

## **Oil and the Propensity to Armed Struggle in the Niger Delta Region of Nigeria**

Aderoju Oyefusi  
Department of Economics and Statistics,  
University of Benin, Nigeria  
E-mail address: [aderojuoyefusi@yahoo.com](mailto:aderojuoyefusi@yahoo.com)

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### **Non-technical Abstract**

*This paper attempts to explain the determinants of the propensity to armed struggle and the probability of participation by individuals in the Niger Delta region of Nigeria using primary (micro) data. While grievance appears to be pervasive among individuals and communities in the region and can be systematically explained, neither the grievance level nor its commonly-cited causal factors appear to be strong enough to create a disposition towards armed rebellion. Rather, factors that reduce the opportunity cost and risk of participation or increase the perceived benefits appear to be more important. The study identifies three of these factors that are amenable to policy makers' control as income level, educational attainment, and government presence.*

### **Technical Abstract**

This paper attempts to explain the determinants of the propensity to armed struggle and the probability of participation by individuals in the Niger Delta region of Nigeria using primary data from a sample of 1,337 individuals drawn from 18 communities in the region. Nineteen variables are used to capture factors that reflect motives and opportunity for rebellion and a logit regression model is used to estimate the propensity to armed struggle in the population.

About 36 percent of the sampled population revealed a willingness to take up arms, which translates to a potential rebel army size of about 24 percent of the male population in the states covered. While grievance appears pervasive and is systematically explained by the data, neither the grievance level nor its commonly-cited causal factors, appear to be strong enough to create a disposition towards armed rebellion. Rather, factors that reduce the opportunity cost and risk of participation or increase the perceived benefits appear to be more important. Three community-level and five individual-level characteristics are particularly found to increase conflict risk in the region. Oil-availability, longer distance from state capital and absence of government presence makes a community a haven for would-be rebels. The propensity to armed struggle also increases in lower income level, lower educational attainment, lack of asset or asset-immobility, if an individual is unconstrained by a marital bond, or is from the dominant ethnic group. Three of these statistically significant variables are amenable to policy-makers' control.

## 1. INTRODUCTION

Empirical studies have established a causal link between natural resource abundance and civil conflict. Collier and Hoeffler (1998), for example, show that natural resource-availability/abundance considerably increases the chances of civil conflict in a country. A country that has no natural resources faces a probability of civil conflict of 0.5 percent, whereas a country with a natural resources-to-GDP share of 26 percent faces a probability of 23 percent. De Soysa (2000) observed a similar correlation between resource wealth and civil conflict; while Addison and others (2003) note that in Africa as well as other developing regions countries with point resources such as minerals have a high propensity for conflict ranging from high levels of political violence to outright wars. Ross (2004b) provides similar evidence linking mineral resources in general to civil conflict. Fearon and Laitin (2003) and Fearon (2005) however argue that the risk of civil war is limited to oil.

There are reasons why oil-dependence is particularly risky. Oil and many other minerals generate large location-specific rents for the states or groups that can control the territory where resources are located. Dependence on such rents also exposes them to shocks arising from world price volatility, discoveries and exhaustion. These (rents and shocks) create multiple routes that link to civil conflict and are particularly large in the case of oil (Collier and Hoeffler, 2005)<sup>1</sup>. It has been shown that oil-dependent countries have a particularly high risk of experiencing secessionist civil wars (Collier and Hoeffler, 2002c; Ross 2003b, 2004b) (Table 1).

According to Ross (2003a), most mineral-related insurrections have four elements. First, the people in the region have a distinct ethnic or religious identity which set them apart from the larger population before resource exploitation began. Second, they share the belief that the central government was unfairly appropriating the wealth that belong to them, and that they would be better off as a separate state. Third, the local people generally bore the greater part of the cost of the extraction process in terms of land appropriation, environmental damage and the immigration

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<sup>1</sup> Ross (2004a), Humphreys (2005) provides detailed treatment of the mechanisms by which resource-dependence leads to conflict.

of labor from other parts of the country, and commonly argue that they have not been sufficiently compensated for these costs. Finally, the intensity of conflict (the cost in terms of lives and money) has been higher when the extraction process is susceptible to “hold-ups” by local people. The author cites recent conflicts in Colombia, Sudan and Indonesia (Aceh) that reflect these dynamics.

Apparently, the Niger Delta region of Nigeria<sup>2</sup> contains these key ingredients for a mineral-based conflict (Ross 2003a). The region is the source of most of the country’s oil reserves (Table 2). It is populated by minority ethnic groups that have borne a disproportionate share of the cost of oil extraction for which they believe they have not been adequately compensated and an equally higher share of government repression. And the spread of oil platforms, pumping stations, and other oil installations and infrastructure across the region provides an opportunity for locals to express their dissatisfaction by blocking the extraction process. Furthermore, as Ross (2003) asserts, the Niger Delta has “three addition liabilities” which increase further the risk of an armed (secessionist) struggle: its unusually high level of unemployment and poverty and abysmally low level of social services compared to the national average<sup>3</sup>, its swampy terrain which makes it difficult and expensive to develop, and what the author calls a “moral social disorder” arising from the activities of youth-based movements that frequently challenge not only the oil companies but also traditional authorities in their own communities, a development which makes peaceful settlement of disputes more difficult to achieve. There is an added “general liability” that the author did not note however : the fact that the Nigerian nation is currently passing through a

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<sup>2</sup> The Niger Delta region is a wetland of about 70000 sq km spread over a number of ecological zones along the Gulf of Guinea, and the third largest wetland in the world (*Tell*, Lagos, 6 September 2004). Officially, the Niger Delta is made up of nine states (Abia, Akwa-Ibom, Bayelsa, Cross River, Delta, Edo, Imo, Ondo and Rivers) and has an estimated population of about 26.7million (*Tell*, 6 September 2004). Two of the states that officially constitute the Niger Delta (Abia and Imo) are situated in the southeastern part of Nigeria, one (Ondo) is located in the Southwest, while the remaining six constitute the South-South geopolitical zone (SSZ) and inhabits the so-called minority ethnic groups. Some authors have distinguished between the official Niger Delta and the geographical Niger Delta. The latter is thought of as consisting only of the six States in the South-South zone of the country.

The Niger Delta alone accounts for over 90 percent of the nation’s oil revenue and its gas reserves are now touted as the next greatest potential revenue earner for the nation (Nigerian National Petroleum Corporation, 2005). Geological research shows that the Niger Delta (both onshore and offshore areas) is particularly conducive to the formation and accumulation of oil and gas (Hyne, 1995:90-98).

<sup>3</sup> Household survey conducted by the Federal Office of Statistics (FOS, 1996) Nigeria, puts poverty in the South-south region at 58.2 percent, the highest rate in the country.

reform process<sup>4</sup> which is creating winners and losers and thereby pushing upward the risk of violent conflict (Hegre and others, 2001; Hegre, 2003).

There have been previous attempts at secession in the Niger Delta region of Nigeria. In early 1967, oil-related disputes motivated an insurrection by the Ijaws<sup>5</sup>. Less than a year after, the country experienced a civil war (the *Biafran* war of 1967-70), a fall-out of disagreement over the sharing of oil revenues and ethnic antagonism that have been created by a series of events which bordered on attempts by each of the major ethnic groups to control political power. More recently, in the latter part of 2004, the Niger Delta People's Volunteer Force (NDPVF), an organization of youths of Ijaw ethnic extraction (officially tagged a "rebel army" by the Nigerian government), engaged the Nigerian military forces in land and aerial battle. At the same time, the federal government declared it has identified 16 ethnic militias in the Niger Delta and discovered evidence linking some of the groups to external and internal collaborators. More recently, there has been a renewed call for local control of oil wealth, an increase in military confrontations between armed groups and the Nigerian government, and attacks on oil installations and facilities in the region. The spate of kidnapping of foreign oil workers for ransom and as a means of asserting political demands has also increased.

In general, the Niger Delta has been the site of much civil violence since 1999. According to a report by Hamilton and others (2003), violence in the Niger Delta is estimated to have killed about 1,000 persons a year between 1999 and 2004.

There are many parts to oil and civil conflict in Nigeria<sup>6</sup>. In this paper, I concentrate on just one: what determines the propensity to armed struggle among individuals in Nigeria's Niger Delta region? The paper is structured as follows. In section 2, I reviewed related literature on the factors that motivate individuals to initiate or participate in rebellion and when rebellion may indeed be expected to occur. A model is developed in section 3 which explains the decision to participate in rebellion as a function of individual and community-level characteristics. The basic predictions of the model are tested in section 4 while section 5 concludes.

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<sup>4</sup> This reform, which combines both economic and political aspects, began in 1999 and has recently gained momentum.

<sup>5</sup> The reference is to the "rebellion" led by Issac Boro and some youths from the Ijaw ethnic extraction in February 1967.

<sup>6</sup> In a related paper ("Oil-dependence and Civil conflict in Nigeria": forthcoming), I explore the interrelatedness between these various parts).

## 2. GREED, GRIEVANCE AND OPPORTUNITY

Resource-availability and extraction may contribute to civil conflict by providing rebels with an opportunity to loot and by creating grievances that exacerbate separatist tendencies (Ross, 2001). Theoretical explanations of the link between natural resources and civil conflict have typically followed these two approaches (Sambanis, 2004). Relative deprivation theories of natural resources and civil wars explain rebellion by atypical severe grievances arising from high level of inequality, government repression and lack of political rights, or ethnic and religious divisions (Borjas 1992, 1995; Easterly 2003; Goodhand, 2003; Cramer, 1999; Moore, 2000; Stewart and FitzGerald, 2000). As the Netherlands Institute of International Relations *Clingendael* (2003) observes, poverty, resource scarcity and inequality hold high mobilizing qualities in rebellion and may be extremely potent when they combine with other factors such as discriminatory and exclusionary policies and failure of political institutions.

Rationalist theories, however, focus on the opportunity to organize rebellion. The emphasis on rebel opportunity rather than grievance was popularized by Skocpol (1979). However, the author focused on political opportunities which make a revolution feasible. Rationalist theories of natural resources and civil war extend this consideration by focusing on the economic opportunities which resources availability presents for rebellion. These models are similar to Becker's (1957) economic model of crime and draw heavily on Grossman (1991, 1995) and Hirschleifer (1995). Rebellion is modeled as an outcome of *kleptocratic rivalry* or as an industry that generate profits from looting (Grossman 1999)<sup>7</sup>, or as an uprising of the poor against the rich with a view to achieving a transfer of resources (Hirschleifer, 1991), or as a quasi-criminal activity (Collier, 2000). In these models, conflicts are outcomes of rational decision making on the part of actors. Actors "choose" conflict when it is more profitable (Hirshleifer 1994). In the words of Collier (2000) "rebellion is motivated by greed, so that it occurs when rebels can do well out of war".

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<sup>7</sup> The author sees no difference between rebellion and crime. Collier (2000) however provides a distinction by consideration of factors such as income level and distribution, structure of the economy and group identity. He identifies a continuum in the scale of criminal violence from the violent robbery perpetrated by one individual against another, through gangs and mafias, up to large-scale conflicts with the state. While violent crimes typically occur within rather than between communities, rebellion often adopts the discuss of grievance and the battle line of ethnic, religious and class division.

There is now a general consensus however about the limitation of the greed-grievance dichotomy in explaining the link between natural resources and civil war (Karen and Sherman, 2003; Collier and Hoeffler, 2002a; Collier and others, 2003:89)<sup>8</sup>. The relationship between greed and grievance in rebellion is symbiotic. Rebellion needs grievance to mobilize and overcome the severe constraints on entry<sup>9</sup>. It also needs greed for it to be sustainable (overcome the financial viability constraint). Thus greed may need to incite grievance for rebellion to get started. Natural resource availability, particularly when the resource is *lootable* and/or *obstructable*<sup>10</sup> provides a unique opportunity for the existence and sustainability of a rebel organization irrespective of whether it is justice-seeking (grievance-motivated) or loot-seeking (greed-motivated) (Collier and Hoeffler, 2002a; De Soysa, 2000).

Collier and Hoeffler (2002a) and Fearon and Laitin (2003) provide two recent applications of the rational choice theories, which explain rebellion as the outcome of rational decision-making subject to the constraint of the labor market. The risk of rebellion increases as per capita income, educational level of the citizens, economic growth declines. This is attributable to declining opportunity cost of violence (and the accompanying reduction in the supply of potential rebels, as in Collier and Hoeffler, 2002a) or to declining state capacity (as in Fearon and Laitin, 2003). According to Fearon and Laitin (2003), the supply of rebels increases if the state is “weak” (where state weakness is measured by income size) and cannot effectively police its territory. In addition, mountainous terrain and a large population make policing more difficult<sup>11</sup>. On the other

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<sup>8</sup> The authors argue that rebellion or civil war has not occurred in some current and historical cases of grievous injustice, such as occur in highly repressive societies (e.g. Iraq and Democratic Republic of Korea) or highly unequal societies (such as Chile and Kenya). Again, some states with large aid flows (e.g. Tanzania) which makes them attractive to capture does not face any greater risk of rebellion.

<sup>9</sup> Analogous to the existence of the free-rider problem for grievance-motivated rebellion and barriers to entry in imperfectly competitive industries, rebellion motivated by greed requires a certain minimum army size for survival (the entry threshold: Collier, 2000).

<sup>10</sup> The concept of lootability is defined in terms of the ease with which a resource can be appropriated by individuals and small groups of unskilled workers (Ross 2002; Collier and Hoeffler 2002; Le Billon, 2001). Obstructability defines the ease with which the processing or transportation of a resource can be interrupted. According to Ross (2002), a resource is obstructable “when its transportation can be easily blocked by a small number of individuals with few weapons”. It is relatively unobstructable “when it can be blocked with many soldiers and heavy equipment”. Oil and natural gas are highly obstructable when they have to be transported long distance through above-group pipelines and trucks. Resource location also affects its obstructability; offshore oil is, for example, relatively unobstructable (Ross 2002).

<sup>11</sup> Several earlier studies has emphasised state weakness as a cause of insurgency (for example, Fearon and Laitin, 1999; Hobsbawn 1973; Russel 1974) or the political dysfunctions of resource-dependent states (Ross, 1999; Karl 1997; Luciani 1990; Mahdavy 1970). Others have emphasised the geographical

hand, higher income and educational attainments reduce the risk of political violence by encouraging political participation and channeling conflicts through institutional pathways rather than violence (Collier and Hoefler, 2002a)<sup>12</sup>.

In the section that follows I present a theoretical model of a conflict entrepreneur's<sup>13</sup> choice of communities and individuals to employ for rebellion and people's willingness to participate in a rebel army.

### 3. THE THEORETICAL MODEL<sup>14</sup>

Assume that a rebel leader's decision to conduct rebellion in a given region<sup>15</sup> is mainly motivated by the revenue that can be obtained from implicit or explicit taxation of the regional communities<sup>16</sup>. Let economic agents be endowed with a unit of labor  $l$ , stock of human capital  $h$

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characteristics of the regions where resources are located as contributory factors to the risk of civil war (Gates, 2002).

<sup>12</sup> Hegre (2002), Alesina and Perotti (1996), Hibbs (1973), Huntington (1968) also emphasize the role of education in reducing civil conflict and violence.

<sup>13</sup> The term is used to describe somebody that employs people and resources in conflict with a view to making maximum profit.

<sup>14</sup> The framework of the model is based on Deininger (2003). The author however focused on crime. I modify and extend the analysis to agent's decision to join a rebel army through a consideration of net benefits and opportunities cost and incorporate non-monetary benefits. Again, I acknowledge (but did not particularly model) the role of uncertainty and agent's attitude to risk in determining the values of benefits from rebellion and productive work.

<sup>15</sup> A region would consist of more than one community and probably more than one state. However these communities and/states would normally share common ethnic identity or characteristics and also be geographically contiguous. It can be assumed, as it always is the case, that the potential rebel leader would be interested in regional control (even though communities in the region may vary in their resource endowment), since it may not be possible to assert political and economic control over some communities in the region while others are left under the control of the State. The Niger Delta, especially the South-South zone of Nigeria, can be viewed as an ethno-regional group consisting of various communities. While some of these communities do not particularly have any oil endowment, the dispersion of oil resource across the region implies that unlimited access to the oil wealth can only be achieved by control over the entire region.

<sup>16</sup> The assumption of a greed-motivated rebellion is also not unreasonable in the case of the crisis in the Niger Delta region. For example, the Congress of Niger Delta Youths (CNDY) and the Ijaw Youth Congress (IYC) publicly disowned Alhaji Asari Dokubo, the leader of the NDVPF (which has recently metamorphosised into the Movement for the Emancipation of the Niger Delta: MEND), describing the group as one of those organizations seeking monopoly of the oil theft business (*The Punch*, Nigeria, 19 July,



as well as physical capital or asset  $k$ . Each agent can allocate her labor endowment either to productive activities ( $l_p$ ) or to rebellion ( $l_r$ ) so that

$$l_p + l_r = 1 \quad (1)$$

Wages in the productive sector depend on  $h$  and  $k$  according to a function

$$w_p(h, k) \quad (2)$$

with positive first derivatives. Communities or regions are assumed to be characterized by a public good endowment  $G_1$ , and pre-existing level of grievance,  $G_2$ . For a community or region where there is widespread discontent arising from a feeling of marginalization or injustice perpetuated by the State, for example,  $G_2$  will tend to be high.

The rebel leader selects communities or a region that provides a sufficient economic base such that he can finance rebellion by imposing a tax,  $t$  on the community or region (consider  $t$  as the rate of expropriation)<sup>17</sup>. For effective expropriation and soldiering, he would need to recruit at least  $n_l$  (number of) persons from each community (as fighters, informants or agents). In addition, since government forces constitute an active threat to rebel survival, rebellion faces the organizational problem of surmounting an entry threshold. The rebel force must exceed some critical level necessary for survival otherwise there will be rebel exit (Collier 2000).

Collier (2000) argues that the relationship between rebel forces and government forces is proportional, such that  $n_l \geq \alpha n_2$ , where  $n_2$  is the size of government forces and  $\alpha$  is a factor of

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2004). The two organizations claim to be the legitimate vehicles for the promotion of change with the object to seek, through dialogue, the economic and political development of the people of the Niger Delta. Reports from daily newspapers as well as foreign organizations appear to confirm this allegation. They also reveal the existence (as at the time of investigation) of a rival group said to be as powerful as the state and enjoying the backing of prominent persons in government (Human Rights Watch, 2005; *The Punch*, Nigeria 30 September, 2004. p6).

However, the assumption of a loot-seeking rebellion is not even necessary for the workability of the model, as it is now commonly agreed that even if a rebel leader is motivated by grievance and not by greed (i.e., rebellion is justice and not loot-seeking), financial resources are needed to prosecute rebellion and the availability of *lootable* and/or *obstructible* resources provides an incentive.

<sup>17</sup> We can view this taxation as a form of looting. For a region rich in oil, for example, this could mean the direct and indirect costs of such activities as bunkering (stealing of crude oil), vandalization of oil installations, pipelines and other facilities; kidnapping for ransom and other forms of extortion on individuals and the community at large. This could include increased insecurity, reduced economic opportunities, reduced socioeconomic activities as a result of increased military presence. When rebellion is successful, taxation takes the form of control of the resource wealth in which case the tax rate,  $t$ , equals unity from the rebel leader's perspective.

proportionality. The rebel force must grow from 0 to  $an_2$  before it can safely operate as a predator. Financial viability at this minimum size is also a necessary condition for the existence of rebellion. It follows that

$$n_1 = n(n_2, G_1, G_2) \quad (3)$$

with  $\partial n_1 / \partial n_2 > 0$ ,  $\partial n_1 / \partial G_1 > 0$  and  $\partial n_1 / \partial G_2 < 0$ . In other words, the number of persons a rebel leader would need to recruit within the community increases with the size of government forces available to crush rebellion and the public good endowment, and decreases with the pre-existing level of grievance. A higher level of  $G_1$  (better infrastructure) increases  $n_1$  in two ways. First, it makes it more difficult for rebel forces to hide from government's forces and also increases asset owner's ability to take preventive measures to avoid taxation, as in private oil companies mobilizing against attacks on facilities and staff. Second, a higher  $G_1$  tends to reduce  $G_2$ . Contrarily, higher  $G_2$  pre-disposes community members toward collaboration with rebels, therefore reducing the cost of initiating and sustaining violence.

Following Gates (2002), I assume that the benefit to be derived by an economic agent from joining the rebel group would consist of both pecuniary and non-pecuniary rewards.

$$B_1 = B_1(M, N, D), \quad (4)$$

where  $B_1$  is net benefit from joining the army,  $M$  is pecuniary benefits,  $N$  is non pecuniary benefits and  $D$  is the cost of joining the rebel army<sup>18</sup>.  $\partial B_1 / \partial M > 0$ ,  $\partial B_1 / \partial N > 0$ ;  $\partial B_1 / \partial D < 0$ . Pecuniary rewards may include wages, one-shot monetary rewards and other tangible rewards such as drugs or alcohol. Non-pecuniary benefits ( $N$ ) includes functional and solidarity rewards (Brehm and Gates, 1994). Functional rewards consist of satisfaction derived from performing a designated 'military' task as given. Solidarity rewards stems from the camaraderie among members of an armed group, a sort of bond developed among members as a result of continuous association in risky environments (Gates, 2002). Wood (2003), Weingstein (2005) also highlights the importance of honour, reputation and agency in providing impetus for collective action.

Some benefits come in the short period. But a larger part may be conditioned on rebel success, in which case the value to the individual would depend on his estimation of the probability of success and his subjective discount rate (attitude to risk). A projected high probability of victory raises the value of the benefit while a strong risk aversion reduces its value to the individual.

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<sup>18</sup> In the limit, this may mean physical death.

The benefit derived from not joining the rebel force, i.e., engaging in productive labor, will be a function of the wage rate and the rate at which rebel army expropriate community's wealth or reduce socio-economic opportunities<sup>19</sup>. Thus

$$B_2 = F(w_p, t) \quad (5)$$

where  $\partial F / \partial w_p > 0$  and  $\partial F / \partial t < 0$ .

For any individual  $i$

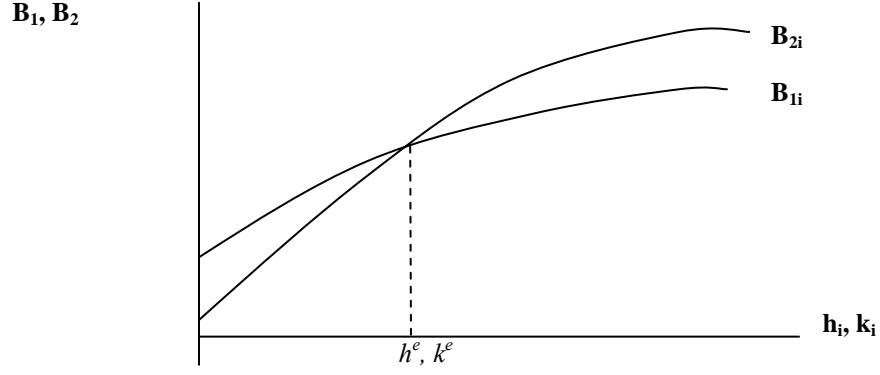
$$w_{pi} = w_i(h_i, k_i, g) \quad (6)$$

where  $g$  is the economy's growth rate. We can think of  $k_i$  as  $i$ 's stock of physical capital, e.g., agricultural land, machineries for production, etc or other forms of asset such as landed property.  $w_{pi}$  will be lower for individuals with smaller  $h$  and  $k$ , but it will also be influenced by the average wage rate, which will depend on the level of productivity in the community and the growth rate of the economy ( $g$ ). Also, in a society with a high unemployment level,  $w_{pi}$  may not be available with certainty irrespective of the individual's level of human capital ( $h_i$ ).

For sufficiently high values of  $t$  and/or abysmally low values of  $w_{pi}$ ,  $B_{1i} > B_{2i}$  in which case, agents will prefer to allocate the whole of  $l$  to rebellion rather than to productive work. In general, for any given  $t$ ,  $B_{1i}$  tends to exceed  $B_{2i}$  at low levels of  $h_i$  and  $k_i$ , and the agent allocates  $l_i$  to rebellion. At higher levels of  $h_i$  and  $k_i$ ,  $B_{1i}$  tends to be lower than  $B_{2i}$  and it is optimal to employ  $l_i$  in productive work rather than in rebellion (Fig 1). It is also clear that for a given  $w_p$  and  $g$ , there is a minimum level of  $h$  and  $k$  (denoted as  $h^e$  and  $k^e$  in Fig1) for which the individual is indifferent between engaging in productive labor and participating in rebellion.

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<sup>19</sup> If rebellion is successful, the rate of expropriation may become zero since there would be a new order of peace, and it may be impossible to exclude the individual from enjoying some of the general benefits.



**Fig. 1: Benefit and opportunity cost of joining a rebel group for given  $h$  and  $k$**

Consider the optimizing behavior of the potential rebel leader. For rebellion to be sustainable, it must be financially viable at the minimum size of the rebel forces that constitute the entry threshold. In regional community  $j$ , with public good endowment,  $G_{1j}$ , a level of pre-existing grievance  $G_{2j}$  and natural resource endowment level  $R_j$ , the rebel leader's profit is given as

$$\Pi_{rj}(R_j, G_{1j}, G_{2j}, h_{ij}, k_{ij}) = tR_j - n(G_{1j}, G_{2j})w_{ri}(h_{ij}, k_{ij}) \quad (7)$$

where  $tR_j$  is the total rent extracted from the community (region) and  $w_{pi}$  is the pecuniary benefits that must be provided to make individual  $i$  indifferent between allocating  $l_i$  between rebellion and production<sup>20</sup>. Profit increases in the resource endowment of the community (region) as well as in the pre-existing level of grievance, falls in the pre-existing level of public goods and in recruits' levels of human and physical capital (or asset). Thus, the profit maximizing decision of the rebel leader will consist in choosing communities with higher resource endowment and recruiting individuals with endowments of  $h$  and  $k$  at the bottom of the distribution (i.e. persons with low levels of human and physical capital or asset) and/or share a common ethnic, religious, ideological or class background, such that the benefits from joining the rebel army outweighs the opportunity cost in terms of foregone income. At the same time, agents with lower  $h$  and  $k$  are more likely to find it optimal to allocate labor to rebellion and violence rather than productive work. Such agents are incentive compatible with the rebel leader and their availability in large number in a community reduces the cost of organizing rebellion. It also enables the rebel leader

<sup>20</sup> I assume that non-pecuniary benefits are provided costlessly by the rebel leader. In order to attract agents into rebellion, the rebel leader has to offer a reward ( $B_{1i}$ ) at least equal to  $B_{2i}$ .

to overcome the collective action problem normally associated with grievance-motivated rebellion<sup>21</sup>.

The potential rebel leader (the government) could also seek to manipulate the cost-benefit structure faced by any given individual in a manner that makes participation (non participation) in rebellion the most highly-valued option (Brough and Elliot, 200?). This can be done through the use of incentives and disincentives for participation (Keen 2000; Brough and Elliot, 200?; Lichbash 1994; Popkin 1979). For example, it may be possible for the rebel leader to use pecuniary enticements, particularly if the economy is underdeveloped and there are limited opportunities and benefits from market participation, or the mobilization of “social capital” (common collective identities or tight social networks) (Taylor, 1988; Weingstein, 2004), or exploitation of personal grievances (Moore, 2000). Similarly, the government can establish and maintain appropriate economic policies that stimulate and sustain growth or provide goods and services to the segment of the population that has the tendency to rebel. Each of these will raise the opportunity cost of rebellion.

When and where possible, the potential rebel leader could also inflict terror or “punishment” on those who are unwilling to participate in rebellion thereby creating a disincentive to non-participation. In the same way, the creation of effective military and police forces, a functioning intelligence gathering capability, stiff penalties against civil disobedience and the deployment of these in counter-insurgency are disincentives which the government may employ to raise the cost of participation<sup>22</sup>. Brough and Elliot (200?) argue that selective disincentives may be used more

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<sup>21</sup> Ordinarily, it is difficult to mobilize large scale participation required for a successful insurgency, since many of the collective benefits of a successful insurgency (e.g grievance alleviation or the provision of justice), assuming there are, will be realized independently of participation. The theories of collective action, for example, Olson, 1965, consider large-scale collective action against the state a very remote possibility. However, Brough and Elliot (200\*) argue that the “free-riding” problem which limits collective organized violence only becomes serious when the cost of participation is substantial.

<sup>22</sup> It can be said that in the past few years the Nigerian government has provided both massive incentives and disincentives to raise the cost of rebellion in the Niger Delta. For example in 2001, the federal government launched the Niger Delta Development Commission (NDDC) with the sole objective of developing and executing a master plan for the overall development of the Niger Delta. The NDDC is an attempt to break away from past practices and results, and is supported by the World Bank and the United Nations Development Program (UNDP). Again, in an attempt to diffuse tension and secessionist tendencies, the government introduced a system that transfer 13 percent of federally collected oil revenue to the oil-producing states. As a way of deterrence however, the government has maintained military presence in the communities and has often employed the tool of repression. It also recently arrested the leaders of the NDVPF, its rival Niger Delta Vigilante (NDV) and the Movement for the Actualization of the Sovereign State of Biafra (MASSOB).

often if the relative cost of providing disincentives is lower than the price of providing incentives<sup>23</sup>

#### **4. MODEL ESTIMATION**

The theoretical model predicts that the individual's propensity to rebellion is a function of some individual-level characteristics, some community-level factors and the extent of personal grievance. In this section I provide a test of these predictions.

##### **4.1 Sample Design and Data Collection Methods**

The empirical analysis focuses on three states in the Niger Delta region: Bayelsa, Delta, and Rivers. Taken together, these states constitute the heart of the Delta and account for the bulk of Nigeria's oil production. The incidences of violent conflicts have also been especially concentrated in these states in the last six to eight years. These features combinedly make them the states of choice. To generate the sample, I selected four local government areas (LGAs) in each state<sup>24</sup> and seven or eight communities from each of the four LGAs. In all 23 communities were selected for the study.

The first phase of the field study involved carrying out a preliminary investigation of the selected communities, conducting focused group discussions (FGDs) and personal interviews with individuals and non-governmental organizations (NGOs) working in the area of conflict prevention and resolution or community development in the selected states. The second phase involved administering 1,500 structured questionnaires on selected individuals in the three states using systematic sampling technique<sup>25</sup>. A total of 18 (six from each state) communities drawn

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Ethnic militias have also employed massive incentives for participation. "Oil bunkering" (stealing of oil), kidnapping for ransom has been a "booming business" in the Niger Delta for some time. According to a report (Collier and Hoeffler, 2005), organised groups earn up to US \$1 billion per year from large-scale "bunkering" in Nigeria, a situation the Nigerian government has only recently begun to address. A lot of propaganda has also been employed by militias to boost public perceptions of their military capabilities.

<sup>23</sup> The analysis ignores third-party involvement which can shift the cost of participation. For example, Collier and others (2003) and Elbadawi and Sambanis (2000) suggest that support from "external patrons" reduces the cost to rebel groups of organizing violence, which makes civil conflict more likely.

<sup>24</sup> An exception is Bayelsa state where the sample cuts across five local government areas. The list of communities is appended.

<sup>25</sup> First, we selected some catchments (areas), where we knew that youths could easily be found (e.g., community halls, motor parks). Second, we determined the number of streets (or major streets) in the community and allocated a fixed number of questionnaires to each street. We then determined the

from the 23 covered in the first phase were chosen for the second phase of the survey<sup>26</sup>. The questionnaires were administered only on males, with a bias towards those who by casual observation are above 15 years old. The focus on males was deliberate. While females (women) have been involved in oil protests in the Niger Delta in recent times, young males remain the best recruits for armed struggle (Collier, 2000; Elbadawi and Sambanis, 2000). At the end of the exercise, a total of 163 ill-conditioned questionnaires were rejected which left us with a functional sample size of 1337.

#### **4.2 Sample Characteristics**

The sample of individuals and communities used in the study gives useful insights. Descriptive analyses (Table 3) show significant variation in the communities in terms of quantity of oil endowment, distance from state capital, social infrastructure and conflict history (this is reflected in the very high standard deviations for these variables). While 38.87 percent of the communities sampled had no oil, those that had oil varied significantly in terms of quantity of endowment. There is also significant variation in income and socio-economic access (personal inclusion) among individuals in the sample. In addition, while 67.14 percent of the people sampled have at least one form of asset, there is significant variation in the assets held.

Only 27.67 percent of the population sampled are unemployed, but income level is generally low. With a mean income class of 0.99, 69.36 percent of the sampled population earns below N7, 000 (about US \$51.47) and 90.08 percent below N15, 000 (about US \$110) a month. Formal educational attainment is also low with only 9.27 percent having completed tertiary education and 51.49 percent never going beyond primary educational level. A generally high level of personal grievance against the Nigerian State is also noticeable. 80.84 percent of sampled population

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residential houses/business premises to be visited using a simple formula  $j = N/n$ , where N is the number of residential houses/business premises in the street and n is the number of questionnaires to be administered in the street. For example, if  $j = 5$ , we begin with the first premise (building), and thereafter, visit each successive fifth premise. In each of the places visited, a male of not less than 15 years old (by observation) was interviewed. Only, one individual is selected from each premise. In order to avoid any bias arising from group influence, selected individuals in the catchments areas were interviewed separately. For example, each field assistant picks one prospective respondent and interview the individual in some distance apart.

<sup>26</sup> As a first step, the questionnaire was pre-tested on 25 respondents randomly selected from two communities in Delta state with a view to gauging its effectiveness, after which some slight changes were made. For example, questions 11 and 13 in the Questionnaire were introduced after the pre-testing. The 18 communities were selected in a way as to make the sample as representative as possible, based on observations in the first phase of the survey. In addition, two communities were dropped as a result of extreme difficulties and risk encountered in the first phase.

expressed a high grievance level while 13.81 percent do not feel as strongly aggrieved. Only a low of 5.12 percent feel personally satisfied or undisturbed with the status quo. Paradoxically, there is a general positive expectation about the future (hope), with only 4.68 percent of the sampled population expressing despair or uncertainty. 77.74 percent of communities surveyed have experienced at least one violent conflict<sup>27</sup> over the past 10 years from the date of survey.

### 4.3 Data

The **Dependent Variable** (*rebel\_participation*) is a dummy indicating that the respondent is willing to be engaged in an armed struggle for self determination<sup>28</sup>.

#### Independent Variables

##### *Individual-level variables*

*Ethnic* is a dummy which takes the value of 1 if the respondent is an *Ijaw* and 0 otherwise. About 14 million *Ijaws* constitute the largest ethnic group in the Niger Delta and the fourth largest ethnic group in Nigeria (Catholic World News, 2004).

*Unemployment* is a dummy measuring the state of unemployment. It takes the value of 1 if the individual is currently unemployed and is not a full-time student or apprentice, and 0 otherwise.

*Studentship* is a dummy indicating that respondent is currently a full-time student in a formal educational institution or apprentice in a vocational training.

*Education* is a discrete variable that measures the level of respondent's formal educational attainment. The variable takes on a value of 3 if respondent completed tertiary education, 2 if respondent completed secondary education, 1 if respondent completed primary education, and 0 if respondent has no formal education.

*Marriage* is a dummy which takes on the value of 1 if respondent is married and 0 otherwise<sup>29</sup>.

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<sup>27</sup> I define a violent conflict as one involving destruction of life and/or property.

<sup>28</sup> The data is derived from answers to the question “*Will you be willing to join a group that will be able to fight to ensure that your community and other communities in the Niger Delta own and manage the oil in their lands?*” It takes a value of 1 if respondent's answer is “yes” and 0 otherwise.

<sup>29</sup> It is possible to make further distinctions, e.g., if divorced or separated, if married with children etc. But I assume that the distinction between married and unmarried is adequate for the purpose of this study.



*Asset* is a dummy that takes on the value of 1 if respondent has a physical asset and 0 otherwise. Three types of assets are considered: landed properties and farmlands, motor vehicles and motor bikes, and machineries that could be used to generate income.

*Assetimmobility* is a dummy that indicate that the asset possessed is highly immobile. Only one class of asset is classified as highly immobile: landed properties and farmlands.

*Farmland* is a dummy whose value is 1 if asset possessed is a farmland and 0 otherwise.

*Farmoil* is a dummy whose value is 1 if asset possessed is a farmland **and** respondent's community is endowed with oil.

*Income* is respondent's average monthly income if employed. The variable takes discrete values ranging from 1 to 7 based on respondent's income bracket. The purpose of measuring income level by income groups rather than the absolute value of income is to avoid having a very large standard deviation for the variable relative to others (Long, 1997:54).

*Inclusion* is a measure of respondent's personal and economic access. It is a discrete variable derived by summing values on some measures of socio-economic access, which includes access to three basic amenities: pipe borne water, modern toilet facility, and electricity. Others are access to education (if respondent is of school-going age) *or* access to employment (by type), and access of children or siblings to secondary or primary education. The variable takes on values from 0 to 11.

*Hope* is a dummy that takes on the value of 1 if respondent expresses hope in the future and 0 otherwise.

*Grievance* is a discrete variable measuring the extent to which the respondent feels personally aggrieved against the Nigerian State or its institution. The variable takes on a value of 0 if respondent exhibit no personal grievance, 1 if respondent shows a moderate grievance, and 2 if respondent exhibits a high grievance<sup>30</sup>.

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<sup>30</sup> The data is derived from answers to the question "As a citizen of Nigeria, do you feel cheated or marginalized?" Responses are coded 2 for "Yes (highly)", 1 for "Yes (fairly)", and, 0 for "Unsure" and "No".

### *Community-level characteristics*

*Oil* is a dummy that takes on the value of 1 if the community in which respondent is resident has a proven oil endowment and 0 otherwise.

*Oilsize* measures the size of oil endowment in respondent's community of residence. The value is determined by the number of oil wells in the community and ranges from 0 to 31.

*Infrastructure* is a discrete variable that measures the extent to which the community the individual is resident is endowed with physical (social) infrastructure. The value is derived by summing up available tarred (paved) roads (measured in kilometers and scaled down by the minimum kilometer of tarred road in the communities covered), the number of functional public schools and hospitals, and other public projects such as town halls or recreational sites available in the community; and ranges from 2 to 22.

*Government* is a discrete variable denoting government's presence in the community. This is measured by the number of state or federal government establishments in the community. Its value ranges from 0 to 2.

*Distance* is a variable measuring the distance between the individual's community of residence and the state capital. The value is based on the cost of transportation from the former to the latter. Actual costs are scaled down by the minimum transportation cost in the sample. The resultant data ranges from 1 to 43.33.

*Conflict* is a variable measuring the extent to which the individual's community of residence has been exposed to violent conflicts. The value is determined by the number of violent conflicts the community has experienced in the last ten years from the date of the survey (March, 2005). I define a violent conflict as one involving a loss of life and/or properties.

*Delta* is a geographic dummy indicating that respondent's community is geographically located in Delta state.

*Rivers* is a geographic dummy indicating that respondent's community is geographically located in Rivers state and 0 otherwise.

While the data gathered from the survey are to the best of my knowledge reliable, there are obvious limitations in the use of the data to generate values for some variables. For example, the decision on what should be the basis for measuring *inclusion* and the weights attached to each of

the factors used is arbitrary. Again, the data on *infrastructure* basically ignores the quality of existing social infrastructures. Also, the *asset* dummy ignores the number or quantity of assets an individual may possess (e.g., an individual with one residential building is treated the same as one with two or more residential buildings) and also the variation in the quality of each type of asset, while data on *oilsize* assumes that a larger number of oil wells translates to a larger endowment of oil. In addition, the figures on the number of oil wells and data on *conflict* are taken as given by community leaders with verification only where possible. However, these limitations are considered acceptable given the absence (or inaccessibility) of official data on these variables. In addition, the data is considered fairly adequate for the purpose of this study, since the main interest is not in the exact figures but in the relative measurements.

### ***Data Grouping***

Following the theoretical literature, I attempt to group the variables into two: those that reflect the motivation for rebellion, and others that reflect opportunity (Table 4).

I consider control over oil rents to be the major potential benefit from rebellion. It is also plausible to assume that the larger the size of the endowment, the greater is the potential benefit. Again, it may be assumed that individuals from the majority ethnic group in the Niger Delta (the *Ijaws*) stand to benefit the most from an independent Niger Delta. These expected benefits can be a major motivation for participation in rebellion.

In the same manner, unemployment; personal economic and social exclusion; absence of social infrastructure at the community level; environmental cost imposed by oil extraction and production activities; physical, monetary and psychological costs imposed as a result of past experiences of violent conflict and other traumatic experiences encountered by an individual or community in which he belongs; may generate personal grievance, which in turn feeds into a disposition to armed rebellion<sup>31</sup>. Similarly, the absence of any government presence (in terms of a government establishment) in a community may create a feeling of corporate exclusion which generate grievance. Also, it may be expected that the *Ijaws* who constitute the largest ethnic group in the Niger Delta (and hence account for the largest share of Nigeria's oil production) are likely to feel more personally aggrieved in relation to the sharing of the nation's oil wealth.

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<sup>31</sup> Conflict history of community may affect the disposition to armed rebellion through channels other than grievance; for example, by building up conflict capital, or by creating a disincentive for further conflicts.

The presence of onshore oil in many parts of the Niger Delta raises the financial viability of rebellion. A lack of government presence; longer distance from state capital; and lack of infrastructure, especially access roads; also reduces the risk of participation. However, higher educational attainment, higher income level from present employment, asset possession and/or asset-immobility, marital commitment, enrolment in a formal educational institution or on-going vocational training (apprenticeship), increases the individual's opportunity cost of participation. Also, while larger oil endowment offers larger potential benefits from rebellion, it raises the prize to be won by both sides in a conflict, and thus tends to increase the intensity of conflict. In particular, larger oil endowment may increase the risk of participation through the "*pre-emptive repression effect*", whereby the government acts strategically to protect its control of a resource by using terror against the population (Ross, 2004a).

#### **4.4 Estimation Procedure and Results**

##### ***Estimating the Propensity to Armed Struggle***

Table 5 presents the estimated coefficients of the explanatory variables and the associated z statistic for the *Logit model* on the propensity to armed rebellion and the predicted probability of participation. The diagnostic tests show that the model fits fairly well and we can reject the hypothesis that none of the regressors determine the propensity toward armed conflict. About 36.18 percent of the sampled population revealed a propensity to take up arms against the state. This implies the existence of a potential rebel army size of 1, 262, 271 (or 24.19 percent of the overall male population) in the three states that constitute the heart of the Niger Delta<sup>32</sup>.

An examination of the results reveals five individual-level and four community-level characteristics that determine the propensity to armed conflict in the Niger Delta. At the individual level, the combination of a low income, low formal educational attainment, lack of marital bond, and lack of asset (or possession of highly mobile asset), reduces the propensity to armed conflict. (This agrees with predictions of the theoretical model developed in section 3).

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<sup>32</sup> The figure is derived as follows. I estimated the population for the three states based on figures for 1998 provided by the Federal Office of Statistics (FOS), Nigeria, using the formula,  $P_t = P_0 e^{rt}$ , with  $r = 0.0283$ . With information provided on the sex and age distributions of the population, I was able to estimate the male population size for each age group in my sample. Next, I found the percentage of the population in each age group in the sample that indicated a propensity to armed struggle and multiplied this by the projected population for the group. The final figure was derived by summing the figures for the various groups in the three states.

Since Bayelsa State came into existence after 1998, and was carved out of the other two, figures provided for Delta and Rivers States were used to estimate the population of the three states.

The propensity is however increased if the individual is from the majority ethnic group in the region and expects his tribe to benefit the most from a successful rebellion.

At the community level, the availability of oil in a community that is administratively peripheral (i.e., the community is far away from the state capital and registers no government presence) makes the community a haven for would-be rebels. The size of the oil endowment however has a negative effect on the propensity to armed conflict. While the discovery of oil in a community is likely to trigger violence, the probability of participating in armed conflict reduces as the quantity of oil resource available in the community increases. From these considerations, it appears that the communities with the highest conflict risk are those with marginal oil endowments and are also administratively peripheral. Intuitively, these communities are also the most disadvantaged. They suffer from the negative effects of oil exploration and rent seeking contest among participants at the local level, which communities without oil may not experience. But they do not have enough oil to secure government's or oil companies' attention as do those with large oil endowments.

Why does the size of oil endowment exhibit a beneficial effect on the propensity to violent conflict?<sup>33</sup> At the micro level, larger oil endowments may make the residents of a community to be less willing to engage in civil disobedience in order not to attract the wrath of the state and the ensuing disorder and pillaging that may result (i.e., it may create an incentive for locals to protect their endowment even if ownership is merely psychological). It may also be that communities with larger oil endowments have already been securitized (the state considers such communities of vital importance and maintains a larger network of security personnel in the area: Klare, 2002, Ross 2004a) so that rebellion is potentially prohibitive. It is also plausible that communities with larger oil endowments also enjoy larger endowments of social infrastructures and amenities since allocation of resources by the various intervention agencies to oil producing communities in the Niger Delta has been based on the share of oil revenue contributed by each community, and oil companies' "development programs" are often directed toward the communities they benefit

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<sup>33</sup> Collier and Hoeffler (2002b) posit the existence of a nonlinear relationship between oil-availability and civil conflict. The larger the oil endowment, the greater the capacity of governments to maintain an extensive security network, and hence the greater the ability to overcome any civil uprising. Other studies have explored the beneficial effects of very large oil wealth, but these studies approach the discussion from the macro level.

from the most in terms of oil exploration<sup>34</sup>. Finally, it is reasonable to assume that the larger a community's oil endowment, the greater the incentive for oil companies to buy peace.

Given the non-significance of *grievance* in the estimated results, I proceeded to check whether the data provide a systematic and rational explanation of personal grievance among the population. To this end, I estimated an *Ordered Regression Model* on *grievance* (McElvey and Zaviona, 1975). The results (Table 6) show that we can safely reject the hypothesis that none of the regressors determine grievance. The estimated thresholds (*cutpoints*) which separates between no grievance and low grievance and between low and high grievance levels are also highly significant, thus justifying the use of the ordered regression model and the choice of the three outcomes.

From the results, six variables systematically explain *grievance*: *infrastructure*, *ethnic*, *education*, *inclusion*, *farmland*, and *income*. Personal grievance level falls as income level, personal socio-economic access, increases and also with increases in social infrastructure at the community level. However, surprisingly, *grievance* increases in the level of educational attainment. This result suggests that *higher educational attainment brings increased awareness which tends to generate grievance when the factors that are capable of producing grievance are present*. The possession of a farmland (as opposed to other types of assets) also increases grievance level but it is difficult to link this with the negative effects of oil exploration and production activities since *farmoil* is highly insignificant in the model. The positive effect and high significance of ethnic in explaining *grievance* tends to lend empirical support to the submission in the literature of the existence of close, sometimes inseparable, connection between grievance and greed in motivating rebellion. The comparison of these results with the descriptive and complementary analysis of the factors at the root of personal grievance in the sampled population (Table 7) reveals some similarity.

Thus, the conclusion that can be drawn from the two set of regression results (Tables 5 and 6) is that while a high level of grievance exists in the sampled population and this can be systematically explained, grievance in itself does not appear to create a disposition to armed conflict. In addition, the variables that are more commonly associated with grievance in the region, such as personal socioeconomic exclusion; corporate exclusion, as revealed in lack of

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<sup>34</sup> The pair-wise correlation analysis shows a positive but moderate correlation between quantity of oil and endowment of social infrastructure.

social infrastructure at the community level; and the negative effect of oil exploration and production activities; while important in themselves, do not appear to have mobilizing power for rebellion. In contrast, all the factors that are used to proxy opportunity in the model (except studentship) are statistically significant thus suggesting that factors that reduce the opportunity cost and risk of participation or increased the perceived benefits are more important. Even though lower income level tends to increase grievance level, its effect on the propensity to armed struggle appears to be via opportunity rather than grievance. Also, state-level differences appear to matter.

### ***Some further Analyses and Robustness Checks***

I investigated the effect of variations in some of the statistically significant variables on the predicted probability of participating in armed conflict (Long, 1997). I find that even though the beneficial effect of larger oil endowment is monotonic, it is not strong enough to totally overcome the corrupting influence of oil availability (Fig. 2 illustrates). For example, an increase in the number of oil wells from 1 to 31 (the highest in the sample) reduces the probability of participation by only 23 percent from 0.4143 to 0.3189. Thus, oil endowment will have to grow to an infinitely large size to completely neutralize the negative effect of oil availability on the probability of participation. The beneficial effect of increases in income on the predicted probability of participation also decreases as we move from the lowest to the highest income group in the sample (Fig. 3). The same form of nonlinearity can be observed in the case of increases in educational attainment (Fig 4). However, the effect of increases in government presence is almost linear (Fig 5).

To further explore the effect of these factors on the propensity to armed conflict and the probability of participation, I generated two samples which are subsets of the overall sample. The first, which I call the “*high-risk*” sample, consists only of respondents with low income, low educational attainment and no marital bond<sup>35</sup>. The second, called the “*geographically risky*”

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<sup>35</sup> Low income is defined as  $INC \leq 2$  (i.e. income of less than N15, 000: about US\$110 a month). Low educational attainment is defined as  $EDU \leq 1$  (Primary education or less). I do not include “no asset” as one of the characteristics of this sample because doing so reduces the size of the sample beyond manageable level. Also students and apprentices are not included.

sample, consists of respondents in communities whose characteristics favor rebellion<sup>36</sup>. I then estimated version of the logit regression on *rebel\_participation* for each sample.

The regression results for the “*high-risk*” sample are presented in Table 8. The variables that determine the propensity to armed struggle (and the probability of participation) in this sample are oil-availability in the community, government presence and the size of oil endowment. As in the overall sample, government presence and larger oil endowment constrain the propensity to rebellion while oil availability spurs rebellion. At the personal level, ethnic identity and grievance do not matter for this group of individuals while distance loses its significance at the community level.

I examined the effect of variations in oil-availability and government presence on the propensity to armed struggle among individuals in this group and find that the discovery of oil in a community that has been without oil (holding other variables constant) increases the propensity by 13.52 standard deviations. This compares unfavorably with the 6.22 standard deviations increase in the general sample. Similarly, a standard deviation increase in government presence reduces the propensity to armed struggle by 3.82 standard deviations (compared to 0.87 in the overall population).

This contrast is even more striking in terms of odds ratios. While oil discovery (other variables remaining constant) raises the odds of participating in an armed struggle by a factor of 5.38 (438 percent) in the overall sample, the odds are 38.36 larger in the “*high risk*” sample! Thus the effect of oil discovery on the odds of participation is more than seven times larger in the latter than in the former. In the same vein, the effect of a “one unit increase in government presence” (other variables held constant) on the odds of participation is about two and a half times as large in the “*high risk*” sample compared to the overall sample. While a one unit increase in government presence reduces the odds of participation by a factor of 0.73 (or 27 percent) in the overall sample, the odds are reduced by a factor of 0.33 (67 percent) in the latter.

Only four individual-level variables statistically determine the propensity to armed rebellion in the “*geographically-risky*” sample: *ethnic*, *income*, *education* and *hope* (Table 9). The first three variables have the expected signs but *hope* is positively related to the propensity to armed

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<sup>36</sup> This sample consists of communities with oil, distant from state capital and without government presence. A community is adjudged to be distant from state capital when the value of *distance* is higher than the overall average (8.23).



struggle. *It appears that a positive expectation about the future feeds into the propensity to armed rebellion in communities where the geographic characteristics increase the probability of success.* While the effect of a variation in income level on the propensity to armed struggle is not significantly different in the “*geographically-risky*” sample compared to the overall sample (even though it is slightly higher in the former), there is a remarkable difference in the effect of variations in educational attainment. While a standard deviation increase in educational attainment (other variables remaining the same) reduces the propensity to armed rebellion by 2.06 standard deviations in the “*geographically risky*” sample, the effect on the propensity to armed rebellion in the overall sample is -0.92 standard deviations. In terms of odds, a one unit increase in educational attainment reduces the odds of participation in armed struggle by 53 percent in the “*geographically-risky*” sample compared to 28 percent in the overall sample.

Finally the mean predicted probability of participation is higher in the “*high-risk*” and “*geographically-risky*” samples compared to the overall sample, and highest in the “*geographically-risky*” sample at 0.78 (Table 10).

## 5. CONCLUSION

This paper attempts to explain the determinants of the propensity to armed struggle and the probability of participation by individuals in the Niger Delta region of Nigeria using primary (micro) data. About 36 percent of the sampled population revealed a likelihood of participating in an armed struggle, implying the existence of a potential rebel army size of about 24 percent of the overall male population in the three states that constitute the heart of the Delta. This is a formidable size and indicates that the risk of an armed struggle in the region is not illusory.

While grievance appears to be pervasive among individuals and communities and is systematically explained by the data, neither grievance level nor its commonly-cited causal factors, appear to be strong enough to create a disposition toward armed rebellion. Rather, factors that reduce the opportunity cost and risk of participation or increase the perceived benefits appear to be more important. Three of these factors (income level, educational attainment, and government presence) are amenable to policy makers’ control.

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**Table 1: Mineral Resources and Secessionist Movements**

Country	Region	Duration	Resources
Angola	Cabinda	1975-2002	Oil, Diamonds
Burma	Hill tribes	1949-	Tin, gems
Congo, Dem. Rep.	Kantaga/Shaba	1960-65	Copper
Indonesia	West Papua	1969-	Copper, gold
Indonesia	Aceh	1975-2005	Natural gas
Morocco	West Sahara	1975-88	Phosphates, Oil
Nigeria	Biafra	196-70	Oil
Papau New Guinea	Bougainville	1988-	Copper, gold
Sudan	South	1983-	Oil

Source: Ross, 2003b

**Table 2: Niger Delta Fields: Operator, Fields and Reserves (million barrels)**

OPERATOR	FIELDS		RESERVES	
Shell	Bonga		600	
	Bonga south West		600	
	Bomu		875	
	Cawthorne Channel		750	
	Forcados-Yokri		1,235	
	Imo River		875	
	Jonnes Creek		900	
	Nembe Creek	<b>8</b>	950	<b>6,785</b>
Mobil	Edop		733	
	Erha		1,200	
	Ubit	<b>3</b>	945	<b>2,878</b>
Chevron Texaco	Agbami		1,000	
	Delta		300	
	Meren		1,100	
	Apoi-North-Funiwa		500	
	Okan	<b>5</b>	800	<b>3700</b>
Agip	Ebegoro	<b>1</b>	160	<b>160</b>
TotalFinaElf	Amenam-Kpono		500	
	Akpo		200	
	Obagi	<b>3</b>	670	<b>1370</b>
Total		<b>20</b>		<b>14893</b>

Source: NNPC (2005)

**Table 3: Descriptive Statistics**

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>
<i>Rebel participation</i>	0.362	0.481
<i>education</i>	1.516	0.747
<i>income</i>	0.994	1.408
<i>asset</i>	0.671	0.470
<i>assetimmobility</i>	0.577	0.494
<i>studentship</i>	0.347	0.482
<i>marriage</i>	0.627	0.484
<i>Oil</i>	0.611	0.488
<i>oilsize</i>	9.611	10.305
<i>ethnic</i>	0.392	0.488
<i>government</i>	0.389	0.756
<i>distance</i>	8.233	9.211
<i>inclusion</i>	3.689	1.939
<i>unemployment</i>	0.281	0.469
<i>hope</i>	0.955	0.207
<i>grievance</i>	2.705	0.720
<i>infrastructure</i>	8.305	5.049
<i>farmland</i>	2.318	2.494
<i>farmoil</i>	0.262	0.440
<i>conflict</i>	1.610	1.458

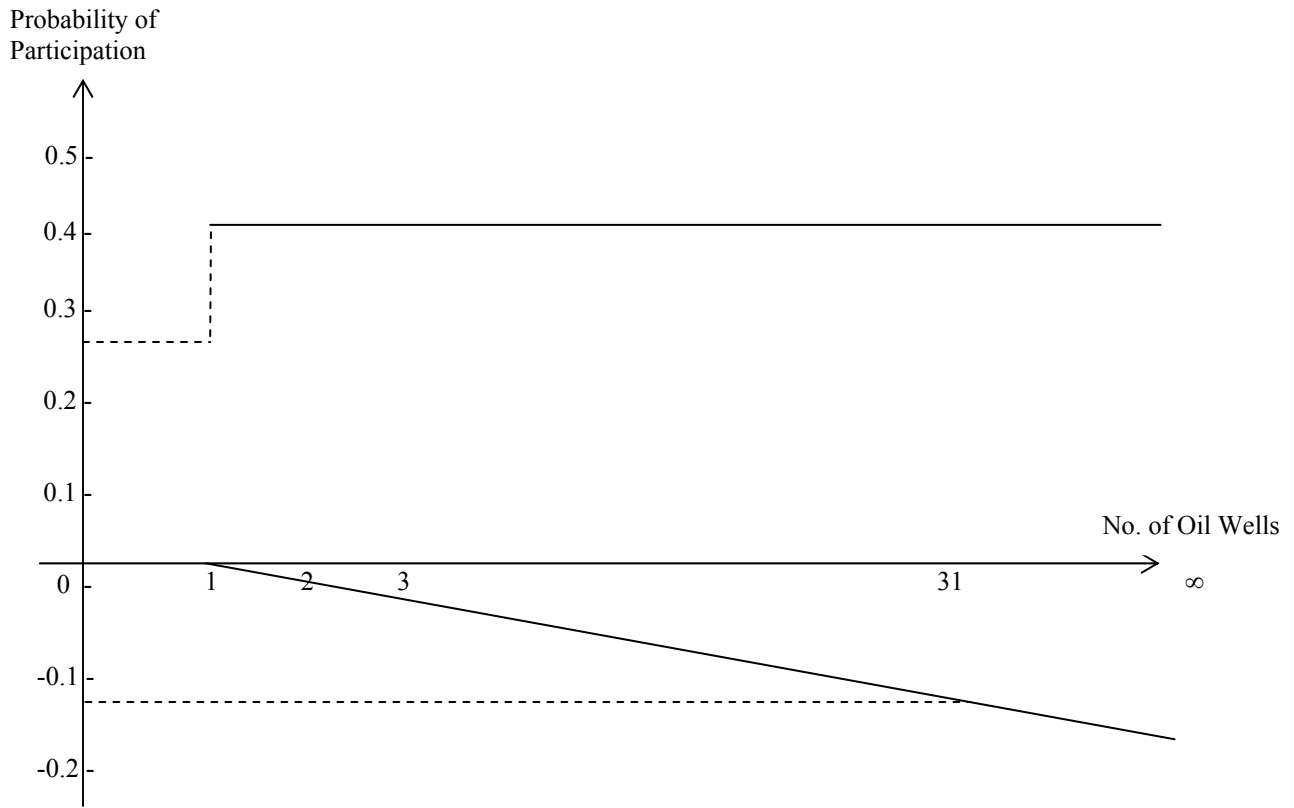
**Table 4: Classification of Variables**

<b>Classification</b>	<b>Variables</b>
<b>1. Motivation</b>	
Greed	<i>oil (+), oilsize (+), ethnic (+)</i>
Grievance	<i>unemployment (+), farmoil (+), inclusion (-), hope (-), grievance (+), infrastructure (-), conflict (+), ethnic (+)</i>
<b>2. Opportunity</b>	
	<i>oil (+), distance (+), government (-), infrastructure (-), oilsize (-), education (-), income (-), studentship(-), marriage (-), asset (-), asset immobility (-)</i>

**Table 5: Logit regression on *rebel\_participation***

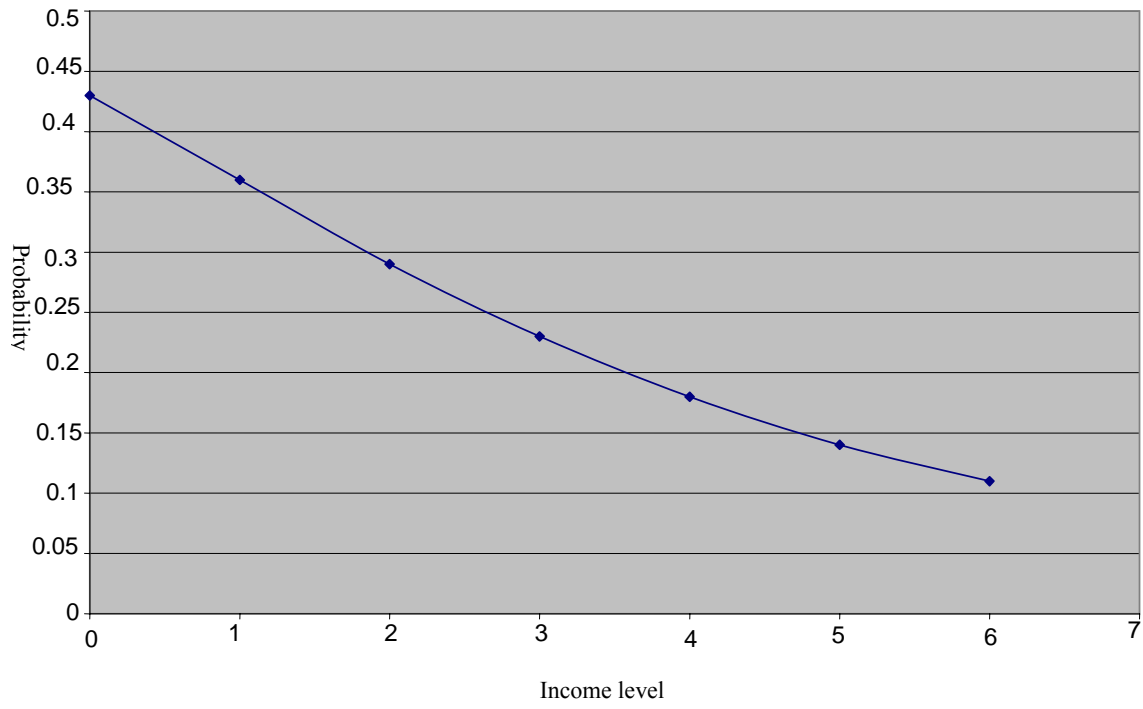
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<b>Motivation</b>									
ethnic	1.12	1.12	1.12	1.12	1.13	1.12	1.15	1.17	1.15
	(0.19)	(0.19)	(0.19)	(0.19)	(0.19)	(0.19)	(0.19)	(0.19)	(0.19)
oilsize	-0.10	-0.09	-0.10	-0.10	-0.09	-0.09	-0.09	-0.10	-0.09
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
oil	1.75	1.64	1.67	1.67	1.68	1.64	1.63	1.67	1.68
	(0.31)	(0.31)	(0.31)	(0.31)	(0.31)	(0.31)	(0.31)	(0.31)	(0.31)
inclusion	0.07	0.07	0.07	0.07	0.07	0.09	0.08	0.08	
	(0.07)	(0.07)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	
infrastructure	-0.18	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02		
	(0.19)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)		
grievance	0.99	0.12	0.12	0.12	0.12	0.12			
	(0.95)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)			
conflict	0.48	0.05	0.05	0.05					
	(0.67)	(0.07)	(0.07)	(0.07)					
unemployment	-0.06	-0.08	-0.05						
	(0.22)	(0.22)	(0.22)						
hope	0.02	0.08							
	(0.45)	(0.45)							
<b>Opportunity</b>									
income	-0.45	-0.47	-0.45	-0.44	-0.44	-0.46	-0.47	-0.48	-0.45
	(0.09)	(0.09)	(0.09)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
asset	-0.68								
	(0.16)								
assetimmobility		-0.81	-0.81	-0.82	-0.82	-0.81	-0.80	-0.78	-0.79
		(0.16)	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)
marriage	-0.54	-0.52	-0.52	-0.51	-0.51	-0.53	-0.52	-0.53	-0.50
	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)
education	-0.40	-0.42	-0.43	-0.43	-0.43	-0.45	-0.43	-0.42	-0.33
	(0.14)	(0.14)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.12)	(0.11)
government	-0.35	-0.33	-0.34	-0.34	-0.34	-0.33	-0.32	-0.33	-0.31
	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)
distance	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
studentship	0.15	0.10	0.12	0.16	0.17				
	(0.24)	(0.23)	(0.23)	(0.17)	(0.17)				
<b>State-level differences</b>									
delta	2.06	1.84	1.83	1.83	1.77	1.78	1.77	1.87	1.96
	(0.30)	(0.29)	(0.29)	(0.27)	(0.27)	(0.27)	(0.26)	(0.26)	(0.26)
rivers	1.03	0.99	0.99	1.00	0.99	1.01	1.00	1.02	1.01
	(0.23)	(0.23)	(0.23)	(0.23)	(0.23)	(0.23)	(0.23)	(0.23)	(0.23)
Observations	1337	1337	1340	1340	1340	1340	1341	1341	1341
Pseudo R <sup>2</sup>	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Log likelihood	-649.9	-646.3	-647.4	-647.5	-647.5	-647.5	-647.9	-647.5	-649.9

Notes: Standard errors in parenthesis. *asset* is replaced with *assetimmobility* in Models 2 through 9. (3) through (9) progressively omits the least significant variable in previous model. The final model (9) contains only variables that are significant at the conventional 5% level. All regressions include an intercept.

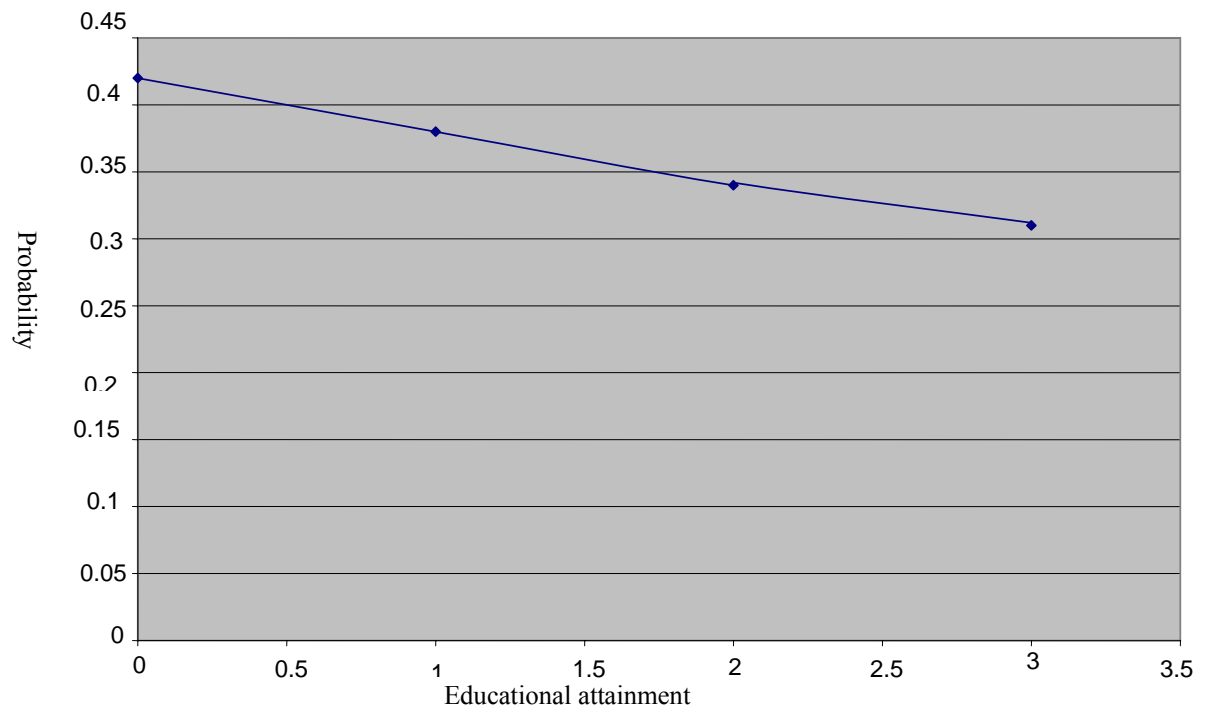


**Fig. 2: The effects of oil availability and the size of endowment on the Probability of Participation**

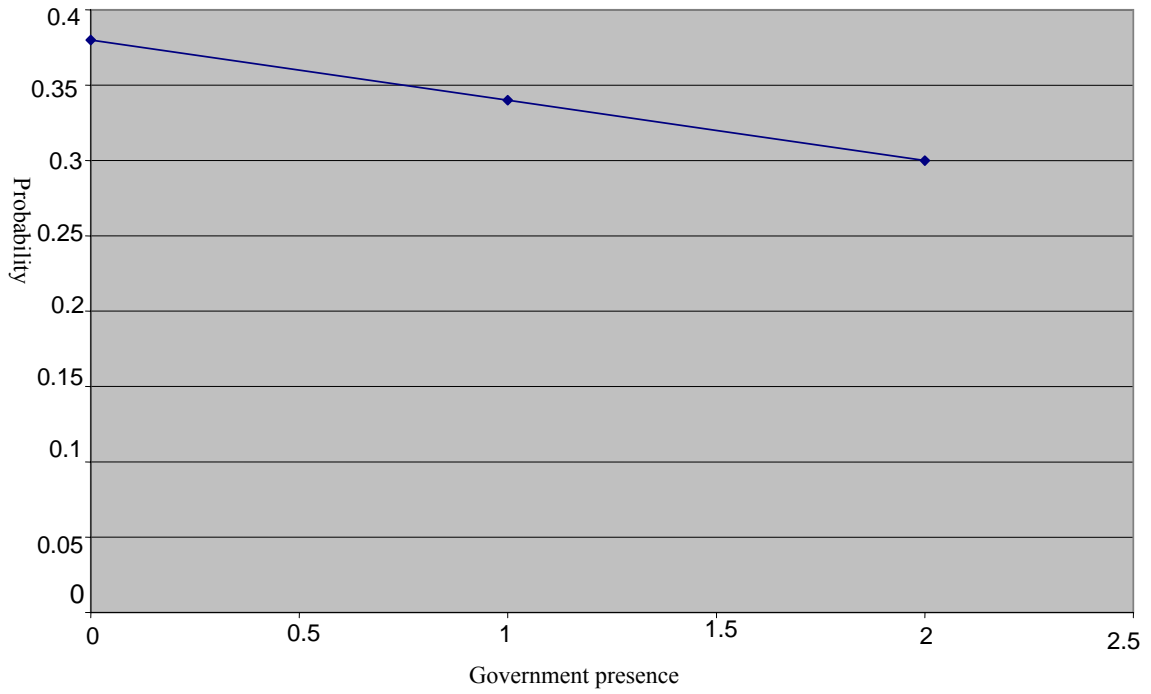




**Fig. 3: Income level and Probability of Participation**



**Fig.4: Educational attainment and Probability of Participation**



**Fig. 5: Government presence and probability of participation**

**Table 6: Ordered Logit regression on grievance**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
infrastructure	-0.11	-0.11	-0.10	-0.10	-0.10	-0.10	-0.09	-0.09
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)
ethnic	0.94	0.94	0.91	0.92	0.94	0.93	0.96	0.96
	(0.18)	(0.18)	(0.17)	(0.17)	(0.17)	(0.17)	(0.17)	(0.17)
education	0.60	0.60	0.61	0.61	0.56	0.57	0.57	0.57
	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.13)	(0.14)
inclusion	-0.23	-0.23	-0.23	-0.23	-0.19	-0.20	-0.20	-0.19
	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)
farmland	0.07	0.07	0.08	0.10	0.10	0.10	0.10	0.10
	(0.06)	(0.04)	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Income	-0.12	-0.12	-0.13	-0.12	-0.13	-0.15	-0.15	-0.14
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)
government	0.22	0.22	0.19	0.19	0.20	0.19	0.16	
	(0.11)	(0.11)	(0.11)	(0.11)	(0.10)	(0.10)	(0.10)	
oilsize	0.01	0.01	0.01	0.01	0.01	0.01		
	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)		
unemployment	0.27	0.27	0.26	0.26	0.24			
	(0.19)	(0.19)	(0.19)	(0.19)	(0.19)			
hope	0.64	0.64	0.66	0.59				
	(0.47)	(0.47)	(0.47)	(0.46)				
asset	0.16	0.16	0.15					
	(0.21)	(0.21)	(0.21)					
oil	-0.23	-0.23						
	(0.31)	(0.29)						
farmoil	0.02							
	(0.32)							
$\tau_1$	-2.59	-2.59	-2.55	-2.62	-3.12	-3.26	-3.23	-3.28
	(0.51)	(0.50)	(0.50)	(0.49)	(0.29)	(0.28)	(0.27)	(0.27)
$\tau_2$	-1.06	-1.05	-1.01	-1.10	-1.59	-1.72	-1.70	-1.75
	0.50	0.50	0.50	0.48	0.27	0.25	0.25	0.25
Observations	1344	1344	1344	1344	1347	1347	1347	1347
R <sup>2</sup>	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Log likelihood	-738.71	-738.71	-738.71	-738.71	-738.71	-738.7	-738.71	-738.71

Notes: The  $\tau_s$  are the ancillary parameter estimates of the thresholds or cutpoints that separate between the various outcomes. Standard errors in parenthesis. Variables are arranged by order of significance. Columns (2) through (8) progressively omit the least significant variable in previous model. The final model (8) contains only variables that are significant at the conventional 5% level.

**Table 7: Causal Factors in the emergence of Personal Grievance against the State**

<b>Factor</b>	<b>Frequency</b>	<b>Percentage</b>
1. Exclusion from political participation by elite	118	9.18
2. Political repression of respondent's ethnic group	112	9.49
3. Marginalization of respondent's ethnic group in the distribution of Public goods	330	25.66
4. Personal economic exclusion, ie, lack of (or inadequate) Economic access	60	4.67
5. General economic inequality	74	5.75
6. Environmental degradation of respondent's community	324	25.19
7. Denial of respondent's community the right to own and manage oil and gas resources	251	19.15
8. Others	3	0.23

Note: Based on respondents' answers to the questions "As a citizen of Nigeria, do you feel cheated or marginalized?" and "Why do you feel cheated/marginalized?" **Source:** Author's Field Survey, March-August 2005

**Table 8: Logit regression on *rebel\_participation* in the “*high-risk*” sample**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
oil	2.87	2.86	2.85	2.79	2.79	2.74	2.66	3.12	3.27	3.30	3.65
	(0.89)	(0.89)	(0.88)	(0.87)	(0.87)	(0.86)	(0.86)	(0.78)	(0.81)	(0.79)	(0.73)
Oilsize	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.11	-0.10	-0.12	-0.16
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)	(0.04)	(0.03)
government	-0.93	-0.93	-0.90	-0.91	-0.92	-0.94	-0.87	-1.04	-0.95	-0.99	-1.12
	(0.48)	(0.48)	(0.45)	(0.45)	(0.45)	(0.45)	(0.42)	(0.41)	(0.39)	(0.38)	(0.36)
rivers	-1.53	-1.53	-1.50	-1.44	-1.53	-1.36	-1.42	-1.36	-1.11	-0.78	
	(0.85)	(0.82)	(0.81)	(0.80)	(0.76)	(0.70)	(0.69)	(0.69)	(0.66)	(0.60)	
hope	1.65	1.65	1.62	1.75	1.94	1.74	1.81	1.59	1.35		
	(1.13)	(1.13)	(1.11)	(1.08)	(0.97)	(0.92)	(0.91)	(0.86)	(0.87)		
conflict	0.33	0.33	0.32	0.36	0.36	0.34	0.33	0.29			
	(0.23)	(0.23)	(0.23)	(0.22)	(0.22)	(0.22)	(0.20)	(0.20)			
distance	0.04	0.04	0.05	0.04	0.04	0.03	0.04				
	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.04)	(0.03)				
infrastructure	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05					
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)					
ethnic	-0.49	-0.49	-0.49	-0.32	-0.32						
	(0.61)	(0.61)	(0.61)	(0.50)	(0.50)						
Inclusion	0.13	0.13	0.14	0.08							
	(0.25)	(0.24)	(0.24)	(0.20)							
Delta	-0.43	-0.43	-0.44								
	(0.89)	(0.88)	(0.88)								
unemployment	-0.09	-0.09									
	(0.51)	(0.50)									
grievance	0.002										
	(0.34)										
Observations	147	147	147	147	147	147	147	147	147	147	147
R <sup>2</sup>	0.23	0.23	0.23	0.23	0.23	0.23	0.22	0.22	0.20	0.19	0.18
Log likelihood	-77.2	-77.2	-77.2	-77.3	-77.4	-77.6	-78.0	-78.7	-79.9	-81.1	-82.0

Standard errors in parenthesis. Variables are arranged by order of significance. Columns (2) through (11) progressively omit the least significant variable in previous model. The final model (11) contains only variables that are significant at the conventional 5% level. All regressions include an intercept.

**Table 9: Logit regression on *rebel\_participation* in the “geographically risky” sample**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ethnic	3.48	3.46	3.42	3.64	3.64	3.64	3.41	3.09	2.94
	(1.24)	(1.23)	(1.21)	(0.84)	(0.84)	(0.84)	(0.82)	(0.79)	(0.78)
income	-0.32	-0.32	-0.34	-0.34	-0.32	-0.35	-0.35	-0.43	-0.50
	(0.19)	(0.19)	(0.16)	(0.16)	(0.15)	(0.15)	(0.15)	(0.14)	(0.14)
hope	1.60	1.73	1.76	1.76	1.84	1.84	1.70	1.81	1.79
	(1.24)	(0.60)	(0.59)	(0.59)	(0.58)	(0.58)	(0.56)	(0.55)	(0.55)
education	-0.73	-0.71	-0.72	-0.72	-0.73	-0.73	-0.76	-0.73	-0.74
	(0.38)	(0.34)	(0.34)	(0.34)	(0.34)	(0.34)	(0.34)	(0.35)	(0.34)
studentship	0.83	0.84	0.76	0.74	0.88	0.92	1.01	0.73	
	(0.79)	(0.79)	(0.55)	(0.54)	(0.52)	(0.51)	(0.51)	(0.46)	
assetimmobility	-0.88	-0.88	-0.88	-0.85	-0.91	-0.97	-0.86		
	(0.52)	(0.52)	(0.52)	(0.50)	(0.50)	(0.49)	(0.48)		
oilsize	0.08	0.07	0.07	0.02	0.02	0.02			
	(0.21)	(0.21)	(0.21)	(0.01)	(0.01)	(0.01)			
marriage	-0.36	-0.36	-0.37	-0.37	-0.37				
	(0.45)	(0.45)	(0.44)	(0.44)	(0.44)				
grievance	-0.18	-0.18	-0.18	-0.18					
	(0.26)	(0.26)	(0.26)	(0.26)					
infrastructure	-0.25	-0.24	-0.22						
	(0.92)	(0.92)	(0.90)						
unemployment	0.12	0.11							
	(0.73)	(0.73)							
inclusion	0.03								
	(0.20)								
Observations	223	223	223	223	223	223	223	223	223
Pseudo R <sup>2</sup>	0.37	0.37	0.37	0.37	0.36	0.36	0.35	0.34	0.33
Log likelihood	-75.3	-75.3	-75.3	-75.3	-75.6	-75.9	-76.9	-78.5	-79.8

Notes: Conflict, delta, rivers dropped due to collinearity. Standard errors in parenthesis. Variables are arranged by order of significance. Columns (2) through (9) progressively omit the least significant variable in previous model. The final model (9) contains only variables that are significant at the conventional 5% level.

**Table 10: Mean predicted Probability of participation, Standardized coefficients  
and Odds ratios in the three Samples**

<i>Variable</i>	<b>Overall</b>				<b>“High-risk”</b>				<b>“Geographically-risky”</b>			
	$\beta$	$\beta^{sy}$	$\beta^s$	<i>Odds ratios</i>	$\beta$	$\beta^{sy}$	$\beta^s$	<i>Odds ratios</i>	$\beta$	$\beta^{sy}$	$\beta^s$	<i>Odds ratios</i>
income	-0.45	-1.67	-2.35	0.63					-0.50	-1.85	-2.61	0.61
education	-0.33	-1.22	-0.92	0.72					-0.74	-2.74	-2.06	0.47
oil	1.68	6.22	-	5.38	3.65	13.52	-	38.36				
government	-0.31	-1.15	-0.87	0.73	-1.12	-4.15	-3.82	0.33				
distance	0.04	0.15	1.38	1.04								
<i>p</i>	(0.36)				(0.43)				(0.78)			

NOTE:  $p$  is the mean predicted probability of participation,  $\beta$  is an unstandardized coefficient;  $\beta^{sy*}$  is a  $y^*$  standardized coefficient (where  $y^*$  is the unobserved latent variable describing the propensity to civil disobedience) and  $\beta^{s*}$  is a fully standardized coefficient.  $\beta^{s*}$  is not applicable in the case of binary independent variables (Scott, 1997:128-9).

## APPENDIX

**Table A1** List of Communities Surveyed and characteristics

S/N	Community	Local Government Area	State	Oil Availability
1.	Elebele	Ogbia	Bayelsa	Yes
2.	Imiringi***	Ogbia	Bayelsa	Yes
3.	Gbarantoru	Gbaran Ekpetiama	Bayelsa	Yes
4.	Gbaran	Gbaran/Ekpetiama	Bayelsa	No
5.	Odi	Kolokoma/Opukuma	Bayelsa	No
6.	Biseni	Yenogoa	Bayelsa	Yes
7.	Sagbama	Sagbama	Bayelsa	No
8.	Afiesere	Ugheli North	Delta	Yes
9.	Evremi**	Ugheli North	Delta	Yes
10.	Ekakpamre	Ugheli South	Delta	Yes
11.	Okpare	Ugheli South	Delta	Yes
12.	Obotobo 1**	Burutu	Delta	Yes
13.	Obotobo 2	Burutu	Delta	Yes
14.	Ugbolu	Oshimili North	Delta	No
15.	Illah	Oshimili North	Delta	No
16.	Edagberi	Ahaoda West	Rivers	Yes
17.	Akinima**	Ahaoda West	Rivers	Yes
18.	Join-Krama 3	Ahaoda West	Rivers	No
19.	Obrikom	Ogba/Egbema/Ndomi	Rivers	Yes
20.	Mgbede	Ogba/Egbema/Ndomi	Rivers	Yes
21.	Umuebulu	Etche	Rivers	Yes
22.	Alesa Eleme*	Eleme	Rivers	No
23.	Nkpolu/Irumigbo**	Obio/Akpor	Rivers	Yes

\*There was a violent conflict in this community a couple of months after the initial field survey. \*\*These communities were not included in the second phase of the field survey.