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The Threat of Domestic Violence and Women's Empowerment: The Case of West Africa

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Abstract: This paper assesses the significance of a set of threats of domestic violence in ten West African countries that arguably limit the potential of women in particular and the development of society. The data consists of the most recent year of a country-specific Demographic and Health Survey (DHS), conducted in the same way for each participating country. The risk of domestic violence and the intensity of its threat are assessed using different probabilistic model specifications together with an assessment of how heterogeneous/homogenous are these effects across the set of countries. The overall results suggest that religion has played a significant role in relation to domestic violence in most countries, the exceptions being Burkina Faso, Mali and Niger. Area of residence (rural) has played an important positive role in Benin, Ghana, Guinea, Senegal and Sierra Leone. The lack of education increases the threat in Benin, Burkina, Ghana, Liberia and Nigeria. The level of well-being and/or household's level of wealth have a significant negative impact on the threat of domestic violence in Benin, Ghana, Nigeria, and Senegal. The factor that defines the improvement in wife's social status which is characterized in the sample by the wife's higher level of education has been also important in reducing the threat of domestic violence in Benin, Ghana and Senegal. Finally, out of the ten countries, a married female it is at the highest risk of violence in Guinea and at the lower risk in Ghana (except for the wives living in rural areas).

Key words: "threat" of domestic violence, women empowerment, West Africa
JEL classifications: J12, J16, I24, I25, I31

1. Introduction

The United Nations Declaration on the Elimination of Violence against Women (1993) defines violence against women as "any act of gender-based violence that results in, or is likely to result in, physical, sexual or psychological harm or suffering to women, including threats of such acts, coercion or arbitrary deprivation of liberty, whether occurring in public or in private life."

It is well known that violence is a major obstacle to economic growth and development and has been recognized as one of the most pervasive human rights abuses in all societies--whether it is violence perpetrated by an intimate partner or violence arising from weapons of war. Violence against women, one of the most spread forms of violence, has long been considered to be a major threat to social and economic development. But while domestic violence has been recognized as the most prevalent form of violence against women in developing countries, only recently (July 2012) he United Nations through the Secretary General's UNiTE to End Violence against Women campaign proclaimed every 25th of the month as Orange Day with the purpose to raise public awareness and to mobilize people everywhere in the world to not sit back when they witness violence against women and girls but react against these acts.

The interest in the issue of domestic violence has arisen recently also because of its placement at the crossroads of several international movements in human rights and public health. The former is now recognized in the Millennium declaration of September 2000, in which General Assembly of the United Nations proposed "to combat all forms of discrimination against women" (United Nations, 1993, 2005). This has made domestic violence a major concern within the international human rights movement. In terms of the latter, violence has been found to be intimately associated with complex social problems such as poverty, lack of education, gender inequality, child mortality, maternal ill health and human immunodeficiency virus/acquired syndrome (HIV/AIDS). It is also widely recognized that gender inequalities hinder child development (World Bank, 2001). For example, Klasen (2003) found in a cross-national study that an additional year of female education tends to reduce the fertility rate by 0.23 births. Boone (1996) found that an increased autonomy of women is associated with a lower infant mortality. In Boone's paper, female autonomy *is defined as an index of ability to control their lives, to have a voice in matters concerning themselves and to make and implement decisions*.

Violence against women occurs in all countries regardless of cultural differences, social status, and level of education, income, ethnicity and age. Although most countries prohibit violence against women, reality is often quite different with justifications often associated with cultural practices, norms, and/or *misinterpretation of religious tenets*. Moreover when the violation takes place within the home, as is often the case, the abuse is effectively condoned by the tacit silence and the passivity displayed by the state. The 2000 report of the United Nations Children's Fund (UNICEF) mentions several complex and interconnected factors that have kept women vulnerable to violence. These include: cultural factors (cultural definitions of appropriate sex roles, belief in the inherent superiority of males, notion of the family as the private sphere and under male control, customs of marriage); political factors (domestic violence is not taken seriously, risk of challenge to status quo and/or religious laws, limited participation of women in organized political system); economic factors (women's economic dependence on men, limited access to education and training for women, limited access to employment in formal and informal sectors); and legal factors (laws regarding divorce, child custody, maintenance

and inheritance; legal definitions of rape and domestic abuse, low levels of legal literacy among women).

A growing advocacy effort to address domestic violence in developing countries contrasts sharply with the limited empirical evidence available on this issue. Despite all the initiatives in recent years, data on the extent of domestic violence and the consequences for women and their families are largely absent for almost all developing countries. Indeed this lack of reliable data contributes to the reluctance of policymakers to address this issue because it touches upon a highly sensitive aspect of family life. In this sense the lack of information on determinants of domestic violence has impeded the development of strong and effective programs targeted especially at prevention.

In today's world, individuals have easier access to information such that incidents of violence against women have had a significant impact on society. Consequently, new policies have been established to enhance female autonomy by facilitating women's access to resources, education, credit and also targeting income transfers to women. One major determinant of female autonomy is the degree to which they control household resources. For example, it has been shown in various papers (see e.g. Thomas, 1990) that additional income in the hands of women has a greater effect on child nutrition and survival rate than does additional income in the hands of men. The magnitude of this effect has been estimated to be between 6 and 20 times higher. This has been used to justify so-called 'targeting policies'—voluntarily giving the household allowance to the woman. More generally, this result has been used to advocate the development of collective decision making models where each family member has a degree of bargaining power dependent on prices and individual incomes (see e.g. Apps and Rees, 1988; Chiappori, 1988; Bourguignon and Chiappori, 1992; Browning and Chiappori, 1998; Chiappori and Ekeland, 2002; and Vermeulen, 2002 for a comprehensive survey).

The capabilities approach of Sen (1979) defines the set of overall social functions among which women can choose. The potential of this set can then be constrained by the "threat" of domestic violence, so it becomes important to understand how the boundary of the set can be constrained. Thus an important aspect of the campaign against violence has been the identification of factors that become "threats" of domestic violence. In Bonne's

1996 paper a measure of the potential has been proposed in an index of women's ability. Consequently, identifying the more specific factors that contribute to making the threat effective is crucial in defining appropriate policies to mitigate this type of violence.

Given the importance of preventing violence, the objective of this paper is to analyze the factors explaining the « threat » of domestic violence in relation to West Africa. To the best of our knowledge, this study is the first to look at the determinants of domestic violence by focusing on the « threat ». The threat is important firstly because it is itself an initial form and indicator of ongoing domestic violence, and secondly because it forms an important constraint on the set of overall social functions among which women can choose, thus limiting the potential development of both women and men. The motivation of this study can be seen in Figures 2 and 3 from Appendix 1, that are showing unconditional correlations between the "threat" of violence against women and types of economies and between the "threat" of violence against women and level of development. As seen, living in a country where agriculture prevails exposes the women to higher threats of violence, in the same time it is observed a negative correlation between levels of development (GDP per capita) and the "threat" of violence against women. The paper is organized as follows: Section 2 presents a review of the literature, Section 3 presents the data used, Section 4 presents the methodology, Section 5 discusses the results and Section 6 presents the a discussion of the main findings and possible policy implications.

2. Review of the literature

There is a wide range of studies on prevalence of domestic violence both theoretically and empirically. Comparisons of findings on the prevalence of domestic violence in developing countries are complicated because of different definitions of violence (physical, verbal, sexual, and psychological abuse as well as combinations), different reference periods, and study populations. Despite these significant differences, almost all studies from developing countries have found significant levels of domestic violence.

Theories of spousal violence in the economics literature focus on non-cooperative bargaining models in which female partners' incomes, and financial resources for women outside the marriage more generally, influence the woman's threat and thus reduce the level of violence in equilibrium (Farmer and Thiefenthaler 1997; Tauchen et al 2001). Bloch and Rao (2002) have modeled spousal violence in India and assumed that a bargaining instrument is used by male partners to extract larger dowry payments from the bride's family. However, the bargaining takes place between the families of the bride and groom, rather than within the couple itself. Those contrasts with the gender perspective's theory of "*male backlash*", which predicts that: *as women's economic opportunities and thus their economic independence increase, violence against them might increase because men feel their traditional gender roles threatened*. Others theoretical works in economics also addresses certain stylized facts of domestic violence, including the fact that battered women are not unlikely to return to an abusive relationship even after seeking help. In a model by Farmer and Thiefenthaler (1996), battered women use shelters and other support services to signal to the abuser their ability to leave the relationship, which changes their threat-point and may reduce their toleration for physical abuse. Aizer and Dal Bó (2007) model this pattern utilizing a framework of time-inconsistent preferences where women who leave the relationship may require a 'commitment device' to ensure that they escape the violent relationship. Pollak (2004) on his hand addresses the intergenerational transmission of violent behavior within the household, i.e., individuals raised in violent homes are more likely to marry partners who were also raised in violent homes. Finally, Couprie and Djebbari (2006) developed a non-cooperative multi-persons household model, and shows under which conditions the introduction of a targeted transfer program may imply inefficiencies in the household decision-making process by increasing the threat a violent husband may exert on his wife. They analyze the effects of targeting policies and/or programs on effective domestic violence, divorce and participation. They found that targeting policies tend to increase the conflicts within the family by increasing the threat of violence and, it also increases unilateral divorce (if divorce is possible by law and/or is socially acceptable).

On the other hand, they are several empirical studies on domestic violence. Koenig and al. (1999) employs multi-level models to explore individual and community level determinants of violence, using data from 1993 cross sectional survey of 10,368 reproductive aged women residing in two rural areas in Bangladesh. The main dependent variable was wife's present sometimes and/or frequently experience with physical violence. Their results highlight the importance of both community and individual level factors, particularly those related to women's status and autonomy in understanding the determinants of domestic violence in this setting.

Bates et al, (2007), focused on the factors and socioeconomics processes associated to domestic violence in rural Bangladesh. The survey made in rural parts of the country shows that 67% of women were victims to domestic violence. Following the qualitative observations, participants believed that educated women that have a higher income were less vulnerable to domestic violence. They believed that bringing a dowry and/or having a registered marriage could strengthen the women's position in the marriage. Using logistic regression, they found that only women's education was associated to a negative significant probability of bringing victims to domestic violence.

Wife beating is a clear expression of male domination, and remains both a cause and a consequence of its unequal position compared to men. In many parts of the world, women still think they can be beaten because of the socio-cultural traditions and customs anchored status. Some of them might even found justified to be physically punished in certain circumstances. A series of Demographic and Health Surveys (DHS) conducted in countries and regions around the world included questions on women's attitudes towards violence they have suffered or were suffering as a result of their actions and behaviors[1]. More precisely, they were asked whether a husband was justified in hitting or beating his wife if she (1) burnt the food, (2) argued with him, (3) refused to have sex with him, (4) went out without telling him, and (5) neglected the children. In 33 countries for which statistics are available, the percentage of women that found it appropriate to be hit or beaten for one of these acts varies considerably. They found for example that a higher percentage (around 41%) of all women in these countries on average, found it appropriate

[1] The World's Women (2010)

to be physically "punished" for neglecting children and 36% for going out without telling the husband. They also mentioned that not all women in these societies and countries have the same level of acceptance of "physical punishment". Education probably plays a crucial role in rejecting these entitlements to violence of their husbands.

Abama and al. (2009) highlights the connections between the Millennium Development Goals (MDGs) and the prevention of violence against women by showing how working towards the MDGs will reduce violence against women; and preventing violence (understanding the threat for example) will contribute to achieving all eight MDGs goals. Goal 3 for example point out that: *development policies that fail to take women to be actors in those policies and actions will have limited effectiveness and serious costs to societies. The reverse is also true: the achievement of Goal 3 depends on the extent to which each of the other goals addresses gender-based constraints and issues.* They mentioned that cultural institutions, particularly religion, are often cited for their role in violence against women. However, very often in these families, there is a tendency to confuse the well-being and the respect of cultural and religious traditions. Bobonis and al. (2009) empirically highlights the connections between the targeting policies or programs and domestic abuse in Mexico. Using data from a unique survey in Mexico, they examine the impact of the "*Oportunidades*", (conditional cash transfer program) on spousal abuse rates and threats of violence. They found that although women in beneficiary households are 33 percent less likely to be victims of physical abuse than women in comparable non-beneficiary households, they are more likely to receive violent threats with no associated physical abuse.

Finally, Macro International Inc. in their report in 2009[2] used a multivariable logistic regression to assess the adjusted relationship between women's, household and partner characteristics, couple differences, and community-level factors and women's experience of physical or sexual violence in their current relationships. They specifically show that if men agreed that wife beating was justified in one or more circumstances; women were more likely to experience physical or sexual violence than if men did not agree that wife

[2] Macro International Inc. (2009)

beating was justified in any circumstance. Their finding suggests that women's and men's attitudes operate independently related to women's risk of violence.

However, most of all these studies are either qualitative without any quantitative explanations, or are using the experience of domestic violence as a dependent variable. Most of them also already suggest that women have experienced domestic violence. They also recognized that there is a step before experiencing domestic violence for women, which is the "threat". So in this study, the threat of domestic violence is used as an outcome measure and to our best knowledge this is the first time in use.

3. Data

For this study the data from the Demographic and Health Survey (DHS) is used. The DHS have been collected in a large number of African countries, and in many cases, at more than one point in time. The surveys were not designed for econometric (or even economic) analysis. Instead, the purpose of the surveys was to assist governments and private agencies in developing countries to better evaluate population, health and nutrition programs. Consequently, there are no data on income or expenditures, the standard money metric measures of well-being. Despite this important drawback, the DHS do contain information on household asset and characteristics, and information about women empowerment that can be used for econometric modeling purpose in order to analyze the determinants of the threat of domestic violence. The DHS also have two distinct advantages: they are available for a large number of West African countries, and key survey instruments are standardized for all countries. The DHS program has conducted over 240 nationally representative household surveys in more than 84 countries since 1984. With funding from United States Agency for International Development (USAID), the program is implemented by Macro International Inc. There are three core questionnaires in DHS surveys: the household questionnaire, the women's questionnaire, and the men's questionnaire. The household questionnaire is used to identify all usual household members and visitors in the selected households and to determine the eligibility of all household members for the individual women's and men's surveys. The household survey also collects some basic information on the characteristics

of each person in the household and on household assets and amenities. In this study, the couple file is used. This file includes respondents to the women's and men's surveys who were identified as husband and wife or cohabiting partners through the linking process used by the DHS. For our purpose, 10 out of 16 West African countries (Benin, Burkina Faso, Ghana, Guinea, Liberia, Mali, Niger, Nigeria, Senegal, and Sierra Leone) are considered, and the surveys for all those countries are nationally representative. Table 1 provides information about the countries included in this study with respect to the dates of fieldwork, sample sizes and the percentage from the rural area.

Table 1: Countries and associated samples used in the analysis

Countries	Survey Years	Obs. Number	Rural area(%)
Benin	2006	3345	64,9%
Burkina	2003	2340	84,3%
Ghana	2004	1883	64,3%
Guinea	2008	1997	79,5%
Liberia	2007	2677	65,7%
Mali	2003	2665	71,6%
Niger	2006	2226	71,6%
Nigeria	2008	1168	66,4%
Senegal	2006	1432	65,7%
Sierra Leone	2008	1747	70,1%

Source: Author

4. Methodology

The analysis is based on a question that can be used to identify the "threat" of domestic violence. In particular, on the couple file, the head of household[3] was asked if he agreed that wife beating can be justified for some reasons? Such reasons were:

- **a.** If she goes out without telling him;
- **b.** If she neglects the children;
- **c.** If she argues with him;

[3] In all cases 98 % times, the household's head is a man

d. If she refuses to have sex with him;

e. If she burns the food.

The distribution of different responses for both men and women is shown in Table 2 and in the Appendix 1 as graphs of distribution of yes by category and by country (category 0 refers to answer "No" to all questions).

Table 2: Response rates on the "wife beating" reasons by country

Countries	Goes out without telling him		Neglects the children		Argues with him		Refuses to have sex		Burns the food	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Benin	41%	46%	40%	44%	38%	33%	20%	13%	21%	15%
Burkina Faso	54%	50%	57%	71%	55%	43%	39%	50%	25%	43%
Ghana	24%	27%	30%	35%	24%	24%	16%	16%	10%	8%
Guinea	77%	70%	75%	70%	64%	58%	68%	62%	41%	42%
Liberia	47%	42%	48%	45%	48%	47%	23%	23%	16%	14%
Mali	54%	33%	49%	38%	48%	33%	55%	50%	16%	21%
Niger	51%	60%	48%	72%	45%	60%	55%	68%	41%	52%
Nigeria	58%	33%	53%	17%	47%	33%	44%	17%	37%	33%
Senegal	57%	46%	55%	44%	52%	48%	52%	42%	27%	16%
Sierra Leone	53%	46%	52%	49%	56%	47%	44%	39%	27%	19%

Source: Author

Using the Demographic and Health Surveys (DHS), an analysis on both men and women's answers to the question that defines our variable of interest was conducted. In particular women were also asked whether a husband was justified in hitting or beating his wife if she (1) burnt the food, (2) argued with him, (3) refused to have sex with him, (4) went out without telling him, and (5) neglected the children. Our analysis suggests that overall, a high percentage (around 47%) of all women in these countries, found it appropriate to be physically "punished" for neglecting children, 45% for arguing with their husband and 44% for going out without telling their husband. In the other hand, almost 80% found that it's not appropriate to be beaten if they burnt the foods. For these countries, the percentage of women that found it appropriate to be beaten for one of these acts varies similarly to men's responses. The result also shows that countries with the

highest response rate of "yes" for husbands have the highest response rate of "yes" for wives as well. For instance, in Guinea 77% of husbands found it justified to punish the wives if they go out without telling them. In the same proportion, 70% of wives found it justified to be beaten if they go out without telling their husbands. Likewise, in Ghana, only 27% of wives found it justified to be beaten if they go out without telling their husbands (24% of husbands answered the same thing). More surprisingly, in Niger, women answer that it is even more justified to be beaten than men's answer on all five circumstances. Other mismatches were found in Mali where men and women answered in different proportions at the questions : goes out without telling him (54% of males answered "yes" versus 33% of women that answered "yes"), neglects the children (49% of males answered "yes" versus 38% of women that answered "yes"), argues with him (48% of males answered "yes" versus 33% of women that answered "yes"), burns food (16% of males answered "yes" versus 21% of women that answered "yes") and Burkina Faso where women were answering more "yes" at the questions about neglecting the children (57% of males answered "yes" versus 71% of women that answered "yes"), refuses to have sex (39% of males answered "yes" versus 50% of women that answered "yes"), burns the food (25% of males answered "yes" versus 43% of women that answered "yes").

While this analysis suggests that women's views are very similar with men's view on the questions related with the "threat" (sometimes, as is the case of Niger and Burkina Faso, women's views are even stronger or in other cases they are weaker as is the case of Mali, Nigeria and Senegal) we should read with caution the answers to hypothetical events in particular for the country specific analyses where more mismatches are observed.

The fact that we have a similar proportion of positive and negative mismatches however balanced out in a pooled analysis, which may suggest that a pooled analysis may do better at capturing both views (of males and females).

The variables that are hypothesized to determine the risk of domestic violence are summarized according to the following categories: a) Area of residence: rural; urban; b) Household characteristics: number of children; number of wives; marital duration; religion (Muslim versus others) ; husband/partner level of education; wife's/partner's

age; household's wealth index (rich, poor); wife's status/autonomy: wife's/partner's highest level of education; wife/partner is working or not; wife's/partner's consulted when household is spending money; wife's/partner's sexual activity (if she had sexual activity last 4 week or not).

Husband responses from Table 2 were also used to generate Figures 1, which is identifying the countries by the risk of women being beaten. Using this risk measure that was plotted in Figure 1, in Figures 2 and 3 the unconditional correlation between this risk and percentage of agriculture and between this risk and level of development are presented. These two figures are also motivating figures for this study. As seen living in a country where agriculture prevails exposes the women to higher threats of violence, in the same time a negative unconditional correlation between levels of development (GDP per capita) and the "threat" of violence against women is observed.

The challenge is to measure and evaluate in the best way the threat of domestic violence. To do so a methodology that builds through a sequence of steps is employed.

In the first step the threat of domestic violence is represented as a dummy variable, where a value of one is associated to either one of the reasons enumerated above. This specification helps us to define a latent utility model for the threat of domestic violence. In particular, the latent model that defines threat of domestic violence is defined as:

$$y^* = X'\beta + \varepsilon \quad ,$$

where y^* represent the latent variable that defines the utility of a threat, X define those factors that have been found in the literature to be important determinants of the event and ε is the residual. A logistic distribution for the residual's distribution is considered as it is more robust to misspecification errors. In this case a Logit model is employed to estimate the probability of the threat of domestic violence.

Following this type of estimation a test for model specification is provided. The test is based on misspecification errors. In particular a misspecification error is observed if the linear prediction of the test is insignificant while the squared prediction is significant. The misspecifications errors can be due either to model assumptions, lack of observables to explain the relationship of interest or both. All these possibilities are investigated using different model specifications, which are briefly described in this section.

The above methodology aggregates the information associated to the threat in one dummy. Therefore, it cannot identify what are the actual risk factors that generate the threat of violence.

In the second step, to identify the relative importance of the determinants of domestic violence the factors are grouped according to the following rule:

$$y = \begin{cases} 0, \text{ If not to all;} \\ 1, \text{ If yes to at least 1 question;} \\ 2, \text{ If yes to at least 2 question;} \\ 3, \text{ If yes to at least 3 question;} \\ 4, \text{ If yes to at least 4 question;} \\ 5, \text{ If yes to all 5 question;} \end{cases}$$

This level of aggregation allows quantifying in a scale ordered the factors that define the outcome of interest. Consequently, an ordered Logit model is employed to model the determinants of the threat on the above risk factors. As in the Logit case the estimation is followed by a similar test of model specification errors. When conditioned on the fact that the choice of observables are explaining the relationship of interest, the test may be also used to see if an ordered probability model describes the data better than a simple probability model.

In the third step, to give a measure of the intensity of the risk factors (1, 2, 3, 4, and 5), a count on how many times husbands agreed that wife beating can be justified is done.

This type of modeling requires a counting and therefore, a Poisson model is employed.

Again, following the factor specific intensity estimation using the Poisson model, a model specification test is performed (similar with the ones performed for Logit and Ordered Logit) to check if misspecification errors appear with this type of estimation. All the models are estimated using the same households characteristics, area of residence, and woman's/partner' autonomy and status, however all models require different assumptions on error specifications. The complexity of a given model may not imply that the model is correctly specified. The tests of model specification errors will help us also to determine which model is more robust to misspecifications and to suggest a better direction of interpretation of the results.

5. Results

First the pooled results are presented where it is controlled for country specific heterogeneity and second, to analyze the differences due to country specific heterogeneity, country specific regressions are presented. The results are presented in the following order: Logit, Ordered Logit and finally Poisson model.

Table 3: Estimates for Pooled Data - All countries[4]

Variables	**Logit**	**Ordered Logit**						**Poisson**
	dy/dx	dy/dx(0)	dy/dx(1)	dy/dx(2)	dy/dx(3)	dy/dx(4)	dy/dx(5)	
Rural	.010295	-0,0348***	-0,0035***	-0,0000	0,0066***	0,0115***	0,0202***	0,0696***
	[.00693]	[0,0079]	[0, 0007]	[0,0001]	[0,0015]	[0,0026]	[0,0044]	[0,013]
Muslim	.0585424***	-0,0869***	-0,0094***	-0,0007**	0,0159***	0,0289***	0,0520***	0,1912***
	[.00715]	[0,0078]	[0,0008]	[0,0003]	[0,0015]	[0,0026]	[0,0047]	[0,013]
No education	.0511379***	-0,0694***	-0,0066***	0,0006*	0,0136***	0,0227***	0,0390***	0,1677***
	[.00647]	[0,0078]	[0,0006]	[0,0003]	[0,0016]	[0,0025]	[0,0041]	[0,013]
Rich	-.0195209***	0,0493***	0,0051***	0,0000	-0,0093***	-0,0163***	-0,0287***	-0,0979***
	[.0064]	[0,0074]	[0,0074]	[0,0004]	[0,0014]	[0,0024]	[0,0042]	[0,012]
Total number of children	0,003642***	-0,00828***	-0,0009***	-0,00007**	0,0015***	0,0027***	0,0049***	0,0017***
	[0, 00138]	[0,0015]	[0,0018]	[0,00004]	[0,0003]	[0,0005]	[0,0009]	[0,0026]
Number of wives	0, 0188***	-0,0293***	-0,0032***	-0,0002**	0,0054***	0,0098***	0,0175***	0,0569***
	[0, 0036]	[0,0043]	[0,0049]	[0,0001]	[0,0008]	[0,0014]	[0,0026]	[0,0070]
Marital duration	-0,00473**	0,0096***	0,0010***	0,0009**	-0,0017***	-0,0032***	-0,0057***	-0,0217***
	[0, 0025]	[0,0027]	[0,0003]	[0,0000]	[0,0005]	[0,0009]	[0,0016]	[0,0047]
Wife age	0, 00041	0,0001	0,00001	0,0000	-0,00002	-0,0000	-0,0000	-0,0002
	[0, 0003]	[0,0003]	[0,0003]	[0,0000]	[0,0006]	[0,0001]	[0,0001]	[0,0005]
Wife is working	0, 0071	0,0091	0,0010	0,0001	-0,0016	-0,0030	-0,0055	-0,0066
	[0, 014]	[0,0141]	[0,0016]	[0,0002]	[0,0025]	[0,0047]	[0,0087]	[0,0252]
Wife is deciding	0, 0058	0,0076	0,0008	0,0000	-0,0014	-0,0025	-0,0045	-0,0138
	[0, 0075]	[0,0082]	[0,0008]	[0,00005]	[0,0015]	[0,0027]	[0,0048]	[0,0141]
Sexual activity	0, 0025	-0,0082	-0,0009	-0,0000	0,0015	-0,0027	0,0049	0,1380
	[0, 0057]	[0,0063]	[0,0006]	[0,0005]	[0,0012]	[0,0021]	[0,0037]	[0,0108]
Wife is educated	-0, 0038***	0,0096***	0,0010***	0,00009**	-0,0017***	-0,0032***	-0,0057***	-0,0207***
	[0, 0014]	[0,0015]	[0,0001]	[0,00004]	[0,0002]	[0,0005]	[0,0009]	[0,0027]
y = Pr(dummy)	**0,1545**	**0,3281**	**0,0996**	**0,1283**	**0,1533**	**0,1338**	**0,1568**	
Number of observation	***21480***	***20541***						***20541***

Source: Author

[4] Notes: Standard errors in parentheses. *** signifies p<0.001, ** signifies p<0.05, * signifies p<0.10.
Marginal effects are presented here and for all countries

The results for all three estimations (Logit, Ordered Logit and Poisson) when pooling all countries together (Table 3) show that household characteristics such as the religion (being a Muslim), uneducated husband, the numbers of children and wives has positive impact on the threat of domestic violence. On the other hand, the household wellbeing (being rich or not) and the marital duration have a negative impact on the threat of domestic violence. The results also show that the wife status and autonomy (wife being involved to household financial decisions, wife having sexual activity frequently) does not have any significant impact on the threat of domestic violence excepting wife's level of education. Therefore, wife being educated has a significant negative impact on the threat of domestic violence. Also, when looking at the pooled conditional effects of living in the rural area on the risk of being beaten when Logit method is used no significant results are found. This result does not explain the positive unconditional effect of the percentage of the agriculture in economy on the risk of being beaten. This result may be driven by the heterogeneity of the country specific effects. This is explored further by looking at the alternative estimators and by looking at the country specific effects.

When the Ordered Logit model is employed, it is observed that rural effect varies from negative values for the first three questions to positive values for the last two questions. Further, for the Ordered Logit model, the level of well-being of the household and the education level of women have a negative impact on the probability of saying "yes" for all categories.

The level of risk captured by the overall probability increases up to three, decreases after four and increases thereafter. It is noted for example that the probability of answering "yes" to all three questions is 15.33% and that to answer "yes" to all questions is 15.68% (see table 4). The unconditional effects are better captured with the Poisson model, which estimates a risk of being beaten of about 7% due to living in rural area.

For the other variables, the three models show similar results. In terms of model specification errors, the only pooled model that does not suffer from misspecification errors is the Logit model.

Table 4: Overall level of Risk by Country – Marginal Effects

Overall level of Risk							
Countries	**Logit**	**Ordered Logit**					
	dy/dx	dy/dx(0)	dy/dx(1)	dy/dx(2)	dy/dx(3)	dy/dx(4)	dy/dx(5)
Benin	54,5%	48,4%	8,4%	11,4%	13,7%	8,1%	10,2%
Burkina	77,0%	24,4%	10,2%	14,6%	21,0%	15,8%	14,0%
Ghana	41,3%	61,2%	11,3%	9,7%	9,0%	4,8%	4,0%
Guinea	90,7%	10,0%	7,1%	12,8%	14,8%	20,9%	34,4%
Liberia	64,8%	36,3%	11,5%	12,7%	20,0%	12,3%	7,2%
Mali	73,9%	27,3%	10,3%	14,8%	16,5%	19,5%	11,6%
Niger	68,0%	32,8%	8,8%	10,5%	8,5%	10,1%	29,3%
Nigeria	70,5%	29,7%	11,9%	10,7%	10,4%	8,8%	28,5%
Senegal	72,5%	28,6%	7,8%	12,3%	12,4%	19,8%	18,9%
Sierra Leone	72,0%	30,3%	7,6%	10,4%	15,1%	13,3%	23,4%

Source: Author

However, for the other two models, even if the prediction is significant, there are unexplained factors that were not captured by the model. This finding may suggest that some heterogeneity may not be fully captured by the pooled Ordered Logit and Poisson type models, and a country specific analysis may be more informative for these models.

Next, the country specific results are presented to assess in what way the pooled results resemble the country specific results and to see if the pooled heterogeneity may have impacted the Ordered Logit and Poisson type models, however the country specific Logit estimation results are also presented.

Table 5: Logit Results by Country – Marginal Effects

Variables	Benin	Burkina	Ghana	Guinea	Liberia	Mali	Niger	Nigeria	Senegal	Sierra Leone
Rural	0,0587**	0,0577	0,1052**	0,0622*	0,0344	0,0003	0,0034	-0,0319	0,0813*	0,0757*
	[0,0289]	[0,0496]	[0,0396]	[0,0362]	[0,0411]	[0,0407]	[0,0471]	[0,0400]	[0,0447]	[0,0430]
Muslim	0,1763***	0,0315	0,1037**	0,2023***	0,1054**	0,0382	-0,0951	-0,1233**	0,1336*	-0,0201
	[0,02806]	[0,0228]	[0,0369]	[0,0433]	[0,0406]	[0,0437]	[0,083]	[0,050]	[0,073]	[0,0295]
No Education	0,0924***	0,0811**	0,0606**	0,0194	0,0579**	0,0142	0,0056	0,0944**	0,0491	-0,0261
	[0,02575]	[0,0322]	[0,0283]	[0,0245]	[0,0225]	[0,0278]	[0,0308]	[0,03817]	[0,0327]	[0,0347]
Rich	-0,1012***	0,0220	-0,1059**	0,0448*	-0,0316	-0,0277	-0,0111	-0,125***	-0,109**	-0,0287
	[0,02559]	[0,0282]	[0,0401]	[0,0239]	[0,0347]	[0,0310]	[0,0391]	[0,0418]	[0,0466]	[0,0344]
Wife is working*	0,1260	-0,0181	-0,3657**		0,0274	0,0337	-0,1563	-0,1506	-0,0673	0,0818
	[0,0823]	[0,0309]	[0,1470]		[0,0464]	[0,0539]	[0,2043]	[0,1468]	[0,0498]	[0,0725]
Wife is deciding	0,0688**	-0,0103	-0,0636**	-0,0052	-0,0301	0,0483	-0,1125	0,0192	0,0383	0,0071
	[0,03382]	[0,0609]	[0,0276]	[0,0185]	[0,0276]	[0,0460]	[0,1451]	[0,0384]	[0,0548]	[0,0341]
Sexual activity	0,0507*	0,0240	-0,0621**	0,0213*	0,0175	-0,0170	0,0877	0,1166***	-0,0443	-0,0392*
	[0,01961]	[0,0194]	[0,0262]	[0,0125]	[0,0230]	[0,0256]	[0,1831]	[0,03592]	[0,0346]	[0,0230]
Wife is educated	-0,0235***	-0,0002	-0,022***	-0,0011	-0,0001	-0,0013	0,0023	-0,0068	-0,0122*	-0,0102
	[0,0047]	[0,0063]	[0,0060]	[0,0036]	[0,0046]	[0,0061]	[0,0075]	[0,0071]	[0,00684	[0,0078]
Number of observation	***3345***	***2340***	***1883***	***1997***	***2667***	***2665***	***2226***	***1168***	***1432***	***1747***

* Wife is working omitted because of collinearity: 99% of them are working

Table 5 presents the country specific Logit results for the variables of interest. The results show a lot of variation between the analyzed countries.

Starting with the conditional effect of living in a rural area, the pooled results show a positive marginal effect of about 1%, which may not explain the unconditional positive pattern that is observed in the unconditional graph (Fig.2). Therefore, by looking at the country specific results we expect to see heterogeneous and in some cases stronger effects of the rural effects. Indeed, by looking at the country specific effects of the Logit regressions heterogeneous effects are observed, with countries as Ghana showing an

increase of 10% in the risk of being beaten if living in a rural area, followed by countries as Senegal (8.1%), Sierra Leone (7.6%), Guinea (6.2%), Benin (5.9%). The rest of the countries while having positive effects they are not significant.

Table 6: Poisson Results by Country – Marginal Effects

Variables	**Benin**	**Burkina**	**Ghana**	**Guinea**	**Liberia**	**Mali**	**Niger**	**Nigeria**	**Senegal**	**Sierra Leone**
Rural	.0608*	.17575***	.2988***	0.1788***	0.0815***	.00752	0,0538	-.11382***	.2050***	.1310***
	[0,033]	[0,054]	[0,071]	[0,043]	[0,040]	[.03634]	[.09044]	[.0499]	[.0506]	[.0463]
Muslim	.2134***	.1226***	.2180***	0.559***	0.3913***	.09130**	-0,0348	.2785***	.4405***	0,0028
	[0,032]	[0,030]	[0,057]	[0,048]	[0,043]	[.046698]	[.1415]	[.0501]	[.1179]	[.04002]
No Education	.2607***	.19761***	.16562***	0.0556	0.0983***	.04397	0,112**	.18654***	.1346868***	.07466
	[0,045]	[0,052]	[0,055]	[0,047]	[0,032]	[.04006]	[.05772]	[.05073]	[.0498499]	[.0518]
Rich	-.20153***	-0,0350786	-.2827539***	0,0477	0,0079	-.11189***	-0,0228	-.3742***	-.2396***	-0,0060
	[0,037]	[0,036]	[0,077]	[0,036]	[0,040]	[.033285]	[.0736]	[.0560]	[.0556]	[.04337]
wife is working*	.35619***	-.087778**	-.905043***		-0,0192	0,136582	-0,4234	0,1907	0,0310	0,1580
	[0,159]	[0,045]	[0,336]		[0,065]	[.08736]	[.3222]	[.3559]	[.0814]	[.1083]
wife is deciding	.19517***	-0,0594507	-.1018975**	-0,0364	-0,0018	-0,0461	-0,3882	.10896***	0,0519	-0,0537
	[0,041]	[0,099]	[0,052]	[0,032]	[0,031]	[.069725]	[.3343]	[.0510]	[.0886]	[.0476]
Sexual activity	.07207***	0,0793318	-.1688715***	0,0203	0,017	-0,01076	0,3294	.1323***	0,0146	-.0815***
	[0,029]	[0,029]	[0,048]	[0,026]	[0,033]	[.036751]	[.32950]	[.0476]	[.0446]	[.0330]
Wife is educated	-.2822***	-0,005	-.0527***	0,0025	-0,0071	-0,0013	0,0025	-0,009	-.03107***	-0,0123
	[0,033]	[0,003]	[0,012]	[0,004]	[0,004]	[.001817]	[.01412]	[.0083]	[.01048]	[.0121]
Number of observation	***3196***	***2190***	***1805***	***1899***	***2582***	***2553***	***2163***	***1147***	***1376***	***1630***

*Wife is working omitted because of collinearity: 99% of them are working

A look at the intensity of the marginal effect for the risk of being beaten (Poisson results – Table 6) when living in rural area shows that the results are more homogeneous across the countries both in terms of sign and significance, and the model predicts higher marginal effects than the Logit model, sometimes even almost three times larger (see for example the results for Ghana).

The religion plays a major role for the threat of domestic violence in many of the analyzed countries. When ranking the religion factor, the highest impact is found in Guinea followed in order by Benin, Senegal, Liberia and Ghana (the variation in the risk of beating is from 20% to 10%). In countries as Burkina, Mali, Niger and Sierra Leone, being Muslim does not have a significant effect, while in Nigeria being a Muslim impacts negatively the threat of domestic violence (here a being a Muslim will decrease the probability of beating his wife by 12%). When looking at the intensity of the threat of being beaten (Poisson results) similar patterns are observed, but even larger impacts, exception being Nigeria (where were found opposite results[5]) and Burkina Faso and Mali where now the positive results are significant. The Poisson results show more homogeneity between the evaluated countries.

After religion, the lack of education of the male partner is one of the most important factors that increase the risk of wife being beaten in most of the countries. The results are homogeneous across the analyzed countries. The risk of being beaten ranges from about 9% (Benin and Nigeria), Burkina (8%), to 6% (Ghana and Liberia), while the intensity of the threat (Poisson results) is even more relevant; about 26% (Benin) to 10% (Liberia) with Burkina (about 20%), Nigeria (19%), Ghana (16%), Senegal (13%) and Niger (11%).

The household wealth index defined by the variable "Rich" shows similar results for both Logit and Poisson models and the impact of this variable is heterogeneous across the countries. In particular, in countries as Benin, Ghana, Nigeria and Senegal, coming from a wealthy family is reducing the risk of being beaten by about 10%. In Guinea, on the contrary, even in a wealthy family the risk of being beaten is increased by about 4.5%.

[5] The Poisson results in this case may be driven by model specification errors (see Appendix 4)

Another important factor (significant in the pooled model) that reduces the risk of being beaten is the education of the wife. If the wife is educated, the risk of being beaten is reduced by 1.2 to 2.4% in countries as Senegal, Ghana and Benin. For the other countries the coefficient while being negative is not statistically significant.

For some other factors that in the pooled model are not statistical significant show a significant and important impact for some of the analyzed countries.

In particular, a working wife is less likely to be beaten in Ghana where the risk of being beaten is reduced by 36% (Logit regression results) and by 90% (Poisson regression results) when the intensity of the threat of being beaten is analyzed. Again in Ghana, a wife that is part of the decision process is less likely to be at risk of being beaten (by about 6%), but can be at risk of being beaten in Benin (with about 7% increased risk). A sexual active wife helps in a relationship in Ghana (where the risk of being beaten is reduced again by 6%) and in Sierra Leone (with 4%) and it does not help in countries as Nigeria (where the risk of being beaten is increased by 12%), Benin (5%) and Guinea (2%). In all cases the intensity of the threat (represented by the Poisson results) presents stronger impacts.

There are other variables that are significant in the pooled model and are increasing the risk of beating (the number of children, number of wives) or decreasing the risk of beating (marital duration), but with negligible marginal impacts when compared to the other factors.

In terms of model specification errors (Table 7), for Benin, the Logit and Ordered Logit models show no additional misspecification errors, however, the Poisson type model still shows additional misspecifications, for Burkina Faso all three models show no misspecification errors, for Ghana again all three models are passing the test of misspecification errors, for Guinea the Ordered Logit fails the test, for Liberia all three models are passing the test, for Mali the only model that passes the test of misspecification errors is the Ordered Logit, for Niger and Nigeria both the Logit and the Ordered Logit are passing the model misspecification test, finally, for Senegal and Sierra Leone all the models passed the test for model misspecification errors.

Table 7: **Results of Model Specification Errors**[6]

Countries	Methods of estimation					
	Logit		Ordered Logit		Poisson	
	Prediction	Prediction Squared	Prediction	Prediction Squared	Prediction	Prediction Squared
Benin	0.992 [0.0775]***	0.042 [0.0915]	1.1359 [0.1975]***	-0.075 [0.1056]	1.3104 [0.1878]***	-0.3760 [0.1878]**
Burkina	1.7915 [0.6619]***	-0.3530 [0.2895]	1.1578 [0.4480]**	-0.0689 [0.2015]	1.9776 [0.7821]**	-0.6002 [0.4751]
Ghana	1.0540 [0.1055]***	0.0769 [0.0959]	0.9701 [0.2989]***	-0.0101 [0.1014]	1.0146 [0.0930]***	-0.2043 [0.1633]
Guinea	1.4101 [0.5690]**	-0.1205 [0.1657]	0.8633 [0.5500]	0.0282 [0.1118]	1.6840 [0.8618]**	-0.0336 [0.3978]
Liberia	1.3356 [0.4646]***	-0.02633 [0.3499]	1.3470 [0.0335]***	-03088 [0.2869]	2.1216 [0.9230]**	-0.0783 [0.6391]
Mali	1.8241 [1.2357]	-0.0394 [0.0579]	1.3040 [0.5383]**	-0.0340 [0.5596]	2.6688 [2.1221]	-1.0383 [1.3030]
Niger	2.1304 [1.0015]**	-0.0798 [0.7081]	0.7157 [0.3264]**	-1.0895 [0.6979]	6.8099 [2.5325]***	-3.3846 [1.4881]*
Nigeria	1.0161 [0.2658]***	-0.0115 [0.1633]	1.0039 [0.1159]***	-0.0095 [0.1138]	1.6269 [0.4088]***	-0.3846 [0.2326]*
Senegal	0.9890 [0.3331]***	0.0077 [0.2170]	0.9863 [0.3199]***	0.0088 [0.1961]	1.5416 [0.7381]**	-0.3553 [0.4679]
Sierra Leone	1.4927 [0.6393]**	-0.2937 [0.3504]	1.3177 [0.3576]***	-0.4893 [0.4355]	3.4640 [1.8371]**	-1.4342 [1.0353]
Pooled (All countries)	1.0198 [0.0514]***	0.0095 [0.0207]	0.9299 [0.4157]***	-0.0670 [0.0283]**	1.4350 [0.0976]***	-0.3081 [0.0605]***

Source: Author

[6] Notes: Standard errors in parentheses. *** signifies p<0.001, ** signifies p<0.05, * signifies p<0.10.

6. Conclusion

This paper assess the determinants of the threat of domestic violence for ten West African countries using the area of residence, various household characteristics, and measures of women's status and autonomy. The data used came from the most recent version of the Demographic and Health Survey (DHS) for these countries. The surveys were identical in scope and coverage for each of the countries in the analysis. To analyze the impact of the threat of domestic violence, three different methods of analysis are used: a Logit model that takes into account the overall risk level, an Ordered Logit model and a Poisson model that assess the level of risk. It is noted that these models provide distinct results for each country suggesting a high heterogeneity associated to the risk of a threat of domestic violence. Also, the results with the country specific analysis is a more appropriate direction for our study as the pooled analysis may suffer from model misspecification errors, especially for the Ordered Logit and Poisson type models. As a more general result, poverty is the crucial factor for domestic violence for each country taken individually and also for all countries together, and therefore the household welfare is very relevant in the perspective of the reduction of wife beating.

When looking at individual countries it is found that living in a rural area increases the risk of domestic violence in Benin, Ghana, Guinea, Senegal and Sierra Leone. In relation to household characteristics, it is found that religion has had a significant positive impact for all countries other than Burkina Faso, Mali and Niger. Another significant and important factor has been the level of household well-being and/or its level of wealth. The latter had a significant negative impact on the threat of domestic violence in Benin, Ghana, Nigeria, and Senegal. Finally, the factor that defines the improvement in the social status of a wife, which is characterized in the sample by the wife's higher level of education, contributes also at the reduction of the threat of domestic violence.

This study suggests that the education of a woman in the household may have positive effects on the functioning of the household. Additionally, only policies aimed on assisting both men and women to acquire education will be beneficial to the functioning of the household.

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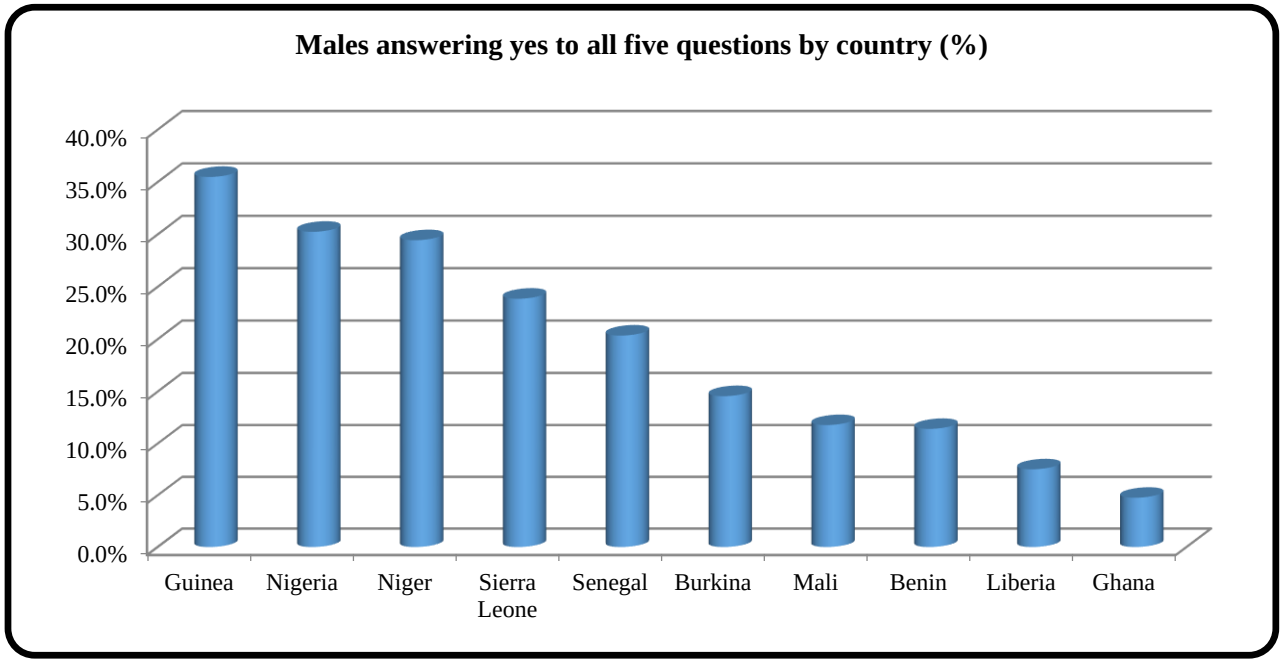
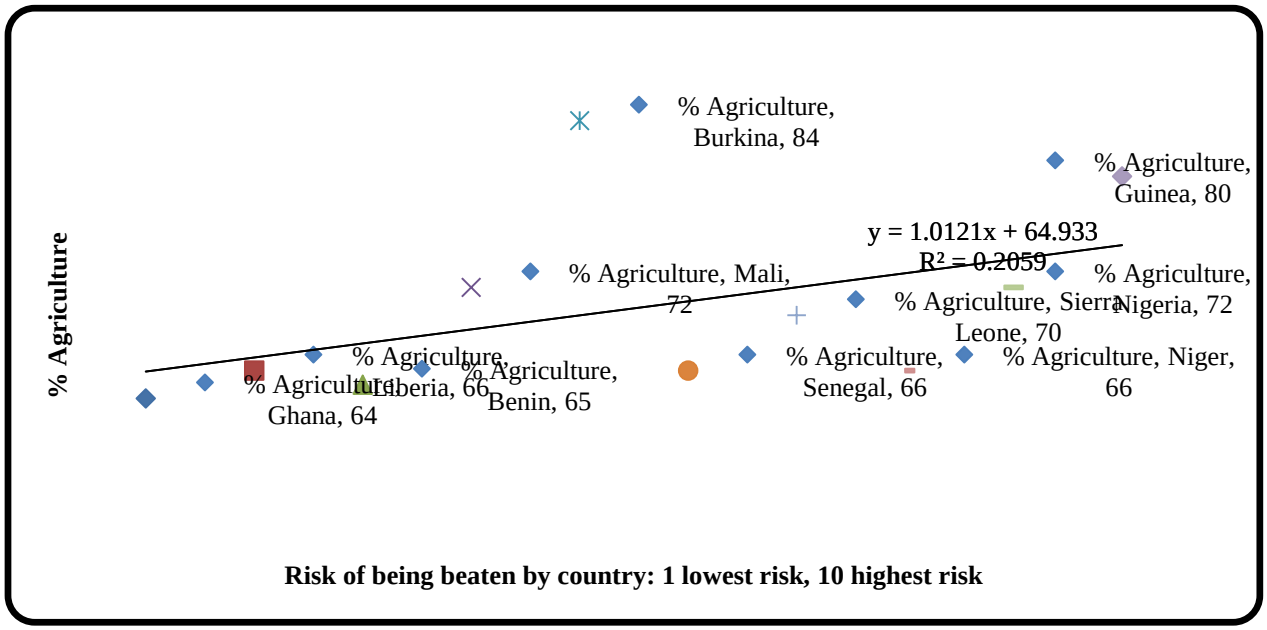
Appendix 1: Data Description

Fig.1 Percentage of males answering yes to all five questions by country



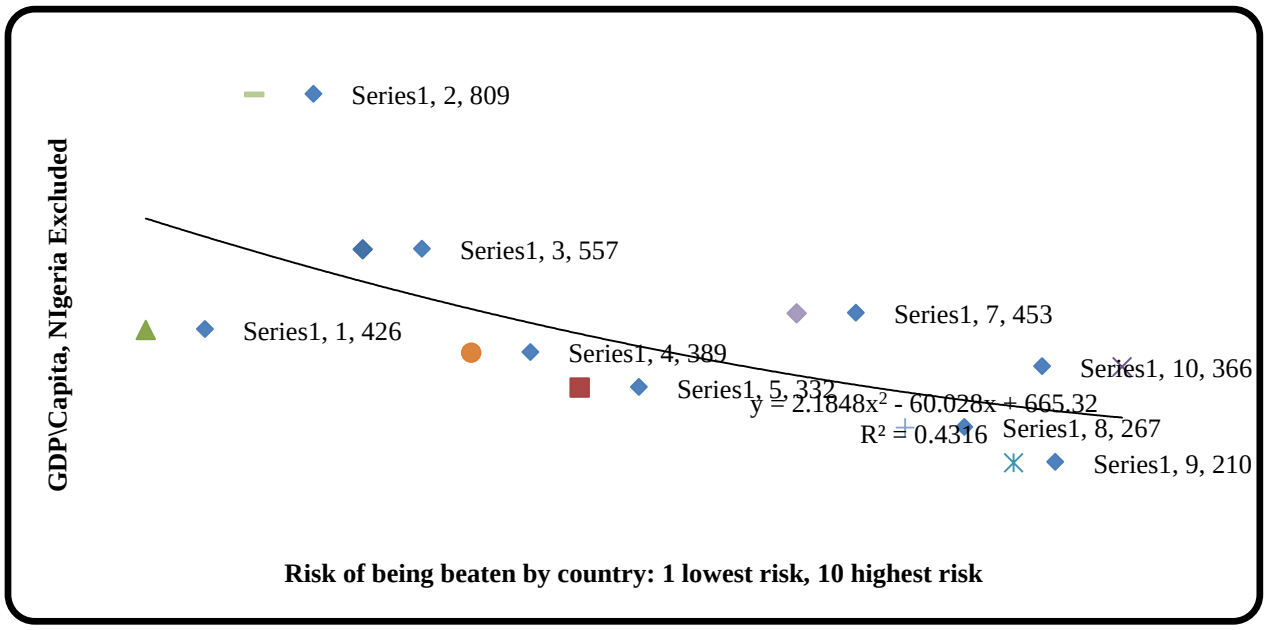
Source: Author

Fig.2 Percentage of agriculture and the risk of being beaten



Source: Author

Fig.3 GDP/Capita in surveyed year and the risk of being beaten, Nigeria is excluded as being a resourse rich country.



Source: Data collected from: http://data.worldbank.org/indicator/NY.GDP.PCAP.CD