{*H}$, ${r_1}^{*H}$, and ${r_2}^{*H}$, we completely characterise the contract and the resulting production on this bengkok plot (${s_1}^{*H} = {s_2}^{*H} = 1$).

Benchmark case of first-best resource allocation

As the benchmark case to compare the two cases above, it is informative to analyse the case for ${\delta_T}^L = \delta_I = {\delta_T}^H$. We can think of this as the case when the incumbent's time preference is the same as the tenant's or the case where the incumbent self-cultivates the bengkok plot with the same production technology (which we assume away in our setting). The optimisation problem is simplified as

$$\max_{x_1, x_2} \quad q_1 f(x_1) - \overline{w} x_1 + \delta_I (q_2(x_1) f(x_2) - \overline{w} x_2) \qquad \text{(A9)}$$

whose FOCs are:

$${r_1}^{**} = q_1 f({x_1}^{**}) - \overline{w} {x_1}^{**} - \overline{U} \qquad \text{(A6'''')}$$
$${r_2}^{**} = q_2({x_1}^{**}) f({x_2}^{**}) - \overline{w} {x_2}^{**} - \overline{U} \qquad \text{(A7'''')}$$
$$q_2({x_1}^{**})\, f'({x_2}^{**}) = \overline{w} \qquad \text{(A4'''')}$$
$$q_1 f'({x_1}^{**}) = \overline{w} - \delta_I q_2'({x_1}^{**}) f({x_2}^{**}) \qquad \text{(A5'''')}$$

By solving these four equations for four unknowns of ${x_1}^{**}$, ${x_2}^{**}$, ${r_1}^{**}$, and ${r_2}^{**}$, this completely characterises the contract and the resulting production if the bengkok plot is managed in the most efficient manner from the viewpoint of the incumbent.

As this is the first best and the tenant always received his reservation utility *U*, any deviation from (A4'''') and (A5'''') involves efficiency loss to the incumbent in the form of reduced income in r_1 and r_2. Intuitively, when the tenant is more myopic than the incumbent, the efficiency loss occurs due to the necessity of adopting sharecropping (which reduces production incentive) for the purpose of land quality conservation; when the tenant is less myopic than the incumbent, the efficiency loss occurs due to the institutional constraint that the share parameter cannot exceed 1 (see Roy and Serfes, 2001).

The above results hold when $\frac{dx_1}{ds_1} > 0$ and $\frac{dx_2}{ds_2} > 0$, i.e., the amount of raw material use increases as the type of tenancy contract changes from sharecropping to fixed rental (Roy and Serfes, 2001). Thus, the solution set for the village head's problem consists of one of the following equilibrium possibilities. Denoting the optimal contract by (${s_1}^*$, ${r_1}^*$, ${s_2}^*$, ${r_2}^*$), we obtain (${s_1}^*$, ${r_1}^*$, 1, ${r_2}^*$) if ${\delta_T}^L < \delta_I$. This is because the tenant cares less for the future compared to the landlord and is likely to use more raw materials to make a higher profit in period $t = 1$. To avoid a faster deterioration of the land quality, the landlord offers a sharecropping contract in period 1, which provides the tenant with less incentive for more raw material use. If $\delta_T = \delta_I$, the tenant and the landlord equally care for the future so that there is no conflict of interest. By offering

the full production incentive to the tenant by offering a fixed rental contract (1, r_1^*, 1, r_2^*), production efficiency is achieved. Finally, if $\delta_I < \delta_T{}^H$, production efficiency would require *s* greater than 1, which is assumed away in our model, as in the standard literature on land tenancy (Otsuka, 2007). Due to this institutional constraint, the tenant is offered a fixed rental contract (s=1) in both periods (1, r_1^*, 1, r_2^*). The point is that the landlord provides a fixed rental contract by giving the tenant additional incentive to use more raw materials and produce more.

When the pool of potential tenants is heterogeneous in terms of the discount factor, and the incumbent has perfect information on it, it is possible that the incumbent employs both types of tenants at the beginning of period 1. Myopic ($\delta_T < \delta_I$) tenants are offered a sharecropping contract for period 1 followed by a fixed rental contract in period 2, while patient ($\delta_T > \delta_I$) tenants are offered a fixed rental contract in both periods. See section A2.4.1 below for the full discussion. With the uncertainty about re-election, to maximise income from bengkok plots, the village head-cum-landlord offers a fixed-rental contract in period 2 to ensure maximum gain in the last period.

A2.3. Electoral competition without a vote-buying strategy

In the spirit of Downsian electoral competition, we consider two candidates to contest in the election: the incumbent village head (I) and a challenger (C). In this section, we assume that the incumbent village head does not have a very strong motivation for re-election so that she does not go for the vote-buying strategy, which prompts her not to offer any adjustment to tenancy contracts with those tenants who were employed in period 1 and not to search for additional tenants on bengkok land she self-cultivates in period 1. We denote electoral platforms for the incumbent and challenger as P_I and P_C, respectively. For the incumbent village head, the electoral platform consists of an equilibrium level of tenancy contracts and additional announcement of other transfers out of non-bengkok transactions. The challenger promises competitive tenancy contracts and other transfers that are equivalent to the proposed platform of the village head. The electoral platforms become a vector of tenancy contract choices. Both the incumbent village head and the challenger also offer indirect benefits to the villagers, which could be thought as public goods (e.g., law and order, or security in the village) that benefit non-tenant voters.

A2.3.1. Preferences of the voters

Now let us assume that there are two groups of voters, who are distinguished by different discount factors. The first group of voters has a lower discount factor than that of the incumbent, and the second group of voters has a higher discount factor than that of the incumbent. Each group consists of potential and actual tenants, who are employed at the

beginning of period 1. Based on the results of equilibrium tenant contracts as discussed in section A2.2, tenancy contracts for voters in the first group are likely to be (s_1^{*L}, r_1^{*L}, 1, r_2^{*L}), with $0<s_1^{*L}<1$, whereas those for the second group of voters are (1, r_1^{*H}, 1, r_2^{*H}), where superscript L corresponds to a low-discount-factor tenant and superscript H corresponds to a high-discount-factor tenant.

The voter i in the group k draws utility from electoral platforms announced by both candidates, and she votes for the incumbent village head if

$$U_i^k(P_I) > U_i^k(P_C) + \Phi_i^k + \gamma, \qquad \text{(A10)}$$

where Φ_i^k measures voter i's ideological bias towards the challenger. If $\Phi_i^k > 0$, then the voter prefers to elect the challenger. Following the standard treatment of the probabilistic voting model, we further assume that Φ_i^k follows a uniform distribution on $\left[\frac{1}{-2\beta^k}, \frac{1}{2\beta^k}\right]$, with density β^k in the k[th] group of voters. On the other hand, γ measures the relative popularity of the challenger, which also follows a uniform distribution on $\left[\frac{1}{-2\theta}, \frac{1}{2\theta}\right]$, with density θ. The value of γ increases as the popularity of the challenger increases relative to that of the incumbent.

A2.3.2. Equilibrium

As the final step, we show the voting equilibrium based on a standard probabilistic voting model. Let α_1 be the share of voters in group 1. We define the swing voters in group k $(= 1, 2)$ based on equation A10. Swing voters are indifferent between the two candidates after electoral platforms are announced, i.e.,

$$\Phi^k = U_i^k(P_I) - U_i^k(P_C) - \gamma \qquad \text{(A11)}$$

Equation A11 suggests that all voters i in group k vote for the incumbent candidate if $\Phi_i^k \leq \Phi^k$. Then the vote share for the incumbent becomes

$$\Delta_I = prob\ (\Phi_i^k \leq \Phi^k) \qquad \text{(A12)}$$

Using the distribution of Φ_i^k, we derive the vote share as

$$\Delta_I = \frac{1}{2} + \alpha_1\beta^1\Phi^1 + (1-\alpha_1)\beta^2\Phi^2 \qquad \text{(A13)}$$

In equation A13, the vote share for the incumbent village head is a random variable because Φ^k depends on the realised value of γ.

From equation A13, the probability of incumbent win can be calculated. We write

$$\begin{aligned} P_I &= Prob\left(\Delta_I \geq \frac{1}{2}\right) \\ &= Prob(\alpha_1\beta^1\Phi^1 + (1-\alpha_1)\beta^2\Phi^2 \geq 0) \end{aligned}$$

$$= Prob\,[\alpha_1\beta^1\{U^1(P_I) - U^1(P_C)\} + (1-\alpha_1)\beta^2\{U^2(P_I) - U^2(P_C)\} \geq \gamma\{\alpha_1\beta^1 + (1-\alpha_1)\beta^2\}] \quad \text{(A14)}$$

Using the distribution of γ, we can write

$$\pi_I = \frac{1}{2} + \frac{\theta}{\alpha_1\beta^1 + (1-\alpha_1)\beta^2}[\alpha_1\beta^1\{U^1(P_I) - U^1(P_C)\} + (1-\alpha_1)\beta^2\{U^2(P_I) - U^2(P_C)\}]. \quad \text{(A15)}$$

To conclude, if the incumbent village head does not pursue a strong re-election motive, then her electoral platform follows the equilibrium tenancy contract choices as discussed in section A2.2.

A2.4. Electoral competition with a vote-buying strategy by the incumbent

We now assume that the incumbent village head has a strong motivation for re-election so that she utilises any strategy to buy votes. In a land-scarce economy of Java (see Section 2), providing access to farmland through bengkok land tenancy can function as one of such strategies. Therefore, at the beginning of period 2, she amends her electoral platform by renting out some or all her own-cultivated bengkok plots, $B - B_R$, over a two-period contract as a vote-buying strategy. The new tenants could be from either group of voters. The new two-period contracts in the form of either sharecropping or fixed rental give an immediate access to bengkok land in period 2 (which is already under the control of the incumbent) and a promised access to bengkok land in the period after the re-election. The electoral platforms are updated accordingly, where (s_2^{*new}, r_2^{*new}) enters in the vector of tenancy contract choices in period 2 as a component of the incumbent's electoral platform.

We further assume that γ, which measures the relative popularity of the challenger, now becomes a function of the total number of tenants, T, such as $\gamma = \frac{1}{T}$, where $\frac{d\gamma}{dT} < 0$. This implies an increase in the number of tenants hired on bengkok plots lowers the relative popularity of the challenger. The role of bengkok tenants as the brokers/intermediaries is reflected in this assumption. We rewrite equation (A10) as

$$U_i^k(P_I) > U_i^k(P_C) + \Phi_i^k + \gamma(T), \quad \text{(A10')}$$

where γ is replaced by $\gamma(T)$. The rest of the calculation to find the probability of an incumbent win remains the same, and we rewrite equation A15 after replacing θ with $f(\gamma)$, both represent the density of the uniform distribution γ on $\left[\frac{1}{-2\theta}, \frac{1}{2\theta}\right]$.

$$\pi_I = \frac{1}{2} + \frac{f(\gamma)}{\alpha_1\beta^1 + (1-\alpha_1)\beta^2}[\alpha_1\beta^1\{U^1(P_I) - U^1(P_C)\} + (1-\alpha_1)\beta^2\{U^2(P_I) - U^2(P_C)\}]. \quad \text{(A15')}$$

A2.4.1. A note on the selection of tenants in period 1

In period 1, the incumbent hires B_R tenants out of a pool of potential tenant-cum-voters, which consists of two groups with (1) a high discount factor ($\delta_I < {\delta_T}^H$) and (2) a low discount factor (${\delta_T}^L < \delta_I$), and the incumbent village head has perfect knowledge about it. Both groups of voters include ideologically biased (to the landlord) voters and the size of their share is not a common knowledge to the landlord. For this reason, driven by the re-election motive, the incumbent village head randomly hires tenants from both groups. This conclusion can also be reached if we assume that the relative size of deviation of ${\delta_T}^L$ (${\delta_T}^H$) from δ_I is such that the efficiency loss is approximately comparable so that the incumbent is indifferent between myopic and patient tenants from the viewpoint of maximising rent income. In this case as well, she randomly employs myopic and patient types, resulting in the replication of population shares of these two types among those who are employed as tenants.

A2.4.2. Tenancy contracts, incumbent-re-election and sharecropping

Proposition 1. *An increase in the number of the total tenancy contracts improves the chances of incumbent re-election.*

Proof. Since $\gamma = \frac{1}{T}$, applying the rule of transformation of variables following uniform distribution, we can write $f(T) = f(\gamma(T)) \left|\frac{d\gamma}{dT}\right|$, or $f(T) = \frac{f(\gamma)}{T^2}$. Replacing the expression of $f(\gamma)$ as $f(T)\, T^2$ in equation A15', it can be easily shown that $\frac{d\pi_I}{dT} > 0$.

Proposition 2. *New tenancy contracts as the time to an election becomes shorter are more likely to be sharecropping.*

Proof: In period 2, the incumbent employs additional tenants as many as B-B_R out of the pool of potential tenant-cum-voters who are not employed in period 1. Given our assumption of the positive impact of hiring a tenant on the incumbent's popularity, she employs fully, i.e., as many as B-B_R tenants are employed at the beginning of period 2. The incumbent offers a similar 2-period contract, with the second period (period 3) comes after the election. As the incumbent has a strong re-election motive, her effective discount factor between period 2 and period 3 is close to the value as before (δ_I). However, from the viewpoint of potential tenants, the subjective probability of re-election is likely to be less than 1 ($0 < k < 1$). Therefore, when the incumbent village head offers a 2-period contract at the beginning of period 2, she needs to use the tenant's effective discount factor between period 2 and period 3 calculated as $k\delta_T$. In a closely-knit society of Javanese villages, we can assume that the incumbent can obtain some good estimate for k when she contacts a potential tenant and finalises the contract. If the newly employed tenant's effective discount factor satisfies $k\delta_T < \delta_I$, he will be offered a

sharecropping contract for the first period (period 2). Therefore, with this adjustment for *k*, the percentage of sharecropping on total bengkok plots including that are rented out from period 2 is likely to be higher than the percentage of sharecropping on total bengkok plots that are rented out from period 1.

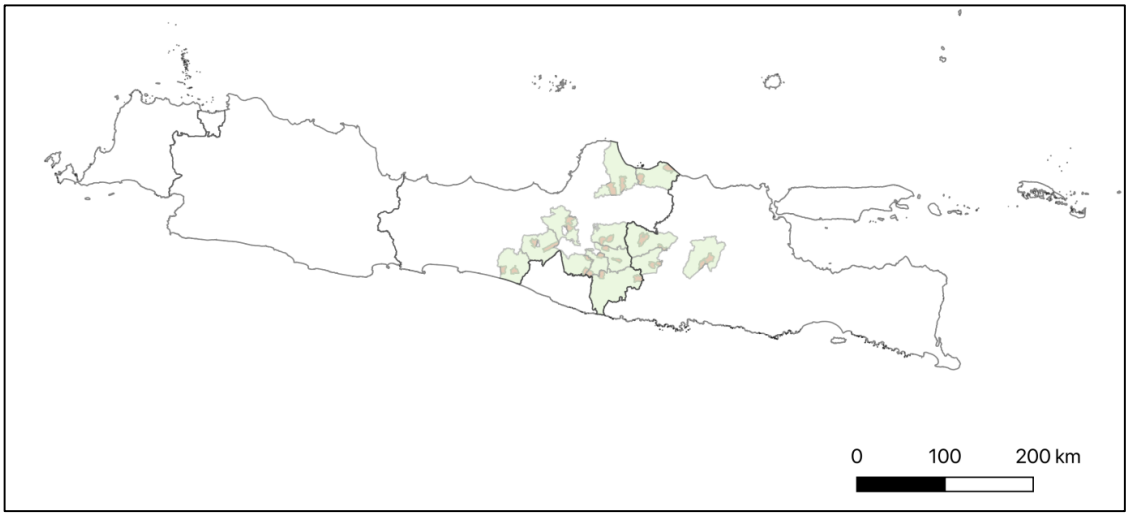
The adjustment parameter *k* may differ from tenant to tenant. Even if the newly employed tenant's innate discount factor is larger than that of the landlord, she will be offered a sharecropping contract if her *k* is sufficiently small. When two potential tenants of type *L* and *H* compete for a bengkok plot, the incumbent will find the *H* type more attractive in terms of rent income receipt if *k* is the same, but she will find the *L* type more attractive if *k* for the *H* type is much smaller than *k* for the *L* type. Therefore, newly employed tenants in period 2 can include both *L* and *H* types, like the case in period 1.

The intuition is that the subjective probability of re-election from the viewpoint of the additional tenants is surely less than 1. The potential tenant, when offered a 2-period contract at the beginning of period 2, discounts the payoff in period 3 by the factor of his own discount factor further discounted by the re-election probability. As an extreme case, the new contract may be regarded essentially as lasting for one year from the viewpoint of the new tenant. Logically, the tenants attempt to maximise their profit from bengkok plots by extensive use of raw materials. Due to tenant's myopic behaviour and an extremely low discount factor, the village head will only offer sharecropping contracts independent of the initial discount factor that the tenants were characterised by.

It is interesting to note that in our model, patient tenant-cum-voters are offered a fixed rental contract if they are hired in period 1 but the same type of tenants could receive a sharecropping contract in the first cropping season if they are hired in the beginning of period 2. The difference in the outcome is driven purely by the incumbent village head's re-election motive, which further discounts the tenant's payoff in period 3 (after re-election) as they consider the subjective probability of re-election of the incumbent to be less than unity.

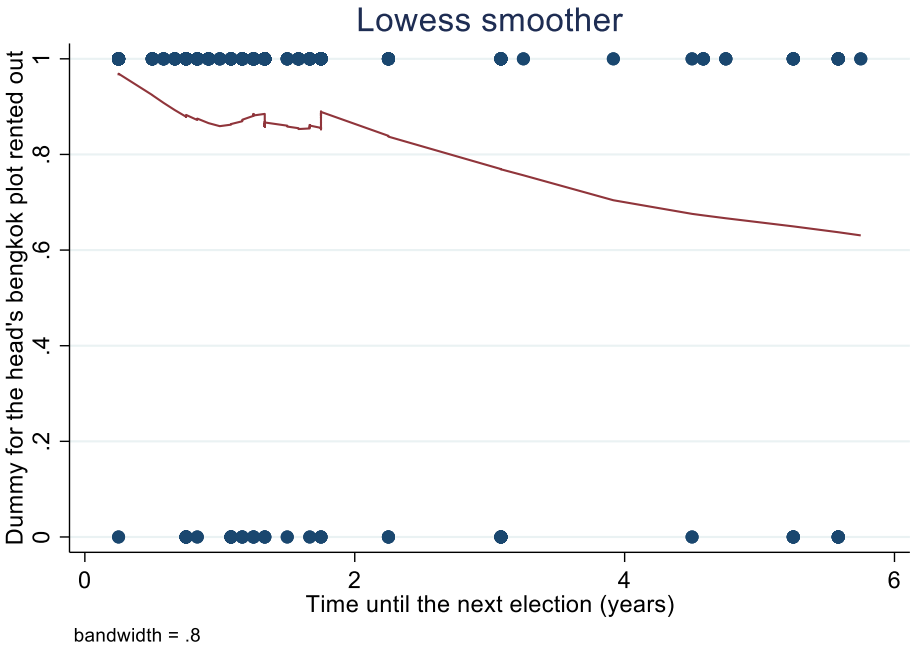
Last but not the least, as the election approaches, our theory predicts that the percentage of sharecroppers increases but it does not preclude the possibility of having new fixed rental contracts at the beginning of period 2. Such cases may arise when potential tenants of type *H* with a high adjustment parameter *k* compete for the access to bengkok plots.

Appendix 3. Districts and sub-districts of the study areas

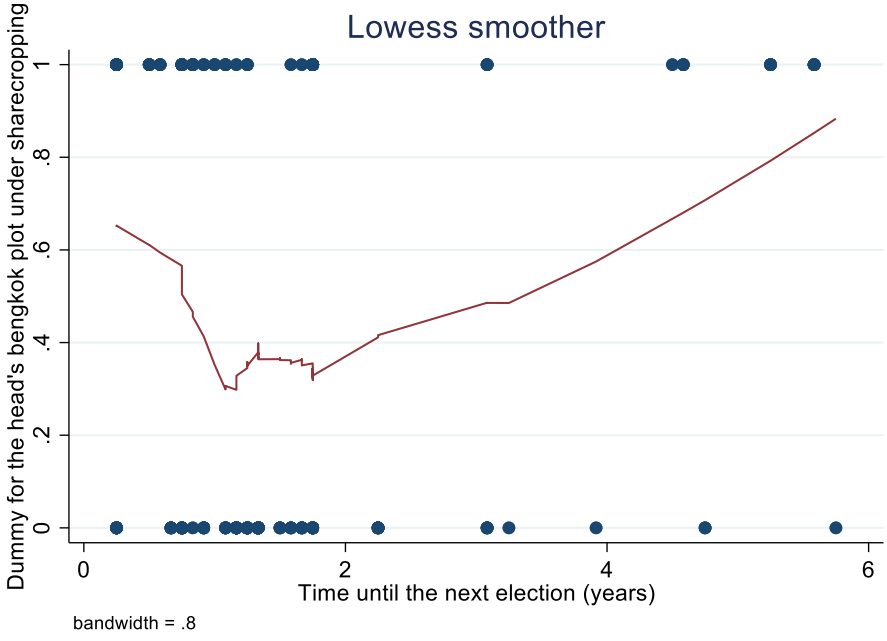


Note: The light brown segments show our sample sub-districts and the light green segments surrounding them show the districts to which our sample sub-districts belong.
Source: SurveyMETER.

Appendix 4. Probability of renting-out/sharecropping and the time until the next election (bengkok plots of village heads in eligible villages)



A. Renting out of the bengkok plot (*n*=273).



B. Sharecropping, given renting-out (*n*=234)

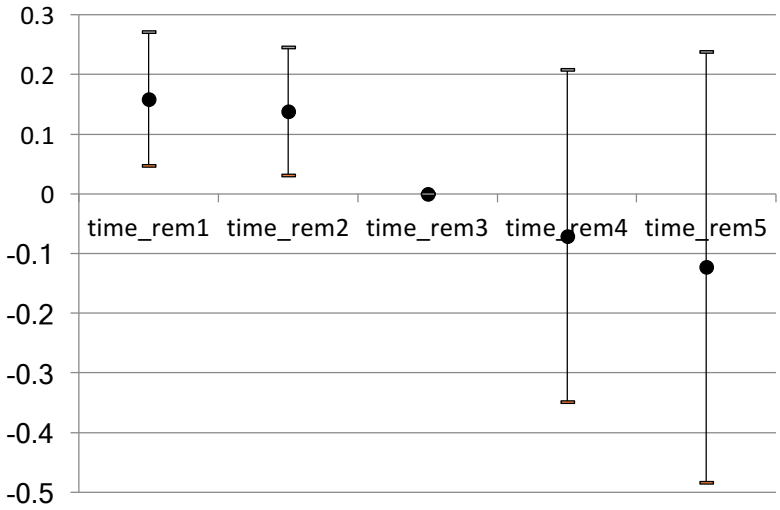
Notes: Plots show raw observations. The red curve shows fitted values from a locally weighted regression (LOWESS).

Appendix 5. Full regression results with plot and landlord household characteristics

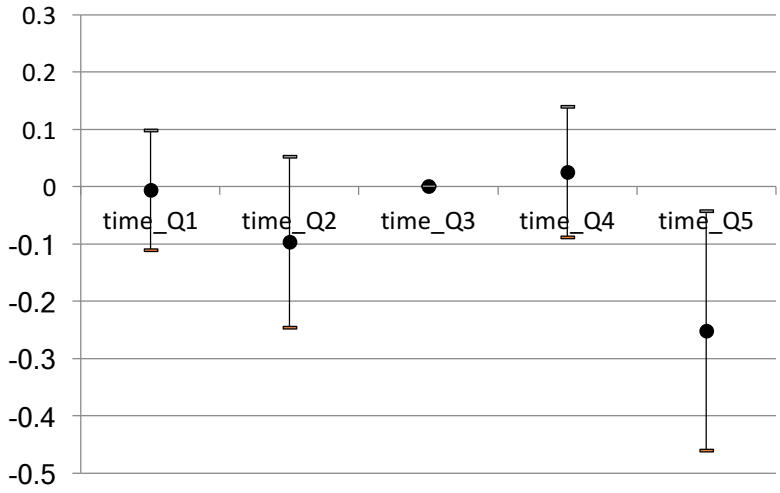
	Multiple regression (OLS) with the dependent variable:					
	Dummy for the bengkok plot to be rented-out			Dummy for the rented-out bengkok plot to be under sharecropping		
Explanatory variables	Coeff.		Std.Error	Coeff.		Std.Error
Key variables of political cycle						
X (years until the next election)	-0.064	*	0.036	-0.350	**	0.158
X^2				0.071	**	0.028
Plot characteristics (reference category = irrigated lowland plot whose size is 1ha or less)						
Dummy for unirrigated lowland plot	-0.057		0.053	-0.139		0.137
Dummy for upland plot	-0.013		0.094	-0.052		0.192
Dummy for the size larger than 1ha	-0.029		0.052	-0.210	**	0.104
Landlord household characteristics (standardised variables)						
Age of the household head	-0.022		0.026	0.124	**	0.057
Years of education of the hh head	0.012		0.030	0.087		0.062
Asset index score	-0.042		0.031	-0.087	**	0.040
Intercept	0.991	***	0.059	0.833	***	0.133
Number of observations	273			234		
Mean of the dependent variable	0.857			0.440		
F-stat for zero slope	1.03			7.53		
p-value (Prob > F)	0.414			0.000		
R-squared	0.065			0.278		

Notes: The observations in columns (1) and (2) are bengkok plots of village heads who are eligible to run for the next elections. The observations in columns (3) and (4) are bengkok plots of eligible village heads that are rented out. Linear probability models are estimated by OLS. Significance levels of * (10%), ** (5%), and *** (1%), based on the village-clustered standard errors.

Appendix 6. Fitted effects of the time until the next election on rental probability (bengkok plots of village heads in eligible villages)



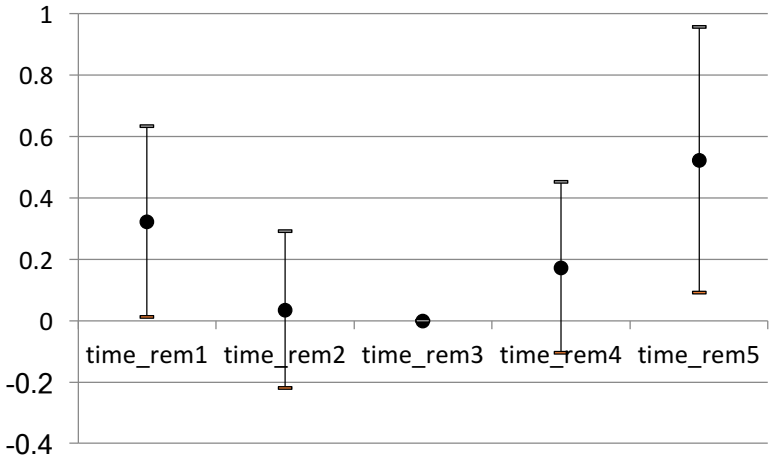
(Annual fixed effects)



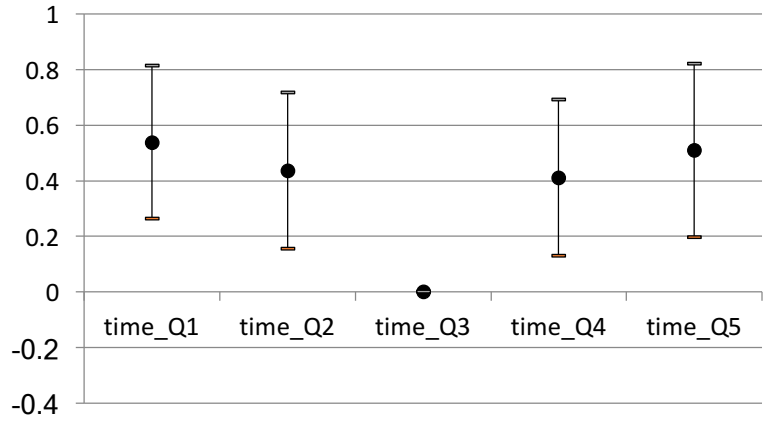
(Quintile fixed effects)

Notes: n=273. The 95% confidence intervals are shown by whiskers. "Annual fixed effects" were created as: time_rem1 for $X < 1$, time_rem2 for $1 \leq X < 2$, time_rem3 for $2 \leq X < 3$, time_rem4 for $3 \leq X < 4$, and time_rem5 for $4 \leq X$, while time_rem represents time remaining (in years) before the next election. "Quintile fixed effects" were created from quintile dummy variables constructed from time_rem variable, which is a continuous variable. In the regression analysis, we used the mid-category as the reference and the same plot-level and household-level controls were included, which are listed in the footnote to Table 2.

Appendix 7. Fitted effects of the time until the next election on sharecropping probability (rented-out bengkok plots of village heads in eligible villages)



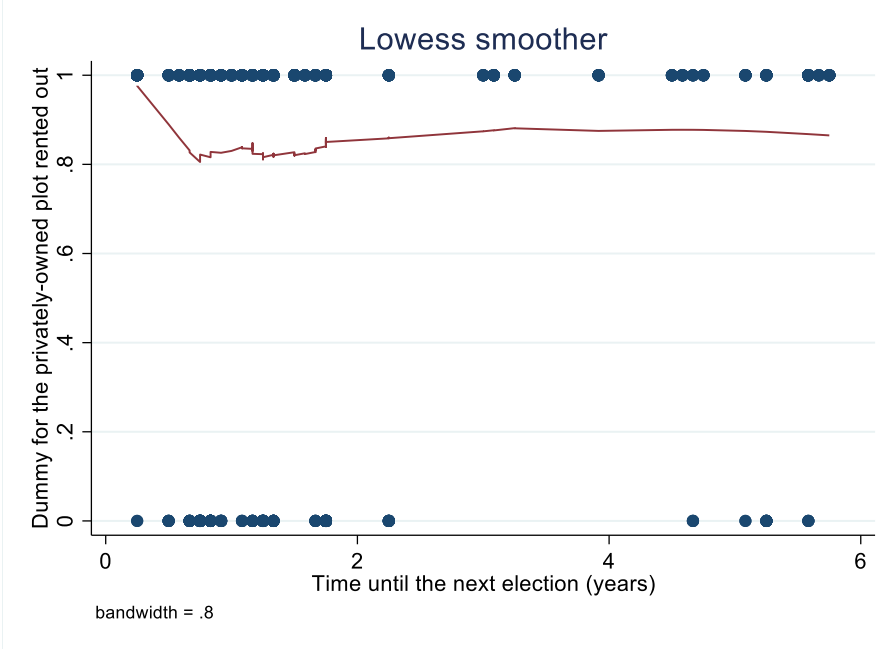
(Annual fixed effects)



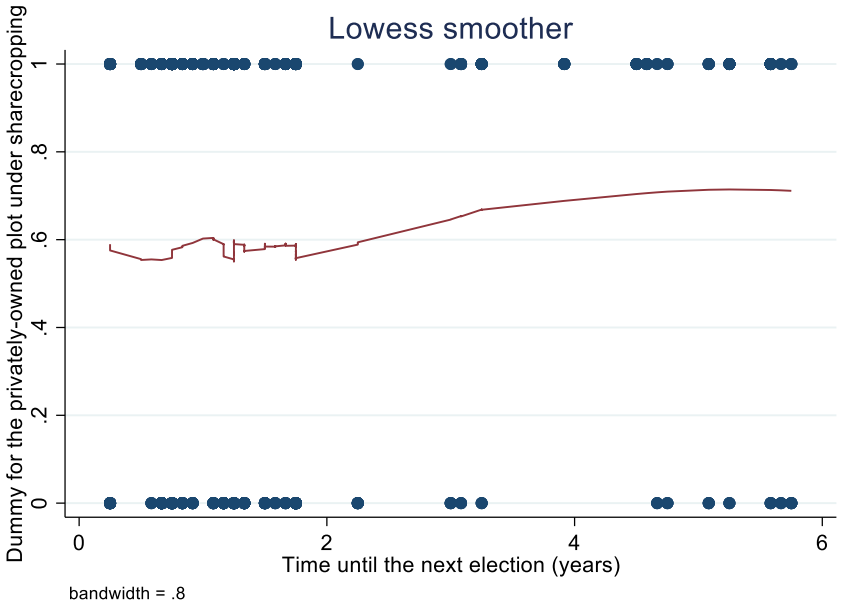
(Quintile fixed effects)

Notes: *n*=234. See notes to Appendix 6 for other details.

Appendix 8. Probability of renting-out/sharecropping and the time until the next election (placebo: private plots of pure private landlords in eligible villages)



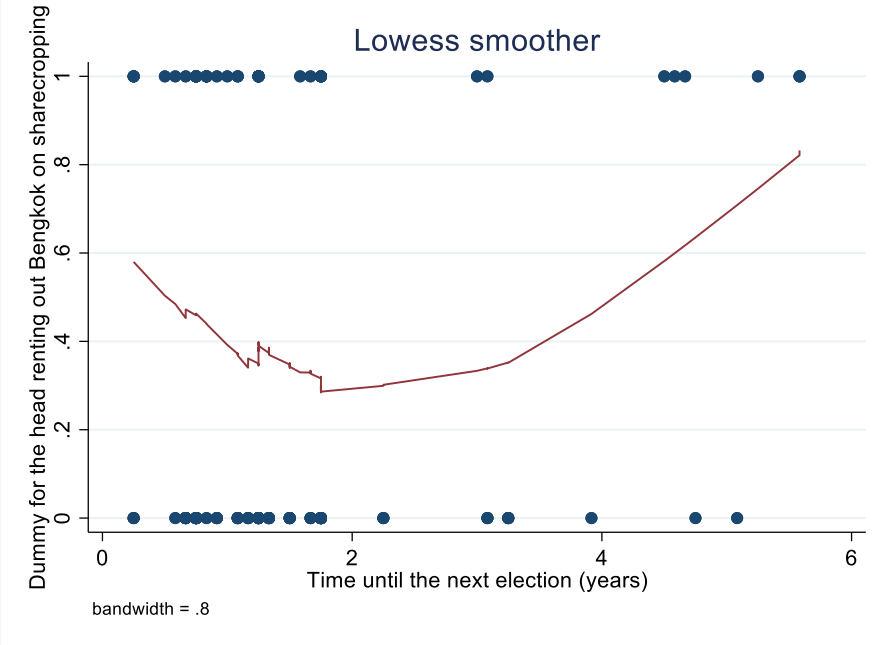
A. Renting out of the private plot (*n*=735).



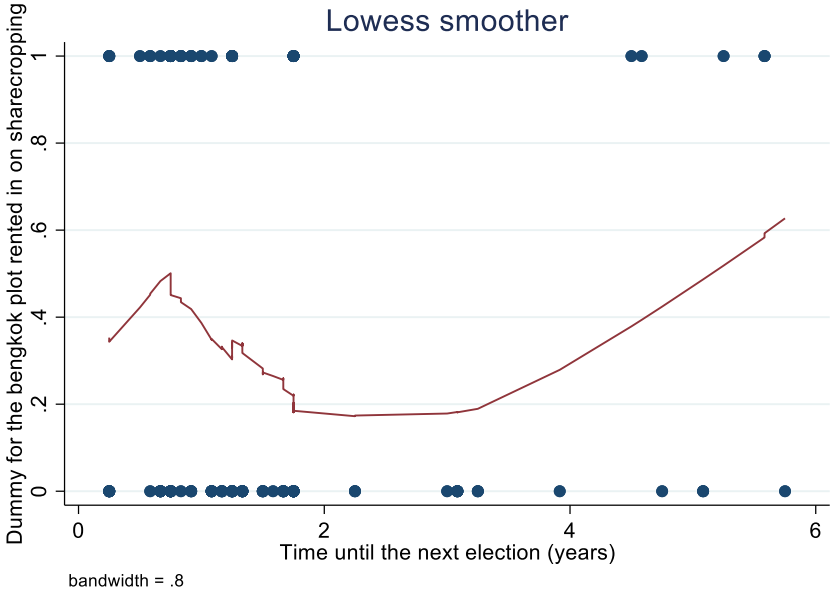
B. Sharecropping, given renting-out (*n*=617)

Notes: Plots show raw observations. The red curve shows fitted values from a locally weighted regression (LOWESS).

Appendix 9. Probability of sharecropping out and the time until the next election (different datasets)



A. Sharecropping, given renting-out, village-level administrators' data (*n*=119).



B. Sharecropping, given renting-out, tenants' plot data (*n*=132)

Notes: Plots show raw observations. The red curve shows fitted values from a locally weighted regression (LOWESS).

Appendix 10. Robustness checks of the main result

(bengkok plots of village heads in eligible villages)

	Dependent variable:			
	Dummy for the bengkok plot to be rented-out		Dummy for the rented-out bengkok plot to be under sharecropping	
	(1)	(2)	(3)	(4)
A. Probit regression using village heads in eligible villages				
Marginal effects				
X (years until the next election)	-0.053 **	-0.029	0.033	-0.454 **
	(0.025)	(0.069)	(0.058)	(0.184)
X^2		-0.004		0.089 **
		(0.013)		(0.034)
LR chi2 stat for zero slope	8.34	8.96	18.42	27.82
p-value (Prob > chi2)	0.304	0.346	0.010	0.001
Pseudo R-squared	0.074	0.074	0.170	0.236
B. OLS regression with more controls, using village heads in eligible villages				
B1. Village-level characteristics added				
X (years until the next election)	-0.067 *	-0.032	0.036	-0.299 *
	(0.037)	(0.087)	(0.053)	(0.153)
X^2		-0.006		0.061 **
		(0.018)		(0.028)
F-stat for zero slope	2.85	3.07	7.25	8.98
p-value (Prob > F)	0.004	0.001	0.000	0.000
R-squared	0.073	0.074	0.254	0.303
B2. District fixed effects added				
X (years until the next election)	-0.063 *	-0.124	0.022	-0.260
	(0.036)	(0.120)	(0.036)	(0.162)
X^2		0.011		0.050 *
		(0.023)		(0.028)
F-stat for zero slope	1.98	1.88	30.68	29.36
p-value (Prob > F)	0.020	0.027	0.000	0.000
R-squared	0.124	0.125	0.569	0.581
Number of observations	273	273	234	234
Mean of the dependent variable	0.857	0.857	0.440	0.440

Appendix 10. Robustness checks of the main result (continues)

(bengkok plots of village heads in eligible villages)

	Dependent variable:			
	Dummy for the bengkok plot to be rented-out		Dummy for the rented-out bengkok plot to be under sharecropping	
	(1)	(2)	(3)	(4)
C. OLS regression with different choice of villages				
C1. All villages including ineligible villages				
X (years until the next election)	-0.058 *	-0.021	0.040	-0.361 **
	(0.031)	(0.078)	(0.046)	(0.157)
X^2		-0.006		0.072 ***
		(0.016)		(0.027)
F-stat for zero slope	1.07	0.99	4.36	8.50
p-value (Prob > F)	0.389	0.451	0.000	0.000
R-squared	0.057	0.058	0.210	0.289
Number of observations	279	279	239	239
Mean of the dependent variable	0.857	0.857	0.444	0.444
C2. Eligible villages with area-changed villages excluded				
X (years until the next election)	-0.066 *	-0.009	0.042	-0.381 ***
	(0.039)	(0.086)	(0.056)	(0.140)
X^2		-0.010		0.080 ***
		(0.019)		(0.024)
F-stat for zero slope	0.90	0.84	4.48	9.37
p-value (Prob > F)	0.509	0.567	0.000	0.000
R-squared	0.069	0.072	0.220	0.310
Number of observations	258	258	223	223
Mean of the dependent variable	0.864	0.864	0.457	0.457
C3. Ineligible villages included and area-changed villages excluded				
X (years until the next election)	-0.059 *	-0.010	0.049	-0.385 ***
	(0.033)	(0.081)	(0.047)	(0.143)
X^2		-0.009		0.079 ***
		(0.016)		(0.024)
F-stat for zero slope	0.97	0.90	4.94	10.57
p-value (Prob > F)	0.458	0.523	0.000	0.000
R-squared	0.061	0.063	0.223	0.318
Number of observations	264	264	228	228
Mean of the dependent variable	0.864	0.864	0.461	0.461

Notes: The observations in columns (1) and (2) are bengkok plots of village heads who are eligible to run for the next elections. The observations in columns (3) and (4) are bengkok plots of eligible village heads that are rented out. Village-clustered standard errors are in parenthesis, with significance levels of * (10%), ** (5%), and *** (1%). Plot characteristics (dummy variables for unirrigated lowland plot, upland plot, and the size larger than 1ha) and landlords' characteristics (age, years of education, and asset index score) are included in both Panel A and Panel B. Village characteristics (total area of the village, population to farmland ratio, number of factories, and distance to the district capital city) are also included in Panel B and C (C1 to C3). Full regression results are available from the authors on request.

Appendix 11 Agricultural productivity, tenancy contracts and bengkok land

Paddy yield (tons/ha), all seasons in the past year						
	(1)	(2)	(3)	(4)	(5)	(6)
Sharecropping	-0.66***	-0.63***	-0.63***	-0.13	-0.63***	-0.20
	(0.158)	(0.157)	(0.156)	(0.129)	(0.180)	(0.150)
Bengkok land					-0.11	-0.12
					(0.145)	(0.144)
Share cropping * bengkok					-0.85***	-0.12
					(0.254)	(0.247)
Control variables						
Seasons	Yes	Yes	Yes	Yes	Yes	Yes
Plot characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Village characteristics	Yes	Yes	Yes		Yes	
Tenant characteristics			Yes	Yes	Yes	Yes
Village fixed effects				Yes		Yes
Observations	2,435	2,435	2,435	2,435	2,435	2,435
R-squared	0.199	0.204	0.211	0.445	0.212	0.446
Number of villages				130		130

Notes: Observations are plots that are either sharecropped or rented out in the last 12 months. Village-clustered standard errors are in parenthesis, with significance levels of * (10%), ** (5%), and *** (1%). Two season dummy variables are included to indicate two seasons of paddy planting within the last 12 months before the most recent one. Plot characteristics include dummy variables for lowland plot, lowland unirrigated plot, and the size larger than 1 ha. Tenant characteristics include age, years of education, and asset index score. Village characteristics (total area of the village, population to farmland ratio, number of factories, and distance to the district capital city) are also included in columns (3) and (5).