Urban-Rural Bias and the Political Geography of Distributive Conflicts

by

Jan Henryk Pierskalla

Department of Political Science
Duke University

Date: ___________________

Approved:

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Karen Remmer, Supervisor

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Michael D. Ward

____________________
Erik Wibbels

____________________
David Soskice

Dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Department of Political Science in the Graduate School of Duke University
2012
Abstract

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Abstract

Pro-urban bias in policy is often seen as a common phenomenon in the developing world. Empirical reality though is much more varied. Many governments actively support agricultural producers and rural citizens, even at early stages of development. In addition, the binary distinction between urban and rural bias in policy aggregates over important sub-national variation in the distributive impact of government policies. This dissertation extends the research frontier by analyzing the political roots underlying spatial bias in policy using new theoretical and empirical approaches. First, this dissertation develops a theory that identifies conditions under which politicians will institute pro-urban or pro-rural policies, by considering the threat of a rural insurgency. Second, I argue that elections in rural majority societies can empower citizens in the rural periphery. Competitive elections and high rural turnout induce governments to supply favorable policies to the rural sector as a whole and salient regions in particular. To test the effect of the threat of rural violence, I use new cross-national data on net taxation in the agricultural sector. Data on fiscal transfers and the sub-national effects of agricultural pricing policies in Indonesian districts provide additional evidence for the first hypothesis. To test the effect of elections on urban bias, I exploit a natural experiment from the Indonesian context. Last, I analyze the proliferation of districts in Indonesia from 2001 to 2009, with important implications for future fiscal transfers, and show the process is largely driven by local elite competition within and between districts.
I dedicate this dissertation to my parents, Elke and Henryk.
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List of Abbreviations and Symbols

Symbols

\( C \) Center region.
\( P \) Periphery region.
\( s \) population share in the center.
\( G \) Government in power.
\( \theta \) Production share in the periphery.
\( \gamma \) Government non-tax revenue.
\( \tau^p \) Tax rate in the periphery.
\( \tau^c \) Tax rate in the center.
\( \eta^p \) Aggregate government expenditures in the periphery.
\( \eta^c \) Aggregate government expenditures in the center.
\( V() \) Government’s policy proposal.
\( g() \) Public goods function.
\( \alpha \) Efficiency of public goods provision.
\( r^c \) Protest decisions of center population.
\( r^p \) Revolt decisions of periphery population.
\( c_p(s) \) Cost of protest.
\( c_r(s) \) Cost of revolt.
\( \beta \) Collective action efficiency.
\( \mu \) Income share protected from taxation.
Utility of the periphery.

Utility of the center.

Utility of the government.

No revolt threshold.

Efficient revolt threshold.

Always protest threshold.

Urban bias in equilibrium.

Periphery region $i$.

Population share in region $i$.

Production share in region $i$.

Tax rate in region $i$.

Aggregate government expenditures in region $i$.

Revolt decisions of region $i$.

Income share protected from taxation in region $i$.

Cost of protest in region $i$.

Cost of revolt in region $i$.

No revolt threshold in region $i$.

Efficient revolt threshold in region $i$.

Abbreviations

Bulog  *Badan Urusan Logistik*, Indonesian Food Logistics Agency.

DAU  *Dana Allokasi Umum*, General Allocation Fund.

DAK  *Dana Allokasi Khusus*, Special Allocation Fund.

SAF  Special Autonomy Fund.

GAM  *Gerakan Aceh Merdeka*, Free Aceh Movement.

INPRES  *instruksi presiden*, Fiscal block grant to district government.
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<td>RRA</td>
<td>Relative Rate of Assistance to Agriculture.</td>
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<td>NRA</td>
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<td>PKI</td>
<td><em>Partai Komunis Indonesia</em>, Indonesian Communist Party.</td>
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“The small-holding peasants form an enormous mass whose members live in similar conditions but without entering into manifold relations with each other. Their mode of production isolates them from one another instead of bringing them into mutual intercourse. The isolation is furthered by France’s poor means of communication and the poverty of the peasants. Their field of production, the small holding, permits no division of labor in its cultivation, no application of science, and therefore no multifariousness of development, no diversity of talent, no wealth of social relationships. Each individual peasant family is almost self-sufficient, directly produces most of its consumer needs, and thus acquires its means of life more through an exchange with nature than in intercourse with society. A small holding, the peasant and his family; beside it another small holding, another peasant and another family. A few score of these constitute a village, and a few score villages constitute a department. Thus the great mass of the French nation is formed by the simple addition of homonymous magnitudes, much as potatoes in a sack form a sack of potatoes. Insofar as millions of families live under conditions of existence that separate their mode of life, their interests, and their culture from those of the other classes, and put them in hostile
opposition to the latter, they form a class. Insofar as there is merely a local interconnection among these small-holding peasants, and the identity of their interests forms no community, no national bond, and no political organization among them, they do not constitute a class. They are consequently incapable of enforcing their class interest in their own name, whether through parliament, or through a convention.”

- Karl Marx, The Eighteenth Brumaire of Louis Napoleon (1852)

Karl Marx’ characterization of peasants as mere “sacks of potatoes” represents a common view of rural politics. His description of the French peasantry as having weak social ties, isolated from each other, spread across the rural periphery, sharing an economic fortune, but being unable to develop a strong class consciousness or political power by themselves, has framed our understanding of rural politics. Protests and revolution are the providence of the middle class and urban population (Scott, 1976, 1985). Peasant wars are rare and not often successful, forcing peasants to rely on indirect and “everyday” forms of resistance (Scott, 1985). Political consciousness and organization is manipulable by economic elites to harness rural support for their own ends (Kurtz, 2004). The early literature on democratization and regime change identifies the rise of the commercial bourgeoisie as the crucial actor in the struggle for institutional change, while the rural sector is largely relegated to a reactive role and ancillary condition. Barrington Moore (1966) famously connects the rise of the urban middle class to the emergence of democracy, while a labor-repressive agrarian sector, paired with a weak bourgeoisie and a failed peasant revolution is tied to fascism. Mancur Olson’s (1965) collective action argument provides the essential insights to understand Marx’s judgment. The weakness of the rural citizenry is intimately connected to their size and geographic dispersion, hampering their ability to organize collectively. Conversely, as the importance of the agricultural sector for the economy dwindles in the process of development, peasants migrate to cities and agricultural
production becomes more concentrated, the political clout of farm lobbies increases.

The purported political marginality of the rural sector for large parts of history and the world has been tied to important policy consequences. Given the general weakness of farmers in articulating and championing their political and economic grievances, governments have little incentive to cater to rural needs. Development economists identified early on a distinct urban bias in the core policies and growth trajectories of many developing countries (Myrdal, 1958; Lipton, 1977; Schultz, 1978). Industrialization requires a structural transformation with peasants turning into urban wage laborers and the rural sector providing cheap food surplus to keep wage costs low. Contrary to peasants, urban workers are highly organized and able to threaten collective action. Furthermore, the interest in low food prices unites urban laborers with industrial capitalists against the interests of the rural sector. Throughout history and across the globe governments have a habit of extracting resources from rural agricultural producers, interfering in market organization and distorting prices in favor of the urban sector (Bezemer and Headey, 2008).

Bates, in his seminal study “Markets and States in Tropical Africa” (1981), identifies the political calculus of politicians that produces urban bias outcomes, disadvantaging rural residents and catering to urban constituents. He argues Africa’s failed developmental and agricultural policy of the post-colonial period was partially caused by adverse incentives for national political leaders. Farmers that produce cash crops for international markets were forced to sell their product at low prices to national marketing boards. Governments and their parastatal organizations in turn generated substantial profits by selling these products at higher prices internationally under the guise of market and price stabilization. The generated profits were then not used to subsidize farmers in lean times, but to provide public goods and services and control inflation in urban centers, finance import-substituting industrialization projects and distribute revenue through networks of political patronage. The rural
African economy experienced stagnating to negative productivity growth, a lack of investment in public infrastructure, lower public goods provision and political repression. In essence, Bates posits governments beholden to urban interests rely on redistribution of economic resources from the countryside to urban citizens to fulfill important political constraints.

The underlying political motivation for this behavior and resulting government policies is the goal of political survival. Government leaders use fiscal resources extracted from politically weak sectors and regions to ward off the possibility of urban riots. Protest by the urban poor or workers in the nascent industrial sector threatens the regime directly or could be interpreted as a sign of weakness by rivaling factions and lead to coup. This transfer of resources is implemented through a varying array of government policies. Commonly, regimes rely on agricultural pricing policies that enforce domestic prices below international levels, input and food subsidies (often for government employees and soldiers), export taxation of agricultural and primary goods, quotas, and over-valued exchange rate and the unequal provision of local public goods and services. Buying off one part of the population to extract the other offers an opportunity to secure office and economic rents (Acemoglu et al., 2004). Ades and Glaeser’s (1995) account of urbanization processes in developing countries features a similar rationale: proximity to the center of political power results in rents, which induces the population to concentrate inefficiently in the capital.

Developmental and social policies in Latin America, specifically import-substitution strategies and welfare state formation, bear important similarities with urban bias in Africa in their disregard for the rural poor (Collier and Collier, 1991; Bruton, 1998; Haggard and Kaufman, 2008; de Janvry, 1981). An urban-rural cleavage can become especially salient when a backward economy with a low labor-land ratio experiences declining trade (Rogowski, 1987). The scarce factors capital and labor have aligned interests and benefit from protection at the expense of land. High levels of Latin
American land inequality put poor rural residents at a disadvantage for organizing powerfully along this cleavage and enabled the formation of a political alliance between rich land owners, capital and urban labor, protecting industry and high-skill labor at the expense of the rural citizens.

This systematic bias in policy against the rural sector carries important implications for long-run development and poverty. Nobel-prize winning economist Arthur Lewis argued with his famous dual economy model that the industrial revolution had to go hand in hand with an agricultural revolution, but there also had to be found a manageable compromise between a steady food supply and low wages in the agricultural sector (Lewis, 1954). He recommended squeezing the gains of productive farmers through taxation and using the revenue for capital formation. This early work recognized the importance of the rural sector, but at the same time offered an economic rationale for the extraction of resources and reinforcing existing political incentives for urban bias. As early as Michael Lipton (1977) though have researchers forcefully argued for government intervention on behalf of agricultural development as a stepping stone for successful development. Schultz (1978) identified the need to offer farmers incentives to adopt new productivity-enhancing technologies. Since then, a plethora of theoretical and empirical research as improved our understanding of the rural sector’s role for development. An extensive number of studies has outlined the importance of good agricultural policy for the development process and poverty reduction (Bravo-Ortega and Lederman, 2005; Kang and Ramachandran, 1999; Kay, 2002; Diao et al., 2006, 2010; Ravaillon and Datt, 2002; Ravaillon and Chen, 2004; Lipton, 2005) and highlighted the importance of government intervention (Binswanger and Deininger, 1997). A whole Word Development Report was dedicated to the issue of agriculture and rural development, concluding that if governments were to enable agricultural markets to function well and supply financial and technological support, large agricultural productivity and growth gains would
be reaped (World Bank, The, 2007). A comparison of development trajectories in sub-Saharan Africa and Southeast Asia identified a combination of sound macroeconomic policies with productivity-enhancing government policies for the rural sector and liberalizing the economy for farmers as key contributors for the divergence in outcomes between the regions (van Donge et al., 2012). The roots of many Asian growth miracles lie not solely in export-oriented industrialization, but feature heavily pro-poor agricultural and rural development policies (Henley, 2012). Given the importance and partial persistence of stunted rural development, the question why governments engage in these inefficient and possibly harmful policies, elevates the role of political incentives even more and Marx’ conclusion on the weakness of peasants and Bates’ dour analysis of the political clout of the African countryside carry increased importance.

1.1 The Puzzle of Urban Bias

Why then did some governments decide to stop harmful agricultural policies and invest resources in the rural sector? Research that has shown the weakness of the African rural sector, politically and economically, contrasts with the experience of vastly more pro-rural development histories in East and Southeast Asia. Under closer inspection, while Bates’ urban bias argument rings true for some cases, empirical reality is far more diverse. The economic success stories of East and South East Asia prominently feature the importance of agricultural growth and government support of rural areas, standing in complete contrast to a simple, unqualified application of urban bias argument to all regions of the world (Kay, 2002). A number of scholars have produced case studies that go against the grain of the urban bias expectation and identify fairly pro-rural policies in places as diverse as India, Costa Rica and the Ivory Coast (Varshney, 1994). There is no uniform pattern of urban bias and policy
change is not uncommon. The partial alliance between landed interests and skilled urban workers in Latin America at the expense of the rural poor did not emerge or last without conflict. The repression of labor movements is a common theme in Latin America and beyond, while the decline in ISI policies reflects shifting political alliances and changes development thinking. In contrast to Latin America’s and Africa’s experience, a surprisingly different pattern is found in Asia. The successful industrialization of Japan and later Taiwan and South Korea focused on export-led growth in the modern sector, but was connected to improvements in agricultural productivity. Wide reaching land reforms created the foundations for sustained growth in South Korea and Taiwan. Southeast Asia similarly featured in the post World War II period a turn to pro-rural and to a lesser degree pro-poor reforms. Malaysia, the Philippines and Thailand all invested considerable resources into rural infrastructure, agricultural R&D, public health and education projects benefiting rural areas and rural citizens (Danguilan, 1999; Doronila, 1992; McGuire, 2001; Haggard and Kaufman, 2008; Birner and Resnick, 2010), while at the same time repressing urban labor movements. Indonesia is a well known example for a successful, government-led surge in agricultural productivity and use of the Green Revolution, despite typical problems of collective action among farmers (Simatupang and Timmer, 2008). Even a look at historical patterns of agricultural and trade policies reveals that in 19th century Europe’s political conflict over trade tariffs there are several political-economic equilibria possible (Tracy, 1989; Webb, 1982).

Furthermore, to understand the phenomenon of urban or rural bias, a number of government activities have to be considered. The traditional view of urban bias has focused on product taxation, tariffs and price manipulation to extract economic surplus from rural producers implicitly. Of equal importance though are explicit transfer arrangements, for example through fiscal transfers in federal systems or the amount of local public goods and services provision across the territory of a state.
Apart from qualitative case studies that assess the overall direction of policy with regard to the rural sector, some studies have attempted to use quantitative measures to estimate the degree of urban bias. Researchers have relied on survey data measuring urban and rural well-being and access to public services or the over-valuation of the real exchange rate as an aggregate measure (Bezemer and Headey, 2008). An influential World Bank study in the late 1980s proposed a novel measurement approach that relies on price data. Comparing domestic farm gate prices to international crop prices, after adjusting for transportation costs, offers a surprisingly good overall estimate of net taxation rates in the agricultural sector through price distortions (Anderson and Hayami, 1986; Krueger et al., 1991). A renewed effort relying on the same methodological approach and an extended country sample has provided even better quantitative estimates of bias for or against the rural sector (Anderson, 2009). When looking across all these existing measures of urban bias, there exists a surprising amount of variation and it is not at all clear which factors drive these differences (Bezemer and Headey, 2008; Anderson, 2009). The standard urban bias account can only partially explain this rich empirical variegation.

For example, new estimates of the relative support for the agricultural sector are shown in Figure 1.1. The figure shows histograms for certain world regions of relative support rates for agriculture from 1970 to 2005. The relative rate of assistance (RRA) measure, defined as \[ RRA = 100\left(\frac{1 + NRAag/100}{1 + NRAnonag/100}\right) - 1 \], is the nominal rate of assistance to agricultural production (NRAag), relative to the assistance for non-agricultural production (NRAnonag) in percentage terms. Positive values indicate support for agriculture, negative values net taxation. The nominal rate of assistance is defined as the percentage by which government policies have raised gross returns to farmers above what they would have been without the government’s intervention. The national measure is calculated from the crop-level price distortion estimates, based on domestic production levels for each country-year. The
nominal rate of assistance is estimated by comparing local prices to world market prices, accounting for transportation and other costs, attributing the remaining difference to government intervention.

The histograms reveal important spatial variation in support for the rural sector. In high income countries (HIC) the relative rate of assistance is nearly always positive, likely due to the small size and concentration of the agricultural sector. Even among

Figure 1.1: Histogram for RRA by region, ECA is Eastern Europe and Central Asia, HIC are High Income Countries, LA is Latin America
the supportive high income countries though, there exists an extreme right tail in the distribution. While most rich countries are fairly supportive of the rural sector, a number of cases show extremely high support levels (e.g. Switzerland). Outside the realm of economies with marginal agricultural sectors, the average level of urban bias decreases. The African cases in the sample do show a clear urban bias on average, confirming the prior work by Bates and others, but also reveal some instances with fairly strong support for the rural sector. The average rate of support in Asia is much higher than in Africa, again with a heavy right tail in the distribution. Latin America and Eastern Europe and Central Asia lie somewhere in the middle in terms of support for the rural periphery. To better understand the temporal variation, Table 1.1 breaks down the regional average support by decades.

Table 1.1: Relative Rate of Support for Agriculture across Time and World Regions.

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Africa</td>
<td>-0.23</td>
<td>-0.15</td>
<td>-0.10</td>
</tr>
<tr>
<td>Asia</td>
<td>0.01</td>
<td>0.15</td>
<td>0.30</td>
</tr>
<tr>
<td>LA</td>
<td>-0.19</td>
<td>-0.09</td>
<td>0.03</td>
</tr>
<tr>
<td>ECA</td>
<td>-0.08</td>
<td>-0.12</td>
<td>0.17</td>
</tr>
<tr>
<td>HIC</td>
<td>0.70</td>
<td>1.02</td>
<td>0.67</td>
</tr>
</tbody>
</table>

The table shows, in addition to the spatial difference, interesting temporal variation in urban bias - Africa starting with the highest levels of urban bias, gradually decreasing, with Latin America and Asia increasing levels of support. In high income countries the RRA measure starts at high levels, increases in the 1980s, to decrease from 1990 onward.

Figure 1.2 shows the nominal rate of assistance for select cases from 1955-2005. A country like Zimbabwe has a long history, in fact over four decades, of clear bias against the agricultural sector. After the unilateral declaration of independence in 1965, Zimbabwe’s prevailing political elite strived to restore land ownership from...
white settlers to the African majority (Bratton, 1988). Slowly proceeding attempts of land reform were accompanied by policies that drove down agricultural prices, monopsonistic buying practices and a highly over-valued exchange rate (Ndlela and Robinson, 2009). In the case of Zimbabwe rural interests were not able to force political elites to offer favorable policies. In contrast, agricultural policies in Nigeria over the same time period were fairly supportive of the rural sector in the aggregate. In the early 1960s export-orientation and open markets prevailed. In the 1970s and 1980s increased revenue from oil allowed the government to direct more resources and finance stronger government intervention in agricultural markets, followed by renewed liberalization through structural adjustment programs in the 1990s (Walkenhorst, 2009). Despite an overall lackluster agricultural performance, Nigeria’s government policies were comparatively pro-rural in the African context. The case of Thailand illustrates important over-time changes in attitudes toward the agricultural sector. Traditionally, Thailand has always been a strong exporter of rice and has a long tradition of high export taxes that have led to an urban bias in the 19th century and large parts of the 20th century. With the increased importance of elections and rural discontent, starting in the 1970s, agricultural policy has incrementally changed toward a more pro-rural stance. The elimination of export taxes for rice has been followed by extensive investments in rural infrastructure, price support for rice farmers and subsidized credit programs (Siamwalla and Setboonsarng, 1989; Siamwalla, 1996; Thailand Development Research Institute, 1988), combined with a general political empowerment of rural agents (Arghiros, 2001). Current politics is heavily influenced by the power of the rural vote and has inspired a series of pro-rural policies that find support across otherwise deep political divides (Hicken, 2006; Phatharathananunth, 2008; Phongpaichit and Baker, 2008; Selway, 2011). The top time series shows agricultural support in Indonesia. Indonesia has historically been characterized by pro-rural policies that especially favored rice farmers (Timmer, 1993). Fueled by nat-
ural resource revenue, the government emphasized attaining self-sufficiency in rice and implemented price support schemes, subsidized fertilizer and credit, as well as invested heavily in rural irrigation systems in the 1970s. Dwindling oil revenues in the 1980s decreased the support for the rural sector, but after democratization in 1998, the political elites coalesced again on positive support levels of the agricultural sector.

![Figure 1.2: Nominal Rate of Assistance to Agriculture, 1960-2005](image)

The theory of urban bias was developed as an exercise in ideal type creation, based on Africa’s experience (Bates, 1993), and fails to directly explain the multitude of outcomes in other regions of the world. The extensive variation in the degree of urban bias, as well as clear cases of rural bias, calls for a better understanding of the driving forces underlying these differences. Explaining “spatial bias” as a product of political conflicts over redistribution between urban and rural interests deserves more attention given its important implications for development and poverty. The
assumption of a “weak” countryside does not offer much purchase for shedding light on this puzzle.

The majority of the political economy literature that deals with explaining agricultural policy choices has focused on influential farmer lobby cases, analyzing OECD countries. The predominant approach in the literature is inspired by Olson’s theory of collective action and free-riding problems (Olson, 1965). More directly, formal models of interest group lobbying by Grossman and Helpman (Olson, 1965; Grossman and Helpman, 2001) have gained popularity. These approaches usually assume a well-functioning, democratic environment, often with only two parties competing for office and the existence of an organized civil society. Interest groups in these models can rely on institutionalized and established channels of interest mediation. The empirical evidence for the usefulness of these models is largely mixed and inconclusive (Swinnen, 2010), but with some findings with respect to electoral systems (Park and Jensen, 2007, 2008; Swinnen, 2010; Thies and Porche, 2007). Importantly, most empirical studies rely on data from the US and EU only and offer little explanatory power when the agricultural sector is still dominant or when formal accountability mechanisms are weak or non-existent. Much less theoretical and empirical attention has been given to the rural sector and agricultural policy determinants in the developing world, when urban bias is usually expected to be very high. While the standard interest group and collective action models have been used (de Gorter and Swinnen, 2002; Anderson, 1995, 2010; Beghin and Kherallah, 1994; Binswanger and Deininger, 1997; Braverman and Kanbur, 1987), these studies still assume forms of interest mediation common in the developed world. By ignoring the weakness of representative institutions, neglecting the uneven organization and influence of producer interests, as well as the overriding concerns of political leaders and bureaucrats, little insight is gained for understanding the distributive conflict underlying the urban bias phenomenon.
The more general body of work on redistribution has largely focused on developed democracies to understand the determinants of distributive politics. Economic class structures (Bradley et al., 2003; Esping-Anderson, 1990; Huber and Stephens, 2001), interpersonal inequality (Meltzer and Richards, 1981), risk and specific skills (Iversen and Soskice, 2001; Moene and Wallerstein, 2003; Iversen, 2005), the electoral system (Austen-Smith, 2000; Iversen and Soskice, 2006), wider economic structures (Hall and Soskice, 2001) or other ascriptive individual-level attributes like identity and ethnicity (Alesina et al., 1999; Alesina and Glaeser, 2005; Stasavage and Scheve, 2006) have all been used to explain patterns of redistribution. More recent work on redistribution in the developing world and 19th century Europe highlights aggregate institutional features and regime type as important factors for the level of redistribution (Huber et al., 2008; Lindert, 2004; Rudra and Haggard, 2005; Segura-Ubiergo, 2007). Most of the existing studies do not explicitly identify geographic elements of redistributive policies and overlook urban or rural bias as salient qualities of welfare state and pricing policies.

In total, existing theoretical arguments and empirical tests fall short of providing satisfying answers to the question of urban and rural bias in low and middle income countries.

1.2 The Puzzle of Regional Bias

The policies at the root of the urban bias phenomenon do not just create a cleavage between a capital region and the rural sector at large. Urban-rural conflicts play an important role in the politics of developing countries, but drawing a conceptual distinction between a single central core and a single rural sector can conceal important sub-national variation. In general, economic activity tends to cluster spatially, especially for agricultural production. Geographic and climatological constraints in conjunction with local agglomeration economies (Krugman, 1991) often create
distinct economic profiles for sub-national regions. Hence, pricing policies for agricultural crops instituted by the central government will have varying effects across the state’s territory. For example, export taxation of major cash crops in Africa only really affects regions in which such crops are grown, making some areas more than others subject to “urban” or “rural” bias.

The characterization of Indonesia as fairly pro-rural in its policies in the 1970s and 1980s cloaks the spatially concentrated effect of many of the most prominent policies. The economic benefits of the strong support for rice farmers through price floors and input subsidies was more important on the main island Java, compared to the other islands, precisely because rice is the dominant crop, while other export crops like coffee and tea are more prominent on the outer islands.

This regional pattern of distributive effects through government pricing policies is often complemented by a more formalized and familiar system of regional transfers and public services provision. Most federal political systems and devolved unitary states utilize extensive systems of regional redistribution through the allocation of transfers by the federal or national-level government (Boadway and Shah, 2009). Furthermore, even in centralized unitary states governments have to decide over the provision of goods and services across space, rendering the construction of schools, hospitals and roads intensely political and affected by political-geographic concerns. Researchers in various fields have investigated the political conflicts underlying fiscal federalism and the geographic distribution of public funds (Baskaran, 2011; Bermendi, 2007; Berry et al., 2010; Besley and Coate, 2003; Borck and Owings, 2003; Dixit and Londregan, 1998a; Enikolopov and Zhuravskaya, 2007; Gibson and Calvo, 2000; Khemani, 2003; Rodden and Wibbels, 2002; Treisman, 1996; Wibbels, 2000), but have not made explicit the connection to more general aspects of regional redistribution: Many government policies create an uneven topography of spatial redistribution, either through explicit and formal institutions (fiscal federalism) or the
implicit allocation of public expenditures and the manipulation of prices.

To present an example for the sub-national variation of resource transfers, Figure 1.3 shows per capita fiscal transfers to district governments in Indonesia, colored from lightest (0-25th percentile) to the darkest (75th-100th percentile). There exist dramatic differences in the amount of resources districts receive from the central government. The question is whether these differences are solely due to the components of the fiscal formula, reflecting regional tax contributions and other concerns, or whether outright political struggles between the center and the regions shape fiscal bargaining outcomes? The figure reveals that per capita allocations are much higher on the outer islands, specifically the provinces of Aceh, Riau, Kalimantan and all of Papua receive dramatically higher fiscal transfers than districts on Java, the main economic center of Indonesia with over 50% of the population and total GDP.

As an important aside, while this dissertation analyzes spatial bias at the aggregate, national and disaggregated sub-national level, it largely disregards intra-rural divisions and how transfers are structured. The question of conflicts between landless or share-cropping peasants and the land-holding elite does carry important implications for spatial bias in policy, welfare effects and the form in which transfers are implemented (Acemoglu and Robinson, 2001b; Baland and Robinson, 2008; Ferguson, 2010; Hidalgo et al., 2010). Also, continental Europe’s experience with powerful land-holders, like the Prussian Junker class (Gerschenkron, 1943), or Latin America’s historically strong land-holding elites (Grindle, 1986), illustrate the political power of the landed class vis-a-vis the state and the poor peasantry, but understanding the independent sources of power for small and medium-scale farmers presents a more interesting puzzle in light of Olson’s collective action argument.
1.3 Collective Action and the Power of the Periphery

This dissertation aims to improve our understanding of the two interrelated questions of urban and regional bias. Under which conditions is the countryside “weak” and urban bias prevails? When does the opposite pattern emerge? Can the factors that explain spatial bias at the aggregate, national level also help elucidate the sub-national patterns of distributive flows? I argue that the ability of collective action, with and without institutional forms of accountability, plays a crucial role in answering these questions. In particular, I argue that two forms of collective action have to be considered. First, the threat of rural violence and the implied costs for the government to engage rural resistance shapes the ability to issue a credible threat to
the central government and bargain for increased access to resources. Second, when institutionalized forms of accountability, i.e. elections, exist, voting in rural majority societies can equally tilt resource transfers in favor of the rural sector.

1.3.1 Rural Violence

In order to develop a better understanding of urban and rural bias, it is instructive to consider the whole spectrum of experiences in developing countries in Latin America, Asia and Africa, but holding on to Bates’ important assumption about a regime leader’s basic motivation: Political survival. The recent experience of the Arab Spring and research on food riots in cities has confirmed the ever-present threat of urban unrest (Arezki and Brückner, 2011; Bellemare, 2011) as a real threat to many regimes. When the danger of urban unrest is strong, rulers will have to use resources to alleviate these pressures. Population concentration in the capital has been found to negatively affect regime stability and political survival (Do and Campante, 2007; Wallace, 2007b,a). This provides general support for the notion that urban actors are politically powerful. Importantly though, rather than assuming citizens in the countryside are powerless, the experience of East and South East Asia with rural insurgencies suggests that collective action in the periphery is possible and can lead to the initiation of rural development programs by the government (Kerkvliet, 1977; Haggard and Kaufman, 2008; Muscat, 1990). That rural violence is possible and sometimes a long-lasting threat to the government is documented in the large literature on civil wars. Violent civil conflicts are often started and fought far away from the capital and urban centers (Wickham-Crowley, 1991; Buhaug and Rod, 2006; Buhaug et al., 2009), motivated by economic grievances, political exclusion or goals of self-determination (Collier et al., 2003; Miguel et al., 2004). The connection between exploitation and repression by the state and rural mobilization is an important theme in the scholarship on historical peasant revolts and uprisings. While
many authors do not see a strong association between actual peasant violence and positive effects on the fate of the rural poor, the threat of rural groups with the backing of powerful landlords can have important consequences for central government policies (Binswanger and Deininger, 1997; Hawes, 1990; Jones, 1989; Migdal, 1974; Moore, 1966; Kerkvliet, 1977; Kriger, 1992; Paige, 1975; Wolf, 1969). In particular, the experience of the Vietnam War has changed the perception of the feasibility of a successful rural insurgency, even against an enemy with vastly more resources.

It does not have to be the case that farmers and other rural citizens join in violent collective action directly, as long as rebel groups depend on the support of the local population to sustain an insurgency campaign (Kalyvas, 2006), government policies toward the countryside are an important bargaining chip. Quantitative work has highlighted an important feature of rural conflict: Difficult terrain favors the outbreak and increases the length of civil wars (Fearon and Laitin, 2003; Buhaug and Rod, 2006). While citizens in the rural periphery might face higher costs of collective action due to their geographic and economic circumstances, the government also often faces much higher costs to enforce central government policies and quell rural resistance. Engaging a rural insurgency can be very costly and bind important resources, weakening the position of the government against other threats. To engage an effective rural insurgency, governments need to invest in a capable military, which in turn might pose problems of military control and coups after the conflict is resolved (Acemoglu et al., 2009).

Given what we know about urban unrest and rural insurgencies, governments are subject to two different threats, creating not a single but dual dilemma of political survival. Rulers interested in survival have to minimize the probability of opposition in both the urban and rural sector. Clearly, rulers need to address the possibility of urban riots. The looming danger of escalating protest and riots in a developing countries’ sprawling capital has probably only increased in recent decades. The
spark for a wildfire of popular protest can be ignited by small numbers of initial protesters, revealing preference falsification at an unexpected scale (Kuran, 1991). At the same time, continuous extraction of economic resources and political repression of the countryside can create important grievances that eventually ferment into organized collective action. Both threats need to be strategically balanced to maximize the chances of political survival. The difference between the urban and rural threat lies in the immediacy of danger and the ability to punish. Rural violence poses a less direct threat to the central government, because insurgents often fight for more regional autonomy or independence, rather than capturing the capital, and can extend over long time periods with varying degrees of intensity. From the perspective of the central government though, engaging a rural insurgency is costly in terms of resources, circumscribing the ability to sustain the support of other elements in the ruling coalition. Riots in the capitol on the other hand represent a more direct threat, while at the same time being more accessible to repressive measures. Rural insurgencies, once started can be very hard to stop and can simmer for long periods of time with rebels retreating into hard to reach territory. Urban protesters though are easier to track down and punish, given that protest does not escalate to an insurmountable size.

Without institutionalized means of political accountability, citizens have to rely on their ability to organize collective action in the face of government power to affect extractive and distributive policies. Understanding policies that contribute to urban bias as a form of redistribution between groups in society, allows to link the credibility of the rural and urban threat to varying degrees of urban and rural bias. Urban bias should be especially strong under conditions of a weak and divided countryside, under the control of the central government. Urban bias should be much lower when the potential of rural violence credibly threatens to bind essential government resources in an open conflict.
Thailand’s historical experience with a rural Communist insurgency serves as a useful illustrative example. For long periods of time, Thailand was characterized by a political system strongly centered around the capital city Bangkok (McVey, 2000). While especially the North and Northeastern provinces were neglected politically and economically, rulers in Bangkok always used export taxation of rice producers and low public goods provision in the countryside, as a means to concentrate economic benefits in the capital region. Having never experienced colonial rule, the revolution of 1932 put an end to absolute monarchy and marked the beginning of Thailand’s constitutional monarchy. Under the leadership of the military governments of Phibun (1938-1944, 1948-1957) and Sarit (1958-1963) Thai politics was conflictual and several coups and counter-coups attempts were testament to the infighting between Bangkok’s elites, largely oblivious to growing discontent over lagging economic development in the countryside (Chaloemtiarana, 2007). The Communist Party of Thailand (CPT) started organizing in the rural periphery and engaged in small-scale conflict in the 1960s. Receiving important support from China and Vietnam, the CPT was able to organize a strong rural support network reaching several million people and several thousand fighters, especially in the North and Northeast. The reaction of the Thai government to this mounting rural threat is highly instructive. It combined military and police action with an extensive government initiative for rural development, strongly backed by the US (Christensen, 1993; Dixon, 1999). Especially in regions suspected of high levels of CPT support, the government started to invest in rural infrastructure, build roads, schools and hospitals (Muscat, 1990). At the same time, agricultural pricing policies toward rice started to shift and alleviated some of the traditional extraction of economic surplus through export taxes (Choeun et al., 2006; Forssell, 2009; Isvilanonda and Poapongsakorn, 1995). The combination of counter-insurgency with development policies eventually drained the support for
the CPT and by the 1980s had dramatically reduced the threat of an active rural insurgency. While the CPT was never really able to threaten the survival of the Thai state, the threat of rural collective action was enough incentive for Bangkok’s elites to initiate important shifts in economic policies and build the foundation of a successful rural development program that marked just the beginning in the pro-rural turn of Thai politics.

The notion of a political struggle between the center and a periphery can be used to derive predictions about the level of urban bias in redistributive policies at the aggregate level, but can also be extended to illuminate sub-national patterns of regional redistribution. If a capital region and several peripheries are considered, then the regional bargaining power is connected to the ability to threaten costly violent collective action. Existing work on separatism and regionalist conflict has already identified the potential power of collective action in the periphery. Treisman (1999) shows that in bargaining over fiscal resources, decentralization empowers regional actors and increases the level of transfers necessary to avoid regional revolts. Appeasing and buying off certain regions might be a necessary cost the central government has to endure in order to divide the opposition (Treisman, 2004).

1.3.2 Voting in the Countryside

Apart from informal threats of violence, if the institutional environment proscribes recurring elections, controlling or winning the rural vote can confer an alternative source of influence to the rural sector. Early democratization and healthy electoral competition in India has had important implications for agricultural policies and rural public goods provision, generally counter-acting movements to urban bias (Varshney, 1994). If elections are an important element for regime legitimacy and leader
selection, controlling rural turnout and voting becomes of paramount importance and can be used to leverage the bargaining position of rural agents versus ruling government (Brown and Mobarak, 2009). If the pivotal voters resides in the countryside, policies toward the rural sector attain particular salience. Even when elections are unfree and rigged, used as a means of orchestrated regime legitimation, controlling the rural vote and ensuring the desired outcome often involves policies that deliver benefits to particular voters or regions. Scholars are still divided over the exact purpose these semi-competitive elections play in autocratic regimes - ranging from signaling strength to the opposition, dividing the opposition or bargaining within the ruling coalition (Blaydes, 2011; Brownlee, 2007; Magaloni, 2006). Elections are also used to select representatives for legislative bodies like parliaments, which in turn are used to manage the ruling coalition, distribute benefits to supporters, elicit information or even tie the autocrats hands to institute credible property rights (Gandhi and Przeworski, 2006, 2007; Gandhi, 2008; Macdonald, 2006; Myerson, 2008). No matter what the ultimate purpose of elections in semi-democracies and autocratic regimes, the ability of rural agents and intermediaries to deliver or withhold votes to the center can be a powerful bargaining tool.

A large body of research deals with the disciplining effects of elections on politician’s behavior and associated implications for policy-making. Formal models of democratic accountability and elections emphasize the ability to punish incumbents at the polls (Besley, 2006; Persson and Tabellini, 2000), endowing the voting population with an important tool to affect the government’s behavior. Empirical studies have found an association between the introduction of elections, the degree of competitiveness and the availability of candidate information to a number of important policy outcomes (Adam et al., 2011; Aidt and Eterovic, 2011; Besley and Burgess, 2002; Besley et al., 2007; Ferraz and Finan, 2011; Huber et al., 2008; Iversen, 2005; Lindert, 2004; Keefer and Vlaicu, 2007; Martinez-Bravo et al., 2011; Stasavage, 2005).
What then are the implications of competitive elections for urban bias? When elections are used as a way to aggregate preferences of the general population and select representatives through a competitive mechanism, rural citizens can supply the necessary votes to induce politicians to supply desired public goods and reduce urban bias. Hence, I expect to find a negative effect of elections on urban bias in rural majority settings, potentially mitigated by the presence of cross-cutting cleavages and the level of competitiveness (Dunning and Harrison, 2010; Habyarimana et al., 2007). Note the argument rests on the assumption of perfect turnout for rural voters. A growing literature on clientelism (Calvo and Murillo, 2004; Hicken, 2011; Kitschelt, 2000; Kitschelt and Wilkinson, 2007; Gehlbach and Keefer, 2008) has shown the enormous importance of patronage networks and personal relationships between voters and local intermediaries in autocratic and democratic electoral settings. Local machine bosses, large landowners, and important intermediaries like financiers or fertilizer distributors are able to trade private goods in direct exchange for votes and turnout, creating mechanisms to monitor voter behavior and establish a long-run relationship with voters (Baland and Robinson, 2008; Joshi and Mason, 2011; Taylor-Robinson, 2010). The presence of well-functioning clientelistic networks under the control of local and regional rural elites can be crucial in negotiations with the center, and are used to influence government policy in a way to avoid overtaxation of rural producers and at the same time funnel resources back through government spending programs (seed banks, fertilizer subsidies, loans, government jobs, health care and education) that improve the living conditions of rural residents and reinforce clientelistic networks.

1 Related research also highlights the role of spatial clustering of ethnic groups and co-ethnic linkages (Kasara, 2007).
1.4 Plan of the Dissertation

This dissertation adds to existing research in several ways. It identifies the two interrelated puzzles of urban and regional bias, which are insufficiently explained by current approaches. The four essays in this dissertation provide new theoretical arguments and detailed empirical tests that engage the problematic of the political geography of distributive conflicts in a novel way. In particular, I explicate in detail the role rural collective action can play in the struggle over resource transfers. Votes and violence can both empower the rural sector and shape the distributive topography created by government pricing policies and public goods provision. On an empirical level, I combine new quantitative measures of urban bias at the country-level with detailed sub-national data on agricultural policy and government expenditures in Indonesia. Indonesia, and parts of Southeast Asia more generally, is a useful case to study the role of rural collective action because it has a large agricultural sector and comparatively low levels of land inequality (Akiyama and Larson, 2004), allowing me to focus on the power of the rural citizenry in the face of classical collective action problems.

The first essay (Chapter 2) advances the theoretical understanding of the urban bias phenomenon by formalizing and extending elements of Bates’ argument, providing a game theoretic model that allows urban and rural bias policy outcomes. The theory situates the urban bias phenomenon as a particular pattern of resource allocation in the political geography of distributive conflicts. It stresses the geographic location of population groups with regard to the center of power as one important factor determining patterns of redistribution in the context of a general accountability problem. This links core insights from political geography to standard theories of redistribution, which usually emphasize the role of economic class structures (Huber and Stephens, 2001), interpersonal inequality (Meltzer and Richards, 1981) or other
ascriptive individual-level attributes like identity and ethnicity (Alesina et al., 1999; Alesina and Glaeser, 2005; Stasavage and Scheve, 2006) in explaining patterns of redistribution. It identifies factors that determine the degree of urban or rural bias in policy. In a second step, I use new data on the taxation of agriculture with broad coverage to assess the relevance of my approach relative to alternative explanations. Using data on net levels of support for the agricultural sector for 88 countries from 1955 to 2005 and two indirect measures of the credibility of a rural threat, I show the relevance of rural collective action. Drawing on instrumental variables I safeguard against potential endogeneity concerns and provide several alternative robustness checks.

The second essay (Chapter 3) builds directly on the findings from Chapter 2. This essay discusses in more detail the importance of sub-national biases in resource transfers. To understand the political topography of distributive politics, I draw on the history of agricultural policy and regional conflicts in post-colonial Indonesia. Agricultural policy in Indonesia has long been characterized as pro-rural in general and pro-rice in particular. This comparative rural bias (Timmer, 1993) though had very different effects across the Indonesian archipelago. Given the special importance of rice for the Javanese rural sector and the stronger importance of plantation and export crops on the outer islands, pricing and support policies favored certain regions more than others. The particular attention to the Javanese farmers was partially motivated by President Suharto’s rise to power and his historical experience with the Indonesian Communist Party’s efforts to organize the Javanese countryside. Similarly, a rich history of separatism and regional conflict illustrates how for long periods of time the Indonesian government extracted resources from the outer islands, but after the fall of Suharto in 1998 and the weakened power of the military, regional bargaining power increased and official fiscal transfers dramatically reversed transfer flows. Building on these two case examples, I extend the formal
model from Chapter 2 to model a conflict between an incumbent government, the urban population and N peripheral regions. I test the main implication of the model using detailed district-level data from Indonesia on central government transfers and sub-national effects of agricultural pricing policies.

The third essay (Chapter 4) moves away from violent collective action and engages the question of elections. Following the argument by Varshney (1994), I formulate a simple model that shows the conditions under which electoral competition should decrease urban bias. The positive effect of electoral competition is expected to be mitigated by the presence of cross-cutting cleavages (Rokkan, 1967) and the level of competitiveness in elections. The main contribution of the chapter is a detailed empirical test of the main hypothesis. There exists little quantitative evidence of a clear causal effect of elections on urban bias, due to measurement issues and endogeneity concerns. To address these issues I rely on a natural experiment from the Indonesian context. The exogenous phasing-in of indirect and direct elections of district heads in Indonesia allows me to test the effect of electoral competition on public expenditures benefitting the urban and rural sector. Using data from the Indonesian context serves as an ideal test case for the scope of the theoretical argument and at the same time, due to the specifics of the case, constitutes a hard test, biasing the results against finding confirmatory evidence. Importantly, I find evidence that the introduction of elections increases expenditures benefiting rural residents and reduces urban bias. Furthermore, additional evidence suggests this effect is dependent on the competitiveness of elections and conditional on the presence of other cross-cutting cleavages, which can split the rural vote.

The fourth essay (Chapter 5) analyzes important implications of the political geography of distributive conflicts on institutional changes. Given the extensive system of fiscal transfers in Indonesia, I empirically assess the role of local politics for the creation of new district governments in post-decentralization Indonesia (2001-2009).
I show that within and across district competition gives local elites strong incentives to capture the district creation process to generate politically “safe” districts. I also introduce a new statistical technique to deal with spatially correlated data structure in a Generalized Linear Model setting and uncertainty over model specification. By combining spike-slab variable selection priors with flexible Bayesian Generalizing Additive Mixed Models I identify the drivers of district splitting in Indonesia and showcase the usefulness of this novel empirical approach.
A Theory of Urban-Rural Bias: A Dual Dilemma of Political Survival

2.1 Introduction

Development economists identified early on a distinct urban bias in the core policies and growth trajectories of many developing countries (Myrdal, 1958; Lipton, 1977). Across the globe governments extract resources from agricultural producers, interfere in market organization and distort prices, although such neglect of agricultural development is generally seen as one of the main obstacles to sustained development\(^1\). If governments were to enable agricultural markets to function well and supply financial and technological support, large agricultural productivity and growth gains would be reaped (World Bank, The, 2007). Given the importance and persistence of stunted rural development, why do governments engage in these inefficient and possibly harmful policies?

Bates (1981) has prominently outlined the political incentives for politicians to favor urban constituents over rural residents. Governments extract revenue from rural cash crop farmers in order to finance urban industrialization projects and buy

\(^1\) For an overview of the empirical literature see Bezemer and Headey (2008)
off the support of the urban poor to secure their political survival. Hence, pro-urban bias will be a persistent feature of many developing economies, as long as political structures make rulers beholden to urban groups. This view of urban bias resonates well with our general understanding of development policies in Africa and Latin America, where governments pursued import substitution industrialization strategies that hurt farmers at the expense of manufacturing interests and urban workers. Recent scholarship on the development of welfare state regimes in the developing world (Haggard and Kaufman, 2008; Wibbels and Ahlquist, 2008) has similarly argued that in the case of Latin America the formation of relatively generous but narrow welfare programs, targeting urban groups, was due to a coalition of capital and labor against rural interests. While Bates’ urban bias argument rings true for some cases, empirical reality is far more diverse (Varshney, 1994). The economic success stories of East and South East Asia prominently feature the importance of agricultural growth and government support of rural areas, standing in complete contrast to a simple, unqualified application of urban bias argument to all regions of the world (Kay, 2002). When looking at existing measures of urban bias, like real exchange rate overvaluation, differential public goods provision or net taxation rates, for different time periods and countries, there exists huge variation and it is not at all clear which factors drive these differences (Bezemer and Headey, 2008; Anderson, 2009). The standard urban bias account can only partially explain this rich empirical variegation.

This paper will attempt to improve our understanding of urban bias by formulating a theoretical model of political survival that formalizes and extends core elements of Bates’ account. In weakly institutionalized or autocratic settings, normal citizens have little institutional control over the government’s actions and can only hold leaders accountable through a direct threat to political survival. By conceptualizing agricultural policy essentially as redistribution between rural and urban areas to en-
sure the continued support of salient groups, I identify conditions under which urban bias is expected to be especially strong and which factors lead to rural favoritism. Rulers have to balance the dual threat of urban unrest and a rural insurgency by selecting an appropriate level of regional redistribution. Cases that resemble the classical account of urban bias emerge in the model when rural residents fail to produce a credible threat, while urban residents pose an immediate danger. On the other hand, if rural groups can mobilize an insurgency and potentially reduce the reach of the central government, less urban bias is to be expected. The model also predicts an increase in urban bias with larger government non-tax revenues, while a public goods effect links higher urbanization to reduced transfers to cities.

While most critics of the urban bias account (Varshney, 1994, e.g.) focus on the underexplored role of political institutions and democratic elections, this paper keeps with focusing on non-institutional forms of political influence. In many low and middle income countries political outcomes are produced by the parallel operation of formal political institutions and strong informal influences. Excluding the institutional dimension for now also circumvents a debate on the endogeneity of institutional arrangements in the context of fluid power relations (Przeworski, 2007).

Building on the core insights from the model, I use new data on estimates of relative net levels of taxation in agriculture to test the main predictions. The data cover 72 low, middle and high income countries from 1955-2007. While the research design and data do not allow me to completely rule out common threats to causal inference, the findings are robust to several specifications and the use of instrumental variables, indicating that the credibility of a rural threat reduces urban bias.

This paper adds to existing research in several ways. First, it advances the theoretical understanding of the urban bias phenomenon by formalizing and extending elements of Bates’ argument, providing a game theoretic model that allows urban and rural bias policy outcomes. Second, I use new data on taxation of agriculture
with broad coverage to assess the relevance of my approach relative to alternative explanations. Third, the theory situates the urban bias phenomenon as a particular pattern of resource allocation in the political geography of distributive conflicts. It stresses the geographic location of population groups with regard to the center of power as one important factor determining patterns of redistribution in the context of a general accountability problem. This links core insights from political geography to standard theories of redistribution, which usually emphasize the role of economic class structures (Huber and Stephens, 2001), interpersonal inequality (Meltzer and Richards, 1981) or other ascriptive individual-level attributes like identity and ethnicity (Alesina et al., 1999; Alesina and Glaeser, 2005; Stasavage and Scheve, 2006) in explaining patterns of redistribution. While all these factors certainly matter too for politician’s decision-making calculus, the geographic clustering of individuals with similar incomes, skills and identity in particular locations, calls for a better integration of standard theories and aspects of political geography.

The next section will outline the specific puzzle of urban bias and the challenges associated with explaining this phenomenon. Section 3 will present a simple, stylized model of political survival. Section 4 presents the data and empirical estimation. Section 5 concludes and discusses the direction of further research.

2.2 The Puzzle of Urban Bias

While an extensive literature in economics has outlined the importance of good agricultural policy for the development process and poverty reduction (Bravo-Ortega and Lederman, 2005; Kang and Ramachandran, 1999; Kay, 2002; Diao et al., 2006; Ravaillon and Datt, 2002; Ravaillon and Chen, 2004; Lipton, 2005) and highlighted the importance of government intervention (Binswanger and Deininger, 1997), the majority of the political economy literature that deals with explaining agricultural policy choices has focused on analyzing OECD countries. The predominant ap-
approach in the literature is inspired by Mancur Olson’s theory of collective action and the formal interest group lobbying model by Grossman and Helpman (Olson, 1965; Grossman and Helpman, 2001). These approaches usually share a reliance on the assumptions of a functioning system of democratic representation, two party competition and the existence of an organized civil society with established channels of interest mediation. Empirical tests of these models, using data from the US and EU countries, have found some limited support (Swinnen, 2010).

Much less theoretical and empirical attention has been given to agricultural policy determinants in the developing world. While the standard interest group and collective action models have been applied (de Gorter and Swinnen, 2002; Anderson, 2010), these studies often ignore the weakness of representative institutions, the uneven organization and influence of producer interests, and the overriding concerns of political leaders and bureaucrats. Theoretically, these models neglect the role of non-institutional threats for policy formulation and empirically they ignore the divisive redistributive impact of agricultural and related policies across cities and the rural periphery.

A different perspective on agricultural policy in developing countries has been developed by Bates and others (Bates, 1981; Lipton, 1977). Bates argues Africa’s failed agricultural policy is in part caused by adverse incentives for national political leaders. Producers of exportable cash crops were forced to sell their product at low prices to national marketing boards, which in turn generated substantial profits on international markets. The generated revenue was then used to provide public goods and control inflation in urban centers, fuel industrialization projects and finance networks of political patronage. Rural areas were disadvantaged in terms of stunted growth and reduced investment, lower public goods provision and political repression.

The driving force behind such policies is the need for political survival. Govern-
ments use revenue to inoculate themselves against the possibility of urban unrest. Protesting urban workers either pose a direct threat to the regime or could trigger a coup by the military and hence have to be avoided at all costs. This transfer of resources is implemented through agricultural pricing policies, input and food subsidies, export taxation, quotas, exchange rate policy and the unequal provision of local public goods.2

African urban bias is often likened to Latin American experiences with import substitution strategies and welfare state development, which were often implemented at the expense of the rural poor (Collier and Collier, 1991; Bruton, 1998; Haggard and Kaufman, 2008). An urban-rural cleavage can become especially salient when a backward economy with a low labor-land ratio experiences declining trade (Rogowski, 1987).

At the same time, the empirical pattern of urban bias is not uniform. In Latin America, rulers did not always align with urban labor without conflict - repression of labor movements and the declining popularity of ISI speak to the fact that there is no iron law of urban bias. Even more so, contrasting Latin America’s and Africa’s experience with that of Asia, often completely reversed patterns emerge. Governments in Taiwan and South Korea implemented sweeping land reforms, Malaysia, the Philippines and Thailand engaged in decidedly pro rural policies, investing considerable resources into public health and education projects benefiting rural areas (Danguilan, 1999; Doronila, 1992; McGuire, 2001; Haggard and Kaufman, 2008; Birner and Resnick, 2010), while repressing urban labor movements. Indonesia is well known for its generous support of rice farmers, despite the characteristic difficulty of organizing collective action among farmers (Simatupang and Timmer, 2008).19th century Europe’s political conflict over trade tariffs equally reflects that there is

2 A similar logic is put forward in Ades and Glaeser’s (1995) account of urbanization processes in developing countries: proximity to the center of political power results in rents, which induces the population to concentrate inefficiently in the capital.
nothing inevitable about supporting industry over agriculture, even at relatively low levels of development (Tracy, 1989; Webb, 1982). New quantitative measures of government induced price distortions in agricultural markets confirm the rich variation in net taxation rates of farmers across countries and time, agricultural sectors and regions within countries for the period after World War II (Anderson and Hayami, 1986; Bezemer and Headey, 2008; Anderson, 2009). Figure 1 shows histograms for certain regions of relative support rates for agriculture from 1970 to 2005. Negative values imply net taxation of agriculture, positive net subsidies (for more details on the measure, see Section 4).

The theory of urban bias was developed as an exercise in ideal type creation, based on Africa’s experience (Bates, 1993), but does not automatically lend itself to explaining the variation in other regions of the world. The RRA estimates show that on average Africa is plagued by urban bias, but there exists important variation within the region. Importantly, both Latin America and Asia feature more rural support.

To make sense out of the empirical variation in urban bias, it is useful to draw on the divergent experience of developing countries in Latin America, Africa and Asia, take Bates’ argument and situate it in a more general framework of political survival. Rulers do fear the power of the urban poor, who can quickly facilitate hard-to-control protest and directly challenge political survival in the capital. When the danger of urban unrest is strong, rulers will have to use resources to alleviate these pressures. Recent research has modeled and empirically evaluated the importance of population concentration in the capital for regime stability and political survival (Do and Campante, 2007; Wallace, 2007b,a). At the same time, rural citizens are not

---

3 Related research also raises the possibility that urban bias is simply epiphenomenal to the spatial clustering of ethnic groups and co-ethnic linkages (Kasara, 2007).
Figure 2.1: Histogram for RRA by region, ECA is Eastern Europe and Central Asia, HIC are High Income Countries, LA is Latin America

completely powerless. The experience of East and South East Asia suggests that the threat of a rural insurgency was one of the main reasons for governments to initiate rural development programs (Kerkvliet, 1977; Haggard and Kaufman, 2008; Muscat, 1990). The power of rural insurgencies has also been documented in recent scholarship on civil wars. Civil wars often start in rural areas, far away from the capital and urban centers (Wickham-Crowley, 1991; Buhaug and Rod, 2006) and are linked to economic grievances and shocks (Collier et al., 2003). Similarly, the liter-
nature on peasant revolts and uprisings has emphasized the linkage between central government policies and rural mobilization. While the actual outbreak of peasant revolts is not often associated with long-lasting effects on the fate of the rural poor, the threat of rural groups with the backing of powerful landlords can have important consequences for central government policies (Binswanger and Deininger, 1997; Hawes, 1990; Migdal, 1974; Moore, 1966; Paige, 1975; Wolf, 1969).

Even if peasants do not engage in political violence directly, insurgents depend crucially on the support of the local population to sustain an insurgency campaign (Kalyvas, 2006). Quantitative work has also shown the importance of rural and difficult terrain for the outbreak and length of civil wars (Fearon and Laitin, 2003). Taking these findings into account, rulers face two different threats from urban and rural citizens, which creates a dual dilemma of political survival. Rulers interested in survival have to minimize the probability of opposition in both urban and rural areas. On the one hand, rulers need to fear the power of popular urban protest. In many developing countries capitals are the biggest urban centers and governments can not control escalating popular protest in the capital. Even small numbers of initial protesters can quickly generate large masses of people opposing the regime (Kuran, 1991). On the other hand, continuously extracting resources from the countryside can lead to growing resentment and eventually armed insurgencies, especially if rural regions produce valuable (and taxable) products. Both scenarios threaten the political survival of the rulers and need to be strategically balanced. Both threats differ in the sense that rural insurgencies pose a less direct threat to survival, because insurgency conflicts can stretch over long time periods with varying degrees of intensity. Rural insurgents often strive for more regional autonomy or independence, rather than capturing the capital and taking over the traditional center of power. While this does not directly threaten the physical seat of power, it often reduces available resources of the leader to buy off the urban population or
other members of the ruling coalition.

This logic should help explain different patterns of urban bias. The next section will present a simple formal model that tries to capture this dual dilemma of survival and will address at least some of the trade-offs rulers in developing countries face. It will illuminate the conditions under which one would expect urban bias and when not.

2.3 A Simple Model of Urban-Rural Bias

2.3.1 Environment

The model builds on and borrows from existing approaches dealing with distributive conflicts in divided societies (I Miguel, 2007). I develop a simple principal-agent extensive game of complete information. Assume an economy of size 1 with a continuum of citizens equally normalized to mass 1. The economy is divided into two regions, the center (C) and the periphery (P). A share $s$ of the population lives in the capital, while the rest $1 - s$ resides in the periphery. For now, we assume no mobility between regions. In addition to the citizens, the third actor is the government (G) which resides in the center. The model makes no explicit assumptions about the political regime type, but political leadership is, independently of political institutions, subject to severe principal agent problems, i.e. the population has no political means of controlling the leader’s actions, except for the direct threat they pose to the leader’s survival. This might be because the government is a pure dictatorship, elections are fraudulent or officials can implement policy unchecked by electoral constraints due to large informational asymmetries. This implies that in the absence of direct threats to the leader’s political survival, he will choose maximal extraction rates in the economy to increase his private consumption.

Both populations engage in location-specific economic activity. Total production is divided into a share $\theta$, produced in the agricultural periphery, government non-tax
revenue of size $\gamma$, which might represent revenue from natural resources or foreign aid, and production in the urban center of size $1-\theta-\gamma$, representing manufacturing. A representative citizen in the periphery receives $\frac{\theta}{1-s}$ and $\frac{1-\theta-\gamma}{s}$ in the center. The decline in economic return with an increase in population in a specific location represents a closed form assumption about underlying labor markets and the division of constant rents$^4$.

A government is headed by a current leader $G$ who taxes production in the periphery at rate $\tau^p$ and production in the center at $\tau^c$ with $\tau^p, \tau^c \in [0, 1]^5$. $G$ can also decide to spend revenues on the provision of public goods in each region. There are no spill-over effects of regional spending. Aggregate spending in the periphery is denoted by $\eta^P$ and spending in the center by $\eta^C$. Individuals receive utility $g(\eta^P)$ or $g(\eta^C)$ from spending in each region, where $g(\cdot)$ is a strictly positive, concave function. For ease of presentation it is assumed $g(\eta^P) = (\eta^P)^{1/\alpha}$ and $g(\eta^C) = (\eta^C)^{1/\alpha}$, where the parameter $\alpha > 1$ regulates the efficiency of public goods provision.

At the beginning of the game $G$ proposes a policy vector $V = (\tau^c, \tau^p, \eta^c, \eta^p)$. Afterward, the population in the capital can choose to accept ($r^c = 0$) the proposed policy or protest against it and oust the current leader ($r^c = 1$). This reflects the political power geographical proximity to the center of government conveys to citizens. Protest in the streets of a densely populated capital can quickly escalate and overthrow the government (Kuran, 1991; Lohmann, 1994), either through the protest movement itself or because protest triggers changes in the ruling coalition which leads to a coup.

If the population in $C$ decides to protest, it has to pay the price of protest

$^4$ If large parts of the rural population migrate to the city, increased labor supply at least in the short run depresses urban wages.

$^5$ Taxation here is assumed to be efficient. One could easily introduce a typical deadweight-loss of taxation, but this does not affect the substantive results with regard to the political influence of geographical groups on policy.
The cost are a convex, falling function of the population $s$ in the capital $c_p(s) = (1 - s)^\beta$, with $\beta > 1^6$. Although, collective action theory suggests overcoming the collective action problem in large groups is more difficult (Olson, 1965), here a larger population also implies a higher population density, given the capital’s fixed size. In an environment of high population density, it is easier to organize protest, because information can flow quickly. Monitoring is easier and potential government repression can inadvertently affect innocent bystanders, which increases their costs of non participation (Kalyvas and Kocher, 2007). Protest removes the current leader $G$ from government and implements the new vector $V = (0, 0, 0, 0)$, i.e. the government is unable to function properly and each individual in the center receives loot $\gamma/s$, i.e. the protesters can acquire the non-tax revenue from the government. Protest removes the current leader who receives payoff zero and the game ends.

While rulers fear the threat of the urban population, it seems unreasonable to assume the population in the countryside has no impact on the political survival of rulers. If the urban population decides to accept the proposed policy, the population in the periphery can decide to accept the policy ($r_p = 0$) or start an insurgency ($r_p = 1$) at cost $c_r(s) = s^\beta$. If $P$ chooses to accept the policy, the proposal is implemented, payoffs are realized and the game ends with the government still in power.

If $P$ decides to start an insurgency, $V$ is still implemented and the current $G$ stays in power, but $G$ can only apply the tax rate $\tau_p$ now to a reduced share $(1 - \mu)\theta$ in the periphery, with $\mu \in [0, 1]$. Conversely, citizens in $P$ always consume $\mu\theta$ tax free. This setup reflects the fact that a rural insurgency can rarely directly challenge the government, but it can seriously hinder resource extraction in the periphery. The parameter $\mu$ measures the effectiveness of the population $P$ in sustaining the insurgency. This captures military efficiency of the insurgents, the difficulty and loss of

---

$^6$ Making the cost of protest increasing the the population share $s$ has no effect on the qualitative implications of the model with regard to urban and rural bias, it just weakens the influence of the center population.
resources for the government to engage the enemy and the ability to shield resources from taxation (e.g. capable insurgent leadership, outside support, large distance to the capital, vulnerable military infrastructure, access to smuggling routes, etc.)\(^7\).

Payoffs for all players are defined as

\[
U^p = (1 - r^p)[(1 - \tau^p) \frac{\theta}{1 - s} + (\eta^p)^{1/\alpha}] + r^p\left[ \frac{\mu \theta}{1 - s} + (1 - \tau^p) \frac{(1 - \mu) \theta}{1 - s} \right] + (\eta^p)^{1/\alpha} - s^\beta \]  

(2.1)

\[
U^c = (1 - r^c)[(1 - \tau^c) \frac{1 - \theta - \gamma}{s} + (\eta^c)^{1/\alpha}] + r^c\left[ \frac{1 - \theta - \gamma}{s} + \gamma \frac{\eta^c}{1 - s} \right] \]  

(2.2)

\[
U^g = (1 - r^g)[(1 - r^p)[\tau^p \theta - \eta^p + \tau^c(1 - \theta - \gamma) - \eta^c + \gamma] + r^p(1 - \mu) \theta - \eta^p + \tau^c(1 - \theta - \gamma) - \eta^c + \gamma] + r^c[0] \]  

(2.3)

The timing of the game is as follows:

1. G proposes \(V = (\tau^c, \tau^p, \eta^c, \eta^p)\)
2. population in C decides to protest \((r^c = 1)\) or not \((r^c = 0)\)
3. if \(r^c = 1, V = (0, 0, 0, 0)\) is implemented and the current government is removed and the game ends
4. if \(r^c = 0, P\) picks \(r^p = 1\) to start an insurgency or \(r^p = 0\) to accept \(V\)
5. if \(r^p = 0, V\) is implemented, payoffs are realized and G stays in power
6. if \(r^p = 1, V\) is implemented, P starts an insurgency, payoffs are realized and G stays in power

\(^7\) Note that citizens in the rural periphery are treated as a unified group, i.e. the model neglects cleavages between the rural poor and rural elite. It seems reasonable to assume that a strong alliance of the rural poor with powerful landlords is associated with high values of \(\mu\), while divisions in the countryside or smallholder rebellions have to be considered as weaker threats.
This extensive game with complete information can be solved by backwards induction. In the following I will focus on core results only, complete derivations and proofs for all propositions can be found in the online appendix.

The behavior of the government will depend crucially on the strength of the threat citizens in each region can pose. Different equilibria are defined through particular threshold values on exogenous parameters like non-tax revenue $\gamma$, the effectiveness of the insurgency $\mu$ and the cost of protest in the center. Figure 2.2 graphically shows all possible equilibria of the game.

On the x-axis I plot the value of non-tax revenue and a threshold on the cost of protest, on the y-axis the effectiveness of the insurgency is shown. There is a total
of seven distinct equilibria. The area in the graph labeled “instability” refers to an equilibrium defined in the following proposition:

Proposition 1: Political Instability; If $\gamma > \hat{\gamma}$ and $\frac{1-s}{s} > (1-s)^{\beta}$, $G$ can pick any $V$, $C$ will protest no matter what and the current leader is removed. $G$ receives payoff zero, the population in $P$ keeps its untaxed income share $\theta/(1-s)$ and $C$ receives $(1-\theta)/s$. Proof in the Appendix.

In this equilibrium the cost of protest in the center are low enough to make $C$ consider overthrowing the government, while at the same time the level of non-tax revenue $\gamma$ is so high that $G$ cannot buy-off the center population, even with maximal levels of redistribution. The outcome is $C$ protesting and appropriating the government’s rents, despite any efforts of $G$ to buy off the center.

Conversely, if neither the population in $C$ or $P$ will ever revolt, even under maximum extraction, because the cost of protest outweigh outweigh any potential gains, the outcome “extraction” in the bottom-left corner of Figure ?? will be the result.

Proposition 2: Leviathan; If $\frac{1-s}{s} < (1-s)^{\beta}$ and $\mu < \hat{\mu}$, the population in $C$ will never protest, $P$ will never start an insurgency and $G$ can implement a policy of maximum extraction $V = (\tau^c = 1, \tau^p = 1, \eta^c = 0, \eta^p = 0)$. Proof in the Appendix.

In both cases there is no urban or rural bias, because the government is either not functional, or extracts equally at maximum rates. Both outcomes can be seen as limiting cases. The classical urban bias outcome emerges, if the population in $P$ is too inefficient at the rural insurgency, while the urban population poses a credible threat that can be addressed with redistribution. In this case $G$ will extract at maximum rates in the periphery, while spending as little as necessary in the center,
appropriating any remaining rents for itself.

Proposition 3: Classical Urban Bias; If \( \gamma < \hat{\gamma}, \frac{1-\theta}{s} > (1 - s)^\beta \) and \( \mu < \hat{\mu} \), G will implement a policy vector \( V = (0 < \hat{\tau}c < 1, \hat{\tau}p = 1, \hat{\eta}c > 0, \hat{\eta}p = 0) \) and stay in power with

\[
\hat{t}c = \frac{s}{1 - \theta - \gamma} \left[ (\alpha/s)^{1/\alpha} + (1 - s)^\beta - \gamma/s \right]
\]

\[
\hat{\eta}c = (\alpha/s)^{1/\alpha}
\]

Proof in the Appendix.

This outcome is shown in the bottom-middle of Figure ???. For this outcome, the model makes predictions about the amount of urban bias in equilibrium. Here, there is clear urban bias, but the degree varies with the exogenous parameters of the model. In particular, if urban bias is defined as the difference in net per capita spending in the center and net per capita spending in the periphery, denoted by \( \zeta \), one can derive an explicit expression:

\[
\zeta = \hat{\eta}c - \hat{\tau}c \frac{1 - \theta - \gamma}{s} - \left[ \eta p - \tau p \frac{\theta}{s} \right]
\]

\[
= (\alpha/s)^{1/\alpha} - (\alpha/s)^{1/\alpha} - (1 - s)^\beta + \frac{\gamma}{s} + \frac{\theta}{s}
\]  

(2.6)  

(2.7)

While urban bias is strictly increasing in \( \gamma \), the population share in the center \( s \) has an negative relationship with urban bias \( \left( \frac{\partial \zeta}{\partial s} < 0 \right) \). This result follows directly from the behavior of the equilibrium tax rate and spending levels in the capital. If the population share in the capital is very low, some redistribution is needed to outweigh the high share of the potential loot derived from protesting. As the population size in the center increases, it becomes less costly for the citizens to protest - representing the powder keg characteristics of densely populated capitals - but two
countervailing factors diminish the need to spend more resources in the center. First, the
individual payoffs to protest decrease, since the loot has to be shared across a larger group. Second, it becomes cheaper and cheaper to buy off the center through public goods that benefit all citizens independently of population size. Urban bias increases in the share of non-tax revenue \( \gamma \) because citizens in the center can expect a higher looting payoff to overthrowing the government, which induces \( G \) to spend more resources in the center.

Proposition 3 captures the key aspects of Bates’ and Lipton’s urban bias argument that stresses the political influence of urban residents, but extends the logic and relates the non-tax revenue of the government, share of the population in the capital, costliness of protest and effectiveness of public goods provision to the realized degree of urban bias. The model also identifies conditions under which one would expect maximum extraction or political instability instead of urban bias.

A different set of equilibria emerges if the population in the periphery has minimum capabilities at insurgent activities, i.e. \( \mu > \bar{\mu} \). Under these conditions, \( P \) will not tolerate maximum extraction and fight. In this case, the government has to evaluate if it prefers maximal extraction with an insurgency to redistributing towards the periphery to avoid rebellion. If at the same time the urban population poses no threat to the government, the outcomes “rural bias” and “extraction with insurgency” can emerge.

*Proposition 4: Rural Bias:* If \( \frac{1-\theta}{s} < (1-s)^\beta \), but \( \mu > \bar{\mu} \) and \( \mu > \hat{\mu} \), \( G \) will implement \( V = (\tau^c = 1, \tau^p = \hat{\tau}^p, \eta^c = 0, \eta^p = 0) \), \( C \) will not protest, \( R \) will not start an insurgency, with

\[
\hat{\tau}^p = \frac{s^\beta(1-s)}{\mu^\theta}
\]

*Proof in the Appendix.*
In the rural bias case, the government prefers to tax less in the countryside, because a potential insurgency would reduce the taxable income by too much ($\mu > \bar{\mu}$). Note that G’s only concession is a reduction of the tax rate. G will never offer public goods because the population in P can enjoy their benefits even during an insurgency. The net per capita difference in spending:

$$\zeta = -\frac{1 - \theta - \gamma}{s} + \frac{s^\beta(1 - s)}{\mu s}$$

(2.8)

is in this case always negative, indicating a rural bias. Interestingly, in this equilibrium, bias is increasing in the center population $s$, i.e. $\frac{\partial \zeta}{\partial s} > 0$, i.e. the population share reverses its effect in a scenario with a weak center and strong periphery. This is the case, because less people in the periphery (higher $s$) increase the cost of an insurgency, raising the opportunity cost of violence and allowing marginally higher taxation. The effects of an increased effectiveness of the insurgency reduces urban bias, while increased government non-tax revenue increases it. Note that observed outbreak of violence in the periphery is not necessarily a sign of strength, in line with the mixed findings of the success of peasant revolutions (Binswanger and Deininger, 1997), but the the most favorable treatment of the countryside emerges without the use of force. Powerful landed elites or well-organized rural guerillas can induce the center to be more responsive, only using their implied power.

If P is only moderately effective at the insurgency, G will prefer to extract maximally in both regions and tolerate violence in the periphery:

**Proposition 5: Leviathan with Insurgency;** If $\frac{1-\theta}{s} < (1 - s)^\beta$, but $\bar{\mu} < \mu < \bar{\mu}$, G will implement $V = (\tau^c = 1, \tau^p = 1, \eta^c = 0, \eta^p = 0)$, C will not protest, P will start an insurgency and consume $\frac{\mu \theta}{1 - s}$.

Finally, if both threats are credible, G always has to satisfy the protest constraint of the center population, but has to evaluate if tolerating an insurgency is better than reducing taxation in the periphery.
Proposition 6: Urban bias with Insurgency; If \( \gamma < \hat{\gamma}, \frac{1-\theta}{s} > (1-s)^{\beta} \) and \( \hat{\mu} < \mu < \bar{\mu} \), G implements a policy vector \( V = (0 < \hat{\tau}^c < 1, \hat{\tau}^p = 1, \hat{\eta}^c > 0, \hat{\eta}^p = 0) \) and stays in power, C accepts the proposal and P starts an insurgency, with

\[
\hat{t}^c = \frac{s}{1 - \theta - \gamma} \left[ \frac{1}{1 - \alpha} \frac{1}{1 - \alpha} + (1 - s)^{\beta} - \gamma/s \right]
\]

\[
\hat{\eta}^c = (\alpha/s)^{\frac{1}{1 - \alpha}}
\]

Proof in the Appendix

Again, if P is too weak, i.e. \( \mu \) is below a particular threshold \( \bar{\mu} \), G will buy off the urban population with reduced taxation and some provision of public goods, while extracting resources from the periphery and tolerating an insurgency. Urban bias is the same as in equation (6) from Proposition 3.

On the other hand, if P is very effective at disrupting taxation in the periphery, G has to minimize taxation of P.

Proposition 7: Dual Threat; If \( \gamma < \hat{\gamma}, \frac{1-\theta}{s} > (1-s)^{\beta}, \mu > \hat{\mu} \) and \( \mu > \bar{\mu} \), G implements a policy vector \( V = (0 < \hat{\tau}^c < 1, 0 < \hat{\tau}^p < 1, \hat{\eta}^c > 0, \hat{\eta}^p = 0) \) and stays in power, C and P accept the proposal, with

\[
\hat{t}^c = \frac{s}{1 - \theta - \gamma} \left[ \frac{1}{1 - \alpha} \frac{1}{1 - \alpha} + (1 - s)^{\beta} - \gamma/s \right]
\]

\[
\hat{\eta}^c = (\alpha/s)^{\frac{1}{1 - \alpha}}
\]

\[
\hat{\tau}^p = \frac{s^\beta(1-s)}{\mu \theta}
\]

Proof in the Appendix

Now, contrary to above, the equation describing net urban bias changes slightly:

\[
\zeta = (\alpha/s)^{\frac{1}{1 - \alpha}} - (\alpha/s)^{\frac{1}{1 - \alpha}} - (1 - s)^{\beta} + \frac{\gamma}{s} + \frac{s^\beta(1-s)}{\mu s}
\]

(2.9)

While the effect of a change in government non-tax revenue or the effectiveness of the insurgency stay the same (\( \frac{\partial \zeta}{\partial \mu} < 0, \frac{\partial \zeta}{\partial \gamma} > 0 \)), the effect of \( s \) is now nonlinear.
For most configurations of the exogenous parameters, urban bias will decline in $s$, reflecting the efficiency of public goods provision in buying off the center population and the decline in the loot share. This effect starts to diminish and potentially even reverse at intermediate to high levels of $s$, only to increase again at very high levels of urban population concentration. This non-linearity is introduced by the increased costliness of a rural insurgency as citizens move to the center.

### 2.3.3 Observable Implications

How do these results help us to explain the empirical variation in urban and rural bias? First, the model provides a formal derivation of equilibria that correspond to idealized empirical outcomes of interest. By doing so, it highlights important factors like the credibility of a rural and urban threat that qualitatively drive fundamental characteristics of policy. Second, simple comparative static results for the main exogenous parameters of interest will allow us to empirically test the usefulness of our theory.

Bracketing for now the extreme cases of instability, complete extraction and pure rural bias and concentrating on the more realistic intermediate outcomes, the equilibrium amount of urban bias, defined as the difference between net per capita spending in the center and periphery, is expressed by equations (6) and (8). In the analysis section I discussed several comparative static results, but will focus for the empirical analysis on the empirical implications of only one of the main quantity of interest: $\mu$. While the share of the urban population $s$ also has important implications for the level of urban or rural bias, the effect varies by equilibrium. Importantly, the proposed model offers an additional interpretation for the effect of urbanization on urban bias that diverges from the standard collective action argument. While related research has made similar claims about the effect of the urbanization rate on policy
bias, using a collective action argument, the model provides a novel justification for this expected effect (Bates and Block, 2010; Gawande and Hoekman, 2010). The collective action argument posits that high urbanization rates imply a small number of actors in the agricultural sector, reducing any costs for collective action, while our model suggests that the effect of urbanization is rooted in the efficiency of urban public goods provision and reduced payoffs to overthrowing the government.

The credibility of the rural threat though provides and novel and intuitive prediction with regard to urban bias. The parameter $\mu$ is the driving force for the main intuition of the model and has some form of measurable empirical referent, providing a clear research hypothesis:

**Hypothesis:** A credible threat of a rural insurgency decreases urban bias.

Within and across equilibria, a higher effectiveness of a rural insurgency $\mu$ reduces the amount of urban bias. The ability of rural citizens to threaten an effective insurgency makes it more likely to attain equilibria with lower levels of urban bias and in addition has a negative comparative static effect on the amount of net rural extraction within an equilibrium. This reflects the importance of a credible rural threat in shifting policies towards the ideal point of rural citizens.

### 2.3.4 Population Mobility

One obvious limitation of the model is the immobility of the population. While assuming a fixed population distribution is sensible in the short run, especially since many governments do not have the means or perspective to directly manipulate population flows, some governments have sufficiently large time horizons to contemplate the direct effects of population mobility and the effect public policies have on mobility itself. Extending the model to allow parts of the population to move should not change any of the qualitative results, but highlights the importance for governments
to control the mobility of citizens across its territory. Assume parts of the population in P and C are allowed to mechanically switch locations after the government has announced its policy vector. An individual will move if the expected income is higher in the other location. Adding population mobility to the instability and total extraction equilibria does not change any of the results (if individuals are allowed to anticipate the reduction of protest cost in either location, the outcome will change if the new cost of protest are below the necessary threshold). In the case of no rural threat, but a binding protest constraint in the center, G initially planned to offer reduced taxation and some public goods in the center and maximum extraction in the periphery. Given this policy vector, each citizen in P who is mobile will migrate to the city. Anticipating this migration, G can offer lower expenditure on public goods and increase taxation in the center, since an increase in $s$ essentially dilutes the power of C. In the case of no urban threat, but a credible danger of a rural insurgency, G initially planned to extract maximally in the center and minimally in the periphery. Now, all mobile citizens from C will migrate to P. This migration increases the population in P, which magnifies the political power of the countryside. Anticipating this movement, G has to adjust its tax rate $\tau_p$ to avoid an insurgency downwards. In case of a dual threat, the effect of population mobility will be a combination of both, depending on the exogenous parameters in the model. Population mobility increases the rents for the government in cases of an urban threat, while it decreases rents when facing a rural threat, indicating the importance for the government to control the mobility of citizens. In reality, government foresight probably lies somewhere between the assumption of total myopia and perfect foresight, but certainly affects behavior substantially. Wallace’s (Wallace, 2007a) insightful analysis of China’s policies on migration across Chinese provinces clearly reflects this rationale - the Communist party, having a long enough time horizon to treat population flows as a malleable variable, allows them to steer flows of people to increase
Importantly though, this reasoning only applies if no other inter-temporal concerns for the government are introduced. Governments might favor migration to urban cities to supply manufacturing industries with cheap labor and break the power of urban union movements. Then urban bias can also be interpreted as a implicit subsidy of urban manufacturing interests. It remains to be determined what the net effects of population in the center is on urban bias under such circumstances, but integrating such concerns formally is beyond the scope of the current paper. At a minimum though, the effects of a credible rural threat should work in parallel to inter-temporal concerns and on average realize irrespective of the endogeneity of population flows.

2.4 Empirical Analysis

The model in Section 3 identified several important variable of interest for determining levels of urban or rural bias: the effectiveness of a rural insurgency, the share of the population in C and the amount of government non-tax revenue, relative wealth disparities, etc. In the following, I will focus on the empirical test for the main hypothesis dealing with the credibility of a rural threat.

For the longest time quantitative research on urban bias has been hampered by the absence of clear and reliable measures, given the multidimensional nature of the concept\(^8\). Fortunately, a recent research effort by the World Bank\(^9\) created estimates of net levels of taxation of the agricultural and industrial sector for a large set of

\(^8\) For a review of empirical studies see Bezemer and Headey (Bezemer and Headey, 2008). The few existing empirical studies have relied on the overvaluation of the real exchange rate or survey measures of public goods provision in cities and the countryside.

low, middle and high income countries, covering the years 1955 to 2007 (Anderson, 2009).

Specifically, the relative rate of assistance (RRA) measure, defined as \( RRA = 100 \[\frac{(1 + NRAag/100)/(1 + NRA_nonag/100) - 1}{\}} \), is the nominal rate of assistance to agricultural production (NRAag), relative to the assistance for non-agricultural production (NRA_nonag) in percentage terms. Positive values indicate support for agriculture, negative values net taxation. The nominal rate of assistance is defined as the percentage by which government policies have raised gross returns to farmers above what they would have been without the government’s intervention. The measure is a trade-weighted average for the major crops in each country-year. The nominal rate of assistance is estimated by comparing local prices to world market prices, accounting for transportation and other costs, attributing the remaining difference to government intervention. While far from being perfect, the RRA measure is a useful roundabout estimate of support for the agricultural sector as a whole. While it does not capture direct income transfers to rural citizens or the provision of public and private goods, it does cover various forms of input subsidies, tariffs, import/export quotas and distortions of the real exchange rate.

The goal of the empirical analysis will be to relate the level of RRA in each country-year to the threat of an insurgency and a number of control variables. Control variables are identified by other model parameters and competing explanations in the literature. To measure the share of the population in the center, I use the percentage of urban population, taken from the World Development Indicators.

Prior empirical analyses of agricultural policy in developing and developed economies

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10 I forego direct estimation of a log-linearized version of the urban bias equation (6), because the RRA measure is not the simple difference in net spending levels, but rather a more complicated fraction.

11 Ideal would be a direct measure of population concentration around the capital, but this is unfortunately not available for a broad panel of countries (Do and Campante, 2007).
have identified several control variables of importance (de Gorter and Swinnen, 2002, for an overview). By controlling for the effects of various interest group and lobbying arguments, I hope to isolate the effects specific to the theoretical model. I control for agriculture’s value added as percentage of GDP (WDI) to account for the importance of the agricultural sector in the economy. Small agricultural sectors are usually associated with stronger support by the government. The share of food exports of total exports (WDI) is meant to control for the taxation necessity argument. Many governments tax agricultural exports because they are an easy source of foreign exchange and less costly to collect than personal income taxes. I control for GDP per capita in 2000 $ US (WDI) because richer countries are found to support agriculture more - one possible mechanism being the reduced role of food expenditures at the household level (Baker, 2003). Using data on sector market shares in agriculture for each country-year from the World Bank project on Agricultural Distortions, I also calculate a Herfindahl concentration index for agriculture. The expectation is that countries with one dominant agricultural product will focus on extracting resources from that particular sector (Bates, 1981). In addition, I include a control for country land area, measured in square kilometers. Lastly, I control for the polity2 score, as reported by the Quality of Government data set. It has been argued that democracy increases the support for farmers (Varshney, 1994).

Quantifying the effectiveness of P at a rural insurgency is deeply challenging. To provide some form of empirical test for the argument, I will rely on two distinct indirect measures of the rural threat. The first measure I utilize draws on the argument of ease of access for the government. Rural peripheries characterized by remote and difficult to access territory will have the ability to threaten conflict more credibly.

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12 Measured in thousands.

13 The data are taken from the World Development Indicators and the Quality of Government data set (Gleditsch et al., 2002; Teorell et al., 2009). Summary statistics and a list of countries in the full sample are available in a supplementary online appendix.
compared to regions accessible by the center. The literature on civil wars has identified difficult terrain as an important predictor for the location of conflict (Fearon and Laitin, 2003; Buhaug and Rod, 2006). Specifically, I will use a country-level measure of terrain ruggedness, developed by Nunn and Puga (2009), which they show offered protection from slave trade in Africa\textsuperscript{14}. This measure comes close to capturing the increase in costs associated with a rural insurgency/opposition for the enforcement of taxation by the central government. In addition, the ruggedness measure is clearly exogenous to the level of urban bias. Since several of the control variables capture the effect of the importance of agriculture, the partial correlation of ruggedness with the level of urban bias should reflect the latent threat a rural insurgency poses.

A second, alternative measure relies on prior experiences with internal violence. Instead of terrain ruggedness, I use the lagged value of the PRIO internal conflict measure, ranging from 0 to 3. The theoretical model defines the rural threat as the ability to shield resources from taxation or interfere with the central government’s policy. Conflict in prior periods is insofar an indirect measure for a rural threat, as experience with conflict indicates prior investment in guerilla techniques, the existence of trained personnel, experience in armed struggle and willingness to engage in future conflict. While in the theoretical model a high efficiency in an insurgency is not necessarily associated with an outbreak of violence, observed civil war indicates at least intermediate levels of efficiency. Taking together the return on past investments in violence and having at least passed the lower threshold on $\mu$, prior levels of conflict should give some indication of the current rural threat. Since for this measure clear endogeneity concerns exist, I will implement in addition an instrumental variables approach.

\textsuperscript{14} This ruggedness measure is defined as the average uphill slope of the country surface.
2.4.1 Data Analysis

The RRA measure shows important variation across geographic regions, as well as time, and the goal of the subsequent multivariate analysis will be to tease out the role of all the variables derived from the model, while controlling for other structural characteristics.

The data cover a sample of 75 countries from 1955-2005. I am dealing with an unbalanced panel of time-series cross-sectional observations, with countries as units. The first set of analyses will rely on simple OLS models relating the ruggedness measure to the RRA variable, controlling for several important covariates:

\[ rra_{it} = \alpha + X'\beta + \delta R_{it} + \epsilon_{it} \]

Where \( rra_{it} \) is the relative rate of assistance for agriculture in country \( i \) in year \( t \), \( \alpha \) is a common intercept, \( X'\beta \) captures the effect of the control variables, \( \delta \) is the coefficient for the rural threat measure \( R_{it} \) (ruggedness) and \( \epsilon_{it} \) an independent error term. The first model uses a pooled sample and robust standard errors to correct for heteroskedasticity. The second model takes advantage of the panel structure of the data. Analysis of time-series cross-sectional data usually presents several challenges: panel heteroskedasticity, serial correlation and unobserved unit heterogeneity. Several methods have been proposed to deal with each of these issues (Stimson, 1985; Beck and Katz, 1995, 1996). Since here the independent variable of interest is constant across time, fixed effects are unavailable. Model 2 reports the results for a random effects model with robust standard errors clustered at the country-level, in which the common intercept \( \alpha \) is replaced by country-specific random effects \( \alpha_i \), which are assumed to be uncorrelated with the observed explanatory variables.

The results in Model 1 and 2 confirm the theoretical expectations. First, a number of control variables behave as expected. Richer countries show higher levels of
Table 2.1: OLS with robust SEs, random effects with clustered SEs

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient (Std. Err.)</td>
<td>Coefficient (Std. Err.)</td>
</tr>
<tr>
<td>Intercept</td>
<td>-0.042 (0.05)</td>
<td>0.07 (0.20)</td>
</tr>
<tr>
<td>GDP pc</td>
<td>$3.06 \cdot 10^{-5}$**</td>
<td>$-5.67 \cdot 10^{-6}$</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(6.29 \cdot 10^{-6})</td>
</tr>
<tr>
<td>Polity</td>
<td>.004** (0.01)</td>
<td>.003 (0.002)</td>
</tr>
<tr>
<td>Agri Value % GDP</td>
<td>-.001 (0.01)</td>
<td>-.009** (0.003)</td>
</tr>
<tr>
<td>Food Exports</td>
<td>-.005** (3.95 \cdot 10^{-4})</td>
<td>-.002 (0.001)</td>
</tr>
<tr>
<td>Herfindahl</td>
<td>-.14* (0.059)</td>
<td>-1.04** (0.29)</td>
</tr>
<tr>
<td>Land</td>
<td>$-4.37 \cdot 10^{-8}$**</td>
<td>$-4.34 \cdot 10^{-8}$**</td>
</tr>
<tr>
<td></td>
<td>(3.85 \cdot 10^{-9})</td>
<td>(1.07 \cdot 10^{-8})</td>
</tr>
<tr>
<td>Urbanization</td>
<td>.001 (0.001)</td>
<td>0.007* (0.003)</td>
</tr>
<tr>
<td>Ruggedness</td>
<td>0.025** (.005)</td>
<td>0.06† (0.033)</td>
</tr>
</tbody>
</table>

N 1682 1682
R² 0.598 0.375
F (8,1673) 277.6

Significance levels: †: 10%  *: 5%  **: 1%

support for agriculture, as do countries with higher polity scores, while countries with a higher share of food exports reduce the support for agriculture. Countries with a highly concentrated agricultural sector are found to tax agriculture more heavily, while a large landmass equally increases urban bias. These results are in line with the general theoretical expectations of existing arguments. Interestingly, the urbanization variable has a positive effect, potentially due to a public goods effect as the model suggests. For both the standard OLS and random effects approach the ruggedness measure has a positive impact on the support for agriculture, below the 1% and 10% level of significance respectively. This implies that in countries with a more rugged terrain, the countryside can issue a more credible threat and in turn receives higher support from the government. The coefficient size of 0.025 implies an effect magnitude of substantive importance. Comparing a country with median levels of ruggedness to a case with ruggedness at the 75th percentile, the expected difference in the RRA measure is 0.059 (95% CI is [0.033,0.08]), a net support rate six percentage points higher. For comparison purposes, the same movement from
the median to the 75th percentile in the urbanization rate only increases net support rates by 1.7 percentage points.

Now, for a second analysis I will employ the lagged conflict variable as an indirect measure of rural threat capacity. Since the conflict variable changes over time, I can rely on panel fixed effects estimation to control for unobserved, time invariant heterogeneity in the sample. The inclusion of country fixed effects provides additional safeguards against omitted variable bias, which is likely to be salient for this measure. For the fixed effects model, the country-specific intercepts \( \alpha_i \) can now have an arbitrary dependence relationship with the observed covariates. The Table 2 reports the results, using clustered robust standard errors to account for arbitrary serial correlation within countries.

Table 2.2: Model 3, fixed effects with clustered SEs

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient (Std. Err.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>28.254 (22.251)</td>
</tr>
<tr>
<td>GDP pc</td>
<td>-1.06 \cdot 10^{-5} (6.88 \cdot 10^{-6})</td>
</tr>
<tr>
<td>Polity</td>
<td>0.002 (0.002)</td>
</tr>
<tr>
<td>Agri Value % GDP</td>
<td>-0.010** (0.003)</td>
</tr>
<tr>
<td>Food Exports</td>
<td>-0.001 (0.001)</td>
</tr>
<tr>
<td>Herfindahl</td>
<td>-1.132** (0.319)</td>
</tr>
<tr>
<td>Land</td>
<td>-2.07 \cdot 10^{-5} (1.64 \cdot 10^{-5})</td>
</tr>
<tr>
<td>Urbanization</td>
<td>0.009* (0.004)</td>
</tr>
<tr>
<td>Conflict_{t-1}</td>
<td>0.032* (0.014)</td>
</tr>
</tbody>
</table>

\[ \begin{align*}
\text{N} & : 1691 \\
\text{R}^2 & : 0.298 \\
\text{F} (7,65) & : 13.356 \\
\end{align*} \]

Significance levels: \( \dagger : 10\% \quad * : 5\% \quad ** : 1\% \)

For this alternative measure of the rural insurgency threat, again I find statistically significant results, even when controlling for a number of covariates and
country-level fixed effects. Again, the control variables perform as expected. The conflict measure indicates that a move from no prior conflict (0) to low levels of prior conflict (1) improves the support for the agricultural sector by approximately 3.2 percentage points (95% CI is [.004, 0.61]). Similar to the ruggedness measure, the implied magnitude of the effect is considerable and highlights the importance of rural collective action for determining urban bias.

2.4.2 Robustness checks

To ascertain the robustness of the initial findings, this section presents a series of auxiliary tests. First, for each of the models in Table 1 and 2 an inspection of the regression residuals shows no obvious problems with outliers. Second, all the above models rely on the full sample of available data. While the control variables refer to theories that apply to all political systems, the theory outlined in Section 3 applies more strongly in the context of weakly institutionalized polities. In the context of malleable formal institutions, informal channels of influence play an important role for the determination of policy. As the strength of formal institutions increases I expect the threat of urban and rural revolt to diminish, because political conflicts are mediated and expressed within the institutional confines of electoral politics. This implies the full sample should bias against finding an effect of ruggedness or prior conflict. As a robustness check I repeat the analysis focusing on a sub-sample of observations with GDP per capita in 2000 $ below $10,000. The OLS model for the ruggedness measure clearly confirms the prior result, while the random effects model now produces statistically insignificant results. For the fixed effects model the reduced sample leads to the same results as before (results available on request). Overall, the evidence supports the importance of the rural threat variable independent of the sample composition.

Third, as an additional check, I also re-estimated the models using the nominal
rate of assistance measure (NRA), which only measures the nominal support to agriculture, but has better coverage than the RRA variable, as an alternative dependent variable. All of the main results are robust to this change (results available on request).

Fourth, the above analysis focuses on domestic determinants of urban bias, partially ignoring the role international factors play. A growing literature in economic geography\textsuperscript{15} argues that increased trade openness can lead to magnified regional inequalities domestically, in turn affecting government policies about regional redistribution and support for the rural sector. The trade openness of a country might operate as an omitted variable, if it also correlates with the threat of a rural insurgency as measured by terrain ruggedness or prior conflict. To control for this possibility, I repeated the analyses in models 1-3 including a measure of trade openness\textsuperscript{16}. None of the findings with regard to the credibility of a rural threat change. In the models using the ruggedness measure, significance even increases. Trade openness itself is found to have either a positive or statistically insignificant effect on the relative rate of assistance to agriculture.

Last, while the classical fixed effects approach in Model 3 tries to correct for certain forms of endogeneity and I do control for a number of important covariates, it is unlikely that the results are estimates of clear causal effects. In particular, for the prior conflict variable reverse causality claims can be raised, since an extractive agricultural policy could create incentives for rural actors to engage in political violence. Furthermore, the theoretical model only relies on the threat of political violence, not necessarily actually realized forms. Both processes would violate the exogeneity assumption and cast doubt on the results. If exogeneity is truly violated according to the mechanism outlined above, one would expect a negative correlation

\textsuperscript{15} See for example Krugman (1991).

\textsuperscript{16} Exports plus imports as a percentage of GDP, taken from the Penn World Tables.
between the RRA measure and urbanization and the conflict variable respectively. Since across all models the effect was estimated likely to be positive, despite this potential bias, the results might actually understate the true magnitude.

To explore this issue further, Table 3 presents results of an IV panel fixed effects estimation with clustered standard errors that tries to circumvent the endogeneity problem of the conflict variable, by instrumenting with total population size. To work as a suitable instrument, population size has to be plausibly exogenous and be sufficiently strongly associated with the conflict variable. The first stage regression reports a positive and highly significant effect of population on the lagged conflict measure, while the Kleibergen-Paap rk Wald statistic of 8.93 is just below the rule-of-thumb threshold of 10, overall indicating that weak instrument bias is less of a concern (Stock et al., 2002). Furthermore, just-identified IV is median-unbiased and unlikely to suffer from weak-instrument bias (Angrist and Pischke, 2009). As to the exclusion restriction, it is at least not obvious how total population has a direct influence on the relative treatment of agriculture versus manufacturing, apart from its role in violent conflict. Using an instrumental variables approach is also theoretically satisfying, since the variation in past conflict explained by an instrument is likely to be a better indirect measure of the effectiveness of a rural threat.

Model 5 reports results of the panel IV estimation for the reduced sample respectively\(^ {17}\). The coefficient for the past conflict measure, as instrumented by population size, remains positive and statistically significant, increasing the overall confidence in the results. As expected, the estimated effect of prior conflict is considerably larger when using instrumental variables, confirming the suspicion that reverse causality effects are likely to lead to an under-appreciation of how conflict potential can influence agricultural policy.

\(^ {17}\) Results are similar for 2SLS and GMM estimation.
Table 2.3: Model 4, Panel IV with fixed effects and clustered SEs

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient (Std. Err.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP pc</td>
<td>$8.27 \cdot 10^{-3}$ (3.71 \cdot 10^{-5})</td>
</tr>
<tr>
<td>Polity</td>
<td>0.004 (0.004)</td>
</tr>
<tr>
<td>Agri Value %</td>
<td>-0.005 (0.003)</td>
</tr>
<tr>
<td>Food Exports</td>
<td>$7.82 \cdot 10^{-5}$ (0.002)</td>
</tr>
<tr>
<td>Herfindahl</td>
<td>-0.627** (0.228)</td>
</tr>
<tr>
<td>Land</td>
<td>$-2.12 \cdot 10^{-6}$ (7.39 \cdot 10^{-6})</td>
</tr>
<tr>
<td>Urbanization</td>
<td>0.005 (0.003)</td>
</tr>
<tr>
<td>Conflict$_{t-1}$</td>
<td>0.203* (0.102)</td>
</tr>
</tbody>
</table>

N 1136
R$^2$ 0.147
F (8,17) 17.14

Significance levels: †: 10%  *: 5%  **: 1%

As a last robustness check I employ a dynamic panel model, specifically the Arellano-Bond difference GMM estimator (Arellano and Bond, 1991), which uses the exogenous population instrument and lagged levels of endogenous variables as instruments$^{18}$. I use the first lag of both the conflict variable and the urbanization measure as instruments in addition to the population measure to address endogeneity concerns for both variables. I also apply a small sample adjustment, using $t$ instead of $z$ statistics. Table 4 reports the results.

In this specification too does the conflict variable imply higher levels or support for the agricultural sector. Across a number of measures and estimation approaches I find generally supportive evidence for one of the main intuitions of the model: the threat of rural collective action mitigates urban bias.

$^{18}$ The results are robust to including a simple lag of the dependent variable, but the presence of fixed effects with lags leads to biased coefficient estimates (Wawro, 2002).
Table 2.4: Model 5, Arellano-Bond GMM difference estimator

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>(Std. Err.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP pc</td>
<td>-5.91 \cdot 10^{-5}***</td>
<td>(3.57 \cdot 10^{-6})</td>
</tr>
<tr>
<td>Polity</td>
<td>0.007**</td>
<td>(0.002)</td>
</tr>
<tr>
<td>Agri Value %</td>
<td>0.002</td>
<td>(0.003)</td>
</tr>
<tr>
<td>Food Exports</td>
<td>-0.001</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Herfindahl</td>
<td>-0.878**</td>
<td>(0.091)</td>
</tr>
<tr>
<td>Land</td>
<td>-1.2 \cdot 10^{-5}</td>
<td>(8.56 \cdot 10^{-6})</td>
</tr>
<tr>
<td>Urbanization</td>
<td>0.049**</td>
<td>(0.003)</td>
</tr>
<tr>
<td>Conflict_{t-1}</td>
<td>0.022\dagger</td>
<td>(0.012)</td>
</tr>
</tbody>
</table>

\begin{align*}
\text{N} & = 1583 \\
\text{Log-likelihood} & = . \\
F_{(8,1575)} & = 74.065
\end{align*}

Significance levels: \dagger : 10\%  \ast : 5\%  ** : 1\%
2.5 Discussion

This paper outlines the existence of an important puzzle in the developing world. Many governments favor urban interests over rural development. Existing explanations focus on the political incentives of rulers to align themselves with powerful urban groups at the expense of rural residents. These explanations fail to account for the rich gradation of urban bias and cases of rural bias. I propose a simple model of political survival that integrates Bates' (1981) argument and extends it, by drawing on the literature on civil wars. Rulers have to balance the threat of urban and rural residents by choosing a level of urban bias that minimizes the chance of removal. The model suggests a novel hypothesis on the determinants of urban bias. I expect urban bias to decline in the credibility and effectiveness of a rural insurgency. This effect results from the dual threat urban and rural residents can pose to the survival of the government. A secondary result suggests a new interpretation for the positive link between urbanization and support for agriculture. While some researchers attribute this to reduced collective action problems in the countryside with a shrinking rural sector, my theory identifies a public goods effect in buying off the urban population.

The empirical analysis utilized new data on agricultural price distortions and allows me to control for a number of mechanisms suggested by the prior literature. I test one of the main implications of the model using two indirect measures of the credibility of a rural threat: terrain ruggedness and prior experience with conflict. For both measures I find supportive evidence that also indicates substantive relevance. The results are unchanged by a number of robustness checks, including varying sample sizes, model specifications and the use of instrumental variables to correct for possible endogeneity bias. Despite the observational character of the data and the natural weakness of causal claims given the empirical measures, the associational patterns in the data support the theoretical claims of the model and encourage
further empirical investigations. Future work should investigate alternative ways to measure urban bias and the credibility of a rural threat.

On a theoretical level the proposed model produces rich implications concerning regional redistribution and the differential provision of public goods, but also indicates interesting opportunities to extend the theoretical framework. In particular, additional inter-temporal concerns about urban migration and the supply of urban labor represent a potentially important addition, as does the heterogeneity of the periphery and the ability of the center to use divide-and-conquer strategies. Furthermore, the way in which rulers have to face varying geographic threats to their political survival also carries implications for the literature on democratization, in which in recent formulations the “elite” and the “poor” operate irrespective of geographic constraints (Acemoglu and Robinson, 2001a). A landed elite has a different set of opportunities to threaten democratic governments, compared to urban elites, implying different paths to institutional change.

The origins of urban bias are an important research question that deserves further study and has important linkages to questions of economic development. More widely though, accounting for the effect of political and economic geography on the distribution of preferences and allocation of power should improve our understanding of various important issues ranging from distributive struggles, political violence to questions of regime change and democratization.
3.1 Introduction

Government policies do not always create distributional impacts along binary urban rural divides. While the variation in support for the agricultural and rural versus the industrial and urban sector in many low and middle income countries features importantly in political conflicts, this simple divide conceals as much as it reveals. More often than not, crop-specific taxation and subsidies, regional transfers and investments in local public goods create more fine-grained topographies of distributional effects. Economic activity is highly spatially clustered, for geographic or climatological reasons and agglomeration economies (Krugman, 1991). Export taxation of major crops in Africa only really affects regions in which such cash crops are grown, making some regions more than others subject to “urban” or “rural” bias. The manipulation of prices has distinct sub-nationally varying effects depending on the structure and composition of regional economies. Indonesia’s main island Java is ideally suited for rice cultivation, allowing for up to three harvests per year, making
rice the dominant product in the agricultural sector and a main source of income for millions of households. While rice is cultivated across the archipelago, export crops like palm oil, coffee and tea are more dominant on the outer islands. Hence, levels of taxation and support specific to certain agricultural crops have dramatically different economic and political consequences on and off Java.

This sub-national topography of distributive effects through government policy takes a more explicit form in systems of regional transfers. A large number of federations and devolved unitary states utilize extensive systems of regional redistribution through the allocation of transfers through the federal or national-level government (Boadway and Shah, 2009). A substantial literature in political science, economics and public policy has analyzed the political conflicts and determinants underlying fiscal federalism and the geographic distribution of public funds (Bermendi, 2007; Berry et al., 2010; Borck and Owings, 2003; Dixit and Londregan, 1998a; Khemani, 2003; Treisman, 1996), but has so far overlooked the more general aspects of regional redistribution: Many government policies create an uneven topography of spatial redistribution, either through explicit and formal institutions (fiscal federalism) or the implicit allocation of public expenditures and the manipulation of prices. By moving from a binary distinction between urban and rural and measuring the degree of bias in resource transfers between sub-national regions, a rich pattern of empirical variation emerges that warrants a better understanding and carries important implications for the choice of political institutions (Boone, 2003).

I trace this distributive topography of government policy by reviewing historical patterns of agricultural policy in Suharto’s Indonesia. After climbing to power, General Suharto ushered in a distinctively pro-rural agricultural policy that had particularly beneficial consequences for rural Javanese rice producers. The strong focus on the economic well-being of farmers was at least partly driven by the prior success of the Indonesian Communist Party in organizing rural collective action be-
fore Suharto’s ascension to the Presidency. The effect of local rural collective action shapes important national-level policies because of their distinct sub-national impacts. The threat of rural collective action also played an important role throughout Suharto’s rule for the allocation of regional development grants. The transfer of resources to assuage separatist sentiment took center stage during the inception of a new system of regional transfers after the fall of Suharto. Regions economically exploited and politically suppressed in the Suharto era, gained new bargaining leverage after democratization. In particular, the regions of Aceh and Papua were able to issue credible threats to the Jakarta government and secure important fiscal commitments for the foreseeable future, while East Timor, after a violent struggle, successfully seceded.

I argue that one important factor driving these explicit and implicit forms of regional bias is the ability to threaten collective action against the center. The threat of violence empowers regions in a bargaining situation with the national-level government, which, under the right conditions, prefers to increase transfers instead of committing resources to squash regional opposition and endure tax evasion. I extend the formal model in Chapter 2 to a conflict between the center and N peripheral regions to generalize the main intuition of the model and derive predictions about the level of regional bias. If there is no strategic interdependence between regions, the local ability to threaten collective action and shield resources from central government access, unequivocally reduces taxation. Appeasement can be a rational strategy and increase resource transfers to peripheral regions (Treisman, 1999, 2004).

Apart from the qualitative evidence from agricultural and regional transfer policy in Indonesia, I draw on original district-level data from Indonesia from 2001 to 2007. Using detailed data on local agricultural production and national-level pricing policies, I develop a measure of how strongly national-level policy affects local incomes in agriculture. I show that this measure is related the the potential costs of central
government enforcement and the ability to threaten collective action. In a second step, I use data on standard fiscal transfers to show that the political threat of collective action affects transfer levels above and beyond factors that are enshrined in the fiscal transfer formula. Overall, this paper contributes to the literature in several important ways: It highlights the existence of an important puzzle - the topography of distributive transfers, that requires better understanding. It provides evidence that important dimensions of this topography in Indonesia are affected by the ability of rural collective action and the cost of central government enforcement. It provides a formalization of the argument by generalizing the model of political survival from Chapter 2, and it uses novel quantitative data to test the core prediction.

The paper proceeds as follows. Section 3.2 reviews the history of agricultural policy and regional transfers in Indonesia, identifying local collective action as an important variable. Section 3.3 formalizes the main argument. Section 3.4 uses new quantitative data and tests the main hypothesis. Section 3.5 concludes.

3.2 The Regional Topography of Distributive Policies in Indonesia

To better understand the political determinants of the geography of distributive flows I will briefly review two important policy arenas in Indonesia’s recent history. Indonesia is a useful case to analyze sub-national conflicts due to its size and heterogeneity in terms of geography, social and cultural factors and economic make-up. Understanding how political forces have shaped crucial policies with regard to regional resource transfers sheds light not only on major conflicts in Indonesian politics, but also bears important implications for the process of economic development. Specifically, I will focus on the implicit effects of agricultural policy and the explicit effects of fiscal transfers to sub-national units. In both areas distributive conflicts over policy have generated regional conflict dynamics that illustrate the constraints central government elites face when deciding over core policies.
3.2.1 The Implicit Effects of Agricultural Policy

Indonesia’s experience with agricultural policy bears instructive lessons for understanding the political geography of distributive conflicts. When evaluating the overall historical pattern, two main themes emerge: The predominance of rice and the comparatively strong support for agriculture. Rice not only is the main food staple and agricultural product in Indonesia, but also occupies the minds of leading politicians, bureaucrats and the public. The idea of self-sufficiency and stable (above low world market) prices is a recurring topic in the Indonesian agricultural policy.

After Suharto took over the Presidency in 1967, Indonesia went through a period of largely sustained growth. With an average growth rate of over 6% from the 1960s to 2005, the Indonesian economy witnessed a dramatic expansion despite the Asian financial crisis in 1997. In 1965 over half of GDP was produced by the agricultural sector (Fane and Warr, 2008), by 2010 that share had dropped to around 14 percent. Despite this decline, the Indonesian agricultural sector remains of immense importance for the labor market. Despite the reduced share in the overall economy, over half of the labor force remains employed in the agricultural sector. Importantly, agriculture has served as an important stabilizer during crisis times, absorbing large numbers of unemployed urbanites. The main agricultural crops produced in Indonesia are rice, maize, fruits and vegetables, rubber, sugarcane, palm oil, coconut, coffee and tea (Fane and Warr, 2008). Rice, as the dominant crop with a 30% share of production in 2000, has been for most years an import-competing crop, having made rice self-sufficiency one of the most prominent self-declared policy goals for the Indonesian government.

After independence in 1949, before Suharto took office, the post-colonial government of President Soekarno pursued a socialist, inward-looking and government intervention focused policy regime (Hill, 1996). The resulting economic turmoil and
rapid inflation established the background for the move on the Presidency by General Suharto. After seizing power, he introduced liberalization and macroeconomic stabilization reforms. Contrasting the overall move to free-market reforms, trade policies were characterized by export taxation for unprocessed agricultural goods and import protection. Fueled by the oil and commodity booms of the early 1970s, the Suharto government intensified the pursuit of rice self-sufficiency, but also engaged in import-substitution manufacturing and the associated trade protection. The decline in oil revenues in the 1980s forced the government to reduce expenditures and open up the domestic economy.

Generally, and similar to most other economies, import-competing crops have received mostly favorable treatment throughout the 20th century, while export crops were used as sources of revenue. The most consequential agricultural policies have been instituted with regard to rice. During colonial times in the 1930s the Dutch government instituted increased control over the rice market after a period of largely free trade (Timmer, 1981). By creating institutional mechanisms for the manipulation of rice prices the colonial administration set an important precedent that elevated the importance of rice prices to a national issue. The turbulent times of the Sukarno era were succeeded by the strict planning and control approach under Suharto. President Suharto created the powerful food logistic agency Bulog (Badan Urusan Logistik), entitled to a monopoly over rice imports and exports and shouldered with the task of stabilizing domestic prices and production levels through the use of price floors and buffer stocks, operating under his direct supervision (Liddle, 1987). Bulog became an important actor in the formulation and implementation of rice policy, with a strong bureaucratic self-interest created by the need to finance its operations without general budget allocations. The first New Order Five-Year development plan highlighted strongly the importance of rice production for the overall wellbeing of the economy (Timmer, 1981, p.38). Throughout the 1970s the government pursued
self-sufficiency in rice by subsidizing the use of new, high-yield rice varieties, while fin-
ancing the increased use of fertilizer and pesticides. The government also undertook
important investments into irrigation systems. The Bimas program offered farmers
subsidized access to credit, agricultural extension services, fertilizer, seeds and other
production inputs. Together, these measures drastically improved rice yields and
overall production, culminating in rice self-sufficiency for the first time in 1985 and
made an important contribution to Indonesia’s overall development success (Booth,
1989; Henley, 2012; Pearson et al., 1991). These positive effects largely applied to
the rice sector only and were concentrated on the Javanese heartland, due to the eco-
nomic geography of Indonesian rice production (Hill, 1989). Contrasting to rice, the
only cash crop sector with economic dynamism over the same period has been palm
oil production (Hill, 1996, p.124) while other, especially smallholder cash crops have
largely stagnated. The strong government support for rice producers has generally
hurt the interests of consumers (McCulloch, 2008).

Figure 3.1 depicts the historical trends in support for agriculture in Indonesia,
based on data from a World Bank project on price distortions in agriculture (An-
derson, 2009). The graph shows the nominal rate of assistance to agriculture (NRA)
and the relative rate of assistance (RRA). The nominal rate of assistance is defined
as the percentage by which government policies have raised gross returns to farmers
above what they would have been without the government’s intervention. Positive
values indicate net support, negative values net taxation. The measure is a trade-
weighted average for the major crops in each country-year. The nominal rate of
assistance is estimated by comparing local prices to world market prices, accounting
for transportation and other costs, attributing the remaining difference to govern-
ment intervention. The RRA measure expresses the support for agriculture relative

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to the support for non-agricultural goods\(^1\).

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**Figure 3.1**: Historical Trends in Indonesia’s Support for Agriculture (NRA and RRA)

The first important observation relates to the strong correlation between the NRA and RRA measure, i.e. an increase in the nominal support usually also implies an increase in the relative support for agriculture. For Indonesia, the graph shows fairly supportive policy throughout the 1970s and 80s which is consistent with the existing accounts of Indonesian agricultural policy (Fane and Warr, 2008; Simatupang and Timmer, 2008). Over this time period the average nominal rate of support for rice was 0.03, implying a three percentage point increase in rice farmer incomes. Maize, soybean and sugar received equally positive average support. In comparison, the

\(^1\) Formally, the RRA measure is defined as \( RRA = 100\left(\frac{1 + NRA_{ag}/100}{1 + NRA_{nonag}/100}\right) - 1 \).
nominal rate of assistance for crops common on the outer islands was much lower. The NRA for coffee was $-0.024, -0.018$ for palm oil, $-0.004$ for rubber, and $-0.057$ for tea, documenting the bias in favor of certain crops and regions in Indonesia’s agricultural pricing policy. Fueled by oil and mineral wealth revenue, the Indonesian government supported rice prices, subsidized important production inputs (e.g. fertilizer) and massively invested in irrigation infrastructure, creating a dynamic and increasingly productive agricultural sector that fed into the overall growth success of the economy. By the end of the 1990s though, government support waned and investments in rural infrastructure dwindled, making the 1990s a period with lower support for the rural sector. This turn away from rural support was only ended with the fall of Suharto and the introduction of competitive elections, which increased pressure to cater to the rural vote. Currently, all major parties firmly support price subsidies for rice farmers.

Importantly, the strong emphasis of rice and the comparatively supportive policies, especially in the 1970s, were of immense importance for rice farmers in Java and Bali, but much less so for agricultural producers elsewhere. Since the majority of rice production is located on Java, while small-holder and plantation cash crops are largely produced on the outer islands, the beneficial distributive effect of agricultural policy was similarly concentrated (Akiyama and Larson, 2004; Hill, 1989). What explains the New Order regime’s commitment to rural Javanese rice farmers, at the expense of manufacturing and other agricultural interests? While many factors played a role in shaping Indonesia’s policy trajectory, the specific origin of the Suharto regime reveals an important determinant.

The early period of post-independence Indonesia was characterized by tumultuous struggles (Feith, 1962). The first free elections in 1955 revealed deep fissures among the political elites over the fundamental basis of the Indonesian state. While
radical Muslim organizations advocated an Islamic state and regionalist sentiments against centralization fanned the flames of unrest, President Sukarno’s Nationalist faction prevailed and established a system of “Guided Democracy” in 1959, dissolving the national parliament in 1960 and restricting political parties. During the years of Guided Democracy, President Sukarno tried to maintain his independence from the military by developing closer relations with the Indonesian Communist Party (PKI). In the 1960s the PKI became an important political force with strong popular support, due to its proposal of land reform and redistribution. On September 30th 1965, the tension underlying Sukarno’s ruling coalition eventually culminated in the kidnapping and killing of six generals. The kidnappers also seized control of the national radio station and communicated their allegiance to President Sukarno, justifying the killings as an attempt to avert a coup by right-wing military officers. In the morning of October 1st, General Suharto took control of the army and started a counterattack against the kidnappers. Within a day he captured or forced to flee all of the members of the September 30th movement. He quickly linked the coup attempt to the PKI and used the opportunity to put President Sukarno under protective custody. He immediately banned the PKI as an organization and used the military forces and civilian militia groups to purge Indonesia from the PKI. He supplanted old farmer’s organizations with a regime-led puppet organization (HKTI), that hampered the emergence of strong collective action by farmers (Aspinall, 2002). The resulting violence is estimated to have led to the killing of Hundreds of thousands of people, mainly in Central and East Java and Bali (Roosa, 2006). Suharto replaced military officers sympathetic to the Communists with close allies and took full control of the presidency in 1967. His “New Order” regime rested on several pillars of control. First, the ideology of Pancasila established a firm nationalistic state ideology. Second, he relied strongly on the extensive power of the Presidency and established control over Parliament by curtailing political opposition to two
parties. He further centralized the government bureaucracy, relying heavily on the military and his ruling party Golkar to penetrate Indonesian society. Last, he elevated economic development as a main goal of the regime, laying the foundation for market-friendly macroeconomic policies and heavy investments in the agricultural sector. Suharto’s bloody ascent to power is of importance to his later development policies precisely because he identified as his main political enemy during transition to Indonesian Communist Party. Firmly established in the Javanese countryside, the PKI and its associated farmer’s organization BTI was actively organizing rural support and threatening the long-run survival chances of the nationalistic government in Jakarta (Aspinall, 2002). Using the failed coup attempt as a pretext, he was able to use military force and the support of local Muslim organizations to implement a violent and systematic purge of opposing elements in the countryside. Despite his show of force, the quick consolidation of power and expansion of the central government’s reach over the following decades, Suharto immediately espoused the idea of developing Indonesia’s economy and in particular the rural sector as a core requirement to his regime’s enduring survival. His own childhood in rural Java made him sympathetic to the needs of the rural sector (Elson, 2001), but the long-term commitment to rural development was at least partially driven by a political calculus that located an important source of support in the Javanese countryside. Furthermore, while important elements of macroeconomic policy formulation was dominated by technocratic advisers, agricultural policy was under firm political control by so-called technologists, favoring import substitution and popular expenditure programs, stabilizing regime support (Amelina, 2004).

3.2.2 Separatism and Explicit Regional Redistribution

The distinct subnational effects of national agricultural policy illustrate the implicit distributive topography of Indonesia. A similar pattern emerges when analyzing
explicit systems of regional fiscal transfers. Indonesia, given its vast size and geographic, economic and ethnic diversity has an established history of regional identity and experience with government decentralization. The post-independence constitution of 1945 established the Republic of Indonesia as a unitary state, but provided for regional autonomy, while the remainder of the Dutch colony was grouped into a series of Republics that were briefly joined as a federal state within the Dutch Commonwealth. The 1950 constitution re-instated the unitary state. Despite the creation of new provinces to assuage regional resentment, the central government was heavily criticized by regional elites, especially over the lack of fiscal resources (Feith, 1962). In 1956/57 an attempt to re-kindle regional autonomy was unsuccessful (Legge, 1961). A committee led by M. Nasroen, a bureaucrat in the Department of Interior, prepared a report on a potential fiscal transfer system that combined elements of local finance with revenue sharing by the central government. Many elements of the proposal were implemented into law in 1956, combined with reforms of the regional parliaments and heads, but lagged in implementation (Booth, 2011). President Sukarno reverted to the 1945 constitution in 1949, following the outbreak of regional unrests in West Java, Sumatra and Sulawesi, essentially halting any increased regional autonomy. The struggle for regional autonomy during the years of “Guided Democracy” in the 1950s though established an important result. Although regional rebellions in the outlying provinces failed and the central government military established supremacy across Indonesia, regional elites realized an opportunity to strike a bargain with the military. The increase in smuggling under the purvey of the military and informal agreements over rent sharing between locals and military officials essentially curtailed the centers ability to enforce resource transfers to the central government (Mackie, 1980).

For the time of Suharto’s Presidency from 1967 to 1998, the territorial make-up
of Indonesia remained largely stable. Despite the creation of some new provinces and
districts over the years, Suharto’s Indonesia was a staunchly unitary and centralized
state (Crouch, 2010, p.88). Although the layered structure of central, provincial,
district, sub-district and village government and the existence of local representa-
tive bodies was sustained throughout Suharto’s rule (“New Order”), major political
decisions were made in the center and implemented by powerful central bureaucra-
cies, with local representatives under tight control by elites in Jakarta, with overall
strongly limited political accountability (Aspinall and Fealy, 2003; Aspinall and Mi-
etzner, 2010). Suharto greatly increased the control over the military and outlying
regions, using his political vehicle *Golkar* to penetrate the periphery to the village
level. During Suharto’s rule, the central government used earmarked grants to cover
local expenditures. The *subsidi daerah otonom* (subsidy for autonomous region) was
used to pay civil servant salaries and most of the routine expenditures. Importantly,
accompanying the centralization of Indonesia, President Suharto used the so called
INPRES block grants (*instruksi presiden*) for development projects to increase re-
source transfers to the periphery. Initially these funds were used for labor-intensive
construction projects to address problems of rural unemployment. The increase in
oil revenues allowed Suharto to expand the INPRES program, massively investing
in the construction of schools across Indonesia (Duflo, 2001) and public health cen-
ters. After a period of cutbacks, following falling oil prices, INPRES expenditures
rose again during the fifth five-year plan from 1989 to 1994, favoring especially non-
Javanese provinces.

While provincial and district governments existed and formally elections took
place, all candidates were vetted and approved by the central Ministry of Home Af-
fairs, leaving no room for local discretion or democratic accountability. After the
fall of President Suharto’s New Order regime in 1998, Indonesia embarked on a
dual project of democratization and decentralization, termed *reformasi*. Apart from
free and fair multi-party elections at the national level, one of the main demands in the wake of the fall of the New Order was increased regional autonomy (fiscal and political), especially for resource-rich regions, as well as improved local accountability (Crouch, 2010; Bünte, 2009). This “big bang” decentralization dramatically shifted policy authority to the local level and instituted and institutionalized a large-scale system of fiscal transfers.

The fall of Suharto suddenly opened the political space and allowed separatist sentiments to flare up and be openly voiced. In particular, demands for independence from Aceh and East Timor and the resentment of resource-rich regions over decades of resource exploitation created a political challenge for the interim President Habibie (Booth, 2003). At breakneck pace the cabinet ordered the drafting of a decentralization proposal. The resulting two laws of the Habibie presidency (1998-99), Law 22/1999 and Law 25/1999, outline in broad brushes the main thrust of decentralization reform: relocate main government responsibilities to the district level, paired with a system of revenue-sharing and regional redistribution (Hofman and Kaiser, 2002; World Bank, 2003). In 1999 citizens elected representatives to national, provincial and district parliaments. Starting in 2001 local legislatures had the right to authorize the budget and vote on local laws and regulations. The share of regional expenditures of total government expenditures rose from 17 percent to over 30 percent in 2001 and 2002 and over 2 million civil servants, nearly two thirds of the central government bureaucracy, were transferred to the regions (World Bank, 2003).

On the financial side, the decentralization laws establish an extensive system of transfers through Law 25 in 1999 and Law 34 in 2000. After 2001, district government activity is financed largely through shared revenue allocations and block-grants (DAU) by the central government. Regions rich in natural resources get special allocations to reflect the above-average contribution in revenue creation. Local govern-
ments also receive ear-marked grants for special development projects (DAK). Over 90 percent of local revenues comes from these three sources, while local taxation authority remains fairly limited (Lewis, 2003, 2005). The DAU block grant is the main source of revenue and has to constitute at least 25% of total central government expenditures. 90% of the DAU funds is channeled to the districts and only 10% to provinces, reflecting the leapfrogging approach that empowers districts over provinces. District DAU allocations are calculated based on a formula that considers district needs and “economic potential” (World Bank, 2003, p.27). The formula considers population size, the poverty rate, land area, a local price index and district wealth. The formula also proscribes a base amount to be allocated. Importantly, the specifics of the formula have changed every year and allocations are subject to intense political struggles. The special allocation funds (DAK) are small in size (about 5% of revenue) and are allocated to fill specific development needs. The shared revenue component has particular importance for district rich in natural resources. The shared revenue allocation transfers back parts of locally generated revenue in the oil and gas sector as well as personal income tax. The central government still engages in regional development expenditure, complementing district and provincial efforts, but is characterized by strong spatial variation (Lewis and Chakeri, 2004).

To present a clearer picture of the sub-national variation in fiscal transfers Figures 3.2 and 3.3 show local government revenue and revenue per capita in 2001. Figure 3.2 shows for each district whether total real government revenue falls in the 0 to 25th, 25th to 50th, 50th to 75th or 75th to 100th percentile. Figure 3.3 takes the same measure and divides by the local population in 2001. There exist dramatic differences in the amount of resources districts receive from the central government. Obviously, some of these differences are due to the varying tax contributions, but an immediate question emerges with regard to the effect of political struggles prominent in the DAU/DAK formula negotiations. Figure 3.2 identifies districts in Aceh,
South Sumatra, on Java, Kalimantan and Eastern Papua as main beneficiaries, but a closer look at the per capita allocations in Figure 3.3 shows a stronger bias toward the outer islands. In particular, Aceh, Riau, Kalimantan and all of Papua receive dramatically higher fiscal transfers than districts on Java, the main economic center of Indonesia with over 50% of the population and total GDP.

Figure 3.2: Local Government Revenue 2001, colors signify quantiles, from lightest (0-25th percentile) to darkest (75th to 100th percentile)
Figure 3.3: Local Government Revenue per capita 2001, colors signify quantiles, from lightest (0-25th percentile) to darkest (75th to 100th percentile)
Interestingly, during the negotiations for decentralization and regional autonomy, the provinces of Aceh and Papua were able to secure a commitment to additional special autonomy funds (SAF), on top of the DAU/DAK and revenue sharing transfers. These special autonomy funds provide additional revenue for 20 years starting in 2008. The SAF by law receives a budget allocation of 2 percent of the total national DAU allocations for 15 years and one percent for five years. The funds are intended for investment and maintenance of infrastructure, poverty eradication and the financing of education, health care and increasing government capacity. The law creating the SAF also requires an additional top-up through increased natural resource revenue sharing. The SAF is allocated to the provincial government with 40% of funds under discretionary authority and 60% allocated by a weighted formula to local districts. In 2008 the province of Aceh received additional funds of Rp 3.59 trillion in SAF and Rp 1.3 trillion in increased revenue sharing, boosting revenues by approximately 40% (World Bank, 2008)!

The eastern province of Papua, the largest in Indonesia, is a ethnically diverse island with large amounts of natural resources. Only officially integrated into the Republic of Indonesia in 1969, it has had a long history of separatist violence and resistance to Indonesian rule. Similar to the province of Aceh, Papua received special autonomy status above and beyond the standard decentralization reforms. Law 21/2001 and 22/2001 establish the basic elements of Papua’s regional autonomy, providing special political rights and the allocation of revenue from the Special Autonomy Fund (SAF), additional natural resource revenue sharing and ad-hoc infrastructure investments. Already before decentralization and the special autonomy status, Papua received large central government transfers (World Bank, 2005) through standard earmarked grants, INPRES allocations and shares of tax revenues from natural resources. After decentralization, Papua’s transfers increased even further, effectively doubling real per capita revenues between 1996 and 2002 (World Bank,
In 2003 the Special Autonomy Funds made up more than 50% of the total provincial revenue and between seven and 23 percent of district revenue. While overall the beneficiary of large transfers, there is an immense amount of sub-provincial variation, the richest district receiving nearly five times as much revenue as the poorest.

To better understand the importance of the special autonomy status, with all its monetary implications, Aceh and Papua received after the fall of Suharto, a brief historical review of these two regionalist conflicts is warranted. Similar to Papua, the province of East Timor has had a comparable history of late integration with the associated struggles with the central government, that did not end in a bargaining compromise, but eventually secession. As a former Portuguese colony East Timor’s conflict for the post-independence direction began in 1974. While socialist and conservative groups fought for predominance, already in 1974 Indonesia started interference against an independent East Timor through operation “Komodo”. Indonesia’s military signaled to the East Timorese conservative leadership the possibility of independence if anti-communism were to persevere. Staging a coup the conservative UDT (Democratic Union of Timorese) briefly took office, only to be ousted by the left-wing military groups. Indonesia forced the fleeing UDT leadership to sign an appeal of integration into Indonesia, used by Suharto to justify the invasion of East Timor in 1975. While the Indonesian military quickly established hold over the capital Dili, it became ensnared in a vicious and drawn out military campaign. The Timorese forces enjoyed the advantage of difficult territory and the support of the local population. The Indonesian military engaged in a brutal campaign of violence, committing human rights violations on a large scale, displacing many and killing tens of thousands of civilians. This military campaign was not able to root out Timorese resistance and had to be extended well into the 1980s. While at the same time investing in government infrastructure and in particular improving the road network,
East Timor’s economy became dominated by the central government military. For example, the military gained a monopoly for the commercial coffee trade, forcing local farmers to sell coffee at low prices, enforcing net taxation in the local agricultural sector. The province also depended heavily on central government transfers in the form of INPRES grants for government expenditures. In the mid-1980s central government transfers to East Timor were considerably higher than transfers to provinces in Java or even Papua (Soesastro, 1989, p.219). Initially tight restrictions on travel for Timorese were lifted in the late 1980s and was followed by a reduction in military violence. In 1991 a shooting of peaceful protesters by the military was captured on camera and led to increased international scrutiny of human rights violations in East Timor, further curtailing the power of the military. The fall of Suharto and the Asian financial crisis provided the necessary exogenous shock to empower the East Timorese independence movement. The Indonesian military was severely weakened in its ability to suppress regionalist independence movement and President Habibie offered a wide-ranging special autonomy deal in 1998. Following more demonstrations, in 1999 President Habibie offered a referendum on independence, to be monitored by the UN. At the same time the Indonesian military tried to undermine these political efforts by arming pro-integration militias and threatening violence. After the rejection of the special autonomy offer by the East Timorese in the referendum, pro-integration militias engaged in wide-spread violence, which only subsided in anticipation of the arrival of UN peacekeepers. In the end, East Timor’s independence was implemented in 1999.

The province of Papua (named Irian Jaya in 1973) shares an equally late integration with Indonesia as East Timor, but was a Dutch East Indies colony. The Dutch West New Guinea territory was ceded to Indonesia in 1963 and followed by a plebiscite on integration in 1969. In the years prior to the election, the Indonesian military banned political parties and plundered the province, ensuring a favorable
pro-integration vote in the 1969 plebiscite. The accession to Indonesia was perceived as illegitimate and led Papuans to organize a guerilla movement (OPM Free Papua Movement). Retreating to the jungle and across the border to Papua New Guinea, the movement spread despite its poor organization and lack of military power. The Indonesian military swiftly reacted with brutal repression, but was not able to root out resistance. After 1969 the central government combined the military campaign with a policy of trans-migration. In the 1980s the OPM implemented small-scale hit-and-run attacks from across the border in Papua New Guinea, while the Indonesian military continued its practice of political repression, torture and killings. The OPM was never able to issue a strong challenge to the central government, but remained active through several decades and required the commitment of significant military resources by Jakarta to control the province of Papua (Bertrand, 2004). The discovery of minerals in the province led to a resource boom that produced large economic rents for foreign investors and the central government. Large tax revenues were only partially funneled back to the province through fiscal transfers while spending did not target indigenous Papuans. Nearly 70% of the development budget in the 1990s was devoted to administrative expenditures, 10% to roads and 8% to transmigration. Small-scale agricultural development programs did target recent migrants and bypassed locals. Again, the fall of Suharto shifted the balance of power by putting firm constraints on the ability of the military to suppress regionalist conflict. President Habibie authorized a fact-finding mission on Papuan grievances and lifted the special status of a military operations zone. In a meeting between President Habibie and Papuan leaders in 1999, clear calls for independence were rejected and followed by a return to a more repressive strategy. Under the Wahid Presidency political dialogue opened up again. While the Jakarta elite was still reeling from the loss of East Timor, Papuan regionalist formalized and consolidated their movement into the Papuan People's Congress, while the OPM continued their strategy of hit-
and-run attacks. While the Wahid Presidency continued the difficult negotiations, local authorities pursued a more repressive strategy, engaging in arrests and killings. Codifying is general decentralization law in 1999, the Jakarta parliament passed a special autonomy law for Papua in 2001, while maintaining a strong stand against formal independence. Given the increased difficulty of the central government ignoring separatist demands, combined with the reduced capacity of the Indonesian military to engage in violent repression after democratization, Papuan demands had to be addressed. By opting for the special autonomy status, the Jakarta government attempted to preserve territorial integrity and avoid a costly military campaign by offering strong financial incentives and increased political autonomy.

In contrast to East Timor and Papua, the province of Aceh shares an important historical experience with the rest of Indonesia, having played an important role in the independence struggle against the Dutch. With a history of regional importance and strong Islamic identity, Aceh joined the Indonesian Republic committed to the idea of the Indonesian nation, but with a distinct regional independence. The first instance of opposition to the central government occurred when the national leadership in Jakarta opted for a unitary structure and rejected Islam as the foundation of the state. Acehnese leaders started an open rebellion in 1953, but were met by military resolve by the center. In 1956 the central government re-instituted Aceh’s provincial status as a form of appeasement and agreed to a cease-fire in 1957. While not attaining the right to an Islamic state, Jakarta ceded a special autonomy status. This special compromise though was quickly rendered obsolete after the rise of Suharto. The general centralization of power in Jakarta and increased power of the military put stronger constraints on Aceh’s autonomy and rolled-back even minor attempts to use Islamic law. The discovery of large natural liquefied gas reserves in Aceh marked the beginning of a natural resource boom, whose economic rents accrued largely to the central government and foreign investors (Aspinall, 2009). The provincial gov-
ernment had little ability of taxation on its own and received only a small fraction of the natural gas revenues transferred to the central government. The natural resource boom brought little economic prosperity to the local population, which remained active in the agricultural sector, while outside workers were employed in the small industrial zones. In 1976 the Free Aceh Movement was founded (GAM), opposing the exploitation of Aceh’s natural resources and the tight military control of the province. While initially weak, with only a few hundred active members, in the late 1980s GAM experienced a surge in support. Importantly, the GAM movement could rely on an inhospitable and hard to access terrain (Aspinall, 2009, p.65). A decrepit road network and the absence of bridges over major water ways severely hindered the militaries access and offered the guerilla fighters ample safe havens. In 1989-90 a renewed wave of attacks signaled the resurgence of GAM. The Indonesian military responded with disproportional troop commitments and violence. A campaign of brutal repression, counter-insurgency and human rights abuses is estimated to have led to the killing of 2,000 people between 1989 and 1991 alone. The military success of the response was followed up with continued presence of the security forces and a strategy of intimidation. As with East Timor and Papua, the fall of Suharto quickly led to increased political demands for independence and GAM resumed its military operations. Habibie ordered the lifting of the status of the military operations zone, the umbrella under which the worst human rights abuses were committed. During the withdrawal of troops riots broke out, the Indonesian military commander Wiranto deployed new, outside units to secure essential oil and gas infrastructure. 1999 was characterized by escalating violence between GAM forces and the national military (ABRI). Violence continued throughout the Habibie and Wahid Presidencies. While attempts to find a political solution were made, the military was able to engage in nearly unconstrained violence, effectively undermining the chances of compromise. Only the devastation brought on by the 2004 Tsunami led to the eventual peace
agreement in 2005, after the death of approximately 12,000 to 20,000 people during the total duration of the conflict from 1976 to 2004 (Aspinall, 2009). The Helsinki peace accord of 2005 concluded in the signing of the Memorandum of Understanding, trading the disarmament of GAM for the withdrawal of government troops and the Law on Governing Aceh (Crouch, 2010, p.303). Aceh was to remain a province of Indonesia, but acquire special autonomy status, including the right to local political parties and access to greater fiscal transfers (Barron and Clark, 2006).

The increased threat of regional collective action against the central government, paired with the reduced ability of the Indonesian military to project its power across the archipelago, led to an important re-arrangement in the distributive topography of the Indonesian fiscal system. While during Suharto’s era resources were largely extracted from the outlying provinces and channeled to beneficiaries in the center, the period after the fall of Suharto witnessed a reversal of that pattern. Central elites were well aware of the increased bargaining power of regional actors and had to offer an improved fiscal bargain to maintain the integrity of the territory. For example, in 1998 deputy parliamentary speaker Abdul Gafur went on record as saying that the best strategy for avoiding separatism in the provinces had to involve increased local autonomy and fiscal resources (van Klinken, 2007, p.45).

3.3 A Model with $N$ Peripheries

The discussion of explicit and implicit distributive policy implications at the sub-national level in Indonesia highlights several important points. First, government policies formulated at the central level carry enormous implications for redistribution of economic resources between sub-national units. The impacts of agricultural policy and the new system of fiscal transfers have had and still have dramatic consequences for growth, inequality and poverty across Indonesia. Second, while certainly some of the sub-national distributive effects of explicit and implicit policies are unin-
tended, the Indonesian experience suggests that in particular regions actors are well aware of the economic and political consequences of decisions made by elites in the center. Third, irrespective of the degree of formalization of distributive transfers, non-institutional threats play an important role for the bargaining between the center and the peripheral regions.

The notion that the exploitation of the rural periphery, as expressed in agricultural taxation and lower public goods provisions, applies only to certain, but not all, peripheral regions has not gone completely unobserved. In a study of the Argentinean countryside, Sawers (1996) argues that while the peripheral region of the Argentinian interior were able to leverage the threat of violence to obtain important subsidies, the fertile Pampas had to endure export taxes on grain and beef, providing important government revenue. Similarly, Bates and Block (2010) point out important unexplained variation in the sub-national impacts of African agricultural policy. When it comes to explicit transfer arrangements, the literature on fiscal federalism (Boadway and Shah, 2009) has established important empirical determinants of fiscal flows, largely driven by institutional arrangements and party system configurations (Gervasoni, 2010; Porto and Sanguinetti, 2001; Rodden, 2002). Building on the qualitative examples above, this section will explicate in more detail a formalization of the basic intuition - that the credible threat of peripheral collective action and the associated costs of central government enforcement increases the bargaining power of the periphery.

The simple model of one center and one periphery from Chapter 2 can be used to derive predictions about the level of urban bias in redistributive policies at the aggregate level. Importantly though, since the political geography of distributive conflicts goes beyond urban-rural differences, the model can easily be extended to divide the territory of a state in a capital region and multiple peripheries, each of which engages in a struggle for resources and public goods provisions with the cen-
central government. In this model, distributive transfers to the regions are motivated by the interest in political survival by the center and the credibility of the rural threat. While the existing literature on fiscal transfers largely focuses on electoral politics, ignoring non-institutional threats, work on separatism and regionalist violence has already identified the potential power of collective action in the periphery. Walter (2006a; 2006b) argues that the central government has a strong incentive to build a reputation for toughness against separatism. Giving in to separatist demands in the present can weaken future bargaining with other regional groups. She shows empirically that ethnic groups strategically decide whether to challenge the central government, based on prior concessions, and central governments are less likely to offer a compromise if future challenges are likely. Clearly, there is a reputational cost attached to appeasement strategies, but Treisman (1999) shows that in bargaining over fiscal resources, decentralization empowers regional actors and increases the level of transfers necessary to avoid regional revolts. Appeasement can be rational if the central government faces multiple opponents and a resource constraint (Treisman, 2004). Buying off the support of some threats can be a necessary cost the central government elites have to incur to ensure their political survival. In a study of fiscal transfers in Russia (Treisman, 1996), it is exactly variables that measure the credibility of a separatist threat that play an important role in determining provincial fiscal flows. Empirical work on violence and civil wars has highlighted the importance of remoteness for the duration of conflicts (Buhag and Rod, 2006; Buhag et al., 2009; Fearon and Laitin, 2003) and identified targeted fiscal largesse as a potential way to buy-off violence entrepreneurs (Fjelde, 2009; Wibbels and Bakke, 2006). Extending the model from Chapter 2 provides a simple formalization of the intuitive argument and is similar to models of decentralization that use self-interested political actors (Treisman, 1999).
As in Chapter 2, assume a government \( G \) in power, seated in the central region \( C \). Now, instead of one periphery \( P \) there are \( N \) peripheral regions \( P_i \) with \( i = 1, 2, \ldots, N \). Each region \( P_i \) produces wealth \( \theta_i \), the government still receives non-tax revenue \( \gamma \) and the center region produces \( 1 - \gamma - \sum_{i=1}^{N} \theta_i \). A share \( s_0 \) of the population resides in the center and in each \( P_i \) resides a share \( s_i \) of the total population, with \( \sum_{i=0}^{N} s_i = 1 \). The government \( G \) can now levy region-specific tax rates \( \tau^p_i \) and \( \tau^c \), as well as provide region-specific amounts of public goods \( \eta^p_i \) and \( \eta^c \). As before, in each region \( P_i \) the representative citizen can decide to revolt at cost \( s_i \beta \) and shield \( \mu_i \) of the local income from taxation. The action space of the center population remains unchanged. \( G \) at the beginning of the game now has to propose a policy vector \( V = (\tau^c, \tau^p_i, \eta^c, \eta^p_i) \) to balance the demands of the center and peripheral regions. The utility functions for each player are as follows:

\[
U^p_i = (1 - \tau^p_i)[(1 - \tau^p_i) \frac{\theta_i}{s_i} + (\eta^p_i)^{1/\alpha}] + r^p_i \left[ \frac{\mu_i \theta_i}{s_i} + (1 - \tau^p_i) \frac{(1 - \mu_i) \theta_i}{s_i} \right] (3.1)
+ \left( \frac{\eta^p_i}{s_i} \right)^{1/\alpha} - (1 - s_i)^{\beta} \]

\[
U^c = (1 - \tau^c)[(1 - \tau^c) \frac{1 - \sum_{i=1}^{N} \theta_i - \gamma}{s_0} + (\eta^c)^{1/\alpha}] + r^c \left[ \frac{1 - \sum_{i=1}^{N} \theta_i - \gamma}{s_0} \right] (3.3)
+ \left( \frac{\eta^c}{s_0} \right)^{1/\alpha} - (1 - s_0)^{\beta} \]

\[
U^g = (1 - r^c)[I_{\forall r^p_i \neq 1} \sum_{i=1}^{N} \tau^p_i \theta_i - \sum_{i=1}^{N} \eta^p_i + \tau^c(1 - \sum_{i=1}^{N} \theta_i - \gamma) - \eta^c + \gamma] (3.5)
+ I_{\forall r^p_i = 1} \sum_{i=1, r^p_i \neq 1}^{N} \tau^p_i (1 - \mu_i) \theta_i + \sum_{i=1, r^p_i \neq 1}^{N} \tau^p_i \theta_i - \sum_{i=1, r^p_i \neq 1}^{N} \eta^p_i \]

\[
+ \tau^c(1 - \sum_{i=1}^{N} \theta_i - \gamma) - \eta^c + \gamma] + r^c[0] \] (3.7)

The results from the simple model with just one peripheral region readily extend
to the model with \( N \) peripheries. Again, the model is solved by backward induction. In each region \( P_i \) the representative citizen has to evaluate the payoffs for \( r^p_i = 1 \) and \( r^p_i = 0 \). Similar to before, for each region \( P_i \) the insurgency constraint on \( \tau^p_i \) can be derived:

\[
\tau^p_i < \frac{(1 - s_i)^\beta s_i}{\mu_i \theta_i} \quad (3.8)
\]

If \( G \) can pick a tax rate \( \tau^p_i \) that satisfies this constraint, \( P_i \) can be dissuaded from an insurgency. Below the threshold \( \hat{\mu}_i \), \( P_i \) will never revolt, even under maximally extractive policies \( \tau^p_i = 1 \) and \( \eta^p_i = 0 \):

\[
\hat{\mu}_i = \frac{(1 - s_i)^\beta s}{\theta_i} \quad (3.9)
\]

The decision-calculus of the center population remains the same and there are conditions under which \( G \) can never avoid protest and the equilibrium in Proposition 1 obtains. The outcome of total extraction (Proposition 2) is realized if neither the center nor any of the \( N \) peripheral regions can credibly threaten the power of the government \( (\frac{1-\theta}{s_0} < (1 - s_0)^\beta \) and \( \forall \mu_i < \hat{\mu}_i \)). Identically, the classical urban bias results if \( C \) can credibly threaten protest, but all \( N \) peripheral regions have too low of a rural insurgency effectiveness:

**Proposition 3': Classical Urban Bias:** If \( \gamma < \hat{\gamma}, \frac{1-\theta}{s_0} > (1 - s_0)^\beta \) and \( \forall \mu_i < \hat{\mu}_i \), \( G \) will implement a policy vector \( V = (0 < \hat{\tau}^c < 1, \hat{\tau}^p_i = 1, \hat{\eta}^c > 0, \hat{\eta}^p_i = 0) \) and stay in power with

\[
\hat{\tau}^c = \frac{s_0}{1 - \sum_{i=1}^N \theta - \gamma} \left[ (\gamma/s_0)^{\frac{1}{1-\alpha}} + (1 - s_0)^\beta - \gamma/s_0 \right]
\]

\[
\hat{\eta}^c = (\alpha/s_0)^{\frac{\alpha}{1-\alpha}}
\]
This equilibrium has the same comparative statics as before, carries the same implications for the level of urban bias and does not predict any differential treatment of the N peripheries. More interesting results emerge when for some regions \( \mu_i > \hat{\mu}_i \). Obviously, for all regions in which \( \mu_i \) remains below this threshold, total extraction will always be the outcome. For regions with \( \mu_i \) above the threshold, the government has to determine whether it will still extract and tolerate an emergency or reduce the amount of taxation in region \( P_i \). If \( \mu_i > \hat{\mu}_i \), then \( G \) will opt for reduced taxation in region \( P_i \). If at the same time, the population in \( C \) is powerless, the rural bias equilibrium described in Proposition 4 is attained, here with a modified “regional bias” interpretation.

**Proposition 4’: Regional Bias 1;** If \( 1 - \frac{\theta}{s_0} < (1 - s_0)^\beta \), but for all \( P_i \) with \( \mu_i > \hat{\mu}_i \) and \( \mu_i > \bar{\mu}_i \), \( G \) will implement \( V = (\tau^c = 1, \tau^p_i = \hat{\tau}^p, \eta^c = 0, \eta^p = 0) \), \( C \) will not protest, \( P \) will not start an insurgency, with

\[
\hat{\tau}^p_i = \frac{(1 - s_i)^\beta s_i}{\mu_i \theta_i}
\]

If \( \mu_i < \hat{\mu}_i \), the government rather extracts all resources and tolerates a minor insurgency for the regions in which \( \mu_i > \hat{\mu}_i \).

**Proposition 5’: Leviathan with Insurgency in some \( P_i \);** If \( 1 - \frac{\theta}{s_0} < (1 - s_0)^\beta \), but for all \( P_i \) with \( \hat{\mu}_i < \mu_i < \bar{\mu}_i \), \( G \) will implement \( V = (\tau^c = 1, \tau^p_i = 1, \eta^c = 0, \eta^p = 0) \), \( C \) will not protest, \( P \) will start an insurgency and consume \( \frac{\mu_i \theta_i}{s_i} \).

This equilibrium describes a situation of total extraction, but with regional flares of violence. The last two scenarios deal with the outcomes in Proposition 6’ and 7’ when the urban population can threaten protest. As the analysis with one peripheral region has shown, \( G \) will always satisfy the protest constraint. The outcomes in
Proposition 6 and 7 are reproduced here, the only difference being that only some of the $N$ peripheries will receive a reduction in taxation or resort to violence while being subject to full extraction by the government.

The extension of the model to $N$ peripheral regions provides an important insight with regard to the levels of interregional redistribution and applies to federal as well as unitary systems. Regions that cannot issue a credible threat, as is expressed by $\mu_i$, will be subject to extraction and the region-specific benefits $(1 - \tau^p_i)\theta_i/s_i^2$ are clearly lowest when $\mu_i < \hat{\mu}_i$. Higher levels of $\mu_i$ moves the outcome first to an equilibrium with observed violence, but no increase in government transfers (i.e. lower levels of taxation), and eventually to an equilibrium with local tax rates below the extractive maximum. Within that last equilibrium, the comparative static effect of $\mu_i$ is also positive and reduces tax rates even further. The geographic pattern of taxation and transfer of resources across the territory of a state should be a function of local levels of $\mu_i$, reflecting the bargaining power of each region vis-a-vis the center. Furthermore, the cost of collective action within the region $-(1 - s_i)^\beta$ also reduce transfers.

3.3.1 Strategic Interdependence

The results of the simple model directly generalize to $N$ peripheral regions because by assumption, the government can engage in essence each region separately. The structure of the model prohibits any direct strategic interdependence. What if some form of interdependence would be allowed in the model? Specifically, what if a majority ($N+1/2$) peripheral regions together can overthrow the central government? For simplicity, assume $N = 2$ and both regions decide simultaneously over the revolt. If both regions chose $r_i^p = 1$ G is overthrown and $\tau_i^p = 0$, $\eta_i^p = 0$, $\tau^c = 0$, $\eta^c = 0$ for all $i$. 

\footnote{Public goos provision in this version of the game is always zero, $\eta_i^p = 0$.}
i, but no player can claim the loot \( \gamma \). If only one region decides to revolt, \( G \) stays in power and the game proceeds. In the following, assume the urban threat is negligible. If none of the regions has a threat level \( \mu_i \) above the minimal threshold \( \hat{\mu}_i \), the usual full extraction outcome cannot be attained, because if both regions coordinate, \( G \) is overthrown despite the low effectiveness. Hence, to stay in power \( G \) will buy off one of the regions and make it indifferent between acquiescing to the policy and joining a successful rebellion. The price of a region is solely determined by the population share \( s_i \) since the potential payoff for joining the insurgency is completely tax free income minus the cost of revolt \( (1 - s_i)^p \). Similarly, if for both regions the threat is intermediate, \( \hat{\mu}_i < \mu_i < \bar{\mu}_i \), \( G \) cannot let them both revolt and will again buy off the cheaper region. If both regions have a credible threat that is also strong, i.e. \( \mu_i > \bar{\mu}_i \), \( G \) will buy both of them off to avoid an insurgency or revolution, no matter what. The case of one region with an intermediate and one with a strong insurgency threat also ends up with the government buying off one of the regions. In general, strategic interdependence can empower smaller, marginal regions, if they are the pivotal joiner in an insurgency. With \( N > 2 \) the decision-making calculus becomes more similar to the original results and the influence of pivotal small regions diminishes, since \( G \) has to buy off only one region to render a coalition of \( \frac{N+1}{2} \) failed.

3.4 Empirical Analysis

Building on the history of fiscal bargains and agricultural policy in Indonesia and the theoretical implications of the model, this section will provide additional quantitative tests for the main argument: that the strength of the sub-national threat increases central government transfers. I will use detailed district-level data on fiscal transfers and the effects of agricultural policy to show the importance of sub-national bargaining threats.
3.4.1 Analysis of Fiscal Transfers

Starting with the analysis of explicit transfers, Figure 3.4 shows yearly box plots for central government fiscal allocations (in million real Indonesian Rupiah) to district governments. These transfers are pure DAU allocations and exclude any special autonomy funds, natural resource revenue or project-specific transfers (DAK). For most years the majority of district governments were allocated between 1,200 and 2,400 million Rupiah, but with a considerable number of outliers receiving three to four times as much. In general, the level of transfers has increased, particularly in 2006 and 2007.

![Figure 3.4: Local Government Fiscal Transfers](image-url)
Indonesia’s decentralization laws enshrine a formula for fiscal transfers that identifies certain district characteristics as crucial determinants of standard fiscal transfers, the experience of Aceh and Papua suggests that informal bargaining power can influence policy. The main hypothesis suggests that the threat of rural collective action should impact the bargaining position of local districts with the central government and increase fiscal transfers above and beyond standard allocations. Ignoring the obvious Special Autonomy Transfers and focusing instead purely on standardized DAU allocations constitutes a hard test for the argument, since the informal regional threat has to influence the implementation of the fiscal transfer formula.

To measure the latent regional threat of a district I forego indicators of actual observed regional violence or experience with separatism, but rather rely on two indirect, but exogenous measures. Similar to the analysis in Chapter 2, I calculated for each district a “ruggedness” measure, calculated as as the average uphill slope of the district surface. Terrain ruggedness is a good proxy measure for the ability of local agents to threaten a prolonged and resource-draining separatist conflict with the central government. Rugged territory offers protection and increases the costs of access for central military troops, allowing local agents to frustrate tax collection and the enforcement of central government policies. Figure 3.5 shows the simple bivariate relationship between district ruggedness and fiscal transfers. There exists a clear positive, linear relationship between ruggedness and fiscal transfers, although potential omitted variables could drive the relationship. Further multivariate analysis will show that this correlation is robust to a number of important covariates.
Figure 3.5: Ruggedness and Local Government Fiscal Transfers
As a secondary, alternative measure of the latent threat of collective action, I will also use the district’s distance to Jakarta. Distance to Jakarta also has a straightforward interpretation, increasing the costs of access for the central government. Distant districts are able to leverage their peripheral status and ability to shield local resources from taxation, to increase payoffs from the center. Figure 3.6 shows the bivariate relationship between the distance to Jakarta and central government transfers, revealing an even stronger positive association than the ruggedness measure.

![Figure 3.6: Distance to Jakarta and Local Government Fiscal Transfers](image-url)
Both measures have the advantage of clear exogeneity and avoid any reverse causality claims. Moreover, the theoretical model suggests it is largely about the threat of violence, not necessarily observed levels of collective action. Section 2 provided several examples how the regions of Aceh, Papua and East Timor had to endure resource exploitation and violent repression, despite the organization of separatist movements. Only after the balance of power shifted after the fall of Suharto, did the threat of peripheral violence gain in credibility and increased costs of the central government. By using ruggedness and distance to Jakarta, indirect costs are captured and potentially identify powerful regions that did not have an openly conflictual relationship with Jakarta, but nonetheless were able to secure important transfers due to their latent threat.

Now, to ascertain the initial bivariate findings, I will use time-series cross-sectional data on fiscal transfers on Indonesian districts from 2001 to 2007 to test the effect of ruggedness and distance to Jakarta. The formula that officially determines DAU fiscal allocations considers a number of district characteristics that capture local needs and resources. For each district logged population counts, logged area and real district GDP are included, featuring prominently as official determinants of transfers. I also include a dummy recording whether a district has a dominant mining and gas industry, entitling the district government to increased funds due to the above average tax contribution. In addition, I include a Java dummy to control for the potential bias for the main island, the former ruling party vote share (Golkar) in the 1999 legislative election and a Herfindahl index of political fractionalization (both measured at the provincial level. The last control variable is a Herfindahl measure of ethnic fractionalization, which indirectly measures internal group costs of collective action.

Fiscal transfers in each district $i$ and year $t$ are estimated with the following
model:

\[ T_{it} = \alpha + X'\beta + \delta R_i + \gamma D_i + \epsilon_{it} \]

where \( \alpha \) is a common intercept term, \( X \) the matrix of control variables, \( R \) measures ruggedness in district \( i \) and \( D \) distance to Jakarta, while \( \epsilon_{it} \) is an independent error term. First, I estimate the model using OLS on the pooled sample and robust standard errors to correct for heteroskedasticity. The second model takes advantage of the panel structure of the data. Analysis of time-series cross-sectional data usually presents several challenges: panel heteroskedasticity, serial correlation and unobserved unit heterogeneity. Several methods have been proposed to deal with each of these issues (Stimson, 1985; Beck and Katz, 1995, 1996). Since here the independent variables of interest are constant across time, fixed effects are unavailable. Model 2 reports the results for a random effects model with robust standard errors clustered at the district-level, in which the common intercept \( \alpha \) is replaced by country-specific random effects \( \alpha_i \), which are assumed to be uncorrelated with the observed explanatory variables.

Table 3.1 shows the estimate coefficients and associated standard errors for the OLS and random effects model. Both models explain about 65% of the variation in fiscal transfers. The variables officially considered in the allocation formula all show statistically significant effects, except for the logged area. More populous districts receive higher transfers, as do richer districts. Resource-rich districts actually receive lower transfers, controlling for everything else, indicating partially offsets in the DAU formula for shared resource revenue transfers, but also the continual expropriation of local resources by the central government. Not surprisingly, districts on the main island Java receive on average higher transfers. Interestingly, the vote share for the former ruling party predicts lower transfers, potentially reflecting the
The post-Suharto government in Jakarta allocating less resources to regions with support for the opposition. Political fractionalization on the other hand has positive effects on transfers, which could proxy for the latent support for new political parties measured in the fractionalization index. Most importantly, both the ruggedness measure and the distance to Jakarta are predicted to have a positive effect on the level of fiscal transfers below the 1% level. These results stand up to the inclusion of random effects, which increases the confidence in the findings. To better assess the substantive magnitude of the effects, Table 3.2 displays the predicted percent change in transfers and associated 95% confidence interval for an increase from the median value to the 75th percentile for each independent variable. Both ruggedness and distance from Jakarta have substantively meaningful effects, increasing transfers by approximately 2% and 5% respectively. This implies that the latent political threat peripheral regions can issue against the central government is important for the allocation of resources, and applies above and beyond official determinants of transfers. In addition, the statistically significant negative effect of ethnic heterogeneity but-

Table 3.1: DV: Transfers, OLS with robust SEs, random effects with clustered SEs

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1 Coefficient (Std. Err.)</th>
<th>Model 2 Coefficient (Std. Err.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dist Jakarta</td>
<td>198.25** (40.73)</td>
<td>206.89** (78.87)</td>
</tr>
<tr>
<td>Ruggedness</td>
<td>65.26** (23.65)</td>
<td>79.24† (46.23)</td>
</tr>
<tr>
<td>log Population</td>
<td>803.30** (26.55)</td>
<td>744.79** (60.92)</td>
</tr>
<tr>
<td>log Area</td>
<td>0.107</td>
<td>0.145</td>
</tr>
<tr>
<td>real GDP</td>
<td>$1.57 \cdot 10^{-11}^*$ (6.13 \cdot 10^{-12})</td>
<td>$3.66 \cdot 10^{-11}^{†}$ (1.88 \cdot 10^{-11})</td>
</tr>
<tr>
<td>ELF</td>
<td>-125.23* (52.91)</td>
<td>-171.68 (112.84)</td>
</tr>
<tr>
<td>Mining &amp; Gas Dominant</td>
<td>-337.56** (60.13)</td>
<td>-374.10** (97.21)</td>
</tr>
<tr>
<td>Java</td>
<td>259.33** (49.59)</td>
<td>233.89* (102.00)</td>
</tr>
<tr>
<td>Golkar Share</td>
<td>-192.93† (103.02)</td>
<td>-214.24 (206.81)</td>
</tr>
<tr>
<td>Polit Fract</td>
<td>316.53* (128.16)</td>
<td>278.61 (254.62)</td>
</tr>
<tr>
<td>Intercept</td>
<td>-8917.16** (363.87)</td>
<td>0.07 (0.20)</td>
</tr>
</tbody>
</table>

| N                         | 1970                             | 1970                             |
| R²                        | 0.656                            | 0.647                            |

Significance levels: †: 10% *: 5% **: 1%
Table 3.2: Predicted Change in Transfers

<table>
<thead>
<tr>
<th>Variable</th>
<th>Expected First-Difference</th>
<th>95% CI</th>
<th>% Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ruggedness</td>
<td>36.16</td>
<td>[10.95, 62.14]</td>
<td>1.7</td>
</tr>
<tr>
<td>Distance to Jakarta</td>
<td>96.85</td>
<td>[58.64, 137.43]</td>
<td>4.7</td>
</tr>
</tbody>
</table>

tresses this main finding, suggesting that heterogenous districts have higher costs of collective action and are less able to threaten the central government.

Now, to further investigate the effects of ruggedness and distance to Jakarta, I consider a model in which an interaction term between the two is included. Table 3.3 shows the estimated coefficients and standard errors.

Table 3.3: DV: Transfers, OLS with robust SEs, random effects with clustered SEs

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 3 Coefficient (Std. Err.)</th>
<th>Model 4 Coefficient (Std. Err.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dist Jakarta</td>
<td>373.89** (56.72)</td>
<td>383.58** (99.34)</td>
</tr>
<tr>
<td>Ruggedness</td>
<td>296.99** (51.20)</td>
<td>317.16** (94.69)</td>
</tr>
<tr>
<td>Rugged X Dist</td>
<td>-166.58** (33.69)</td>
<td>-169.74** (60.32)</td>
</tr>
<tr>
<td>log Population</td>
<td>789.19** (26.04)</td>
<td>732.84** (58.81)</td>
</tr>
<tr>
<td>log Area</td>
<td>1.62 (7.31)</td>
<td>0.11 (14.87)</td>
</tr>
<tr>
<td>real GDP</td>
<td>1.61 \cdot 10^{-11}\text{*} (6.01 \cdot 10^{-12})</td>
<td>3.62 \cdot 10^{-11}\text{*} (1.84 \cdot 10^{-11})</td>
</tr>
<tr>
<td>ELF</td>
<td>-44.16 (54.92)</td>
<td>-89.94 (113.18)</td>
</tr>
<tr>
<td>Mining &amp; Gas Dominant</td>
<td>-344.93** (59.96)</td>
<td>-379.03** (97.50)</td>
</tr>
<tr>
<td>Java</td>
<td>373.96** (57.16)</td>
<td>349.61** (112.26)</td>
</tr>
<tr>
<td>Golkar Share</td>
<td>-121.85 (102.98)</td>
<td>-143.15 (204.23)</td>
</tr>
<tr>
<td>Polit Fract</td>
<td>583.19** (143.83)</td>
<td>549.17\text{f} (282.46)</td>
</tr>
<tr>
<td>Intercept</td>
<td>-9215.88** (370.55)</td>
<td>0.07 (0.20)</td>
</tr>
</tbody>
</table>

N: 1970
R²: 0.662

Significance levels: ↑: 10% *: 5% **: 1%

Again, the control variables show the expected effects and both ruggedness and distance to Jakarta independently have positive effects on fiscal transfers. Curiously, the interaction term suggests both measures act as substitutes for the bargaining power of the district. Figure 3.7 shows the predicted effects of ruggedness on fiscal transfers far and close to Jakarta. Importantly, the net effect of ruggedness always
stays positive, representing the increase in bargaining power, but is less effective in distant districts. This suggests each factor has diminishing returns and can act as a substitute for the other.
Figure 3.7: Marginal Effects for Ruggedness, close to Jakarta (left panel), far from Jakarta (right panel)
3.4.2 Analysis of Agricultural Policy

To assess the impact of regional threats on policies that create informal regional distributive flows, I turn to the analysis of the sub-national impact of agricultural level policy in Indonesia. Indonesia has a highly varied agricultural profile across its territory. Having a largely tropical climate with a distinct dry and wet season, temperature varies little across the 33 provinces, while precipitation and soil quality vary greatly (Hill, 1989). Indonesia’s main agricultural products are rice, soybeans, maize, coffee, tea, palm oil, rubber, coconut and sugar. While Java is dominated by the rice economy, the outer islands feature more strongly other, plantation-friendly crops. To substantiate the qualitative evidence from Indonesia’s agricultural policies in the 1970s-90s, I measure the sub-national impact of national-level pricing policies. To do so, I rely on crop-level estimates of the nominal rate of assistance. The national NRA measure used above to characterize general trends in Indonesian agricultural policy is a weighted average of crop-level estimates of producer support. To calculate the local nominal rate of assistance, I obtained detailed data on district-level agricultural production by crop type from 1994-2009 from the Indonesian Ministry of Agriculture. The data on crop production is collected through annual surveys and recurring agricultural censuses. For each district \( i \) in year \( t \) this data allows me to calculate the local nominal rate of assistance, using information on crop production, domestic farm gate prices and the nominal rate of assistance for each crop. This measure offers an estimate of government support for local agricultural incomes. To account for the fact that there exists strong variation in the importance of the agricultural sector for the local economy across districts, I additionally weight the local NRA measure by the share of the agricultural sector of local GDP. The final measure (W-NRA) is a measure of how strongly government pricing policies affect local incomes. High positive values imply agricultural policy offer a strong boost to local
incomes, while high negative values imply net taxation. Values around zero indicate little impact of pricing policy on local incomes.

Equipped with this measure, I again estimate a simple linear model of the following form for each district from 2001 to 2007, with the same model specification as in the analysis of fiscal transfers:

\[ WNRA_{it} = \alpha + X'\beta + \delta R_i + \gamma D_i + \epsilon_{it} \]

Again, I rely on standard OLS with robust standard errors and a panel random effects model with clustered robust standard errors. Table 3.4 reports coefficient estimates and the associated standard errors. Of the control variables only district GDP per capita, ethnic fractionalization, the Java dummy and the Golkar vote share have a statistically significant impact\(^3\). Richer districts receive less support through agricultural price manipulations, as do districts on Java or regions with a large vote share for the former ruling party. As before, ethnic fractionalization also has a negative effect on support levels, suggesting the ease of collective action plays an important role to secure favorable policy. Most importantly, of the two alternative measures for the local collective action threat, both are estimated to be positive and the ruggedness measure is significant at the one and five percent level in the OLS and random effects model respectively.

Table 3.5 presents expected first differences in the weighted local NRA measure for moving from the median to the 75th percentile of the ruggedness measure’s distribution. Comparing a district with a median level of ruggedness to a district at the 75th percentile, the weighted nominal rate of support is on average 6.2% higher.

To further explore the relationship between the threat of collective action and levels of price support, Table 3.6 shows coefficient estimates for models that include

\(^3\) Results are the same if district GDP instead of GDP per capita is used.
Table 3.4: DV: W-NRA, OLS with robust SEs, random effects with clustered SEs

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>(Std. Err.)</th>
<th>Coefficient</th>
<th>(Std. Err.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dist Jakarta</td>
<td>0.003</td>
<td>(0.003)</td>
<td>.003</td>
<td>(0.004)</td>
</tr>
<tr>
<td>Ruggedness</td>
<td>0.006**</td>
<td>(0.001)</td>
<td>0.006*</td>
<td>(0.002)</td>
</tr>
<tr>
<td>log Population</td>
<td>0.001</td>
<td>(0.001)</td>
<td>-2.73 \times 10^{-6}</td>
<td>(0.002)</td>
</tr>
<tr>
<td>log Area</td>
<td>6.21 \times 10^{-5}</td>
<td>(0.001)</td>
<td>-0.001</td>
<td>(0.007)</td>
</tr>
<tr>
<td>real GDP pc</td>
<td>-1.06 \times 10^{-9**}</td>
<td>(2.03 \times 10^{-10})</td>
<td>-1.10 \times 10^{-9**}</td>
<td>(3.46 \times 10^{-10})</td>
</tr>
<tr>
<td>ELF</td>
<td>-0.012**</td>
<td>(0.003)</td>
<td>-0.013*</td>
<td>(0.006)</td>
</tr>
<tr>
<td>Mining &amp; Gas Dominant</td>
<td>-0.001</td>
<td>(0.036)</td>
<td>0.001</td>
<td>(0.005)</td>
</tr>
<tr>
<td>Java</td>
<td>-0.012**</td>
<td>(0.004)</td>
<td>-0.013*</td>
<td>(0.005)</td>
</tr>
<tr>
<td>Golkar Share</td>
<td>-0.023**</td>
<td>(0.008)</td>
<td>-0.021*</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Polit Fract</td>
<td>0.007</td>
<td>(0.009)</td>
<td>0.001</td>
<td>(0.013)</td>
</tr>
<tr>
<td>Intercept</td>
<td>0.042*</td>
<td>(0.02)</td>
<td>0.058†</td>
<td>(0.032)</td>
</tr>
</tbody>
</table>

N: 1062 1062
R^2: 0.119 0.117

Significance levels: †: 10% *, : 5%, **: 1%

Table 3.5: Predicted CHange in W-NRA

<table>
<thead>
<tr>
<th>Variable</th>
<th>Expected First-Difference</th>
<th>95% CI</th>
<th>% Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ruggedness</td>
<td>0.002</td>
<td>[0.001,0.004]</td>
<td>6.2</td>
</tr>
</tbody>
</table>

an interaction effect between the two main variables.

The results with regard to the control variables remain largely the same. Including the interaction term leaves the constituent effect for ruggedness positive and significant, and shows again a negative coefficient for the interaction. Figure 3.8 shows the effects of ruggedness close and far from Jakarta. As in the analysis of fiscal transfers, ruggedness always has a positive effect on price support, but the effect is diminished far from the center, suggesting a substitution effect between the two measures.

Although agricultural pricing policy in Indonesia is set at the national level, given the distinct and varied economic geography of the country, decision-makers at the center to take into account the sub-national effects of their policies. Implementing a price floor or export tax for rice has vastly different political implications than for
Table 3.6: DV: W-NRA, OLS with robust SEs, random effects with clustered SEs

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 7</th>
<th></th>
<th>Model 8</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>(Std. Err.)</td>
<td>Coefficient</td>
<td>(Std. Err.)</td>
</tr>
<tr>
<td>Dist Jakarta</td>
<td>0.015</td>
<td>(0.011)</td>
<td>0.015</td>
<td>(0.009)</td>
</tr>
<tr>
<td>Ruggedness</td>
<td>0.021*</td>
<td>(0.010)</td>
<td>0.021**</td>
<td>(0.007)</td>
</tr>
<tr>
<td>Rugged X Dist</td>
<td>−0.016†</td>
<td>(0.008)</td>
<td>−0.016*</td>
<td>(0.007)</td>
</tr>
<tr>
<td>log Population</td>
<td>−0.003</td>
<td>(0.003)</td>
<td>−0.003</td>
<td>(0.002)</td>
</tr>
<tr>
<td>log Area</td>
<td>−0.002</td>
<td>(0.001)</td>
<td>−0.001*</td>
<td>(0.007)</td>
</tr>
<tr>
<td>real GDP pc</td>
<td>5.22 · 10⁻¹⁰</td>
<td>(3.39 · 10⁻¹⁰)</td>
<td>5.22 · 10⁻¹⁰**</td>
<td>(1.73 · 10⁻¹⁰)</td>
</tr>
<tr>
<td>ELF</td>
<td>−0.015</td>
<td>(0.010)</td>
<td>−0.015*</td>
<td>(0.006)</td>
</tr>
<tr>
<td>Mining &amp; Gas Dominant</td>
<td>−0.013</td>
<td>(0.011)</td>
<td>−0.013†</td>
<td>(0.007)</td>
</tr>
<tr>
<td>Java</td>
<td>0.013</td>
<td>(0.009)</td>
<td>0.013*</td>
<td>(0.006)</td>
</tr>
<tr>
<td>Golkar Share</td>
<td>−0.032</td>
<td>(0.021)</td>
<td>−0.03**</td>
<td>(0.012)</td>
</tr>
<tr>
<td>Polit Fract</td>
<td>−0.019</td>
<td>(0.026)</td>
<td>−0.019</td>
<td>(0.013)</td>
</tr>
<tr>
<td>Intercept</td>
<td>0.233**</td>
<td>(0.054)</td>
<td>0.233**</td>
<td>(0.032)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N</th>
<th>1062</th>
<th>1062</th>
</tr>
</thead>
<tbody>
<tr>
<td>R²</td>
<td>0.114</td>
<td>0.117</td>
</tr>
</tbody>
</table>

Significance levels: †: 10%  * : 5%  ** : 1%

coffee, given the geographic impact of the policy. The multivariate analysis of the sub-national impact of agricultural pricing policies clearly shows that the informal bargaining threat of peripheral regions plays an important and distinctive role in this process. The difficulty of access for the central government empowers the rural periphery in a bargaining context, and in effect provides tangible monetary benefits.
Figure 3.8: Marginal Effects for Ruggedness, close to Jakarta (left panel), far from Jakarta (right panel)
3.5 Conclusion

This chapter identified an important puzzle that moves beyond the binary distinction of urban and rural bias. Government policies often have distributive effects that vary across the territory of the state. For some policies, like explicit fiscal transfer arrangements between geographic units, these effects are clearly visible and easily measurable. For other policies, geographic distributive effects are implicit and harder to quantify. Decisions over the location and monetary resources of schools and hospitals can have important distributive effects across regions, irrespective of the federal or unitary structure of the state. Similarly, government intervention in product markets through price manipulation has sub-nationally varying effects due to the spatial clustering of production. For agricultural policy the economic geography of crop production concentrates the effects of subsidies or taxes for certain goods on particular regions. Hence, urban or rural bias at the national level often implies a far more differentiated distributive struggle at the regional level. Understanding this political topography of distributive conflicts is an important and distinct puzzle. This paper engages this thematic using qualitative and quantitative evidence from Indonesia.

The existing literature on urban bias largely neglects the sub-national variation in its effects, while the existing literature on federalism and decentralization focuses on the analysis of explicit and formal resource transfers. It is essential to consider both explicit and implicit distributive effects. I argue one important determinant of both implicit and explicit distributive transfers is the informal threat of collective action peripheries can pose against the center. Drawing on a generalization of a simple model of political survival, I show that the level of resource transfers from the center is dependent on the ability of the region to credibly threaten a costly action that diminishes the access of the central government to local taxable resources.

The political-economic history of Indonesia offers several important examples for
this logic. The rise to power of General Suharto in the 1960s was followed by a violent purge of opposing elements in the Javanese countryside. By eliminating the threat of rural collective action, the Suharto regime consolidated its hold on power and ushered in an unprecedented period of economic growth and stability. Given the violent origin of the regime, the ruling leadership was acutely aware of the importance to secure the future support of the Javanese countryside. To assure future loyalty, the “New Order” regime followed the purge of the Communist Party with a series of agricultural policy reforms (amongst others) that set the stage for an economic revival on Java and played an important role in the overall economic success of Indonesia. Guaranteed prices for their rice crop, subsidized fertilizer, agricultural extension programs, investment in research and large-scale irrigation systems boosted Javanese farmer’s incomes and contrasts anti-agricultural policies of that era in sub-Saharan Africa.

Similarly, being a staunchly unitary and centralized state, the Suharto regime fought several separatist movements and used the military to extract natural resource revenue from the periphery. While already during Suharto’s rule military repression was combined with a system of Presidential grants to channel resources in particularly important outlying provinces and assure political compliance, the bargain over regional transfers was fundamentally re-shaped after the fall of the New Order regime. The transition to democracy imposed higher costs of enforcement in the central government military and empowered peripheral regions, leading to a dramatically deepened fiscal transfer arrangement. A series of decentralization laws created an extensive system of regional transfers that explicitly recognized the strong demands of peripheral regions like Aceh and Papua. Fueled by the credible threat of separatism and the example of East Timor, the now democratically elected central government in Jakarta caved to the financial demands of Aceh and Papua, committing large financial resources.
These successful examples of peripheral bargaining power are backed up by quantitative evidence. Using detailed data on fiscal transfers and the sub-national impact of agricultural policies at the district level between 2001 and 2007, I show that the bargaining power of districts, proxied by terrain ruggedness and distance to the capital, positively affects central government transfers and pricing policies. These effects are robust to the inclusion of a number of important covariates and capture the informal bargaining threat peripheral regions can utilize.

Overall, this provides further evidence that a simple binary distinction between urban and rural often masks important regional differences. More generally, both the results for agricultural policy and subnational fiscal transfers show the importance of informal threats for the shape of formal and implicit redistributive policies. This suggests that many of the insights from the literature on federalism and decentralization bear potential lessons even for the analysis of government policy in unitary systems. It also shows that analysts of distributive struggles should look beyond formalized and explicitly geographic resource transfers and also consider implicit geographic effects of government spending.
4.1 Introduction

Public policies in many developing countries are often seen to exhibit a pattern of urban bias. Taxation of agricultural exports, paired with a concentration of public expenditures in urban centers, characterizes wide parts of the developing world. Bates (1981), building on Olson’s collective action theory (1965) and prior work by economists like Lipton and Myrdal (Myrdal, 1958; Lipton, 1977), famously connects urban bias to the disproportionate political influence of urban residents. The extraction of revenue from rural cash crop farmers, used to finance industrialization projects in urban centers and provide private and public goods to the urban poor, secures the government’s political survival in the face of urban riots. Simultaneously, the collective action problem of farmers renders rural interests incapable of influencing policies formulated in the capital. Hence, pro-urban bias will be a persistent feature of many developing economies, as long as political structures make rulers beholden to urban groups. The notion of urban bias has become one of the dominant themes in the analysis of agricultural policy in the developing world (Bezemer and Headey,
2008) and also informs work on welfare states in the developing world (Haggard and
Kaufman, 2008; Wibbels and Ahlquist, 2011).

While an important stepping stone for understanding patterns of agricultural
and public policy as well as the distributive implications thereof, the classical urban
bias account neglects important theoretical and empirical considerations. First, low
and middle income countries show an impressive amount of variation in agricultural
policy and the degree of urban bias (Bezemmer and Headey, 2008; Anderson, 2009).
While some countries in sub-Saharan Africa and Latin America have exhibited a dis-
tinct urban bias in policy, many others, especially in South and Southeast Asia, have
implemented policies that funnel resources to the countryside, even amounting to
an overall rural bias in policy. Similarly, agricultural policy in 19th century Europe,
at comparatively low levels of development, ranged from high to low levels of pro-
tection for agricultural producers (Tracy, 1989; Webb, 1982). Overall, the observed
empirical variation across countries, time and levels of analysis provides a rich and
unexplained landscape of government activity. Second, the urban bias hypothesis
neglects the potential role of elections in empowering rural constituencies (Varshney,
1994; Stasavage, 2005). Under particular circumstances the rural vote can play an
important role for the national leadership in semi and full democracies. This paper
complements the existing literature by building on Bates urban bias argument and
addresses the issue of democracy in rural majority settings. I first develop a simple
theoretic account of urban bias and determine the effects of electoral competition on
urban bias in public policy. This positive effect of electoral competition is expected
to be mitigated by the presence of cross-cutting cleavages (Rokkan, 1967) and the
level of competitiveness in elections.

Then, using the exogenous phasing-in of indirect and direct elections of district
heads in Indonesia and data on local expenditures, I estimate the effect of elections
on urban bias, measured by rural public expenditures and public goods provision.
Using data from the Indonesian context serves as an ideal test case for the scope of the theoretical argument and at the same time, due to the specifics of the case, constitutes a hard test, biasing the results against finding confirmatory evidence. Importantly, I find clear evidence that the introduction of elections increases expenditures benefiting rural residents and reduces urban bias. Furthermore, additional evidence suggests this effect is dependent on the competitiveness of elections and conditional on the presence of other cross-cutting cleavages, which can split the rural vote. The paper contributes to the existing literature in several ways. It speaks directly to the shortcomings of the urban bias hypothesis on a theoretical and empirical level. By considering the effect of elections in the context of the classical urban bias account and providing the first quantitative evaluation of the causal effect, I am able to enrich the understanding of the processes underlying urban-rural divisions and the role of elections for distributive conflicts. Furthermore, extending the concept of urban bias to contexts of institutional accountability reveals important insights for the more general literature on democratic elections and public policy, as well as sub-national politics. While prior research has generally found elections to have positive effects and lead to more responsive public policy profiles (Adam et al., 2011; Aidt and Eterovic, 2011; Besley and Burgess, 2002; Besley, 2006; Besley et al., 2007; Ferraz and Finan, 2011; Huber et al., 2008; Iversen, 2005; Lindert, 2004; Stasavage, 2005), others have argued for the importance of a differentiated view on the actual impacts on welfare spending (Ross, 2006; Timmons, 2010). Evaluating the effects of elections on urban-rural divides adds an additional facet to the existing literature. While the majority of redistributive theories used in political science apply to horizontal redistribution in the income distribution (Huber and Stephens, 2001; Meltzer and Richards, 1981; Moene and Wallerstein, 2003) or vertical redistribution between territorial units (Beramendi, 2007; Dixit and Londregan, 1998a), considering urban-rural divisions adds a useful conceptual dimension for understanding public policies
and the effects of elections. Last, by using evidence on local elections in Indonesia, in an environment of elite dominance (Hadiz, 2010), investigating the role of elections contributes to our understanding of electoral processes and elite capture in young and fragile democracies (Bardhan, 2002; Bardhan and Mookherjee, 2006).

The paper is structured as follows, Section 2 outlines the theoretical debate around urban bias and democracy, situating the theoretical question in the wider literature and formulates a simple theoretical model to guide the empirical investigation. Section 3 discusses local elections in Indonesia and how they can be used to estimate the causal effect on urban bias. Section 4 presents the data sources, model specifications and results for difference-in-difference and several robustness checks. Section 5 concludes.

4.2 Urban Bias and Democracy

While an extensive literature in economics has outlined the importance of good agricultural policy for the development process and poverty reduction (Bravo-Ortega and Lederman, 2005; Kang and Ramachandran, 1999; Kay, 2002; Diao et al., 2010; Ravaillon and Datt, 2002; Ravaillon and Chen, 2004; Lipton, 2005) and highlighted the importance of government intervention (Binswanger and Deininger, 1997), policies in many low and middle income countries have a decidedly anti-rural bias (Bezemer and Headey, 2008). While the majority of the political economy literature has focused on analyzing agricultural policies in OECD countries, using approaches inspired by Mancur Olsons theory of collective action and the formal interest group lobbying model by Grossman and Helpman (Olson, 1965; Grossman and Helpman, 2001), these approaches have found only limited explanatory power in the context of developing economies (de Gorter and Swinnen, 2002; Anderson, 2010).

A different perspective on agricultural policy in developing countries has been
developed by Bates and others (Bates, 1981; Lipton, 1977). Bates argues Africa’s failed agricultural policy is in part caused by adverse incentives for national political leaders. Producers of exportable cash crops were forced to sell their product at low prices to national marketing boards, which in turn generated substantial profits on international markets. The generated revenue was then used to provide public goods and control inflation in urban centers, fuel industrialization projects and finance networks of political patronage. Rural areas were disadvantaged in terms of stunted growth and reduced investment, lower public goods provision and political repression. The driving force behind such policies is the need for political survival. Governments use revenue to inoculate themselves against the possibility of urban unrest. Protesting urban workers either pose a direct threat to the regime or could trigger a coup by the military and hence have to be avoided at all costs. This transfer of resources is implemented through agricultural pricing policies, input and food subsidies, export taxation, quotas, exchange rate policy and the unequal provision of local public goods. African urban bias is often likened to Latin American experiences with import substitution strategies and welfare state development, which were often implemented at the expense of the rural poor (Collier and Collier, 1991; Bruton, 1998; Haggard and Kaufman, 2008). An urban-rural cleavage can become especially salient when a backward economy with a low labor-land ratio experiences declining trade (Rogowski, 1987).

At the same time, the empirical pattern of urban bias is not uniform. In Latin America, rulers did not always align with urban labor without conflict - repression of labor movements and the declining popularity of ISI speak to the fact that there is no iron law of urban bias. Even more so, contrasting Latin Americas and Africas experience with that of Asia, often completely reversed patterns emerge. Governments in Taiwan and South Korea implemented sweeping land reforms, Malaysia, the Philippines and Thailand engaged in decidedly pro-rural policies, investing considerable re-
sources into public health and education projects benefiting rural areas (Danguilan, 1999; Doronila, 1992; McGuire, 2001; Haggard and Kaufman, 2008), while repressing urban labor movements. Indonesia is well known for its generous support of rice farmers, despite the characteristic difficulty of organizing collective action among farmers (Simatupang and Timmer, 2008). 19th century Europe’s political conflict over trade tariffs equally reflects that there is nothing inevitable about supporting industry over agriculture, even at relatively low levels of development (Tracy, 1989; Webb, 1982). New quantitative measures of government induced price distortions in agricultural markets confirm the rich variation in net taxation rates of farmers across countries and time, agricultural sectors and regions within countries for the period after World War II (Anderson, 2009).

Incidentally, the theory of urban bias was developed as an exercise in ideal type creation, based on Africa’s experience (Bates, 1993), but does not automatically lend itself easily to explaining the variation in other regions of the world or over time. While interest group-based theories of agricultural policy are less suitable for explaining urban bias, because they pre-suppose a strong institutional environment and a system of interest mediation, the classic urban bias account neglects other forms of institutional accountability. In particular, forms of electoral accountability can play an important role for urban-rural divides and policy-making. Early democratization and healthy electoral competition in India has had important implications for agricultural policies and rural public goods provision, generally counter-acting movements to urban bias (Varshney, 1994). If the institutional environment includes the use of elections, rural agents have the opportunity to use their control over turnout and vote choice as a bargaining chip vis-a-vis the ruling government (Brown and Mobarak, 2009). When institutional means of accountability exist and the electoral system places the decisive voter in the periphery, winning the rural vote becomes an important strategy. Even when elections are unfree and only used as a means
of regime legitimation, controlling the rural vote and ensuring the desired outcome often involves policies that deliver benefits to particular voters or regions\textsuperscript{1}. In total, echoing the criticisms of Varshney and others (Varshney, 1993), considering the role of elections in rural, developing countries has the potential to improve our understanding of the policy-making process.

The link between electoral accountability and potential bias in public policies echoes a large body of research dealing with the disciplining effects of elections. Basic models of electoral accountability highlight the control function electoral competition plays for the behavior of self-interested politicians (Besley, 2006; Persson and Tabellini, 2000), endowing the voting population with an important tool to affect the government’s behavior. Existing empirical research has linked the introduction of elections, the degree of competitiveness and the availability of candidate information to a number of important outcomes (Adam et al., 2011; Aidt and Eterovic, 2011; Besley and Burgess, 2002; Besley et al., 2007; Ferraz and Finan, 2011; Huber et al., 2008; Iversen, 2005; Lindert, 2004; Keefer and Vlaicu, 2007; Stasavage, 2005).

When elections are used as a way to aggregate preferences of the general population and select representatives through a competitive mechanism, rural citizens can supply the necessary votes to induce politicians to supply desired public goods and reduce urban bias.

\textsuperscript{1} Scholars are still divided over the exact purpose these semi-competitive elections play in autocratic regimes - ranging from signaling strength to the opposition, dividing the opposition or bargaining within the ruling coalition (Blaydes, 2011; Brownlee, 2007; Magaloni, 2006). Elections are also used to select representatives for legislative bodies like parliaments, which in turn are used to manage the ruling coalition, distribute benefits to supporters, elicit information or even tie the autocrats hands to institute credible property rights (Gandhi and Przeworski, 2006, 2007; Gandhi, 2008; Macdonald, 2006; Myerson, 2008). No matter what the ultimate purpose of elections in semi-democracies and autocratic regimes, the ability of rural agents and intermediaries to deliver or withhold votes to the center can be a powerful bargaining tool.
4.2.1 The Effects of Elections on Rural Public Goods Provision

For illustrative purposes consider the following simple formalization of the argument, similar in spirit and structure to Stasavage’s (2005) model on public education expenditures. A government G rules over an urban center (C) with population share \( s \) and a rural periphery (P) with population share \( 1 - s \), with \( s \in (0, 0.5) \) and total population size 1, defining a rural majority society. The government has to decide over the allocation of public expenditures to be spend in the urban center, the rural periphery and how much is appropriated as private rents. Total government expenditures are normalized to 1, \( g_c \) denotes spending in the urban center, \( g_p \) expenditures in the countryside and \( 1 - g_c - g_p \) is private government consumption.

At the beginning of the game the incumbent government proposes a policy vector \( p_g = (g_c, g_p) \). In a society with no means of institutional accountability, the rural population is forced to accept any proposal, while the urban population has a choice of letting the proposed policy being implemented or rioting \( r = 1 \) at a cost \( c(s) = (1 - s)^2 \), leading to the overthrowing of the government. This reflects the political power geographical proximity to the center of government conveys to urban citizens. Protest in the streets of a densely populated capital can quickly escalate and depose the government (Kuran, 1991; Lohmann, 1994), either through the protest movement itself or because protest triggers changes in the ruling coalition which leads to a coup.

If the population in the center decides to riot, it has to pay the price of protest \( c(s) = (1 - s)^2 \). The cost are defined to be a convex, falling function of the population \( s \) in the capital. Olsonian collective action theory suggests collective action problems are more severe in large groups (Olson, 1965), but in the context of this model more citizens in the urban center also implies higher population density. In an environment of high population density, it is easier to organize protest, because information trans-
mission and monitoring is less costly, while government repression often inadvertently affects innocent bystanders, which increases their costs of non-participation (Kalyvas and Kocher, 2007). Rioting deposes the incumbent government (which receives zero utility), no government spending takes place in either region, but urban protesters receive a fraction $\alpha \in (0, 1)$ for taking over the government. High values of $\alpha$ make rioting very attractive to the urban population because they can appropriate a large share of the government’s budget, while low values of $\alpha$ imply large amounts of destruction.

If the urban population decides not to riot ($r = 0$), the proposed policy is implemented and the government stays in power, receiving implied rents from the budget and a positive payoff $\gamma$ for simply holding office. This setup implies the following utility functions for a representative citizen in C and P and for the government G:

$$U^G = (1 - r)(\gamma + 1 - g_c - g_p) + r \cdot 0 \quad (4.1)$$

$$U^C = (1 - r)\frac{g_c}{s} + r \cdot (\frac{\alpha}{s} - (1 - s)^2) \quad (4.2)$$

$$U^P = (1 - r)\frac{g_p}{1 - s} + r \cdot 0 \quad (4.3)$$

The sub-game perfect equilibria of the game can be found by backwards induction. First, a citizen in the city will only riot if $\frac{g_c}{s} < \frac{\alpha}{s} - (1 - s)^2$. If $\frac{\alpha}{s} < (1 - s)^2$, rioting is never rational. To make the game interesting, I assume the urban threat is credible and $\alpha > s(1 - s)^2$ is always true. Given the threat is credible, this defines a threshold on $g_c$ above which no rioting will take place and the government remains in office ($g_c \geq \alpha - s(1 - s)^2$). Now, the incumbent government will pick a vector $p = (g_c, g_p)$ that maximizes $U_G = \gamma + 1 - g_c - g_p$, subject to a budget constraint $1 \geq g_c + g_p$ and the riot constraint $g_c \geq \alpha - s(1 - s)^2$. It is easily seen that G will always pick $g_p = 0$ to minimize spending and fulfill the riot constraint with equality, implying equilibrium levels of spending in the city of $g^*_c = \alpha - s(1 - s)^2$. Urban bias
can then be defined as the difference in spending between the city and the periphery $g_c^* - g_p^* = \alpha - s(1-s)^2$, which is in this equilibrium always greater than zero. The comparative statics are also straightforward and intuitive, a greater value of alpha increases urban bias ($\frac{\partial g_c^*}{\partial \alpha} > 0$), because the reservation price for not rioting increases. Equally, a larger share of the population in the city $s$ increases urban bias, due to the reduced costs of protest ($\frac{\partial g_c^*}{\partial s} > 0$). The effect of the urban population share expresses the political influence dense cities have over policy formulation in the capital.

This is the typical urban bias outcome, in which in the absence of elections the minority urban population can secure favorable government policies by threatening riots. Now, if free and fair elections are introduced the equilibrium amount of urban bias will change. In a game with elections, the incumbent government now faces a challenger in simple plurality elections. Denote the incumbent government $A$ and the challenger $B$, both propose a policy vector $p_{A,B} = (g_c, g_p)$ at the beginning of the game. The second stage of the game allows all citizens to cast one vote for incumbent $A$ or the challenger $B$, which is determined by the difference in payoffs incurred under the proposed policies. After a government is elected, citizens in the urban center are still allowed to riot and overthrow whoever won the election. Again, the sub-game perfect equilibrium of the game is found by backwards induction. As before, the urban population imposes a riot constraint on $g_c \geq \alpha - s(1-s)^2$ on whoever wins the election. Given that during the voting stage the median voter is by definition a rural citizen, both $A$ and $B$ have to compete only over values of $g_p$ to win the election. In case $A$ and $B$ propose the same policy for the periphery, a coin toss decides the election. At the first stage, both $A$ and $B$ will propose a policy vector that maximizes $\gamma + 1 - g_c - g_p$ subject to the budget and riot constraint.

\[2 \text{ Furthermore, if urban bias is alternatively defined as the difference in per capita spending, comparative statics remain the same.}\]
Since winning the election does not imply any positive payoffs if the riot constraint is not fulfilled, it is still the case that \( g^*_c = \alpha - s(1 - s)^2 \). To win the rural vote, both candidates have to determine optimal levels of \( g_p \). If one candidate picks the prior equilibrium strategy and assigns \( g_p = 0 \), the other has an incentive to deviate and propose any \( g_p > 0 \) and win the election. Furthermore, if \( g_{pA} > g_{pB} \) the median rural citizen will vote for the incumbent and A stays in power. In this case candidate B can do better by proposing at least \( g_{Bp} \geq g_{Ap} \). Electoral competition between A and B leads both candidates to allocate the remaining budget to \( g_p \), implying each candidate wins with probability \( \frac{1}{2} \) and \( g^*_p = 1 - (\alpha - s(1 - s)^2) \).

First note that electoral competition in this context forces the government to spend the whole budget on its citizens, rather than misappropriating parts for private consumption. Furthermore, urban bias is now \( g^*_c - g^*_p = \alpha - s(1 - s)^2 - [1 - (\alpha - s(1 - s)^2)] = 2\alpha - 1 - 2s(1 - s)^2 \), which is always lower than the amount of urban bias with no elections. Introducing electoral competition in a rural majority setting strictly reduces urban bias, even though the city population retains the ability to protest\(^3\). The comparative statics with regard to \( \alpha \) and \( s \) remain the same\(^4\). Interestingly, while electoral competition improves the responsiveness of the government with regard to the rural majority, the urban population can always secure a minimum level of spending determined by the riot constraint.

This simple formalization gives credence to the intuition that elections in rural majority settings should counteract urban bias. Crucially, the model suggests a causal mechanism that relies on three assumptions: Rural majority, competitiveness, and unidimensionality. Government’s will only reduce urban bias if the decisive voter is truly located in the countryside, either by sheer numbers of aggregation bias or the

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\(^3\) Absolute levels of urban bias might still be positive.

\(^4\) Again, if urban bias is alternatively defined as the difference in per capita spending, the results remain the same.
electoral system. Furthermore, in equilibrium elections will only drive policy away from urban bias if competition is free and fair. If elections are of low quality and candidates can collude, the results might be much weaker. Last, the model relies on the assumption of unidimensionality. Cross-cutting cleavages like ethnic identity or religious affiliation can be exploited by urban interests to implement a divide-and-rule strategy (Dunning and Harrison, 2010; Huber and Stanig, 2011; Moore, 1985).

Hence, for the empirical analysis I expect to find a negative effect of elections on urban bias in rural majority settings, potentially mitigated by the presence of cross-cutting cleavages and the level of competitiveness

4.3 District Head Elections in Indonesia

Testing the causal effect of elections on urban bias is difficult for at least two reasons. One, urban bias is an inherently multidimensional concept and not straightforwardly measured. Two, democratization and electoral reforms are usually determined in endogenous processes, which are likely related to urban-rural cleavages. Given these difficulties it is not surprising that to date there has not been a quantitative evaluation of the causal claim. Luckily, a particular feature of Indonesia’s democratization and decentralization program in the last decade provides an ideal opportunity to

5 Also note the model rests on the assumption of perfect turnout for rural voters. A growing literature on clientelism (Calvo and Murillo, 2004; Kitschelt, 2000; Kitschelt and Wilkinson, 2007; Gehlbach and Keefer, 2008) has shown the enormous importance of patronage networks and personal relationships between voters and local intermediaries in autocratic and democratic electoral settings. Local machine bosses, large landowners, and important intermediaries like financiers or fertilizer distributors are able to trade private goods in direct exchange for votes and turnout, creating mechanisms to monitor voter behavior and establish a long-run relationship with voters (Baland and Robinson, 2008). The presence of well-functioning clientelistic networks under the control of local and regional rural elites can be crucial bargaining chip against the center, which can be used to influence government policy in a way to avoid overtaxation of rural producers and at the same time funnel resources back through government spending programs (seed banks, fertilizer subsidies, loans, government jobs, health care and education) that improve the living conditions of rural residents and reinforce clientelistic networks. Such aspects of turnout and vote control seem promising theoretical extensions, but go beyond the scope of the current paper.

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confront the electoral hypothesis with new evidence.

During Suharto’s rule of Indonesia from 1965 to 1998 public policies were largely formulated and implemented by a highly centralized political apparatus and with strongly limited political accountability (Aspinall and Fealy, 2003; Aspinall and Mietzner, 2010). While provincial and district governments existed and formally elections took place, all candidates were vetted and approved by the central Ministry of Home Affairs, leaving no room for local discretion or democratic accountability. After the fall of President Suharto’s New Order regime in 1998, Indonesia embarked on a dual project of democratization and decentralization, termed reformasi. Apart from free and fair multi-party elections at the national level, one of the main demands in the wake of the fall of the New Order was increased regional autonomy (fiscal and political), especially for resource-rich regions, as well as improved local accountability (Crouch, 2010; Bünte, 2009). Two laws, drafted under the Habibie presidency (1998-99), Law 22/1999 and Law 25/1999, outline in broad brushes the main thrust of decentralization reform: relocate main government responsibilities to the district level, paired with a system of revenue-sharing and regional redistribution (Hofman and Kaiser, 2002; World Bank, 2003). In 1999 citizens elected representatives to national, provincial and district parliaments. Starting in 2001 local legislatures had the right to authorize the budget and vote on local laws and regulations. District government activity is financed largely through shared revenue allocations and block-grants (DAU) by the central government. Regions rich in natural resources get special allocations to reflect the above-average contribution in revenue creation. Local governments also receive ear-marked grants for special development projects (DAK). Local taxation authority remains fairly limited (Lewis, 2003, 2005). In the period between 1999 and 2004 local legislatures elected district heads, while starting in 2005 electoral reform introduced the direct election of district heads. This switch in electoral law was driven by the general impression of elite
collusion in the district head elections and lack of transparency and accountability. District head candidates had to be nominated by parties or coalitions of parties represented in local parliament, which often led to the selling of party nominations and votes to rich local candidates (Buehler and Tan, 2007; Buehler, 2010). The switch to direct elections still requires candidates to run with the nomination of parties, but removes the election from bargaining in the legislature to competitive general polls. While there are still concerns about elite collusion and vote buying, the direct election (pilkada) are generally seen as fairly competitive (Clark and Palmer, 2008; Erb and Sulistiyanto, 2009). Furthermore, evidence on local village-level elections suggests direct elections can counter-act elite capture (Olken, 2010).

While local legislatures pass laws and regulations, can impeach the district head and question the leadership after a yearly accountability speech, local district heads (bupati or walikota) have strong discretionary and agenda setting powers with respect to government spending, giving special importance to the identity and mode of selection for district heads.

Importantly for the analysis, the indirect (1999-2004) and direct (2005 onward) election of district heads was phased-in not uniformly. In an attempt to smooth the process of parallel decentralization and democratization local district heads appointed under Suharto before 1999 were allowed to finish their terms and were replaced only consecutively between 1999 and 2004. The replacement of an appointed district head took place at the end of the original term or after recusals from office due to health reasons or no-confidence votes, but exogenously and unrelated to other district characteristics. This exogenously determined schedule of district head replacements was kept for the direct elections between 2005 and 2009.

This exogenous timing implies that in 2001 when districts took up major spend-

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6 Independent candidates are possible, but the regulatory and financial burden is seen as prohibitively high.
ing and public goods provision responsibilities, only a subset had democratically elected district heads, while others still operated under the leadership of appointed heads. Similarly, in 2005 only a select number of district implemented direct elections, while others passed budget allocations under the agenda setting of indirectly elected district heads. The exogenous phasing-in of indirect and direct elections has been used successfully to analyze the effect on absolute expenditure levels (Skoufias et al., 2011) and deforestation (Burgess et al., 2010).

Analyzing the effect of elections on urban bias using Indonesian local elections offers several advantages. First, given the transition from appointed, to indirectly, to directly elected district heads allows me to estimate two causal effects: one capturing the difference between autocratically appointed governments and indirectly elected ones, the second one representing the difference between indirectly and directly elected district heads. The main difference between these two modes of election for the purposes of the argument is not the distinction between indirect and direct elections, but rather the level of competitiveness and responsiveness to voters, which is generally seen to have increased with the move to pilkada. In both cases the expectation is to find a positive effect on expenditures benefiting rural citizens and an overall reduction of urban bias. Given that districts are responsible for many important government functions, bias in local spending is a good overall measure of urban or rural bias.

Second, using Indonesian local elections constitutes a hard test, since the overall effect of elections is decomposed into two parts and the time period under scrutiny is rather short. Even if the move from autocracy to perfect electoral democracy has an overall effect on urban bias, identifying the effect in two separate steps might be hard. Similarly, observing relevant changes in the budget composition in a time period of a few years equally requires a strong accountability effect of elections. Furthermore, even though local elections are seen as generally free and fair, elite dominance is a
serious concern in Indonesian politics. Finding any type of positive effect of indirect or direct elections on public expenditures suggests strong evidence in favor of the accountability effects of elections versus the political power of urban residents.

Third, Indonesia represents a good case for the wider evaluation of the urban bias argument. Featuring a large number of diverse rural districts, characterized by variation in agricultural production, wealth, ethnic heterogeneity and situated in an overall environment of new and fragile institutions, any inference about the link between electoral competition should offer important insights for other low and middle income countries\footnote{While in 2010 only about 14\% of GDP was produced by the agricultural sector, over half of the labor force is still employed in agriculture.}. Quantitatively testing the causal effect of elections is difficult due to endogeneity concerns and unobserved heterogeneity. This is evidenced by the general lack of quantitative investigations of the connection between urban bias and democracy (a notable exception is Stasavage (2005)). Using cross-country data on urban bias offers few advantages given the strong variation of important unobserved factors that can drive both democratization and urban bias. Foregoing the generalizability of cross-country studies and focusing on sub-national data allows the analysis of a more homogenous set of units.

Last, the focus on district-level budgets has an additional measurement advantage. Since net levels of urban bias are affected by public expenditures and pricing policies, few good measures at the country-level exist - governments might tax cash crop producers in the countryside through export taxes, but also spend revenue on rural road construction. For Indonesian district heads though the decision over the local budget composition is the main available policy lever. Since districts have little to no own tax capabilities (Lewis, 2003, 2005) and agricultural pricing policies are set at the national level, the budget decision is the most important policy at the local level. While the usual urban bias argument focuses on the national level, it is still
possible to learn about the underlying logic from sub-national processes. For example, in the district of Bone in the South Sulawesi province under the leadership of the appointed district head Muhammad Amir, a former military officer, over half of the budget was devoted to administrative expenditures, despite the fact that Bone is a strongly rural district with over half of the local GDP generated in the agricultural sector and only 15% of the population living in the local district capital. Administrative expenditures directly benefit the population in the local capital and have only indirect relevance for the majority of the rural population. Importantly, after the introduction of elections in 2002, Muhammad Amir was replaced by a challenger, who in his first year in office slashed administrative expenditures by nearly five percentage points and increased agricultural expenditures by one percentage point. The following section will use a large number of Indonesian districts to show that this is a common pattern, driven by electoral accountability.

4.4 Empirical Analysis

4.4.1 Data Sources and Empirical Approach

The main goal of the empirical analysis will be to determine if the introduction of elected district heads had any effect on the public expenditure profile in Indonesian districts. In particular, I am interested in the relative changes of expenditures benefitting rural or urban residents. The analysis will only consider districts officially classified as rural (“kabupaten”) and also discard districts that split as part of the decentralization process. Each rural district has a local “capital” in which urban residents can exert political power over elected officials and hence replicates the national level logic of urban bias at the local level. The splitting of districts is an intensely political process and has wide-ranging budgetary consequences (Fi-
trani et al., 2005), rendering split districts unfit for inclusion in the sample. For the analysis of indirectly elected district heads, there is available data on 143 rural, non-splitting districts, 80 of which had indirectly elected bupatis taking over budgetary authority in 2002 and 63 with appointed district heads. Similarly, in 2005 86 of the 140 non-splitting rural districts with available data, had direct district head elections, leaving 54 control units.

Focusing on expenditures is reasonable given the short time frame considered here. In each district the budget compromises various budgetary categories covering administrative, health care, education, construction and several other areas. Expenditures in each category are classified as routine or development. Routine expenditures are regular recurring costs like salaries and expenses related to maintaining infrastructure, development expenditures are capital investments like the construction of a new buildings or infrastructure. For many spending categories it is unclear whether urban or rural residents are the main beneficiaries, making them unsuitable for an analysis of urban bias. For that reason, I will focus in particular on two spending areas: agriculture and administration. Agricultural expenditures cover the construction and maintenance of irrigation systems, seed vaults and storage facilities, agricultural extension services, etc. and most directly capture the relative emphasis the local government puts on spending in the rural sector. Administrative spending on the other side is used to construct and maintain main government buildings and hire administrative staff. This expenditure category is used heavily by local district heads for patronage jobs and can reach up to 80% of the budget, but has little relevance for rural residents in the district. At a minimum, urban-rural bias is most pronounced in these two categories compared to the others. For each spending area I consider as a dependent variable the share of the expenditure cat-

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8 In a different paper, I show that district splitting is most likely in large and rural districts (AUTHOR 2011), which implies that the units for which elections should have the clearest effect are removed from the sample.
egory as a percentage of the total budget\textsuperscript{9}. I also split total spending into routine and development expenditures and calculate respective shares for agricultural and administrative expenditures, with the expectation that an effect is most likely for agricultural development expenditures (starting new projects) and routine administrative expenditures (slashing expenditures). Raw data on budgetary expenditures at the district level for the period 2001-2006 come from the Ministry of Finance and have been cleaned and corrected thoroughly by the World Bank Jakarta Office.

\textbf{Figure 4.1: Share of agricultural expenditures, by year}

Figure 1 and 2 show the development of expenditure shares over time. Looking at the share of agricultural expenditures, one can see that after 2001 and 2005 the share of agricultural expenditures increased, while administrative expenditures decreased.

\textsuperscript{9} The important assumption here is that expenditures in all other categories benefit both urban and rural citizens, but with a fixed split, i.e. a reduction in administrative expenditures cannot be substituted one-for-one by an increase in education or health expenditures.
slightly. District expenditures are nearly completely financed by central government transfers. Over 90% of local budgets comes from block grants (DAU) and special allocation grants (DAK), while own source revenue plays only a marginal role (Lewis, 2003, 2005). Nonetheless, in the empirical analysis I will control for the size of the revenue, since the central government could have increased local budgets especially in district with new elections to ensure a positive outcome. Other control variables used in the analysis are the total population count, distance to Jakarta, ethnic heterogeneity and the share of the urban population. Information on covariates comes from the World Bank, the Indonesian social survey (SUSENAS), the village census (PODES) and the population census. Information on the status of the district head for each year was obtained from the Ministry of Home Affairs, recording whether in a particular district in a given year the district head was appointed, indirectly
elected or directly elected\textsuperscript{10}. Summary statistics on all variables can be found in the appendix.

\textsuperscript{10} In some cases district heads are classified as “caretakers”, occurring when district splits and new elections have not yet taken place. These cases are inconsequential for the analysis.
4.4.2 The Exogeneity of the District Head Status

The identification of a causal effect hinges on the assumption that the treatment assignment is truly exogenous to potential outcomes and other observable and unobservable characteristics. A priori, the phasing-in of indirect and direct elections in Indonesia fulfills the criteria for a natural experiment (Dunning, 2008; Robinson et al., 2009). In addition, the appendix presents balance statistics for a number of covariates. The vast majority of variables show no statistical difference between treatment and control units and as a further robustness check I predict for each district the status of the district head in 2002 and 2006 using observable district characteristics. Using a long list of district-level variables, I find no statistically significant relationships for the direct and indirectly elected district heads (details can be found in the Appendix). Nonetheless, in the subsequent analysis I will control for several context factors.

4.4.3 Difference-in-Difference Estimation

The main approach to estimating the potential causal effect of elections on urban bias and the rural public expenditures relies on a simple group-level multi-year differences-in-differences analysis. For such an analysis, the estimation of a causal effect essentially comes down to comparing changes in districts with and without elected districts heads. The key assumption for identification in a difference-in-difference analysis is the commonality of time trends. For all districts there are changes in expenditure shares over time, but these time trends are shared across treatment and control groups. Then any difference between changes over time between treatment and control units can be attributed to the treatment (Angrist and Pischke, 2009). Focusing on the difference-in-difference removes the influence of any shared unobserved

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11 For details see Angrist and Pischke (2009)
group-level fixed characteristics of all the districts that held elections in 2001 or 2005 respectively. The difference-in-difference estimation can easily be implemented using a regression framework with the correct set of dummy variables:

\[ y_{it} = \alpha + \gamma_t + \theta \cdot D_i + \delta \cdot Elec_{it} + \beta'x_{it} + \epsilon_{it} \] (4.4)

Where \( \alpha \) is the generic intercept, \( \gamma_t \) represents year fixed effects, \( D_i \) is a dummy denoting membership in the group of districts with elections in 2001 or 2005 respectively and \( Elec_{it} \) a dummy variable that takes the value 1 for districts with \( D_i = 1 \) in post 2001 or post 2005 years. The coefficient \( \delta \) is then the estimate of the difference-in-difference effect of having an elected district head. This setup also allows the inclusion of district-level time-invariant or time-changing covariates \( x_{it} \).

Since the dependent variable of interest is a budget share and is bounded between 0 and 1, direct application of standard OLS will induce inferential problems and produce non-normal errors. To rectify this problem, I log-transform the dependent variable\(^{12}\). Throughout I will be using robust standard errors clustered at the district level.

Table 4.1 shows the difference-in-difference estimation for the log-transformed share of agricultural expenditures with indirectly elected district heads as treatments, using data from 2001 to 2004. The model includes information on district revenue, total population, the distance to Jakarta, ethnic fractionalization and the share of the urban population. First, the dummy variable identifying the treatment group shows that there are little mean differences treatment and control units in their budgetary shares. The treatment effect \( \delta \) is statistically insignificant across all three expenditure types, indicating that the first type of local elections did not improve the expenditure profile for rural citizens. The control variables on the other

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\(^{12}\) The log transformation \( y_{it} = \ln\left(\frac{\text{Share}_{it}}{1-\text{Share}_{it}}\right) \) ensures that \( y_{it} \in [-\infty, \infty] \). Virtually all budget shares in the sample lie between 0 and 1 and pose no complication for this transformation. For a handful of districts the share of development administrative expenditures of all development expenditures is 100%. For these districts I use budget shares of 99% to implement the transformation.
hand perform largely as expected. In particular, the share of urban population in the district has a statistically significant negative effect on relative agricultural expenditures. A one percentage point increase in the urban population is expected to reduce the share of agricultural expenditures in the total budget by several percentage points. This result confirms the comparative static result from the formal model with regard to the share of the urban population, that even in the presence of electoral accountability, non-institutional threats of the urban population are important determinants of policy.

Table 4.1: Difference-in-Difference indirect elections (with controls), 2001-2004

<table>
<thead>
<tr>
<th></th>
<th>Agri Exp Share</th>
<th>Dev Agri Exp Share</th>
<th>Routine Agri Exp Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>-3.161***</td>
<td>-2.872***</td>
<td>-3.438***</td>
</tr>
<tr>
<td>Treatment Group</td>
<td>-0.144†</td>
<td>-0.075</td>
<td>0.069</td>
</tr>
<tr>
<td>δ</td>
<td>0.065 (0.087)</td>
<td>-0.002 (0.095)</td>
<td>-0.132 (0.105)</td>
</tr>
<tr>
<td>Revenue</td>
<td>-0.068 (0.434)</td>
<td>-0.446 (0.553)</td>
<td>-0.913 (0.711)</td>
</tr>
<tr>
<td>Total Pop</td>
<td>-60.449 (89.42)</td>
<td>86.013 (121.05)</td>
<td>115.834 (142.07)</td>
</tr>
<tr>
<td>Dist Jakarta</td>
<td>1.830* (0.879)</td>
<td>1.738 (1.07)</td>
<td>3.088** (0.972)</td>
</tr>
<tr>
<td>ELF</td>
<td>0.203* (0.083)</td>
<td>0.229 (0.149)</td>
<td>0.016 (0.166)</td>
</tr>
<tr>
<td>Share Urban Pop</td>
<td>-0.621* (0.171)</td>
<td>-0.475* (0.228)</td>
<td>-0.401 (0.316)</td>
</tr>
</tbody>
</table>

N 541 537 531
$R^2$ 0.266 0.082 0.128
adj. $R^2$ 0.252 0.065 0.111
Resid. sd 0.403 0.616 0.638

Clustered Robust standard errors in parentheses
† significant at $p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$

Now, moving to the analysis of administrative expenditures, Table 4.2 repeats the analysis using log-transformed total, development and routine administrative expenditures.

Here the treatment effect is estimated to be negative for all three spending categories and statistically significant at the 5% and 1% levels. Having an indirectly elected district head is expected to reduce general administrative, development and routine expenditures. Interestingly, for administrative expenditures, the share of the urban population is estimated to have a positive effect, completely in line with the standard urban bias argument. Note, that the results are likely to be biased against
Table 4.2: Difference-in-Difference indirect elections (with controls), 2001-2004

<table>
<thead>
<tr>
<th></th>
<th>Admin Exp Share</th>
<th>Dev Admin Exp Share</th>
<th>Routine Admin Exp Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>1.072*** (0.151)</td>
<td>-0.699*** (0.195)</td>
<td>-1.482*** (0.207)</td>
</tr>
<tr>
<td>Treatment Group</td>
<td>0.080 (0.118)</td>
<td>0.069 (0.084)</td>
<td>0.313 (0.201)</td>
</tr>
<tr>
<td>(\delta)</td>
<td>-0.233* (0.11)</td>
<td>-0.245* (0.099)</td>
<td>-0.462* (0.176)</td>
</tr>
<tr>
<td>Revenue</td>
<td>-0.124 (0.389)</td>
<td>-0.955** (0.391)</td>
<td>1.986** (0.656)</td>
</tr>
<tr>
<td>Total Pop</td>
<td>-102.817 (88.85)</td>
<td>175.454 (101.51)</td>
<td>-527.250*** (151.3)</td>
</tr>
<tr>
<td>Dist Jakarta</td>
<td>2.561** (0.929)</td>
<td>1.512 (1.03)</td>
<td>3.263** (1.204)</td>
</tr>
<tr>
<td>ELF</td>
<td>0.277* (0.141)</td>
<td>0.170 (0.117)</td>
<td>0.395* (0.198)</td>
</tr>
<tr>
<td>Share Urban Pop</td>
<td>0.057 (0.209)</td>
<td>0.399 (0.203)</td>
<td>-0.265 (0.312)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N</th>
<th>545</th>
<th>541</th>
<th>543</th>
</tr>
</thead>
<tbody>
<tr>
<td>(R^2)</td>
<td>0.146</td>
<td>0.211</td>
<td>0.199</td>
</tr>
<tr>
<td>adj. (R^2)</td>
<td>0.130</td>
<td>0.196</td>
<td>0.184</td>
</tr>
<tr>
<td>Resid. sd</td>
<td>0.600</td>
<td>0.677</td>
<td>0.867</td>
</tr>
</tbody>
</table>

Clustered Robust standard errors in parentheses

\(^*\) significant at \(p < .10\); \(^*\)\(p < .05\); \(^{**}\)\(p < .01\); \(^{***}\)\(p < .001\)

finding a statistically significant effect for at least two reasons. One, indirect _bupati_ elections were generally seen as not very competitive and largely driven by “money politics”, i.e. the buying of political positions and votes. Second, some districts switch to having indirectly elected district heads after 2002, but are for the purposes of the analysis part of the control group. This means that between 2002 and 2004 expenditures on agriculture and administration in some of the control units have become more favorable to rural residents, diminishing the probability of finding a statistically significant difference. Finding any result indicates the causal effect of elections might even be larger than estimated.
The comparison of the 2001-2005 period to expenditures in 2006 after some districts had directly elected district heads, allows the estimation of the causal effect of moving from indirect to direct elections. Table 4.3 shows the difference-in-difference results for the log-transformed share of agricultural expenditures.

Table 4.3: Difference-in-Difference direct elections (with controls), 2001-2006

<table>
<thead>
<tr>
<th></th>
<th>Agri Exp Share</th>
<th>Dev Agri Exp Share</th>
<th>Routine Agri Exp Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>-2.949*** (0.129)</td>
<td>-2.570*** (0.168)</td>
<td>-3.325*** (0.152)</td>
</tr>
<tr>
<td>Treatment Group</td>
<td>-0.069 (0.050)</td>
<td>-0.098 (0.066)</td>
<td>-0.018 (0.095)</td>
</tr>
<tr>
<td>δ</td>
<td>0.108* (0.047)</td>
<td>0.185* (0.074)</td>
<td>0.072 (0.103)</td>
</tr>
<tr>
<td>Revenue</td>
<td>-0.130 (0.257)</td>
<td>-0.435 (0.32)</td>
<td>-0.356 (0.293)</td>
</tr>
<tr>
<td>Total Pop</td>
<td>-124.875 (73.88)</td>
<td>-19.185 (96.86)</td>
<td>-36.698 (105.72)</td>
</tr>
<tr>
<td>Dist Jakarta</td>
<td>2.003** (0.721)</td>
<td>2.102* (0.874)</td>
<td>2.532** (0.86)</td>
</tr>
<tr>
<td>ELF</td>
<td>0.128 (0.72)</td>
<td>0.091 (0.114)</td>
<td>0.021 (0.134)</td>
</tr>
<tr>
<td>Share Urban Pop</td>
<td>-0.629* (0.138)</td>
<td>-0.430* (0.166)</td>
<td>-0.525* (0.249)</td>
</tr>
</tbody>
</table>

| N        | 812 | 808 | 798 |
| R²       | 0.356 | 0.151 | 0.153 |
| adj. R²  | 0.347 | 0.138 | 0.140 |
| Resid. sd| 0.368 | 0.566 | 0.589 |

Clustered Robust standard errors in parentheses
† significant at p < .10; *p < .05; **p < .01; ***p < .001

The treatment effect of switching from indirect to direct elections is estimated to be positive for all three spending categories, but only found statistically significant for total and development expenditures. Again, this is reasonable since only one year of expenditures after the treatment is available and any changes to budgetary structures are most likely in the general or development category. Again, the share of the urban population has a negative effect on the share of agricultural expenditures.
Table 4.4: Difference-in-Difference direct elections (with controls), 2001-2006

<table>
<thead>
<tr>
<th></th>
<th>Admin Exp Share</th>
<th>Dev Admin Exp Share</th>
<th>Routine Admin Exp Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>-1.234*** (0.134)</td>
<td>-1.069*** (0.154)</td>
<td>-1.500*** (0.203)</td>
</tr>
<tr>
<td>Treatment Group</td>
<td>0.161* (0.075)</td>
<td>0.077 (0.070)</td>
<td>-0.113 (0.104)</td>
</tr>
<tr>
<td>δ</td>
<td>0.059 (0.081)</td>
<td>0.021 (0.087)</td>
<td>-0.018 (0.107)</td>
</tr>
<tr>
<td>Revenue</td>
<td>-0.076 (0.153)</td>
<td>-0.606** (0.188)</td>
<td>0.764* (0.302)</td>
</tr>
<tr>
<td>Total Pop</td>
<td>-76.503 (72.95)</td>
<td>144.701* (81.16)</td>
<td>-312.956** (121.83)</td>
</tr>
<tr>
<td>Dist Jakarta</td>
<td>2.148** (0.776)</td>
<td>1.316 (0.863)</td>
<td>2.796** (1.046)</td>
</tr>
<tr>
<td>ELF</td>
<td>0.248* (0.117)</td>
<td>0.039 (0.093)</td>
<td>0.448** (0.171)</td>
</tr>
<tr>
<td>Share Urban Pop</td>
<td>0.087 (0.169)</td>
<td>0.423* (0.154)</td>
<td>-0.165 (0.246)</td>
</tr>
</tbody>
</table>

| N                      | 819             | 815                  | 813         |
| R²                     | 0.108           | 0.165                | 0.174       |
| adj. R²                | 0.095           | 0.153                | 0.162       |
| Resid. sd              | 0.612           | 0.699                | 0.798       |

Clustered Robust standard errors in parentheses

* significant at p < .10; ** p < .05; *** p < .01; **** p < .001
Contrastingly, I find no effect of direct elections on administrative expenditures. Table 4.4 reports coefficient estimates and standard errors. Similar to the prior models, the effect of the urban population is found to increase the share of administrative expenditures (at least for the development category). Across spending types and the different forms of elections, I find evidence of a causal effect in line with the theoretical expectations. Despite the likely bias against finding a statistically significant result, the data clearly show that that gradual move to increased electoral accountability has shifted the relative composition of local budget in favor of rural residents. In addition, across all models, the share of the urban population behaves as the theoretical model predicts and indicates the struggle of competing influences on local politicians. Elections mute urban bias, while classic non-institutional pressures of urban citizens operate in parallel.

Apart for statistical significance, the substantive magnitude of the effect is sizable. Figure 3 graphically shows the estimated treatment effects for the statistically significant coefficients and associated 95% confidence intervals on the untransformed scale. Indirect elections of district heads reduce the relative share of administrative expenditures anywhere between 1-18 percentage points, a dramatic shift in policy. Somewhat smaller, but applying in addition of the effects of indirect elections, the move to direct elections causes an increase in agricultural expenditures roughly from 0-2 percentage points. Since the average share of agricultural expenditures is around 3%, the move to direct elections nearly doubles the relative share of expenditures directly benefitting rural residents.
Figure 4.3: Estimated Average Treatment Effects and 95% CIs
The fact that only administrative expenditures are affected in indirect elections and agricultural expenditures in direct elections deserves further attention. One possible explanation rests on the ability of local district heads to affect certain budget items. Potentially, it is easier for newly elected district heads to cut large budget items in administration fairly quickly, but it takes more time to develop and plan the creation of new projects in the field of agriculture.

An additional concern stems from the potential interaction of local politics with national-level developments. Local district heads to could adjust local expenditures to counter-act welfare effects of price distortions caused at the national level. The inclusion of year effects though safeguards against this possibility and assures that changes in local budgets are driven by electoral timing only.

4.4.4 Robustness Checks

Importantly, an analysis of residuals shows an approximately normal distribution and no problems with outliers. All results of the prior section hold up if control variables are dropped, increasing the confidence in the difference-in-difference assumptions. In addition, similar results are obtained even when using the original budget shares, avoiding the logit transformation. A more conservative alternative to the simple group-level difference-in-difference in panels is the inclusion of district fixed effects. The inclusion of district fixed effects removes any potential influence of unobserved time-invariant district characteristics. For a standard fixed effects model, the log-transformed expenditure share is estimated as a linear function of a dummy variable indicating indirectly or directly elected district head status, control variables and district and year fixed effects:

$$ y_{it} = \alpha_i + \gamma_t + \rho \text{Elec}_{it} + \beta' x_{it} + \epsilon_{it} $$

(4.5)
where $\alpha_i$ is the district-specific fixed effect, $\gamma_t$ the year fixed effects, $Elec_{it}$ the dummy variable indicating the district heads elected status and $x_{it}$ are time-varying covariates. Importantly, conditional on the fixed effects and time-varying covariates, the elected status is assumed to be exogenous. One also has to assume that the causal effect of elections is additive and constant. This fixed effects model can be estimated with OLS and I use robust standard errors clustered at the district level to correct for heteroskedasticity and arbitrary serial correlation. While this model specification removes another potential source of confounding, it is important to note that this comes at a price. The inclusion of fixed effects does not allow me to explore the interaction of elections with other time-invariant variables like ethnic fractionalization, which I will consider below. In addition, the time-series dimension of the data is very short and the estimation of the district fixed effects essentially relies on only a handful of years for each district, raising concerns of inefficiency.

Table 4.5 shows the estimated effects for indirect and direct elections, but suppresses the estimates for covariates\(^\text{13}\). The results for administrative expenditures are not robust to the inclusion of district-level fixed effects. Neither for indirect or direct elections do I find statistically significant effects in all three budget categories. On the other hand, for agricultural expenditures the results a strongly robust. For indirect elections, the fixed effects model estimates a positive effect on the share of agricultural expenditures, but fails to reach conventional levels of statistical significance. For direct elections, the fixed effects model confirms the results of the difference-in-difference estimation. Both the share of total and development expenditures have a statistically significant effect at the 10% and below 1% level respectively.

Another important concern with regard to the initial analysis stems from the com-

\[^\text{13}\text{All models control for district and year fixed effects, revenues, total population and the share of the urban population.}\]
Table 4.5: Fixed effects (with controls), 2001-2006

<table>
<thead>
<tr>
<th></th>
<th>Admin Exp Share</th>
<th>Dev Admin Exp Share</th>
<th>Routine Admin Exp Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>δ, Indirect</td>
<td>0.050 (0.051)</td>
<td>0.093 (0.056)</td>
<td>0.091 (0.071)</td>
</tr>
<tr>
<td>δ, Direct</td>
<td>0.053 (0.079)</td>
<td>-0.021 (0.084)</td>
<td>0.009 (0.098)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Agri Exp Share</th>
<th>Dev Agri Exp Share</th>
<th>Routine Admin Exp Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>δ, Indirect</td>
<td>-0.031 (0.032)</td>
<td>-0.092 (0.057)</td>
<td>0.051 (0.053)</td>
</tr>
<tr>
<td>δ, Direct</td>
<td>0.082ı (0.045)</td>
<td>0.215** (0.077)</td>
<td>-0.013 (0.090)</td>
</tr>
</tbody>
</table>

ı significant at \( p < .10 \); *\( p < .05 \); **\( p < .01 \); ***\( p < .001 \)

positional data structure of the budget shares. The simple difference-in-difference analysis treats administrative and agricultural expenditure shares as independent, when in fact they are part of a budget. In fact, budgetary data has a clear compositional structure, i.e. each district budget \( b_i \) is composed of \( J \) budget shares: \( b_i = (b_{i1}, ..., b_{ij})' \). For each budget share \( j \) in district \( i \) \( b_{ij} \in [0,1] \forall j = 1, ..., J \) and \( \sum_j b_{ij} = 1 \forall i \). Data of this type can be modeled following an approach by Katz and King (1999), developed for multiparty election data. The \( J \) budget shares in each district are transformed into a vector of \( J - 1 \) log-odds ratios \( y_i \): \( y_{ij} = log(b_{ij}/biJ) \forall j = 1, ..., J-1 \), using one budget category as reference. For simplicity, I divide the budget into administrative, agricultural and other expenditures, with “other” as the reference category. The data is fit in a Bayesian context with a multivariate \( t \) distribution, the simple difference-in-difference specification and diffuse normal priors on \( \beta \) and uniform priors for the remaining model parameters (for details see Jackman (2004, p.286)):

\[
y_1 = \begin{pmatrix} y_{i1} \\ y_{i2} \end{pmatrix} \sim t_v \left( \left[ \begin{array}{c} x_{i1} \beta_1 \\ x_{i2} \beta_2 \end{array} \right], \Sigma \right)
\]

The results of the analysis are best presented graphically. Figure ?? shows ternary plots for the effect of indirect and direct elections on budget compositions. Ternary plots show possible budget configurations with the three vertices representing a budget wholly devoted to one category. The left panel confirms the results from the
original difference-in-difference analysis, indirect elections shift the budget composition away from administrative expenditures to other expenditures, with no clear effect on agricultural expenditures. Similarly, direct elections increase agricultural expenditures at the expense of administrative and other expenditures. As long as administration and agriculture are the most biased budget items for and against the urban population respectively, these shifts imply a reduction in urban bias.

The last set of robustness checks moves from technical considerations to an exploration of the implied mechanism of the theoretical argument. The ameliorating effect of elections on urban bias hinges at a minimum on the rural majority condition, actual competition between candidates and the assumption of homogeneity in
Figure 4.5: 95% HPD Regions for Budget Compositions, Direct Elections

the rural sector.

The empirical analysis specifically targets districts classified as “rural”, excluding city-regencies from the sample, because one crucial assumption of the model locates the decisive voter in the rural periphery. If the decisive voter were in the urban sector, the introduction of elections should have no reductive impact on urban bias. When the difference-in-difference analysis is repeated in a sample of cities, indeed I find that elections have no reductive effect on administrative expenditures, as one would expect in urban-majority settings\textsuperscript{14}. In addition, the results are also robust to a Java dummy that controls for potential idiosyncrasies of the main island. The

\textsuperscript{14} Agricultural expenditures are negligible in urban districts.
potential pro-rural effect of elections is also dependent on the absence of cross-cutting cleavages. If the rural periphery is strongly divided along ethnic lines, then politicians could forge an electoral coalition based on urban constituents and specific, matching rural ethnic groups, dividing the rural vote and cementing traditional urban bias. To check for this possibility I include an interaction term between the treatment effect $\delta$ and the ethnic fractionalization score in the difference-in-difference regressions. In the case of indirect elections, including the interaction term increases statistical significance of the main treatment effect and implies that the share of administrative expenditures is reduced more strongly in ethnically homogenous districts. Similarly, including an interaction in the models for direct elections shows that ethnically homogenous districts increase the share of agricultural expenditure more strongly, while the impact of direct elections becomes unclear in ethnically divided districts. These results suggest that cross-cutting cleavages can mute the anti-urban bias effect of elections, providing further evidence for the primary causal effect and underlying mechanism$^{15}$.

A last robustness check focuses on the actual competitiveness of elections. The theoretical model’s causal mechanism rests on the assumption of competition between candidates to lead to public expenditures favoring the rural median voter. If electoral competition is characterized by collusion and unsavory conduct, it is likely that the pro-rural effects of elections on public spending profiles are muted. To investigate this claim, I collected election results for the first round of direct district head elections in 2005$^{16}$. While the timing of elections in Indonesian districts is plausibly exogenous, the same is not true for the actual level of competitiveness. Hence, in the following it will be important to control for a longer list of potential confounders.

$^{15}$ Detailed results available on request.

$^{16}$ Data on election results come from the central electoral commission (KPU), NDI and the Ministry of Home Affairs.
In particular, I will use 1 minus the winning party vote share as a rough measure of competitiveness and control for total population, urban population, district revenue, distance to Jakarta, ethnic fractionalization, real district GDP and the former ruling party’s vote share in the 1999 legislative elections. Tables 4.6 and 4.7 show the results of a simple OLS model with robust standard errors.

Table 4.6: Competitiveness in 2005 Elections

<table>
<thead>
<tr>
<th></th>
<th>Agri Exp Share</th>
<th>Dev Agri Exp Share</th>
<th>Routine Agri Exp Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>-2.487***</td>
<td>-1.962***</td>
<td>-3.029***</td>
</tr>
<tr>
<td></td>
<td>(0.221)</td>
<td>(0.347)</td>
<td>(0.205)</td>
</tr>
<tr>
<td>Competitiveness</td>
<td>0.005†</td>
<td>0.005</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
<td>(0.004)</td>
<td>(0.003)</td>
</tr>
<tr>
<td>Golkar Share</td>
<td>0.231</td>
<td>-0.112</td>
<td>0.263</td>
</tr>
<tr>
<td></td>
<td>(0.294)</td>
<td>(0.460)</td>
<td>(0.365)</td>
</tr>
<tr>
<td>ELF</td>
<td>0.291**</td>
<td>0.192</td>
<td>0.328**</td>
</tr>
<tr>
<td></td>
<td>(0.100)</td>
<td>(0.137)</td>
<td>(0.114)</td>
</tr>
<tr>
<td>Share Urban Pop</td>
<td>-0.297†</td>
<td>0.023</td>
<td>-0.453*</td>
</tr>
<tr>
<td></td>
<td>(0.159)</td>
<td>(0.275)</td>
<td>(0.209)</td>
</tr>
<tr>
<td>Real GDP</td>
<td>-0.032</td>
<td>-0.055</td>
<td>-0.011</td>
</tr>
<tr>
<td></td>
<td>(0.021)</td>
<td>(0.035)</td>
<td>(0.033)</td>
</tr>
<tr>
<td>Total Pop</td>
<td>-231.047</td>
<td>-54.770</td>
<td>-307.168</td>
</tr>
<tr>
<td></td>
<td>(194.853)</td>
<td>(326.154)</td>
<td>(204.957)</td>
</tr>
<tr>
<td>Revenue</td>
<td>-0.445</td>
<td>-0.718</td>
<td>-0.281*</td>
</tr>
<tr>
<td></td>
<td>(0.615)</td>
<td>(0.782)</td>
<td>(0.127)</td>
</tr>
<tr>
<td>Dist Jakarta</td>
<td>0.316</td>
<td>-0.001</td>
<td>1.300</td>
</tr>
<tr>
<td></td>
<td>(1.440)</td>
<td>(2.371)</td>
<td>(1.830)</td>
</tr>
</tbody>
</table>

N 59 59 56
R² 0.617 0.318 0.659
adj. R² 0.556 0.209 0.601
Resid. sd 0.241 0.329 0.247

Clustered Robust standard errors in parentheses
† significant at p < .10; *p < .05; **p < .01; ***p < .001

Table 4.7: Competitiveness in 2005 Elections

<table>
<thead>
<tr>
<th></th>
<th>Admin Exp Share</th>
<th>Dev Admin Exp Share</th>
<th>Routine Admin Exp Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>-1.413***</td>
<td>-1.358**</td>
<td>-1.188**</td>
</tr>
<tr>
<td></td>
<td>(0.275)</td>
<td>(0.449)</td>
<td>(0.362)</td>
</tr>
<tr>
<td>Competitiveness</td>
<td>0.000</td>
<td>0.005</td>
<td>-0.004</td>
</tr>
<tr>
<td></td>
<td>(0.004)</td>
<td>(0.005)</td>
<td>(0.005)</td>
</tr>
<tr>
<td>Golkar Share</td>
<td>0.738</td>
<td>0.060</td>
<td>1.596*</td>
</tr>
<tr>
<td></td>
<td>(0.541)</td>
<td>(0.630)</td>
<td>(0.691)</td>
</tr>
<tr>
<td>ELF</td>
<td>0.217</td>
<td>-0.024</td>
<td>0.378*</td>
</tr>
<tr>
<td></td>
<td>(0.124)</td>
<td>(0.205)</td>
<td>(0.174)</td>
</tr>
<tr>
<td>Share Urban Pop</td>
<td>0.028</td>
<td>0.319</td>
<td>-0.177</td>
</tr>
<tr>
<td></td>
<td>(0.218)</td>
<td>(0.430)</td>
<td>(0.334)</td>
</tr>
<tr>
<td>Real GDP</td>
<td>0.010</td>
<td>-0.008</td>
<td>0.031</td>
</tr>
<tr>
<td></td>
<td>(0.025)</td>
<td>(0.049)</td>
<td>(0.051)</td>
</tr>
<tr>
<td>Total Pop</td>
<td>-101.632</td>
<td>305.258</td>
<td>-575.458</td>
</tr>
<tr>
<td></td>
<td>(275.075)</td>
<td>(369.203)</td>
<td>(345.628)</td>
</tr>
<tr>
<td>Revenue</td>
<td>-0.061</td>
<td>-0.159</td>
<td>-0.073</td>
</tr>
<tr>
<td></td>
<td>(1.178)</td>
<td>(0.745)</td>
<td>(0.856)</td>
</tr>
<tr>
<td>Dist Jakarta</td>
<td>0.695</td>
<td>3.563</td>
<td>-4.121*</td>
</tr>
<tr>
<td></td>
<td>(1.038)</td>
<td>(3.193)</td>
<td>(1.951)</td>
</tr>
</tbody>
</table>

N 59 59 56
R² 0.359 0.131 0.417
adj. R² 0.257 0.008 0.318
Resid. sd 0.288 0.436 0.387

Clustered Robust standard errors in parentheses
† significant at p < .10; *p < .05; **p < .01; ***p < .001

For the share of agricultural expenditures, higher levels of competitiveness are
estimated to have a positive effect across spending types, but only statistically sig-
nificant for overall expenditures. For administrative expenditures, the effect is esti-
mated to be negative, but generally not statistically significant at usual levels.

These auxiliary results bolster the findings of the difference-in-difference and fixed
effects models, that the introduction of elections has weakly improved spending pro-
files in rural district in favor of rural residents and highlights the importance of
electoral competitiveness.

Overall, given the move to indirectly and then directly elected district heads, in
a political environment characterized by elite dominance, it is telling to find any
statistical evidence for the effect of elections on urban bias and rural government
expenditures. These findings give credence to Varshney’s (1994) suspicion that elec-
tion in rural majority settings can have important mitigating effects on urban bias,
but also caution somewhat against an unconditional expectation of electoral compe-
tition as a panacea for the rural poor. First, while the empirical evidence finds a link
between elections and expenditure patterns, the political power of the urban popu-
lation is also found to be an important determinant of policy. Second, the presence
of ethnic divisions or low levels of competitiveness weaken the role the rural vote can
play in elections.

4.5 Conclusion

Urban bias is a common phenomenon around the developing world and has many
important political and economic consequences. Understanding determinants of poli-
cies that support or hinder rural development are of enormous consequence for wider
economic development. In addition, the purported power of the urban poor is seen
to play an influential role for institutional and policy change, illustrated by the re-
cent elevated attention to food riots and political transitions in North Africa and
the Middle East (Arezki and Brockner, 2011; Bellemare, 2011; Bush, 2010). While a potential power for change and a threat to despots, the non-institutional influence urban groups hold can at the same time cement the political and economic exclusion of the rural periphery. Understanding the role of elections in this context of skewed political access, carries important insights. This paper provides a quantitative test of the hypothesis that electoral accountability diminishes urban bias in a rural majority setting. By leveraging a natural experiment of local elections in Indonesian districts, I am able to identify a causal effect, reflecting the improved sway the rural vote can hold over policy-makers. The estimated causal effect is of substantive importance and shows how electoral accountability shifts the budget composition of local governments. Importantly, I also find auxiliary empirical evidence that the positive effects of elections is mitigated by the presence of cross-cutting cleavages and low levels of electoral competitiveness. These results draw an interesting parallel to developments in the rest of the developing world, particularly Africa. The dramatic reduction of distortionary policies in Africa in the 1990s (Anderson and Masters, 2009), followed by the rise of multiparty elections (Lindberg, 2006), offers an important set of cases to study changes in urban-rural cleavages.

On a theoretical level, this paper shows that by extending the ideal-typical concept of urban bias to a theory that identifies conditions under which urban bias varies, new insights on questions of democratic accountability, redistributive conflicts and sub-national politics can be gained. An attractive feature of the urban bias account is the use of the spatial dimension to disaggregate redistributive policies and configurations of power, cutting across more commonly used theories of elections and redistribution. The paper also highlights further areas of research. While this paper does not investigate divisions within the rural sector (landed elite versus landless poor) or what form of political participation is used to win rural voters, it seems
obvious that both topics deserve further attention. The role of clientelistic linkage strategies and intra-rural conflicts both have to potential illuminate further determinants of urban bias. Conversely, approaching questions of democratization and clientelism using urban-rural conflict as a theoretical lens might add valuable insights and identify new testable propositions.
The Political Geography of District Splitting

Starting in 1999, after the transition to democracy and the beginning of wide-ranging decentralization reforms, Indonesia has not only relocated essential government functions to the district level, but also heavily increased the number of local governments, dramatically re-shaping the territorial structure of the archipelago. What factors drive such wide-ranging reforms in Indonesia and smaller efforts in many developed and developing countries (Bardhan, 2002)?

The size and territorial structure of a polity has been an important topic of theoretical discussion since the early beginnings of political theory, ranging from Plato and Aristotle, through the Federalist Papers, to more recent positivist research on federalism (Wibbels, 2006) and has been at the center of many actual political conflicts around the world. Modern research on territorial boundaries, federalism and decentralization has investigated the determinants of country size and federal structures. For one, country size is driven by a trade-off between market size and efficient public goods provision on the one side and the negative effects of an increasingly heterogeneous population on the other (Alesina and Spolaore, 2003; Bolton and Roland, 1997). Furthermore, outside military threats (Riker, 1964) and local administrative
capacity are also seen to shape the horizontal and vertical allocation of powers across territorial units (Ziblatt, 2004, 2006). Of equal importance for the creation and operation of multi-layered government structures are accompanying fiscal reforms and the timing of decentralization steps (Beramendi, 2007; Diaz-Cayeros, 2006; Falleti, 2010), which are both affected by distributive struggles and political concerns.

Federalism and decentralization have proven to be a popular political phenomenon in the developing world, not least because of their purported benefits, which include more efficient public goods provision, increased political accountability, healthy jurisdictional competition, improved economic performance, reduced ethnic strife and diminished violent conflict (Bardhan, 2002; Bednar, 2009; Boadway and Shah, 2009; Filippov et al., 2004; Tiebout, 1956; Oates, 1972; Weingast, 1995; Wibbels, 2006). While many experts and politicians vociferously promote decentralization reforms, the theorized benefits of a decentralized political system have only partially materialized across different contexts. Reflecting on the historical experiences with federalism and recent institutional changes in developing countries, a new wave of research has investigated how decentralization can have perverse effects, how local elites capture political institutions and more generally, how the choice of institutional arrangements is determined endogenously in a highly politicized process (Bardhan, 2002; Besley and Coate, 2003; Berry, 2009; Beramendi, 2007; Cai and Treisman, 2004; Craw, 2010; Dixit and Londregan, 1998b; Eaton et al., 2010; Gibson and Calvo, 2000; Grindle, 2009; Lassen and Serritzlew, 2011; Rodden and Wibbels, 2002; Rodden, 2006; Treisman, 1999, 2000, 2007; Wibbels, 2000, 2005; Wibbels and Bakke, 2006; Wibbels, 2006).

This paper aims to improve our understanding of decentralization processes by analyzing the determinants of district splitting in Indonesia. Indonesia’s radical decentralization process offers a data-rich environment to enhance our understanding of these questions. Starting in 2001 local parliaments were allowed to lobby the central
government and legislature to split existing districts (pemekaran). This process of pemekaran has led to a virtual explosion of new governments, increasing the number of districts from 292 in 1999 to 497 in 2009. Since district governments increasingly fulfill basic government functions, have access to large amounts of central government revenue and are now linked through electoral accountability to the local population, understanding the motives behind district creation has important implications for the study of politics in Indonesia.\(^1\)

Furthermore, apart from contributing to a better understanding of Indonesia’s decentralization process, the theoretical argument and empirical evidence presented in this paper speak directly to a wider literature on decentralization and institutional change. In particular, building on prior work by Fitrani, Hofman and Kaiser (2005), I show the creation of districts is partly driven by traditional optimal federalism concerns, but also strongly influenced by within and across district competition between local elites for economic and political rents. Importantly, the findings highlight the significance of local dynamics for understanding the implementation and success of decentralization reforms, rather than national level elites’ concerns.

Understanding the process of district splitting in Indonesia presents several difficult methodological challenges. First, on a theoretical and empirical level spatial dependence through common exposure to local competitive pressures invalidates standard limited dependent variable approaches for the analysis. Second, in the absence of strong theoretical priors, but a plethora of possible covariates, issues of model specification and model uncertainty loom large. To address these concerns, I draw on recent work on generalized additive mixed models (GAMMs) and variable selection in a Bayesian context. Prior work by Beck and Jackman (1998) and Keele (2008)

\(^1\) A government taskforce for the 2010-2025 Grand Design for the Structuring of Regions estimated growth up to 545 districts by 2025. Recent parliamentary and popular discussion on the topic of district proliferation clearly voiced the concern of inefficiencies, with a view towards introducing an end to district creation (The Jakarta Post, 2011).
has introduced generalized additive models to political science, but widespread use of this powerful framework is still lagging. Using a data set covering district splits in Indonesia between 2001 and 2009, I use Bayesian Generalized Additive Mixed Models with spatial effects based on Markov Random Fields (Fahrmeir and Lang, 2001; Fahrmeir et al., 2004; Fahrmeir and Kneib, 2004; Kneib et al., 2009) to analyze the determinants of district creation. GAMMs allow a flexible model specification, while the addition of spatial random effects addresses spatial dependence concerns present in the data. In addition, the GAMM specification is augmented by spike-slab variable selection priors for all the model terms (Scheipl, 2010). This allows me to take advantage of the flexible structure of GAMMS and avoid many ad-hoc model specification decisions that are not rooted explicitly in theory. This approach extends standard Bayesian variable selection for linear models and generalized linear models (Montgomery and Nyhan, 2010). While tailored to the question of district splitting in Indonesia, the general GAMM approach with variable selection is applicable to normal, binomial or poisson distributed data and allows for the parallel inclusion of of various types of spatial, time and cluster random effects. This makes the GAMM approach useful in a large class of applied research question in political science and beyond.

The paper proceeds as follows. The next section outlines crucial features of Indonesia’s decentralization process and illustrates the motivating empirical puzzle. In Section 3 I discuss the local political economy of district splitting. Section 4 introduces the basic GAMM modeling approach, the spatial effects structure and discuss the variable selection prior. Section 5 presents the data, the model specification and the main results of the statistical analysis. Section 6 discusses the results and further avenues of research, Section 7 concludes.
5.1 Pemekaran and District Creation in Indonesia

At the time of President Suharto leaving office in 1998 and Indonesia suddenly transitioning to democracy, the territorial make-up of Indonesia had been largely stable for decades. Despite the creation of some new provinces and districts over the years, Suharto’s Indonesia was a staunchly unitary and centralized state. Although the layered structure of central, provincial, district, sub-district and village government and the existence of local representative bodies was established long before the end of Suharto’s rule (“New Order”), major political decisions were made in the center and implemented by powerful central bureaucracies, with local representatives under tight control by elites in Jakarta. One of the main demands in the wake of the fall of the New Order was increased regional autonomy (fiscal and political), especially for resource-rich regions, as well as improved local accountability (Crouch, 2010; Bünte, 2009). Two laws, drafted under the Habibie presidency (1998-99), Law 22/1999 and Law 25/1999, outline in broad brushes the main thrust of decentralization reform: relocate the main government responsibilities to the district level, paired with a system of revenue-sharing and regional redistribution (World Bank, 2003). Now, local legislatures are allowed to elect the district head, authorize the budget and vote on local laws and regulations. District government activity is financed largely through shared revenue allocations and block-grants (DAU) by the central government. Regions rich in natural resources get special allocations to reflect their above-average contribution in revenue creation. Local governments also receive ear-marked grants for special development projects (DAK). Local taxation authority though remains fairly limited (Lewis, 2003, 2005).

An important feature of Indonesia’s decentralization is the process of provincial and district creation. To better reflect the large diversity across the archipelago, the decentralization laws created a provision that allows new regions to be formed on
the initiative of parliament or the executive. The former simply needs to pass a law creating new regions, while the latter needs prior approval of the originating region, an evaluation report by the Regional Autonomy Advisory Council and eventually parliamentary approval. Both processes are often initiated at the behest of local interests. Newly created districts are then fiscally supported by the parent region until central government transfers start. Before inaugural elections are implemented, the Ministry of Interior appoints a district head and the new local legislature’s seats are allocated according to the originating district’s seat distribution\(^2\).

In the pre-decentralization period from 1999 to 2001 the number of districts grew from 292 to 341. From 2001 to 2009 the number of districts grew to a staggering 497, a total increase from 1999 to 2009 of over 70\(^%\)\(^3\). At the same time parliament increased the total number of provinces to 33. This change in administrative structure and proliferation of new local accountable governments certainly had large implications for government performance and citizen’s overall satisfaction with decentralization and democratization. Figure 5.1 presents a map of Indonesia’s districts in 2001 and indicates splitting districts in red.

\(^2\) See Fitrani, Hofman and Kaiser (2005) for more detail on the overall process.

\(^3\) Splitting usually evolved around existing sub-district (kecamatan) lines. Some districts split once, others multiple times.
Figure 5.1: Map of Indonesia, splitting districts in red.
The map clearly visualizes the extreme growth in districts over the last few years and invites a series of important questions. If districts have increasingly important government responsibility, what factors drive this process and what are its consequences? Furthermore, the map also reveals an important spatial clustering of the pemekaran process. Nearly all new districts were created off Java. Not surprisingly, a join-count test for spatial auto-correlation clearly rejects the null hypothesis of a random spatial pattern, i.e., if the underlying process determining district splits were accurately described by flipping a fair coin, the administrative make-up of Indonesia in 2009 would look vastly different and evenly spaced. The curious clustering of splitting and non-splitting districts near to each other raises two important concerns for the analysis of district splitting. First, can the pre-dominance of district splitting on Indonesia’s outer islands simply be explained by certain covariates that cluster similarly, such as the prolonged under-representation of minorities and administrative neglect, or has the creation of districts in part been influenced by a spatial process that represents local competition? Second, if there are covariates that partially explain the spatial pattern of district creation, do they confirm the popular argument made during the transition period for better regional representation, the designs of central government agents or rather reflect more instrumental interests of local elites?

5.2 The Local Political Economy of District Splitting

The literature on federalism has produced many concise theoretical accounts outlining the benefits of decentralization and competition between sub-national units (Bardhan, 2002; Tiebout, 1956; Weingast, 1995). These largely theoretical models provide guidance with regard to the proper design of decentralized or federal structures (Bednar, 2009; Boadway and Shah, 2009; Filippov et al., 2004). Proper decentralization

4 For more detail see Goodchild (1986).
allows for more efficient public goods provision, increased accountability, the reduction of waste and rent-seeking through healthy competition between sub-national units and government activity that better reflects local preferences. Determining the appropriate size and number of jurisdictions tasks an optimal planner to trade-off the efficiency of national public goods provisions with local preferences and access to information. In reality, administrative boundaries are not drawn by an optimal planner, but are rather the result of a long-run historical process, reflecting geography, political conflicts and demographic changes. Even though the territorial make-up of a nation is not drawn or re-drawn according to theoretical principles, decision-makers often do take into consideration important variables like size of the unit, population counts, income levels, etc. when introducing changes to administrative boundaries.

In case of Indonesia’s *pemekaran* process national and local leaders had the opportunity to re-draw important administrative boundaries in an open-ended fashion. The general tenor during the democratic transition and embodied in the discussions around the decentralization law emphasized the popular demand for better regional representation in Indonesia’s unitary state. Regional representation encompasses more authority with regard to local law-making and spending decisions, access to natural resource revenue and the ability to protect and foster particular regional identities. Creating new provinces and districts is an important and integral policy tool in this endeavor.

Given that such concerns were prominent at the local and national level, as well as with outside actors advising on decentralization reforms, it is natural to expect that the *pemekaran* process produces district proposals that reflect such demands and eventually lead to administrative district boundaries that are more “optimal”, i.e. factors like district size and population counts should emerge as important predictors of district splitting.

While the literature on optimal jurisdictions provides important arguments as to
which factors should be considered when re-arranging district boundaries and statements of public officials and experts reflect these arguments, this framework all too often neglects the political incentives of important decision-makers at the local or national level. A growing literature on the unintended consequences of decentralization, elite capture and political conflicts underlying institutional choice identifies the pervasive role misaligned incentives can play in subverting carefully designed reforms in multiple contexts (Bardhan, 2002; Besley and Coate, 2003; Beramendi, 2007; Cai and Treisman, 2004; Eaton et al., 2010; Gibson and Calvo, 2000; Lassen and Serritzlew, 2011; Rodden and Wibbels, 2002; Rodden, 2006; Treisman, 1999, 2000, 2007; Wibbels, 2000, 2005; Wibbels and Bakke, 2006; Wibbels, 2006). In particular, current research has emphasized the role of national-level actors in shaping the bargaining process over decentralization. Central government actors value the control of fiscal resources, policies and electoral strategy, generally pitting these interests against local demands for increased autonomy.

Much less attention has been paid to the role of local elites in driving or subverting decentralization processes. While the optimal federalism literature outlines functional pressures for the specifics of territorial organization and national-level centered models of political bargaining emphasize central government preferences, both influences can be overpowered by local concerns. In the case of Indonesia, there exist strong incentives for local elites to pursue a strategy of district creation that benefits their personal and electoral fortunes, instead of conforming to optimality concerns or central government plans.

Earlier work by Fitrani, Hofman and Kaiser (2005) succinctly identifies several potential reasons why district creation offers political benefits above and beyond pure decentralization concerns. Apart from administrative dispersion, the expectation of fiscal spoils and political rents is likely to fuel the demand for local government. While access to new fiscal resources (fiscal transfers like DAU/DAK, the right to
issue regulations, natural resource revenue) provides a uniform incentive to support a district split, political rent-seeking offers an additional perspective to explain the differences in district proliferation across Indonesia. Conversely, the large fiscal costs of district creation incurred by the central government creates a unifying opposition against excessive proliferation of districts at the national level. Each newly created district is entitled to a minimum amount of fiscal transfers and additional funding allocations for the construction of basic government infrastructure. Splitting an existing district creates fiscal transfers for the two new units that surpass transfers for the originating district (World Bank, 2003).

I argue that beyond structural optimal federalism concerns and uniform fiscal incentives, local elite competition within and across districts plays an important role for district splitting.

5.2.1 Within Competition

Distinct from fiscal spoils, local elites can use district splitting to further their political goals in an increasingly competitive environment. The fall of Suharto in 1998 dislodged a heavily centralized and in the end personalized system of rule. Centered around Suharto, a small circle of cronies exercised immense control down to the local level using pervasive institutions like the military, Suharto’s ruling party (Golkar) and various bureaucracies. Once Suharto and his closest circle of allies were removed from power, democratic reforms did not sweep away these old institutions of power or dismiss the majority of elite actors involved in the “New Order”, but rather created a system of oligarchic competition for the access of power. Old elites in the party system, military, business, judiciary and bureaucracy entrenched their hold on power and decentralized the access to spoils (Robison and Hadiz, 2004; Boudreau, 2009; Bünte, 2009; Hadiz, 2010). At the same time new actors entered the stage
and through electoral politics fought to receive their share of rents. Although the introduction of elections certainly has improved accountability in a general sense, elections at the local and national level are still largely an affair of elites, prone to cartelization, offering only weak links of accountability (Buehler, 2010; Choi, 2009; Palmer, 2010; Sherlock, 2010; Slater, 2004). Public office is treated as an access point to state resources, which has to be capitalized on in order to repay the various debts incurred during the election process (Buehler and Tan, 2007; Mietzner, 2007, 2011).

While central elites recognize the need for territorial reform to avoid increased separatist sentiment, the large fiscal costs pre-dispose crucial actors like the Presidency and Ministry of Finance to limit district creation. From the perspective of local elites though, the creation of a district does not predominantly reflect improved governance and accountability, but rather personal access to rents and the opportunity to secure ones political future.

The creation of a new district has two main advantages from the perspective of local elites. One, new districts need a whole new government, administration and offer control over a budget dedicated to providing local goods and services. Controlling a district government offers access to various monetary resources, gives the ability to sell valuable licenses and hand out highly-sought after jobs in the bureaucracy (International Crisis Group, 2007). Second, re-drawing administrative boundaries allows political actors to form a local electoral district that reduces the competition by rival factions and maximizes chances to retain local office in the future. At the same time, creating a new district is costly too. First, collective action problems within elite groups need to be overcome and resources have to be expended to lobby the national parliament or the executive to create a new district. Furthermore, a new district is dependent on fiscal resources from the parent district in the first few years, essentially draining resources from other projects, making district creation a political investment only lucrative under particular conditions.
Given these incentives, a series of factors should be considered. For one, ethnic and religious diversity identify districts in which local elites can re-draw administrative boundaries to create more homogenous and simultaneously more electorally “safe” districts. In addition, widespread flares of local ethnic and religious violence across Indonesia (Bertrand, 2004) have created an additional incentive for homogeneity, much in line with research from the US context (Alesina et al., 2004). Similar to ethnic fractionalization, political fractionalization might also indicate a potential for district splitting to create politically homogenous districts.

At the level of elites, in an environment of competition between former ruling and new elites, former ruling party pre-dominance is expected to be an important factor for the analysis. Former ruling party strength might induce district splits, because Golkar elites that still have a hold on office rationally expect future electoral declines and use institutional reform to slow this process (Crouch, 2010; Tomsa, 2009), similar to how conservative parties in Western Europe supported the switch to proportional electoral systems as a rational strategy (Boix, 1999). Specifically, I expect an inverted U relationship between Golkar pre-dominance and the probability of district splitting. At low levels of Golkar dominance, old elites do not have the power to use institutional reform to entrench their position. As dominance increases, Golkar elites have the incentive and means to use district splitting as a forward-looking electoral strategy. At very high levels of dominance though, the need for institutional reform should diminish since old elites are so strongly entrenched that they can expect to remain in control of the district. This calculus of local elites also relates to Hirschman’s argument on exit, voice and loyalty (Hirschman, 1970). It is more beneficial to use the “exit” of district creation to ensure political survival, compared to engaging in “voice” and facing the hard battle of competitive politics.
5.2.2 Across Competition

Apart from within-district competition, several reasons suggest an important form of across-district competition with important implications for the probability of a district split. The visual evidence of clustering in district splits suggest some form of spatial dependence. Franzese and Hays (2008) distinguish between common exposure to shocks (observed or unobserved) and true interdependence between local processes as potential sources of spatial dependence. In the context of Indonesia, there exist some theoretical reasons to expect a pattern of clustering driven by unobserved local shocks. The emergence of powerful businessmen in the provinces created a class of political entrepreneurs and funders of political campaigns that act across district lines. The creation of a new district can serve as a useful tool to induce powerful and rich supporters to reallocate their support to the new district, if the new government can credibly promise preferential treatment through government policies. The growing importance of provincial businessmen that act across district lines in financing local politicians and effectively lobby for jurisdictional changes suggests an important spatial effect (Morishita, 2011). Similarly, the relative dearth of district splits on Java could be caused by actors that act across district boundaries to prevent changes to the administrative structure, like the Indonesian military and its entrenched interests on Java. The competition for support of influential donors forces local elites to consider district splitting if in the surrounding region other elites pursue the same strategy. The multiplication of districts and thus increased competition between local governments has also been found to foster deforestation and play into the hands of local business interests (Burgess et al., 2010). In total, I expect to find important spatial dependence in the process of district splitting even after accounting for the effects of district-level covariates.
5.3 Bayesian GAMMs

To engage the question of district splitting, at least two important problems have to be addressed. Ignoring spatial dependence leads to biased parameter estimates (Anselin, 1988; LeSage and Pace, 2009) and ignores the substantive interest in across-district competition. Furthermore, while the discussion in Section 3 has identified several important covariates to consider in the model specification, no strong theoretical priors exists with regard to the exact functional forms or the inclusion of additional control variables.

To address these concerns, I will rely on Bayesian Generalized Additive Mixed Models (Fahrmeir and Lang, 2001; Fahrmeir et al., 2004; Fahrmeir and Kneib, 2004; Kneib et al., 2009)\(^5\). Specifically, the dependent variable \(y_i\) is a binary indicator whether the district \(i\) split:

\[
y_i = \begin{cases} 
1 & \text{district split} \\
0 & \text{otherwise}
\end{cases}
\]

The distribution of \(y\) is assumed to belong to the exponential family, here the binomial family. In a conventional Generalized Linear Model (GLM), the expected value of \(y\), \(\mu = E(y|x, \beta)\) is linked to a linear predictor:

\[
\mu = g(\eta) \\
\eta = x'\beta
\]

where \(x\) are observed covariates of dimension \(p\), \(\beta\) are \(p\) unknown regression parameters and \(g(\cdot)\) is a known link function that maps the linear predictor \(\eta\) to the range of \(\mu\) (commonly the logit or probit link for binary dependent variable models). This standard GLM approach is fairly limited in general and specifically for this

application. In general, there are few reasons to assume *a priori* that continuous covariates have a linear effect on $\eta$. Furthermore, for a large number of observational data settings in political science, observations are not identically and independently distributed, but show various forms of dependence. For district splitting in Indonesia the preliminary evidence of Section 2 certainly suggests issues with spatial dependence that are not easily solved in standard GLMs.

A Generalized Additive Mixed Model addresses these concerns by using the following linear predictor:

$$\eta = \sum_{j=1}^{p} f_j(x_j)$$

The linear predictor $\eta$ is a function of transformed covariates $x$, where the transformation $f_j(\cdot)$ can be of various types. In the simplest case $f(x) = \beta x$, just like in the standard GLM. Similarly, factor variables can be included: $f(x) = \beta x(i)$ if and only if $x = i$ as well as interactions. More importantly $f(\cdot)$ can be a smooth function of continuous covariates, for example Bayesian p-splines, Gaussian Markov random fields for discrete spatial covariates, time and seasonal trends, surface estimators, varying coefficient terms and standard random effects for units or clusters (Fahrmeir et al., 2004).

The smooth functions $f(\cdot)$ for continuous covariates are often expressed via basis function expansions. Each function $f_j(x_j) = \sum_{k=1}^{K} \delta_k B_k(x_j) = B\delta$, where $\delta$ is a vector of parameters associated with basis functions $B_k(\cdot)$; $k = 1, ..., K$. A common basis function expansion relies on Bayesian p-splines (Lang and Brezger, 2004). Here, the basis functions are B-splines and prior on the parameters $\delta$ is a Gaussian random walk shrinkage prior of order $d$:

$$\Delta^d \delta \sim N_{K-d}(0, \tau^2 I_{K-d})$$
where $\Delta^d$ is the $d$-th difference operator matrix. Note that in most situations this prior is partially improper. B-splines are sequences of curve segments connected appropriately to form a continuous curve. One advantage of B-splines is that their basis functions are strictly local. Each basis function is only non-zero over an interval between $m + 3$ adjacent knots, with $m + 1$ being the order of the spline ($m = 2$ for cubic splines)$^6$.

A p-spline augments the standard B-spline basis with evenly spaced knots and a difference penalty on $\delta$ to control wiggliness. A reasonable default uses univariate cubic splines with a 2nd order difference penalty: $\delta \sim \exp(-\frac{1}{2}\delta'P\delta/\tau^2)$, with $P = \Delta^d \Delta^d$ being the precision matrix$^7$. The variance parameter $\tau^2$ usually receives weakly informative inverse Gamma hyperpriors.

Similar to the priors for the smooth function parts, priors for time or seasonal effects or spatial effects follow the same basic structure. For a spatial effect $f(x) = f_{\text{spatial}}(s)$ it is useful to rely on intrinsically Gaussian Markov Random field priors (Rue and Held, 2005). The spatial index $s \in \{1,\ldots,S\}$ represents the location in connected geographical regions. Generally, with spatial effects neighboring units are assumed to be more similar to each other than non-neighboring units. For each location $s$ a set of neighbors is defined, based on adjacency, common borders or other reasons.

$^6$ The basis functions are defined recursively, for more details see (Wood, 2006, p.152):

$$B_i^m(x) = \frac{x - x_i}{x_{i+m+1}}B_i^{m-1}(x) + \frac{x_{i+m+2} - x_{i+1}}{x_{i+m+2} - x_{i+1}}B_i^{m-1}(x), \text{ with } i = 1, \ldots, k$$

$^7$ Fahrmeier, Kneib and Lang (Fahrmeir et al., 2004) recommend to re-parametrize in such a situation into a penalized and unpenalized part (for details see (Scheipl, 2010, p. 6)):

$$\delta = X_1\beta_1 + X_2\beta_2$$

where the unpenalized part $\beta_1$ has a flat prior and the penalized part $\beta_2 \sim N_{K-d}(0, s^2 I)$. 

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sonable connectivity concepts. Then, the spatial smoothness prior for $f_{\text{spatial}}(s) = \beta_s$ is

$$\beta_s | \beta_{s'}, s' \neq s, \tau_j^2 \sim N\left( \frac{1}{N_s} \sum_{s' \in \Omega_s} \beta_{s'}, \frac{\tau_j^2}{N_s} \right)$$

with $N_s$ the number of neighboring sites and $s' \in \Omega_s$ indicates that $s'$ is a neighbor of site $s$. The conditional mean of $\beta_s$ is an unweighted average of function evaluations at neighboring sites. Other approaches to spatial dependence on a lattice have been proposed for normal and binary dependent variables, with one popular variant relying on the inclusion of spatial lags (Anselin, 1988; Ward and Gleditsch, 2002; Beck et al., 2006; Hays and Franzese, 2007; Franzese and Hays, 2008). Spatial lags have the advantage of providing one summary parameter for the spatial dependence, but suffer from computational difficulties in the GLM setting. While spatial lags offer a succinct summary parameter, spatial random effects provide more flexibility and potentially reveal more interesting information, since spatial dependence is allowed to vary across geographic regions. Gaussian Markov random fields for lattice data offer a more flexible alternative that readily integrates in the GAMM framework.

Importantly, while very flexible with regard to the types of dependent variables, the correlation structure between observations and the effects of covariates, the standard GAMM approach requires the researcher to specify the list of model terms to be included in the model \textit{a priori}. In many applied settings though, such as in the analysis of district splitting in Indonesia, there exists uncertainty about which covariates to include in the model. Ad-hoc adding and dropping of variables or decisions based on p-values (or other test statistics) can lead to the exclusion of relevant predictors or the inclusion of irrelevant ones. Since there exist $2^p$ potential model specifications (not even considering interaction terms), researchers can easily be led
astray by ad-hoc selection into finding spurious findings. Second, confidence regions and p-values for parameter estimates assume that the model has been given to the researcher a priori, but if a model has been pre-selected based on a test statistic, the distribution of the final estimator depends on the competing models and the random elements of the test procedure (Cameron and Trivedi, 2005, p.285). For many models and selection procedures it is unclear what the exact properties are for such estimators. Specifically, p-values and confidence/credible regions calculated after alternative specifications have been discarded without accounting for the process and the associated uncertainty generally have far lower coverage probabilities than the specified significance level (Kabaila, 2005, 2009).

A principled way to address problems of specification search and account for model uncertainty is provided by Bayesian variable selection and model averaging approaches (Hoeting et al., 1999; Clyde and George, 2004; O’Hara and Sillanpää, 2009; Montgomery and Nyhan, 2010).

A computationally practical and substantively interesting way to implement Bayesian variable selection draws on a popular prior that utilizes Stochastic Search Variable Selection (SSVS) by George and McCulloch (1993; 1997). SSVS assigns a spike-and-slab mixture prior on variables that are subjected to variable selection. A latent variable \( \gamma_j \) for each coefficient \( \beta_j \) conditions the contribution of \( \beta_j \) to the predictor to be zero (or close to zero) or unchanged, depending on the state of the latent \( \gamma_j \). The posterior distribution of \( \gamma_j \) can be interpreted as a marginal inclusion probability for the model term associated with \( \beta_j \) and informs the researcher about the relevance of that particular predictor. One common approach to spike-slab variable selection has been developed by Ishwaran and Rao (2005) and uses a Normal- mixture of inverse Gammas (details in Appendix A).

\footnote{Other forms of model selection that compare marginal likelihoods of models are very computationally intense because they have to search the complete model space.}
Using SSVS is a powerful addition to the GAMM framework and apart from providing marginal inclusion probabilities, leads to posterior credible intervals that correctly reflect model uncertainty (Montgomery and Nyhan, 2010). Scheipl (2010) develops the necessary prior to extend spike-slab SSVS to Bayesian GAMMs. The appendix provides more detail on the prior specification for the GAMM model with variable selection.

The GAMM approach augmented with spike-slab priors offers the opportunity to employ Bayesian variable selection not only on standard covariates, but also for any of the random effects, offering an important extension of existing techniques (Montgomery and Nyhan, 2010). Similarly, standard GLMs with or without variable selection are special cases of the GAMM structure outlined above, allowing the researcher to make informed decisions about theoretically guided models or more flexible specifications. Finally, the posterior inclusion probabilities provided by the sampler offer an intuitive way to judge the relevance of covariates and are interpretable as a Bayesian two-sided hypothesis test (Pang and Gill, 2009).

5.4 Empirical Analysis

Equipped with the basic elements of the GAMM model, I turn now to the analysis of district splitting in Indonesia. The goal of the analysis to identify the key driving factors underlying district creation.

5.4.1 Data Sources

As explained above, a large set of covariates can reasonably be expected to explain variation given the competing theoretical accounts. In general, I will utilize Indonesia’s district configuration at the start of 2001 and a large set of district-level covariates to predict the splitting of a district in the 2001 to 2009 period. Using official district lists from Indonesia’s statistical service (BPS) for the years 2001-2009 I
determine which districts split over the time period of consideration, the names and locations of the newly created anak districts and whether multiple splits occurred.

Information on district level covariates comes from various sources, the SUSENAS household survey, the general population census, the World Bank, the electoral commission and the PODES village census. I will consider a total of 16 covariates. General controls included to capture optimal federalism and revenue concerns include district population counts (logged), area in $km^2$ (logged), real GDP per capita (without natural resources), local development expenditures (% of GDP), the share of natural resources (% of GDP), secondary school enrollment rates, urbanization, the distance to the capital city Jakarta, a Gini coefficient for sectoral inequality, total government revenues (% of GDP), the share of agricultural production (% of GDP) and total government expenditures (% of GDP).

To measure aspects of within-district competition, I include a Herfindahl index of ethnic fractionalization, a Herfindahl index of political fractionalization, based on party vote shares in the 1999 national legislative election (measured at the provincial level), a Herfindahl index of religious fractionalization and the former ruling party (Golkar) vote share in the 1999 national legislative election (measured at the provincial level), to measure former ruling party dominance. While the Golkar vote share in national-level elections does not directly measure local levels of old elite support, it offers the advantage of being exogenous and prior to the process of district splitting.

5.4.2 Model Specification

Based on this data, I will start with a spatio-temporal model, using a time-series-cross-sectional data structure with a simple dummy variable indicating a district

---

9 Summary statistics are displayed in the Appendix. Data on these covariates is near-complete (the splitting indicator is always fully observed). Less than 2% of cells in the data matrix are missing. For simplicity and to preserve the spatial structure, I impute the missing data once and use a complete data set for the analysis. A simple analysis using list-wise deletion that ignores the spatial structure confirms the main qualitative findings.
split in year \( t \), and covariate information for each year from 2001 to 2009\(^{10} \). The model includes a spatial random effect at the district level and a temporal effect for years since 2001:

\[
\eta_{it} = \sum_{j=1}^{K} f_j(x_{ij}) + f_{\text{time}}(\text{Year}) + f_{\text{spatial}}(s_i)
\]

The spatial effect is propagated by a neighborhood structure based on “Sphere-of-Influence” neighborhood status\(^{11} \). Importantly, binary dependent variable time-series-cross-sectional data are equivalent to event history analysis (Beck et al., 1998) and the inclusion of the time random effect accounts for the duration dependence in the data. Furthermore, this specification is strongly related to Bayesian spatial survival models (Banerjee et al., 2004; Darmofal, 2009). The spatial random effects \( f_{\text{spatial}}(s_i) \) play the role of frailty terms that condition district-specific risk propensities on neighboring units. Since the variable selection priors also cover the spatial effects, this approach also offers a convenient way to assess the importance of spatial frailty terms based on posterior inclusion probabilities.

The posterior distributions for the parameters in the Bayesian GAMM with variable selection are estimated via MCMC through the R package \texttt{spikeSlabGAM} (Scheipl, 2011). I use default settings for the hyperparameters, three parallel chains with a burn-in of 500 and a thinning rate of 5, for a total of 10,000 draws from the posterior. Scheipl (2010) uses extensive simulation tests and real data examples to validate the default hyper-parameter choices. The Gelman-Rubin test statistic suggests no problems of non-convergence. Figure 5.2 shows the posterior marginal inclusion prob-

\(^{10} \) For some covariates information in the years 2008 and 2009 was unavailable. For those cases I used the last available year as reference.

\(^{11} \) The Gaussian Markov Random field specification requires a symmetric connectivity concept. Since Indonesia is an archipelago with many islands, popular symmetric concepts like contiguity create isolated points on the lattice. “Sphere-of-Influence” is an alternative, graph-based connectivity concept.
abilities for all model terms. By default, model terms for continuous covariates are split in a linear and smooth part, with variable selection for each.

Figure 5.2: Posterior Marginal Inclusion Probabilities $\gamma$. Red line indicates $\gamma > 0.20$

The space-time model specification provides strong evidence for the main expectations of the theoretical section. The highest inclusion probabilities are reported for a linear effect of ethnic fractionalization, logged population counts and the share of agriculture of total local GDP. Similarly high inclusion probabilities are found for the spatial and year effect in the model. Taking an arbitrary threshold of 20% as an initial guideline, other relevant covariates include a smooth effect of logged population counts, a smooth effect of district size, a smooth effect of GDP per capita (without natural resources), a smooth effect of ethnic fractionalization, linear and
smooth effects of political fractionalization, a linear effect of the Golkar vote share, a smooth effect of natural resource GDP (\% of total), a linear effect of urbanization, a smooth and linear effect of the distance to Jakarta and a smooth effect of religious fractionalization. These results alone show the importance of political competition variables and the spatial dependence argument. To better assess the qualitative effect of each of the variables, the following plots show the predicted effects on the linear predictor \( \eta \).

Figure 5.3 shows the effects of population counts, the distance to Jakarta, area and agricultural GDP. Higher population counts increase the probability of a split, as does the distance to Jakarta. Districts with large populations are good candidates for splitting to allow local governments to cater more efficiently to their audiences. The distance effect likely reflects the historical neglect of the outer islands by the Jakarta-centric New Order and shows the desire to create more local accountability. The affect of district area is fairly neutral for smaller districts, but turns positive above the median vale of logged district size. Again, simple optimal federalism concerns provide an intuitive explanation. Conversely, agricultural GDP has initially a positive effect on the probability of a split, but fails to have an impact above a share of 40\% of local GDP.

Figure 5.4 shows the effects of district GDP per capita, the level of urbanization, natural resource GDP and the time effect. Richer districts are less likely to split, as are heavily urbanized districts. Rich districts with large parts of the population living in cities are better at providing public goods and services and have a lower incentive to split. The duration dependence suggests an early wave of splitting right after 2001, followed by a slow down and again an increase in the probability of a split 6-8 years after 2001. The effect of natural resources resembles an inverted-U shape, suggesting that initially higher levels of natural resources create incentives for local
elites to use district splitting as a tool to gain access to resource rents, but at very high levels of local resource dependence, district boundaries are left intact.

Now, turning to the variables capturing political competition, Figure 5.5 presents the effects of ethnic, religious and political fractionalization and the Golkar vote share. Both ethnic and political fractionalization have a positive effect on district splitting, that levels off at very high levels of fractionalization. This result directly represents a strategy for local elites to create ethnically and politically unified districts, improve the electoral future and and lower the chances for communal violence. The Golkar vote share has a clear linear positive effect on splitting. While the smooth effect of the Golkar vote share has exactly the expected inverted U shape, the marginal inclusion probability is low and the effect is dominated by the linear positive effect. This does buttresses the idea of rationally-forward looking elites, that
use their current hold on power and utilize institutional change to lock-in access to future economic and political rents in expectation of a future electoral decline, but suggests elites never feel entrenched enough to forego a strategy of district splitting. Religious fractionalization on the other hand remains relatively neutral until fairly high fractionalization values are reached. The substantive importance of the political competition variables can be evaluated by comparing changes in the linear predictor $\eta$. For example, moving from the median of ethnic fractionalization (0.4) to the 75th percentile increases the linear predictor from zero to approximately 0.8, implying an increase of the splitting probability of 28 percentage points. In comparison, moving from the median to the 75th percentile of the logged population counts implies a similar change in the splitting probability. Politics is as much a driving factor of district creation, as are structural concerns with regard to the feasibility of local
government.

Figure 5.5: Posterior means and 95% HPD intervals.
Now, Figure 5.6 plots the mean spatial effects for each district. The posterior inclusion probability for the spatial effects is very high and suggest spatial dependence induced by competition for the support of regionally influential elites. In particular, districts in Aceh, Riau, Bangka-Belitung, North and South Sumatra, East Kalimantan, Central and South Sulawesi, Central Java, as well as Papua show strong local effects supporting district splits. These findings resonate with qualitative impressions of rent-seeking on the outer islands, but even more so provide clear guidance for further research to substantiate the exact mechanisms underlying local initiatives for district splitting.

Figure 5.6: Spatial Effects Heat Map, darker colors signify a positive spatial effect.
Apart from judging the statistical and substantive importance of individual covariates, overall model fit has to be assessed as well. One sensible approach, particularly in the context of binary dependent variables, focuses on the predictive capabilities of a model (Ward et al., 2010). A novel and intuitive way to judge model fit and predictive power relies on “separation plots” (Greenhill et al., 2011). A separation plot orders observations according to their predicted probabilities derived from the model and plots the predicted probability curve (black). For each observation realized events in the data are then plotted with red vertical lines. A good model fit shows a clustering of actual events (red) for higher predicted probabilities, whereas an inferior model fit shows a haphazard pattern. Figure 5.7 shows a separation plot for a basic probit model using only structural and optimal federalism variables.

This model does not do particularly well in predicting actual splits, as can be seen by the large amount of events at low levels of predicted probabilities. If now the covariates that relate to local political competition are added, model fit improves (Figure 5.8). Most dramatically though, Figure 5.9 shows the separation plot for the fully specified spatio-temporal Bayesian GAMM, presenting a vastly improved model fit. The inclusion of spatial random effects, the flexible covariate effects and the implied probability weighting of covariate effects through the variable selection priors clearly outperforms standard models in predicting actual district splits.
Figure 5.8: Separation plot, standard probit model, political covariates.

Figure 5.9: Separation plot, Bayesian spatial GAMM.
5.4.3 Robustness Checks

As a first robustness check, I will rely on an alternative model with a purely cross-sectional specification that collapses the time dimension. Now the model uses a dependent dummy variable that indicates whether a district split in the 2001-2009 period, information on covariates from 2001 and a spatial random effect at the provincial level:

$$\eta_i = \sum_{j=1}^{p} f_j(x_{ij}) + f_{\text{spatial}}(s_i)$$

Again, the spatial effect relies on a provincial neighborhood structure using “Sphere-of-Influence” graphs to determine neighborhood status. Figure 5.10 shows the posterior marginal inclusion probabilities for all model terms.

The highest marginal posterior inclusion probabilities are reported for a smooth effect of logged population counts and a linear effect of the urbanization rate. Both have inclusion probabilities close to 1. In addition to these two covariates, several others present reasonably high posterior inclusion probabilities. The linear effect of population counts, the smooth effect of the urbanization rate, a linear effect of ethnic fractionalization, a smooth effect of religious fractionalization, a linear effect of development expenditures, a smooth effect of the Golkar vote share and the spatial random effect are likely candidates for inclusion. The substantive effects for all relevant variables remain the same, while the evidence for an inverted U effect of the Golkar vote share is somewhat stronger in the cross-sectional specification (Figures 5.11 and 5.12 show the effects of the main variables). Overall, the results clearly support the findings in Section 5.2, underlining the importance of political within and across-district competition for district splitting.
Figure 5.10: Posterior Marginal Inclusion Probabilities $\gamma$. Red line indicates $\gamma > 0.20$.
Figure 5.11: Posterior means and 95% HPD intervals.
Figure 5.12: Posterior means and 95% HPD intervals.
Last, an additional robustness check was performed relying on a standard Bayesian spatial probit specification, in which the latent variable \( z_i \) is modeled as follows (LeSage and Pace, 2009):

\[
  z = \rho W z + X \beta + \epsilon
\]

(5.1)

Here, the regression part includes a spatial lag term \( \rho W z \) which is standard for a typical spatial autoregressive model (SAR). Throughout I assume \( \epsilon_i \sim \mathcal{N}(0,1) \) and the variance is set to 1 for identifiability in the probit context. In such a SAR model \( z \) is a function of covariates of unit \( i \) through \( X \beta \) (\( \beta \) has dimension \( p \)), but is also affected by realizations of \( z_j \) in neighboring units. The effect of the neighboring units is propagated by the spatial weights matrix \( W \). Often \( W \) is defined to be a symmetric matrix with 0 and 1 entries recording neighboring status (and 0 on the diagonal) which has been row-standardized. Neighbor status can be determined by shared borders, nearest neighbors or other approaches. I rely on a k-nearest neighbor connectivity matrix to avoid problems of non-connected units. The spatial term \( \sum_{j=1}^{n} W_{ij} z_j \) is a weighted average of the realizations of \( z_j \) in neighboring units. The parameter \( \rho \) captures the strength of the spatial dependence. In addition, instead of using a standard diffuse normal prior for the regression parameters, I employ a mixture prior to implement a simplified form of variable selection. Using the spatial probit, I confirm the relevance of spatial dependence, Golkar dominance, ethnic fractionalization and political fractionalization at the expense of standard optimal federalism concerns\(^{12}\).

5.5 Discussion of Results

The results of the empirical section show strong support for a theory of district creation that focuses on local political incentives, rather than only economic optimality

\(^{12}\) Results and details on the MCMC algorithm are available on request. Findings are based on 10,000 draws and a burn-in of 1000 implemented in R.
concerns for jurisdictional boundaries. The effects of Golkar dominance, ethnic and political fractionalization remains strongly robust across different specifications, after controlling for a long list of potential confounders and accounting for unobserved spatial heterogeneity and model uncertainty.

While indicative, more research needs to be done. In particular, the present study had to rely on fairly aggregate measures of Golkar dominance and political fractionalization. Using actual seat allocations in the local DPR-Ds and tracking the electoral outcomes in districts created from parent regions with Golkar dominance or high political fractionalization will allow to truly test whether the pemekaran process has been used to affect electoral fortunes.

At the same time, the findings of this and prior research (Fitrani et al., 2005) already have clear implications for the ongoing discussion about Indonesia’s decentralization process and hold important lessons for a more general discussion of institutional reform. First studies on particular decentralization outcomes in Indonesia (Chowdhury et al., 2009; Chowdhury and Yamauchi, 2010; Decentralization Support Facility, 2007; Hadiz, 2010; Kristiansen et al., 2009; Lewis, 2005; von Luebke, 2009) and growing concern about corruption and elite dominance in local elections indicates a general sense of reform falling short of the initial goals. Given the findings of this study, it is not surprising that many new district governments struggle to effectively shoulder the new wide-reaching responsibilities of local government. Future discussion of the decentralization reforms and the continuation of pemekaran have to seriously consider the trade-off between the need for more regional autonomy and the threat of institutional elite capture. Given that local elites have incentives to highjack and abuse district creation, similar behavior can be expected when it comes to local budget allocations, regulations and the general operation of government in newly created districts. Although new evidence suggests the introduction of direct elections has increased local government expenditures (Skoufias et al., 2011) at least
in non-splitting districts, it remains to be seen if the additional expenditure is used to improve public goods or rather used as investment in clientelistic structures. The disciplining effect of local direct elections also can only operate consistently, if such elections remain truly competitive.

More generally, Indonesia’s experience with territorial reform bears important lessons for the wider literature on institutional change. Abstract theoretical models of institutional endogeneity often frame institutional choice as a strategic game during moments of crisis, in which pivotal actors can overcome their collective action problems (Acemoglu and Robinson, 2001a; Shvetsova, 2003; Ticchi and Vindigni, 2005). While helpful when trying to understand initial bargains during the initiation phase, district creation in Indonesia shows the importance of change as a continuous process, in which national and local elites use their power to bend the ongoing process to fit their goals. Even more importantly, the explicit spatial analysis uncovered the presence of spatial dependence, indicating the relevance of competition across districts.

5.6 Conclusion

In this paper I investigate the determinants of district creation in Indonesia. The virtual explosion of districts across Indonesia’s archipelago creates the need for a thorough investigation of this process to inform future reforms. A large literature in economics and political science espouses the many benefits of decentralization and local government accountability, identifying important characteristics that should guide politicians and bureaucrats in their institutional reform considerations. During the deliberation of Indonesia’s “big bang” decentralization many optimal design and representational concerns were echoed in popular demands for increased regional
autonomy, preservation of local identities and better local government. Research on decentralization has also stressed the power central government actors have in shaping decentralization outcomes. On the other hand, the experience of district creation, local elections and government behavior suggests political incentives of local elites can override such concerns. In particular, I argue that it is largely the competition of local elites for access to government rents within and across districts that drives the splitting process. To analyze the curious spatial pattern inherent to the district splitting and to better reflect the theoretical framework of elite competition, I rely on Bayesian GAMMS with flexible variable selection priors.

This approach offers several important advantages: It allows the modeling spatial dependence; It eases the interpretation of covariate effects; It safeguards against ad hoc model selection; It is applicable to a large set of applied questions in political science. The results clearly support the importance of political elite behavior and show the usefulness of the Bayesian GAMM approach. While variables that capture the role of optimal jurisdiction concerns are found to partially determine district splits, Golkar dominance, ethnic and political fractionalization and spatial dependence have a statistically and qualitatively important role.

Future research will hopefully address several remaining concerns. In particular, better information on local politics is needed to really ascertain the mechanism underlying elite competition. It will be necessary to collect information on local election results to confirm the suspicions about district creation implemented in order to reduce political competition. In addition, after having established a basic understanding of the process driving district creation, this information can be used to better evaluate the effects of district creation on important governance outcomes and the overall performance of the decentralization process.
A.1 Chapter 2

Proof of Proposition 1: The proof follows directly from the threshold values on $\gamma$ and the restrictions on the cost of protest. If $\gamma > \hat{\gamma}$ and $\frac{1-\theta}{s} > (1 - s)^{\beta}$ the dominant action for C is $r^c = 1$. Since the game ends after $r^c = 1$, P’s strategy is irrelevant. G can pick any policy vector $V$ and will always receive a payoff of zero. Under the above conditions a strategy profile consisting of any $V$, $r^c = 1$, $r^p = \{0, 1\}$ is an equilibrium.

Proof of Proposition 2: If $\frac{1-\theta}{s} < (1 - s)^{\beta}$ C’s dominant action is $r^c = 0$. If $\mu < \hat{\mu}$ P’s dominant strategy, even under full extraction, is $r^p = 0$. Given the actions of C and P, G will maximize it’s payoff by picking the following policy vector $V = (\tau^c = 1, \tau^p = 1, \eta^c = 0, \eta^p = 0)$, establishing the equilibrium in Proposition 2.

Proof of Proposition 3: If $\mu < \hat{\mu}$ P’s dominant action is $r^p = 0$, irrespective of G’s policies. If $\gamma < \hat{\gamma}$ and $\frac{1-\theta}{s} > (1 - s)^{\beta}$ C is able to protest, but can be dissuaded from doing so by sufficient levels of redistribution. The protest constrain for the government is binding, since payoffs for violating it are zero. To stay in power G has
to solve the following maximization problem:

$$\begin{align*}
\max_{\tau^c, \tau^p, \eta^c, \eta^p} & \quad \tau^p \theta - \eta^p + \tau^c(1 - \theta - \gamma) - \eta^c + \gamma \\
\text{s.t.} & \quad \tau^c \left(1 - \theta - \gamma \right) - (\eta^c)^{1/\alpha} \leq (1 - s)^3 - \gamma/s \\
& \quad \eta^p + \eta^c \leq \tau^p \theta + \tau^c(1 - \theta - \gamma) + \gamma \\
& \quad 0 \leq \tau^p \leq 1 \\
& \quad 0 \leq \tau^c \leq 1 \\
& \quad 0 \leq \eta^p \\
& \quad 0 \leq \eta^c
\end{align*}$$

The solution can be found quickly by writing out the Lagrangian and finding the F.O.C. of the problem:

$$\begin{align*}
\mathcal{L} & = \quad \tau^p \theta - \eta^p + \tau^c(1 - \theta - \gamma) - \eta^c + \gamma - \lambda_1(-\tau^p) - \lambda_2(\tau^p - 1) \\
& - \quad \lambda_3(-\tau^c) - \lambda_4(\tau^c - 1) - \lambda_5(-\eta^p) - \lambda_6(-\eta^c) \\
& - \quad \lambda_7(\tau^c(1 - \theta - \gamma) - (\eta^c)^{1/\alpha} - (1 - s)^3 + \gamma/s + \delta V\theta(N) \\
& - \quad \lambda_8(\eta^p + \eta^c - \tau^p \theta - \tau^c(1 - \theta - \gamma) + \gamma)
\end{align*}$$
This system of equations can now be solved quickly. First, we know G will set \( \eta^p = 0 \) and \( \tau^p = 1 \) since the countryside poses no threat and G wants to maximize its revenue. This immediately implies from (24) that \( \lambda_5 > 0 \), from (20) that \( \lambda_1 = 0 \) and from (21) that \( \lambda_2 > 0 \). For now, assume G does not spend all the revenue on public goods provision, but rather retains positive rents, then from (27) \( \lambda_8 = 0 \). Using (16) we can conclude that \( \lambda_2 = \theta \) and from (18) that \( \lambda_5 = 1 \). Next, assume \( \lambda_3 = \lambda_4 = 0 \), which implies by (22) and (23) that \( 0 < \tau^c < 1 \). Since the protest constraint is binding, by (26) we know that \( \lambda_7 > 0 \). Use (17) to derive \( \lambda_7 = s \). Assume \( \lambda_6 = 0 \), which implies by (25) that \( \eta^c > 0 \). By (19) we can substitute the quantities we know to derive \( \eta^c = (\alpha/s)^{\alpha/(1-\alpha)} \). Finally, use the protest constraint to
derive \( \tau^c = \frac{s}{1-\theta-\gamma} [(\alpha/s)^{1/\alpha} + (1-s)^\beta - \gamma/s] \). This proofs that the policy vector in Proposition 3 is one possible candidate for a solution. We also have to rule out other possible scenarios to establish uniqueness. If the budget constraint were binding with equality and G spends all revenues on public goods provision, realized payoffs are zero, which is worse than the equilibrium outlined above. If we assume \( \lambda_3 = 1 \) it follows that \( \tau^c = 0 = \lambda_4 \) and we can derive an alternative \( \lambda_7 = s + \frac{s}{1-\theta-\gamma} \). Still assuming \( \lambda_6 = 0 \) we derive a new equilibrium provision of public goods in the center \( \eta^c = (\frac{\alpha}{s+\frac{\alpha}{1-\theta-\gamma}})^{\alpha/(1-\alpha)} \), which together with \( \tau^c = 0 \) violates the protest constraint. If we alternatively assume \( \lambda_6 > 0, \eta^c \) has to be zero and by (19) \( \lambda_6 = 1 \), which still violates the protest constraint. Lastly, if \( \lambda_3 = 0, \lambda_4 > 0 \) and \( \lambda_6 > 0, \tau^c = 1 \) and \( \eta^c = 0 \), which also violates the protest constraint. Hence, only the policy vector \( V \) proposed in Proposition 3 satisfies the protest constraint and maximizes G’s utility.

**Proof of Proposition 4**: If \( \frac{1-\theta}{s} < (1-s)^\beta \) C will never protest. If also \( \mu > \hat{\mu} \) P will start an insurgency if extraction is too high. Starting with equation (13) we can derive a threshold value for \( \mu \) above satisfying (12) is preferred to tolerating an insurgency but extracting maximally the remaining income:

\[
\frac{s^\beta (1-s)}{\mu} + 1 - \theta \geq (1-\mu)\theta + 1 - \theta \quad \text{(A.13)}
\]

\[
0 \geq \mu - \mu^2 - \frac{s^\beta (1-s)}{\mu} \quad \text{(A.14)}
\]

We can quickly solve this quadratic equation and rule out the negative solution to find \( \bar{\mu} = -1/2 + \frac{(1+4s^{\beta(1-\alpha)})^{1/2}}{2} \).

If \( \mu > \bar{\mu} \), G will implement \( V = (\tau^c = 1, \tau^p = \hat{\tau}^p, \eta^c = 0, \eta^p = 0) \). The insurgency constraint only applies to \( \tau^p \) which will be set as high as possible up to the insurgency threshold to make P just indifferent between accepting the policy and starting an
insurgency. G will set $\eta^p = 0$ because no positive amount of spending is needed to buy off P.

Proof of Proposition 5: If $\frac{1-\theta}{s} < (1 - s)^\beta$ C will never protest. If $\hat{\mu} < \mu < \bar{\mu}$ P is not efficient enough to make the insurgency constraint binding. To maximize utility, G will implement $V = (\tau^c = 1, \tau^p = 1, \eta^c = 0, \eta^p = 0)$, P will start an insurgency and consume $\frac{\mu^p}{1-s}$.

Proof of Proposition 6: If $\gamma < \hat{\gamma}$, $\frac{1-\theta}{s} > (1 - s)^\beta$ C can protest but is willing to be bought off, i.e. G has to satisfy the protest constraint. If at the same time $\hat{\mu} < \mu < \bar{\mu}$, G implements a policy vector $V = (0 < \hat{\tau}^c < 1, \hat{\tau}^p = 1, \hat{\eta}^c > 0, \hat{\eta}^p = 0)$ and stays in power, C accepts the proposal and P starts an insurgency, with

$$\hat{\tau}^c = \frac{s}{1 - \theta - \gamma} \left[ (\alpha/s)^\frac{1}{1-\alpha} + (1 - s)^\beta - \gamma/s \right]$$

$$\hat{\eta}^c = (\alpha/s)^\frac{\alpha}{1-\alpha}$$

The proof for satisfying the protest constraint is identical to the proof for Proposition 3. Given $\hat{\mu} < \mu < \bar{\mu}$ is better for G to tax P at maximum rates and tolerate and insurgency.

Proof of Proposition 7: If $\gamma < \hat{\gamma}$, $\frac{1-\theta}{s} > (1 - s)^\beta$, C can protest but is willing to be bought off, i.e. G has to satisfy the protest constraint. If also $\mu > \hat{\mu}$ and $\mu > \bar{\mu}$ P poses a credible insurgency threat and G also has to satisfy the insurgency constraint. Optimal rates for $\tau^c$ and $\eta^c$ have been established in the proof of Proposition 3. G can set $\eta^p = 0$ because it does not enter the insurgency constraint and doing so maximizes residual revenue. G will set $\hat{\tau}^p = \frac{s^\beta(1-s)}{\mu^p}$ to make P indifferent between accepting the policy and starting an insurgency. Setting a higher tax rate violates the insurgency constraint, implementing a low tax reduces residual rents for the government.
A.1.1 Data

The data covers the following countries: Argentina, Australia, Austria, Bangladesh, Benin, Brazil, Bulgaria, Burkina Faso, Cameroon, Canada, Chad, Chile, China, Colombia, Cote d’Ivoire, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt, Estonia, Ethiopia, Finland, France, Germany, Ghana, Hungary, Iceland, India, Indonesia, Ireland, Italy, Japan, Kazakhstan, Kenya, Korea, Latvia, Lithuania, Madagascar, Malaysia, Mali, Mexico, Mozambique, Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Pakistan, Philippines, Poland, Portugal, Romania, Russia, Senegal, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sudan, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Togo, Turkey, Uganda, UK, Ukraine, United States, Vietnam, Zambia, Zimbabwe.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std.Dev.</th>
<th>Min</th>
<th>Max</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>RRA</td>
<td>0.14</td>
<td>0.65</td>
<td>-0.94</td>
<td>4.06</td>
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</tr>
<tr>
<td>Agriculture value added, % GDP</td>
<td>19.71</td>
<td>15.02</td>
<td>0.8</td>
<td>74.3</td>
<td>2475</td>
</tr>
<tr>
<td>Food exports, % of GDP</td>
<td>27.6</td>
<td>24.2</td>
<td>0.01</td>
<td>96.4</td>
<td>2384</td>
</tr>
<tr>
<td>Agriculture Herfindahl</td>
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<td>0.14</td>
<td>0.03</td>
<td>1</td>
<td>3647</td>
</tr>
<tr>
<td>GDP pc in constant $</td>
<td>6458</td>
<td>8774</td>
<td>72.3</td>
<td>40600</td>
<td>2914</td>
</tr>
<tr>
<td>% Urban population</td>
<td>48.41</td>
<td>23.5</td>
<td>3.7</td>
<td>92.2</td>
<td>3334</td>
</tr>
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<td>Polity</td>
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<td>7.34</td>
<td>-9</td>
<td>10</td>
<td>3233</td>
</tr>
<tr>
<td>Conflict$_{t-1}$</td>
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<td>0.74</td>
<td>0</td>
<td>3</td>
<td>3131</td>
</tr>
<tr>
<td>Total non-tax revenue, % of GDP</td>
<td>6.62</td>
<td>5.07</td>
<td>-3.27</td>
<td>38.1</td>
<td>1161</td>
</tr>
</tbody>
</table>

Table A.1: Descriptive Statistics

Table A.1 shows standard descriptive statistics for the variables in the data set.

A.2 Chapter 4

The following table lists summary statistics for the main variables in rural Indonesian districts. For scaling reasons total population counts are measured in billions, revenue in trillions of Rupiah and distance to Jakarta in 10,000 meters.

The following tables report means for district with and without elections in 2001 and 2005 respectively, as well as p-values for a difference in means test and a bootstrap Kolmogorov-Smirnoff test.
Table A.2: Summary Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>mean</th>
<th>std.dev</th>
<th>min</th>
<th>max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agri Exp Share</td>
<td>0.04</td>
<td>0.02</td>
<td>0.01</td>
<td>0.11</td>
</tr>
<tr>
<td>Dev Agri Exp Share</td>
<td>0.06</td>
<td>0.04</td>
<td>0.01</td>
<td>0.40</td>
</tr>
<tr>
<td>Routine Agri Exp Share</td>
<td>0.03</td>
<td>0.01</td>
<td>0.00</td>
<td>0.08</td>
</tr>
<tr>
<td>Admin Exp Share</td>
<td>0.27</td>
<td>0.13</td>
<td>0.12</td>
<td>1.00</td>
</tr>
<tr>
<td>Dev Admin Exp Share</td>
<td>0.27</td>
<td>0.12</td>
<td>0.04</td>
<td>1.00</td>
</tr>
<tr>
<td>Routine Admin Exp Share</td>
<td>0.28</td>
<td>0.17</td>
<td>0.03</td>
<td>0.99</td>
</tr>
<tr>
<td>Total Pop</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Revenue</td>
<td>0.30</td>
<td>0.16</td>
<td>0.07</td>
<td>1.57</td>
</tr>
<tr>
<td>Dist Jakarta</td>
<td>0.08</td>
<td>0.05</td>
<td>0.00</td>
<td>0.33</td>
</tr>
<tr>
<td>ELF</td>
<td>0.29</td>
<td>0.32</td>
<td>0.00</td>
<td>0.99</td>
</tr>
<tr>
<td>Share Urban Pop</td>
<td>0.27</td>
<td>0.17</td>
<td>0.00</td>
<td>0.89</td>
</tr>
</tbody>
</table>

Table A.3: Balance Statistics, 2001

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean Treatment</th>
<th>Mean Control</th>
<th>T-test p-value</th>
<th>KS Bootstrap p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agri Exp Share</td>
<td>0.039</td>
<td>0.045</td>
<td>0.089</td>
<td>0.066</td>
</tr>
<tr>
<td>Admin Exp Share</td>
<td>0.232</td>
<td>0.266</td>
<td>0.099</td>
<td>0.278</td>
</tr>
<tr>
<td>Real GDP</td>
<td>(2.78 \cdot 10^{12})</td>
<td>(2.89 \cdot 10^{12})</td>
<td>0.884</td>
<td>0.304</td>
</tr>
<tr>
<td>Revenue</td>
<td>0.239</td>
<td>0.212</td>
<td>0.069</td>
<td>0.274</td>
</tr>
<tr>
<td>ELF</td>
<td>0.271</td>
<td>0.251</td>
<td>0.722</td>
<td>0.138</td>
</tr>
<tr>
<td>Dist Jakarta</td>
<td>0.074</td>
<td>0.096</td>
<td>0.019</td>
<td>0.016</td>
</tr>
<tr>
<td>Total Pop</td>
<td>0.001</td>
<td>0.001</td>
<td>0.270</td>
<td>0.548</td>
</tr>
<tr>
<td>Share Urban Pop</td>
<td>0.265</td>
<td>0.284</td>
<td>0.536</td>
<td>0.592</td>
</tr>
<tr>
<td>Sec Enrollment</td>
<td>0.453</td>
<td>0.396</td>
<td>0.048</td>
<td>0.038</td>
</tr>
<tr>
<td>Share Asphalt Rd</td>
<td>0.596</td>
<td>0.586</td>
<td>0.79</td>
<td>0.9</td>
</tr>
<tr>
<td>Share Agri GDP</td>
<td>0.402</td>
<td>0.397</td>
<td>0.849</td>
<td>0.688</td>
</tr>
<tr>
<td>Share Min GDP</td>
<td>0.046</td>
<td>0.032</td>
<td>0.471</td>
<td>0.63</td>
</tr>
</tbody>
</table>
Table A.4: Balance Statistics, 2005

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean Treatment</th>
<th>Mean Control</th>
<th>T-test p-value</th>
<th>KS Bootstrap p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agri Exp Share</td>
<td>0.049</td>
<td>0.048</td>
<td>0.781</td>
<td>0.628</td>
</tr>
<tr>
<td>Admin Exp Share</td>
<td>0.248</td>
<td>0.270</td>
<td>0.099</td>
<td>0.016</td>
</tr>
<tr>
<td>Real GDP</td>
<td>$2.89 \cdot 10^{12}$</td>
<td>$3.78 \cdot 10^{12}$</td>
<td>0.355</td>
<td>0.428</td>
</tr>
<tr>
<td>Revenue</td>
<td>0.493</td>
<td>0.444</td>
<td>0.134</td>
<td>0.54</td>
</tr>
<tr>
<td>ELF</td>
<td>0.300</td>
<td>0.295</td>
<td>0.921</td>
<td>0.288</td>
</tr>
<tr>
<td>Dist Jakarta</td>
<td>0.085</td>
<td>0.093</td>
<td>0.407</td>
<td>0.334</td>
</tr>
<tr>
<td>Total Pop</td>
<td>0.001</td>
<td>0.001</td>
<td>0.411</td>
<td>0.636</td>
</tr>
<tr>
<td>Share Urban Pop</td>
<td>0.254</td>
<td>0.281</td>
<td>0.372</td>
<td>0.362</td>
</tr>
<tr>
<td>Sec Enrollment</td>
<td>0.568</td>
<td>0.517</td>
<td>0.062</td>
<td>0.338</td>
</tr>
<tr>
<td>Share Asphalt Rd</td>
<td>0.623</td>
<td>0.641</td>
<td>0.675</td>
<td>0.984</td>
</tr>
<tr>
<td>Share Agri GDP</td>
<td>0.377</td>
<td>0.377</td>
<td>0.987</td>
<td>0.394</td>
</tr>
<tr>
<td>Share Min GDP</td>
<td>0.056</td>
<td>0.047</td>
<td>0.713</td>
<td>0.739</td>
</tr>
</tbody>
</table>

Table A.5: Prediction of District Head Status in 2002 and 2006

<table>
<thead>
<tr>
<th></th>
<th>Directly Elected</th>
<th>Indirectly Elected</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>0.697 (2.489)</td>
<td>−0.633 (2.197)</td>
</tr>
<tr>
<td>Agri Exp Share</td>
<td>12.026 (22.401)</td>
<td>−16.040 (14.843)</td>
</tr>
<tr>
<td>Admin Exp Share</td>
<td>−3.216 (3.574)</td>
<td>−2.396 (2.620)</td>
</tr>
<tr>
<td>Real GDP</td>
<td>−0.000 (0.000)</td>
<td>−0.000 (0.000)</td>
</tr>
<tr>
<td>Revenue</td>
<td>4.428 (2.952)</td>
<td>5.838 (6.954)</td>
</tr>
<tr>
<td>ELF</td>
<td>−0.200 (0.820)</td>
<td>1.058 (0.960)</td>
</tr>
<tr>
<td>Dist Jakarta</td>
<td>−10.231 (8.088)</td>
<td>−11.308 (7.847)</td>
</tr>
<tr>
<td>Total Pop</td>
<td>−1561.380 (1075.300)</td>
<td>−281.901 (1141.273)</td>
</tr>
<tr>
<td>Share Urban Pop</td>
<td>−2.476 (2.101)</td>
<td>−3.825 (2.406)</td>
</tr>
<tr>
<td>Sec Enrollment</td>
<td>2.832 (1.892)</td>
<td>2.830 (1.798)</td>
</tr>
<tr>
<td>Share Asphalt Rd</td>
<td>0.022 (1.304)</td>
<td>1.822 (1.464)</td>
</tr>
<tr>
<td>Share Agri GDP</td>
<td>−1.463 (2.412)</td>
<td>1.828 (2.384)</td>
</tr>
<tr>
<td>Share Min GDP</td>
<td>−4.016 (3.166)</td>
<td>0.442 (4.215)</td>
</tr>
</tbody>
</table>

| N    | 133 | 127 |
| AIC  | 182.319 | 173.057 |
| BIC  | 332.617 | 320.955 |
| log L| 39.159 | 34.529 |

Robust standard errors in parentheses
* indicates significance at $p < 0.1$
This section quickly reviews main results from Scheipl (Scheipl, 2010). For regression parameters not subject to variable selection $\beta_u$ receive a flat, non-informative Gaussian prior. For the remaining model terms, the prior structure follows Ishwaran and Rao (Ishwaran and Rao, 2005):

$$
\beta | \gamma, \tau^2 \sim N(0, v^2) \text{ with } v^2 = \tau^2 \gamma \\
\gamma | \omega \sim \omega I_1(\gamma) + (1 - \omega) I_{v_0}(\gamma) \\
\tau^2 \sim IG(a_\tau, b_\tau) \\
\omega \sim Beta(a_\omega, b_\omega)
$$

$I_x(y)$ is an indicator function that is 1 in $x$ and 0 everywhere else, while $v_0$ is a small positive constant, so that the indicator $\gamma$ is 1 with probability $\omega$ and close to zero with probability $(1 - \omega)$. Since this standard NMIG prior is problematic in the context of coefficient selection for spline basis functions, due to the difficulty for the MCMC sampler to switch between different components of the mixture, Scheipl (Scheipl, 2010) develops a parameter expansion for the NMIG prior. For each $\beta_j = \alpha_j \xi_j$ and mutually independent $\alpha_j$ and $\xi_j$. Each $\alpha_j$ follows the NMIG prior outlined above, while $\xi$ are i.i.d. normal, with mean $m_{jk}$ ($k = 1, ..., d_j; j = 1, ..., p; m_{jk}$ 1 or $-1$ with equal probability) and standard deviation of 1. Default values for the hyperparameters are $a_\tau = 5, b_\tau = 25, v_0 = 2.5 \cdot 10^{-4}, a_\omega = b_\omega = 1$ and $Gamma^{-1}(10^{-4}, 10^{-4})$.

Furthermore, each term in the GAMM model structure associated with covariate $x$ is represented as
\[ \tilde{f}(\mathbf{x}) = \sum_{k=1}^{K} \delta_k \tilde{B}_k(\mathbf{x}) = \mathbf{B}\delta \]

where \( \delta \) is the vector of coefficients associated with the basis functions \( B_k(\cdot)(k = 1,\ldots,K) \) evaluated in \( \mathbf{x} \). The \( \delta \) has a conditionally multivariate Normal prior \( \delta|\nu^2 \sim N((0),\nu^2\mathbf{P}^{-1}) \), with a fixed scaled precision matrix \( \mathbf{P} \) that is often positive semi-definite. Scheipl (Scheipl, 2010) outlines details for how to handle partially improper priors and describes full conditionals and MCMC implementation.
A.3.2 Descriptive Statistics

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>logged population</td>
<td>12.92</td>
<td>0.91</td>
<td>10.09</td>
<td>15.27</td>
</tr>
<tr>
<td>logged area</td>
<td>21.31</td>
<td>1.71</td>
<td>16.11</td>
<td>25.52</td>
</tr>
<tr>
<td>real GDP per capita (no oil)</td>
<td>6003.27</td>
<td>10048.66</td>
<td>1249.15</td>
<td>143688.20</td>
</tr>
<tr>
<td>Development exp, % of total</td>
<td>0.30</td>
<td>0.14</td>
<td>0.01</td>
<td>0.80</td>
</tr>
<tr>
<td>Ethnic fractionalization</td>
<td>0.46</td>
<td>0.33</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Political fractionalization</td>
<td>0.74</td>
<td>0.10</td>
<td>0.36</td>
<td>0.85</td>
</tr>
<tr>
<td>Golkar 1999 vote share</td>
<td>0.28</td>
<td>0.16</td>
<td>0.10</td>
<td>0.66</td>
</tr>
<tr>
<td>Natural resource GDP, % of total</td>
<td>0.08</td>
<td>0.19</td>
<td>0.00</td>
<td>0.97</td>
</tr>
<tr>
<td>Enrollment, secondary</td>
<td>0.78</td>
<td>0.18</td>
<td>0.18</td>
<td>1.17</td>
</tr>
<tr>
<td>Urbanization</td>
<td>0.39</td>
<td>0.33</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Distance to Jakarta</td>
<td>1040.98</td>
<td>750.13</td>
<td>0.00</td>
<td>3781.74</td>
</tr>
<tr>
<td>Religious fractionalization</td>
<td>0.19</td>
<td>0.20</td>
<td>0.00</td>
<td>0.77</td>
</tr>
<tr>
<td>Sectoral gini</td>
<td>0.65</td>
<td>0.10</td>
<td>0.36</td>
<td>0.84</td>
</tr>
<tr>
<td>Total government rev, % of GDP</td>
<td>0.15</td>
<td>0.12</td>
<td>0.01</td>
<td>1.03</td>
</tr>
<tr>
<td>Agriculture GDP, % of total</td>
<td>0.33</td>
<td>0.20</td>
<td>0.00</td>
<td>0.72</td>
</tr>
<tr>
<td>Government exp, % GDP</td>
<td>0.12</td>
<td>0.10</td>
<td>0.01</td>
<td>0.91</td>
</tr>
</tbody>
</table>
Bibliography


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Gerschenkron, A. (1943), *Bread and Democracy in Germany*, Cornell University Press.


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Biography

- Jan Henryk Pierskalla, born in Berlin, Germany on March 29th 1982
- Diplom Politikwissenschaften, Free University of Berlin, 2007
- Master of Arts, Economics, Duke University, 2011
- PhD, Political Science, Duke University, 2012

Publications:


Awards:

- PARISS Fellowship, SSRI, 2011-12
- DIPE Research Funding, 2010, 2011
- Robert R. Wilson Award, 2010
- Walter Molano Graduate Fellow in Comparative Politics, 2010-11
- James B. Duke International Research Travel Fellowship, 2010-11
- Earhart Graduate Studies Fellowship, 2008-2009