Avoiding The Fragility Trap in Africa: The Case of Guinea Bissau

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Introduction:

Twenty-two out of 48 Sub-Saharan African countries are classified by the World Bank as “fragile and conflict affected states”, countries where policies and institutions—or governance, broadly defined—are so weak that the state’s ability to guarantee security to its citizens and deliver basic public services is severely limited (see World Bank, 2002 for details on the technical criterion used, ‘CPIA’). In addition to the above problems, the lack of functioning institutions and security is much felt by neighboring countries and generates a development crisis, which encompasses the generalized incapacity of an economy to generate the conditions necessary for a sustained improvement in the standard of living. The problem is basically structural in nature and its antecedents lay in part in the inability of postcolonial governments to fundamentally transform the economies inherited at independence. Guinea Bissau is a good example of countries that have been mired in political crisis because of absence of state able to guarantee control of the territory, assure minimum public services and control the army’s political dominance.

More disturbing than the structural factors is the fact that the performance of fragile countries in Sub-Saharan African has been dismal. In an era of globalization when many developing countries are increasing their flow of trade, FDI and non-FDI flows, Sub-Saharan Africa fragile countries are found increasingly marginalized in the global economy with shrinking growth rates of real GDP per capita. For instance, since the late 1990s, their performance has been lagging behind that of non-fragile countries, with the gap widening over time (see display in Figure 1).

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1 This brief summary is based on “Avoiding the Fragility Trap in Africa” (November, 2011) by Noro Andriamihaja, Matthias Cinyabuguma, Shantayanan Devarajan. This brief refers to the paper, especially as regards to equations and empirical results. Readers should refer to the paper as well or contact the authors at Matthias@umbc.edu, Sdevarajan@worldbank.org, and nandriamihaja@worldbank.org if they have any question.
Furthermore, fragility seems to be persistent: the probability that an African fragile state in 2001 remained fragile in 2009 was 0.95. Globally speaking, 35 countries defined by the World Bank as fragile in 1979 were still fragile in 2009 (European Report on Development, 2009), and most of them remain trapped into political conflict and poverty.

Since the end of colonial era, there has been a surge of findings to explain the interplay between security and development as the costs and consequences of violence, conflict and insecurity on development outcomes have become apparent. These researches have laid to an increasing understanding of the role of development process and the strong correlation between low levels of economic development and conflict. The countries that are at the bottom of the human development index also tend to be the countries which face persistent violence, conflict and human security challenges. As a result, development problems, political instability as well as institutional issues should be addressed at the same time in order to fully address socio-economic problems of post-conflict development.

One trait of fragile countries has been the absence of the state and the low equilibrium trap of political instability, weak governance, and low economic growth. In Guinea
Bissau, in particular, political instability has weakened any governments’ ability to provide basic service and infrastructure, and undermined the economic environment for investment (domestic and public). The lack of economic growth has, in turn, fueled political instability and has created incentives for rent seeking and predation. Low economic growth has in addition affected the capacity of the state to collect tax revenues, and limited the prospects for external development assistance (ODA).

Guinea Bissau is one of the 22 Sub-Saharan African fragile countries. The country has ranked low in UNDP Human Development indicators, being the 164th out of 169 countries in the 2010 HDI, having 70% of the population living under PPP$ 2 dollar-a-day poverty line, and more than a third of its population living under the $1-a-day line. Since 1998-99 the situation has worsened with a 1998 civil conflict that has significantly damaged the physical capital in the country. The conflict is estimated to have decreased national income by 25% with a negative rate of GDP per capita growth. Infrastructure, including, but not limited to, energy, ports, roads, have been negatively impacted by years of political instability, mismanagement and corruption. Poor economic policies and bad governance have also slowed down economic growth (see CEM, 2011 for details). Hence, addressing issues of fragility for a country like Guinea Bissau is a complex and difficult task. While institutional domestic reform is crucial to addressing such issues, it is almost certain that the country cannot exit from fragility trap without external assistance to build strong institutions and invest in productive infrastructures and sectors.

In fact, there is a consensus that the needs for fragile states are important and it has become clear that not acting is a costly solution. The next important question that will be faced by donors is how to best engage with states that are desperately struggling to exist from low equilibrium trap of political instability, weak governance, and low economic growth?

In this project, we build on the observations above to show that, because of their weak policies and institutions, some of the fragile countries could be caught in a low-
growth-poor-governance equilibrium trap, while others risk falling into the trap with a small shortfall in resources. For this purpose, we develop an analytical model where weak governance is reflected in three dimensions of economic life, namely: i) instability and violence damaging part of the country’s capital stock; ii) insecurity of property rights and unenforceable contracts undermining the productivity of labor; iii) corruption and other forms of capture limiting government tax revenues. These features of the economy, when combined with a minimum level of subsistence consumption, result in an economy that can collapse or is at risk of collapsing into low-investment, slow growth equilibrium. A careful analysis of the same feature indicates that if, however, the economy has access to sufficient resources that can be spent on addressing the three issues raised above, it will emerge from the trap—or avoiding falling into one—and enjoy sustained growth. Our analytic results are supplemented by empirical estimates, which corroborate the main relationships of the model. In particular we find that aid to fragile states is more productive than aid in general. Further confirmations of the predictions of the model as regards the effect of ODA on sector productivity are being undertaken. In short, the finding that there exists a fragility trap that can be alleviated by a well-defined and efficient use of external aid (ODA) is not a theoretical construct of our model but could well be a feature of the real world.

The results of this paper have important implications for aid policy towards fragile states like Guinea Bissau. For the understanding of the same features that lead these countries into fragility trap in first place would help researchers and policy makers to define new strategies through which to channel aid on needs based criterion and not solely on performance based assessment that has been used so far because of fear of wasting resources on the part of international donors. Our finding have shown that if aid can be used to addressing the problems of the economy, then aid could help avoid the fragility trap, in which case he external resources would have been extremely productive.
As will become clear in the next lines, an equilibrium model in which political instability, insecure property rights, and corruption interact with minimum subsistence consumption is built to explain why Africa’s fragile states are caught in a low level equilibrium trap.

The model is of general equilibrium type with three agents, namely households, firms and a government. Agents maximize lifetime utility during two period of adulthood, subject to a budget constraint in each period. During young adulthood, individuals work for firms and pay a portion of their labor income in form of taxes, while the remaining is used to fund their children’s consumption as well as savings for retirement. There is no work in retirement and consumption is made of interests on savings. Firms produce output, $Y_t$, with a modified constant returns to scale Cobb-Douglas production function that takes into account the effects of instability and insecure property right. In aggregate, we refer to the following production technology:

$$Y_t = [(1 - \lambda_t) K_t]^{\alpha} (G_t L_t)^{1-\alpha},$$  \hspace{1cm} (1)

where $G_t$ reflects the level of institutions (e.g., the degree of law and contract enforcement among private citizens); it is know at time (t) and depends on investment made by government at time $t-1$. Improvement in $G_t$ helps increase production like in Barro (1990), Barro and Sala-i-Martin (1992), and Benhabib et al., (2001). $L_t$ is the number of working people which grows at an exogenous rate $n$; and $(1 - \lambda_t)$ is the fraction of physical capital $K_t$ that is destroyed because of political unrest or violence.

In many cases, consumers evaluate governments and their policies solely on output growth. Hence, policy makers have incentives to invest in growth enhancing institutions such as stability and absence of violence, secure property rights and enforceable contracts, and absence of corruption. Government chooses investment policies to maximize aggregate income growth instead of maximizing a general
welfare function. This behavior of the government helps address issues of optimal resources allocation and tax collection faced by most fragile countries.

While good governance is important when dealing with issues of fragility traps, it is important to note that the momentum needed to escape from fragility traps cannot be obtained unless international donors make necessary assistance available. Our model considers that aid is optimally allocated to help build political and strong legal institutions.

In our analysis we refer to economic growth as a natural goal for the government because it helps raise individuals’ income while sustaining government goals by increasing tax revenues and the government ability to implement new policies. Policies are here simple and are meant to contribute directly to production and to raise government resources.

In the process, we define political instability as the proportion of an economy’s physical capital destroyed in violence or civil wars; it is kept exogenous for both the consumer and the producer.

Political rights and enforceable contracts are part of the investments that make labor more productive. In a country like Guinea Bissau these investments might account for investment in sectors (agriculture, energy, roads) as well as promotion of strong institutions of property rights, rule of law and good governance.

Unlike standard results in the growth literature, our results are dependent on subsistence consumption, political instability, property right and corruption. Likewise, factor prices are also defined in terms of the same variables except subsistence consumption, and indicate that political instability reduces the equilibrium wages and increases the cost of financing capital investment.
Improvement in $G_t$, however, raises both the wage and returns to savings. Likewise the enforcement of property rights provides great incentives for production as it raises both wage and interest rate.

As it was expected, the saving function is negatively related to both $\lambda_t$ and the tax rate. In fact, as we note in the paper, political instability can delay investment, destroy the existing capital stock, resulting in harmful political uncertainty.

The dynamical equation is based on the saving function and is conditional on covering subsistence consumption. More important, using the minimum subsistence consumption, we are able to derive a fragility condition which depends on the level of political instability, and the level of $G_t$.

In particular, the economy is at risk of falling into a fragility trap when the existing stock of physical capital falls below the modified subsistence constraint, $\bar{k}_t$:

$$\bar{k}_t \equiv \left[ \frac{\bar{c}}{(1-\alpha)(1-\tau_t)(1-\lambda_t)G_t^{1-\alpha}} \right]^{\alpha},$$

where $\bar{k}_t$ is inversely related to level of institutions, $G_t$, the rate of undestroyed physical capital, $(1-\lambda_t)$, and the rate of net disposable income after tax, $(1-\tau_t)$. Government’s stability and viability depend on its ability to collect resources from the working population. Such resources are necessary for government programs such as building strong institutions and providing basic infrastructures to citizens. Hence, a government that is unable to collect tax revenues will not be able to fund basic programs, unless it receives external aid from international donors. Building an efficient infrastructure to collect tax resources and to combat tax expropriation becomes a key priority for the government.

The government problem consists of choosing three investment policies in order to maximize aggregate growth income subject to a set of three constraints. The first order conditions from this maximization confirm standard intuitions and indicate that most investment policies are positively related to the level of tax base and the level of...
foreign aid. However, the optimal tax rate is negatively related to tax base and foreign aid. Henceforth, this model predicts that better tax codes that contain provisions for tax enforcement are associated with lower optimal tax rates and, in turn, would stimulate production and growth. Furthermore the negative relationship between optimal tax rate and foreign aid suggests that tax income and foreign aid can be regarded as substitute policy instruments. Consequently, increase in foreign aid can allow poor states to sustain lower tax rates, and could exert positive shocks on income growth through the promotion of physical capital accumulation.

Upon government optimization we allow investment policies to be endogenous, leading the fragility constraint to depend on foreign assistance as in the equation below:

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\bar{k}_L \equiv \left[ \frac{\bar{c}((2 - \alpha (1 - \sigma)))^{2-\alpha(1-\sigma)}}{\alpha \sigma(1-\alpha)^{2} \varphi \bar{Z}_t + \bar{\tau}_t (1-\alpha) \bar{Y}_t + \frac{(1-2\bar{\tau}_{t+1})}{\nu}} \right]^{1/\alpha},
\]

where \( \nu \) is the rate of tax enforcement, \( \sigma \) the share of resources that is allocated to improving political stability and absence of violence, and \( \varphi \) is the productivity of any such resources. \( \bar{\tau}_{t+1} \) is the maximum amount of leakage in any given period \( t+1 \).

The above equation indicates that external aid has the potential to reduce risks that a country falls into fragility traps or, inversely, to increase the likelihood that a country reaches sustained and balanced economic growth. As it is indicated in our paper, an increase in the amount of external assistance will shift the \((k_t, k_{t+1})\) locus up, resulting in the reduction of the threshold level of stock of physical capital, \( \bar{k}_L \), required to escape from fragility traps.

**Required amount of \( \bar{Z}_t \) for a given economy to escape fragility traps**

Relative to the size of each economy and conditional on its fundamentals, there exists a level of external aid, say \( \bar{Z}_t^* \), such that a fragile economy can rise at once from low-
level equilibrium (or fragility trap) to a sustained and balanced economic growth. The required level of foreign assistance is given below by the following equation:

$$Z^*_{t} \geq (2 - \alpha(1 - \sigma)) \left[ \frac{(1 + \gamma)(K_t L_t)^{1-\alpha}}{\nu \varphi \sigma \gamma^2 (1 - \alpha)^2} \right]^{(1-\alpha)(1-\sigma)} \left[ - \bar{\tau}_{t}(1 - \alpha) \bar{Y}_{t} + \frac{(1 - 2\bar{\tau}_{t+1})}{\nu} \right]. \quad (4)$$

This Equation indicates that the required amount of foreign assistance for an economy to escape from fragility traps is positively related to the cost of investment policies \((2 - \alpha(1 - \sigma))\), the capital stock \(K_t\), the labor force or the size of the working population \(L_t\), and the amount of tax leakage \(\bar{\tau}_{t+1}\). However an increase in the tax base or any of its components, \(\bar{\tau}_{t}(1 - \alpha) \bar{Y}_t\), is associated with a decrease in the required amount of foreign assistance. Notice also that the rate of tax enforcement \(\nu\) and the rate of time preference \(\gamma\) have negative effects on the required amount of foreign assistance, suggesting that countries with a well functioning tax authority and an efficient infrastructure to enforce an income tax, as well as countries where people highly value savings will require less foreign assistance in order to rise to balanced path of economic growth.

Globally speaking, this equation predicts that the amount of foreign assistance to escape from fragility traps is proportional to the level of capital stock, the size of labor force, as well as the cost of investing in government policies. It also indicates that countries mired in corruption or with high tax leakage will require increased foreign assistance to be able to emerge from fragility traps.

**Empirical corroboration of the model**

In this fragility model we use savings as the key element that connects the three features of political stability and absence of violence, secure property rights and enforceable contracts, and absence of corruption with the long-run economic growth.

Consequently, our empirical strategy emphasizes the model’s implication that physical capital increases when (i) political instability decreases, (ii) corruption decreases, (iii) tax rate decreases, and, (iv) property rights and contract enforcement
are improved. More specifically, the model predicts that government investment in state capacity such as political stability, property rights and absence of corruption depends on its tax base, its ability to collect tax revenue, and the level of foreign aid received. In addition, results in our model predict that external aid affects the growth rate of GDP per capita via its effects on government policies.

Panel data (World Bank, WDR, 2011) spanning from 1980-2010 are used to corroborate the predictions of the model. Three regressions models were used, namely OLS with robust standard errors, FE within estimation regression models and IV-2SLS models. These models were used with various controls including the initial GDP per capita, Latitude and various intercept and slope dummy variables. FE regressions models were used to account for possible unobservable country heterogeneity, while IV-2SLS regressions models were used to account for possible endogeneity related to institutional variables.

The OLS regression models are our baseline, and results from FE and IV-2SLS were much improved compared to the OLS ones, suggesting the existence of possible unobservable country characteristics in the first case and confirming the endogeneity of the institutional variable in the second case (using geographical variables and historical factors as instruments).

In all our regression models and specifications we obtained standard results on initial GDP per capita and investment-to-GDP ratio; their respective signs were also expected. ODA were always significant and positively related to growth with the expected signs. However their coefficients increased remarkably with the use of IV-2SLS models but remained statistically significant at 5% across models and specifications.

The most striking results were obtained from FE and IV-2SLS models when a dummy variable for African fragile countries were account for a long with an interaction term between African fragile countries and Official Development
Assistance (ODA). The first variable is known as an intercept dummy variable while the second is what we call a slope dummy variable. In the FE regression models, the intercept dummy was highly significant with a negative sign while the slope dummy variable was significant and positive. This suggests that being in an African fragile country is bad for growth, while ODA was helpful for growth in fragile African countries. Most stunning is that once the above are accounted for in the FE models, ODA in the global sample becomes insignificant and political stability that was significant in all FE specifications becomes insignificant as well.

The IV-2SLS models obtain similar results in the specification where the same strategy was applied. The only slight difference is that ODA and political stability continue to exert positive effects on growth in the global sample even after both the intercept and slope dummies were accounted for. But the magnitude of their coefficients and their significance power are much smaller.

The IV-2SLS findings suggest that while ODA and political stability might exert independent effects on growth in African fragile countries, they continue to have positive impacts on growth for the rest of the countries in our global sample. An interaction term between ODA and non-fragile African countries reveals that ODA might have a negative effect on growth in African non-fragile countries.

Summary and conclusion
The paper was set to explore whether some particular traits of African fragile states—instability and violence, insecure property rights, and high levels of corruption—led them to be caught in a low-growth equilibrium trap and whether external assistance had independent and statistically significant effects on fragile African countries as opposed to the rest of the world.

We used an analytical model that factored the effects of these features into savings, investment, and economic growth to show that such an economy would lead to two possible equilibria: one of sustained growth, and the other of continuous decline and
eventual collapse. More exciting is that there is hope; countries could escape the low-level equilibrium, or avoid falling into it, by addressing the problems of instability, insecure property rights, and corruption; but this required resources.

If resources are conditioned on growth performance based criterion rather than on needs based assessments, then it becomes almost impossible for fragile countries to escape from their vicious circle of instability, poverty, corruption and weak institutions. Rather, we derived an equation that suggests that resources should be given on needs based assessments as opposed to performance-based criterion. However this does not preclude the close involvement of donors to assure an efficient allocation of resources in government policies and infrastructures that are supportive of a productive economy.

In addition, empirical models corroborate the model and its conclusion. Globally put, the analytical and empirical results lend support to the propositions of Collier, Sachs, Zoellick and others, synthesized in the 2011 World Development Report, that fragile states are qualitatively different from non-fragile states. Assuming that all fragile African countries are pretty much identical, increasing ODA by 100 units for Guinea-Bissau would be associated with about 0.2 increases in the growth rate of GDP-per capita.

In case of Guinea Bissau, the message is clear: resources and lot of resources are needed to tackle the problems of political instability, institutions, and corruption. Likely, if we know the fundamentals of the Guinea-Bissau economy as imbedded in some of the parameters describing preferences and technologies (for firm and government), we could estimate the amount of resources needed for a given fragile economy to escape from fragility traps without any delay. In order to be able to estimate this amount of required $Z_t$ from equation (4), further analysis and data collection are needed.