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The Spillover Effects of Country Fragility in Africa

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Abstract

With a focus on African countries, the purpose of this study is to test if country fragility, defined as failing social, political, and economic systems, can spillover and 'infect' its neighbors. In other words, can failure in one country spillover and weaken the systems of its contiguous neighbor(s)? This question extends previous research exploring negative country-neighbor contagion effects and the results are relevant to current debates regarding best strategies for building regional stability in Africa. The spillover effect is tested using the Fund for Peace's 2015 Fragile States Index (FSI), a broad measure of country fragility, and the Moran Index, a measure of spatial autocorrelation. The results of this analysis indicate that country failure has a significant spillover effect with its contiguous neighbors, which supports the policy shift some international aid organizations have made toward building regional resilience in Africa. Specifically, policy makers have begun to consider responses to global crises that take a more regional, rather than national, perspective and the results of this analysis support this strategic policy shift.

Key Words: Weak States, Failed States, Spillover Effect, Country Neighbor Effects

1. Introduction

Globalization, technological advances, and social networking have caused some global threats to morph while giving rise to new threats. Many of these new threats make geographical distance between the attacker and the victim irrelevant as a cyber-attack on a country's institutions can be launched from almost anywhere in the world (Geers, 2011). Nonetheless, many threats to a country's health and stability can be linked to its physical proximity to conflict, environmental disasters, and political and economic instability. Previous research indicates that emerging nations are particularly susceptible to regional crises as they tend to lack the preventative measures necessary to keep external crises from crossing their borders. Further, as discussed in Patrick (2006), when a country's structures fail their borders become more porous allowing for the exportation of violence, refugees, and political and economic instability. Thus, the question arises, can emerging nations effectively 'import' failure from their neighbors? Alternatively stated, can failure spillover country borders and drive failure in neighboring countries?

A significant body of research has explored various kinds of spillover effects. In regards to positive spillover effects, researchers have identified the positive spillovers or externalities associated with a variety of state and firm level investments in research and development, foreign direct investment, human capital investments, among others (Wei and Liu, 2006; Audretsch and Lehmann, 2005; Barrios et al., 2003). A smaller body of research has considered the negative spillover effects that regional conflict and political instability can have on neighboring countries. These studies have largely found that countries that neighbor countries experiencing significant conflict or political turmoil suffer slowed economic growth and weaker overall economic performance. It is the proximate to instability, both in terms of violent conflict and political turmoil, which researchers have identified as the source of hindered economic performance in neighboring countries. The research question posed in this study extends previous work by asking if country failure has negative spillover effect. In other words, can one state's failure spillover and cause its neighbors to experience not only economic slowdown, but overall state failure? As Patrick (2006) notes, few experts have explored the relationship between state weaknesses and cross-border spillovers and this study contributes to this research by empirically testing if state failure can be exported and effectively imported by a neighboring country. Specifically, the Moran Index, a measure of spatial autocorrelation, and the 2015 Fragile States Index developed by the Fund for Peace, are used to test if a country is more likely to experience weaknesses in its social, economic, political, and military structures if its contiguous neighbor(s) also experience such weaknesses.

The focus of this study is Africa considering not only the ongoing regional crises in this continent, but also previous research indicating that cross-border effects are more likely to occur in emerging nations. The research implications of this study are particularly current and relevant for policy makers and international aid organizations. Writing for the World Economic Forum, Galvan (2015) notes that responses to global risks are often undertaken at the national level; however, recently policy makers are beginning to shift this thinking and consider responses that are focused on building regional resilience. As Galvan (2015) states, global risks do not recognize country borders and regional resilience requires the combined efforts of all stakeholders. The results of this analysis contribute more information to policy makers contemplating responses to global crises and offers empirical evidence that regional responses and efforts to build regional resilience will likely have a stronger and longer lasting effect than responses aimed at nation building.

2. Previous Research: Cross-Country Spillovers and Failed States

As briefly mentioned above, there is a considerable body of research examining a variety of geographical spillover effects. Specifically, past research has considered the spillover effects of knowledge and R&D investment at the firm and industry level to cross-country spillover effects of investment, conflict, and political instability. At the firm level, a recent empirical study by Filatotchev et al. (2011) find returnee entrepreneurs create a knowledge spillover effect by sparking innovation in other local high-tech firms. Earlier studies such as Glaeser et al. (1992) have identified such knowledge spillovers occurring between industries in the same city.

In reference to cross-country spillover effects, the research has primarily focused on the effects that investment, conflict (generally defined as violent conflict and civil wars) and regional instability (generally defined as political instability) have on the economic performance of neighboring countries. In regards to investment, Chua (1993) provides empirical evidence that a country's economic growth rate depends both on the level of domestic investment and the level of investment of its neighboring countries. Findings related to conflict suggest a similar geographical relationship as Murdoch and Sandler (2002) provide empirical evidence that, in the short run, civil war negatively effects the economic growth in neighboring countries. In an analysis of African countries, De Groot (2010) finds that violent conflict hampers economic growth in contiguous neighbor countries, but the effect is not passed on to secondary neighbors. De Groot's (2010) results suggest that while violent conflict significantly impacts the economic performance of contiguous neighbors, this negative effect does not spread pass a single border. In a related analysis exploring the spillover effects of economic growth, Conley and Ligon (2002) find that when geographical distance is used to measure the distance between countries, the effects of economic growth spillovers are not particularly noticeable. These results suggest that while there are spillover effects of economic growth, these effects are not likely to travel significant distances and cross multiple borders. Further, in reference to political instability, Ades and Chua (1997) conclude that regional instability, which they define as political instability in neighboring countries, has a strong negative impact on a country's economic growth rate.

There is general consensus in the literature and significant empirical evidence to suggest that a country's economic growth rate is hampered if violent conflict and/or political instability plagues their neighbor(s). As discussed in Ades and Chua (1997), there are a few primary reasons for this effect. First, if a country's neighbor is suffering from uprisings, either political in nature or not, this initiates increased military outlays. Second, instability within a region disrupts trade. As Ades and Chua (1997) note, countries with high regional instability suffer from significantly lower shares of trade. Thus, military expenditures and trade losses both slow economic growth in neighboring countries that are not necessarily experiencing the unrest.

Extending this research, this study hypothesizes that the overall failure of a country, or the breakdown of its economic, social, and political structures, can spillover and not only cause its neighbors to experience economic hardship, but can also lead their neighbors into collapse. As the previous literature suggests, when a country begins to fail, its neighbors will increase military expenditures and trade flows will be interrupted and, as Patrick (2006) discusses, when a country fails their borders become increasingly permeable, which allows for an outflow of refugees and violence. Further, as Patrick (2006) notes, weaker states are often adjacent to countries with similar characteristics that have limited resources to defend against such spillovers. The outflow of refugees and violence into weaker neighboring countries will exacerbate any political or economic instability. Thus, it is theorized here that state failure has a neighbor spillover effect that can be more devastating than economic hardship. Specifically, a state failure can spillover and lead its contiguous neighbors into failure and previous research suggests that the spillover effect should be more significant in emerging nations that are less equipped to manage such stressors.

3. Defining and Measuring Failed States

Defining fragile or failing states is difficult as organizations use various criteria to assess weaknesses and, as Patrick (2006) discusses, there is not a general consensus as to how to define weak or failing states. In 2015, the United Nations' Development Policy and Analysis Division identified 48 countries, 34 of which are located in Africa, as Least Developed Countries suffering from structural impediments to sustainable development. To assess state weakness, they use three main criteria of gross national income per capita and measures of human assets and economic vulnerability. For 2016, the World Bank defines a group of 35 countries as Fragile and Conflict Affected Situations, 19 of which are located in Africa, using a variety of country economic, health, environment, and education indicators.

This analysis uses the Fund for Peace's 2015 Fragile States Index (FSI) as a proxy for the overall state weakness. The FSI is provided annually and the 2015 data covers the period January 1, 2014 through December 31, 2014 for 178 countries. The Fund for Peace reports that it applies specialized search parameters to millions of documents each year to score each country on twelve primary political, social, and economic indicators. The twelve primary indicators are based on over 100 sub-indicators and, based on comprehensive social science methodology, the 2015 Fragile States Index report indicates that the data is triangulated and subjected to critical review. The FSI data is selected for this analysis because it is a comprehensive measure of the overall health of a country as it considers a variety of measures of economic stability, human rights, state legitimacy, conflict, power struggles, public services, and external intervention, among other country indicators. The FSI data is scored such that larger values represent more fragile states and lower values represent more stable states.

Of the 178 FSI data points for 2015, 54 represent African countries and all four of the countries classified as 'Very High Alert' with the highest FSI values are African. South Sudan ranked highest, or most fragile, of all 178 countries with an FSI value of 114.5. Following South Sudan are Somalia, Central African Republic, and Sudan with FSI values of 114.0, 111.9, and 110.8, respectively. On the other end of the spectrum, the most stable country is Finland with the lowest FSI value of 17.8, followed by Sweden and Norway with FSI values of 20.2 and 20.8, respectively.

Generally speaking, African countries faired considerably worse on the FSI scale relative to other global regions. The 2015 FSI report discusses some of these countries and offers reasons for the continuous struggle that so many African countries face. In particular, Central African Republic is discussed at some length and the report indicates that while it is a resource-rich country, it is has become a victim of the coups and rebellions that spillover from regional conflicts. In other words, it is a highly fragile state, and some might argue it is a failing state, largely due to the regional spillover effects. The next section discusses the empirical method used to test the failing state spillover effect in Africa.

4. Methodology

The Moran Index is a measure of spatial autocorrelation and is used to test if countries with higher 2015 FSI values are more likely to have contiguous neighbors that also have higher FSI values. In other words, are more fragile and perhaps failing countries, more likely to have neighbors that are in a comparable weakened state? The Moran Index is similar, although not the same, as a correlation coefficient in that it ranges from -1 to +1 and has an expected value of -1/(N-1), which tends to zero as, N, the sample size increases. The index is defined as:

$$I = \frac{N \sum_{i=1}^{N} \sum_{j=1}^{N} w_{ij}(x_i - \bar{x})(x_j - \bar{x})}{(\sum_{i=1}^{N} \sum_{j=1}^{N} w_{ij}) \sum_{i=1}^{N} (x_i - \bar{x})^2}$$

where: N is the number of observations in the data set (in this case 54), $\bar{x}$ is the mean of the FSI data for the 54 African countries included in the data set, x_i is country i's FSI value, x_j is country j's FSI value, and w_{ij} is the weighting matrix that takes a value of 1 if country i and j are contiguous neighbors and 0 otherwise. As Tłuczak (2013), discusses, when positive autocorrelation exists, or when nearby points have similar values (in this case when neighbor countries have similar FSI values), the cross-product becomes high, yielding a positive Moran Index larger than -1/(N-1).

In other words, to test if neighboring African countries tend to have similar levels of fragility, the Moran Index is estimated using the FSI country values from Africa (a total of 54 country values) and a weighting matrix that measures 'closeness' as a contiguous neighbor. Thus, the weighting matrix only pulls two countries' FSI data points into the analysis if they share a geographic border. This methodology provides an estimate of the spatial dependency or spatial relationship between the levels of fragility of contiguous country neighbors in Africa.

Using this methodology, the Moran Index value is estimated to be 0.460. The positive value provides evidence that positive spatial autocorrelation exists, or in this case, that countries with higher FSI values tend to have neighbors with higher FSI values. In other words, fragile states tend to border other fragile states. To test the statistical significance of this result, the Moran Index is converted to a *z*-score. Using the formula for the variance of the Moran Index, which is rather complex and is outlined in Lee and Wong (2001), the *z*-score for the Moran Index estimated in this analysis is 4.85, indicating statistical significance at 99% confidence. In sum, the analysis provides empirical evidence that weak and failing states tend to border other weak and failing states and this result is statistically significant.

In an effort to explore this result further, a Moran scatter plot is provided in Figure 1. Moran plots illustrate spatial dependence of a given variable; in this case, country fragility. Following a similar approach used in Attila (2008), the diagram shows the relationship between a country's FSI value and the regional FSI value, which is defined as the average FSI value of its contiguous neighbors. The scatter plot shows an overall positive linear relationship between the two variables, suggesting that countries with higher FSI values tend to have country neighbors with higher FSI values. Further, as shown in Table 1, the estimated trend line between the country and regional FSI values has a positive and significant slope coefficient, which offers additional empirical evidence of the positive spatial relationship.

Figure 1. 2015 FSI: Country versus Regional Values

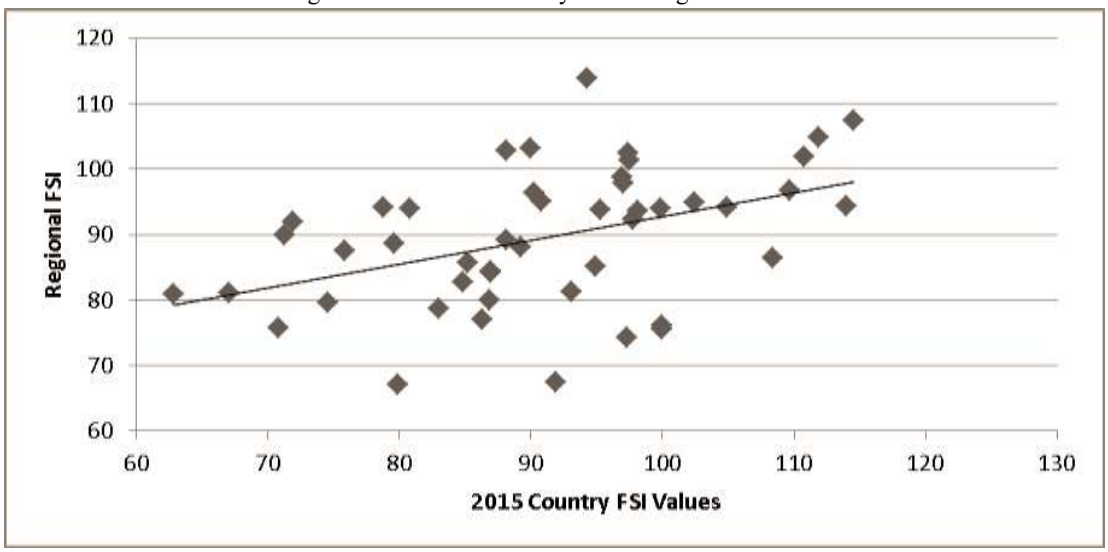

Table 1. Estimated Trend Line: Dependent Variable Regional FSI

	Intercept	*FSI*	R_a^2	*F*
Estimate	56.58*	0.36*	0.168	10.32*
Standard Error	(10.33)	(0.11)		

*Significance at 99%

5. Discussion

The empirical results provide evidence to support the hypothesis that country failure can have a contiguous neighbor spillover effect. While previous studies have shown that political instability and conflict in a county's neighbors can spillover and hamper its economic performance due to increased military outlays and disrupted trade, this study extends these findings by offering evidence that overall state fragility can spillover and cause not only economic hardship in country neighbors, but failure on a much grander scale. As countries become

increasingly frail and are hindered by weak and failing political, social, and economic systems, their borders become more porous and allow for the outflow of refugees, conflict, and instability. If neighboring countries are ill-equipped to prevent the inflow of these stressors, they can 'catch' failure from their neighbor.

The literature suggests these spillover effects are more likely to occur in regions where there are emerging nations as these nations tend not to have the necessary structures and systems to manage their borders and protect themselves from regional crises. The majority of countries in Africa fall into this category and, as the data in this study indicates, are likely some of the most susceptible to failure spillover effects. Further, many crises in Africa are not contained within country borders, but are more regional in nature. The Ebola outbreak and the terrorism inflicted by Boko Haram are two current examples of crises that are not country specific, but rather cross national borders.

In terms of policy implications, this study echoes the recommendations made by Galvan (2015), De Groot (2010), and Murdoch and Sandler (2002) that policy makers and international aid organizations need to consider the entire region that is affected by the crisis, including neighboring countries that may not yet be affected, and not host countries only. In an effort to guide policy makers working to build regional resilience in sub-Saharan African, Galvan (2015) discusses that for the first time the World Economic Forum's Global Risks 2015 report asked the Forum's multi-stakeholders to identify three global risks for which their region, not country, is least prepared. One out of every five survey respondents noted that the geopolitical risks of interstate conflict and large scale terrorist attacks were global risks for which their region is least prepared. Further, over 30 percent of respondents indicated that their region was least prepared to address unemployment and approximately 24 percent of respondents identified food crises and spread of infectious disease as global risks for which their region is least prepared to manage (Galvan, 2015). These crises – interstate conflict, terrorist attacks, food shortages, and infectious diseases – identified by business leaders, government officials, academia, and non-governmental organizations living and operating in sub-Saharan Africa are transnational in nature. As policy makers and international aid workers contemplate plans to support Africa in such crises, the results of this study encourages the recent shift in aid strategy that focuses regionally rather than nationally. If efforts to build regional resistance to global crises are successful, it is likely that regional strength can also spillover and support neighboring regions.

While this study contributes to the small, but growing body of literature exploring country neighbor spillover effects, it does have limitations that should be noted. First, there are always shortcomings when quantitative data are used to measure qualitative concepts such as country fragility. Although the FSI data is created by specialists and is subjected to significant review, any quantitative measure of country fragility is a proxy measure and will inherently have its imperfections. Second, while this study provides empirical evidence of a country failure spillover effect, it does not directly test for causality and the results provided here should be considered association relationships rather than causal. Nonetheless, this study lends support to the new strategical approach to addressing global crises that takes a regional rather than national approach and encourages future work, especially studies empirically testing the causality behind such spillover effects. Further, and perhaps more importantly, future research should consider assessment studies that analyze the effectiveness of the regional-based policies in Africa over time. Such future research can not only guide policy makers in developing strategies that build long-term regional stability in Africa, but also can help guide policy makers working in other developing regions of the world.

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