

A Model of Endogenous Property Rights in a Democracy

Georgi Boichev

February 28, 2012

Abstract

I develop an occupational choice model with open-rule legislative bargaining to determine the conditions allowing for poor property rights to arise in a democratic equilibrium and to also demonstrate their presence leads to inefficient outcomes. The necessary conditions emerge when each rich agent self-selects as an entrepreneur for a positive theft rate. The equilibrium occupational shares determine the necessity for coalition formation in the legislature, where the endogenously-determined status-quo theft rate is subject to revision. A minimum winning coalition favouring a higher theft rate up to a threshold value, at which each rich agent just prefers to be an entrepreneur who hires workers, provide the sufficient conditions. The equilibrium is inefficient because a positive equilibrium theft rate reduces total output. I use a motivating example of a politically-organized land invasion to argue the model's assumptions are plausible and to also motivate why a puzzle of partial stealing and no evictions emerges in equilibrium.

Preliminary and incomplete. Do not quote.

1 Introduction

1.1 Property Rights, Weak and Strong States and Development

There is an overwhelming consensus strong property rights protection is essential for economic development. Alston and Mueller (2008, p. 573) outline several forms of inefficiency associated with insecure property rights - sub-optimal level of investment as well as misallocation of labour to non-productive activities such as guarding and stealing assets to name a few. Alston and Mueller (2008, p. 573) define the role of the state with respect to property rights protection as to define, interpret and enforce property rights. They importantly stress each of these functions of the state must be conducted by a specific branch of the government for properly functioning property rights to emerge. Defining property rights is a role assigned to the legislative branch, their interpretation to the judicial branch, and their enforcement to the executive branch.

Property rights, to be meaningful, require to be enforced. Alston and Mueller (2008, p. 573) Poor enforcement is suggested to arise either because of weak states or strong

(predatory) states: '...The state is either too weak to prevent theft of property by private actors, or so strong that the state itself threatens property rights and personal independence...' Shirley (2008, p. 612). Acemoglu (2005) emphasizes much of the political economy literature has focused on strong states and the importance of 'limited government' for property rights protection. Similarly, Marcoulier et al. (1995) discuss the importance of democratic checks and balances to avoid expropriation of assets by a country's rulers. On the other side of the spectrum, Besley (2011) models explicitly the government capacity to enforce property rights. In this paper, I am focusing my attention to a case where a state with democratic checks and balances has the administrative capacity to enforce property rights but fails to do so in equilibrium, features that distinguish it from what has been studied in the literature. What makes this case interesting is that property rights are not automatically enforced by the executive branch; instead the decision to what extent property rights are to be enforced is one left to the discretion of the legislative branch.

There is a growing literature that investigates the causal relationship between inequality, property rights protection and economic growth. Keefer and Knack (2002), in a cross-country empirical study, find that first, polarization in the form of income inequality, land inequality, and ethnic tensions is inversely related to a commonly-used index of the security of contractual and property rights, and secondly, that inequality reduces growth in part through its effect on the security of property rights. I am developing a theoretical model able to generate theoretical predictions consistent with their findings by explicitly modelling the necessary conditions that favour insecure property rights as well as the trigger in the political equilibrium that gives rise to them.

1.2 Objectives

The objectives of this paper are two-fold. First, I show what the endogenously determined necessary and sufficient conditions are for insecure property rights to arise in a democratic setting. Secondly, I demonstrate insecure property rights lead to less efficient economic outcomes consistent with most of the findings in the property rights literature. To show these results, I develop a highly-stylized two period occupational choice - open rule legislative bargaining model. My model is based on two key assumptions, both of which I argue are plausible in the institutional setting of the Ecuador land invasion. Property rights in this model are not automatically enforced (by the executive branch); instead, to what extent they are to be enforced is a decision left to the legislative branch. Contrary to most models in the literature, I assume that stealing is a costly transfer of resources, while restoration of property rights is a costless transfer of resources.

The model, very simply described works, as follows. There is an initial heterogeneity with respect to the initial endowment agents receive - rich, who receive a positive endowment, and poor, who do not receive an endowment. There are two technologies,

called subsistence, which requires labour only, subsisters, and entrepreneurial, which requires both labour, entrepreneurs who invest the capital as well as workers, and capital, supplied from an entrepreneur's initial endowment. There is a competitive labour market, in which entrepreneurs demand labour and workers supply it and the equilibrium wage rate is determined by equalising the income of a worker to that of her outside option (becoming a subsister). Each entrepreneur and each worker must supply their entire time endowment to supervising and working respectively in the entrepreneurial sector, while each subsister allocates her time endowment between stealing from rich agents and working in the subsistence sector. This asymmetry I argue is plausible in the institutional setting of an organized land invasion. Since only rich agents can become entrepreneurs due to the capital requirements of the entrepreneurial technology, there is a threshold theft rate, at which each entrepreneur is indifferent between becoming an entrepreneur and a subsister since they have to pay a higher wage to the worker they hire. However, up to this threshold each entrepreneur is willing to tolerate stealing without switching their occupation, which endogenously creates the necessary conditions for insecure property rights to emerge.

Each occupation is represented by a political party, such that each occupational share trivially determines the vote share of its political representative in the legislature. The equilibrium occupational shares endogenously determine the necessity for a coalition formation in the legislature. Similarly, the fraction of the time endowment allocated to stealing by each subsister endogenously determines the status quo theft rate that is subject to a downward revision in the legislative bargaining process.

The Party of the Subsisters (PS) prefers a higher theft rate to a lower one, while the Party of the Entrepreneurs (PE) a lower theft rate to a higher one. The Party of the Workers (PW) faces a trade-off: it prefers a higher theft rate to a lower one provided it is below the threshold theft rate, up to which each rich person is still willing to become an entrepreneur. A greater value than this threshold implies no workers are hired and the PW loses its entire membership in the second period. If the status quo theft rate is below this threshold theft rate, PS and PW form a coalition to implement the status quo; if above this rate, PE and PW form a coalition to revise the status quo theft rate downwards up to the threshold value. The incentives faced by the political parties in the legislative bargaining process create the sufficient conditions for insecure property rights to arise.

Forming rational expectations about the political equilibria that could arise, each subsister allocates a fraction of her time such that the status quo theft rate equals the threshold theft rate. The equilibrium theft rate, determined in the political stage, consequently also equals the threshold theft rate supported by a minimum winning coalition of PS and PW. Thus, in equilibrium, there is partial stealing and no restoration of property rights to their original owners. This equilibrium is second-best efficient because there are efficiency losses from stealing, but a third-best efficient outcome is

avoided because there is no misallocation of too many agents self-selecting into the relatively less productive subsistence sector.

My model is based on several key assumptions, which I argue are plausible in the institutional setting of this paper describing a politically organized land invasion in Quito, Ecuador. First, property rights in this model are not automatically enforced (by the executive branch); instead, to what extent they are to be enforced is a decision left to the legislative branch. Contrary to most models in the literature, I assume that stealing is a costly transfer of resources to society, while restoration of property rights is a costless transfer of resources. In addition, I assume the entrepreneurial technology is the relatively more productive technology and also that stealing is more profitable to an agent than working in the subsistence sector. Finally, there is an imperfect commitment assumption aligning the interests of the members of each occupation to those of their political representative.

The paper could have contributions beyond those of the property rights literature. The intertemporal trade-off of increasing per member income in period 1 at the expense of the size of their membership size modelled at the political stage could be applied to study the behaviour of political parties with steady versus rapidly expanding or collapsing memberships over time.

1.3 Roadmap

In section 2, I describe the institutional setting surrounding the politically organized 'Struggle of the Poor' land invasion of 1983 in Quito, Ecuador and the political dispute that led to its resolution. In section 3, I introduce the occupational choice model. In section 4, I describe the property rights and political institutions and augment the model with open-rule legislative bargaining features. In section 5, I solve for the equilibrium and, in section 6, I conclude with a brief discussion of the main results.

2 Institutional Setting

2.1 Who Organises Land Invasions?

Land invasions are a common phenomenon across the developing world and, in particular, in Latin America. According to Dosh (2010, p. 4), throughout the latter half of the twentieth century, tens of millions of Latin Americans participated in illegal land invasions. Informal settlements grew exponentially in that period and affected large and medium-sized cities alike.

The decision-making process of such illegal land invasions appears to have run at two levels - those of the individual squatters and the organizers. '...Though individual

families often made quick decisions to join an imminent land invasion, the phenomenon was rarely spontaneous. To the contrary, such mobilizations typically required months of planning and preparation...' (Dosh (2010, p. 4)). The 1970s and 1980s witnessed massive and now-legendary invasions such as Villa El Salvador in Lima, Peru, Comité del Pueblo (Committee of the People) and Lucha de los Pobres (Struggle of the Poor) in Quito, Ecuador.

The 1980s witnessed reshaped land invasion patterns that focused increasingly on land that was already in use, including private land, or land that was precarious or barely habitable (Dosh (2010, p. 4)). These patterns were arguably influenced by economic policies that '...debilitated already weak social safety nets...' (Dosh (2010, p. 5)), as well as the expansion of informal labour. However, '...during this period, the fundamental objectives of invasion organizations remained unchanged: reliable electricity, potable water, sewer drainage, and, often most important, legal title to illegally acquired land...' (Dosh (2010, p. 5)).

The pre-cooperativas and the cooperativas in Ecuador, for instance, are legal entities that have served an important role in conducting land invasions. Their intended role has been to allow a single entity to purchase property on behalf of a group of individuals.¹ The Executive Board, elected by the qualified members of a (pre-)cooperativa is the legal representative of the cooperativa that administers the purchase of the land. (Burgwal (1995, p. 46)) The State has direct control over the cooperativas and, as a measure of last resort, the law gives the State the right to put a cooperativa under State supervision.

2.2 What Type of Political Support Can Make a Land Invasion Successful?

The 'Struggle of the Poor' illegal land invasion, that took place in 1983, named after the cooperativa that organised it, is of particular interest, first, because it creates a puzzle why the organisers of the invasion chose to invade only a fraction of a large landowner's private land but at the same time why none of the illegal squatters were evicted despite the original landowner's fierce resistance that included the use of a range of legal and political tools for that purpose. This puzzle is more intriguing if one evaluates these stylized facts in a broader context: public policies of settler protection existed in Peru but not in Ecuador, which '...played an important role in creating a situation in Lima where invasions have become routine and institutionalized, while in Quito they are considered aberrations...' (Dosh (2010, p. 44)).

Secondly, this land claims dispute had a strong political flavour as all involved parties involved in the dispute had strong ties to politically represented parties in the National Congress and also as this dispute was resolved by a decree issued by the National Congress. The leadership of the 'Struggle of the Poor' (pre-)cooperativa included

¹Once a property is purchased and its members become owners, a pre-cooperativa's status is elevated to that of a cooperativa.

members of Parliament from the Popular Socialist Party (PSP) as well as the labour union CEDOC, while the owners of the target of the land invasion were members of a politically influential family that included a former cabinet minister as well as a vice-presidential candidate in the 1984 elections. The resolution of this land claims dispute is interesting taking into account the same land owners have been subjected to an earlier invasion. However, in that instance '...[t]he attempt was thwarted because a [relative of the land owners] was in the government at the time and got the police there to evict them quickly...' (Burgwal (1995, p. 237))

Next, this context is particularly valuable because the incentives and the trade-offs political parties faced in resolving this land claims dispute are used to justify the model's commitment assumptions between individuals and their political representatives. The political representatives of the original owners demanded complete eviction of the squatters from the hacienda, while the PSP demanded the expropriation of the hacienda in favour of the 'The Struggle of the Poor' Cooperativa. (Burgwal (1995, p. 61)) The key to the resolution of the land invasion dispute was the intervention of a 'mediator' who served in two positions. He was the president of the regional chamber of Agriculture that represents the local land owners and also as the highest leader of the labour union CEDOC, to whom both the leadership of and many of the squatters from the 'Struggle of the Poor' Cooperativa belonged. (Burgwal (1995, p. 63)) The position of a mediator appeared credible because on one hand in his first position he '...had to defend the interests of the [legal owners of the land]...' (Burgwal (1995, p. 63)). But, on the other, he was a personal friend of one of the organizers of the land invasion and PSP leader (Burgwal (1995, p. 63)); furthermore, many of the 'Struggle of the Poor' members were also CEDOC activists. Initially, he offered the National Congress's support to have the squatters from the hacienda evicted, where he appeared to have enough influence to hold the balance of power. But later, his position had moderated and he invited both parties to his office to come to an agreement. This change in position is alleged to have been driven by '...the growing internal problems of the Cooperativa, and especially the growing power of the Loja Colony who proposed not to pay anything [in compensation for invading the land]...' (Burgwal (1995, p. 238)).

Last but not least, at the organisational level both the squatters and the original owners relied on politicians to represent their interests. The squatters relied on politicians from the PSP, while the legal owners operated through 'friends of relatives' with political power (Burgwal (1995, p. 68)). However, there was some asymmetry with respect to the power the organizers of the land invasion on one hand and the Herreras on the other enjoyed. The leaders of the land invasion in addition to 'instrumental' friendships with politicians, also had an 'independent power base' of squatters that gave them an extra tool to achieve their objectives. I construct this asymmetry in the model by allowing the members of one occupational group to make an additional choice relative to the other occupational groups.

3 Model

3.1 Timing of game.

Period 1:

Stage 1:

At the beginning of this stage, each receives a non-negative endowment. Each agent self-selects into an occupation (a subsister, worker or an entrepreneur) based on her period 1 endowment.

Stage 2:

Agents make simultaneous economic decisions. Each entrepreneur chooses how much of her endowment to invest and also make a binary choice whether to allocate her time endowment to monitoring workers; each worker makes a binary choice on whether to allocate her time endowment to working; each subsister continuously allocates her time endowment between working and stealing. The economic outcomes including the endogenous status quo theft rate τ^{sq} are realized. The latter is subject to a downward revision in the political stage.

Stage 3:

Each occupation is represented by a political party. The political stage proceeds in two substages. In the initial substage, a political party chosen at random as the agenda setter makes a proposal to revise the theft rate. If the proposed policy gains support in the Legislature, the game ends and outcomes are realized; otherwise, the game moves to the amendment stage, where one of the remaining two parties is chosen at random as the agenda setter. If the proposed policy gains support in the Legislature, it is implemented; otherwise, the status quo policy τ^{sq} is implemented. In both instances, the game ends and the outcomes are realized. The equilibrium theft rate determined in the political stage in period 1 is enforced in both periods 1 and 2.

Period 2:

Stage 4:

At the beginning of this stage, each receives a non-negative endowment. Given the equilibrium theft rate determined in period 1, each agent self-selects into an occupation (a subsister, worker or an entrepreneur) based on her period 2 endowment.

Stage 5:

Each agent faces the same problem as in stage 2 except each subsister now faces an additional constraint - allowed to allocate a fraction of their time endowment that cannot exceed the equilibrium theft rate.

3.2 Economic environment.

3.2.1 Demographics and preferences.

Consider a two-period economy inhabited by agents whose population in each period is large and its size is normalized to 1. There are two goods in the economy, labour, and some final output which can serve as a consumption good. Each agent lives for one period and is endowed with 1 unit of labor. A fraction of agents $\alpha \in (\frac{1}{4}, \frac{1}{2})$ in each period receive an initial endowment $e_t = 1$ and the rest $(1 - \alpha)$ individuals receive no initial endowment $e_t = 0$, where the subscript t denotes the time period in which the endowment is received. Individuals with $e_t = 1$, I will refer to as rich agents and those with $e_t = 0$ as poor agents. Each agent earns income by supplying labour and capital from their endowment and the resulting income y_t is consumed by the agent. Each agent is assumed to be risk-neutral and has a linear utility function:

$$U_t^i = y_t^i \quad (1)$$

3.2.2 Production technologies.

There are two production technologies, both of which are deterministic. One uses no capital and divisible units of labour to produce divisible units of output $\underline{w} > 0$. This will be described as a subsistence (or an agricultural) technology, where the output \underline{w} will be referred to as the subsistence wage. The other technology, described as the entrepreneurial technology, uses divisible units of capital z_t and two (indivisible) units of labor (one unit of supervisory labour and one unit of ordinary labour) to produce:

$$q(z_t) = dz_t \quad (2)$$

units of output, where $d > 1$ is an efficiency parameter of the entrepreneurial technology. One supervisor (or entrepreneur) can perfectly monitor one worker spending her entire labour endowment.

Assumption 1. *I assume, as in Ghatak and Jiang (2002), that the entrepreneurial technology is superior in the sense that the net output of using this technology is greater than were two units of labor using the subsistence technology if the entire endowment of a rich individual is being invested. That is,*

$$q(e_t = 1) > 2\underline{w} + 1 \quad (3)$$

3.2.3 Occupations.

There are three possible occupations open to an individual who has wealth $e_t = 1$ - subsister, worker and entrepreneur since I assume agents are unable to borrow. Similarly, there are two possible occupations open to an individual who has no wealth - subsister and worker. The respective shares of subsisters, workers and entrepreneurs in the population are denoted by a_t^S , a_t^W and a_t^E .

Definition 1. I denote the occupational shares of subsisters, workers, and entrepreneurs in the population with the short-hand notation $a_t^S, a_t^W, a_t^E \in [0, 1]$ respectively.

Definition 1. $\tau_t \in [0, 1]$ represents the fraction of a subsister's time endowment she allocates to stealing in period t . The remainder $(1 - \tau_t)$ she allocates to working in the subsistence sector. Furthermore, τ_t units of a subsister's time endowment allocated to stealing translate into $\tau_t \frac{\alpha}{a_t^S}$ units of stolen (capital) endowment. This transformation rate of time endowment allocated to stealing into units of stolen (capital) endowment guarantees the total amount of stolen (capital) endowment does not exceed the aggregate (capital) endowment in the economy.

$$\tau_t \frac{\alpha}{a_t^S} \leq \frac{\alpha}{a_t^S} \quad (4)$$

where the left-hand side represents the amount of (capital) endowment stolen by a subsister and the right-hand side the per subsister amount of (capital) endowment in the economy.

1. Subsister - earns income from stolen assets as well as labour income from the subsistence sector:

$$y_t^S(\tau_t) = \tau_t \frac{\alpha}{a_t^S} + (1 - \tau_t) \underline{w} + \mathbf{1}_{e_t=1}((1 - \tau_t)), \quad (5)$$

where τ for now is taken as an exogenous parameter. The indicator function term $\mathbf{1}_{e_t=1}((1 - \tau_t))$ denotes the case when a rich individual self-selects herself as a subsister. A fraction τ_t of her (capital) endowment is stolen from other subsisters.

2. Worker - earns labour income from the entrepreneurial technology, where the wage in the entrepreneurial sector w_t is determined in a perfectly competitive labour market. She allocates her entire time endowment to supplying labour units in the entrepreneurial sector.

$$y_t^W(\tau) = w_t + \mathbf{1}_{e_t=1}((1 - \tau_t)) \quad (6)$$

3. Entrepreneur - earns capital income from the entrepreneurial technology net of wage costs paid out to a worker and incurred losses from stolen non-invested assets $(1 - z)$ at the rate τ . She invests an amount z of her wealth and allocates her entire time endowment to supplying labour units in the entrepreneurial sector, where she supervises one worker. She receives income from the entrepreneurial sector,

$$y_t^E(\tau) = q((1 - \tau_t)z_t) + (1 - \tau_t)(1 - z_t) - w_t$$

The distinction between invested and non-invested capital is important. At the time when investment decisions made, property rights are fully protected. However, during the production process a fraction τ_t of both the invested and the non-invested capital is subject to theft.

Substituting for the entrepreneurial production function yields:

$$y_t^E(\tau) = d(1 - \tau_t)z_t + (1 - \tau_t)(1 - z_t) - w_t \quad (7)$$

Assumption 1. *I assume $(1 - 2\alpha)\frac{\alpha}{1-2\alpha} > \underline{w}$. The condition $\frac{\alpha}{1-2\alpha} > \underline{w}$ guarantees each subsister strictly prefers stealing to working in the subsistence sector for any τ_t . The extra requirement of $(1 - 2\alpha)\frac{\alpha}{1-2\alpha}$ on the left-hand side is necessary to guarantee an alignment of the interests of each subsister to those of their representatives in the political stage.*

Assumption 1. *An entrepreneur, if for any unit of her endowment is indifferent between investing it as capital in the entrepreneurial technology and leaving it idle, invests it into the entrepreneurial technology.*

Each entrepreneur invests an amount z to maximize her income:

$$\max_{z_t \in [0,1]} y_t^E(z_t) = d(1 - \tau_t)z_t + (1 - \tau_t)(1 - z_t) - w_t, \quad (8)$$

The first-order condition yields:

$$\frac{dy_t^E(z)}{dz_t} = (d - 1)(1 - \tau_t) \geq 0, \quad (9)$$

since $d > 1$ and $\tau_t \in [0, 1]$. The first-order holds with equality when $\tau_t = 1$ leaving an entrepreneur indifferent between investing and non-investing her endowment in the entrepreneurial technology. For any $\tau_t \in [0, 1]$, there is a corner solution for which the entrepreneur invests her entire endowment in it.

This implies the optimal level of investment undertaken by each entrepreneur is $z_t^* = 1$ for any given $\tau_t \in [0, 1]$.

3.3 Efficient Allocations

Social Planner's Problem:

A benevolent social planner maximizes a utilitarian social welfare function that assigns occupational status to each agent $\{E, W, S\}$, sets the theft rate for subsisters and allocates how much of each entrepreneur's endowment to be invested into the entrepreneurial technology. The occupational shares of entrepreneurs, workers, and subsisters are denoted by a_t^E , a_t^W , and a_t^S respectively.

$$\max_{a_t^i, z_t^i, \tau_t} SW = a_t^E y_t^E + a_t^W y_t^W + a_t^S y_t^S, \text{ for } i = \{E, W, S\} \quad (10)$$

subject to the resource constraint:

$$a_t^E|(e_t = 1) + a_t^W|(e_t = 1) + a_t^S|(e_t = 1) \leq \alpha, \quad (11)$$

where the right-hand side represents the aggregate endowment α in the economy, while the left-hand side represents how the aggregate endowment is distributed across occupations.

and also to the occupational distribution constraint:

$$a_t^E + a_t^W + a_t^S = 1. \quad (12)$$

The social planner takes the endowment structure in the economy as given.

$$\begin{aligned} \max_{a_t^i, z_t, \tau_t} SW &= a_t^E \{d(1 - \tau_t)z_t + (1 - \tau_t)(1 - z_t)\} \\ &+ a_t^W \{\mathbf{1}_{e_t=1}((1 - \tau_t))\} \\ &+ a_t^S \left\{ \tau \frac{\alpha}{a_t^S} + (1 - \tau_t)\underline{w} + \mathbf{1}_{e_t=1}((1 - \tau_t)) \right\} \end{aligned}$$

subject to:

$$a_t^E|(e_t = 1) + a_t^W|(e_t = 1) + a_t^S|(e_t = 1) \leq \alpha, \quad (13)$$

$$a_t^E + a_t^W + a_t^S = 1. \quad (14)$$

The solution to the social planner's problem proceeds in multiple steps:

First, the social planner realizes $\tau_t \frac{\alpha}{a_t^S}$ is a transfer of wealth from entrepreneurs to subsisters that reduces SW by $\tau_t[\underline{w} + (d - 1)]$ due to the opportunity cost of stealing incurred in the subsistence sector $\tau_t \underline{w}$ and in the entrepreneurial sector $\tau_t(d - 1)$. The social planner minimizes this loss by setting $\tau_t = 0$.

The social planner's problem then reduces to:

$$\max_{a_t^i, z_t, \tau_t} SW = a_t^E \{dz_t + (1 - z_t)\} + a_t^W (\mathbf{1}_{e_t=1}(1)) + a_t^S (\underline{w} + \mathbf{1}_{e_t=1}(1)) \quad (15)$$

subject to:

$$a_t^E|(e_t = 1) + a_t^W|(e_t = 1) + a_t^S|(e_t = 1) \leq \alpha, \quad (16)$$

$$a_t^E + a_t^W + a_t^S = 1. \quad (17)$$

Secondly, when $\tau_t = 0$ the social planner maximizes output from the entrepreneurial technology by setting $z_t^* = 1$ since $\frac{d(dz_t + (1 - z_t))}{dz_t} > 0$ for any $z \in [0, 1]$.

Third, the social planner chooses the occupational shares. He finds it optimal to set $a_t^E = a_t^W$ since the modern technology uses entrepreneurs and workers into a 1 : 1 ratio. If $a_t^E < a_t^W$, there are idle workers of size $(a_t^W - a_t^E)$ who could have increased SW by $(a_t^W - a_t^E)\underline{w}$ if they were subsisteners instead. Similarly, if $a_t^E > a_t^W$ there are idle entrepreneurs of size $(a_t^E - a_t^W)$ who could have increased SW by $(a_t^E - a_t^W)\underline{w}$ if they were assigned the occupational status of subsisteners instead.

By assumption, the entrepreneurial technology is more productive than the subsistence technology for $q(z_t = 1) > 2\underline{w}$. For the socially optimal $\tau_t = 0$ and $z_t^* = 1$, an entrepreneur can generate: $y^E(z_t = 1) = q(z_t = 1) - \underline{w} > \underline{w} = y^S(z_t = 1)$, where the term $(-\underline{w})$ is the opportunity cost of allocating one agent from subsistence to the workers' occupation. Therefore, it is socially optimal to set the fraction of entrepreneurs equal to the fraction of rich individuals in the economy $a_t^E = \alpha$ such that all rich individuals become entrepreneurs.

The above results yield the first-best occupational distribution: $\Gamma(a_t^S, a_t^W, a_t^E) = \Gamma(1 - 2\alpha, \alpha, \alpha)$.

There are two sources of inefficiency in this model that could arise due to:

1. a misallocation of subsisteners' time endowment that results in foregone subsistence earnings and foregone output from the entrepreneurial technology.
2. a misallocation of subsister's time endowment to the point the subsistence technology becoming more productive relative to the entrepreneurial technology.

Then I can define the efficient allocations in this economy:

1. First-best allocations:

$$\{a_t^E = a_t^W = \alpha, a_t^S = 1 - 2\alpha, z_t = 1, \tau_t = 0\}.$$

2. Second-best allocations:

$$\{a_t^E = a_t^W = \alpha, a_t^S = 1 - 2\alpha, z_t = 1, \tau_t \in [0, \hat{\tau}]\},$$

where $\hat{\tau}_t$ is the threshold level that leaves the two technologies equally productive $d(1 - \tau_t) = 2(1 - \tau_t)\underline{w} + 1$.

3. Third-best allocations:

$$\{a_t^E = a_t^W = 0, a_t^S = 1, z_t = 0, \tau_t \in (\hat{\tau}_t, 1]\}.$$

3.4 Labour market.

The condition that leaves a poor agent indifferent between becoming a worker and a subsister is given by:

$$w_t = (1 - \tau)\underline{w} + \tau \frac{\alpha}{a_t^S} \quad (18)$$

where a^S is the endogenously determined share of subsisters in the economy. It will be shown a^S implicitly pins down the quantity of labour demanded and the quantity of labour supplied in the entrepreneurial sector.

The labour supply curve is given by:

$$L_t^S = \begin{cases} 0 & : \text{ if } w_t < (1 - \tau)\underline{w} + \tau \frac{\alpha}{a_t^S} \\ [0, 1 - \alpha] & : \text{ if } w_t = (1 - \tau)\underline{w} + \tau \frac{\alpha}{a_t^S} \\ 1 - \alpha & : \text{ if } w_t > (1 - \tau)\underline{w} + \tau \frac{\alpha}{a_t^S} \end{cases}$$

The condition that leaves a rich agent indifferent between becoming an entrepreneur and a worker is given by:

$$d(1 - \tau_t) - w_t = w_t - (1 - \tau_t) \quad (19)$$

and that between an entrepreneur and a subsister:

$$d(1 - \tau_t) - w_t = (1 - \tau_t)\underline{w} + \tau_t \frac{\alpha}{a_t^S} - (1 - \tau_t) \quad (20)$$

Assumption 2 1. *If $y_t^E(w, \tau | e_t = 1) = y_t^W(w, \tau | e_t = 1)$ or $y_t^E(w, \tau | e_t = 1) = y_t^S(w, \tau | e_t = 1)$, I assume in each case a rich agent becomes an entrepreneur.*

The labour demand curve is given by:

$$L_t^D = \begin{cases} \alpha & : \text{ if } d(1 - \tau_t) - w_t \geq \max\{w_t, (1 - \tau_t)\underline{w} + \tau_t \frac{\alpha}{a_t^S}\} + (1 - \tau_t) \\ 0 & : \text{ if } d(1 - \tau_t) - w_t < \max\{w_t, (1 - \tau_t)\underline{w} + \tau_t \frac{\alpha}{a_t^S}\} + (1 - \tau_t) \end{cases}$$

Proposition 1. *The labour demand and labour schedules imply the labour market equilibrium is characterized by the pair (L_t^*, w_t^*) and the associated occupational equilibrium shares a_t^E, a_t^W, a_t^S :*

$$L_t^* = \begin{cases} \alpha & : \text{ if } d(1 - \tau_t) - w_t^* \geq w_t^* + (1 - \tau_t) = (1 - \tau_t)\underline{w} + \tau_t \frac{\alpha}{a_t^S} + (1 - \tau_t) \\ 0 & : \text{ if } \min\{d(1 - \tau_t) - w_t^*, w_t^* + (1 - \tau_t)\} < (1 - \tau_t)\underline{w} + \tau_t \frac{\alpha}{a_t^S} + (1 - \tau_t) \end{cases}$$

and

$$w_t^* = \begin{cases} (1 - \tau_t)\underline{w} + \tau_t \frac{\alpha}{1-2\alpha} & : \text{ if } d(1 - \tau_t) - w_t^* \geq w_t^* + (1 - \tau_t) = (1 - \tau_t)\underline{w} + \tau_t \frac{\alpha}{a_t^S} + (1 - \tau_t) \\ [0, (1 - \tau_t)\underline{w} + \tau_t \frac{\alpha}{1-2\alpha}] & : \text{ if } \min \{d(1 - \tau_t) - w_t^*, w_t^* + (1 - \tau_t)\} < (1 - \tau_t)\underline{w} + \tau_t \frac{\alpha}{a_t^S} + (1 - \tau_t) \end{cases}$$

This implies when $L_t^* = \alpha$, the occupational equilibrium shares are $a_t^E = a_t^W = \alpha$ and $a_t^S = 1 - 2\alpha$. When $L_t^* = 0$, all agents become subsisters in equilibrium, i.e. $a_t^S = 1$.

This result has important implications for the political stage. In the former case, the legislature is populated by three political parties representing each of the occupations, assuming the vote shares of each political party equal the respective equilibrium occupational shares. The occupational equilibrium shares imply that neither political party has the majority in the legislature, thus endogenously setting the *necessity* for coalition formation in the legislature. In the latter case, the legislature is populated by political representatives of the subsisters, thus endogenously leading to a single party holding the majority in the legislature.

Corrolary 2 1. *The labour market equilibrium condition and the condition leaving non-constrained individual indifferent between occupations implies the theft rate, at which entrepreneurs are indifferent is given by:*

$$\hat{\tau} = \frac{(d-1) - 2\underline{w}}{2\frac{\alpha}{1-2\alpha} + (d-1) - 2\underline{w}} \in [0, 1). \quad (21)$$

To solve for the threshold $\hat{\tau}$, I compare the incomes of an entrepreneur and a worker that could be earned by a rich agent:

$$q(1 - \hat{\tau}, z^* = 1) - w^*(\hat{\tau}) = w^*(\hat{\tau}) - (1 - \hat{\tau}) \quad (22)$$

Next, I use $q(1 - \hat{\tau}, z^* = 1) = d(1 - \hat{\tau})$ and $w^*(\hat{\tau}) = (1 - \hat{\tau})\underline{w} + \hat{\tau} \frac{\alpha}{1-2\alpha}$:

$$(d-1)(1 - \hat{\tau}) = 2((1 - \hat{\tau})\underline{w} + \hat{\tau} \frac{\alpha}{1-2\alpha}) \quad (23)$$

Isolating for $\hat{\tau}$ yields:

$$\hat{\tau} = \frac{(d-1) - 2\underline{w}}{2\frac{\alpha}{1-2\alpha} + (d-1) - 2\underline{w}} \in [0, 1) \quad (24)$$

since $\frac{2\alpha}{1-2\alpha} > 0$.

Corrolary 3 1. *For sufficiently low productivity differential $\frac{d-1}{\underline{w}} \leq 2$ between the entrepreneurial and the subsistence technologies for a given endowment distribution $\{1, 0; \alpha, 1 - \alpha\}$, rich agents become entrepreneurs only when property rights are perfectly enforced. If the ex-post inequality generated by the two technologies exceeds this threshold, i.e. $\frac{d-1}{\underline{w}} > 2$, each rich agent is willing to become an entrepreneur for some positive range of the theft rate.*

The land reform act of 1973, which favour increased productivity in large haciendas rather than redistribution of land, could be interpreted to have contributed to entrepreneurs being willing to tolerate an increasingly higher theft rate as the productivity of the entrepreneurial sector increased.

Corrolary 4 1. *The threshold level $\hat{\tau}$ is:*

1. *positively related to the subsistence wage*

$$\frac{d\hat{\tau}}{d\underline{w}} = \frac{4\frac{\alpha}{1-2\alpha}}{(2\frac{\alpha}{1-2\alpha} + (d-1) - 2\underline{w})^2} > 0 \quad (25)$$

2. *negatively related to the efficiency parameter d of the entrepreneurial technology*

$$\frac{d\hat{\tau}}{dd} = -\frac{2\frac{\alpha}{1-2\alpha}}{(2\frac{\alpha}{1-2\alpha} + (d-1) - 2\underline{w})^2} < 0 \quad (26)$$

An improvement in the efficiency of the entrepreneurial technology relative to the subsistence technology increases the ex-post inequality between entrepreneurs, on one hand, and workers and subsisters, on the other. This disparity can also be interpreted as the difference between an entrepreneur's income and her outside option. A higher efficiency parameter, d , implies the threshold theft rate $\hat{\tau}$ increases, i.e. each rich agent is willing to accept an even higher fraction of her endowment being stolen and still voluntarily become an entrepreneur.

3. *positively related to the fraction of non-constrained agents α in the economy*

$$\frac{d\hat{\tau}}{d\alpha} = -\frac{(d-1) - 2\underline{w}}{(2\frac{\alpha}{1-2\alpha} + (d-1) - 2\underline{w})^2} \frac{2(1-4\alpha)}{(1-2\alpha)^2} > 0 \quad (27)$$

A larger fraction of rich agents, when all of them become entrepreneurs, implies there is a greater pool of agents from whom assets are being taken away form and a smaller pool of agents to whom the benefits of stealing are being distributed to.

The changes in each of the above exogenous factors could have a meaningful interpretation in explaining how the necessary conditions for the increased frequency of land invasions in Quito, Ecuador, were created. Burgwal (1995) and Dosh (2010) discuss government policies that increased the productivity in the entrepreneurial sector d and also decreased \underline{w} in the subsistence sector if \underline{w} is given the interpretation of a minimum wage or its rate be at least partly some form of government assistance for the poor. Furthermore, there was an exogenous increase of poor agents from rural areas that reduced the relative fraction of entrepreneurs in the economy α . The changes in d and \underline{w} could be interpreted to have exacerbated income inequality, while the exogenous increase in α to

have led to a more skewed distribution of poor to rich agents. To observe the combined effect of these three individual effects, consider a minor transformation of:

$$\hat{\tau} = \frac{(d-1) - 2\underline{w}}{2\frac{\alpha}{1-2\alpha} + (d-1) - 2\underline{w}} = \frac{\frac{d-1}{\underline{w}} - 2}{\frac{2}{\underline{w}}\frac{\alpha}{1-2\alpha} + \frac{d-1}{\underline{w}} - 2} \quad (28)$$

The term $\frac{d-1}{\underline{w}}$ clearly increases when d increases but \underline{w} decreases. The term $\frac{1}{\underline{w}}\frac{\alpha}{1-2\alpha}$, however, is ambiguous. However, suppose \underline{w} is interpreted to have 'plummeted', while α to have increased only 'moderately' due to migrant population such that the term $\frac{1}{\underline{w}}\frac{\alpha}{1-2\alpha}$ overall decreases.² This would imply $\hat{\tau}$ has also increased unless there is a corner solution, while subsisters face an altered trade-off between stealing and working at the subsistence wage. If the changes in these exogenous factors are sufficiently large, the set of government policies could have, paradoxically, created the necessary conditions for insecure property rights to arise - subsisters strictly preferring stealing to working in the subsistence sector, while non-constrained agents still preferring to becoming entrepreneurs for 'moderate' levels of stealing, i.e. $\tau \leq \hat{\tau}$.

Corrolary 5 1. *Any positive amount of stealing increases the outside option for workers by the amount $\tau(\frac{\alpha}{a^S} - \underline{w})$. In equilibrium, the equilibrium wage increases in a one-to-one ratio with this amount such that $y^S(\tau) = y^W(\tau)$ for any τ .*

The net cost each entrepreneur incurs due to stealing is:

$$NC^E(\tau) = d\tau + (w^*(\tau) - \underline{w}) \quad (29)$$

where the first term of the RHS is the direct loss incurred due to stealing and the second term of the RHS is the externality effect measuring the extra amount paid to a workers in excess of the subsistence wage. Substituting for the equilibrium wage for an economy where subsisteners steal from workers and entrepreneurs only yields:

$$NC^E(\tau) = d\tau + \tau(\underline{w} + \frac{\alpha}{1-2\alpha} - \underline{w}) \quad (30)$$

$$NC^E(\tau) = \tau \frac{d(1-2\alpha) - \alpha}{1-2\alpha} \quad (31)$$

Corrolary 2 1. *The labour market condition together with the condition leaving non-constrained individuals indifferent between becoming either entrepreneurs or workers imply that at the labour market equilibrium wage rate, an entrepreneur earns at least as much as a worker or a subsister.*

²Note $v(\alpha) = \frac{\alpha}{1-2\alpha}$ is a strictly increasing function of α as $\frac{dv(\alpha)}{d\alpha} = -\frac{1}{(1-2\alpha)^2} > 0$.

4 Property rights and political institutions.

4.1 Political representation.

Each occupational group has a political representation denoted by the Party of Subsisters PS , the Party of Workers PW , and the Party of Entrepreneurs PE in the legislature who care about the total income generated from their membership.

$$U^{Pi}(\tau) = t\{a_1^i y_1^i(\tau) + a_2^i(\tau) y_2^i(\tau)\}, \text{ where } i = \{S, W, E\}, \quad (32)$$

Assumption 3 1. *In exchange for representing their members' interests at the political stage, each political party levies a proportional income membership dues at a fixed rate t invariant across political parties.*

This levy on members' income aligns the interests of the membership to those of their representative for a fixed membership size. This levy also has the advantage of being non-distortionary. It is effectively a 'tax on profits', net of any costs agents incur and also identical across occupations.

Each political party has some control over τ , which will be explicitly specified when laying out the rules governing the legislative bargaining process. Through τ , each political party can indirectly influence the per member income in each period $y_1^i(\tau)$ and $y_2^i(\tau)$ as well as its respective membership size in the second period $a_2^i(\tau)$. Each political party takes their respective membership size in the first period as given $a_1^i(\tau)$.

This specification of political preferences' generates the following trade-off faced by each political party: a political party might be willing to increase (decrease) per member income each period at the expense of (in favour of) smaller (greater) membership size in the second period.

4.2 Legislative Bargaining.

I employ a game-theoretic open-rule legislative bargaining model to allow for the possibility of a coalition formation in the political stage. A key feature of this model is the endogenous status quo policy τ^{sq} determined in the economic stage, which is trivially implied by the fraction of time a subsister devotes to stealing.

I assume an open-rule bargaining process, where the political stage proceeds in two stages: initial and amendment. In the initial stage, a political party is randomly assigned the proposal power, and also referred to as the agenda setter, with a probability equal to the relative size of its membership. The agenda setter seeks the support of at least one more political party, the one that is cheapest to buy ala Bertrand competition. The agenda setter and its coalition partner form what is known in the literature as

the Minimum Winning Coalition (MWC). The agenda setter offers a theft rate that maximizes its own payoff within the set of policies its coalition partner will be at least as well off relative to the default.

The default in the amendment stage is the status quo policy τ^{sq} , while the default in the initial stage is the expected utility from moving the game to the amendment stage. If the MWC votes in favour of the proposed policy against the default, the proposed policy is implemented. If the proposal fails in the initial stage, the game moves to the amendment stage where one of the other two political parties is randomly assigned the proposal power (i.e. being the agenda setter). The probability of being the agenda setter is equal to the ratio of: (numerator) the share of a party's membership that did not have the proposal power in the initial stage that relative to that of the two parties that did not have the proposal power in the initial stage. For instance, if PS has the proposal power in the initial stage, PW will have the proposal power in the amendment stage with probability $\frac{a^W}{a^W+a^E}$ and PE will have the proposal power in the amendment stage with the remaining probability $\frac{a^E}{a^W+a^E}$. The game proceeds in the same manner except that the status quo policy is implemented in the case the proposed policy is defeated. This results in two distinct decisions problems.

In the amendment stage, political parties have the option to seek the protection of the status quo in case the political party that is cheapest to buy would result in a payoff lower than that under the status quo policy. This in case there was a single stage would have been problematic since the proposal power is randomly determined and in general agenda setters tend to capture a disproportionate amount of the rents. This issue would have been further exacerbated in this model. This is because the subsisters could have a monopoly power over the determination of the theft rate: directly, at the economic stage, and indirectly, through their political representative at the political stage.

In the initial stage, however, the political parties face a completely different problem. They are maximizing their expected political party utility (not that of their voters) over the permissible range of the theft rate, where expectations are based on the probabilities and outcomes of each branch of the tree if the game moves to the amendment stage. What each party tried to improve on is not the status quo policy but the expected utility from the implemented policies at the amendment stage.

4.3 Property rights institutions.

Assumption 3 1. *A commitment to a non-strong state is assumed, i.e. $\tau \leq \tau^{sq}$, meaning the legislature is 'constitutionally' obliged to revise the theft rate determined in the economic stage τ^{sq} only downwards.³*

³A weak state arises when $\tau \leq \tau^{sq}$, i.e. when the state fails to enforce property rights, in this instance allowing economic agents to hold on to stolen assets. On the other hand, a strong (predatory)

Definitions:

1. Perfect enforcement of property rights: $\tau^{eq} = 0$, where τ^{eq} is the equilibrium theft rate determined in the political stage. This rate τ^{eq} may, in general, differ from the rate τ^{sq} that subsisteners choose in the economic stage.
2. Imperfect enforcement of property rights: $\tau^{eq} > 0$.

Assumption 4 1. *Stealing is a costly transfer of resources, while restoration of property rights is a costless transfer of resources.*

1. *Sunk cost of stealing: each subsister incurs a sunk cost $SC^S = (\tau^{sq} - \tau^{eq})\underline{w}$ of foregone labour income at the subsistence wage rate when the property rights of original owners are either partially or fully restored at the equilibrium theft rate τ^{eq} determined in the political stage. Similarly, each entrepreneur incurs a sunk cost $SC^E = d(\tau^{sq} - \tau^{eq})$ of foregone entrepreneurial income. The total sunk cost in the economy is: $(a^S \underline{w} + a^E d)(\tau^{sq} - \tau^{eq})$.*
2. *Restoring property rights is assumed to be a mere transfer of resources from the 'illegal' owners to their original owners.*

4.4 Political Parties' Optimization Problem

4.4.1 Amendment Stage

Without loss of generality, the optimization problem of the political party of the subsisteners is given by:

$$\max_{\tau, c} U^{PS}(\tau) = a_1^S y_1^S(\tau) + a_2^S(\tau) y_2^S(\tau) \quad (33)$$

subject to:

$$U^{PS}(\tau) = a_1^S y_1^S(\tau) + a_2^S(\tau) y_2^S(\tau) \geq a_1^S y_1^S(\tau^{sq}) + a_2^S(\tau^{sq}) y_2^S(\tau^{sq}) = U^{PS}(\tau^{sq}) \quad (34)$$

$$U^{PW}(\tau) = a_1^W y_1^W(\tau) + a_2^W(\tau) y_2^W(\tau) \geq a_1^W y_1^W(\tau^{sq}) + a_2^W(\tau^{sq}) y_2^W(\tau^{sq}) = U^{PW}(\tau^{sq}) \quad (35)$$

$$U^{PE}(\tau) = a_1^E y_1^E(\tau) + a_2^E(\tau) y_2^E(\tau) \geq a_1^E y_1^E(\tau^{sq}) + a_2^E(\tau^{sq}) y_2^E(\tau^{sq}) = U^{PE}(\tau^{sq}) \quad (36)$$

state emerged when $\tau > \tau^{sq}$, i.e. when the states expropriates and redistributes assets in addition to those stolen in the economic stage.

$$c = \begin{cases} PW & : \text{ if } U^{PS}(\tau^*|c = PW) > U^{PS}(\tau^*|c = PE) \\ PE & : \text{ if } U^{PS}(\tau^*|c = PW) < U^{PS}(\tau^*|c = PE) \\ \{PW, PE\} & : \text{ if } U^{PS}(\tau^*|c = PW) = U^{PS}(\tau^*|c = PE) \text{ and } \tau^*|c = PW \equiv \tau^*|c = PE \end{cases}$$

$$0 \leq \tau \leq \tau^{sq} \tag{37}$$

PS's objective is to maximize its utility by choosing a theft rate τ and a coalition partner c such that the chosen theft rate will leave *PS* and the coalition partner of its choice at least as well off as if the status quo policy were implemented. The first constraint indicates that *PS* would choose τ such that *PS* is at least as well off as under the status quo policy. The next two constraints are the participation constraints of its potential coalition partners *PW* and *PE* respectively; however, *PS* needs to satisfy the constraints only for its chosen, not its potential, coalition partner(s). The last constraint indicates under what circumstances *PS* would choose either *PW* or *PE* or both in order to maximize its utility. The first line reads *PS* will choose $c = PW$ provided that the utility-maximizing theft rate ($\tau^*|c = PW$) if *PW* were its coalition partner (*PW*'s participation constraint is satisfied) leaves *PS* strictly better off relative to the utility-maximizing theft rate ($\tau^*|c = PE$) if *PE* were its coalition partner (*PE*'s participation constraint is satisfied). The choice of a coalition partner from this constraint determines whether *PS* will need to satisfy *PW*'s participation constraint or *PE*'s participation constraint or both. The last constraint $0 \leq \tau \leq \tau^{sq}$ is the set of τ that could be proposed and implemented in the political stage.

There are two special cases that could arise. The first one arises when *PS*'s participation constraint is satisfied only for the status quo policy τ^{sq} . In this case, the solution to the problem is trivial. It is optimal for *PS* to propose τ^{sq} because at τ^{sq} the participation constraints of both *PW* and *PE* are also satisfied.

The second special case arises when *PS*'s participation constraint is satisfied for some range of τ other than the status quo policy τ^{sq} but those of its potential coalition partners are satisfied only for τ^{sq} . In this case, *PS* proposes τ^{sq} because this is the only value of τ for which *PS* is able to satisfy its own constraint and that of at least one coalition partner.

4.4.2 Initial Stage

Next, I describe the optimization problem faced the Party of the Subsisters, without loss of generality, in the initial stage, where each political party takes the expected value of moving the game into the amendment stage as the default policy.

$$\max_{\tau,c} U^{PS}(\tau) = a^S(\tau)y^S(\tau) \quad (38)$$

subject to

$$U^{PS}(\tau) = a^S(\tau)y^S(\tau) \geq \frac{a^W}{a^W + a^E} U^{PS}(\tau|N^{AS} = PW) + \frac{a^E}{a^W + a^E} U^{PS}(\tau|N^{AS} = PE) \quad (39)$$

$$U^{PW}(\tau) = a^W(\tau)y^W(\tau) \geq \frac{a^W}{a^W + a^E} U^{PW}(\tau|N^{AS} = PW) + \frac{a^E}{a^W + a^E} U^{PW}(\tau|N_t^{AS} = PE) \quad (40)$$

$$U^{PE}(\tau) = a^W(\tau)y^W(\tau) \geq \frac{a^W}{a^W + a^E} U^{PE}(\tau|N^{AS} = PW) + \frac{a^E}{a^W + a^E} U^{PE}(\tau|N^{AS} = PE) \quad (41)$$

$$0 \leq \tau \leq \tau^{sq} \quad (42)$$

$$c = \begin{cases} PW & : \text{ if } U^{PS}(\tau^*|c = PW) > U^{PS}(\tau^*|c = PE) \\ PE & : \text{ if } U^{PS}(\tau^*|c = PW) < U^{PS}(\tau^*|c = PE) \\ \{PW, PE\} & : \text{ if } U^{PS}(\tau^*|c = PW) = U^{PS}(\tau^*|c = PE) \end{cases}$$

4.5 The Subsister's Problem

In the first period, each subsister chooses to allocate a fraction of her time endowment to stealing at a rate τ_1 , while anticipating some fraction of the stolen endowment could be returned to their original owners as an outcome of the legislative bargaining:

$$\max_{\tau_1} \mathbf{E}y_1^S(\tau_1) = \mathbf{E}\tau \frac{\alpha}{a_1^S} + (1 - \tau_1)\underline{w} + \mathbf{1}_{e_1=1}((1 - \mathbf{E}\tau)), \quad (43)$$

subject to:

$$(\tau_1 - \mathbf{E}\tau) \frac{\alpha}{a_1^S} \geq 0 \quad (44)$$

$$0 \leq \tau_1 \leq 1 \quad (45)$$

where $\mathbf{E}\tau$ is the expected theft rate a subsister foresees to arise as result of the legislative bargaining process. The expected theft rate is governed by the probability distributions of proposal power in both the initial and the amendment stages of the legislative bargaining game. If the constraint binds, in expectation there is no (either partial or full) restoration of property rights to their original owners.

A special case arises when no restoration occurs in expectation. The no-strong state assumption implies a subsister expects this event to occur deterministically regardless which party has the proposal power.

Each subsister faces the following trade-off: a higher theft rate τ_1 up to the expected theft rate $\mathbf{E}\tau$ increases her expected income. However, any further increase in τ_1 results in lower expected income since each subsister incurs a sunk cost by foregoing income in the subsistence sector.

The solution to the subsister's problem, denoted by τ_1^* , trivially determines the status quo policy τ^{sq} in the legislative bargaining, where $\tau^{sq} \equiv \tau_1^*$.

In the second period, property rights are enforced automatically (by the executive branch) subject to the theft rate legislated in the first period, τ^{eq} .

$$\max_{\tau_2} y_2^S(\tau_2) = \mathbf{E}\tau \frac{\alpha}{a_2^S} + (1 - \tau_2)\underline{w} + \mathbf{1}_{e_2=1}((1 - \tau_2)), \quad (46)$$

subject to:

$$0 \leq \tau_2 \leq \tau^{eq} \quad (47)$$

4.6 The Trade-offs Faced by Political Parties

Next, I describe the properties of each of the political parties' utility functions. Each of them depends on the occupational distribution $\Gamma(a^S, a^W, a^E)$ that has arisen in the occupational stage.

Suppose $\Gamma_1(1, 0, 0)$.

The only relevant payoff is that of U^{PS} , which is the only party represented in the legislature and the exclusive agenda setter because of its vote share in it. If $\tau^{sq} \in [0, \tau^E]$, $\frac{dU^{PS}}{d\tau} = \frac{dU^{PS}}{dy_1^S} \frac{dy_1^S}{d\tau} + \frac{dU^{PS}}{dy_2^S} \frac{dy_2^S}{d\tau} > 0$, where the first term is equal to zero (as it is a mere redistribution among its membership) but the second is strictly positive. If $\tau^{sq} \in (\tau^E, 1]$, $\frac{dU^{PS}}{d\tau} = \frac{dU^{PS}}{dy_1^S} \frac{dy_1^S}{d\tau} + \frac{dU^{PS}}{dy_2^S} \frac{dy_2^S}{d\tau} = 0$, where both terms are equal to zero (as it is a mere redistribution among its membership). There is a jump discontinuity of positive sign at $\tau^{sq} = \tau^E$ associated with the anticipated occupational distribution in period 2 $\Gamma_2(1 - 2\alpha, \alpha, \alpha)$ to $\Gamma_2(1, 0, 0)$. The assumption for the indifference case is extended to the period model as well.

Suppose $\Gamma_1(1 - 2\alpha, \alpha, \alpha)$.

PE's Payoffs:

$$U^{PE}(\tau) = \begin{cases} t\{\alpha y_1^E(\tau) + \alpha y_2^E(\tau)\} & : \text{ if } \tau \in [0, \hat{\tau}] \\ t\alpha y_1^E(\tau) & : \text{ if } \tau \in (\hat{\tau}, 1], \end{cases}$$

where $y_1^E = d(1 - \tau^{sq}) + (\tau^{sq} - \tau) - (1 - \tau^{sq})\underline{w} - \tau\frac{\alpha}{1-2\alpha}$ and $y_2^E = d(1 - \tau) - (1 - \tau)\underline{w} - \tau\frac{\alpha}{1-2\alpha}$. Note that $\frac{dy_1^E}{d\tau} = -(1 + \frac{\alpha}{1-2\alpha}) < 0$ and $\frac{dy_2^E}{d\tau} = -(d - \underline{w} + \frac{\alpha}{1-2\alpha}) < 0$ for any $\tau \in [0, 1]$.

$$\frac{dU^{PE}}{d\tau} = \begin{cases} t\alpha\{-(d-1) + \underline{w} - 2\frac{\alpha}{1-2\alpha}\} < 0 & : \text{ if } \tau \in [0, \hat{\tau}] \\ t\alpha\{-1 - \frac{\alpha}{1-2\alpha}\} < 0 & : \text{ if } \tau \in (\hat{\tau}, 1] \end{cases}$$

At $\hat{\tau}$, there is a jump discontinuity of size $-t\alpha\{d(1 - \hat{\tau}) - (1 - \hat{\tau})\underline{w} - \hat{\tau}\frac{\alpha}{1-2\alpha}\} < 0$ due to the discontinuous drop in a_2^E from α to 0. This implies $U^{PE}(\tau)$ achieves a global maximum at $\tau = 0$ for any $\tau \in [0, \tau^{sq}]$. (See the Appendix pp. 42 - 44 for graphical illustration.)

PS's Payoffs:

$$U^{PS}(\tau) = \begin{cases} t(1 - 2\alpha)\{y_1^S(\tau) + y_2^S(\tau)\} & : \text{ if } \tau \in [0, \hat{\tau}] \\ t\{(1 - 2\alpha)y_1^S(\tau) + y_2^S(\tau)\} & : \text{ if } \tau \in (\hat{\tau}, 1], \end{cases}$$

where $y_1^S = (1 - \tau^{sq})\underline{w} + \tau\frac{\alpha}{1-2\alpha}$ and $y_2^S = (1 - \tau)\underline{w} + \tau\frac{\alpha}{1-2\alpha}$. Note that $\frac{dy_1^S}{d\tau} = \frac{\alpha}{1-2\alpha} > 0$ and $\frac{dy_2^S}{d\tau} = -\underline{w} + \frac{\alpha}{1-2\alpha} > 0$ for any $\tau \in [0, 1]$.

PS 's utility is strictly increasing in τ for $\tau \in [0, \tau^E]$ because

$$\frac{dU^{PS}}{d\tau} = \begin{cases} (1 - 2\alpha)t\{2\frac{\alpha}{1-2\alpha} - \underline{w}\} > 0 & : \text{ if } \tau \in [0, \hat{\tau}] \\ t\{(1 - 2\alpha)\frac{\alpha}{1-2\alpha} - \underline{w}\} > 0 & : \text{ if } \tau \in (\hat{\tau}, 1] \end{cases}$$

and at $\hat{\tau}$, there is a jump discontinuity of size $\alpha t\{(1 - \hat{\tau})\underline{w} - \hat{\tau}\frac{\alpha}{1-2\alpha} + \alpha\} > 0$ due to a discontinuous increase in a_2^S from $(1 - 2\alpha)$ to 1.

This implies $U^{PS}(\tau)$ achieves a global maximum at $\tau = \tau^{sq}$ for any $\tau \in [0, \tau^{sq}]$.

PW's Payoffs:

$$U^W(\tau) = \begin{cases} \alpha t\{y_1^W(\tau) + y_2^W(\tau)\} & : \text{ if } \tau \in [0, \hat{\tau}] \\ \alpha t y_1^W(\tau) & : \text{ if } \tau \in (\hat{\tau}, 1], \end{cases}$$

where $y_1^W = (1 - \tau^{sq})\underline{w} + \tau\frac{\alpha}{1-2\alpha}$ and $y_2^W = (1 - \tau)\underline{w} + \tau\frac{\alpha}{1-2\alpha}$. Note that $\frac{dy_1^W}{d\tau} = \frac{\alpha}{1-2\alpha} > 0$ and $\frac{dy_2^W}{d\tau} = -\underline{w} + \frac{\alpha}{1-2\alpha} > 0$ for any $\tau \in [0, 1]$.

The profile of PW is more specific than those of the other two political parties since PW 's utility is continuously increasing in τ but the jump discontinuity is of negative sign:

$$\frac{dU^{PW}}{d\tau} = \begin{cases} t\alpha\{(1 - \tau^{sq})\underline{w} + (1 - \tau)\underline{w} + 2\frac{\alpha}{1-2\alpha}\} > 0 & : \text{ if } \tau \in [0, \hat{\tau}] \\ t\alpha\{(1 - \tau)\underline{w} + \tau\frac{\alpha}{1-2\alpha}\} > 0 & : \text{ if } \tau \in (\hat{\tau}, 1] \end{cases}$$

but at τ^E , there is a jump discontinuity of size $-\alpha t\{(1-\tau)\underline{w} + \tau\frac{\alpha}{1-2\alpha}\} < 0$ due to the drop of a_2^W from α to 0. PW 's profile leads to the presence of two local maxima: at $\tau = \hat{\tau}$ and at $\tau = 1$. Next, I am going to determine under what conditions each becomes the global maximum.

$$U^W(\tau = \hat{\tau}) = U^W(\tau = 1) \quad (48)$$

$$t\alpha\{(1-\tau^{sq})\underline{w} + (1-\hat{\tau})\underline{w} + 2\hat{\tau}\frac{\alpha}{1-2\alpha}\} = t\alpha\{(1-\tau^{sq})\underline{w} + \frac{\alpha}{1-2\alpha}\} \quad (49)$$

Solving for $\hat{\tau}$ yields:

$$\hat{\tau} = \frac{\frac{\alpha}{1-2\alpha} - \underline{w}}{2\frac{\alpha}{1-2\alpha} - \underline{w}} \quad (50)$$

Using the threshold theft rate leaving non-constrained agents indifferent between becoming entrepreneurs and workers: $\hat{\tau} = \frac{(d-1)-2\underline{w}}{2\frac{\alpha}{1-2\alpha} + (d-1)-2\underline{w}}$:

$$\hat{\tau} = \frac{(d-1) - 2\underline{w}}{2\frac{\alpha}{1-2\alpha} + (d-1) - 2\underline{w}} = \frac{\frac{\alpha}{1-2\alpha} - \underline{w}}{2\frac{\alpha}{1-2\alpha} - \underline{w}} \quad (51)$$

Dividing the numerator and the demoninator of each side by \underline{w} yields:

$$\frac{\frac{d-1}{\underline{w}} - 2}{2\frac{\alpha}{\underline{w}(1-2\alpha)} + \frac{d-1}{\underline{w}} - 2} = \frac{\frac{1}{\underline{w}}\frac{\alpha}{1-2\alpha} - 1}{2\frac{\alpha}{\underline{w}(1-2\alpha)} - 1} \quad (52)$$

Letting $r = \frac{1}{\underline{w}}\frac{\alpha}{1-2\alpha}$ and $p = \frac{d-1}{\underline{w}}$. Note $p = \frac{1-2\alpha}{d\alpha}r = mr$, where $m = \frac{1-2\alpha}{d\alpha}$. Also note $r = \frac{1}{\underline{w}}\frac{\alpha}{1-2\alpha} > 1$, which is satisfied by assumption (stealing is more profitable than working at the subsistence wage).

$$\frac{p-2}{2r+p-2} = \frac{r-1}{2r-1} \quad (53)$$

$$\frac{mr-2}{2r+mr-2} = \frac{r-1}{2r-1} \quad (54)$$

Solving for r in terms of m yields the quadratic equation:

$$-(2-m)r^2 = 0, \quad (55)$$

which has two roots: $r = \frac{1}{\sqrt{2-m}}$.

This implies $U^W(\tau = \hat{\tau}) > U^W(\tau = 1)$ for $r \in [0, \frac{1}{\sqrt{2-m}})$, i.e. PW achieves a global maximum at $\tau = \hat{\tau}$. Also, $U^W(\tau = \hat{\tau}) \leq U^W(\tau = 1)$ for $r \in [\frac{1}{\sqrt{2-m}}, \infty)$.

As an illustration, for $\alpha = \frac{1}{3}$, the term $\frac{1-2\alpha}{\alpha} = 1$. Consequently, $q = \frac{1}{\sqrt{2-m}}$ is equivalent to $\frac{1}{\underline{w}} = \frac{1}{\sqrt{2-\frac{1}{d}}}$, which can be also simplified to $2 - \frac{1}{d} = \underline{w}^2$. This expression could be

viewed as another way of representing the relative productivity of the subsistence and the entrepreneurial sectors in this economy.

Assumption 5 1. *I assume $\sqrt{2 - \frac{1-2\alpha}{d\alpha}} > \frac{w^{1-2\alpha}}{\alpha}$. This condition guarantees PW's utility achieves a global maximum at $\tau = \hat{\tau}$.*

5 Equilibrium

Stage 5:

For a political equilibrium theft rate τ^{eq} and an occupational distribution $\{\Gamma_2(a_2^S(\tau|\tau \leq \hat{\tau}), a_2^W(\tau|\tau \leq \hat{\tau}), a_2^E(\tau|\tau \leq \hat{\tau})) = \Gamma_2(1-2\alpha, \alpha, \alpha)\}$, each subsister chooses $\tau_2^* = \tau^{eq}$, which determines the subgame equilibrium theft rate for this occupational distribution in period 2. Also, each entrepreneur allocates her entire time endowment to supervision and invests her entire endowment $z_2^* = 1$ since $q(z) = dz > z$ and each worker allocates her entire time endowment to working.

For a political equilibrium theft rate τ^{eq} and an occupational distribution $\{\Gamma_2(a_2^S(\tau|\tau \leq \hat{\tau}), a_2^W(\tau|\tau \leq \hat{\tau}), a_2^E(\tau|\tau \leq \hat{\tau})) = \Gamma_2(1, 0, 0)\}$, each subsister chooses $\tau_2^* = \tau^{eq}$, which determines the subgame equilibrium theft rate for this occupational distribution in period 2.

Stage 4:

For a political equilibrium theft rate $\tau^{eq} \in [0, \hat{\tau}]$, each rich agent compares the income she would receive from each of the three occupations in the economic stage. She optimally selects herself into the occupation, in which she could earn the highest income. I use the already established fact that for any $\tau^{eq} \in [0, \hat{\tau}]$, $y^E(\tau_2|e_2 = 1, 0 \leq \tau^{eq} \leq \hat{\tau}) \geq y^W(\tau_2|e_2 = 1, 0 \leq \tau^{eq} \leq \hat{\tau}) = y^S(\tau_2|e_2 = 1, 0 \leq \tau^{eq} \leq \hat{\tau})$, which implies all rich agents of size α become entrepreneurs. Each entrepreneur hires one worker from the poor agents. The rest of the poor agents of size $1 - 2\alpha$ become subsisters since the income of a worker and that of a subsister are equal in equilibrium. The resulting subgame equilibrium occupational distribution is $\Gamma_2^*(a_2^S, a_2^W, a_2^E) = \Gamma_2(1 - 2\alpha, \alpha, \alpha)$.

For a political equilibrium theft rate $\tau^{eq} \in (\hat{\tau}, 1]$, each rich agent compares the income she would receive from each of the three occupations in the economic stage. She optimally selects herself into the occupation, in which she could earn the highest income. I use the already established fact that for any $\tau^{eq} \in (\hat{\tau}, 1]$, $y^E(\tau_2|e_2 = 1, 0 \leq \tau^{eq} \leq \hat{\tau}) < y^W(\tau_2|e_2 = 1, 0 \leq \tau^{eq} \leq \hat{\tau}) = y^S(\tau_2|e_2 = 1, 0 \leq \tau^{eq} \leq \hat{\tau})$, which implies all rich agents of size α become subsisters. Although workers' and subsisters' incomes are equalized in equilibrium, there are no entrepreneurs in this economy, who would otherwise have hired workers of the same size. The resulting subgame equilibrium occupational distribution is: $\Gamma_2^*(a_2^S, a_2^W, a_2^E) = \Gamma_2(1, 0, 0)$.

Period 1:**Stage 3:**

As in the one-period model, I am considering two cases with respect to the occupational distribution that has arisen in stage 1 and has determined the vote shares of each of the political parties in the legislature.

Suppose $\Gamma_1(1, 0, 0)$.

This occupational distribution $\Gamma_1(1, 0, 0)$ arises if the labour market has unraveled, i.e. $L^* = 0$. The occupational shares imply PS has the proposal power in both the initial and the amendment stage with probability equal to 1. Therefore, PS can propose any $\tau \in [0, \tau^{sq}]$ that satisfies its own participation constraint and will trivially achieve majority in the legislature to have its proposed policy passed. Since $\frac{dU^{PS}}{d\tau} = 0$ for $\tau \in [0, \tau^{sq}]$, PS will propose $\tau^{eq} = \tau^{sq}$, which is trivially passed and implemented in both the initial and the amendment stages.

Suppose $\Gamma(1 - 2\alpha, \alpha, \alpha)$.

The occupational shares imply no political party has the majority and they need to engage in coalition formation to have any amendment to the status quo policy passed.

I adopt the following notation to denote the subgame equilibrium theft rate corresponding to the initial stage (IS) and the amendment stage (AS) respectively given nature (N) has assigned party Pi the proposal power: $\tau^{seq}|N^{IS} = Pi$ and $\tau^{seq}|N^{AS} = Pi$ for $i = \{S, W, E\}$.

Political Equilibria:

Proposition 1. *For $\tau^{sq} \in [0, \hat{\tau}]$ and $\Gamma_1(1 - 2\alpha, \alpha, \alpha)$, the equilibrium policy in each subgame of the original game is $\tau^{eq} = \tau^{sq}$ regardless which party has the proposal power. For $\tau^{sq} \in (\hat{\tau}, 1]$ and $\Gamma_1(1 - 2\alpha, \alpha, \alpha)$, the equilibrium policy is either $\{\hat{\tau}, \tau^{seq}|N^{IS} = PE \in (\hat{\tau}, \hat{\tau}]; 1 - \alpha, \alpha\}$ or $\{\hat{\tau}, \tau^{seq}|N^{IS} = PW \in (\hat{\tau}, \hat{\tau}], \tau^{seq}|N^{IS} = PE \in (\hat{\tau}, \hat{\tau}]; 1 - 2\alpha, \alpha, \alpha\}$ depending on the values of the parameters, where $\tilde{\tau} \in [0, \hat{\tau}]$ is such that $U^{PW}(\tau = \tilde{\tau}) = U^{PW}(\tau = \tau^{sq})$.*

Proof: Left to the Appendix

Note the game is never moved to the amendment stage but the two-stage political structure serves an important purpose by not allowing the party randomly assigned proposal power to have superior bargaining power relative to the other parties. In this context, PS is not allowed to implement $\tau^{eq} = \tau^{sq}$ for $\tau^{sq} \in (\hat{\tau}, 1]$, which it would have implemented in a one-stage political structure.

This result has the following implication: when the theft rate is small enough (below the threshold $\hat{\tau}$), there is no eviction; however, when it exceeds the above threshold, some of the stolen assets are being returned to its original owners.

Stage 2:

For an occupational distribution $\Gamma_1(a_1^S, a_1^W, a_1^E) = \Gamma_1(1, 0, 0)$, and correctly anticipating no (partial or complete) restoration of original property rights in the political stage, each subsister optimally chooses $\tau_1^* = 1$. This is because each subsister rationally expects its representative the Party of the Subsisters, the only party representing in the legislature for this occupational distribution, to not restore original property rights since it constitutes a mere transfer of resources from some of its members to others, thus leaving PS's income unaffected. Each subsister's optimal choice also trivially determines the status quo policy in the legislative bargaining $\tau^{sq} = \tau_1^* = 1$ associated with this occupational distribution.

For an occupational distribution $\Gamma_1(a_1^S, a_1^W, a_1^E) = \Gamma_1(1 - 2\alpha, \alpha, \alpha)$ I solve the subsister's problem by analyzing two ranges of τ : $\tau^{sq} \in [0, \hat{\tau}]$ and $\tau^{sq} \in (\hat{\tau}, 1]$. This is necessary because each of these intervals leads to a different solution with respect to the restoration of property rights in the political stage. Each subsister requires this information to form rational expectations about the political equilibrium to arise for each interval.

If $\tau^{sq} \in [0, \hat{\tau}]$ were to arise, there is a unique equilibrium $\tau^{eq} = \tau^{sq}$, which implies is no restoration of original property rights irrespective of which political party has the proposal in the initial stage. (Note the game never moves to the amendment stage.) Thus, each subsister, if she chooses $\tau_1^* \in [0, \hat{\tau}]$, foresees $\tau^{eq} = \tau^{sq}$. This implies $\tau_1^* = \mathbf{E}\tau | 0 \leq \tau^{sq} \leq \hat{\tau}$, where $\mathbf{E}\tau | 0 \leq \tau^{sq} \leq \hat{\tau} = a_1^S \tau^{sq} + a_1^W \tau^{sq} + a_1^E \tau^{sq} = (1 - 2\alpha)\tau^{sq} + \alpha\tau^{sq} + \alpha\tau^{sq} = \tau^{sq}$. Each subsister, if she chooses $\tau_1^* \in [0, \hat{\tau}]$ would not incur any sunk costs from foregone income in the subsistence sector as a result of stealing beyond what would be legitimized in the legislative bargaining process. This combined with $\frac{dy_1^S}{d\tau_1} > 0$, implies the optimal choice of a subsister is the highest possible theft rate $\tau_1 \in [0, \hat{\tau}]$, i.e. $\tau_1^* | (0 \leq \tau_1 \leq \hat{\tau}) = \hat{\tau}$.

If $\tau^{sq} \in (\hat{\tau}, 1]$ were to arise, the equilibrium theft rate is either $\{\hat{\tau}, \tau^{seq} | N^{IS} = PE \in (\hat{\tau}, \hat{\tau}]; 1 - \alpha, \alpha\}$ or $\{\hat{\tau}, \tau^{seq} | N^{IS} = PW \in (\hat{\tau}, \hat{\tau}], \tau^{seq} | N^{IS} = PE \in (\hat{\tau}, \hat{\tau}]; 1 - 2\alpha, \alpha, \alpha\}$, which implies there is at least some partial restoration of original property rights irrespective of which political party has the proposal in the initial stage. (Note the game never moves to the amendment stage.) Therefore, it always arises $\tau^{eq} < \tau^{sq}$. Each subsister foresees any choice $\tau_1^* (\hat{\tau} < \tau^{sq} \leq 1) > \mathbf{E}\tau | (\hat{\tau} < \tau^{sq} \leq 1)$, i.e. each subsister incurs some sunk cost from foregoing income in the subsistence sector as a result of stealing beyond what would be legitimized in the legislative bargaining process. Furthermore, $\mathbf{E}\tau | (\hat{\tau} < \tau^{sq} \leq 1) = a_1^S \hat{\tau} + a_1^W \hat{\tau} + a_1^E \tau^{seq} | (N^{IS} = PE) = (1 - \alpha)\hat{\tau} + \alpha\tau^{seq} | (N^{IS} = PE) < \hat{\tau}$ or $\mathbf{E}\tau | (\hat{\tau} < \tau^{sq} \leq 1) = a_1^S \hat{\tau} + a_1^W \tau^{seq} | (N^{IS} = PW) + a_1^E \tau^{seq} | (N^{IS} = PE) = (1 - 2\alpha)\hat{\tau} + \alpha\tau^{seq} | (N^{IS} = PW) + \alpha\tau^{seq} | (N^{IS} = PE) < \hat{\tau}$. If the optimal choice of each

subsister is restricted to $\tau_1 \in (\hat{\tau}, 1]$, she will choose the lowest possible value in the set to minimize the sunk cost of foregone income $\tau_1^*(\hat{\tau} < \tau_1 \leq 1) = \inf(\hat{\tau}, 1]$.

Comparing the optimal values for each of the intervals, I find $\mathbf{E}y_1^S(\tau_1|0 \leq \tau^{sq} \leq \hat{\tau}) > \mathbf{E}y_1^S(\tau_1|\hat{\tau} < \tau^{sq} \leq 1)$. Therefore, $\tau_1^* = \hat{\tau}$ is each subsister's optimal choice, which also trivially determines $\tau^{sq} = \hat{\tau}$. The decisions of the entrepreneurs and the workers are identical to their counterparts in period 2.

Stage 1:

Each rich agent correctly anticipates if $\Gamma_1(1 - 2\alpha, \alpha, \alpha)$ were to arise, each subsister chooses $\tau_1^* = \hat{\tau}$ and also the equilibrium theft rate in the political stage is $\tau^{eq} = \hat{\tau}$. This implies $y^E(\hat{\tau}|e_1 = 1) = y^W(\hat{\tau}|e_1 = 1) = y^S(\hat{\tau}|e_1 = 1)$. Therefore, each rich agent becomes an entrepreneur. On the other hand, if $\Gamma_1(1 - 2\alpha, \alpha, \alpha)$ were to arise, each subsister chooses $\tau_1^* = 1$ and also the equilibrium theft rate in the political stage is $\tau^{eq} = 1$. Then, each rich agent compares her income profile associated with the subgame equilibrium associated with each occupational distribution: $y^E(\tau^{eq} = \hat{\tau}|e_1 = 1, \Gamma(1 - 2\alpha, \alpha, \alpha)) > y^S(\tau^{eq} = 1|e_1 = 1, \Gamma(1, 0, 0))$. Each rich agent chooses to become an entrepreneur. Consequently, the equilibrium occupational distribution is $\Gamma_1^*(a_1^S, a_1^W, a_1^E) = \Gamma_1(1 - 2\alpha, \alpha, \alpha)$.

5.1 Efficiency of Equilibrium Allocations

The equilibrium allocations are: $\{\Gamma_i^*(1 - 2\alpha, \alpha, \alpha), z_i^* = 1, \tau^{eq} = \tau^{sq} = \tau_1^* = \hat{\tau}\}$. In addition, in equilibrium $y_i^E = y_i^W = y_i^S$ for $i = \{1, 2\}$, i.e. there is ex-post income inequality in both periods. This equilibrium is second-best efficient in both periods.

6 Conclusion

The model has been able to endogenously determine both the status quo policy and the vote shares of each of the political parties in the political stage, allowing for both a one-party and a multi-party political systems to arise depending on the income/wealth inequality parameters. Consistent with Ecuador's experience, insecure property arise, legitimized by the political system, in a multi-party democracy when both wealth and ex-post income inequality are the highest but never in a one-party political system. Noting the assumptions of strict preference for subsisters and PS when $\Gamma_1(1, 0, 0)$, the model has been able to yield unique equilibrium predictions for each set of parameteric restrictions.

The model has been able to also to provide both the necessary and the sufficient conditions for insecure property rights to arise. There are several factors that need

to be in place for favourable conditions to be generated. First, each subsister has to find it in her interest to steal assets, which critically depends on the endogenous size of subsisters in the economy a^S relative to the exogenous total size of assets in the economy ($\alpha\bar{z}$) and subsistence wage \underline{w} . Secondly, each non-constrained individual has to be willing to tolerate a positive theft rate and self-selecting as an entrepreneur, which can be generated when the ex-post income inequality is sufficiently high ($\frac{d\bar{z}}{\underline{w}} > 2$). Third, it must be assumed the legislature is left with the decision to what extent to protect property rights. When all of above conditions are being met, the trigger leading to insecure property rights in a multi-party equilibrium is the must at least two political parties to find such government policy beneficial. For the Party of the Subsisters the higher the theft rate, the better. However, for the Party of the Workers (PW), there is a critical threshold up to which it is willing to accept insecure property rights. PW prefers a higher theft rate to a lower one so long as it does not have to trade-off its membership in the second period for a higher per-member income in the first period. The trade-off PW faces is an indirect result of the labour market equilibrium conditions, where subsisters' and workers' incomes are being equalized in equilibrium and entrepreneurs need to be kept at least as well off as their outside option in order to hire workers. If this critical threshold is being exceeded, PW is ready to exercise the threat of eviction. Ultimately, this credible threat of eviction results in partial stealing of assets even if subsisters would, in the absence of this threat, find it in their interest to steal the entire assets of the economy. Because of the sunk cost of stealing, subsisters are being deterred from stealing beyond what would be permitted in the political stage.

Last but not least, the model has been able to explain all relevant facts documented in the case study. The model has been able to explain why partial stealing has occurred but no evictions have followed. In addition, the trade-off faced by Dr. Ramiro Camacho in the case study has been successfully reconstructed in the trade-off faced by the Party of the Workers. Furthermore, the government policies of 'drastically' trimming the safety nets in the early 1980s and favouring increase in productivity at large farms that Dosh (2010) and Burgwal (1995) respectively suggest to have influenced the rise in land invasions are also supported by the model. In fact, the sufficiently large increase in d and large decrease in \underline{w} and a small enough decrease in α could have created the necessary conditions for the economy to move from $\underline{w} < \bar{z}\frac{\alpha}{1-2\alpha}$ to $\alpha\bar{z} > \underline{w}$ and also for the threshold level τ^E to increase from 0 to a positive number. The equilibrium result of perfect ex-post equality across occupational groups for $\underline{w} < \bar{z}\frac{\alpha}{1-2\alpha}$ needs to be interpreted with caution because each entrepreneur's income is driven to their reservation income, which by construction happens to be that of a worker or a subsister. Generating an exogenous income wedge between what a non-constrained agent and a constrained agent earns for any occupation will be sufficient to reduce but at the same time preserve some ex-post inequality in equilibrium to better reflect the stylized facts of high income and land inequality.

References

- [1] Acemoglu, Daron (2005) *Politics and economics in weak and strong states* , Journal of Monetary Economics, Vol. 52, Issue 7, pp. 1199 – 1226.
- [2] Burgwal, Gerrit (1995) *Struggle of the Poor: Neighbourhood Organization and Clientelist Practice in a Quito Squatter Settlement*, CEDLA - Amsterdam.
- [3] Dosh, Paul (2010) *Demanding the Land: Urban Popular Movements in Peru and Ecuador, 1990 – 2005.*, The Pennsylvania State University Press, University Park, PA.
- [4] Ghatak, Maitreesh and Neville Nien-Huei Jiang (2002) *A simple model of inequality, occupational choice, and development* , Journal of Development Economics, Vol. 69, Issue 1, pp. 205 – 226.
- [5] Keefer, Philip and Stephen Knack (2002) *Polarization, Politics, and Property Rights: Links between Inequality and Growth* , Public Choice, Vol. 111, # 1/2 (Mar., 2002), pp. 127 – 154.

7 Appendix

7.1 Status-quo Policy $\tau^{sq} \in [0, \hat{\tau}]$

I consider two cases associated with the occupational distributions $\Gamma(1 - 2\alpha, \alpha, \alpha)$ and $\Gamma(1, 0, 0)$, which trivially determine the respective shares of their political representatives PS , PW , and PE in the Legislature.

Suppose $\Gamma(1, 0, 0)$.

This occupational distribution $\Gamma(1, 0, 0)$ arises if the labour market has unraveled, i.e. $L^* = 0$. The occupational shares imply PS has the proposal power in both the initial and the amendment stage with probability equal to 1. Therefore, PS can propose any $\tau \in [0, \tau^{sq}]$ that satisfies its own participation constraint and will trivially achieve majority in the legislature to have its proposed policy passed. Since $\frac{dU^{PS}}{d\tau} = 0$ for $\tau \in [0, \tau^{sq}]$, PS will propose $\tau^{eq} = \tau^{sq}$, which is trivially passed and implemented in both the initial and the amendment stages.

Suppose $\Gamma(1 - 2\alpha, \alpha, \alpha)$.

The occupational shares imply no political party has the majority and political parties need to engage in coalition formation to have any amendment to the status quo policy passed in the legislature.

First, consider the amendment stage:

Suppose PS has the proposal power.

Range of τ for which $U^{PS}(\tau) \geq U^{PS}(\tau^{sq})$: τ^{sq} . This is because $U^{PS}(\tau)$ is strictly increasing in $\tau \in [0, \tau^{sq}]$, while $a^S(\tau) = 1 - 2\alpha$ is constant for any $\tau \in [0, \tau^{sq}]$. PS 's utility is maximized at τ^{sq} , the highest theft rate value in the permissible range.

The coalition formation in this instance is trivial since PS has no incentive to propose a theft rate different from the default value. PS proposes τ^{sq} , which is supported by: $c = \{PW, PE\}$ as each of them are indifferent between the proposed τ^{sq} and the default τ^{sq} .

Proposed policy: $\tau = \tau^{sq}$; passed. MWC: $\{PS, PW, PE\}$.

Suppose PW has the proposal power.

Range of τ for which $U^{PW}(\tau) \geq U^{PW}(\tau^{sq})$: τ^{sq} . This is because $U^{PW}(\tau)$ is strictly increasing in $\tau \in [0, \tau^{sq}]$, while $a^W(\tau) = \alpha$ is constant for any $\tau \in [0, \tau^{sq}]$. PW 's utility is maximized at τ^{sq} , the highest theft rate value in the permissible range.

The coalition formation in this instance is trivial since PW has no incentive to propose a theft rate different from the default value. PW proposes τ^{sq} , which is supported by: $c = \{PS, PE\}$ as each of them are indifferent between the proposed τ^{sq} and the default τ^{sq} .

Proposed policy: $\tau = \tau^{sq}$; passed. MWC: $\{PW, PS, PE\}$.

Suppose PE has the proposal power.

The range of τ , for which $U^{PE}(\tau) \geq U^{PE}(\tau^{sq})$, is $\tau \in [0, \tau^{sq}]$ with a global maximum value attained at $\tau_t = 0$. This is because $U^{PE}(\tau)$ is strictly decreasing in $\tau \in [0, \tau^{sq}]$, while $a^E(\tau) = \alpha$ is constant for any $\tau \in [0, \tau^{sq}]$. These properties of the utility function lead to a corner solution where PE 's utility is maximized at $\tau = 0$, the lowest theft rate value in the permissible range.

Next, PE is seeking a coalition partner from the other two political parties in the legislature and will select the one that is cheaper to buy. I have already established that, for $\tau^{sq} \in [0, \tau^E]$, the range of τ for which $U^{PS}(\tau) \geq U^{PS}(\tau^{sq})$ is the value of τ^{sq} only and that the range of τ for which $U^{PW}(\tau) \geq U^{PW}(\tau^{sq})$ is also the value of τ^{sq} only. The complete overlap in the permissible range implies PS and PW are equally cheap to buy for PE .

This implies PE proposes τ^{sq} , the only theft rate value that satisfies its participation constraint and for which it would receive the backing of at least one coalition partner. The proposed theft rate is supported by: $c = \{PS, PE\}$ (both are equally expensive to buy) as they are indifferent between the proposed (τ^{sq}) and the default (τ^{sq}) policies.

Proposed policy: $\tau = \tau^{sq}$; passed. MWC: $\{PE, PS, PW\}$.

Next, consider the initial proposal stage:

Next, I show the participation constraints for each of the political parties are identical to their respective ones in the amendment stage. Once this result is established, I will show each political party faces the exact same problem as in the amendment stage.

First, I show PS is facing the same constraint as in the amendment stage.

$$a_1^S y_1^S(\tau) + a_2^S(\tau) y_2^S(\tau) \geq \frac{a^W}{a^W + a^E} U^{PS}(\tau | N^{AS} = PW) + \frac{a^E}{a^W + a^E} U^{PS}(\tau | N^{AS} = PE) \quad (56)$$

Consider the RHS of PS 's participation constraint:

$$\mathbb{E} U^{PS}(\tau) = \frac{a^W}{a^W + a^E} U^{PS}(\tau | N^{AS} = PW) + \frac{a^E}{a^W + a^E} U^{PS}(\tau | N^{AS} = PE) \quad (57)$$

I use the following facts: $\frac{a^W}{a^W+a^E} = \frac{a^E}{a^W+a^E} = \frac{\alpha}{\alpha+\alpha} = \frac{1}{2}$ for $\tau \in [0, \tau^{sq}]$; and $\tau|(N^{AS} = PW) = \tau|(N^{AS} = PE) = \tau^{sq}$.

$$\mathbb{E} U^{PS}(\tau) = \frac{1}{2}\{a_1^S y_1^S(\tau^{sq}) + a_2^S(\tau^{sq})y_2^S(\tau^{sq})\} + \frac{1}{2}\{a_1^S y_1^S(\tau^{sq}) + a_2^S(\tau^{sq})y_2^S(\tau^{sq})\} \quad (58)$$

The above equation also indicates the occupational choice and economic decisions in the second period if $\tau = \tau^{sq} \in [0, \hat{\tau}]$ were implemented as the equilibrium policy in period 1.

$$\mathbb{E} U^{PS}(\tau) = a_1^S y_1^S(\tau^{sq}) + a_2^S(\tau^{sq})y_2^S(\tau^{sq}) \quad (59)$$

I also make use of the fact $a_1 = a_2^S(\tau) = a_2^S(\tau^{sq}) = 1 - 2\alpha$ for any $\tau \in [0, \tau^{sq}]$. This implies PS 's participation constraint it faces in the initial stage is identical to the one PS faces in the amendment stage:

$$U^{PS}(\tau) = (1 - 2\alpha)(y_1^S(\tau) + y_2^S(\tau)) \geq (1 - 2\alpha)(y_1^S(\tau) + y_2^S(\tau)) = \mathbb{E} U^{PS}(\tau) \quad (60)$$

Next, I establish the same result for PW 's participation constraint.

$$a_1^W y_1^W(\tau) + a_2^W(\tau)y_2^W(\tau) \geq \frac{a^W}{a^W+a^E} U^{PW}(\tau|N^{AS} = PW) + \frac{a^E}{a^W+a^E} U^{PW}(\tau|N^{AS} = PE) \quad (61)$$

Consider the RHS of PW 's participation constraint:

$$\mathbb{E} U^{PW}(\tau) = \frac{a^W}{a^W+a^E} U^{PW}(\tau|N^{AS} = PW) + \frac{a^E}{a^W+a^E} U^{PW}(\tau|N^{AS} = PE) \quad (62)$$

I make use of the following facts: $\frac{a^W}{a^W+a^E} = \frac{a^E}{a^W+a^E} = \frac{\alpha}{\alpha+\alpha} = \frac{1}{2}$ for $\tau \in [0, \tau^{sq}]$; and $\tau|(N^{AS} = PW) = \tau|(N^{AS} = PE) = \tau^{sq}$.

$$\mathbb{E} U^{PW}(\tau) = \frac{1}{2}\{a_1^W y_1^W(\tau^{sq}) + a_2^W(\tau^{sq})y_2^W(\tau^{sq})\} + \frac{1}{2}\{a_1^W y_1^W(\tau^{sq}) + a_2^W(\tau^{sq})y_2^W(\tau^{sq})\} \quad (63)$$

$$\mathbb{E} U^{PW}(\tau) = a_1^W y_1^W(\tau^{sq}) + a_2^W(\tau^{sq})y_2^W(\tau^{sq}) \quad (64)$$

I also make use of the fact $a_1^W = a_2^W(\tau) = a_2^W(\tau^{sq}) = \alpha$ for any $\tau \in [0, \tau^{sq}]$. This implies PW 's participation constraint it faces in the initial stage is identical to the one PW faces in the amendment stage:

$$U^{PW}(\tau) = \alpha(y_1^W(\tau) + y_2^W(\tau)) \geq \alpha(y_1^W(\tau) + y_2^W(\tau)) = \mathbb{E} U^{PW}(\tau) \quad (65)$$

Last, I establish the same result for PE 's participation constraint.

$$U^{PE}(\tau) = a^E(\tau)y^E(\tau) \geq \frac{a^W}{a^W + a^E}U^{PE}(\tau|N^{AS} = PW) + \frac{a^E}{a^W + a^E}U^{PE}(\tau|N^{AS} = PE) \quad (66)$$

Consider the RHS of PW 's participation constraint:

$$\mathbb{E}U^{PE}(\tau) = \frac{a^W}{a^W + a^E}U^{PE}(\tau|N^{AS} = PW) + \frac{a^E}{a^W + a^E}U^{PE}(\tau|N^{AS} = PE) \quad (67)$$

I am making use of the following facts: $\frac{a^W}{a^W + a^E} = \frac{a^E}{a^W + a^E} = \frac{\alpha}{\alpha + \alpha} = \frac{1}{2}$ for $\tau \in [0, \tau^{sq}]$; and $\tau|(N^{AS} = PW) = \tau|(N^{AS} = PE) = \tau^{sq}$.

$$\mathbb{E}U^{PE}(\tau) = \frac{1}{2}\{a_1^E y_1^E(\tau^{sq}) + a_2^E(\tau^{sq})y_2^E(\tau^{sq})\} + \frac{1}{2}\{a_1^E y_1^E(\tau^{sq}) + a_2^E(\tau^{sq})y_2^E(\tau^{sq})\} \quad (68)$$

$$\mathbb{E}U^{PE}(\tau) = a_1^E y_1^E(\tau^{sq}) + a_2^E(\tau^{sq})y_2^E(\tau^{sq}) \quad (69)$$

I also make use of the fact $a_1^E = a_2^E(\tau) = a_2^E(\tau^{sq}) = \alpha$ for any $\tau \in [0, \tau^{sq}]$. This implies PW 's participation constraint it faces in the initial stage is identical to the one PW faces in the amendment stage:

$$U^{PE}(\tau) = \alpha(y_1^E(\tau) + y_2^E(\tau)) \geq \alpha(y_1^E(\tau) + y_2^E(\tau)) = \mathbb{E}U^{PE}(\tau) \quad (70)$$

Once it is established each constraint in the amendment stage is identical to its correspondent constraint in the initial stage, it is trivial to determine that the solution to each problem faced in the initial stage is identical to its correspondent solution to its corresponding problem in the amendment stage.

Suppose PS has the proposal power.

Proposed policy: $\tau = \tau^{sq}$; passed. MWC: {PS, PW, PE}

Suppose PW has the proposal power.

It can be analogously established the three political parties participation constraints in the initial stage are also identical to their correspondent constraints in the amendment stage. Then, it is trivial to determine the solution to each problem faced in the initial stage is identical to its correspondent solution obtained for the amendment stage.

Proposed policy: $\tau = \tau^{sq}$; passed. MWC: {PW, PS, PE}

Suppose PE has the proposal power.

It can be analogously established the three political parties participation constraints in the initial stage are also identical to their correspondent constraints in the amendment

stage. Then, it is trivial to determine the solution to each problem faced in the initial stage is identical to its correspondent solution obtained for the amendment stage.

Proposed policy: $\tau = \tau^{sq}$; passed. MWC: $\{PE, PS, PW\}$

7.2 Status-quo Policy $\tau^{sq} \in (\hat{\tau}, 1]$

Suppose PS has the proposal power.

The range of τ for which $U^{PS}(\tau) \geq U^{PS}(\tau^{sq}) : \tau^{sq}$.

This is because $U^{PS}(\tau)$ achieves a global maximum at τ^{sq} as $U^{PS}(\tau)$ is strictly increasing in $\tau \in [0, \hat{\tau}] \cup (\hat{\tau}, \tau^{sq}]$ and discontinuously increasing at $\tau = \hat{\tau}$.

This implies PS proposes τ^{sq} , which is supported by: $c = \{PW, PE\}$. Both PW 's and PE 's constraints are trivially satisfied.

Proposed policy: $\tau = \tau^{sq}$; passed. MWC: $\{PS, PW, PE\}$.

Suppose PW has the proposal power.

The range of τ for which $U^{PW}(\tau) \geq U^{PW}(\tau^{sq})$ is $\tau \in [\tilde{\tau}, \hat{\tau}] \cup \tau^{sq}$, where $\tilde{\tau} \in [0, \hat{\tau}]$ and $U^{PW}(\tilde{\tau}) = U^{PW}(\tau^{sq})$, with a global maximum at $\hat{\tau}$. This is true since $U^{PW}(\tau)$ is strictly increasing in $\tau \in [0, \hat{\tau}] \cup (\hat{\tau}, \tau^{sq}]$ but is discontinuously decreasing at $\tau = \hat{\tau}$.

PW seeks a coalition partner from the other two parties in the legislature and selects the one that is cheaper to buy:

The range of τ for which $U^{PS}(\tau) \geq U^{PS}(\tau^{sq}) : \tau = \tau^{sq}$, since $U^{PS}(\tau)$ is strictly increasing in $\tau \in [0, \hat{\tau}] \cup (\hat{\tau}, \tau^{sq}]$ and discontinuously increasing at $\tau = \hat{\tau}$. If PW were to pick PS as its coalition partner, it can only propose $\tau = \tau^{sq}$, the single value for which both PW 's and PS 's participation constraints are being satisfied.

The range of τ for which $U^{PE}(\tau) \geq U^{PE}(\tau^{sq}) : \tau \in [0, \tau^{sq}]$, since $U^{PE}(\tau)$ is strictly decreasing in $\tau \in [0, \hat{\tau}] \cup (\hat{\tau}, \tau^{sq}]$ and discontinuously decreasing at $\tau = \hat{\tau}$. If PW were to pick PS as its coalition partner, it can propose any $\tau \in [\tilde{\tau}, \hat{\tau}] \cup \tau^{sq}$, the values of τ for which both PE 's and PW 's participation constraints are being satisfied. Having the proposal power, PW would pick $\tau = \hat{\tau}$, the value at which $U^{PW}(\tau)$ is being maximized.

Finally, PW evaluates the payoffs from choosing either PS or PE as its coalition partner. Since $U^{PW}(\hat{\tau}) > U^{PW}(\tau^{sq})$, PW proposes $\tau = \hat{\tau}$ chooses PE as its coalition partner.

Proposed policy: $\tau = \hat{\tau}$, passed. MWC: $\{PW, PE\}$.

Suppose PE has the proposal power.

The range of τ for which $U^{PE}(\tau) \geq U^{PE}(\tau^{sq}) : \tau \in [0, \tau^{sq}]$, since $U^{PE}(\tau)$ is strictly decreasing in $\tau \in [0, \tau^E] \cup (\tau^E, \tau^{sq}]$ and discontinuously decreasing at $\tau = \tau^E$. $U^{PE}(\tau)$ achieves a global maximum at $\tau = 0$.

PE is seeking a coalition partner from the other two parties in the legislature and will select the one that is cheaper to buy:

The range of τ for which $U^{PS}(\tau) \geq U^{PS}(\tau^{sq}) : \tau = \tau^{sq}$, since $U^{PS}(\tau)$ is strictly increasing in $\tau \in [0, \hat{\tau}] \cup (\hat{\tau}, \tau^{sq}]$ and discontinuously increasing at $\tau = \hat{\tau}$. If PW were to pick PS as its coalition partner, it can only propose $\tau = \tau^{sq}$, the single value for which both PW 's and PS 's participation constraints are being satisfied.

The range of τ for which $U^{PW}(\tau) \geq U^{PW}(\tau^{sq})$ is $\tau \in [\tilde{\tau}, \hat{\tau}] \cup \tau^{sq}$, where $\tilde{\tau} \in [0, \tau^E]$ and $U^{PW}(\tilde{\tau}) = U^{PW}(\tau^{sq})$, with a global maximum at $\hat{\tau}$. This is true since $U^{PW}(\tau)$ is strictly increasing in $\tau \in [0, \hat{\tau}] \cup (\tau^E, \tau^{sq}]$ but is discontinuously decreasing at $\tau = \hat{\tau}$. If PE were to pick PW as its coalition partner, it can propose any $\tau \in [\tilde{\tau}, \hat{\tau}] \cup \tau^{sq}$, the values of τ for which both PE 's and PW 's participation constraints are being satisfied. Having the proposal power, PE would pick $\tau = \tilde{\tau}$, the value at which $U^{PE}(\tau)$ is being maximized.

Finally, PE evaluates the payoffs from choosing either PS or PW as its coalition partner. Since $U^{PE}(\tilde{\tau}) > U^{PE}(\tau^{sq})$, PE proposes $\tau = \hat{\tau}$ chooses PW as its coalition partner.

There are some interesting comparative statics that emerge due to the non-convexities in PE 's utility function at $\tau = \hat{\tau}$. Since $U^{PW}(\tilde{\tau}) = U^{PW}(\tau^{sq})$ and $U^{PW}(\tau)$ is strictly increasing in $\tau \in [0, \hat{\tau}] \cup (\hat{\tau}, \tau^{sq}]$, this implies as τ^{sq} increases, so does $\tilde{\tau}$. That is, as subsisters allocate a greater fraction of their time endowment to stealing, PW needs to be compensated with a larger theft rate $\tilde{\tau}$ in the amendment stage.

Proposed policy: $\tau = \tilde{\tau}$; passed. MWC: $\{PE, PW\}$

Next, consider the initial proposal stage:

Suppose PS has the proposal power.

Consider the set of participation constraints faced by each of the political parties in the initial stage when PS has the proposal power:

$$U^{Pi}(\tau) \geq \frac{a^W}{a^W + a^E} U^{Pi}(\tau^{seq} | N^{AS} = PW) + \frac{a^E}{a^W + a^E} U^{Pi}(\tau^{seq} | N^{AS} = PE), i = \{S, W, E\} \quad (71)$$

where $\tau^{seq}|N^{AS} = PW$ and $\tau^{seq}|N^{AS} = PE$ are the subgame equilibrium theft rates corresponding to Nature (N) having assigned the proposal power to PW and PE respectively.

$$U^{PS}(\tau^{PS}|N^{IS} = PS) = \frac{a^W}{a^W + a^E} U^{PS}(\hat{\tau}|N^{AS} = PW) + \frac{a^E}{a^W + a^E} U^{PS}(\tilde{\tau}|N^{AS} = PE), \quad (72)$$

The theft rate leaving PS indifferent to the expected utility from moving the game to the amendment stage when PS has the proposal power in the initial stage is denoted by $\tau^{PS}|N^{IS} = PS$. Those leaving PW and PE indifferent when PS has the proposal power are denoted by $\tau^{PW}|N^{IS} = PS$ and $\tau^{PE}|N^{IS} = PS$ respectively. Since $U^{Pi}(\tau), i \in \{S, W, E\}$ is a linear function of $\tau \in [\tilde{\tau}, \hat{\tau}]$ and there are no discontinuities, the three values coincide: $\tau^{PS}|N^{IS} = PS = \tau^{PW}|N^{IS} = PS = \tau^{PE}|N^{IS} = PS = \tau|N^{IS} = PS \in (\tilde{\tau}, \hat{\tau})$.

The range of τ for which $U^{PS}(\tau) \geq \mathbb{E}U^{PS}(\tau)$ is: $\tau = [\tau^{PS}|N^{IS} = PS, \tau^{sq}]$. This is because $U^{PS}(\tau)$ is strictly increasing in $\tau \in [0, \hat{\tau}] \cup (\hat{\tau}, \tau^{sq}]$ and discontinuously increasing at $\tau = \hat{\tau}$. PS 's utility is maximized at τ^{sq} .

PS is seeking a coalition partner from the other two parties in the legislature and will select the one that is cheaper to buy:

The range of τ for which $U^{PW}(\tau) \geq \mathbb{E}U^{PW}(\tau)$ is: $\tau = [\tau|N^{IS} = PS, \hat{\tau}]$. This is because $U^{PE}(\tau)$ is strictly increasing in $\tau \in [0, \hat{\tau}] \cup (\hat{\tau}, \tau^{sq}]$ but is discontinuously decreasing at $\tau = \hat{\tau}$. Also, recall $\tilde{\tau}$ is such that $U^{PW}(\tilde{\tau}) = U^{PW}(\tau^{sq})$. If PS were to pick PW as its coalition partner, it can propose any $\tau \in [\tau|N^{IS} = PS, \hat{\tau}]$, the values of τ for which both PS 's and PW 's participation constraints are being satisfied. Having the proposal power, PE would pick $\tau = \hat{\tau}$, the value in the interval at which $U^{PE}(\tau)$ is being maximized.

The range of τ for which $U^{PE}(\tau) \geq \mathbb{E}U^{PE}(\tau)$ is: $\tau = [0, \tau|N^{IS} = PS]$. This is because $U^{PE}(\tau)$ is strictly decreasing in $\tau \in [0, \hat{\tau}] \cup (\hat{\tau}, \tau^{sq}]$ and discontinuously decreasing at $\tau = \hat{\tau}$. If PS were to pick PW as its coalition partner, it can propose any $\tau = \tau|N^{IS} = PS$, the values of τ for which both PE 's and PW 's participation constraints are being satisfied. Having the proposal power, PE would pick $\tau = \tau|N^{IS} = PS$, the value in the interval at which $U^{PE}(\tau)$ is being maximized.

Finally, PS evaluates the payoffs from choosing either PS or PW as its coalition partner. Since $U^{PE}(\hat{\tau}) > U^{PE}(\tau|N^{IS} = PS)$, PE proposes $\tau = \hat{\tau}$ and selects PW as its coalition partner.

Proposed policy: $\tau = \hat{\tau}$; passed. MWC: $\{PS, PW\}$

Suppose PW has the proposal power.

Consider the set of participation constraints faced by each of the political parties in the initial stage when PS has the proposal power:

$$U^{Pi}(\tau) \geq \frac{a^S}{a^S + a^E} U^{Pi}(\tau^{seq}|N^{AS} = PS) + \frac{a^E}{a^S + a^E} U^{Pi}(\tau^{seq}|N^{AS} = PE), i = \{S, W, E\} \quad (73)$$

where $\tau^{seq}|N^{AS} = PS$ and $\tau^{seq}|N^{AS} = PE$ are the subgame equilibrium theft rates corresponding to the branches of the tree of the amendment stage (AS) where PS and PE respectively have the proposal power.

$$U^{PW}(\tau^{PW}|N^{IS} = PW) = \frac{a^S}{a^S + a^E} U^{PW}(\tau^{seq}|N^{AS} = PS) + \frac{a^E}{a^S + a^E} U^{PW}(\tau^{seq}|N^{AS} = PE), \quad (74)$$

$$U^{PW}(\tau^{PW}|N^{IS} = PW) = \frac{a^S}{a^S + a^E} U^{PW}(\tau^{sq}) + \frac{a^E}{a^S + a^E} U^{PW}(\tilde{\tau}), \quad (75)$$

The theft rate leaving PW indifferent to the expected utility from moving the game to the amendment stage when PW has the proposal power in the initial stage is denoted by $\tau^{PW}|N^{IS} = PW$. Those leaving PS and PE indifferent when PW has the proposal power are denoted by $\tau^{PS}|N^{IS} = PW$ and $\tau^{PE}|N^{IS} = PW$ respectively.

I establish $\tau^{PW}|N^{IS} = PW < \min\{\tau^{PS}|N^{IS} = PW, \tau^{PE}|N^{IS} = PW\}$. Recall $U^{PW}(\tilde{\tau}) = U^{PW}(\tau^{sq})$. This implies $U^{PW}(\tau) \geq \mathbb{E}U^{PW}(\tau)$ when $\tau \in [\tilde{\tau}, \hat{\tau}]$. On the other hand, $\tau^{PE}|N^{IS} = PW \in (\tilde{\tau}, \tau^{sq})$ since $U^{PE}(\tau)$ is strictly decreasing in $\tau \in [0, \hat{\tau}] \cup (\hat{\tau}, \tau^{sq}]$ and discontinuously decreasing at $\tau = \hat{\tau}$. Similarly, $\tau^{PS}|N^{IS} = PW \in (\tilde{\tau}, \hat{\tau})$ $U^{PS}(\tau)$ is strictly increasing in $\tau \in [0, \hat{\tau}] \cup (\hat{\tau}, \tau^{sq}]$ and discontinuously increasing at $\tau = \hat{\tau}$.

The range of τ for which $U^{PW}(\tau) \geq \mathbb{E}U^{PW}(\tau)$ is: $\tau = [\tau^{PW}|N^{IS} = PW, \hat{\tau}]$, where $\tau^{PW}|N^{IS} = PW \in (\tilde{\tau}, \hat{\tau})$. This is because $U^{PE}(\tau)$ is strictly increasing in $\tau \in [0, \hat{\tau}] \cup (\hat{\tau}, \tau^{sq}]$ but is discontinuously decreasing at $\tau = \hat{\tau}$. Also, recall $\tilde{\tau}$ is such that $U^{PW}(\tilde{\tau}) = U^{PW}(\tau^{sq})$. PW 's utility is maximized at $\tau = \hat{\tau}$.

Next, PW seeks a coalition partner from the other two parties in the legislature and selects the one that is cheaper to buy:

The range of τ for which $U^{PS}(\tau) \geq \mathbb{E}U^{PS}(\tau)$ is: $\tau = [\tau^{PS}|N^{IS} = PW, \tau^{sq}]$. There are two possibilities in what interval $\tau^{PS}|N^{IS} = PW$ may lie due to the discontinuous increase in $U^{PS}(\tau)$ at $\tau = \hat{\tau}$:

1. $\tau^{PS}|N^{IS} = PW \in (\tilde{\tau}, \hat{\tau})$. If PS were to pick PW as its coalition partner, it can propose any $\tau \in [\tau^{PS}|N^{IS} = PS, \hat{\tau}]$, the values of τ for which both PE 's and PW 's participation constraints are being satisfied. Having the proposal power, PE would pick $\tau = \hat{\tau}$, the value for which $U^{PE}(\tau)$ is being maximized such that the two constraints are simultaneously satisfied.

2. $\tau^{PS}|N^{IS} = PW \in (\hat{\tau}, \tau^{sq})$. In this case, there is no value of τ for which both PS 's and PE 's participation constraints are simultaneously being satisfied and thus a coalition between the two political parties is impossible.

The range of τ for which $U^{PE}(\tau) \geq \mathbb{E}U^{PE}(\tau)$ is: $\tau = [0, \tau^{PE}|N^{IS} = PW]$. There are two possibilities in what interval $\tau^{PE}|N^{IS} = PW$ may lie due to the discontinuous decrease in $U^{PE}(\tau)$ at $\tau = \hat{\tau}$:

1. $\tau^{PE}|N^{IS} = PW \in (\tilde{\tau}, \hat{\tau}]$. If PW were to pick PE as its coalition partner, it can propose any $\tau \in [\tilde{\tau}, \tau^{PE}|N^{IS} = PW]$, the values of τ for which both PE 's and PW 's participation constraints are being satisfied. Having the proposal power, PW would pick $\tau = \tau^{PE}|N^{IS} = PW$, the value for which $U^{PE}(\tau)$ is being maximized such that the two constraints are simultaneously satisfied.
2. $\tau^{PE}|N^{IS} = PE \in (\hat{\tau}, \tau^{sq})$. If PW were to pick PE as its coalition partner, it can propose any $\tau \in [\tilde{\tau}, \hat{\tau}]$, the values of τ for which both PE 's and PW 's participation constraints are being satisfied. Having the proposal power, PW would pick $\tau = \hat{\tau}$, the value for which $U^{PE}(\tau)$ is being maximized such that the two constraints are simultaneously satisfied.

Finally, PW evaluates the payoffs from choosing either PS or PW as its coalition partner. There are four possible cases arising:

1. $\tau^{PS}|N^{IS} = PW \in (\tilde{\tau}, \hat{\tau}]$ and $\tau^{PE}|N^{IS} = PW \in (\tilde{\tau}, \hat{\tau}]$. PW proposes $\hat{\tau}$, its most preferred theft rate value, and chooses PS as its coalition partner by satisfying its participation constraint.
2. $\tau^{PS}|N^{IS} = PW \in (\tilde{\tau}, \hat{\tau}]$ and $\tau^{PE}|N^{IS} = PE \in (\hat{\tau}, \tau^{sq})$. PW proposes $\hat{\tau}$, its most preferred theft rate value, and chooses both PS and PE as its coalition partners by simultaneously satisfying their respective participation constraints.
3. $\tau^{PS}|N^{IS} = PW \in (\hat{\tau}, \tau^{sq})$ and $\tau^{PE}|N^{IS} = PE \in (\hat{\tau}, \tau^{sq})$. PW proposes $\hat{\tau}$, its most preferred theft rate value, and chooses PE as its coalition partner by satisfying its participation constraint.
4. $\tau^{PS}|N^{IS} = PW \in (\hat{\tau}, \tau^{sq})$ and $\tau^{PE}|N^{IS} = PW \in (\tilde{\tau}, \hat{\tau}]$. PW proposes $\tau = \tau^{PE}|N^{IS} = PW$, its utility-maximizing theft rate value such that simultaneously satisfies its own participation constraint and that of its coalition partner PE .

Proposed policy: 1., 2., and 3. $\tau = \hat{\tau}$; passed. 4. $\tau = \tau^{PE}|N^{IS} = PW \in (\tilde{\tau}, \hat{\tau}]$; passed. MWC: 1. $\{PW, PS\}$, 2. $\{PW, PS, PE\}$, 3. and 4. $\{PW, PE\}$

Suppose PE has the proposal power.

Consider the set of participation constraints faced by each of the political parties in the initial stage when PW has the proposal power:

$$U^{Pi}(\tau) \geq \frac{a^S}{a^S + a^W} U^{Pi}(\tau^{seq}|N^{AS} = PS) + \frac{a^W}{a^S + a^W} U^{Pi}(\tau^{seq}|N^{AS} = PW), i = \{S, W, E\} \quad (76)$$

where $\tau^{seq}|N^{AS} = PS$ and $\tau^{seq}|N^{AS} = PW$ are the subgame equilibrium theft rates corresponding to the branches of the tree of the amendment stage (AS) where PS and PW respectively have the proposal power.

$$U^{PE}(\tau^{PE}|N^{IS} = PW) = \frac{a^S}{a^S + a^W} U^{PE}(\tau^{sq}|N^{AS} = PS) + \frac{a^W}{a^S + a^W} U^{PE}(\tau^E|N^{AS} = PW), \quad (77)$$

The theft rate leaving PW indifferent to the expected utility from moving the game to the amendment stage when PE has the proposal power in the initial stage is denoted by $\tau^{PE}|N^{IS} = PE$. Those leaving PS and PE indifferent when PW has the proposal power are denoted by $\tau^{PS}|N^{IS} = PE$ and $\tau^{PW}|N^{IS} = PE$ respectively.

Next, I establish $\tau^{PW}|N^{IS} = PE < \min\{\tau^{PS}|N^{IS} = PE, \tau^{PE}|N^{IS} = PE\}$. Recall $U^{PW}(\tilde{\tau}|N^{AS} = PE) = U^{PW}(\tau^{sq}|N^{AS} = PS)$. This implies $\tau^{PW}|N^{IS} = PE \in (\tilde{\tau}, \hat{\tau})$ for the following reason: $U^{PW}(\tau)$ is a linear function in $\tau \in [\tilde{\tau}, \hat{\tau}]$ and also $U^{PW}(\tau^{PW}|N^{IS} = PE) = \frac{a^S}{a^S + a^W} U^{PE}(\tilde{\tau}) + \frac{a^W}{a^S + a^W} U^{PE}(\hat{\tau})$.

If U^{PS} and U^{PE} were also evaluated in the interval $\tau \in [\tilde{\tau}, \hat{\tau}]$, $\tau^{PW}|N^{IS} = PE = \tau^{PS}|N^{IS} = PE = \tau^{PE}|N^{IS} = PE$. However, the interval is extended further to the right $\tau \in [\tilde{\tau}, \tau^{sq}]$, in which PS (PE) is strictly decreasing (increasing) in τ with a discontinuous decrease (increase) at $\tau = \hat{\tau}$. This implies $\tau^{PW}|N^{IS} = PE < \min\{\tau^{PS}|N^{IS} = PE, \tau^{PE}|N^{IS} = PE\}$.

The range of τ for which $U^{PE}(\tau) \geq \mathbb{E}U^{PE}(\tau)$ is: $\tau = [0, \tau^{PE}|N^{IS} = PE]$. This is because $U^{PE}(\tau)$ is strictly increasing in $\tau \in [0, \hat{\tau}] \cup (\hat{\tau}, \tau^{sq}]$ but is discontinuously decreasing at $\tau = \hat{\tau}$. Also, recall $\tilde{\tau}$ is such that $U^{PW}(\tilde{\tau}) = U^{PW}(\tau^{sq})$.

Next, PE seeks a coalition partner from the other two parties in the legislature and selects the one that is cheaper to buy:

The range of τ for which $U^{PS}(\tau) \geq \mathbb{E}U^{PS}(\tau)$ is: $\tau = [\tau^{PS}|N^{IS} = PE, \tau^{sq}]$. There are two possible case that may arise:

1. $\tau^{PE}|N^{IS} = PE \geq \tau^{PS}|N^{IS} = PE$.

If PW were to pick PE as its coalition partner, it can propose any $\tau \in [\tau^{PE}|N^{IS} = PE, \tau^{PS}|N^{IS} = PE]$, the values of τ for which both PE 's and PW 's participation constraints are being satisfied. Having the proposal power, PW would pick $\tau = \tau^{PE}|N^{IS} = PE$, the value for which $U^{PE}(\tau)$ is being maximized such that the two constraints are simultaneously satisfied.

$$2. \tau^{PE}|N^{IS} = PE < \tau^{PS}|N^{IS} = PE.$$

There is no value of τ for which both constraints are simultaneously satisfied. Hence, PE cannot choose PS as its coalition partner.

The range of τ for which $U^{PW}(\tau) \geq \mathbb{E}U^{PW}(\tau)$ is: $\tau = [\tau^{PW}|N^{IS} = PE, \tau^E]$. If PE were to pick PW as its coalition partner, it can propose any $\tau \in [\tau^{PW}|N^{IS} = PE, \tau^{PE}|N^{IS} = PE]$, the values of τ for which both PE 's and PW 's participation constraints are being simultaneously satisfied. Having the proposal power, PW would pick $\tau = \tau^{PE}|N^{IS} = PE$, the value for which $U^{PE}(\tau)$ is being maximized such that the two constraints are simultaneously satisfied.

Finally, PE evaluates the payoffs from having PS and PW as its potential coalition partners. $U^{PE}(\tau^{PW}|N^{IS} = PE) > U^{PE}(\tau^{PS}|N^{IS} = PE)$ since $\tau^{PW}|N^{IS} = PE < \tau^{PE}|N^{IS} = PE$ and $\frac{dU^{PE}}{d\tau} < 0$. Therefore, PE proposes $\tau = \tau^{PW}|N^{IS} = PE$ and chooses PW as its coalition partner by satisfying its participation constraint.

Note the positioning of $\tau^{PS}|N^{IS} = PE$ and $\tau^{PE}|N^{IS} = PE$ with respect to $\hat{\tau}$ in this case is of little relevance to the analysis.

Proposed policy: $\tau = \tau^{PW}|N^{IS} = PE \in (\tilde{\tau}, \hat{\tau}]$; passed. MWC: $\{PE, PW\}$.





