

A Theory of Urban and Rural Bias: A Dual
Dilemma of Political Survival

by

Jan Henryk Pierskalla

Department of Economics
Duke University

Date: _____

Approved:

Charles Becker, Supervisor

Bahar Leventoglu

Huseyin Yildirim

Thesis submitted in partial fulfillment of the requirements for the degree of
Master of Arts in the Department of Economics
in the Graduate School of Duke University
2011

ABSTRACT

A Theory of Urban and Rural Bias: A Dual Dilemma of
Political Survival

by

Jan Henryk Pierskalla

Department of Economics
Duke University

Date: _____

Approved:

Charles Becker, Supervisor

Bahar Leventoglu

Huseyin Yildirim

An abstract of a thesis submitted in partial fulfillment of the requirements for
the degree of Master of Arts in the Department of Economics
in the Graduate School of Duke University
2011

Copyright © 2011 by Jan Henryk Pierskalla
All rights reserved except the rights granted by the
Creative Commons Attribution-Noncommercial Licence

Abstract

Pro-urban bias in policy is a common phenomenon in many developing countries. Bates (1981) has famously argued the wish to industrialize paired with the political clout of urban residents results in distinctly anti-rural policies in many developing countries. At the same time, empirical reality is much more varied than the standard urban bias argument suggests. Many governments have actively supported agricultural producers and rural citizens at early stages of development. Building on Bates' argument, this paper 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. Specifically, the direction of urban-rural bias is a function of the asymmetric political threat geographically distinct groups pose to the survival of the central government.

Contents

| | |
|--------------------------------------|-----|
| Abstract | iv |
| List of Figures | vi |
| List of Abbreviations and Symbols | vii |
| Acknowledgements | ix |
| 1 Introduction | 1 |
| 2 The Puzzle of Urban Bias | 5 |
| 3 A Simple Model of Urban-Rural Bias | 10 |
| 3.1 Analysis | 14 |
| 4 Population Mobility | 29 |
| 5 Discussion | 32 |
| A Appendix | 34 |
| A.1 Proofs of Propositions | 34 |
| Bibliography | 39 |

List of Figures

| | | |
|-----|---|----|
| 3.1 | Urban bias as a function of s | 18 |
| 3.2 | Urban bias as a function of γ | 19 |
| 3.3 | Urban bias ζ as a function of s | 22 |
| 3.4 | Urban bias as a function of s | 25 |
| 3.5 | Urban bias as a function of s | 27 |

List of Abbreviations and Symbols

Symbols

| | |
|----------|---|
| C | Center region. |
| P | Periphery region. |
| s | population share in the center. |
| G | Government in power. |
| θ | Production share in the periphery. |
| γ | Government non-tax revenue. |
| τ^p | Tax rate in the periphery. |
| τ^c | Tax rate in the center. |
| η^p | Aggregate government expenditures in the periphery. |
| η^c | Aggregate government expenditures in the center. |
| $V()$ | Government's policy proposal. |
| $g()$ | Public goods function. |
| α | 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. |
| β | Collective action efficiency. |
| μ | Income share protected from taxation. |

| | |
|----------------|-----------------------------|
| U^p | Utility of the periphery. |
| U^c | Utility of the center. |
| U^g | Utility of the government. |
| $\hat{\mu}$ | No revolt threshold. |
| $\bar{\mu}$ | Efficient revolt threshold. |
| $\bar{\gamma}$ | Always protest threshold. |
| ζ | Urban bias in equilibrium. |

Acknowledgements

I wish to thank Karen Remmer, Erik Wibbels, David Soskice, Torben Iversen, Pablo Beramendi, Jonathan Rodden, Luis de la Calle, Bahar Leventoglu, Charles Becker, Husseyin Yildirim, David Laitin and Sean Zeigler, seminar participants at Duke and conference participants at the Juan March Institute for many helpful comments and suggestions.

1

Introduction

Development Economists recognized 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 development¹. If governments were to enable agricultural markets to function well and supply financial and technological support, huge agricultural productivity and growth gains were to 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 revenues from rural cash crop farmers in order to finance urban industrialization projects and buy 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

¹ For an overview of the empirical literature see Bezemer and Headey (2008)

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 or differential public goods provision, 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). 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 as essentially redistribution between rural and urban areas to ensure the continued support of salient groups, we will be able to identify conditions under which urban bias is expected to be especially strong and which factors will reduce urban 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. While most critics of the urban bias account (Varshney, 1994, e.g.) focus on the underexplored role of political institutions and democratic elections, we keep 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).

This paper adds to existing research in several ways. First, we advance the theoretical understanding of the urban bias phenomenon by formalizing and extending elements of Bates' argument, providing a formal model that allows urban and rural bias policy outcomes. Second, our 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 stands in contrast to existing arguments that emphasize the role of economic class structures (Huber and Stephens, 2001), interpersonal or interregional inequality (Meltzer and Richards, 1981) or other ascriptive attributes like identity and ethnicity (Alesina et al., 1999; Alesina and Glaeser, 2005; Stasavage and Scheve, 2006) in shaping 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 main results of the model and Section 5 discusses a possible extension to include population mobility. Section 6 concludes and discusses the direction of further research.

2

The Puzzle of Urban Bias

Improving agricultural productivity and correcting market failures in agriculture is generally considered an important stepping stone for long-term economic development (Bravo-Ortega and Lederman, 2005; Dixit, 1969; Kang and Ramachandran, 1999; Kay, 2002; Diao et al., 2006) and the reduction of poverty (Ravaillon and Datt, 2002; Ravaillon and Chen, 2004; Lipton, 2005). Government intervention is needed to overcome market failures and foster investment in agriculture (Binswanger and Deininger, 1997). Policies that favor urban production and urban residents exacerbate failures of agricultural markets and are a crucial hindrance to generating sustained growth. In a seminal study Bates (1981) argues that Africa's failed agricultural policy is in part caused by adverse incentives for national political leaders. He documents for cases in sub-Saharan Africa that agricultural policy throughout the post WW II era was heavily biased against rural development. 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 pa-

tronage. 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 was the need for political survival. Governments had to use some of the revenue to inoculate themselves against the possibility of urban unrest. Protesting urban workers either posed a direct threat to the regime or could trigger a coup by the military and hence had to be avoided at all costs. Rulers tried to defuse the threat of escalating urban protest by controlling the cost of living (e.g. low prices for food, fuel subsidies) and co-opting labor leaders. In rural areas, the regime not only engaged in resource extraction but also political repression and some targeted subsidies to avoid rural mobilization of opposition¹.

In most accounts urban bias implies the transfer of economic resources from the countryside to urban centers, economic regulations that inhibit investment and growth in the rural sector, price controls and political repression. Lipton (1977) similarly defines urban bias as the combination of an inefficient and inequitable transfer of resources to urban areas, paired with the support of the political elite. If conceptualized this way, measuring urban bias is not straightforward. To determine the level of urban bias in any given society, one would have to measure the level of urban-rural redistribution, specific domestic policies and regulations for agricultural markets, trade policies and the distribution of political rights. In absence of any holistic measures, researchers have fallen back on using data on differential public goods provision, household consumption levels, overvaluation of the exchange rate and producer support estimates. When using these incomplete measures, urban bias has indeed been found to be a common phenomenon in developing countries, especially persistent in Africa over time, while advanced industrialized countries heavily support agriculture and rural citizens (Anderson and Hayami, 1986; Bezemer and

¹ 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.

Headey, 2008; Anderson, 2009). 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). A 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. Even 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 East and South East 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), 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). Not only did conservative rulers in Asia direct economic resources to the countryside, but also groomed in the long-run rural residents as a conservative voting base to counterbalance the influence of urban groups. 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).

The question then becomes, why do we see urban bias in some but not all developing countries? When does the logic outlined by Bates dominate the urban-rural cleavage and when do politicians favor the countryside? Is urban bias actually a result of an urban-rural political conflict, or simply epiphenomenal to the spatial

clustering of ethnic groups, income levels or the result of co-ethnic linkages (Kasara, 2007)?

To make sense out of the 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 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). 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 civil 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 his 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 try to 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.

A Simple Model of Urban-Rural Bias

The model builds on and borrows from existing approaches dealing with distributive conflicts in divided societies (i Miguel, 2007; Acemoglu and Robinson, 2001; Acemoglu et al., 2004)¹. We develop a simple principal-agent extensive game of complete information². 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.

¹ Acemoglu and Robinson (2001) are interested in the inability of ruling elites to make credible commitments over redistribution in the absence of institutional commitments. The model considered here brackets this dynamic commitment problem, but adds the provision of public goods instead of pure resource transfers to a redistributive struggle.

² The results presented here are qualitatively equivalent to a slightly more general version of the game with an infinite horizon.

This might be because the government is a dictatorship or the elected government can implement policy unchecked by electoral constraints due to informational asymmetries. This implies that in the absence of 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 θ , produced in the periphery, government non-tax revenue of size γ , which might represent revenue from natural resources or foreign aid, and production in the center of size $1 - \theta - \gamma$. 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 rents³.

A government is headed by a current leader G who taxes production in the periphery at rate τ^p and production in the center at τ^c with $\tau^p, \tau^c \in [0, 1]$ ⁴. 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 η^P and spending in the center by η^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

³ If large parts of the rural population migrate to the city, increased labor supply at least in the short run depresses urban wages.

⁴ 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 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 $c_p(s)$. The cost are a convex, falling function of the population s in the capital $c_p(s) = (1 - s)^\beta$, with $\beta > 1$ ⁵. 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 γ/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

⁵ 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.

in power, but G can only apply the tax rate τ^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 μ measures the effectiveness of the population in P in sustaining the insurgency. This captures military efficiency of the insurgents, the difficulty for the government to engage the enemy and the ability to shield resources from taxation (e.g. large distance to the capital, vulnerable military infrastructure, access to smuggling routes, etc.)

The game features a fundamental principal-agent problem. Independently of the make-up of political institutions, no other mechanism of accountability other than a direct threat to the leader's survival can induce a change in policy.

Payoffs for all players are defined as

$$U^p = (1 - r^p)\left[(1 - \tau^p)\frac{\theta}{1 - s} + (\eta^p)^{1/\alpha}\right] + r^p\left[\frac{\mu\theta}{1 - s} + (1 - \tau^p)\frac{(1 - \mu)\theta}{1 - s} + (\eta^p)^{1/\alpha}\right] \quad (3.1)$$

$$U^c = (1 - r^c)\left[(1 - \tau^c)\frac{1 - \theta - \gamma}{s} + (\eta^c)^{1/\alpha}\right] + r^c\left[\frac{1 - \theta - \gamma}{s} + \frac{\gamma}{s} - (1 - s)^\beta\right] \quad (3.2)$$

$$U^g = (1 - r^c)\left[(1 - r^p)[\tau^p\theta - \eta^p + \tau^c(1 - \theta - \gamma) - \eta^c + \gamma]\right] \quad (3.3)$$

$$+ r^p[\tau^p(1 - \mu)\theta - \eta^p + \tau^c(1 - \theta - \gamma) - \eta^c + \gamma] + r^c[0] \quad (3.4)$$

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

3.1 Analysis

We can solve this extensive game with complete information by backwards induction. In the following we will focus on core results only, complete derivations and proofs for all propositions can be found in the Appendix.

First, the behavior of the citizens in the periphery at the final decision node is of interest. P has to compare the payoffs for $r^p = 1$ and $r^p = 0$. Comparing these payoffs, we can derive the insurgency constraint on τ^p :

$$\tau^p \leq \frac{s^\beta(1-s)}{\mu\theta} \quad (3.5)$$

If G can pick a tax rate τ^p that satisfies this constraint, P can be dissuaded from an insurgency. Given the exogenous parameters θ , γ , α , β and s , we can immediately identify a threshold $\hat{\mu}$ below which P will never revolt, even under maximally extractive policies $\tau^p = 1$ and $\eta^p = 0$:

$$\hat{\mu} = \frac{s^\beta(1-s)}{\theta} \quad (3.6)$$

Now, moving to the decision of the citizens in the center. Again, we compare the payoffs for protest and accepting the policy proposal to derive a constraint on government policy that avoids any threat to political survival:

$$\frac{1-\theta}{s} - (1-s)^\beta \leq (1-\tau^c) \frac{1-\theta-\gamma}{s} + (\eta^c)^{1/\alpha} \quad (3.7)$$

$$(\eta^c)^{1/\alpha} - \tau^c \left(\frac{1-\theta-\gamma}{s} \right) \geq \frac{\gamma}{s} - (1-s)^\beta \quad (3.8)$$

Equation (8) says that the net payoff to the government's policy proposal has to outweigh the net benefit of protesting. The government G has to fulfill this constraint if it wants to stay in power, since the payoffs for being removed from office are zero. If $\frac{1-\theta}{s} < (1-s)^\beta$, C will never protest regardless the amount of taxation and G can ignore the constraint. If $\frac{1-\theta}{s} > (1-s)^\beta$, potential benefits from protesting are higher than the immediate costs and G has to worry about the constraint. Note that there are conditions under which G can never fulfill this constraint. Specifically, if G commits to a maximum level of redistribution $V = (\tau^c = 0, \tau^p = 1, \eta^c = \theta + \gamma, \eta^p = 0)$, the following inequality

$$\begin{aligned} \frac{1-\theta-\gamma}{s} + (\theta+\gamma)^{1/\alpha} &\geq \frac{1-\theta}{s} - (1-s)^\beta \\ (\theta+\gamma)^{1/\alpha} &\geq -(1-s)^\beta \end{aligned}$$

implicitly defines a threshold value $\bar{\gamma}(\theta, s, \alpha, \beta)$ for γ , above which G can never avoid protest⁶. Using these cutoff points for the behavior of the population in the periphery and the center, we can determine the first two equilibria of the game.

Proposition 1: Political Instability; If $\gamma > \bar{\gamma}$ and $\frac{1-\theta}{s} > (1-s)^\beta$, 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

⁶ This threshold is increasing in s , θ and α , but falling in β . Specifically, if s is very low relative to the potential loot, protest becomes harder and harder to avoid, even with maximum levels of redistribution.

$(1 - \theta)/s$. *Proof in the Appendix.*

Proposition 1 describes an equilibrium of political instability in which the high benefits of looting negate the survival chances of any government.

*Proposition 2: Leviathan; If $\frac{1-\theta}{s} < (1 - s)^\beta$ 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.**

If the potential payoff of protesting is smaller than the cost of protest and the effectiveness of a rural insurgency in hindering government extraction is too low, G faces no credible threat of political survival and it can extract at maximum rates⁷.

On the other hand, if protest is possible ($\frac{1-\theta}{s} > (1 - s)^\beta$), while P remains powerless and G is potentially able to dissuade the urban population from protest ($\gamma < \bar{\gamma}$), the government will have to identify levels of taxation and spending that maximize its own utility and fulfill the protest and budget constraint. There is a unique solution to this maximization problem, expressed in the following proposition:

Proposition 3: Classical Urban Bias; If $\gamma < \bar{\gamma}$, $\frac{1-\theta}{s} > (1 - s)^\beta$ 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

$$\begin{aligned}\hat{t}^c &= \frac{s}{1 - \theta - \gamma} [(\alpha/s)^{\frac{1}{1-\alpha}} + (1 - s)^\beta - \gamma/s] \\ \hat{\eta}^c &= (\alpha/s)^{\frac{\alpha}{1-\alpha}}\end{aligned}$$

Proof in the Appendix.

⁷ If one includes a deadweight loss of taxation, maximum extraction would be implemented at a rate where marginal revenue increases equals marginal costs.

The government will extract maximum rents from the periphery because they do not pose a threat to political survival. It uses these revenues for private consumption and to buy-off the population in the center to make them just indifferent between protesting and accepting the current government. It is already possible to read off interesting comparative static effects from these results. The equilibrium level of government spending in the center is decreasing in the government's efficiency of providing public goods ($\frac{\partial \eta^c}{\partial \alpha} < 0$), as is the equilibrium tax rate ($\frac{\partial \tau^c}{\partial \alpha} < 0$). The equilibrium tax rate in the center is also falling in the costliness of protest ($\frac{\partial \tau^c}{\partial \beta} < 0$) and the amount of government non-tax revenue ($\frac{\partial \tau^c}{\partial \gamma} < 0$).

Using these results, the model makes predictions about the amount of urban bias in equilibrium. In both the instability and complete extraction equilibria there is no differential treatment of the center and the periphery, either because the government cannot expropriate any resources or expropriates equally. In the equilibrium of Proposition 3, there is urban bias, but the degree varies with the exogenous parameters of the model. In particular, if we define urban bias as the difference in net per capita spending in the center and net per capita spending in the periphery, denoted by ζ , we can derive an explicit expression:

$$\zeta = \hat{\eta}^c - \hat{\tau}^c \frac{1 - \theta - \gamma}{s} - [\eta^p - \tau^p \frac{\theta}{s}] \quad (3.9)$$

$$= (\alpha/s)^{\frac{\alpha}{1-\alpha}} - (\alpha/s)^{\frac{1}{1-\alpha}} - (1-s)^\beta + \frac{\gamma}{s} + \frac{\theta}{s} \quad (3.10)$$

Figure 3.1 shows the relationship between population share s the amount of urban bias and Figure 3.2 as a function of γ .

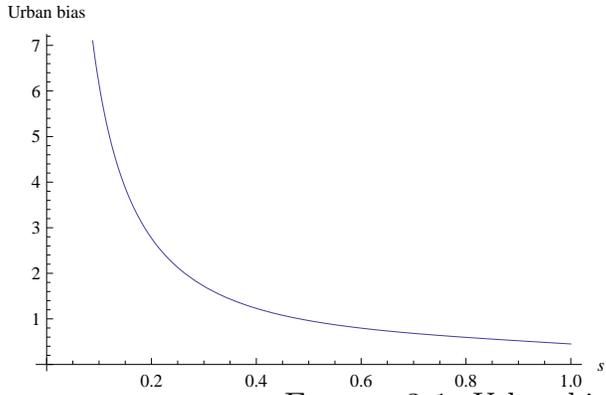


FIGURE 3.1: Urban bias as a function of s

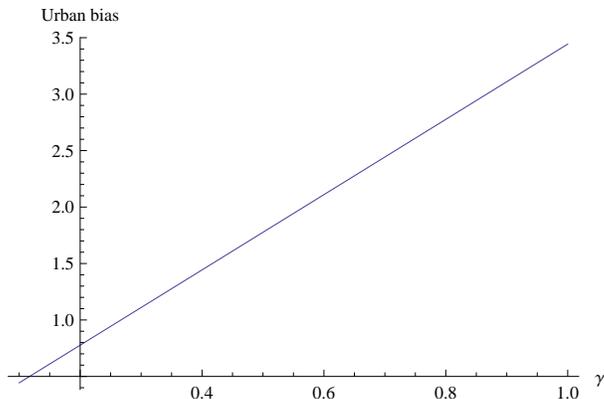


FIGURE 3.2: Urban bias as a function of γ

While urban bias is strictly increasing in γ , the population share in the center s has a negative relationship with urban bias ($\frac{\partial \zeta}{\partial s} < 0$). 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 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 counts. In this equilibrium, highest levels of urban bias are to be expected in societies with smaller shares of the population 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 we would expect

maximum extraction or political instability instead of urban bias.

While rulers fear the threat of the urban population, it seems unreasonable to assume the population in the countryside has no political power whatsoever, i.e. $\mu < \hat{\mu}$. If the population in the countryside is somewhat effective at implementing a rural insurgency, a new set of equilibria emerges. If $\mu > \hat{\mu}$, 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. Insurgency can be avoided, if P prefers a minimally redistributive policy to maximal extraction with an insurgency, expressed by the following inequality:

$$(1 - \tau^p) \frac{\theta}{1 - s} + (\eta^p)^{1/\alpha} \geq (1 - \tau^p)(1 - \mu) \frac{\theta}{1 - s} + (\eta^p)^{1/\alpha} - s^\beta + \frac{\mu\theta}{1 - s} \quad (3.11)$$

Which can be rearranged to give the following constraint:

$$\tau^p \leq \frac{s^\beta(1 - s)}{\mu\theta} \quad (3.12)$$

The threat of the countryside only constrains the tax choice of the government, not the level of public goods provision. Since the government tries to maximize the budget residual for its own consumption, even in the presence of a rural threat, it will set $\eta^p = 0$. This result implies that for political reasons, the government tends to provide fewer public goods in the periphery, relative to the center, much in line with the reasoning in Ades and Glaeser (1995). Nonetheless, we can derive an equilibrium with rural bias. Assume while the countryside can issue a credible threat ($\mu > \hat{\mu}$), the citizens in the center will never protest ($\frac{1-\theta}{s} < (1-s)^\beta$). Then, G can fully expropriate the center ($\tau^c = 1, \eta^c = 0$), but has to weigh the payoff for buying off the countryside, i.e. reduced extraction, against extracting at maximum levels and tolerating an insurgency:

$$\frac{s^\beta(1-s)}{\mu} + 1 - \theta \geq (1-\mu)\theta + 1 - \theta \quad (3.13)$$

The left hand side represents the payoff to the government implementing a tax rate in the periphery that satisfies the insurgency constraint. The right hand side shows the payoff for the government if G chooses to violate the constraint and then, in order to maximize utility, implement $\tau^p = 1$. Rearranging and solving for μ , we can identify a threshold value $\bar{\mu}$, above which the insurgency is so effective, that G opts for a peaceful resolution.

Proposition 4: Rural Bias; If $\frac{1-\theta}{s} < (1-s)^\beta$, but $\mu > \hat{\mu}$ and $\mu > \bar{\mu}$, 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.

This is actually a rural bias outcome. If the urban population poses no threat to the government and the insurgency is very capable of seriously stunting the government's extractive capabilities, G has to implement pro-rural policies. The net per capita difference in spending:

$$\zeta = -\frac{1-\theta-\gamma}{s} + \frac{s^\beta(1-s)}{\mu s} \quad (3.14)$$

is 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 (Figure 3.3).

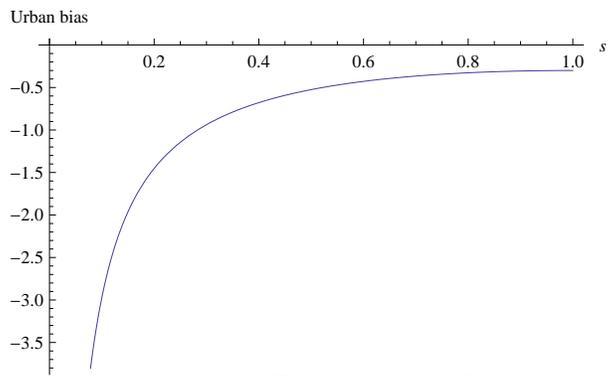


FIGURE 3.3: Urban bias ζ as a function of s

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.

Increasing the effectiveness of the insurgency reduces urban bias ($\frac{\partial \zeta}{\partial \mu} < 0$), while the effect of increased government non-tax revenue stays the same as before.

On the other hand, if $\mu < \bar{\mu}$, the government rather extracts all resources and tolerates a minor insurgency.

Proposition 5: Leviathan with Insurgency; If $\frac{1-\theta}{s} < (1-s)^\beta$, but $\hat{\mu} < \mu < \bar{\mu}$, 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 $\frac{\mu\theta}{1-s}$.

In contrast to the complete extraction case from in Proposition 2, here G has to endure an insurgency and lose partial control over its territory.

The last case deals with a dual threat by both the center and the periphery. If the protest constraint is binding, G has to spend resources in the center to assure political survival, but still has the choice between tolerating an insurgency or minimal 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

$$\begin{aligned}\hat{t}^c &= \frac{s}{1-\theta-\gamma} [(\alpha/s)^{\frac{1}{1-\alpha}} + (1-s)^\beta - \gamma/s] \\ \hat{\eta}^c &= (\alpha/s)^{\frac{\alpha}{1-\alpha}}\end{aligned}$$

Proof in the Appendix

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 as a function is the same as in equation (10) 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

$$\begin{aligned}\hat{t}^c &= \frac{s}{1-\theta-\gamma} [(\alpha/s)^{\frac{1}{1-\alpha}} + (1-s)^\beta - \gamma/s] \\ \hat{\eta}^c &= (\alpha/s)^{\frac{\alpha}{1-\alpha}} \\ \hat{\tau}^p &= \frac{s^\beta(1-s)}{\mu\theta}\end{aligned}$$

Proof in the Appendix

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

$$\zeta = (\alpha/s)^{\frac{\alpha}{1-\alpha}} - (\alpha/s)^{\frac{1}{1-\alpha}} - (1-s)^\beta + \frac{\gamma}{s} + \frac{s^\beta(1-s)}{\mu s} \quad (3.15)$$

While the effect of a change in government non-tax revenue or the effectiveness of the insurgency stay the same ($\frac{\partial \zeta}{\partial s} > 0$, $\frac{\partial \zeta}{\partial \gamma} > 0$), the effect of s is now nonlinear. Figure 3.4 displays urban bias as a function of s for the conditions in Proposition 7.

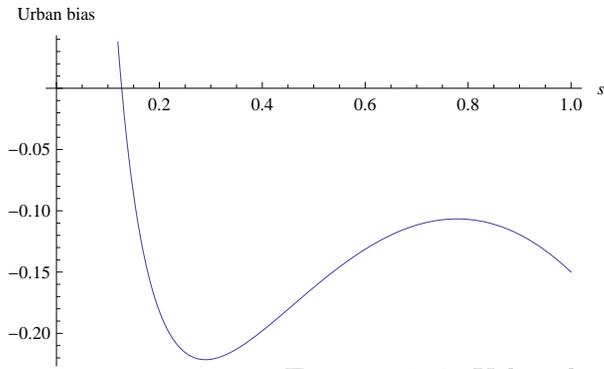


FIGURE 3.4: Urban bias as a function of s

When the majority of the population resides in the periphery, the government will implement policy that does favor the center, reflecting the threat of protest, but at the same time has to minimize taxation to avoid an insurgency. As more and more people move to the center, it becomes increasingly cheap to buy off the center population, while the threat of an insurgency declines less fast, up to the point where an insurgency becomes very costly and G starts again to improve conditions in the center. At very high levels of s , the center again loses relative political power, while rural residents have much to gain from shielding their high economic rents from taxation.

We constructed a simple game to model the strategic conflict over geographic redistribution, when actors can issue different kinds of threats. Using intuitively appealing assumptions we were able to derive equilibria that directly map to observable outcomes. The game allows for extractive outcomes, political instability, urban and rural bias, as well as the presence of a rural insurgency. Figure 3.5 illustrates the equilibrium outcomes as a function of the threshold values on μ , γ and the cost of protest.

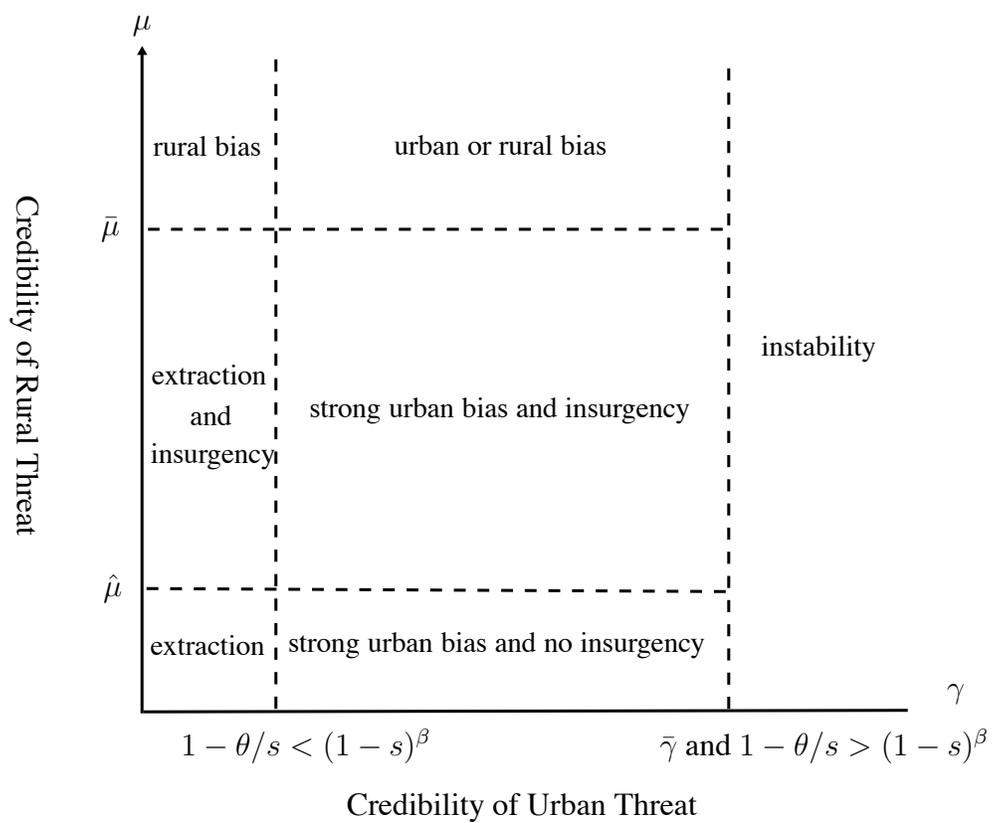


FIGURE 3.5: Urban bias as a function of s

If both the periphery and the center pose no credible threat to the current government, both areas are expropriated equally. This outcome might or might not be paired with an inefficient insurgency. This is especially likely if the government has few non-tax revenues, a potential insurgency does not threaten the government and a relatively high share of the population resides in the center. If the government has large amounts of non-tax revenue and the population share in the center is relatively low, political instability with constantly changing leaders arises, which can not be ameliorated by redistribution. If the protest threat is binding, but not the insurgency threat, the outcome will be classical urban bias. If the population in the periphery can start an insurgency, urban bias can be paired with rural unrest. If the protest threat is not credible, but a potential insurgency is highly effective, rural bias can emerge. If both the protest and insurgency threat are credible, the government will implement policies that extract less resources from both areas. In this equilibrium, both urban and rural bias are possible. Interestingly, the effectiveness of an insurgency μ has indirect and direct effects. It directly reduces the amount of taxable resources the government can expropriate and it indirectly makes it harder for the government to buy-off urban groups.

Bracketing for now the extreme cases of instability, complete extraction and pure rural bias, the equilibrium amount of urban bias, defined as the difference between net per capita spending in the center and periphery, is defined by equations (10) and (15). We can derive empirical implications of the model with regard to at least three observable quantities of interest: μ , γ and s . Across cases, a higher effectiveness of a rural insurgency should reduce the amount of urban bias. More government non-tax revenue should increase urban bias, while the effect of the population share in the center is likely negative or potentially follows a U-shaped curve.

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, some governments have sufficiently large time horizons to contemplate the direct effects of population mobility and the effect public policies have on mobility itself. Short of a detailed analysis of an extended model, we will discuss the potential qualitative changes a mobile population introduces to the model above.

Assume the population in P and C can mechanically switch locations after the government has announced its policy vector, disregarding the strategic implications of the resulting change in the cost of protest. In particular, after V has been announced and before agents in C make the decision to protest or not, citizens migrate until the expected payoffs, conditional on the policy being implemented, in both regions are equalized. To simplify matters, migration from one region to another comes at an individual cost of ϵ_i , where each ϵ_i a draw from a Bernoulli random variable on $\{0, k\}$. If $\epsilon_i = 0$ the individual is mobile, if $\epsilon_i = k$, the individual is considered to be immobile. Using the realizations of the ϵ_i 's, we can group individuals in each region according to their ability to move. An individual will only migrate from one place

to another if the cost $\epsilon_i = 0$ and there exists a positive expected income differential. Adding population mobility to the instability and total extraction equilibria does not change any of the results. Introducing mobility in the cases of urban or rural bias though is likely to produce changes.

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 (see Figure 3). Anticipating this movement, G has to adjust its tax rate τ^P to avoid an insurgency downwards.

Population mobility increases the rents for the government in cases of an urban threat, while it decreases rents when facing a rural threat. 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. Overall, population mobility should not affect the empirical predictions of the model: we expect to see a negative or positive association between s and urban bias, depending on the presence of a rural threat. This discussion clearly reveals though that governments have an incentive to influence ϵ_i in order to increase their payoffs. Channeling population flows through policies that affect mobility can be used by a government with a long time horizon to increase extraction of the general population. In reality, government foresight probably lies somewhere between the assumption of total myopia and perfect foresight, but cer-

tainly affects behavior substantially. Wallace's (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 survival chances and rents.

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 an 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.

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. We 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 degree of bias is then a function of government non-tax revenues, the share of the population in the capital and the potential effectiveness of a rural insurgency. While simple, the model still produces rich observable implications.

The theoretical model makes several simplifying assumptions that bracket important aspects of urban-rural bias. In particular, the model does not allow for the government to engage in repression while setting levels of regional redistribution. Repression is a common strategy to control rural opposition groups but also urban labor movements. Future modeling efforts should certainly include the possibility

for governments to selectively repress the population. Several studies also have highlighted the possibility to co-opt rural leaders to control the rural population. Leaders from the center use extensive patronage networks to funnel resources to key players in urban and rural settings, ensuring their support.

Furthermore, the model assumes the presence of a strong principal-agent problem, underlying the interaction between citizens and rulers. Agents in the model act supremely self-interested and ignore any kind of bounds based on identity, culture or elections. This immediately suggests, as other institutional means of accountability become available, the importance of geographical threats should diminish or at least change. Hence, future modeling should consider the role of elections and identity bounds in conjunction with geographical location.

The origins of urban bias are an important research question that deserves further study. Empirically, it remains unclear whether urban bias is a mere side product of the geographic concentration of specific groups (ethnic or social) or if geographic features like population density and location also affect policy decisions. The model presented here took the latter approach and emphasized the importance of the geographic advantage urban citizens enjoy in challenging the government and the survival advantage of a rural insurgency. We hope to extend and confirm the usefulness of this approach for explaining agricultural development, sub-national patterns of redistribution and political violence, as well as connections to existing theories of redistribution.

Appendix A

Appendix

A.1 Proofs of Propositions

Proof of Proposition 1: The proof follows directly from the threshold values on γ 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:

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

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

$$\begin{aligned}
\mathcal{L} &= \tau^p \theta - \eta^p + \tau^c (1 - \theta - \gamma) - \eta^c + \gamma - \lambda_1 (-\tau^p) - \lambda_2 (\tau^p - 1) \\
&- \lambda_3 (-\tau^c) - \lambda_4 (\tau^c - 1) - \lambda_5 (-\eta^p) - \lambda_6 (-\eta^c) \\
&- \lambda_7 \left(\tau^c \left(\frac{1 - \theta - \gamma}{s} \right) - (\eta^c)^{1/\alpha} - (1 - s)^\beta + \gamma/s \right) + \delta V^g(\mathcal{N}) \\
&- \lambda_8 (\eta^p + \eta^c - \tau^p \theta - \tau^c (1 - \theta - \gamma) + \gamma)
\end{aligned}$$

$$\frac{\partial \mathcal{L}}{\partial \tau^p} = \theta + \lambda_1 - \lambda_2 + \lambda_8 \theta = 0 \quad (\text{A.1})$$

$$\frac{\partial \mathcal{L}}{\partial \tau^c} = (1 - \theta - \gamma) + \lambda_3 - \lambda_4 - \lambda_7 \left(\frac{1 - \theta - \gamma}{s} \right) + \lambda_8 (1 - \theta - \gamma) = 0 \quad (\text{A.2})$$

$$\frac{\partial \mathcal{L}}{\partial \eta^p} = -1 + \lambda_5 - \lambda_8 = 0 \quad (\text{A.3})$$

$$\frac{\partial \mathcal{L}}{\partial \eta^c} = -1 + \lambda_6 + \lambda_7 \frac{1}{\alpha} (\eta^c)^{(1-\alpha)/\alpha} - \lambda_8 = 0 \quad (\text{A.4})$$

$$\lambda_1 \tau^p = 0 \quad (\text{A.5})$$

$$\lambda_2 (\tau^p - 1) = 0 \quad (\text{A.6})$$

$$\lambda_3 \tau^c = 0 \quad (\text{A.7})$$

$$\lambda_4 (\tau^c - 1) = 0 \quad (\text{A.8})$$

$$\lambda_5 \eta^p = 0 \quad (\text{A.9})$$

$$\lambda_6 \eta^c = 0 \quad (\text{A.10})$$

$$\lambda_7 \left(\tau^c \left(\frac{1 - \theta - \gamma}{s} - (\eta^c)^{1/\alpha} - (1 - s)^\beta + \gamma/s \right) \right) = 0 \quad (\text{A.11})$$

$$\lambda_8 (\eta^p + \eta^c - \tau^p \theta - \tau^c (1 - \theta - \gamma) + \gamma) = 0 \quad (\text{A.12})$$

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 $\tau^c = \frac{s}{1-\theta-\gamma}[(\alpha/s)^{\frac{1}{1-\alpha}} + (1-s)^\beta - \gamma/s]$. This proves 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 $\eta^c = (\frac{\alpha}{s + \frac{s}{1-\theta-\gamma}})^{\alpha/(1-\alpha)}$, which together with $\tau^c = 0$ violates the protest constraint. If we alternatively assume $\lambda_6 > 0$, η^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 μ 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 $\bar{\mu} = -1/2 + \frac{(1+4\frac{s^\beta(1-s)}{\theta})^{1/2}}{2}$

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 τ^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 $\frac{\mu\theta}{1-s}$.

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

$$\begin{aligned}\hat{t}^c &= \frac{s}{1-\theta-\gamma} [(\alpha/s)^{\frac{1}{1-\alpha}} + (1-s)^\beta - \gamma/s] \\ \hat{\eta}^c &= (\alpha/s)^{\frac{\alpha}{1-\alpha}}\end{aligned}$$

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 τ^c and η^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 $\hat{\tau}^p = \frac{s^\beta(1-s)}{\mu\theta}$ 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.

Bibliography

- Acemoglu, D. and Robinson, J. (2001), “A Theory of Political Transitions,” *American Economic Review*, 91, 938–963.
- Acemoglu, D., Robinson, J. A., and Verdier, T. (2004), “Kleptocracy and Divide-And-Rule: A Model of Personal Rule,” *Journal of the European Economic Association*, 2, 162–192.
- Ades, A. and Glaeser, E. L. (1995), “Trade and Circuses: Explaining Urban Giants,” *Quarterly Journal of Economics*, 110, 195–227.
- Alesina, A. and Glaeser, E. (2005), *Fighting Poverty in the US and Europe: A World of Difference*, Oxford University Press.
- Alesina, A., Baqir, R., and Easterly, W. (1999), “Public Goods and Ethnic Divisions,” *The Quarterly Journal of Economics*, 114, 1243–1284.
- Anderson, K. (ed.) (2009), *Distortions to Agricultural Incentives. A Global Perspective, 1955-2007*, World Bank.
- Anderson, K. and Hayami, Y. (1986), *The Political Economy of Agricultural Protection. East Asia in International Perspective*, Allen& Unwin.
- Bates, R. H. (1981), *Markets and States in Tropical Africa. The Political Basis of Agricultural Policies*, University of California Press.
- Bezemer, D. and Headey, D. (2008), “Agriculture, Development and Urban Bias,” *World Development*, 36, 1342–1364.
- Binswanger, H. P. and Deininger, K. (1997), “Explaining agricultural and agrarian policies in developing countries,” *Journal of Economic Literature*, 35, 1958–2005.
- Bravo-Ortega, C. and Lederman, D. (2005), “Agriculture and National Welfare around the World: Causality and international heterogeneity since 1960,” World Bank Policy Research Working Paper No. 3499.
- Bruton, H. J. (1998), “A Reconsideration of Import Substitution,” *Journal of Economic Literature*, 36, 903–36.

- Buhaug, H. and Rod, J. K. (2006), "Local determinants of African civil wars, 1970-2001," *Political Geography*, 25, 315–335.
- Collier, R. and Collier, D. (1991), *Shaping the Political Arena: Critical Junctures, the Labor Movement, and Regime Dynamics in Latin America*, Princeton University Press.
- Danguilan, M. (1999), "Bullets and Bandages: Public Health as a Tool of Engagement in the Philippines," Takemi Program in International Health Research Paper No. 161.
- Diao, X., Hazell, P., Resnick, D., and Thurlow, J. (2006), "The role of agriculture in development: Implications for Sub-Sahara Africa," IFPRI Development Strategy and Policy Division Discussion Paper No. 29.
- Dixit, A. (1969), "Marketable Surplus and Dual Development," *Journal of Economic Theory*, 1, 203–219.
- Do, Q.-A. and Campante, F. R. (2007), "Keeping Dictators Honest: the Role of Population Concentration," Working Paper.
- Doronila, A. (1992), *The State, Economic Transformation, and Political Change in the Philippines*, Oxford University Press.
- Fearon, J. D. and Laitin, D. D. (2003), "Ethnicity, Insurgency, and Civil War," *American Political Science Review*, 97, 75–90.
- Haggard, S. and Kaufman, R. R. (2008), *Development, Democracy, and Welfare States. Latin America, East Asia, and Eastern Europe*, Princeton University Press.
- Huber, E. and Stephens, J. (2001), *Development and Crisis of the Welfare State: Parties and Policies in Global Markets*, University of Chicago Press.
- i Miguel, G. P. (2007), "The Control of Politicians in Divided Societies: The Politics of Fear," *Review of Economic Studies*, 74, 1259–1274.
- Kalyvas, S. and Kocher, M. A. (2007), "How "Free" is Free Riding in Civil Wars? Violence, Insurgency, and the Collective Action Problem," *World Politics*, 59, 177–216.
- Kalyvas, S. N. (2006), *The Logic of Violence in Civil Wars*, Cambridge University Press.
- Kang, K. and Ramachandran, V. (1999), "Economic transformation in Korea: Rapid growth without an agricultural revolution?" *Economic Development and Cultural Change*, 47, 783–801.

- Kasara, K. (2007), "Tax Me If You Can: Ethnic Geography, Democracy, and the Taxation of Agriculture in Africa," *American Political Science Review*, 101, 159–172.
- Kay, C. (2002), "Why East Asia overtook Latin America: Agrarian reform, industrialization and development," *Third World Quarterly*, 23, 1073–1102.
- Kerkvliet, B. J. (1977), *The Huk Rebellion: A Study of Peasant Revolt in the Philippines*, University of California Press.
- Kuran, T. (1991), "Now Out of Never: The Element of Surprise in the East European Revolution of 1989," *World Politics*, 44, 7–48.
- Lipton, M. (1977), *Why Poor People Stay Poor. A study of urban bias in world development*, Harvard University Press.
- Lipton, M. (2005), "The family farm in a globalizing world: The role of crop science in alleviating poverty," 2020 Discussion Paper No. 40 International Food Policy Research Institute.
- Lohmann, S. (1994), "Dynamics of Informational Cascades: The Monday Demonstrations in Leipzig, East Germany, 1989-1991," *World Politics*, 47, 42–101.
- McGuire, J. (2001), "Social Policy and Mortality Decline in East Asia and Latin America," *World Development*, 29, 1673–97.
- Meltzer, A. H. and Richards, S. F. (1981), "A Rational Theory of the Size of Government," *Journal of Political Economy*, 89, 914–928.
- Muscat, R. J. (1990), *Thailand and the United States. Development, Security, and Foreign Aid*, Columbia University Press.
- Myrdal, G. (1958), *Economic theory and underdeveloped regions*, Duckworth.
- Olson, M. (1965), *The Logic of Collective Action. Public Goods and the Theory of Groups*, Harvard University Press.
- Przeworski, A. (2007), *Is the Science of Comparative Politics Possible?*, chap. 6, pp. 147–171, Oxford University Press.
- Ravaillon, M. and Chen, S. (2004), "China's (Uneven) progress against poverty," World Bank Policy Research Working Paper No. 3408.
- Ravaillon, M. and Datt, G. (2002), "Why has economic growth been more pro-poor in some states of India than others?" *Journal of Development Economics*, 68, 381–400.

- Rogowski, R. (1987), "Political Cleavages and Changing Exposure to Trade," *The American Political Science Review*, 81, 1121–1137.
- Simatupang, P. and Timmer, C. P. (2008), "Indonesian Rice Production: Policies and Realities," *Bulletin of Indonesian Economic Studies*, 44, 65–79.
- Stasavage, D. and Scheve, K. (2006), "Religion and Preferences for Social Insurance," *Quarterly Journal of Political Science*, 1, 255–286.
- Tracy, M. (1989), *Government and Agriculture in Western Europe, 1880-1988*, New York University Press.
- Varshney, A. (1994), *Democracy, Development, and the Country. Urban-Rural Struggles in India*, Cambridge Univ Press.
- Wallace, J. (2007a), "Cities and Stability: Directing Urbanization, Defining Unrest, and Distributing Transfers in China," Working Paper.
- Wallace, J. (2007b), "Cities and Stability: Urbanization and Non-Democratic Regime Survival," Working Paper.
- Webb, S. B. (1982), "Agricultural Protection in Wilhelminian Germany: Forging an Empire with Pork and Rye," *Journal of Economic History*, 42, 309–326.
- Wibbels, E. and Ahlquist, J. (2008), "The Three Worlds of Developmental Capitalism: Development Strategies, Labor Markets and Social Spending Regimes," Working Paper.
- Wickham-Crowley, T. P. (1991), *Guerrillas and Revolution in Latin America*, Princeton University Press.
- World Bank, The (2007), *World Development Report 2008. Agriculture for Development*, The World Bank.