

IMPROVING WELFARE: FOREIGN AID VERSUS GOVERNMENT SOCIAL SPENDING, EVIDENCE FROM AFRICAN COUNTRIES USING A QUANTILE REGRESSION

Zakaria Zoundi

Graduate School of International Cooperation Studies, Kobe University, Department of Economic Development and Policies, 2-1 Rokkodai-cho, Nada-ku, Kobe 657-8501, Japan

ABSTRACT: *The study uses a quantile regression to investigate the role of government actions to enhance welfare. Instead of using the Human Development index as a broad indicator of welfare, the analysis focuses on life expectancy at birth, which is more specific and pertinent for the case of less advanced economies. In addition to life expectancy, infant mortality rate is used as additional indicator. To avoid a bias in the estimates generated by a double count of the variable aid, the residual from the regression of social spending on aid is used, instead of the variable social spending itself, as some portions of government social spending are financed by aid. Results reveal that aid does not directly affect welfare. On the opposite, government social spending contributes to increase life expectancy, reduces infant mortality, and therefore plays an important role in the improvement of welfare. In addition, the impact of social spending on welfare appears stronger in the countries with poor welfare indicators, than the countries with relatively better welfare indicators.*

KEYWORDS: Aid, Social Spending, Welfare, Quantile Regression.

INTRODUCTION

Government social intervention in the economy takes different aspect depending on the nation's welfare level. In developed nations, government's actions are more targeted towards policies such as improving the pension system, unemployment compensation, insurance, elderly's assistance etc. In developing countries, and particularly Africa, the civil society sees government as major player in the fight against poverty, and the leverage of households' living standard. The areas of government priorities cover a wide range of sectors including healthcare, housing education, water and sanitation. The limited government resources, combined with the increasing demand for assistance in remote areas has been catching the attention of NGOs, bilateral as well as multilateral partners for more involvement in poor countries. Therefore, in addition to the annual budget allocated for social purposes, government makes use of aid from development partners (UNCTAD, 2006). The risk attributed in development aid is the disruption generated in the 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 huge inefficiency, when managed by bureaucratic institutions. In Africa, aid has financed elections, government purchases and holidays instead of constructing schools and hospitals. However countries such as Gambia and Togo and have been experiencing good progress in both development aid and government budget effectiveness (OECD, 2010). The capacity of aid or social spending to improve people living's standard justifies the implementation of study. The study is focused on the Economic Community

of West African States (ECOWAS) composed of 15 countries. By focusing on an economic community, results and interpretations provide a pertinent information on the possible existence of disparities in terms of spending and aid effectiveness in an economic community composed of countries with low economic and welfare indicators, and sharing common macroeconomic policy directives. Besides, the study aims to answer the followings questions: what is the impact of development aid, and government social spending on welfare? Precisely, the study has two particular targets. The first target is to analyze the impact of aid and government social spending on infant mortality rate, and life expectancy at birth. The second target is to investigate the efficiency of aid and social spending on the distribution of welfare across the community.

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. Section 4 provides the results from the estimations. Section 6 concludes.

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 improving economic growth and found that aid is efficient under good policy and institutions. Some economists have pointed out different mechanisms through which a nation could gain a sustained growth, with less reliance on aid. 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). He 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 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 (Aiyya and Ruthbah, 2008).

The distinction between economic growth and economic development led researchers to rethink the the role of aid in the economy. Gomanee al. (2005) has examined the same concept of government spending of aid, by focusing on welfare. Applying a quantile regression on developing countries data, Gomanee al. (2005) 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 analysis as direct indicator likely to affect welfare, rather as an intermediate

factor. Precisely, aid affects government spending, first, which in turn influences social spending. Social spending becomes then the direct factor that can affect welfare.

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 it provides more detail on the component of aid. The variable aid is composed of grant (current transfer to the public sector). Loan is excluded for two reasons: lack of data on concessional loan and the risk of misleading results generated by combining 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 members states of the ECOWAS (Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo).

The analysis uses 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 services sectors such as education, health and housing, has an effective effect in curbing poverty and improving household living standards. The unavailability of data on government spending for housing for the majority of countries restricts the choice of government spending indicator to educator and health.

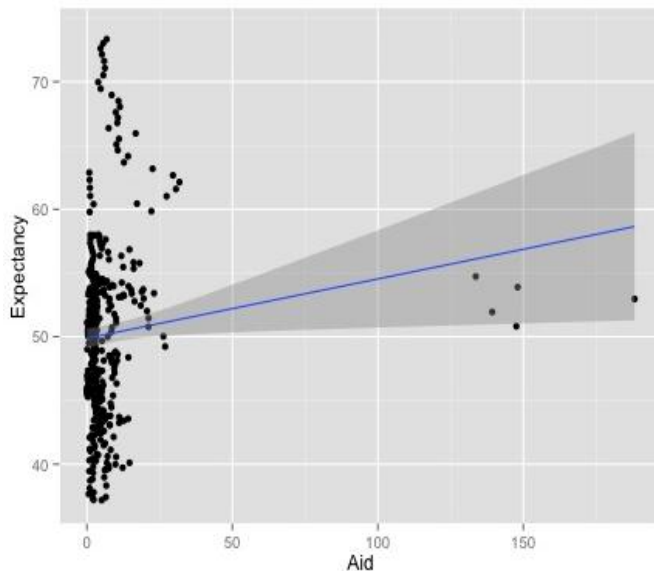
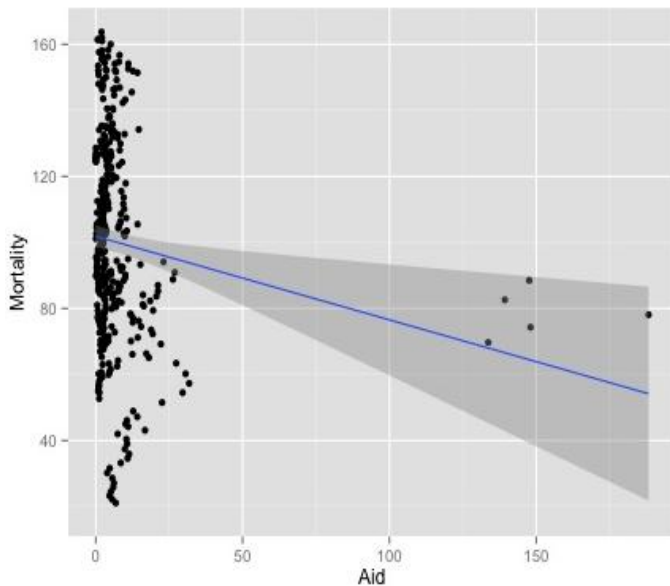
Table 1 reports the summary statistic of the variables of interest. Results indicate poor welfare indicators in the whole union. For 1000 births, nearly 100 die, with more than 150 in some countries (such as Liberia and Sierra Leone). The source of death includes early pregnancy of the mother, the deteriorating conditions of health service, poverty, malnutrition, violence etc., which are common in the majority of the countries. These factors explain the low life expectancy in the union. On average, people do not expect to cross the age of 50. On the other side, social spending and aid appears to be 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, some part of government spending for social purposes are coming from aid.

Table 1. Summary statistic

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 correlation between welfare indicators and development aid (graph 1 and 2), on one hand, and, on the other hand, the correlation between social spending and welfare indicators (graphs 3 and 4).

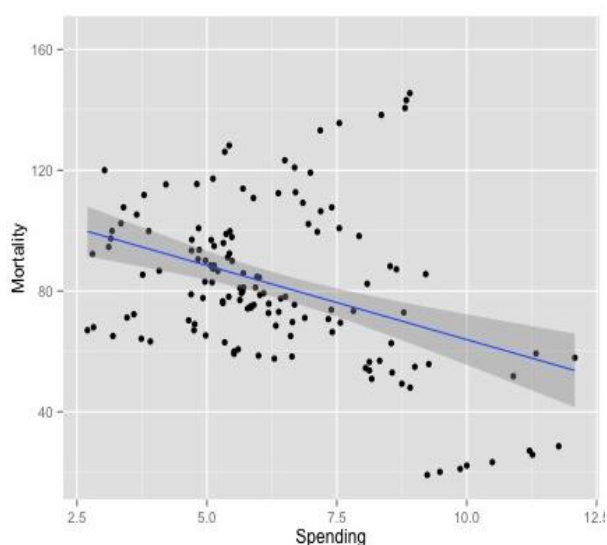
As shown in plots 1 and 2, the correlation between aid and welfare indicators does not appear apparent, although the fitted line indicates that aid is negatively correlated with mortality, and positively correlated with life expectancy. The gap between of the fitted line and the points is another factor explaining the weak correlation between aid and welfare indicators.



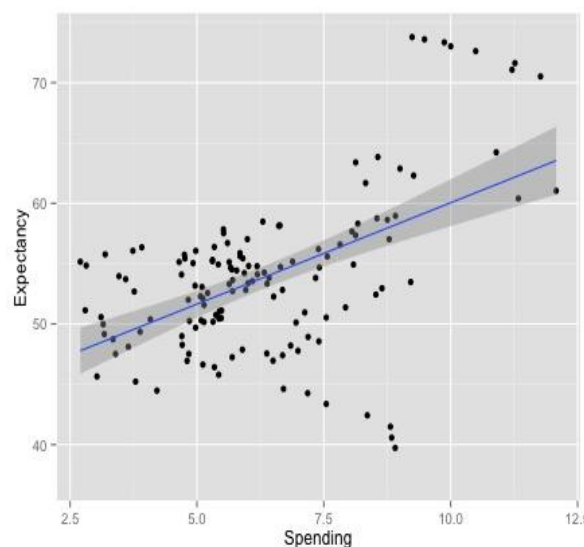
Plot 1. Aid and mortality

Plot 2. Aid and life expectancy

On the opposite, plots 3 and 4 provide clear result of the correlation between social spending and welfare indicators. The graph 3 shows that, social spending and infant mortality appear negatively correlated. An increase 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 leads to a raise in life expectancy



Plot 3. Social spending and mortality



Plot 4. Social spending and life expectancy

The findings from the four plots suggest that aid appear weakly correlated with welfare (life expectancy and infant mortality). On the opposite, government social spending improves welfare by increasing life expectancy and reducing infant mortality. The next section examines these findings by using an appropriate econometric tool.

Econometric approach

The approach follows the methodology used by Gumanee et al. (2005), and focuses on ECOWAS countries. 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 birth mortality rate. 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:

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

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 extracted from GSE. A new variable GSE_{resid} is obtained by taking the residual from the regression of GSE on AID:

$$GSE_{it} = \beta_0 + \beta_1 AID_{it} + \widehat{GSE_{Resid_{it}}} \quad (2)$$

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

$$WLF_{it} = \beta_0 + \beta_1 AID_{it} + \beta_2 INC_{it} + \beta_3 MEX_{it} + \beta_4 \widehat{GSE_{Resid_{it}}} + \varepsilon_{it} \quad (3)$$

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. Beyond the 75th percentile, social spending appears less effective. However, it is found that aid has no direct significant impact on social spending 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 the infant mortality rate by around 0.02 points. Unlike social spending and per capita GDP, an increased military expenditure has a negative 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

	(1)	(2)	(3)	(4)	(5)
VARIABLES	10%	25%	Infant Mortality 50%	75%	95%
Social spending (residuals)	-0.2771** (0.1314)	-0.1585 (0.1029)	-0.2479*** (0.0893)	-0.2751* (0.1597)	0.2810 (0.2565)
Aid (/GDP)	0.0002 (0.0732)	-0.0006 (0.0779)	-0.0110 (0.0502)	-0.0180 (0.0703)	-0.0362 (0.1929)
Log per capita GDP	-0.0183*** (0.0049)	-0.0238*** (0.0056)	-0.0273*** (0.0050)	-0.0311*** (0.0071)	-0.0233** (0.0104)

Military Expenditure (/GDP)	0.6360 (0.4928)	1.4796** (0.5708)	1.4554*** (0.4176)	1.4306*** (0.5227)	0.2916 (0.7414)
Constant	0.1655*** (0.0238)	0.1930*** (0.0324)	0.2272*** (0.0334)	0.2585*** (0.0455)	0.2490*** (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, as the second indicator of welfare. The findings match with the previous results. 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 14 for 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

	(1)	(2)	(3)	(4)	(5)
	Log life expectancy				

VARIABLES	10%	25%	50%	75%	95%
Social spending (residuals)	1.1209 (1.0464)	1.6835*** (0.6301)	1.6755*** (0.4778)	1.6528*** (0.4885)	2.8017*** (0.9194)
Aid (/GDP)	-0.1485 (0.6530)	-0.1140 (0.1996)	0.0550 (0.4344)	0.0117 (0.3982)	-0.0203 (0.3749)
Log per capita GDP	0.1422*** (0.0394)	0.1578*** (0.0224)	0.1482*** (0.0238)	0.1203*** (0.0158)	0.0747*** (0.0197)
Military Expenditure (/GDP)	-8.3394*** (2.5740)	-6.5714*** (2.3094)	-2.9934* (1.7073)	-4.2845* (2.3547)	-1.1582 (2.3523)
Constant	3.1717*** (0.2243)	3.0890*** (0.1432)	3.1325*** (0.1490)	3.3538*** (0.0936)	3.6364*** (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, the results show that aid does not have a 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. However, military expenditure is harmful for the development of the union. An increased military expenditure reduces life expectancy and increases the infant mortality rate. Countries with the poor welfare indicators appear to be the most vulnerable to military expenditures.

CONCLUSION

The idea that aid promotes development remains unclear among economists. This study used an econometric investigation to address the effect of aid on welfare, and the possible contribution of government social spending to the enhancement of people living standard. Results showed that aid is not effective in promoting welfare. On the opposite, an increasing social spending contributes to the leverage of welfare standard by reducing infant mortality and increasing life expectancy. Another important finding is the effect of government military spending. Results showed that military spending has a negative impact on life expectancy and a positive effect on infant mortality, and therefore undermines the efforts to improve households' living standards. In

the context of increasing insecurity and violence in West Africa, the study reveals the existence of a trade-off between government efforts to improve welfare and its action to preserve peace. One of the most challenging task for government as well the international community is tackle the issue of peace, with no harm on welfare.

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