

**Myopic Banditry and Foreign Settlement on the Gold Coast:
The Emergence of Bad Institutions in Ghana (1843-1901)¹**

By

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One of the lamentable principles of human productivity is that it is easier to destroy than to create. A house that takes several man-years to build can be destroyed in an hour by any young delinquent who has the price of a box of matches. Poisoning dogs is cheaper than raising them. And a country can destroy more with twenty billion dollars of nuclear armament than it can create with twenty billion dollars of foreign investment. The harm that people can do, or that nations can do, is impressive. And it is often used to impress.

The power to hurt – to destroy things that somebody treasures, to inflict pain and grief – is a kind of bargaining power, not easy to use but used often. In the underworld it is the basis for blackmail, extortion, and kidnapping, in the commercial world for boycotts, strikes, and lockouts. It has its nonviolent forms like the sit-ins that cause nuisance or loss of income, and its subtle forms like the self-inflicted violence that sheds guilt or shame on others. Even the law itself can be exploited: since the days of early Athens, people have threatened to extort money, owed them or not. It is often the basis for discipline, civilian and military; and gods use it to extract obedience.

— Schelling (1966, p. v)

1. Introduction

The central role of “good” social institutions – or of the good “rules of the game in a society” (North 1990, p. 3) – is to reduce uncertainty and to align incentives (e.g., Schotter 1981; Platteau 2000; Page 2008). An inefficient or “bad” social institution does the opposite: it creates incentives for the predatory appropriation of output rather than for the enhancement of welfare (e.g., Acemoglu *et al.* 2001), and thus prevents agents from fully realizing gains from trade, resulting in net deadweight losses (e.g., Leeson 2005, p. 76). A bad institution, then, increases uncertainty rather than reduces it. As a result, Acemoglu *et al.* (2001, p. 1371) observe that the increased uncertainty generated by bad institutions is a direct result of the “risk of expropriation” following the failure of the state to protect property.²

The work of North (e.g., 1981, 1990) has inspired a vast literature explaining the link between poor growth, instability and conflict, and bad institutions in Africa and elsewhere (*inter alia*, Bates *et al.* 2002; Fafchamps 2004; Eggertsson 2005; Leeson 2005; Nunn 2005). More specifically, North (1990, p. 9) points out that, in comparison to more developed economies, the institutional frameworks persisting in contemporary less-developed economies generate more redistribution, predation, and a general lack of protection of property rights, rather than foster greater production, equality and enforcement of property rights. But except for Acemoglu *et al.* (2001), Leeson (2005, 2007, 2008) and Acemoglu and Robinson (2006), the majority of the literature regarding institutions in Africa has focused on the causal relationship between bad institutions and development trajectories on the continent. Little attention has been given to why bad institutions *emerge* in general, and in Africa or in parts of it in particular.

This paper considers the emergence of bad institutions (especially political ones) in the Gold Coast (contemporary Ghana) over the period of colonial rule in the region and following independence (1843-1966). This is a relevant objective to pursue for markets “do not necessarily spontaneously emerge in response to opportunities for profitable exchange. For exchange to transpire, institutions that protect property rights and provide contract enforcement must be in place. By

² For the purposes of this paper, government and state can be considered as synonymous.

determining what products can be exchanged, these institutions determine the scope and scale of the market” (Greif 2006, p. 56).³

The pages that follow accordingly try to offer an explanation about why soon after colonization (1843) from the British Empire the Gold Coast moved from a period of large empires characterized by political and social stability, developed bureaucracies and free economic expansion to a period (lasting beyond its 1957 independence) plagued by social strife and political turmoil, extractive governments and economic contraction. By interpreting institutional change as endogenous (e.g., Alston *et al.* 1996; Greif 2006; Aoki 2007) and by using some of the formalism of elementary game theory, the paper suggests that in the case of the Gold Coast myopic colonization objectives led to an exogenous institutional shock that systematically telescoped local agents’ time horizons and increased uncertainty. In different terms, during the period under consideration the rules of the game of the Gold Coast became insufficiently rational to rationally guide and bind future behaviour.

The logic of the suggested argument is simple. Parties involved in transactions can increase their welfare, as well as possibly that of others, by not only making the rules of the game explicit but also by credibly following them: there are gains from trade *ex post* if one’s choice set is *ex ante* constrained.⁴ The reduction of the choice set is in effect a means to promote specialization and to obtain predictability as allowing for too much flexibility in action can be tantamount to limiting the ability of others to plan their own purposive action (Brennan and Buchanan, 2000[1985]).⁵

³ Among others, Greif (2006) acknowledges the importance of both formal institutions, such as rules and laws, and informal institutions, such as social norms and practices, and how the evolution of both sets of these institutions often moves in parallel. When considering institutions then, it is important to note the importance that both types have on the economy. As such, the paper does not imply that the institutional embeddedness of market transactions derives only from formal institutions.

⁴ As North and Weingast (1989) also note, most of contemporary economics of organization theory concerns this issue (*inter alia*, Williamson, e.g., 2005), but the insights of this theory still have to fully enter the political economy discourse.

⁵ How the choice set is reduced, i.e., whether voluntarily or not, is intentionally vague here. In line with North (1981, p. 21), the role of the state as protector emerges from its “comparative advantage in violence.” Conceptually, such view innately contains the social contract or spontaneous convergence of wills about the fundamental rules of a society’s game as in, say, Rawls (1971) as well as the predatory approach of Marx and his followers (e.g., Hymer 1971) because the relative advantage in violence can, in any point in time, dominate the possible convergence of wills. For the similarities and differences between North and Marx, see Wisman *et al.* (1988). At the same time, and again in line with North (1981, p. 64), we cannot generally say how the state actually originated (*viz.*, from contract or from predation) – as clarified in a moment, the point of departure is then necessarily conjectural. And yet, it is additionally important to note that within the broader pre-colonial African landscape there was also “peaceful exchange” that occurred through an implicit convergence of wills stemming from costly signalling mechanisms (e.g., Leeson 2005, p. 82).

The mechanics of the suggested argument are informed by a conjectural history interpretation of government formation. The analytical centre of attention about the rules of the game over the *longue durée* has been traditionally directed towards European settings. There are several theories about how European governments formed and what this entailed for European institutional development. Of particular interest among these theories is that of Olson (e.g., 1993, 2000). Using the notion of comparative advantage in military power, Olson helps explain the emergence of European autocracy, and the evolution to democracy. The heart of Olson's theory about European government – and hence institution – formation can be schematized as in Figure 1.

Figure 1: A Schema of Olson's Bandit Theory



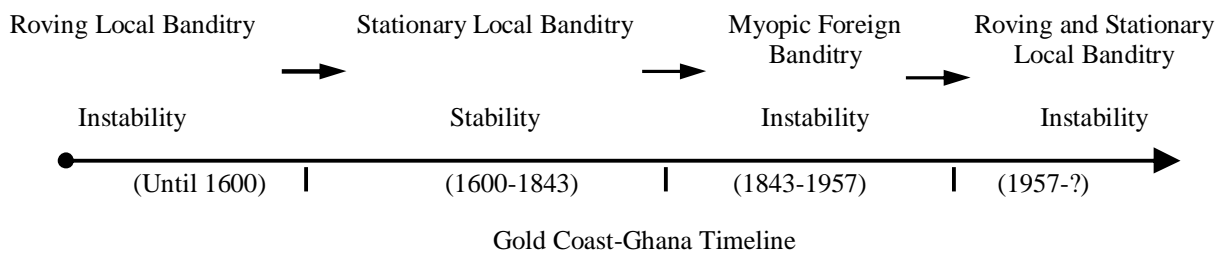
As Figure 1 illustrates, there are basically three stages to government/institution formation (roving banditry, stationary banditry and stability); moreover, there are three types of actors, namely, citizens, roving bandits, and stationary bandits. Roving banditry is characteristic of anarchy, where production is at a low level and agents face two technologies: one of production and one of appropriation (Hirshleifer 1995). Roving banditry decreases total welfare in anarchy because of sporadic attacks on citizens' output. Yet, as the technology stock increases, so does the return to raiding. The latter in turn increases the incentive for a bandit with a comparative advantage in military power and a long time horizon to become stationary and to offer a set of individuals (the citizens) protection from other bandits in exchange for a portion of their revenue. In Olson's theory, the stationary bandit thus is necessary for the materialization of stability. Bates *et al.* (2002, p. 612) moreover qualify that the stationary bandit can be viewed at root as a state since citizens pay it a tax in exchange for the provision of public goods.⁶

Olson's bandit theory has not been applied to African scenarios, but there is no specific reason why it cannot be. In recent history, matters of banditry in the case of Africa are characterized by an additional actor – a colonial power with a military advantage. Such colonial power can either have a long time horizon, such as the one

⁶ Compare also, *inter alia*, Tullock (e.g. 2005, *passim*).

that settled in North America, or a short time horizon, such as the one under consideration in this paper.⁷ A colonial influence without long term settlement objectives can create instability by imposing or generating bad institutions, namely, a myopic foreign bandit can be a source of social rules of the game that contract rather than expand commerce.⁸

Figure 2: A Schema of the Modified Bandit Theory



The paper hence adheres to the Olsonian bandit theory, but modifies its key ingredients as in Figure 2: there are four stages (instability, stability, instability, and instability) and four types of actors (roving local bandits, stationary local bandits, myopic foreign bandit and citizens). To characterize the delicate political-economic equilibria tied to different types of strategic interactions emanating from the dynamics of the modified Olsonian analytical metaphor, the analysis of the paper is complemented by an elementary variant of the game theoretic model by Bates *et al.* (2002). There are three main differences between the Bates *et al.* model and the one presented here. First, the proposed model endogenizes the military endowment of the bandits; second, it includes the cost of defending as well as the cost of attacking; and the third is that the Folk Theorem is shown to hold for the case of anarchy, implying that the optimal welfare in anarchy can hold.⁹

⁷ Take note also that the same colonial power can have a short time horizon in the case of one colony, and a long one in the case of another colony. For instance, this is the case of England in Africa vis-à-vis North America or Australia. Additionally, there can be more than one colonial power simultaneously competing for the same territory. For instance, this is the case of Portugal and Spain in South America and of England, Germany, Holland and Portugal in Southern Africa.

⁸ The paper does not consider the total effects that an empire may have, such as a *pax* and common standards of measurement and communication. For such a discussion, see for instance the recent Ferguson (2004). Similarly, the paper does not have the ambition to explain the development trajectory of contemporary Ghana or of the African continent as a whole. Further, the paper is not concerned with democratization. Again, the focus is merely on the emergence of bad institutions over a well-defined region in light of an external influence with a low discount factor and a comparative advantage in coercion. Still, the general outlook is that the emergence of bad institutions in one area of an empire does not necessarily imply that the overall net effects of that same empire are negative.

⁹ Compare Bush and Mayer (1974) and Hirshleifer (1995).

The proposed argument proceeds in three steps. Olson's banditry approach is modelled from anarchy (Section 3) to the formation of the state (Section 4). The paper models these first two stages of the timeline of Figure 2 merely to show the connection between the modified Olsonian theory and the original one. In fact, as mentioned, the main interest is on the period 1843-1966; 1966 being the year that Ghana's first President, Kwame Nkrumah, was overthrown by a military coup d'état.¹⁰ In Section 5 – the main contribution of the paper – the proposed model is adapted to reveal the exogenous impact of a foreign bandit. Each step of the proposed argument presents evidence from the Gold Coast. Before proceeding to our argument, however, we need to spend a few more words on the bandit theory (Section 2).

¹⁰ Take note that the 1966 coup is just one of many that followed after Ghana's independence. The paper only considers this coup because the others are believed to follow from the same proposed explanatory logic.

2. The Criminal Metaphor

At least since Adam Smith (1981[1776], I.xi.p.10, pp. 266-7; 1987[1977], pp. 217-8; 286-7), we know that institutions are often developed by special interest groups. As such, they are not always generally efficient for their society as a whole. The most extractive institutions are the most inefficient for the greater population, but the most efficient for the individuals who hold the greatest bargaining power (Olson 1965, 1982). Therefore, understanding why there is not a fair distribution of bargaining power within an economy can help explain the origin of bad institutions.¹¹

As Olson clarifies in several works, the formal institutions that coalesce in a given economy will depend on two fundamental attributes of the bandit with a comparative advantage in violence: the bandit's extent of encompassing interest and its time horizon. The

Mafia family that monopolizes crime in a community has, because of this monopoly, a moderately encompassing interest or stake in the income of that community, so it takes the interest of the community into account in using its coercive power. Whereas the individual criminal in a populous society bears only a minuscule share of the social loss from his crime, the gang with a secure monopoly on crime in a neighbourhood obtains a significant fraction of the total income of the community from its protection tax theft. Because of the encompassing interest in the income of society that this monopoly gives, it bears a significant fraction of social losses, including those from its own protection theft. Therefore, though the individual criminal normally takes all of the money in the wallet he steals, the secure and rational Mafia leader never sets a protection tax rate near 100 percent: this would reduce the neighbourhood's income so much that the Mafia family itself would be a net loser (Olson 2000, p. 6).

¹¹ Acemoglu and Robinson (2006, pp. 119-122) point out that the political elite and citizens have differing preferences over specific institutions. As a consequence, conflict between the two groups is inevitable. For example, a small group that may have *de facto* political power within a society could impose its preferred institutions, namely, those that maximize its own wealth and power over a given time period. In short, like others before them, Acemoglu and Robinson too suggest that those agents with the most bargaining power will be able to influence the functioning of an institution towards their own special interest.

The longer the bandit's time horizon, the greater is its encompassing interest over the society over which it presides. That is to say that a long time horizon increases the likelihood that the bandit will secure its position of power and extract revenues from citizens in exchange for protection from other bandits and for the provision of other public capital, such as infrastructure, order and law. If the bandit has little encompassing interest in a society, then it will extract as much as possible within its expected time horizon. Such a bandit will typically be short-term rational, or myopic, and have little incentive to provide public goods that increase the future production of the society.

These are the central arguments that Olson adduces to explain the formation of governments in Europe. These arguments are crucial for this paper's approach: although Olson's theory is ultimately a metaphor that lacks any applications beyond Europe, it does provide a useful framework on which the exogenous influence of a colonizer in a society can be modelled.

3. Anarchy in a World of Equals

In examining the birth of exchange transactions amongst agents for the case of a small homogenous society, one can consider the two person case (Buchanan 2000[1975], p. 31). Bates *et al.* assume that each individual in a society allocates his time so that

$$w_i + m_i + l_i = T, \quad i = \{1, 2\}. \quad (1)$$

Each individual therefore allocates time to working, w_i , investing in military preparedness, m_i , and leisure, l_i . The assumption of homogeneity (or a world of equals) implies identical production and utility functions for each individual. Hours spent working produce output given by the production function,

$$F = F(w_i), F'(w_i) > 0, F''(w_i) < 0. \quad (2)$$

For simplicity, the capital stock is assumed to be fixed and labor is the only input to production, an assumption that is relaxed in later sections.

Investing in military preparedness allows individuals to raid one another and protect themselves from raids. Raiding requires a fixed cost of k units of output. The share of another individual's output that one acquires from raiding depends on the relative military strength of the agents under consideration. This is captured by the military share function,

$$M(m_i, m_{-i}), \quad (3.1)$$

where $M(m_i, m_{-i})$ represents the share of individual $-i$'s output that individual i gains from raiding, given that both individuals invest in military. The greater the relative military strength of individual i with respect to individual $-i$, the greater the share of individual $-i$'s output that i can obtain from raiding. Furthermore, if $m_{-i} = 0$ and $m_i > 0$, then $M(m_i, m_{-i}) = 1$, since individual $-i$ has no way to protect himself from raids. The above assumptions can be summarized by the following relationships:

$$0 \leq M(m_i, m_{-i}) \leq 1 \quad (3.2)$$

$$\frac{\partial M(m_i, m_{-i})}{\partial m_i} > 0 \quad (3.3)$$

$$\frac{\partial M(m_i, m_{-i})}{\partial m_{-i}} < 0 \quad (3.4)$$

Given the above, the pattern of play is as follows. In the first stage of a single-shot game, each individual simultaneously chooses $w_i, m_i, l_i \geq 0$ subject to (1). In the next stage, Player 1 decides whether or not to raid Player 2. In the final stage, Player 2 observes the raiding decision of Player 1, and then decides whether or not to raid Player 1. Each individual's payoff function is known by the other and is common knowledge. This constitutes an extensive form game of complete but imperfect information¹².

Letting $r_i \in \{0,1\}$ be a variable indicating whether individual i raids ($r_i = 1$) or not ($r_i = 0$), and noting that Player 1 moves first, the payoffs from working and investing in military for Player 1 and Player 2 are:

$$I_1 = F(w_1) + r_1(F(w_2)M(m_1, m_2) - k) - r_2[F(w_1) + r_1(F(w_2)M(m_1, m_2) - k)]M(m_2, m_1)$$

$$I_2 = F(w_2) - r_1(F(w_2)M(m_1, m_2)) + r_2([F(w_1) + r_1(F(w_2)M(m_1, m_2) - k)]M(m_2, m_1) - k)$$

Total payoffs, taking leisure into account, are given by the common utility function $U(I_i, l_i)$, where:

$$\frac{\partial U(\bullet)}{\partial I_i}, \frac{\partial U(\bullet)}{\partial l_i} > 0$$

¹² Information regarding each individual's allocation of time towards working, leisure and military is imperfect, as these allocations are determined simultaneously.

It is assumed that individuals devote a fixed amount of time to leisure irrespective of their allocation to military preparedness and working. This implies that the less time an individual allocates to military preparedness, the more time is devoted to working. Therefore – excluding instances of raids – time allocated to investing in military is wasteful. It is sufficient to only consider individuals' payoffs from working and raiding, rather than having to contend with unlikely large changes in utility emanating from changes in the amount of leisure consumed.

Given the pattern of play, the game is represented in extensive form in Figure A.1 in the appendix. The sub-game perfect equilibrium (SPE) path is determined by first solving the last two stages of the game by backward induction, followed by finding the Nash equilibrium in the first stage of the game, which is the simultaneous-move stage. The SPE condition eliminates Nash equilibria that may involve non-credible threats, and thus provides a stronger result. By determining the optimal decisions in the last and second-to-last stages, the game can be represented in normal form as in Table 1.

		Player 2	
		$m_2 > 0$	$m_2 = 0$
Player 1	$m_1 > 0$	$r_2 = 1$	$r_2 = 0$
	$m_1 = 0$	$r_1 = 1$	$r_1 = 1$
		$r_2 = 1$	$r_2 = 0$
		$r_1 = 0$	$r_1 = 0$

Table 1: The Anarchy Game

The unique Nash equilibrium for the first stage of the extensive form game therefore requires both players to invest in military. The SPE path is the upper-most branch of Figure 1, where both players raid one another. In a single-shot framework the optimal welfare outcome, where each individual chooses the allocation vector

$\begin{bmatrix} w_i \\ m_i \\ l_i \end{bmatrix} = \begin{bmatrix} w_i^* \\ 0 \\ l_i^* \end{bmatrix}$, does not hold. Bates *et al.* reach this same conclusion, but contend that

the optimal welfare outcome does not hold as an equilibrium in repeated play, a point that need not necessarily be the case as is shown below.

In repeated play, individuals are concerned with the present value of all future payoffs, given some discount factor δ . Each player adopts the following trigger strategy:

Play $m_i = 0 \Rightarrow r_i = 0$ in period t_0 iff for $\forall t \in [0, t_0 - 1]$ $r_{-i} = 0$, otherwise play $m_i = 1 \Rightarrow r_i = 1$ for $\forall t \in [t_0, \infty)$.

This strategy implies that in repeated play, the individuals should cooperate with each other and not raid. In the instance where one individual does however deviate, such an individual will be raided for each future period. The assumption behind the above strategy is that individuals do not have to invest in military for the sole purposes of defending their own output. However, if an individual is raided, it is likely that in subsequent periods this individual will invest in military as he believes he will be raided again in the future. If all players adopt this trigger strategy, allocating time to military investment is only profitable if an individual raids, otherwise it is an inefficient allocation of resources. This is contrary to the belief of Bates *et al.* that contends that individuals allocate a small amount of resources to military preparedness for the sole purpose of deterring raids. As is discussed in detail below, such a feature of stateless societies need not hold in equilibrium.

To show the conditions under which the optimal welfare allocation holds as an equilibrium in repeated play, define the total payoff function for player i in each period from not raiding (and thus the optimal feasible payoff) as $\pi_i^{nr} = U(F(w_i^*), l^*)$. Similarly, the payoff function corresponding to the sub-optimal Nash equilibrium from the single-shot game can be represented by $\pi_i^r = U(I_i^{1,1}, l)$, where $m_i > 0$. If both players play the trigger strategy above, the optimal feasible payoff is reached in each period. To show this, assume that player i does not adopt the trigger strategy but player $-i$ does. i 's best deviation in the first period of play (or any other period

t_0 where $r_i = 0$ for $\forall t \in [0, t_0 - 1]$) is to invest in military and raid $-i$, where this optimal deviation is represented by $\pi_i^d = U(F(w_i) + M(m_i, m_{-i})F(w_{-i}^*) - k, l_i)$. Since $-i$ does not invest in military, $M(m_i, m_{-i}) = 1$. Once i deviates, $-i$ will invest in military in the next period and raid i for $\forall t \in [t_0 + 1, \infty)$. i 's best response after t_0 is to invest in military and raid forever. The present value of i 's future payoffs after deviating in the first period, V_i^d , is:

$$V_i^d = \pi_i^d + \delta\pi_i^r + \delta^2\pi_i^r + \dots = \pi_i^d + \frac{\delta}{1-\delta}\pi_i^r.$$

For i 's strategy above to be sub-optimal, V_i^d must be less than the present value of future payoffs from not deviating (i.e. never raiding), which is:

$$V_i^{nr} = \pi_i^{nr} + \delta\pi_i^{nr} + \delta^2\pi_i^{nr} + \dots = \frac{\pi_i^{nr}}{1-\delta}$$

Thus,

$$V_i^{nr} \geq V_i^d \Rightarrow \delta \geq \frac{\pi_i^d - \pi_i^{nr}}{\pi_i^d - \pi_i^r} \quad (4)$$

This condition is the precise conclusion of Friedman's (1971) Folk theorem for repeated games with grim trigger strategies. Friedman's theorem states that if agents are relatively patient, or δ is close to 1, and information is complete, then there exists a sub-game perfect Nash equilibrium for an infinitely repeated game where the optimal payoff is the outcome in every sub-game. Therefore, according to Friedman, the trigger strategy defined above is a Nash equilibrium if all players have discount factors close to one. Furthermore, by Selten (1965), this Nash equilibrium is sub-game perfect since a Nash equilibrium is played in every sub-game.

Bates *et al.* (2002, p. 609) argue that the optimal welfare outcome is not possible when play is infinitely repeated. Their argument relies on the fact that a positive technology shock or an increase in the capital stock shifts the production

function outward. As the production function shifts outward and the marginal product of labor falls, along with the lower cost of raiding following improved technology, raiding becomes more profitable. To prevent raids individuals will therefore have to decrease output to the point where raiding will not be profitable – *i.e.*, where $F(w_i^*) < k$. Under these circumstances, society becomes ‘lazy’ as more time is allocated to leisure rather than work. Therefore, Bates *et al.* argue that the second best outcome entails individuals investing small amounts in military preparedness to deter attempted raids. This argument is correct insofar as increased profitability from raiding vis-à-vis a lower marginal product of labor is concerned; but this point alone does not imply that raiding becomes more profitable than cooperation. However, citizens will invest in military to protect themselves from external raids; but internal raids are unlikely to occur regardless of production or technology. Since play is repeated infinitely, the adoption of the above trigger strategy by all individuals ensures that no agent within a society raids. This implies that any investment in military preparedness concerning internal raids, regardless of how small, is wasteful. Individuals will also not decrease output to such a low level that raiding becomes unprofitable. This is so because the present value of future payoffs when output is at a low level is likely to be significantly lower than the present value of future payoffs when an individual is raided in the first period (and loses all output in this period) followed by the player raiding in all subsequent periods. Raiding will only be profitable if the output gained from raiding is greater than the fixed cost from raiding. Algebraically,

$$\frac{\delta}{1-\delta} \pi_i^r \geq \frac{\pi_i^{[F(w_i^*) < k], nr}}{1-\delta}$$

Bates *et al* implicitly contend that this expression does not hold. However, only if the discount factor is low will the above not hold. Therefore, in repeated play, when societies are relatively small and homogenous, the first best outcome does hold in equilibrium, and all agents cooperate. To reiterate, however, individuals do not invest in military for the purpose of deterring raids from within their community. Yet as technology improves, the returns from raiding do increase and this would inevitably increase the amount of raids from external bandits.

This conclusion supports Buchanan's (1975[2000], pp. 33-41) argument vis-à-vis the need for some contract that defines the property rights of individuals in small societies. A contract that defines some acceptable assignment of property rights has the ability to "reduce [their] private investment in attack and defense; in the limit, the full value of [output] can be realized without cost" (Buchanan, 2000[1975], p. 33). Buchanan shows that in a simple two person economy, any contract that defines the property rights of individuals will be self-enforcing since if any individual violates the contract "he may rationally anticipate that the other's reaction would force a quick return to the precontract state of nature" (Buchanan, 1975[2000], p. 36).

Therefore, the trigger strategy discussed above is analogous to the views of Buchanan regarding contracts that protect property rights. Buchanan formulates his argument for a small and primitive society while accepting that in larger societies, the first best outcome can not be achieved through mutual bargaining. Punishing defectors privately becomes difficult since information costs increase as the number of citizens in a society increases. So, as a society grows it becomes more difficult to identify, and therefore punish raiders. The anarchy equilibrium just described is present in the Gold Coast in the sixteenth and seventeenth century.

At the beginning of the seventeenth century the fall of empires in Western Sudan led to large migrations southwards into the forest zone of the Gold Coast. These migrations culminated in the formation of new states, such as the Bona and Banda. Prior to European contact, the Akan-a linguistic group consisting of a variety of tribes-lived in small chiefdoms scattered throughout the Gold Coast. The foundation of these societies was the family, where larger groups were governed by chiefs while a family head presided over smaller groups. The relationships that existed between chiefs and families or family heads were "harmonious". Although state boundaries existed, clan membership accommodated the mobility of individuals from one state to another with relative ease. Peaceful relationships therefore existed between different societies. Skirmishes and raids by external predators did occur, but such conflicts were quite often settled through arbitration: large scale wars of aggrandisement were non-existent (Daaku, 1970, pp. 1, 4, 5). The chiefs and family heads in these states were a type of stationary bandit, but their military endowments were small. Community leaders were only essential in resolving disputes within their communities and with other states. These small nations were consequently a type of stateless polity. Stateless societies were common across sub-Saharan Africa before

any European contact was made. The fact that skirmishes and wars were not observed during this period makes it clear that these polities comprised small societies with general cooperation amongst their citizens.

From another perspective, Hymer (1970) comments furthermore on the importance that land and land ownership had in pre-colonial Ghana. Land was distributed equally to ensure that families had full rights to its use. Rents and taxes were not paid by families for use of land so that everything produced belonged to the family cultivating the land. Land ownership was the right of all families in a structure designed to ensure that one group of people would not control the majority of the land. Pre-colonial Ghana thus fits with the above explanation of small stateless societies. It was the rapid expansion of trade at the Gold Coast that ultimately led to the replacement of these small societies with large trading empires (Hymer 1970, pp. 49-59).

4. Bandit Approach: The Traditional Wisdom

4.1 Theory

Buchanan and Tullock (1962) contend that a society's best interest is not reached since public interest is simply an aggregation of private interests, which tend to be skewed towards the most powerful private agents and special interest groups. An autocracy is therefore likely to impose institutions that maximize its utility over a given time horizon. This follows by virtue of the fact that an autocrat necessarily controls all the bargaining power in a society. If an autocrat's interests are aligned with the greater population, i.e., the maximization of future income over an infinite time horizon, then such an autocrat will actively enforce property rights and provide sufficient public goods. If an autocrat's interest is to maximize revenue over a short period of time, then this autocrat will try to extract as much as possible in a short period of time.

The previous section introduced the framework in which the proceeding arguments are modelled and explored. The anarchic equilibrium set up above is stable under a restrictive set of assumptions. Most notably, the assumptions of homogeneity and a small population are the key determinants in the formation of a stable anarchic state. Buchanan, however, observes that as "more parties are added to the initial contractual agreement...the influence of any one person's behaviour on that of others becomes less and less" (Buchanan, 2000[1975], p. 85). This observation is complemented by Olson (1993, p. 568) who writes that there "has been lots of writing about the desirability of social contracts to obtain benefits of law and order, but no one has ever found a large society that obtains law and order through a voluntary social contract". Thus, as a society's population grows, the incentive to continue adhering to a social contract defining the division of output amongst its citizens diminishes. This is so two reasons. Firstly, the larger a population, the smaller the individual's share of the gains from the increase in welfare that result from cooperating to achieve the optimal payoff. Secondly, enforcement costs are a positive function of population size, thus making deviations more profitable as the probability of being punished falls.

Hirshleifer (1995) notes that anarchy breaks down when there are increasing returns to fighting effort and a group in society obtains a comparative advantage in

military strength. Olson's (2000) simple notion of the bandit in a society helps make sense of how larger, more heterogeneous populations operate with some level of law and order.

A bandit faces a single technology of appropriation that is a function of relative military strength, as opposed to the agents described in the previous section that face a technology of production in addition to that of appropriation (Hirshleifer, 1995, pp. 29-33). Roving bandits have a low discount factor, which is why they raid from community to community, appropriating as much as possible in the shortest time possible. The fact that they are non-stationary makes it problematic for the communities affected to enforce any form of punishment upon such bandits. As the threat of an attack increases, societies shift to a state of military armament. This in turn decreases overall output due to the misallocation of resources and the inevitable raids within the community that follow. The existence of a bandit that has a high discount factor can lead to an efficient and stable equilibrium. This is the case of Olson's stationary bandit, where a centralised figure, which can be a dictator, a government or any other form of elite, collects taxes in exchange for protection from non-stationary bandits and citizens wanting to raid within the community. It has been argued that, under a certain set of assumptions, a centralized system of defence (in which one group has a comparative advantage in military strength) allocates resources more efficiently than the decentralized system observed under anarchy (Usher, 1989; Olson, 1993, 2000; Grossman, 2002). These ideas are discussed below by modifying the simple game theoretic model introduced in the previous section.

Representing the stationary bandit as G , citizens can choose to pay a tax (in the form of a portion of their output) to G in return for protection from raids by other citizens within the community or by external roving bandits. The tax rate, τ , is exogenously determined. The prevailing tax rate takes the form:

$$\tau = \tau'' + \varepsilon ,$$

where τ'' is the tax rate that exists in a utopian society, where all tax revenue is redistributed in the form of public goods. If taxes are collected for the sole purpose of providing public goods, then the ideal tax rate is the rate that equates the marginal social benefit of public goods to their marginal social cost (Olson, 1993, p. 571). So

the tax rate must be at that level where the decrease in income resulting from the tax is just offset by the increase in income arising from the provision of public goods. In an autocracy, however, this ideal tax rate does not prevail. Dictators and kings lack the required benevolence to charge the tax that maximizes their citizens' incomes. Such autocrats have a comparative advantage (and a monopoly, as will be seen below) in military power, thus allowing them to extract rents by charging a tax rate above τ^* . The level of this higher tax rate is determined by the autocrat's encompassing interest in a society. If more public goods are provided, incomes increase and future tax revenues for the autocrat will also increase. The greater an autocrat's encompassing interest in a society, the lower ε is. This follows since an autocrat will want to increase citizens' incomes for the sole purpose of increasing the amount of tax revenue collected. Expenditures on public goods will nonetheless be less than the amount of taxes collected, since the autocrat will keep a portion of the tax revenues for its own consumption. This tax rate cannot, however, be too high so that citizens are better off not paying it, nor too low so that G finds it more profitable to prey on its citizens.

In a large, heterogeneous society, citizens have two options:

1. disarm and pay the tax to G in exchange for protection, or
2. invest in military for self protection, and do not pay the tax to G .

The case where a citizen can pay taxes and invest in military is not feasible since investing in military under such circumstances is wasteful, as is shown below. The case where a citizen does not invest in military and does not pay taxes is also not considered since all of a citizen's output is lost to raids and predatory attacks by G in this situation.

The following strategies exist for the citizens and the bandit:

i : Choose $t_i = (0,1)$ at the first stage, $r_i = (0,1)$ in the raiding stage, given t_i, t_{-i}

G : Choose $p_i = (0,1)$ for $\forall i$

The first stage of the game is a simultaneous move game where each citizen decides whether to pay taxes or invest in military preparedness. The second and third stages of the game are sequential move stages, where citizen i observes $-i$'s military investment decision and decision to pay taxes, and then decides whether or not to raid. In the third stage, $-i$ observes t_i , $M(m_i, m_{-i})$ and r_i following which $-i$ decides whether or not to raid. In the final stage, G decides whether or not to prey on all the citizens. In a single-shot game G 's decision to turn predatory does not depend on citizens' choices regarding tax payments. Citizens' decisions to raid in the second and third stages of the game do, however, depend on their decision to pay taxes in the first stage of the game. In the first stage of the game, citizens will simultaneously determine whether to pay taxes and disarm, or not pay taxes and invest in military preparedness. After this stage, the citizens fully disclose their decisions regarding armament and tax payments. Citizens observe each other's choices and accordingly make a decision regarding raiding. Military share functions between all players are directly observable and are common knowledge. Thus, all possible payoff functions are observable by all players. Since each player's utility function is increasing in the amount of output that one has at the end of each sub-game, the payoffs from appropriation and production of output are only considered and the effects that changes in leisure have on utility are ignored to simplify the analysis.

In accordance with Bates *et al.*, the bandit's payoff function is:

$$\pi_G^{p_i, t_i} = \sum_{\forall i} [t_i \tau I_i + p_i M(m_G, m_i) I_i (1 - t_i \tau) - C p_i]$$

Where $M(m_G, m_i)$ is the relative military share function between the bandit and a citizen, i . C is the fixed cost of predation for G and I_i is the output payoff for i , given $M(m_i, m_{-i})$, r_i and r_{-i} . The total payoff function for i is:

$$\pi_i^{p_i, t_i} = I_i (1 - \tau t_i) [1 - M(m_G, m_i) p_i]$$

In a single-shot game, predation strictly dominates non-predation for G . If a citizen pays taxes to the bandit, the bandit will protect that citizen's property rights from raiding citizens, but at the same time prey on that citizen in the final stage of the

game. A bandit will also prey on (but get a lower payoff) citizens who don't pay taxes. Therefore, a citizen's best response is to invest in military armament to protect himself from the predatory bandit, and raid other citizens. The game is identical to the two player case presented earlier, except that the final payoffs are lower for all citizens. The game is represented in extensive form in Figure A.2. The information sets imply that an SPE cannot be established through backward induction. The last two stages of the game can be solved by backward induction and the first simultaneous move stage of the game can be represented in normal form. See Table 2.

		Player 2	
		$m_2 > 0$ ₂	$m_2 = 0$ ₂
Player 1	$m_1 > 0$ ₁	$r_2 = 1$ $r_1 = 1$	$\alpha r_2 = 1 + (1 - \alpha)r_2 = 0$ $r_1 = 0$
	$m_1 = 0$ ₁	$r_2 = 0$ $\alpha r_1 = 1 + (1 - \alpha)r_1 = 0$	$\alpha r_2 = 1 + (1 - \alpha)r_2 = 0$ $\alpha r_1 = 1 + (1 - \alpha)r_1 = 0$

Table 2. The Bandit Game for

The unique Nash equilibrium for the above game requires all citizens to invest in military and raid one another. The bandit will prey on all citizens, but citizens will have a positive final payoff thanks to their ability to protect themselves. The SPE path is the uppermost path in Figure A.2. In the single-shot game, peace does not prevail while citizens raid one another and the bandit is predatory. This equilibrium is informative in explaining the characteristics of a society ruled by an insecure stationary bandit as discussed in some detail in what follows.

In repeated play, a two agent framework, where there is one representative citizen and one bandit, is considered. The following strategy profile is assumed:

i : play $m_i = 0 \Rightarrow t_i = 1, r_i = 0$ at time t_0 iff for $\forall t \in [0, t_0 - 1]$ $p_i = 0$, otherwise play $m_i > 0 \Rightarrow t_i = 0, r_i = 1$ for $\forall t \in [t_0, \infty)$.

G : play $p_i = 0$ at time t_0 iff $t_i = 1$ for $\forall i$ and $t \in [0, t_0 - 1]$, otherwise play $p_i = 1$ for $\forall i$ from $t \in [t_0, \infty)$.

Once again, the above strategy profile can be shown to constitute a sub-game perfect Nash equilibrium. Assume first that G does not adopt the assumed trigger strategy but i does. G 's best deviation in the first period (or any other period t_0 such that $p_i = 0$ for all $t \in [0, t_0 - 1]$) is to prey on i . In so doing, G 's payoff in period t_0 is:

$$\pi_G^{1,1} = \tau F(w_i^*) + F(w_i^*)(1 - \tau) - C$$

Since i adopts the above trigger strategy, at t_0 all citizens set $m_i = 0$ and therefore have no means of protecting themselves. In the next period G 's credibility as a patient bandit is diminished and citizens lose trust in G 's mandate to protect property rights. Therefore, i invests in military and does not pay taxes to G in subsequent periods. It follows that citizens raid one another once they invest in military. G 's best response for periods $t \in [t_0 + 1, \infty)$ is to be predatory, i.e., $p_i = 1$ for $\forall i$. G 's per period payoff after t_0 becomes,

$$\pi_G^{1,0} = M(m_G, m_i)I_i - C$$

Where $I_i < F(w_i^*)$ since the optimal amount of time is not allocated to production, coupled with the fact that citizens lose output by raiding one another. It can be assumed that $M(m_G, m_i)I_i - C < \tau F(w_i^*)$. This follows firstly because the more citizens there are raiding the lower the amount of available output there will be for G to gain through predation, given that citizens incur a cost from raiding. Secondly, citizens produce less output during periods of conflict following the misallocation of resources to military armament. Lastly, the cost incurred by the bandit when preying (C) can be substantial, especially if the population is large.

Given a set of discount factors for each agent, the present value of future payoffs for G is:

$$V_G = \pi_G^{1,1} + \sum_{j=1}^{\infty} \delta_G^j [\pi_G^{1,0}] = \pi_G^{1,1} + \frac{\delta_G}{1-\delta_G} (\pi_G^{1,0})$$

A bandit will not deviate if $V_G^* > V_G$, where $V_G^* = \sum_{j=0}^{\infty} \delta_G^j [\pi_G^{0,1}] = \frac{\pi_G^{0,1}}{1-\delta_G}$ is the present value of future payoffs if G never preys on citizens. This implies that G will not prey on its citizens if:

$$\delta_G > \frac{\pi_G^{1,1} - \pi_G^{0,1}}{\pi_G^{1,1} - \pi_G^{1,0}}$$

So, if δ_G is close to 1, or the bandit is patient, the optimal strategy is to never deviate. In a similar fashion it can be shown that i will never deviate, and therefore always pay taxes, if:

$$\delta_i > \frac{\pi_i^{0,0} - \pi_i^{0,1}}{\pi_i^{0,0} - \pi_i^{1,0}},$$

where $\pi_i^{0,0} = F(w_i) + F(w_{-i})M(m_i, m_G) - k$ ¹³ is i 's payoff from deviating given that the bandit and other citizens (assuming only one other here) adopt their respective trigger strategies. By Friedman (1971) this strategy profile constitutes a sub-game perfect Nash equilibrium.

The stationary bandit's discount factor represents its level of insecurity and determines whether it will be predatory or if it will protect citizens' property rights. An insecure bandit will believe that its position of power is constantly under threat, thus decreasing its expected time horizon. To gain as much output as possible, an insecure bandit will resort to predation while tax revenues fail to increase its per-period payoff.

It is worth noting, however, that if a bandit turns predatory, it is unlikely that it will be able to be predatory indefinitely. Robinson (2006, pp. 505-506) observes that a bandit's payoff is constrained by the payoff of its citizens. A bandit, or elite, must

¹³ Similarly, $\pi_i^{0,1} = F(w_i^*)(1-\tau)$ and $\pi_i^{1,0} = I_i^{1,1}[1 - M(m_G, m_i)]$.

choose a level of income redistribution in the present and future periods that maximizes its utility subject to the minimum reservation utility of the citizens. A bandit must promise a level of future income redistribution to its citizens given the level of redistribution in the present period. The strategy profile assumed for the game is therefore consistent with the model of revolution proposed by Robinson, since a bandit loses credibility and cannot promise higher levels of redistribution in the future period once it has turned predatory.

On the other hand, a secure bandit that isn't predatory can make credible promises regarding future levels of income redistribution. Robinson refers to the minimum reservation utility of the citizens in a society as the revolution constraint. As a bandit preys more and appropriates larger amounts of citizens' incomes, it becomes increasingly difficult to maintain the minimum level of utility required to avoid a revolution. In such circumstances, the bandit can either concede power or use repression to decrease the minimum reservation utility of the citizens.

The notion of the revolution constraint implies that a bandit cannot prey on the citizens forever, since as it does so the probability of a revolution increases. Tullock (2005, pp. 174-220), however, notes that external revolutions, i.e. uprisings by the citizens, are extremely rare. Tullock introduces a private benefit theory of revolutions, where an individual observes the present discounted value of costs and benefits to joining a revolution; where the costs far outweigh the benefits for a member of the population. A citizen's costs incurred in joining a revolution could be death if the revolution is unsuccessful, and the public good a revolution generates, generally a new government, offers the citizen little future benefit. This follows since positions of power would most likely go to those agents who led a revolution and not the ancillary members of the polity that offered their support. Furthermore, the individual benefit from joining a successful revolution decreases as the number of citizens taking part in the revolution increases. Popular uprisings are therefore unrealistic.

The presence of a minority group that has a greater incentive to stage a revolution is required to overthrow an insecure autocrat. Revolutions are more likely to be carried out by internal factions of the elite, or an external rival group, or bandit, that is well organised. Olson (1965) substantiates this argument, observing that large groups, such as the general public, fail to collectively organise in the aim of achieving some common good. Olson argues that smaller groups can readily solve the

collective action problem since the expected gains accruing to individuals in a group increase as the members in the group falls, thus offering greater incentive for such a group to efficiently organise in achieving its common interest. Robinson's concept of the revolution constraint thus depends on the composition of the population in a given society. A revolution will be more likely when a minority group that can challenge the stationary bandit's power exists. As predation continues, such a minority group can harness the resentment of the greater population towards the incumbent autocrat, and in so doing either force the government to concede power or successfully overthrow the government in a revolution. This point becomes critical later in explaining the formation of many small yet inefficient minority groups following the behaviour of a predatory state. A secure bandit, on the other hand, has little or no external threats challenging its position. Such a bandit will therefore expect an infinite time horizon, implying a high discount factor. If a bandit has a high discount factor it becomes essential for this bandit to increase the income of its citizens through the provision of public goods, which in turn increases tax revenues accruing to the bandit. Hereditary positions of power, such as monarchies, ensure that stationary bandits do indeed have infinite time horizons (Olson, 2000).

4.2 Illustration: Bandits in the Gold Coast (1600-1843)

African contact with European traders in the Gold Coast in the sixteenth century initialised the radical political and social changes that followed in the proceeding two centuries. As trade between Europeans and Africans intensified, smaller states became consumed by larger trading empires, and the rise of the merchant class undermined the egalitarian societies that dominated the landscape in the sixteenth and early seventeenth centuries. The increase in production and the accumulation of capital and education increased the returns to banditry, as predicted by Bates *et al.* Hymer (1970, p. 42) observes that the "economic basis of the State was a substitution of taxes for banditry. Without a strong State, long distance trade is continuously in danger of predatory attacks by armed robbers. A military group, able to maintain peace and security in a given area, can ensure the safety of traders and then tax accordingly." Hymer's observation concerning the Gold Coast at the time is that these raiders were typically roving, preying on merchants as they travelled between states. Olson (1993, 2000) characterizes such bandits as long-term irrational, implying that they had low discount factors. There was thus a need for powerful and

long-term rational bandits, with large endowments in military capabilities that could enforce peace and security, which in turn increase the returns to trading. This is exactly what started happening in the region during the seventeenth century. Powerful and stationary bandits emerged and this in turn led to the formation of large trading empires such as the Denkyira, Akwamu and Ashanti.

Tensions mounted between rival trading states, and the introduction of firearms in the second half of the seventeenth century catalyzed inter-state warfare, where weaker states were incorporated into stronger ones. Daaku (1970, p. 5) observes that the “proliferation of firearms made possible the forcible incorporation of weaker states into more powerful ones. The latter half of the seventeenth century, therefore, witnessed the formation of sizeable empires in the hinterland of the coast.” Following the emergence of stationary bandits and large empires was a period of territorial aggrandisement, thus increasing the power and influence of the empires.

The Denkyira and the Ashanti were two empires that reached their height in power and wealth in the seventeenth and eighteenth centuries in the Gold Coast are worth some mention. These two empires emerged following the need for increased trade, but contrasted in the way in which they set about their territorial expansions. These states present contrasting instances of an insecure, short-term rational state on the one hand, and a unified and long-term rational state on the other. The first three rulers of the Denkyira devised a concrete basis for the growth of the state under which it was administratively and militarily separated amongst wing chiefs, who acted as generals in times of war (Daaku, 1970, pp. 159-160). On this foundation, Denkyira was able to extend its territorial dominance northwards in order to monopolise trade through to Bono-Manso and Begho. In this drive, it conquered the Adansi and the Asantemanso, which constituted the nub of the Ashanti nation. In the 1680s, while expanding towards the coast, the gold mines of the Sefwi, Wassa and Aowin came under control of the Denkyira. By 1699, the Denkyira had reached its height in power and wealth. Its control of gold and far reaching trade routes allowed it to invest largely in military. The leaders of Denkyira were characteristic of stationary bandits who had low discount rates. The State’s irrational rush to monopolise and control as much of the region’s trade as possible turned them predatory against the states of Wassa, Sefwi, Aowin, Assin and Ashanti, which were obliged to pay the Denkyira “exorbitant and burdensome tributes” (Daaku, 1970, p. 160) to fund military expansion. Daaku further notes that a “tributary state which prevaricated in the

payment of its tributes was quickly visited with Denkyira armies. In 1700, for instance, apparently needing more money for its war against Asante, Denkyira invaded Twifo with a large army and demanded over £800 from Akafo, the Twifo king” (Dakku, 1970, p. 160). Thus, the leaders of the Denkyira hastily attempted to expand their empire’s territorial influence. The threat of the Ashanti Empire turned the Denkyira leadership predatory against its tributary states, as more importance was placed on swift territorial expansion rather than promoting peace and stability within its tributary states.

The Ashanti adopted similar principles to the Denkyira regarding administration and the military. The Ashanti, however, stressed the importance of national unity. Early rulers put in place the fundamentals for a strong and cohesive state, thus demonstrating their long-term rationality. Osei Tutu, the founder of the Ashanti Empire, understood the importance of territorial expansion but at the same time recognised the need for a unified nation. The Golden Stool symbolized such unity, and aided in the Ashanti defeat of the Denkyira in 1899. The Ashanti, under Osei Tutu and succeeding leaders, flourished as a powerful and respected nation for two and a half centuries, and the unity of the nation was critical in this regard.

5. A Foreign Bandit Model

5.1 Theory

Olson's theoretical conceptualization of the origins of governments assumes a neat and simple structure. The presence of a patient stationary bandit offers a stable form of government, whether it is a monarchy or dictatorship. Conflict becomes transitory when another, more powerful bandit deposes the old one, after which the stable and efficient equilibrium is reached once again. Such a bandit would typically come from another society trying to expand its territorial dominance, or would form as a minority resistance group in a period of banditry predation. A third alternative is that a foreign bandit with a low discount factor but large military endowment can depose all other previous domestic bandits.

This case is distinctly different from the case where one autocracy is replaced by another, either by a coup or revolution. A foreign bandit, as will be discussed below, has little encompassing interests in the society over which it presides. Therefore a foreign bandit has a low discount factor. The superior military endowment of a foreign bandit makes it difficult for old domestic bandits to regain control of a society. It is unlikely then that a domestic bandit will use repression to avoid conceding power to the foreign bandit. The cost of repressing a foreign bandit will be high for a domestic bandit for two reasons. Firstly, the foreign bandit is assumed to be relatively more powerful than the domestic bandit, implying that repression may not be successful. Secondly, Robinson (2006, p. 508) implicitly notes that the relative cost of repression is inversely proportional to the expected payoff a domestic bandit stands to lose when it concedes power to a foreign bandit. Algebraically, the relative cost of repression, K , assumes the following relationship:

$$K \propto \frac{1}{\pi_G^P - \pi_G^{NP}}$$

Where π_G^P is the domestic bandit's payoff whilst in power and π_G^{NP} is its expected payoff after it concedes power to the foreign bandit. Therefore, the cost of repression depends on the foreign bandit's actions, since π_G^{NP} depends on how much a foreign bandit is willing to redistribute to the domestic bandit. A foreign bandit will

encounter much resistance if it did not distribute a share of its revenues to the old elite, which implies that the foreign bandit will most likely form coalitions with the old domestic bandit. The cost of repression for a domestic bandit in such a situation would be high, and the domestic bandit would accept a coalition with the foreign bandit.

Where a domestic bandit is relatively powerful however, it stands to lose a large amount if it concedes power to the foreign bandit and will therefore incur a relatively low cost of repression. Under such circumstances the foreign bandit has a lot to gain and will also use force to realise these gains. These points are discussed below through a modification of the model introduced above.

If a foreign bandit has a significantly greater endowment of military power and human capital than the domestic bandit, it is plausible to assume that the foreign bandit will successfully compete with the domestic bandit for the protection of citizens' property rights. Citizens choose a bandit to pay taxes to in return for the enforcement of their rights to property. Since military capabilities are common knowledge, citizens will pay taxes to the foreign bandit, provided this bandit charges a tax rate identical to that which the domestic bandit originally charged¹⁴. As a result, the domestic bandit incurs a significant loss of tax revenue. The domestic bandit's main strategic objective thus entails minimizing these losses. It is shown below that the way in which the domestic bandit minimizes such losses has a significant impact on the type of equilibrium that follows.

Some modifications to the model discussed previously must be considered. Firstly, it is assumed that with the entry of a foreign bandit comes a positive technology shock. Contact with a foreign bandit invariably brings with it foreign capital and technology, as is explained through historical observations later. Secondly, along with the cost of raiding incurred by the respective agents, it is assumed that a further cost is incurred by an agent who defends itself from raids. This assumption helps make the analysis clearer as it incorporates the full expected loss in output that arises from raiding and predation. Letting H denote the foreign bandit, the preceding discussion implies the following strategy profile:

¹⁴ It is possible for a foreign bandit to charge a higher tax rate than the domestic bandit, which the citizens will agree to pay due to the threat of greater expected losses should the foreign bandit turn predatory. However, for simplicity it can be assumed that the foreign bandit charges the same tax rate as before so that citizens are indifferent vis-à-vis the level of the payable tax rate, and only take the relative military capabilities of the two bandits into account.

i : play $t_i^b = 1$ to bandit b at time t_0 , $M(m_b, m_{-b}) > M(m_{-b}, m_b)$, iff $p_i^b = 0$ for $\forall t \in [0, t_0 - 1]$, otherwise play $t_i^b = 1$. If $p_i^b = 1$ for $b = \{H, G\}$ and any $t \in [0, t_0 - 1]$, then $m_i > 0$ and $t_i^b = 0$ for $\forall b$ and $t \in [t_0, \infty)$.

G : Play $p_i^G = 0$ iff $t_i^G = 1$ for $t = t_0 - 1$, otherwise play $p_i^G = 1$.

H : Play $p_i^F = 0$ iff $t_i^F = 1$ for $t = t_0 - 1$, otherwise play $p_i^F = 1$.

This strategy profile implies a pattern of play where citizens pay taxes to the foreign bandit once they obtain full information regarding this bandit's military capabilities. The moment in which this happens is denoted by time $t = 0$. The grim trigger strategies implied in the previous section are unrealistic for the case where two bandits exist. The above strategy profile accommodates the assumption that a citizen has a choice as to which bandit to pay taxes to. A citizen only stops paying taxes to a bandit if taxes were paid to that bandit in the previous period but the citizen was preyed upon nonetheless. Therefore, citizens have two options when preyed upon by the foreign bandit. The first choice is to pay the domestic bandit for protection against the foreign bandit, and then to invest in military themselves to protect against predatory foreign and domestic bandits.

The loss of tax revenue incurred by the domestic bandit means that the bandit will resort to predation until the citizens pay taxes to it once again. A predatory domestic bandit reduces the final payoffs of the citizens and the foreign bandit. If a domestic bandit turns predatory, citizens' per-period payoffs become $F^K(w_i^*)[1 - M(m_G, m_H)](1 - \tau)$, while those of the foreign bandit become $F^K(w_i^*)[1 - M(m_G, m_H)]\tau - k_d$, where k_d is the cost incurred by defending raids.

The existence of two bandits means that the domestic bandit loses its monopoly in defence. If the foreign bandit decides to turn predatory, citizens need not respond by providing defence themselves since the more efficient alternative of paying the domestic bandit for protection exists. Under such circumstances, the per-period payoffs to citizens and the domestic bandit are $F(w_i^*)[1 - M(m_H, m_G)](1 - \tau)$ and $F^K(w_i^*)[1 - M(m_H, m_G)]\tau - k_d^b$. Given these payoffs, it is clear that citizens will not provide defence autonomously if the option to pay the domestic bandit for defence

exists, since almost all their output will be lost to predatory attacks by both bandits. Citizens only invest in military preparedness when both bandits turn predatory. When this is the case, it is assumed that the more powerful bandit has a first mover advantage in predating over the domestic bandit¹⁵. Under these circumstances, the per-period payoffs to the domestic bandit and foreign bandit are $F^\kappa(w_i)[1 - M(m_H, m_G)]M(m_G, m_H) - k_r^b$ and $F^\kappa(w_i)M(m_H, m_G) - k_r^b$ respectively. A predatory bandit (regardless of which one is predatory) generates a loss of total output since there are fixed costs involved in predation and defence. Therefore, the most efficient outcome when there are two bandits would require cooperation between both bandits and the citizens.

The strategy profile above implies that citizens' decision to pay taxes is dependant on the actions taken by the bandits. As was shown, a bandit is not predatory if it is relatively patient. In the context of the game above, H won't be predatory since it receives taxes from citizens. G 's loss of tax revenue however implies that it will turn predatory to minimize its losses. This holds even if G is patient. A predatory domestic bandit implies lower tax revenues for the patient foreign bandit. There is therefore an incentive for a coalition to form between the three players involved in the game. The inclusion of a foreign bandit into the analysis is modelled with a different game to the one introduced above, where there were only two players. The existence of a third player necessitates the need for a new cooperative game. This does not imply, however, that there will be switching between different solution concepts, as the two games are independent to one another. The grand coalition, where citizens pay taxes and neither bandit is predatory, and both bandits share tax revenues, can be represented by the value function:

$$V(N) = F^\kappa(w_i^*)$$

The grand coalition only forms if there is a set of allocations of this value that is fair, efficient and individually rational. Consider the following allocation for each player in the game:

¹⁵ Since a foreign bandit's endowment in human capital and military power is greater than the domestic bandit's endowment, it will be easier for this bandit to appropriate output through predation.

$$i: F^\kappa(w_i^*)(1-\tau)$$

$$G: M(m_G, m_H)\tau F^\kappa(w_i^*)$$

$$H: M(m_H, m_G)\tau F^\kappa(w_i^*)$$

This allocation is fair since the distribution of tax revenues to the respective bandits is proportional to their relative military strengths. Furthermore, given that the tax rate is exogenously determined and constant across ruling bandits, citizens are indifferent to whom they pay taxes to. For the above allocation to lie in the core however, it must be individually rational and efficient for all players. For G , individual rationality implies:

$$\begin{aligned} \sum_{j=0}^{\infty} \delta_G^j M(m_G, m_H)\tau F^\kappa(w_i^*) &\geq V(\{G\}) \\ \Rightarrow \sum_{j=0}^{\infty} \delta_G^j M(m_G, m_H)\tau F^\kappa(w_i^*) &\geq \sum_{j=0}^m \delta_G^j [F^\kappa(w_i^*)M(m_G, m_H) - k_r] \end{aligned}$$

This implies that G will only join the grand coalition when the following condition holds:

$$\tau \geq [1 - \delta_G^{m+1}] \left[1 - \frac{k_r}{F^\kappa(w_i^*)M(m_G, m_H)} \right] \quad (5.1)$$

Since the tax rate is exogenously determined, a domestic bandit's decision to join the grand coalition is therefore positively affected by the cost of predation and negatively affected by the level of production and the domestic bandit's military endowment. Most importantly however, it can be seen that as the discount rate tends to 1, the domestic bandit will join the grand coalition with greater certainty. So the cost of raiding, military endowment and the level of production only determine whether an impatient domestic bandit joins the grand coalition. If the cost of predation is high, either due to low levels of technology or large and heterogeneous populations, it is more likely that the domestic bandit will join the grand coalition. This is intuitive since the bandit will have a higher payoff in the grand coalition. As the level of production in an economy increases, it is less likely that a domestic bandit

will join the grand coalition. Higher levels of production imply greater returns from predation, and therefore less incentive to join the grand coalition. Finally, if the domestic bandit's military endowment is high relative to the foreign bandit, there is less incentive for the domestic bandit to join the grand coalition.

The second condition for the allocations above to lie in the core is that the foreign bandit can do no better by deviating. This implies:

$$\begin{aligned} \sum_{j=0}^{\infty} \delta_H^j [M(m_H, m_G) \tau F^\kappa(w_i^*)] &\geq V(\{H\}) \\ \Rightarrow \sum_{j=0}^{\infty} \delta_H^j [M(m_H, m_G) \tau F^\kappa(w_i^*)] &\geq \sum_{j=0}^n \delta_H^j [F^\kappa(w_i^*) M(m_H, m_G) - k_r] \end{aligned}$$

This implies that the foreign bandit will join the grand coalition if:

$$\tau \geq [1 - \delta_H^{n+1}] \left[1 - \frac{k_r}{M(m_H, m_G) F^\kappa(w_i^*)} \right] \quad (5.2)$$

This condition is analogous to the condition determining the domestic bandit's decision to join the grand coalition. If the foreign bandit is impatient, the likelihood of this bandit joining the grand coalition increases as the cost to predation increases and as the level of production and the military endowment decreases.

The last condition that must hold requires the citizens to be individually rational:

$$\begin{aligned} F^\kappa(w_i^*) (1 - \tau) &\geq V(\{i\}) \Rightarrow \\ F^\kappa(w_i^*) (1 - \tau) &\geq F^\kappa(w_i) [1 - M(m_H, m_i)] [1 - M(m_G, m_i)] - k_d^i \end{aligned} \quad (5.3)$$

Finally, these imputations are efficient since:

$$\sum_{\alpha \in N} x_\alpha(N) = V(N),$$

where $x_i(N)$ is the value of the imputations for $\alpha \in \{i, G, H\}$ and N is the grand coalition.

(5.1), (5.2) and (5.3) offer some insight into the likely equilibrium that prevails, given the characteristics of each agent involved in the game. Firstly, an outward shift in the production function decreases the likelihood that the grand coalition will form. All else held constant, an increase in production makes deviating from the grand coalition more profitable. When this is the case, both bandits will turn predatory and citizens will invest in military armament for protection. This equilibrium is consistent with Bates *et al.*'s warlord equilibrium. This equilibrium will also prevail in the presence of positive technology shocks. Technology shocks reduce the cost of predation, therefore making deviations more profitable, implying both bandits turn predatory. Finally, holding everything else constant, an increase in a bandit's military endowment will decrease that bandit's incentive to cooperate and join the grand coalition. If, on the other hand, bandits are patient, and therefore have discount factors close to 1, conditions (5.1) and (5.2) predict that these bandits almost certainly cooperate and join the grand coalition. The optimal outcome is only obtained then when both bandits are patient or, for the case of impatient bandits, when production and technology are at relatively low levels.

This outcome will not hold as an equilibrium for a number of reasons. Firstly, by its very nature, and following the arguments made by Acemoglu *et al* (2001), a foreign bandit is long-term irrational. This is discussed in more detail below, but a foreign bandit that isn't patient implies that this bandit will not cooperate and will therefore be predatory. Secondly, a domestic bandit is also unlikely to have a discount factor close to one. The presence of a more powerful foreign bandit increases the insecurity of a domestic bandit, thus implying that this bandit also turns predatory. It will be discussed below that this is not the only reason why a domestic bandit becomes insecure following the entry of a foreign bandit.

A foreign bandit's primary goal is to extract as many resources as possible in the shortest period of time. In light of Robinson's concept of the revolution constraint, complemented with the arguments put forward by Tullock (2005) and Olson (1965) with regard to revolutions and collective action, citizens' investment in military in the wake of predatory attacks inevitably leads to the formation of a number of small resistance groups, each competing for their own special interest. The decentralisation of defence is critical in this regard. As citizens become more discontent and invest more in private defence, more resistance groups form. The fact that large groups fail to collectively organise to achieve their common goal implies

that the resistance groups that do form are typically small, as the historical examples below will point out. Therefore, once the foreign bandit can no longer avoid a revolution and concedes to, or is deposed by some minority resistance group, society is dominated by numerous competing minority groups. As a result, insecurities remain high and discount factors remain low, implying continued conflict.

Since domestic and foreign bandits compete for power, the most efficient equilibrium is not reached. The equilibrium is characteristic of the warlord equilibrium discussed previously. When this is the case, societies enter a state of uncertainty and instability. The likely predatory attacks by bandits and increased insecurity of citizens following the decentralization of defence decreases production. Furthermore, this equilibrium persists even after a foreign bandit concedes power or is deposed in some way. The decentralisation of defence is the primary reason why discount factors remain low for the players of the game. This instability ultimately leads to the formation of an insecure government. Extractive institutions develop in the wake of an insecure government for two reasons. Firstly, such a government will typically have a short time horizon with a small encompassing interest in the society. The government will extract as much as possible in the shortest possible time. Secondly, the increased competition for power will decrease the relative cost of repression for the government to attempt to hold onto power. These points are discussed below in conjunction with the case study.

5.2 Illustration: Foreign Banditry and the Start of Colonization at the Gold Coast (1843-1966)

5.2.1 The Start of Foreign Rule and Non-Cooperation (1843)

The Gold Coast experienced unprecedented levels of growth during the eighteenth and early nineteenth centuries, primarily due to increased trade of gold, ivory, cocoa, palm oil and slaves (Cruickshank, 1853, pp. 290-312). The accumulation of wealth is what initiated the formation of a crown colony at the Gold Coast. A plethora of treaties and trade agreements between Europeans and different Gold Coast states emerged in the seventeenth century. These agreements, whether implicit or explicit, were embarked upon to increase trade opportunities and try to squeeze out other competitors. At the same time, such collaborations were mutually beneficial for the European powers and states of the region (Daaku, 1970, pp. 48-49). These included,

to name two, the British's trade alliance with Fetu and Fanti, and the Ashanti's friendship with the Dutch.

Although most friendships and alliances between Europeans and Africans existed, the regular competition for trade between the European powers situated in the region led to the breakdown of many of these friendships (Conton, 1963, pp. 25-34). At the start of the nineteenth century, the British were the dominant European power in the Gold Coast, controlling a majority of the coastal forts that once belonged to the Portuguese, Dutch and Swedes. The cooperation between foreign bandits and local states of the Gold Coast during the eighteenth century eventually became inadequate to completely secure trade in the region (Daaku, 1970, pp. 54). The returns to extraction clearly increased as trade flourished, and it became more likely that an exploitative foreign bandit would assume *de facto* power in order to extract as many resources as possible. Kimble (1963, pp. 168-175) notes that the British found it more efficient to assume direct control of trade routes within the Gold Coast rather than having to depend on large annual grants from the Office of the Exchequer to maintain British trade within the region. Gold Coast settlements were thus permanently taken over by the crown in 1843, and the crown colony of the Gold Coast was established in 1874.

It is likely that the formation of a crown colony at the Gold Coast was intended to aid the extraction of rents and maximize resource appropriation for the British. It would, however, be problematical to determine whether the institutional structure in the region under colonial rule was planned to increase extraction, with little emphasis on the future social, economic and political development of the colony. Acemoglu *et al* (2001) introduces a novel way of determining whether institutions under colonial rule were extractive by considering mortality rates of foreigners within a region. The presence of yellow fever, malaria and other tropical diseases in sub-Saharan Africa increased the likelihood of death for foreigners within the region. Under such circumstances it would be unlikely that foreigners would settle in such regions. Acemoglu *et al* contend that high foreigner mortality rates proxy for extractive institutions. Kimble and Daaku both take note of the unfavourable health conditions within the Gold Coast in the eighteenth and nineteenth centuries, citing this as a reason why trade was concentrated around the security of European forts. Curtin (1998, p. 18) documents that at the Gold Coast, in the "years 1824-26, their [British troops] annual death rate was 668 per thousand mean strength. Of these deaths, 382

per thousand were from ‘fevers.’ Another 221 per thousand died from gastrointestinal diseases.” British troops dying as a result of a fever would most likely have contracted malaria or yellow fever. Curtin (1998, p. 65) remarks that past West African experiences indicated that the probable loss of life resulting from a yellow fever outbreak could be as much as 70 percent. Given these observations, coupled with the predictions made by Acemoglu *et al.*, it can be inferred that the crown colony of the Gold Coast was established for commercial, rather than settlement purposes.

The establishment of the Gold Coast colony in 1874 is adequately predicted by the model. The continuous competition between European powers trading in the Gold Coast, most notably the competition between the British and the Dutch, increased the insecurity of these foreign bandits, thus lowering their respective discount factors. As bandits became more long-term irrational, the increase in trade and the opportunity for wealth inflamed the existing tension between the European powers. Daaku (1970, pp. 48-49) documents many instances where the friendships and trading treaties which were formed during the seventeenth and eighteenth centuries between Africans and Europeans in the Gold Coast started to dissolve as foreign bandits became increasingly insecure and hasty to directly control and monopolise trade in the region. After the British had squeezed the Dutch from the Gold Coast, it thus became inevitable that a rent seeking colony would be formed.

5.2.2 The Poll Tax and the First Signs of Decentralized Violence (1850-1862)

Although the crown colony of the Gold Coast was formed in 1874, the British Forts and Settlements were separated from Sierra Leone and became a strict dependency of the crown in 1850 (Kimble, 1963, p. 168). From 1850, there was an evident increase in British officials within the region which was followed by an urgent sense for the need to increase revenue in some way. Lord Grey, the Secretary of State, favoured the imposition of a direct tax that would aid in building schools, roads and other necessary services required to increase revenues. Rather than relying on grants from parliament, the imposition of a direct tax in the Gold Coast implied that increases in British revenues from the region would ultimately be financed internally. Lord Grey knew, however, that this tax was unlikely to be paid, unless the Chiefs could be persuaded into believing that the purpose of the tax was for their own benefit. The British did just that, and by 1852 the Assembly of Chiefs, a supra-tribal structure, had placed themselves under British protection and agreed to pay the Poll Tax (Kimble,

1963 pp. 173-175; Cruickshank, 1853, p. 208). The reason these Chiefs, a type of small domestic bandit, agreed to the Poll Tax was twofold. Firstly, the Chiefs believed that paying the tax would lead to a better provision of services, and that they would ultimately benefit from it. This point is critical in explaining the concept of the tax rate discussed in the model, where citizens only agree to pay a tax to a foreign bandit if they can do no better by not paying it. The citizens clearly believed that paying the tax would be beneficial. Furthermore, the Chiefs agreed to the tax since in return they were awarded a stipend for their services (Kimble, 1963, pp. 176-180, Metcalfe, 1964, p. 232). Secondly, the growing presence of British elites surrounding the Forts and Settlements contrasted with the small native neighbouring towns. These towns would thus agree to pay such a tax in fear of the perceived human capital and military superiority of the British. Kimble (1963, p. 178) notes that in some instances they “[The natives] only agreed to pay under protest after [Governor] Hill threatened to use force”

The reasons why Chiefs and the societies over which they presided initially agreed to the Poll Tax is explained by the model. Firstly, domestic bandits and citizens only cooperate with the foreign bandit when it comes to tax payments in exchange for protection when the tax rate is not so high so that non-cooperation becomes profitable. For the case of the Poll Tax, individuals and Chiefs were led to believe that this tax would ultimately benefit them, which is why it was agreed to by many Chiefs. Secondly, the Chiefs received a stipend for agreeing to induce their citizens to pay the tax. This is a unique case where the efficient equilibrium is obtained where citizens pay taxes to the foreign bandit, who in turn shares these revenues with the old domestic bandit.

The Poll Tax did not however achieve its intended, or perhaps promised outcomes. The failure of the Poll tax is documented in the House of Commons Papers, volume v, 1865, in “the first year (1852) of the imposition of the poll tax the sum of £7,567 was raised by this tax, but in succeeding years various causes...produced a strong feeling of dislike to it, and the receipts fell to £1,552 in 1861” (Crooks, 1923, p. 343). Although the tax initiated cooperation between many Chiefs and the British for a short time, mismanagement of tax collections, the inability to pay Chiefs’ salaries and the all too apparent lack of promised services led many citizens and Chiefs to believe that the tax was put in place for extraction purposes. Trouble broke out in Accra when the Chiefs of the eastern districts refused

to continue paying the tax. Kimble (1963, p. 176) documents that “Hill hurried over from Cape Coast to investigate and found several thousand armed men from all the coastal villages between Accra and Volta...menacing the Fort.” The Poll Tax therefore became the first visible example of British predation, which was followed by violent protests and a sense of general resentment towards foreign rule. However, since these protests were largely dispersed across the region, and not centrally organised, their effect on the British protectorate were not severe.

5.2.3 The Problem of the Weak Fanti Confederation and the Powerful Ashanti (1868-1897)

An exchange of territory in the southern part of the Gold Coast between the British and the Dutch in 1868 redefined protection rights across these territories (Conton, 1963, pp. 33-34). The Fanti were the most affected by these exchanges as they moved from a British to a Dutch protectorate. They feared that being part of a Dutch protectorate would expose them to attacks from the Ashanti to the north, which had ties with the Dutch (Conton, 1963, p. 34). The Fanti had previously been loyal to the British and welcomed their protection, with most Fanti Chiefs agreeing to the Poll Tax (Metcalf, 1964, p. 244). However, this exchange of territories shed light on the lack of incentive the British had to protect the Fanti. The British were more concerned with acquiring a continuous coastline, thus reducing the cost of trade and increasing revenues, than with their promised obligations to the Fanti (Daaku, 1970). In this context, the British can be regarded as non-cooperative, breaking their alliance with the Fanti. This is so for, as mentioned, a continuous coastline was essential for efficient and inexpensive trade. As a result, the British had no incentive to cooperate with the Fanti in such a situation. The exchange of these territories increased the threat of an attack by the Ashanti on the Fanti.

Without British protection, the Fanti secretly resorted to forming their own confederation with the purpose of self government and self-defence. The following excerpt is from the secretaries of the Fanti confederation, Quassie Edo, Anfoo Otoo and Quoy Yanfoo, to the Governor of the Gold Coast:

We, the Kings, Chiefs, and others assembled at Mankessim, beg most respectfully to forward you the enclosed copy of a Constitution framed and passed by us after mature consideration. We have united together for the

express purpose of furthering the interests of our country. In the Constitution it will be observed that we contemplate means for the social improvement of our subjects and peoples, the growth of education and industrial pursuits, and in short every good which the British philanthropy may have designed for the good of the Gold Coast, but for which we think it impossible for it at present to do for the country at large (Crooks, 1923, p. 397)¹⁶.

The Chiefs of the Fanti united in the quest for self government in what can be seen as the first attempt of collective organisation against a foreign bandit unwilling to protect property rights of the public, and its weaker domestic leaders. One reason the Fanti confederation was able to form during the period of foreign banditry can be explained by the strategy profile of the model. Initially, the Chiefdoms of the Fanti welcomed foreign protection, realising the superior strength of the British. The commercial need for a continuous coastline and the exchange of territories occurred following the foreign bandit's realisation of higher payoffs off the equilibrium path. Ultimately this led to the foreign bandit neglecting to protect any property rights. Without protection from the Ashanti, the Fanti considered self protection necessary, something that could only happen with the cooperation of the citizens from each chiefdom. The confederation, however, survived only until 1874 due to the lack of strong leadership.

The powerful Ashanti Empire of the north no doubt had a lowered sense of security as British influence and dominance grew to the south. This greater insecurity became evident as the Ashanti preyed on British sponsored neighbouring states in an effort to retain the Empire's control of trade in the interior. The presence of the British had challenged the Empire's monopoly on trade in the interior, forcing the Ashanti to engage in conflict with neighbouring territories (Conton, 1963, pp. 26-28). The Ashanti even disrupted the collection of the Poll Tax in 1853 during an attack on the south (Kimble, 1963, p. 268). The presence of a powerful domestic bandit, like the Ashanti leaders, posed a problem for the British foreign bandit. The Ashanti's increased insecurity led to a loss of revenue for the British. Furthermore, attempts at coordinating coalition agreements between the Ashanti and the British never materialized. Kimble describes Anglo-Ashanti relations in the nineteenth century as

¹⁶ Crookes only documents this letter, but does not document when, or where, it was signed.

conflicting due to the threats each power posed on the other. Since the Ashanti were militarily powerful, relative not only to their neighbouring states but also to the British, it was less likely that the Empire would cooperate with the British. This is explained by condition 5.1 and 5.2 in the model, where an insecure domestic bandit is less likely to cooperate with the foreign bandit if its relative military endowment is large. As explained above, a domestic bandit with a large military endowment has more to gain if it doesn't cooperate but instead turns predatory.

The case of the Ashanti and their unwillingness to cooperate with the British and her protectorate states is thus explained by the model. The British were ultimately forced to try to overthrow the Ashanti Empire in order to secure trade in the north, even though this came at a large cost. Kimble (1963, p. 272) takes account of the cost and need to overthrow the Ashanti: the "extent to which the British Government was prepared to man and finance this expedition indicates their realization that not only military honour but the very survival of imperial and commercial interests on the coast." Despite the Colonial Office's reluctance to assume control of Ashanti after the 1874 war, the British policy of expansion made its incorporation into the Gold Coast colony inevitable. The fall of the Ashanti, which culminated in the British invasion of Ashanti in 1896, was critical in the outcome of the region's politics over the following fifty years. By the turn of twentieth century, British influence of the Gold Coast was far reaching, and the large Empires that dominated the landscape over the preceding two centuries had fallen apart.

5.2.4 Increased Tensions, the Formation of Resistant Groups and Conflict after Independence (1874-1992)

After the fall of the Ashanti at the hands of the British, the Gold Coast lacked a dominant domestic bandit capable of challenging British rule. Furthermore, the citizens of the Gold Coast had become exposed to extractive colonial policies, while at the same time being negated any external protection against such policies. As a result, citizens moved towards self-protection and a number of anti-colonial organisations formed. As mentioned, the observations of Olson (1965) are critical in explaining the formation of such resistance groups. Olson contends that large groups almost always fail to collectively organise to achieve their common goal. The incentive for an individual to join a group acting towards some common interest decreases as the members in the group increase for two reasons. Firstly, the more

individuals in a group, the smaller the total gains to an individual in that group, should the group successfully achieve its goal. Secondly, large groups are subject to the free rider problem, where individuals find it optimal to do nothing in aiding the group in achieving its common interest. It is for these reasons that Tullock (2005) contends that popular uprisings rarely occur. Tullock shows that an individual's optimal choice regarding a revolution is to remain neutral for reasons discussed above. Once again, the individual's total gain from overthrowing an extractive government falls as the size of the popular uprising increases. Tullock also notes that the State is generally well equipped to suppress any popular uprising, should one occur. For these reasons, the absence of a powerful domestic bandit following colonial rule in the Gold Coast made any popular uprisings problematic to organise and initiate. In light of exploitative colonial policies, small groups formed in the Gold Coast to resist this exploitation, but these groups often were at conflict with each other. No strong resistance to colonial rule existed.

The Aborigines' Rights Protection Society (A.R.P.S.) was one of the resistance movements that formed in the wake of extractive colonial policies. The A.R.P.S. formed in 1897 to protest the Crown Lands Bill of 1896 and the Lands Bill of 1897 at the Gold Coast (Metcalf, 1964, p. 471). These bills were intended to give the Crown rights of administration over land in the region. African's rights of land ownership would no longer be recognized under the bills and occupants of land would only be granted settler rights. Kimble (1963, pp. 358-371) documents that although the A.R.P.S. continued to mount opposition against colonial policies, the society's focus was largely on the preservation of traditional rights, whilst at the same time ignoring the rising educated class and the changing socio-political landscape. Tensions between the young, educated class and the chiefs and their traditional supporters, such as the A.R.P.S., mounted under colonial rule as a result. The concept of indirect rule, set in motion by the Native Jurisdiction Ordinance of 1883 and the Native Administration Ordinance of 1927, arose from constant pressure from the Chiefs to secure and preserve their traditional power under colonial rule.

The opposition provided by King Aggeri and the Fanti Confederation offer two examples of traditional leaders engaging in nationalist movements. Their failure to accomplish what they had set out to do however highlights the inefficiency of minority resistance groups opposing colonial rule at the time. Kimble (1963, p. 457) notes:

Agger's challenge to British jurisdiction in Cape Coast was ineffective partly because the area of his own inherited jurisdiction was too small; and the later Confederation broke down largely because the fatal inability of the Chiefs to agree amongst themselves prevented their effective combination over a wider area. The only place where the traditional unit of government was powerful enough to build up anything approaching a nation out of a large number of different tribes was Ashanti-and here, when the British eventually recognized a barrier to the extension of their own authority, the Asantehene was removed.

In light of the Native Administration Ordinance, which some believed increased the privileges of the Chiefs at the expense of the citizens, factions intended to curb the powers of the Head Chiefs formed within the A.R.P.S. The divisions between the traditional supporters of the Chiefs and the young educated class became evident by the start of the twentieth century, and extended through to independence under Nkrumah. Rathbone (2000) documents Nkrumah's Convention Peoples' Party (CPP) objectives in challenging chiefly power after independence.

Conflicts did not only occur between the Chiefs and the educated class. Within the educated class, resistance groups at conflict with one another had also formed. Tsikata and Seini (2004) summarize how, in addition to the chiefs being divided from their subjects due to conflict, so too were the educated class divided from the greater population. Two political parties that formed to oppose colonial rule were Nkrumah's CPP and the United Gold Coast Convention (UGCC). These two parties were in a state of constant conflict, with some ethno-regional parties supporting one or the other (Tsikata and Seini, 2004). Colonial rule had redefined the boundaries of the sixteenth century Gold Coast, amalgamating a number of nation states comprised of differing ethnic backgrounds within one set of boundaries. Ethnic rivalries penetrated the political sphere in which these two parties were formed, thus leading to several conflicts over certain issues. The Northern People's Party (NPP) was the largest group formed as a result of nationalism from the north of the region, but the disparity in incomes and development between the north and south of the Gold Coast increase tensions between the NPP and rival parties.

Although the growth of nationalism within the Gold Coast and the numerous resistant organisations forming in the wake of colonial rule ultimately brought about

independence in 1957, the tensions between these rival minority groups continued. These conflicts ultimately resulted in high levels of insecurity amongst the ruling elite. The Nkrumah government adopted many sycophantic policies that ultimately destroyed confidence in the leadership of rival organisations (Conton, 1963, pp. 146-147).

An example of such policies introduced by Nkrumah characteristic of an insecure government following the existence of rival organisations was the Trade Unions Act of 1958. This Act restricted the rights of Ghanaians in that it made strikes illegal following the Gold Miner's Strike of 1955. The Preventative Detention Act made it possible to arrest anyone suspected of treason without the involvement of the courts. The railway worker's strike of 1961 prompted the Nkrumah government to arrest many opposition leaders under the Trade Unions Act, while the Preventative Detention Act allowed many of Nkrumah's followers in government to arrest members opposing the government for their own economic and personal gain. The 1964 amendment of Ghana's constitution made the CPP the only legal party in the country, a move to try and consolidate Nkrumah's hold on power. Many of the policies that prevailed under Nkrumah were characteristic of an insecure government.

What followed was a series of coups with interchanging military and multi-party governments, all characterized by the notions that follow an insecure government (Tsikata and Seini, 2004). Colonization therefore shifted the societies of the Gold Coast from a path of development and stability to one of conflict and instability. The path of development was characterised by the expansion of powerful empires willing to assert their territorial influence whilst at the same time fostering growth and social stability. The exogenous influence of colonial policies increased insecurities of the societies and their leaders, which led to a decentralisation of defence. The decentralisation of defence decreased agents' discount factors as societies moved towards appropriation rather than production.

6. Conclusion

The Olsonian approach adopted throughout the paper adds rigour and clarity to why some African nations are branded as having extractive governments and institutions. As the evidence from the Gold Coast suggests, some African societies were developing along a path characterized by growth and stability. Conflict was transient when one powerful empire engaged in wars of aggrandisement. Pre-colonial Gold Coast witnessed the emergence of powerful empires ruled by leaders with high discount factors. As a result, growth and stability prevailed, rather than extraction and internal conflict. Foreign rule shifted the societies of the Gold Coast away from this path of development and towards a path of conflict and instability. The low discount factor of the colonial power, coupled with its superior military strength, led to a period of extraction. The loss of revenue incurred by the domestic bandits made predation by them more likely. Agents' insecurities therefore increased as discount factors fell. The ensuing decentralisation of defence implied greater conflict and extraction. After independence, there was a reversion back to the warlord equilibrium introduced by Bates *et al* (2002). This explains why the governments that followed introduced extractive policies and institutions rather than those fostering growth and enforcing property rights.

The main limitation of the proposed model is that it only considers one foreign bandit rather than exploring the impact that multiple competing foreign bandits may have on their respective action sets. Clearly, the competition between different foreign bandits has implications on the bandits' strategy profiles. Modelling the rush for Africa would enable the foreign bandit's discount factor to be endogenized within a more complete model of conflict. Another limitation of the model is the need to switch between solution concepts, i.e., the SPNE in the early sections and the core in the foreign bandit model. However, there is a clear distinction between the basic bandit model and the foreign bandit model implying that these two games can be modelled separately from one another.

The model captures the instability that followed after independence in Ghana. Towards the end of its term in power, the Nkrumah government imposed many extractive laws that generated wide-spread conflict within the country. Nkrumah's government finally lost power in the 1966 coup d'état, the first of many. This

instability can be explained as a result of the insecurities of the extractive civilian and military governments that exchanged power throughout the latter part of the twentieth century in the region.

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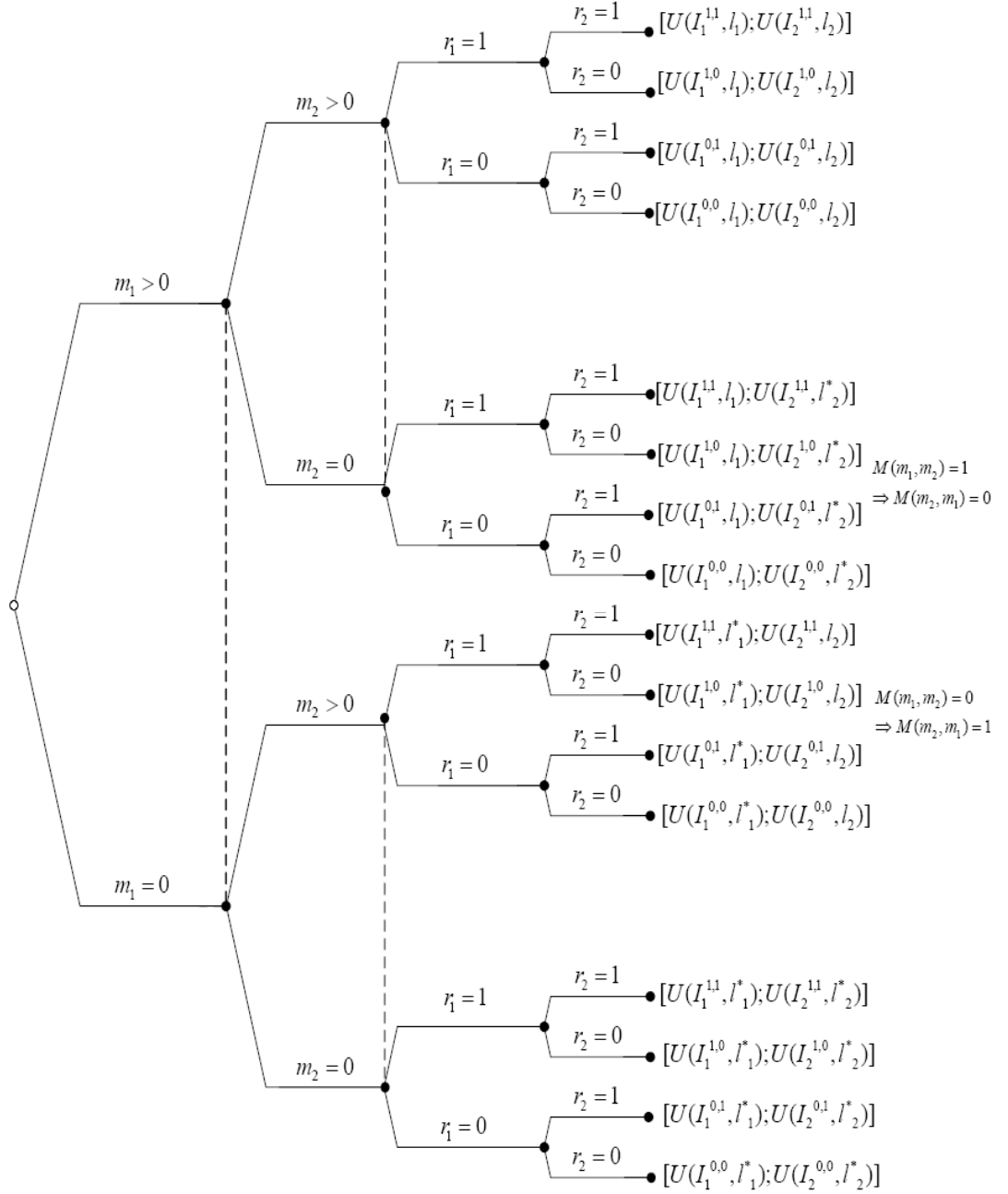
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Appendix

Figure A.1: The Extensive Form Anarchy Game



Where $I_i^{r_1, r_2}$ is the payoff from working and investing in military for player i , given r_1 and r_2 .

Figure A.2: The Extensive Form Bandit Game

