On The Trade-Off Between Welfare and Peace: Evidence from West African Countries Using a Quantile Regression

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Abstract
The recent relapse of peace across Africa, especially in West Africa has been nurturing a wide range of concerns on the responsibility of both government and the international community. The effectiveness of actions against insecurity and terrorism with no harm on welfare remains the predominant outlook in all debates. With the aim to assess the current regional synergy against insecurity in all kinds, this study applies a quantile regression approach to investigate the effectiveness of governments' efforts to improve welfare, in the context of increasing insecurity. Instead of focusing on the Human Development Index, repeatedly used in previous studies as an indicator of welfare, the approach in this study favors two different variables, which are less broad and more pertinent when analyzing poor economies. These indicators are life expectancy at birth and infant mortality. From the analysis, development aid is found to have no direct impact on welfare. On the opposite, government social spending contributes to increase life expectancy, reduce infant mortality, and therefore plays an important role in the enhancement of welfare. The impact of social spending on welfare is stronger in countries with poor welfare indicators. However, military spending remains an undermining factor in the effort to heighten households' welfare.
Key words: *Development Aid, social spending, welfare, peace, quantile regression*.

I. Introduction

Government's social intervention in the economy takes different configurations, depending on the nation's economic progress. In developed countries, government's actions are mostly targeted towards policies such as the improvement of the pension system, unemployment compensation, insurance, elderly care etc. In developing areas, civil society considers government as the main player in the improvement of households' living standard. The areas of government priorities generally cover basic need sectors and include healthcare, housing, education, water and sanitation. The narrow budget leeway of government, coupled with the increasing demand for assistance in remote areas has been catching the attention of NGOs, bilateral as well as multilateral partners for more commitment in poor countries. In line with this commitment to curb poverty, government makes use of foreign aid from development partners (UNCTAD, 2006) in addition to the annual budget allocated for social purposes. Yet, decades of development aid rushes did not have noteworthy effectiveness in boosting real growth in Africa (Moyo, 2009). The risk attributed to the surge of development aid is the disruption generated in its management, as it is taken for granted (De Valk, 2010)**.** In effect, most aid targeted for social purposes are not tied with any repayment system, and therefore lead to significant inefficiency, when managed by bureaucratic institutions. In Africa, aid has financed elections, government purchases and holidays instead of schools and hospitals. However, countries such as Gambia, Ghana and Togo have been experiencing good progresses in the management of both development aid and government budget (OECD, 2010).

With the spread of violence, and terrorism across African countries (Nigeria, Chad, Sudan, Cote d'Ivoire, Mali, Algeria etc.), the majority of governments have shifted their priorities to a new challenge: national defense, and the reestablishment of peace. Every year, government spends thousands of dollars for the purpose of peace and protection against attacks. As depicted in the chart 1 below, over the period 2004-2013 the increment rate in military spending outpaced 50% in the majority of African countries. In Ghana and Chad, the rate crosses the 200%. Nigeria is one of the West African countries that are the most exposed to terror. Due to the presence of the terrorist group Boko Haram, a large portion of government budget is allocated for rockets, munitions, and

war equipment. The 2014 government's plan was to allocate around $1 million for military purpose (the Guardian, 2014).

Chart 1.. Military spending across Africa
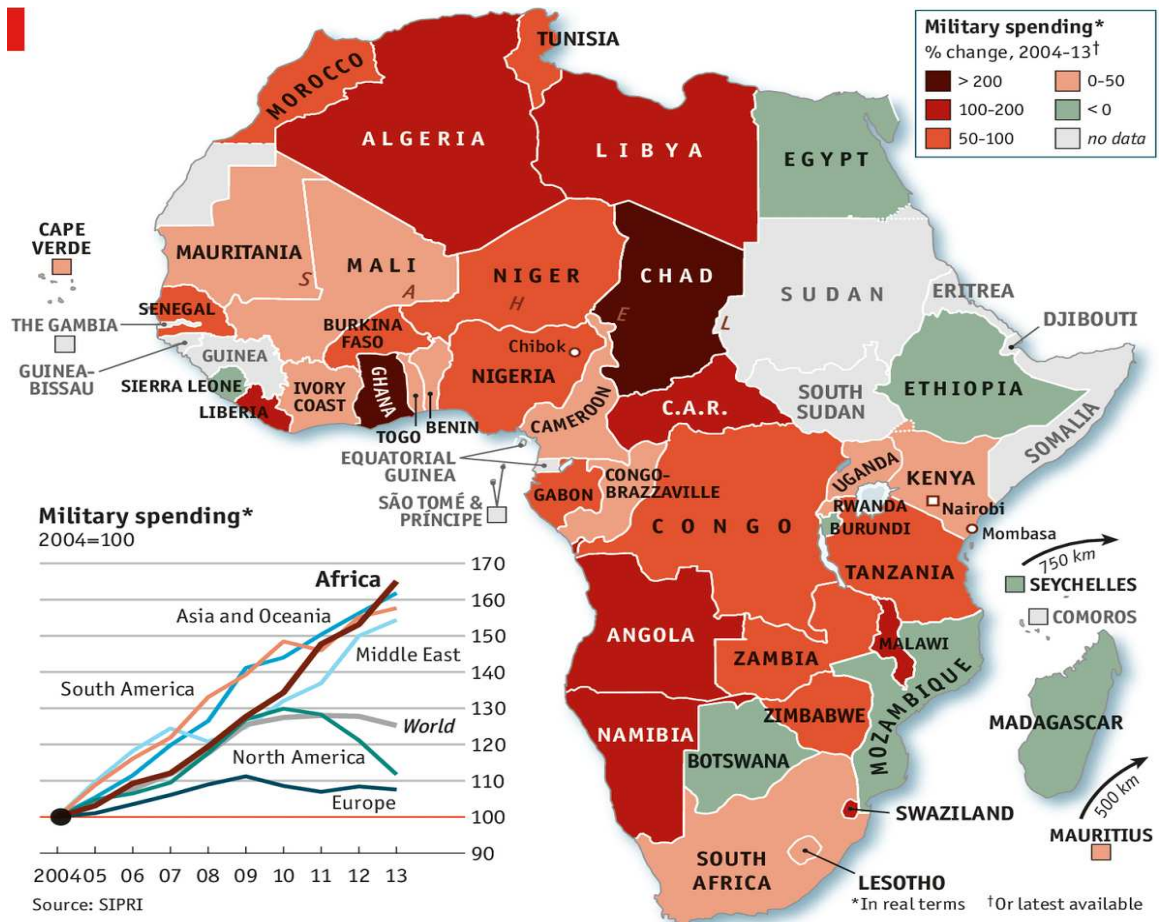
This deviation in government's actions has some adverse effects. The limited financial resources imply that government has to trade-off between peace and welfare. On one hand, too much investment for national defense jeopardizes household's living standards in the sense that national budget allocated for social purpose has to be cut down in favor of peace. On the other hand, no sustainable welfare can be achieved if peace is not guaranteed. The capacity of aid or social spending to improve households' living standard in a situation of increasing insecurity justifies the implementation of this study. The study is focused on the Economic Community of West African States (ECOWAS) composed of 15 countries. By centering the analysis on an economic community, results and interpretations can provide pertinent information on the possible existence of disparities in terms of military spending impact on welfare, as well as aid and social spending effectiveness in a region composed of countries with low economic and social indicators, and sharing common macroeconomic policy directives. The study aims to answer the following questions: what is the impact of development aid and government social spending on welfare? Does increased military spending role as boosting or hindering factor in the welfare improvement

process? More precisely, the analysis has two targets. The first target is to investigate the impact of aid, government social spending and military spending on infant mortality rate, and life expectancy at birth. The second target is to analyze the efficiency of aid, social spending and military spending on the distribution of welfare across the community.

The rest of the paper is organized as following: section 2 reviews the literature on the topic. Section 3 details the data and the approach used for the analysis. The results from the estimations are provided in section 4. Section 6 concludes.

II. Literature review

One of the most inspiring works on financial resources management started with Burnside and Dollar (2000). The two authors have analyzed the contribution of aid in the improvement of economic growth and have found that aid is efficient under good policy and institutions. Some economists have pointed out different mechanisms through which a nation can benefit from a sustained growth with less reliance on aid. For instance, Agénor (2010) has found that, under good policy, increasing public investment in infrastructure can help developing countries shifting from low to faster and sustained growth. In effect, investing in infrastructure such as transport, roads, bridges, electricity, and dams has a so-called "crowding-in" effect in the sense that it reduces the cost of individual firms and increases their productivity (Foster and Killick, 2006). This evidence contradicts the findings of Pritchett (2000). Pritchett (2000) estimated that around 50% of government expenditure generally does not lead to the enhancement of productivity, and consequently does not generate capital. Berg et al. (2007) explored the concept of aid absorption and spending to investigate the trade-off between central bank and government's actions on aid. They found that, the lack of coordination between central bank and government can jeopardize the effectiveness of aid. In developing countries, the spending capacity of aid appears lower than the absorption capacity of aid. This finding is due to the poor quality of institutions and the lack of coordination between government and central bank (Aiyar and Ruthbah, 2008).

The distinction between economic growth and economic development has led researchers to rethink the role of aid in the economy. Gomanee al. (2005) have examined the same efficiency of government spending of aid, by focusing on welfare. Applying a quantile regression on developing countries, Gomanee al. (2005) have found that aid is effective in boosting welfare (aid better-off human development index and reduces infant mortality), through its impact on government spending. For the countries below the median of the distribution of human development index or above that of infant mortality, the impact appears stronger. This finding opposes Boone's (1996) results, who did not find any significant capacity of aid in reducing infant mortality. For Morrissey et al. (2005), the spurious result in the previous study comes from the fact that aid should not be analyzed as a direct indicator likely to affect welfare, rather, as an intermediate factor. In other words, aid affects government spending, first, which in turn influences social spending. Social spending becomes then the factor that affects directly welfare.

Few studies have paid attention to the impacts of military spending on welfare. For Deger (1985) and Nabe (1983), military spending has a mixed impact on welfare. Although an increased recruitment of soldiers reduces unemployment, and positively affects welfare through salaries, and new organizational behavior gained from trainings, the problem appears when soldiers are not willing to integrate the social life after army. This case is common in most developing countries and contributes to slower the economic progress. Apart from the fact that military spending implies additional cost such as education and health, Smith & Smith (1980) see a crowding effect attributed to the surge of military spending. In effect, increasing military spending implies a creation of funds.

The scenario of money creation for military purpose falls into the traditional configuration of budgetary expansion. Financing by notes printing leads to inflation, increases interest rate and crowds-out private investment. The same final impact exists for bond purchases. Increasing taxes reduces households' disposable income and hinders their welfare in favor of soldiers'. Coulomb and Dunne (2008) supported the idea of mixed effect of military and social spending and analyzed military and social spending in terms of opportunity cost. The two authors presented army and welfare as two goods, and government has to trade-off between them. To increase the security level, some welfare has to be scarified.

III. Data and methodology

Data are mainly collected from the African development indicators, available in the World Bank database. The only exception is the variable aid. Data on aid are compiled from the IMF balance of payment statistics as provides more details on the components of aid. The variable aid is composed of grant (current transfer to the public sector). Loan is excluded for two reasons: the lack of data on concessional loan and the risk of misleading results generated by the combination grant and loan into a single variable, as the two variables can have contradictory effects (M'Amanja et al. 2005). The study covers 32 years (1980-2011) and focuses on all 15 countries of the Economic Community of West African Countries composed of Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo).

The analysis focuses on two indicators of welfare as regressant: life expectancy (in years) and infant mortality rate (per 1000 live births). The list of control variables includes per capita GDP (PPP constant, 2005), government social spending, aid-grant and military expenditure, all computed as share of GDP. The indicator of government social expenditure includes government spending for health and education. As posited by Verschoor (2002), increasing expenditure in social sectors such as education, health and housing, has an effective impact in curbing poverty and improving households' living standard. The unavailability of data on government spending for housing for the majority of countries restricts the choice of government social spending to education and health.

Table 1 reports the summary statistic of the variables of interest. Results show poor welfare indicators in the whole region. For 1000 births, nearly 100 die, with more than 150 in some countries (such as Liberia and Sierra Leone). The source of death includes early pregnancy of the mother, the deteriorating conditions of health service, poverty, malnutrition, violence etc.. These factors explain the low life expectancy in the region. On average, people do not expect to cross the age of 50. On the other side, social spending and aid are close to each other. 6% of GDP are spent for social purposes against 7% as contribution of development partners for leveraging households' living standards. In reality, social spending is overestimated and should be less than 6% of GDP. The reason is that, a portion of government spending for social purposes is coming from development aid. Around 1.5% of GDP is spent for military purposes, with nearly 30% of GDP in countries prone to terror (such as Chad).

Table 1. Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Mortality (1000 births)	480	98.65	31.97	18.20	163.70
Life expect	480	50.48	7.15	37.19	73.92
Social spending	138	6.33	2.05	2.70	12.08
Aid	386	7.18	17.53	0.01	188.24
Per capita GDP	474	384.49	274.98	54.51	2038.88
Military expenditure	275	1.56	2.24	0.18	29.73

The next plots describe the possible correlation between welfare indicators (infant mortality and life expectancy) and the variables of interest (aid, government social spending and military spending). Plots 1 and 2 indicate a positive impact of aid on welfare. Increasing aid contributes to reduce infant mortality and increase life expectancy. However, the two fitted lines appear less steep, implying a weak correlation between the variables. On the opposite, plots 3 and 4 provide a clear view of the correlation between social spending and welfare indicators. The fitted lines becomes steeper than those of plots 1 and 2. Graph 3 shows that, social spending and infant mortality are negatively correlated. An increment in social spending is followed by a decrease in infant mortality. Besides, life expectancy appears to move towards the same direction as social spending (plot 4). In other words, increasing social spending contributes to raise life expectancy. A comparison between the plots for aid and social spending shows that government social spending is strongly correlated with welfare compared with aid. Unlike aid and social spending, military spending appears negatively correlated with welfare. Plots 5 and 6 indicate that a surge in expenditure for military purpose in associated with a decrease in life expectancy and an increase in mortality rate.
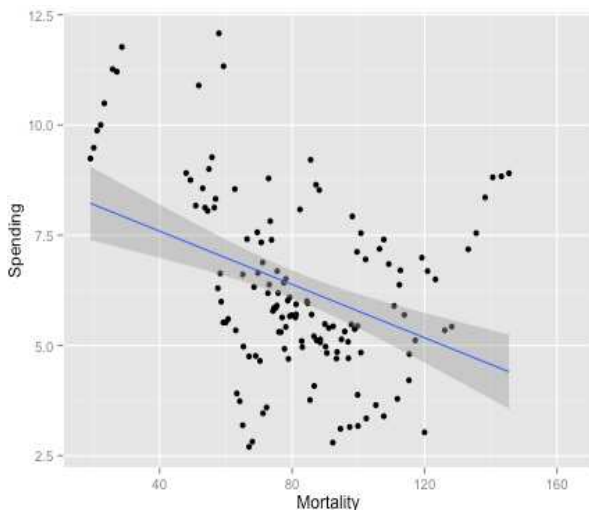
Plot 1. Aid and mortality
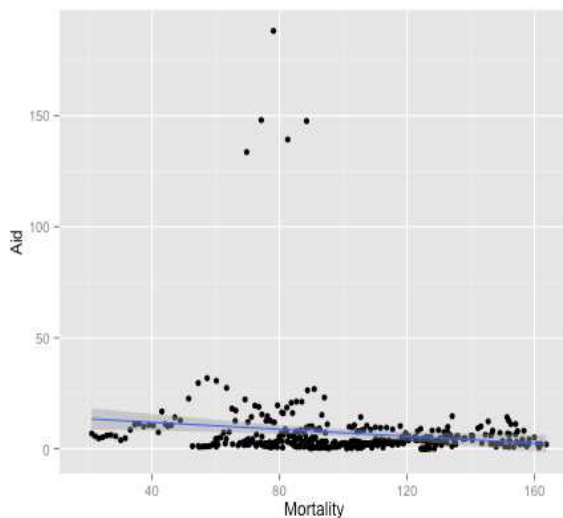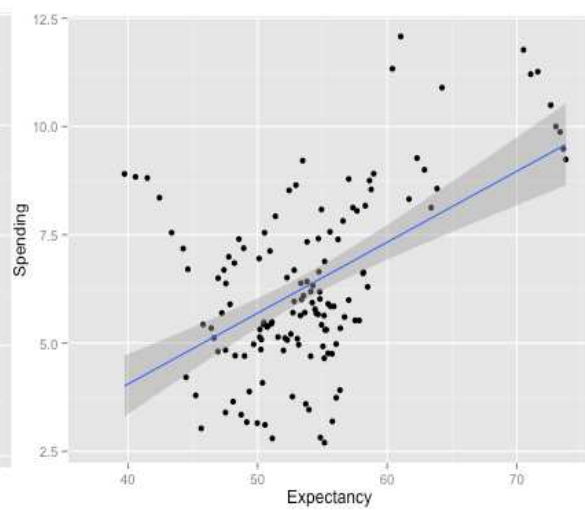
Plot 2. Aid and life expectancy
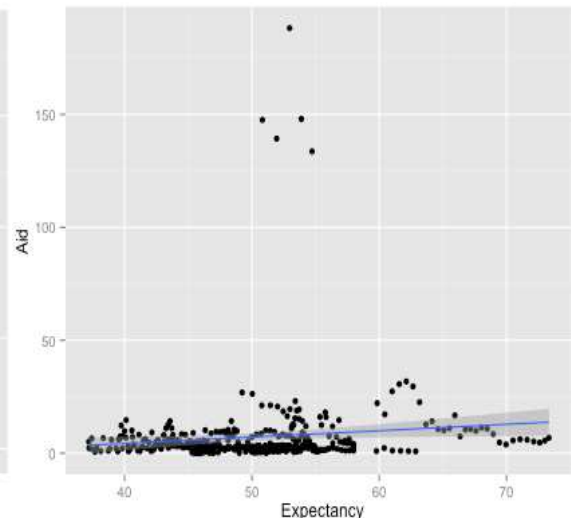
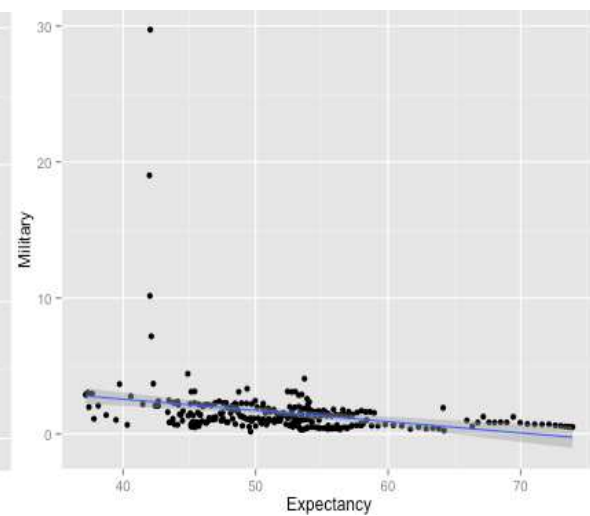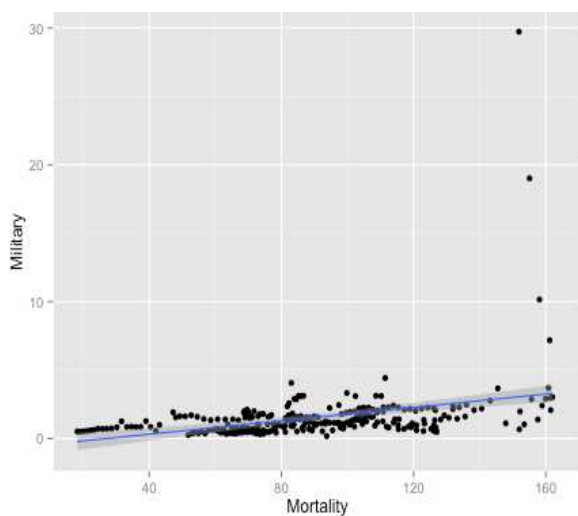Plot 3. Social spending and mortality

Plot 4. Social spending and life expectancy

Plot 5. Military spending and mortality   Plot 6. Military spending and life expectancy

The findings from the 6 plots suggest that aid is weakly correlated with welfare (life expectancy and infant mortality), compare with social spending. Social spending has a higher impact on welfare through increasing life expectancy and reducing infant mortality. On the opposite, military spending remains harmful for welfare. The next sections examine these findings by using an appropriate econometric tool.

III. Econometric approach
The approach follows the methodology used by Gumanee et al. (2005). A distinctive feature in this study is the welfare indicators. Instead of using Human Development Index, which is a broad indicator, life expectancy at birth is included, in addition to the infant mortality. Although life expectancy is one of the HDI components, its importance in the analysis of welfare, especially in Africa, is critical. Therefore, limiting the analysis to the HDI as general indicators hides some important information.

The starting point for the analysis is the following equation:

$$WLF_{it} = \beta_0 + \beta_1 AID_{it} + \beta_2 INC_{it} + \beta_3 GSE_{it} + \varepsilon_{it} \qquad (1)$$

WLF is an indicator of welfare, namely the life expectancy (in years), and infant mortality rate; INC the income per capita; GSE government social spending, as share of GDP; AID is aid-grant, as share of GDP.

As government source of social expenditure includes aid, to avoid redundancy in the regressors (double count), AID has to be removed from GSE. A new variable GSE$_{resid}$ is obtained by taking the residual from the regression of GSE on AID:

$$GSE_{it} = \beta_0 + \beta_1 AID_{it} + \widehat{GSE}_{Resid\_it} \qquad (2)$$

The variable military expenditure (MEX) is added to analyze its possible contradictory impact on welfare (Morrissey et al., 2005). The final equation is obtained by replacing GSE in the equation (6) by $\widehat{GSE}_{Resid\_it}$ GSE$_{resid}$:

$$WLF_{it} = \beta_0 + \beta_1 AID_{it} + \beta_2 INC_{it} + \beta_3 MEX_{it} + \beta_4 \widehat{GSE}_{Resid\_it} + \varepsilon_{it} \qquad (3)$$

IV. Results and interpretations

The results in table 2 show that social spending has a negative and significant impact on infant mortality. The impact is higher at the 10th percentile and also for the median. At the 10th percentile, a USD 1 increase in social spending reduces the infant mortality ratio by 0.28 points. At the median of the distribution of infant mortality, the coefficient becomes smaller (0.25). In other words, social spending has stronger impact in the countries with lower infant mortality rate. at the 25th percentile and beyond the 75th percentile, social spending becomes less significant . Besides, the result shows that aid has no direct significant impact on welfare at all percentiles, which is consistent with the findings of Morrissey et al. (2005).

Per capita GDP appears to be negatively correlated with infant mortality. The overall results show that a 1% increase in per capita GDP reduces infant mortality rate by around 0.02 points. Unlike social spending and per capita GDP, an increased military expenditure has a positive impact on infant mortality. The impact is more prominent between the 25th and the 95th percentiles. The results suggest that a USD 1 additional military expenditure increases the infant mortality rate by 1.4 points between the 25th and the 95th percentile, on average.

Table 2. The impact of aid and social spending on Infant mortality

VARIABLES	(1)	(2)	(3)	(4)	(5)
			Infant Mortality		
	10%	25%	50%	75%	95%
Social (residuals)	-0.2771**	-0.1585	-0.2479***	-0.2751*	0.2810
	(0.1314)	(0.1029)	(0.0893)	(0.1597)	(0.2565)
Aid (/GDP)	0.0002	-0.0006	-0.0110	-0.0180	-0.0362
	(0.0732)	(0.0779)	(0.0502)	(0.0703)	(0.1929)
Log per capita GDP	-0.0183***	-0.0238***	-0.0273***	-0.0311***	-0.0233**
	(0.0049)	(0.0056)	(0.0050)	(0.0071)	(0.0104)
Military Expenditure (/GDP)	0.6360	1.4796**	1.4554***	1.4306***	0.2916
	(0.4928)	(0.5708)	(0.4176)	(0.5227)	(0.7414)
Constant	0.1655***	0.1930***	0.2272***	0.2585***	0.2490***
	(0.0238)	(0.0324)	(0.0334)	(0.0455)	(0.0576)
Observations	78	78	78	78	78
reps	20	20	20	20	20
df_r	73	73	73	73	73
q1	0.1	0.25	0.50	0.75	0.95
sumrdv1	0.832	1.408	1.783	1.432	0.445
sumadv1	0.307	0.658	0.868	0.720	0.237
n_q	1	1	1	1	1
convcode	0	0	0	0	0
rank	5	5	5	5	5

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3 reports the results for life expectancy at birth, the second indicator of welfare. The findings match with the previous results. On average, social spending is found to have a positive and significant impact on life expectancy. The impact becomes more robust from the 25th percentile of the life expectancy distribution. At the 25th percentile, a USD 1 increase in government social spending increases life expectancy by 1.68%. Countries with the highest life expectancy benefit more from social spending. At the 95th percentile, the impact of social spending on life expectancy appears higher and close to 3% for any additional spending for social purposes. However, as found in table 1for the case of infant mortality, aid has no direct impact on life expectancy. At all ranges of the distribution of life expectancy, the coefficient of the variable Aid does not show an effect on life expectancy.

High per capita GDP leads to high life expectancy. At all percentiles of the distribution of life expectancy, per capita GDP shows a positive and significant impact on life expectancy. However, the magnitude of the impact reduces when approaching the highest percentile. From the 10th percentile to 95th percentile of the distribution of life expectancy, the impact of per capita GDP on life expectancy reduces from 0.14% to 0.07%. The only exception is the 25% percentile where the impact is around 16%. Military expenditure, on the contrary, has a perverse effect on life expectancy. Countries with lower life expectancy are the most vulnerable. In effect, at the 10th percentile of the distribution, a USD 1 additional government expenditure for military purposes reduces life expectancy by around 8%, higher than the other percentiles. However, at the 95th percentile, the impact of military expenditure on life expectancy becomes insignificant. These results indicate that the lower the life expectancy, the worse the effect of an increased military expenditure

Table 3. The impact of aid and social spending on life expectancy

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Log life expectancy				
	10%	25%	50%	75%	95%
Social spending (residuals)	1.1209	1.6835***	1.6755***	1.6528***	2.8017***
	(1.0464)	(0.6301)	(0.4778)	(0.4885)	(0.9194)
Aid (/GDP)	-0.1485	-0.1140	0.0550	0.0117	-0.0203
	(0.6530)	(0.1996)	(0.4344)	(0.3982)	(0.3749)
Log per capita GDP	0.1422***	0.1578***	0.1482***	0.1203***	0.0747***
	(0.0394)	(0.0224)	(0.0238)	(0.0158)	(0.0197)
Military Expenditure (/GDP)	-8.3394***	-6.5714***	-2.9934*	-4.2845*	-1.1582
	(2.5740)	(2.3094)	(1.7073)	(2.3547)	(2.3523)
Constant	3.1717***	3.0890***	3.1325***	3.3538***	3.6364***
	(0.2243)	(0.1432)	(0.1490)	(0.0936)	(0.0906)
Observations	78	78	78	78	78
reps	20	20	20	20	20
df_r	73	73	73	73	73
q1	0.100	0.250	0.500	0.750	0.950
sumrdv1	3.375	5.939	7.649	6.480	2.493
sumadv1	1.646	2.874	3.360	2.642	0.770
n_q	1	1	1	1	1
convcode	0	0	0	0	0
rank	5	5	5	5	5

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In summary, aid has no direct effect on welfare. Government social spending appears to be strongly and positively correlated with welfare. An increase in social spending contributes to increase life expectancy at birth, and reduces the infant mortality rate. In effect, as aid (grant, the variable of interest for this study) is not tied with any repayment system, in countries with poor institutional qualities, like the majority of West African countries, it is usually used for purposes other than the ones it has been assigned to. In the majority of cases, a large portion of aid is used for government's own interests. Another reason that explains the insignificance of the variable aid in the result is its computation process. The misuse of aid has led some development partners to invest directly in specific projects in the recipient nation, with no connection with government. As these types of assistance are not recorded in the balance of payment, it is followed by an underestimation of the variable aid. Social spending (net of aid) is found better to improve welfare due to government's social concerns, that pushes to more budget allocation and monitoring for more satisfactory policy. The increasing in budget efficiency can also be related to development partners conditionality for aid disbursement **(Mosley et al., 2004)**. However, military expenditure appears to be harmful for welfare. An increased military expenditure reduces life expectancy and increases infant mortality rate. Countries with poor welfare indicators are the most vulnerable to military spending. The negative impact of military spending on welfare is explained by the following. To finance military spending, other budgets have to be cut down. This means that if the budget allocated for social sectors (education and health) have to be reduced to finance military spending, households' demand for health and education will remain partially satisfied. The aftermath is the deterioration of their welfare; explained by many factors such as he limited healthcare service, the lack of hospitals and proper treatments, and the reduction of school enrolment, due to the lack of schools; leading to juvenile depravation and the deterioration of social cohesion.

Conclusion

The idea that aid promotes development remains mixed among economists. To bring a contribution to the literature, this study used an quantile regression to analyze the effect of aid on welfare, and the possible contribution of government social spending to the enhancement of households' living standard in the context of arms race in the majority of West African countries. From the analysis, it is found that has no direct effect in promoting welfare. On the opposite, an increasing social spending contributes to the leverage of welfare by reducing infant mortality and increasing life expectancy. Besides, military spending has a negative impact on life expectancy and a positive effect on infant mortality, and therefore undermines the improvement of households' living standards. In the context of increasing terror and violence in Africa, and particularly in West Africa, the study shows the trade-off that exists between government efforts to improve welfare and government's actions the preserve peace. The efforts to reach a global sustainable development require an enhancement and a rethinking of the global security framework as well actions to alleviate poverty. At national level, the improvement of institutional quality, the increase in social spending with more attention to marginalized and extremely poor people, more accountability at both local and central level, the implementation of policies that match with households' needs rather than government ambitions, can contribute to level up the effectiveness of governments' actions. At the international or regional level there is a need to increase partnership in social areas with more focus on technical support and capacity development. Funds disbursement should be conditioned by evidence of effective social actions at local and national level. There should also be constant monitoring and assessment of the actions plan and policies. As increasing military spending undermines the efforts to enhance welfare, alternative strategies need to be set up. The peace negotiation strategy should be revised. National alertness and responsibility (individual and

collective) remain powerful tools that can considerably reduce the spread of terrorism. Besides, in line with the European Union strategy, information sharing and the creation of a regional migration management unit can be an effective option to handle human traffic in a region constantly prone to insecurity and terrorism.

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