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Exiting From Fragility in sub-Saharan Africa: The Role of Fiscal Policies and Fiscal Institutions

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Abstract

This paper studies the role of fiscal policies and institutions in building resilience in sub-Saharan African countries during 1990-2013, with specific emphasis on a group of twenty-six countries that were deemed fragile in the 1990s. As the drivers of fragility and resilience are closely intertwined, we use GMM estimation as well as a probabilistic framework to address endogeneity and reverse causality. We find that fiscal institutions and fiscal space, namely the capacity to raise tax revenue and contain current spending, as well as lower military spending and, to some extent, higher social expenditure, are significantly and fairly robustly associated with building resilience. Similar conclusions arise from a study of the progression of a group of seven out of the twenty-six sub-Saharan African countries that managed to build resilience after years of civil unrest and/or violent conflict. These findings suggest relatively high returns to focusing on building sound fiscal institutions in fragile states. The international community can help this process through policy advice, technical assistance, and training on tax administration and budget reforms.

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[1] This paper develops earlier analysis published in IMF (2014b) and in IMF (2015). The paper benefitted from comments by David Robinson, Enrique Gelbard, Tanim Bayoumi, Tito Da Silva Filho, Marshall Mills, Futoshi Narita, Rene Tapsoba and IMF seminar participants. All remaining mistakes are our own. The views expressed herein are those of the authors and should not be attributed to the IMF, its Executive Board, or its management.

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I. INTRODUCTION

Economic performance in most sub-Saharan African countries has improved substantially over the past twenty years. The past decade was particularly favorable with annual average growth rates above three percent. However, this strong growth performance was not equally observed in every country in the region. Fragile states, in particular, faced severe obstacles to generate high or consistent economic growth, even despite favorable headwinds from increases in world commodity prices. In fact, the growth performance and social conditions in fragile states have lagged behind the region's average and these countries seem to have fallen into a fragility trap, a vicious circle of underdevelopment, instability, and weak institutions. Given the large number of fragile states in sub-Saharan Africa (SSA),[2] it is imperative for the international community as well as the fragile state governments themselves to identify strategies for building resilience and achieving sustainable growth.

Past studies have identified several factors that contribute to fragility, including a recent history of conflict (Collier and Hoeffler, 2004), poor economic performance (Miguel et al, 2004; Murdoch, 2002), as well as low institutional quality and weak enforcement of contracts and property rights (Bertocchi and Guerzoni, 2010, David et al., 201, Hegre et al., 2001, Pritchett and de Veijer, 2010). All the aforementioned factors are closely intertwined and mutually reinforcing, making it very difficult to break out of fragility (Andrimihaja et al., 2011). Previous work underlined that democratic institutions are key to building resilience, as a broad-based enforcement of property rights and rule of law will help spur economic institutions that favor development and stability (Wantchekon and Neeman, 2002, Acemoglu et al, 2004). However, political institutions tend to be persistent and the process of switching from a limited access to an open access social order occurs only over a long time horizon (North et al, 2006; Gollwitzer and Quintyn, 2012).

Taking a medium-term view, some studies have suggested that governments can take more immediate and decisive action to promote development and stability by building fiscal capacity. Fiscal capacity, defined as the ability to raise revenue, is a key dimension of state capacity, along with the capacity of the state to support the development of private markets (legal capacity) and to provide public goods (collective capacity).[3] More specifically, effective tax collection institutions can spur demand for democracy and more inclusive institutions, as tax payers expect an improved delivery of public services and demand more transparency and accountability in the management of the tax revenue. A higher tax intake is critical to allow the state to deliver basic goods and services and carry out growth-enhancing investments, thus contributing to building resilience by reducing poverty, inequality and the likelihood of conflict (Burgoon, 2006, Chu et al., 2000, Collier and Hoeffler, 2007, Gupta et

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[2] A total of 19 SSA countries remain fragile as of 2013 based on a CPIA score of 3.2 or less, or the presence of a United Nations/regional peace-keeping or peace-building mission during 2011-13.

[3] See Besley and Persson, 2014, 2010, 2009, Besley et al., 2013, OECD, 2013.

al., 2003, Gupta and Verhoeven, 2001, IMF, 2014a, Singh et al. 2014, Taydas and Peksen, 2012).

Based on this strand of the literature, we explore the role of fiscal policies and institutions in building resilience and exiting fragility in the context of sub-Saharan African countries. Even though the development of effective fiscal institutions takes time and resources, these requirements are much smaller than those needed for more general institutional improvement and could thus act as the engine that jump starts the process and helps fragile states exit their "capability trap" (Pritchett and de Veijer, 2010). Gollwitzer and Quintyn (2010) find that strong budget institutions are particularly effective as a disciplining device in weak institutional frameworks. This would suggest relatively high returns to focusing on building sound fiscal institutions in fragile states. The international community can help this process through policy advice, technical assistance, and training on tax administration and budget reforms.

Our sample covers the 44 sub-Saharan African countries (excluding South Sudan, which was not a separate country until 2011) during 1990-2013, with specific emphasis on a group of 26 countries that were deemed fragile in the 1990s. Fragility is measured by the Country Policy and Institutional Assessment (CPIA) ratings published annually by the World Bank.[4] Even though the ratings may suffer from subjective biases, they have been shown to be broadly correlated with rankings based on a number of other indicators, including the World Governance Indicators (WGI) and the Heritage Foundation's Economic Freedom Indicator.[5] We look at the impact of both total spending and tax revenue and their components, and use a number of proxies to measure the quality of budget institutions. As in IMF (2014b) resource-rich fragile countries are treated as a distinct group in the analysis. This distinction is introduced to address the question of whether these countries used the commodity boom in 2000-2008 to build resilience, and also because an abundant literature shows that resource-rich countries tend to have weaker institutions and economic performances overall and a weaker tax effort in particular (Gupta et al., 2014, Sachs and Warner, 2001).[6]

Because all factors affecting fragility are closely interrelated and causality is difficult to establish, the empirical strategy relies on using a GMM specification, which uses econometric instruments to attempt to correct for endogeneity. As an alternative approach, we also estimate the model using a probabilistic model which looks into factors associated with greater odds of being resilient, without making strong judgments regarding the direction of causality. These findings are robust to estimation method, sample choice and definition of

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[4] The CPIA rates countries against a set of 16 criteria grouped in four clusters, namely economic management, structural policies, policies for social inclusion and equity, and public sector management and institutions. Details about the scores can be found on the World Bank Website.

[5] An evaluation by the World Bank's independent evaluation office found that the content of the CPIA broadly reflects the determinants of growth and poverty reduction identified in the economics literature, though it recommended some changes in indicators (World Bank, 2009).

[6] Resource rich countries are defined as those that have primary commodity rents exceeding 10 percent of GDP.

dependent variable. The empirical analysis is complemented by a more qualitative study of a group of seven countries that are deemed to have overcome fragility and become "resilient" since the 1990s, based both on CPIA ratings and the absence of major conflicts in recent years. Reordering the sample using as the starting year (t=0) the year in which the lowest CPIA score was registered in the 1980s or 1990s, we explore the pattern of key variables along the path to greater resilience to gain some insights into the prioritization and sequencing of policies and reforms.

The empirical results support the notion that sound fiscal policies and institutions contribute to resilience. A better quality of budget institutions, and greater fiscal space as measured by higher tax revenue and education spending, lower recurrent spending (particularly military spending), and higher domestic investment, are associated with significant increases in the CPIA rating and with the probability of reaching the threshold of "resilience." Our findings also highlight the importance of the composition of tax and expenditure for resilience. On the expenditure side, education and military spending are, respectively, positively and negatively associated with resilience. The experience of the seven countries that were identified as having built resilience during the period is consistent with these findings. Economic stabilization following a period of civil conflict is usually led by policies that stabilize inflation (if initially high or volatile) and create fiscal space, the latter defined as the ability of the government to raise revenues, and contain current spending to make more resources available for public investment and social spending.

The rest of the paper is organized as follows. Section 2 presents a brief literature review. Section 3 discusses the data and some stylized facts about fiscal policies and detailed fiscal outcomes in the sample period. The empirical analysis is conducted in Section 4. In Section 5, we zoom in and study the experience of the seven countries that gained resilience since 1990s. Section 6 concludes with some policy implications.

II. SELECTIVE LITERATURE REVIEW

Efficient fiscal institutions can help maintain or improve fiscal space, which enables countries to increase spending and incur larger fiscal deficits without jeopardizing macroeconomic stability and debt sustainability.[7] Countries with enough fiscal space can run expansionary fiscal policies in response to negative shocks, which in turn help contain the impact of any decline in private sector demand. However, if countries are constrained by a lack of buffers or financing or by high levels of government debt, the scope for an expansionary fiscal policy is negated and the economy becomes much more vulnerable to shocks. Following a long-standing strand of the literature led by Alesina et al. (1999), Dabla-Norris et al. (2010) and Gollwitzer (2010) find that, among low-income countries overall (in

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[7] Fiscal institutions cover the entire range of entities responsible for public resource management: revenue collection, budget preparation, budget planning, expenditure execution, procurement, reporting, and oversight. A government can create fiscal space by raising taxes, securing outside grants, curring lower priority expenditures or borrowing resources, while making sure that it has the capacity in the short term and the longer term to finance its desired expenditure programs as well as to service its debt (Heller, 20015).

particular in Africa), better budget institutions are associated with better fiscal outcomes, including lower public external debt and higher primary budget balance, as well as a less pro-cyclical fiscal stance.[8] Their findings are based on an index measuring the adequacy of the institutions, rules, and procedures governing the budget, where the index includes three stages of the budget process, with measures along five different criteria. IMF (2014b) pointed out that those fragile countries that became "resilient" managed to build stronger fiscal institutions and fiscal space (in terms of stronger government financial positions, favorable debt dynamics, higher revenue-raising capacity and expenditure flexibility) when compared to other countries that remained fragile or regressed.

Besley and Persson present theoretical models highlighting the importance of the state's tax revenue raising capacity in the development process (see for example Besley et al., 2013, Besley and Persson, 2014, 2011). However, no study investigates empirically the relation between specific taxes and state fragility, although a number of papers have explored the relation between different categories of taxes and growth as well as inequality (Crivelli and Gupta, 2014, IMF, 2014a, Siebrits and Calitz, 2006, Skinner, 1987). IMF (2014b) reports initial results supporting the hypothesis that tax revenue is positively and significantly associated with the odds of a country becoming "resilient". In a sample of 31 SSA countries, Skinner (1987) shows that revenue-neutral shifts from import, corporate and personal tax to a sales/excise tax will encourage economic growth, and tax-financed public investment was predicted to have reduced output growth during 1965-1982. These findings are broadly consistent with evidence for advanced economies, for which studies find that indirect taxes are less distortionary and more growth-friendly than direct taxes (Acosta-Ormaecha and Yoo, 2012, Arnold et al., 2011). Siebrits and Calitz (2006) documented an increased reliance on taxes on income and profits in SSA countries, despite the widespread reduction in personal and corporate income tax rates, which suggests some success with broadening the income tax base and/or improving tax administration.

Countries that derive a large share of their revenue from natural resources have been found to exert less effort to collect taxes, which, in the case of fragile states, could hamper the building of fiscal capacity. For example, Crivelli and Gupta (2014) find offset coefficient of about 30 percent for each additional percentage point of GDP in resource revenue increase. The negative effect is by far the strongest on indirect taxes (goods and services and VAT), and lowest on trade taxes, with corporate and personal income taxes somewhat in the middle. They note that a weaker domestic revenue base exposes resource-rich countries to reversals of fortune associated with shifts in oil and other commodity prices. The shift towards less growth-friendly direct taxes is another source of concern.

On the expenditure side, no empirical study directly estimates the impact of expenditure amount or composition on state fragility, although, as noted in Besley and Persson (2014), the capacity of the state to provide public goods is seen as a critical pillar of development.

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[8] A long and well-established theoretical and empirical literature shows that budget institutions are important determinants of fiscal outcomes (see Dabla-Norris et al., 2010, for a survey).

Nonetheless, a number of papers tackle the impact of public spending on various aspects of state fragility, including conflict, poverty and inequality (Burgoon, 2006, Chu et al., 2000, Collier and Hoeffler, 2007, Gupta et al., 2003, Gupta and Verhoeven, 200, IMF, 2014a, Singh et al. 2014, Taydas and Peksen, 2012, Thyne, 2006). As for tax revenue, findings suggest that the impact of some categories of spending varies depending on whether countries are resource-rich or not, highlighting the importance of controlling for this factor in empirical investigations.

The literature on public spending and conflict highlights the importance of higher public spending in preventing violent conflict. A number of studies suggest that higher government spending could signal a willingness of political leaders to buy support from powerful segments of the population and political opponents.[9] Some papers find a particularly important role of higher social spending, rather than military or overall government spending, in preventing the onset of violent conflict (Collier and Hoeffler, 2007, Singh et al. 2014, Taydas and Peksen, 2012). Taydas and Peksen (2012), following Azam (2001), Azam and Mesnard (2003), and Bueno de Mesquita et al. (2003), argue that welfare spending, defined as spending on health, education and social security, contributes to sustaining peace by signaling the commitment of the government to its citizens' well-being.

A number of studies also show that welfare spending can help offset the impact of poverty and inequality on fragility, thus reducing populations' grievances, and raising the cost of rebellion (also see Acemoglu and Robinson, 2000). Effective social spending, particularly on health and education, has been found to be negatively associated with reductions in other factors contributing to state fragility, such as economic insecurity, poverty and inequality, and positively associated with increased social mobility and labor opportunities (Burgoon, 2006, Chu et al., 2000, Gupta et al., 2003, Gupta and Verhoeven, 2001, IMF, 2014a, Thyne, 2006).

Interestingly, while Taydas and Peksen (2012) find a positive but statistically insignificant association between military spending and the onset of conflict, Singh et al. (2014) find that higher levels of military spending are significantly associated with a lower risk of conflict in oil-rich countries. In oil-poor countries military spending increases the risk of conflict. They argue that the potential benefit of oil wealth has been generally overlooked, including the option of increasing public spending to buy off citizens and elites, increasing state legitimacy by providing basic services and strengthening the military and security apparatus. They also find that welfare expenditure is associated with lower risk of small-scale conflict, irrespective of the level of oil revenue, consistent with the government's incentives to discourage civil conflict by improving basic services.

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[9] See Singh et al., 2014 for a selective review of the relevant literature.

Finally, a long strand of studies investigates the relationship between public investment and growth,[10] but not specifically between public investment and state fragility. In this paper we investigate whether the state's capacity to execute domestically-financed public investments is significantly associated with building resilience. Unlike foreign-financed projects which are often executed and overseen by donors, domestically-financed projects require the capacity to plan, prepare, and execute projects.

Overall, this brief survey of the literature suggests that, other things equal, stronger fiscal institutions should be associated with more favorable fiscal outcomes in terms of fiscal space and resilience to shocks. In turn, fiscal space is generated both through tax revenue generating capacity and the ability to contain current spending. In fragile countries, broadening the tax base can create a constituency for spending efficiency and accountability, while the willingness and ability of the state to provide public goods such as health and education can show credible commitment to citizens' welfare and strengthen social cohesion.

III. DATA AND STYLIZED FACTS

A. Data Description

In the analysis below, we use a sample of 26 sub-Saharan African countries that were deemed fragile in the 1990s and follow their evolution through 2013. Due to data availability constraints, the sample period is 1990-2013.[11] We follow the same methodology of IMF (2014a) that defines fragile countries based on the 3-year average of their CPIA and whether they experienced conflict.[12] More specifically, for the initial group of countries, a country was deemed fragile if its average score on the aggregate country policy and institutional assessment (CPIA) rating during 1991-2000 was below the 3.2 threshold or if it experienced "significant conflict", the latter defined as either five or more years of lower-level conflict (less than 1,000 deaths per year) or two or more years of severe conflict (more than 1,000 deaths per year). The other 18 countries that were not fragile during either 1991-2000 or 2011-2013 are identified as stable countries. Among the twenty-six fragile countries, nineteen countries had average scores on the CPIA ratings below 3.2 or had hosted a UN/regional peace-keeping or peace-building mission in 2011-2013. These countries are considered to have remained fragile. Finally, seven countries that were identified as fragile in the 1990's but not in 2011-13 are identified as "becoming resilient".

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[10] See IMF, 2014b and IMF, 2014c for a discussion of public infrastructure investment in sub-Saharan Africa and a discussion of macroeconomic impacts of public investment, respectively.

[11] Data availability on fiscal and social indicators for fragile countries prior to 1990 is limited.

[12] The methodology is almost the same as that of the World Bank and the African Development Bank, where countries in fragile situations are defined as those with either a harmonized average CPIA country rating of 3.2 or less or the presence of a UN and/or regional peace-keeping or peace-building mission during the past three years. This list includes only IDA eligible countries and non-member or inactive territories/countries without CPIA data. The harmonized World Bank and African Development Bank list of countries in fragile situations can be found at: http://www.worldbank.org/en/topic/fragilityconflictviolence.

However, the nature of fragility is complex and multidimensional and difficult to be captured by a single indicator. Most dimensions of fragility such as economic foundations are measured along a continuum rather than a binary condition. Our choice of CPIA as a measure of fragility comes after considering several fragility indicators used from different donor agencies and international financial institutions. The edge of the CPIA score is that it goes through a rigorous review process and it reflects a degree of subjective judgement, thus avoiding any direct correlations of the scores with other measures of fragility. Furthermore, after 1990 the methodological changes of the compilation of the CPIA scores do not impact the outcomes when it comes to establishing the fragile states list.

To check the robustness of the CPIA score in defining fragility, we compared the list of fragile states created through the CPIA scores with different indicators such as the OECD-DAC and the Brookings' Index of State Weakness and the Fund for Peace Fragile States Index. However, as most indices aim at measuring the degree of state impairment, most countries identified as fragile in one list appear as fragile in other lists (for example, the correlation between the CPIA and the Brookings' Index of State Weakness is about 0.8). The CPIA scores provide a widely accepted operational measure of fragility.

Compared to other existing definitions and indices of state fragility, the CPIA places greater emphasis on a country's economic and institutional framework. Some other indices, such as the OECD Development Assistance Committee (DAC) and the Brookings' Index of State Weakness, or the Fund for Peace's Failed States Index, place more weight on security and political variables, while yet others focus more on governance (Ibrahim Index of Governance from the Mo'Ibrahim Foundation), or on poverty and deprivation aspects (Human Development Index (UNDP). Because all the dimensions of state fragility are closely correlated, there is a high degree of overlap between the groups of countries identified by the various indices.[13] Previous studies have used CPIA ratings in empirical analysis, as an explanatory or dependent variable to proxy for institutional quality and state fragility.[14]

For natural resource endowment, we use the same definition as IMF (2011) where countries are classified as resource-rich if their resource rents exceed 10 percent of GDP. We follow a similar classification as in IMF (2014b), where eleven countries were identified as resource rich, of which one country has been stable throughout the sample period, two countries became resilient, and eight countries remained fragile or regressed. As the objective is to study the process of building resilience in fragile states, we drop from the empirical work the "stable" group of countries and work with the twenty-six remaining countries (Table 1).

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[13] Cilliers and Sisk (2013) present in more detail the World Bank and African Development Bank's approaches to state fragility, and present alternative sub-Saharan African country rankings based on a range of indices.

[14] See Chauvet and Collier, 2005, 2009, Bertocchi and Guerzoni, 2010.

B. Stylized Facts

Fragility, measured by the CPIA, is a highly persistent condition. CPIA scores tend to move slowly over time as fragile countries face the complex challenges of development with scarce resources and capacity. This is reflected in most CPIA scores in sub-Saharan countries in the past two decades. In fact, a slight deterioration of the average CPIA for all countries (from 3.3 to 3.2) is driven by a sharp decline in the CPIA of fragile resource-poor countries (from 3.2 to 2.8) that is partially offset by progress in some resource-rich countries and in the ones that became resilient. Of the eight fragile resource-rich countries, four have had stagnant CPIA scores and four showed significant gains over the past 15 years. Interestingly, the resilient condition is also persistent, with countries likely to remain resilient once this status is achieved, and only a few countries showing a reversal of fortune.

Table 1. Classification of Sub-Saharan African Countries (2011-13)

Remained or became fragile	Became resilient	Remained stable
Angola + ◎	Cameroon + ◎	Benin
Burundi +	Ethiopia +	Burkina Faso +
Central African Rep. +	Mozambique	Cabo Verde
Chad + ◎	Niger +	Gambia, The
Comoros +	Nigeria + ◎	Ghana
Congo, Dem. Rep. of + ◎	Rwanda	Kenya +
Congo, Republic of + ◎	Uganda +	Lesotho
Côte d'Ivoire + ◎		Senegal
Eritrea +		Tanzania
Guinea + ◎		Zambia ◎
Guinea-Bissau +		
Liberia + ◎		
Madagascar +		
Malawi +		
Mali +		
São Tomé & Príncipe		
Sierra Leone + ◎		
Togo +		
Zimbabwe +		

Sources: Authors' calculations, based on data for the CPIA ratings, the Uppsala conflict database, and information on UN/regional peace-keeping or peace-building missions.
+' OECD DAC considered these countries to be fragile in 2014.
◎' Resource rich countries.

The economic and political evolution of African countries has been diverse starting from the 1990s. As shown in IMF (2014a), CPIA scores (see Table 2 below) show that resilient countries improved markedly in all four areas: macroeconomic; structural policies; social inclusion; and public sector management. Fragile resource rich countries, benefiting from resource windfalls, have also showed consistent improvement in recent years, albeit at lower levels. On the other hand, fragile resource poor countries had a lackluster performance.

	Overall CPIA[1]	Macroeconomic[2]	Structural[3]	Social Inclusion[4]	Public Sector[5]
Table 2. Average Change in CPIA Scores by Country Group					
			(Units)		
Resilient	0.41	0.43	0.26	0.37	0.23
Fragile resource-rich	0.40	0.29	0.17	0.33	0.31
Fragile nonresource-ric	-0.33	-0.20	-0.28	0.12	0.00

Sources: World Bank; Authors' calculations.

[1] Change is measured as the difference between average scores in 1992-2001 and 2011-2012.

[2] Economic management cluster includes monetary and exchange rate policy, fiscal policy, and debt policy.

[3] Structural policies cluster includes trade, the financial sector, and the business regulatory environment.

[4] The policies for social inclusion and equity cluster includes gender equality; equity of public resource use; building human resources; social protection and labor; and policies for environment sustainability.

[5] The public sector management and institutions cluster includes property rights and rule based governance; quality of budgetary and financial management; efficiency of revenue mobilization; quality of public administration; and transparency, accountability and corruption in the public sector.

Appendix Table 2 presents the evolution of available economic and development indicators, defined in Appendix Table 1, that are believed to be linked to the capacity of a country to build resilience and eventually move out of fragility. Given the persistence of fragility, the data is split in two periods (1990-2000 and 2001-2013) to assess progress on macroeconomic performance with specific focus on fiscal policies and outcomes. The analysis of the evolution of the relevant indicators is complemented with the evaluation of possible statistical differences in the indicators between resilient and fragile countries (Appendix Table 3).

Making progress

Sub Saharan African countries have made substantial progress in their macroeconomic performance during 2001-2013 as compared to the previous decade (1990-2000). The core measure of standards of living, the growth of real GDP per capita, has improved significantly (Appendix Table 2). While most countries appear to enjoy the fruits of a commodity boom, resilient countries benefit from an average growth rate that goes beyond that of the overall sample. Fragile countries maintain a steady trend around the overall average, with fragile resource poor lagging behind. These improvements, along with lower occurrence of high inflation, increased private investment, and constraints on the executive branch, characterized the resilient countries and seem to have been trickling down to the population as evidenced by a decline in infant mortality.

In addition, an enhancement in trade capacity and competitiveness prevails among the entire group of SSA countries, demonstrated by an improvement in terms of trade index and exports. Resilient countries once again exceed the average in these measures, whereas fragile countries sustain an average somewhat similar to that of the overall group. At the same time the group of fragile resource poor countries experienced a deterioration in terms of trade from the previous decade.

Fiscal outcomes, on the other hand, differ for the four country groups (fragile resource rich, fragile non-resource rich, resilient resource-rich, and resilient non-resource rich). Tax revenue increases for all countries except for the resilient resource rich (latter covers only 2

countries). The increase in tax revenues is mostly driven by substantial increases in taxes on profits, income, and capital gains, followed by taxes on goods and services. Even though all countries are experiencing an increase in tax revenues, they all remain below the average for SSA.

On the expenditure side, changes between both sub-periods are mainly driven by current spending. At the level of country groupings, we observe that resource-rich countries – either fragile or resilient – display a significant decrease in current spending over time, whereas resource-poor countries either maintain the same level of spending or show increases. Expenditure on goods and services and those on wages and salaries decrease for all countries except the resilient resource rich. Capital expenditure, on the other hand, decreases for all countries also except the resource rich. More generally, increases in tax revenue, a decrease in current expenditure, and an increase in capital expenditure indicate improved fiscal space in all but the subgroup of fragile resource-poor countries.

Fragile versus resilient

A comparison of the performance of those countries that managed to build resilience with the ones that remained fragile can provide insights on what factors and policies that accompany and possibly contribute to moving a country out of fragility. For the group of twenty-six SSA countries, there is evidence that resilient countries are statistically different in most aspects of economic and social development, progress in building of institutions, and the availability of fiscal space and policies (IMF, 2014a). A simple test of difference in means for the period 1990-2013 confirms that resilient countries consistently out-perform their fragile counterparts, with lower inequality, higher private investment, and stronger executive constraints, regulatory quality and budget institutions. Interestingly, resilient countries have somewhat higher infant mortality than fragile countries and received less development aid (Appendix Table 3).

On the fiscal side, even though overall tax revenue in resilient countries is on average lower than in fragile countries, the former tend to rely more on broad-based indirect taxes, which have been found in the literature to be more pro-growth than direct taxes (Crivelli and Gupta, 2014). They also do a better job in containing current government expenditure and so are able to invest more, compared to fragile countries. In our sample resilient countries seem to spend less on health and education than fragile countries, but they have significantly lower levels of military expenditures. This could suggest that an important difference between fragile and resilient countries lies in the quality of spending and revenue collection, which is facilitated by higher quality of institutions, particularly budget institutions and governance.

Turning to the group of countries that remained fragile throughout the whole period of analysis, the data show that the performance of resource-rich fragile countries differs systematically from that of their resource-poor counterparts. Fragile resource-rich countries tend to be more frequently affected by conflict, to have high-inflation episodes, have high infant mortality, lower constraints on the executive, but also have higher private investment and receive less development aid, but there is no significant difference in the level of income

inequality between both groups of countries. On the fiscal side, they have higher tax revenue than resource-poor fragile countries but tend to rely more on direct taxes, consistent with the evidence in Crivelli and Gupta (2014). Fragile resource-rich countries have much higher current expenditure than resource-poor fragile countries, and consequently invest less. They spend less on health and education than resource-poor countries but more on the military.

IV. EMPIRICAL ANALYSIS

A. Baseline Specification

Guided by the literature review and stylized facts, we study the factors associated with building resilience in fragile sub-Saharan African countries, paying particular attention to the relationship between fiscal institutions and policies and resilience. Our working definition of resilience is the inverse of that of fragility, which can be understood as the ability to provide basic human security and/or create the public goods and conditions needed for human development (Cilliers and Sisk, 2013). This is closely related to Besley and Persson's concept of state capacity described earlier.

The key dimensions of resilience are similarly the opposite of the drivers of fragility, namely the ability to (i) maintain peace and security; (ii) reduce poverty and promote inclusion; and (iii) improve governance. Because these dimensions are closely interrelated, we do not pretend to establish causality. Rather, our empirical strategy is to rely on techniques that either control for endogeneity in an econometric sense (GMM) or perform well given weak exogeneity of independent variables (probabilistic model, with lagged explanatory variables). Our baseline specification is presented in equation 1, where a measure of resilience is related to a set of control variables, as well as various measures of fiscal policies and institutions.

(1) $Resilience_{i,t} =$
$f\left(Resilience_{i,t-1}; Controls_{i,t}; Fiscal\ institutions_{i,t}; Fiscal\ policies_{i,t}; \varepsilon_{i,t}\right)$

B. Hypotheses of Interest

Following the theoretical and empirical literature surveyed earlier, we are interested in testing the following hypotheses:

- *A higher quality of fiscal institutions should be associated with a higher probability of becoming resilient*. We use Gollwitzer's Quality of Budget Institutions Index (2010), as well as measures of government effectiveness and regulatory quality (World Governance Indicators) (see Appendix Table 1 for a definition of all variables and data sources).[15]

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[15] We also used an indicator variable reflecting whether the country had adopted a fiscal rule, from a database developed by the IMF's Fiscal Affair Department, as a proxy for the quality of budget institutions. In empirical analysis the variable wasn't significant and dropped for parsimony. We however found it to be highly correlated with other measures of fiscal institutions and space, such as the index of the quality of budget institutions and the fiscal balance.

- *Greater fiscal space should be positively associated with the probability of becoming resilient.* We use the overall fiscal balance (excluding grants) to construct an indicator variable taking the value of 1 if the overall deficit is greater than the sample's median value, as well as development aid, measured as a share of GDP, and public debt,[16] also measured as a share of GDP as proxies. We also decompose the overall balance into tax revenue either as a share of GDP or as a share of total revenue (excluding grants), current expenditure and domestically-financed expenditure. We expect that greater tax generating capacity should be associated with a higher probability of becoming resilient, as would be higher domestically-financed capital spending, while higher current spending would be negatively associated with building resilience.

- *The composition of spending and tax revenue should also matter for building resilience.* The share of indirect taxes in total revenue should be positively associated with the probability of becoming resilient, while greater reliance on direct taxes should be negatively associated with resilience. On the expenditure side, higher social spending, and lower military spending, measured either in per capita terms or as a share of total expenditure, are expected to be associated with a higher probability of becoming resilient.[17] Health and education spending are used as proxies for social spending - given that social safety nets and pensions still play a very small role in SSA (Monchuk, 2014). We use data from the IMF's Fiscal Affairs Department for education spending, and, for health expenditure, data from the World Health Organization. In this paper we consider (reductions in) military spending as a proxy for fiscal space with countries rebalancing expenditure away from emergency to more long-lasting human capital investment improving the odds of building resilience.

- *Infant mortality* is used in some specifications as an outcome-based measure of health spending and a proxy to capture the ability of the state to deliver basic goods and services (Besley and Persson's 2014 "collective capacity"). Lower infant mortality is hence expected to be positively associated with resilience. Compared to other social indicators, infant mortality data are of better quality and available for most countries.

- We also considered a measure of *income inequality* (from the Standardized World Income Inequality Database, see Solt, 2014), but there the direction of causality between inequality and fragility on the one hand, and inequality and fiscal policy, on the other, is much more difficult to disentangle, both conceptually and empirically. Nonetheless, as discussed in Berg, Ostry and Tsangarides (2014, p.5) there is now a "*tentative consensus*

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[16] When the ratio of public debt-to-GDP was included in the empirical analysis (logit regressions) the STATA algorithm failed to converge – one possible reason being high correlation with other fiscal space variables. The aid-to-GDP ratio performed better and is arguably a better measure of total external financing (grants and loans) available to fragile states.

[17] Proper measuring of social expenditure proved to be difficult. A decline in military expenditure can also be interpreted as a proxy for fiscal space with countries rebalancing expenditure away from emergency to more long-lasting human capital investment, improving the odds of building resilience.

in the growth literature that inequality can undermine progress in health and education, cause investment-reducing political and economic instability, and undercut the social consensus required to adjust in the face of major shocks, and thus that it tends to reduce the pace and durability of growth". That study's findings also support the notion that redistributive fiscal policies can contribute to reducing inequality, without harming growth.

- *Resource-rich countries are likely to be different, in a number of dimensions*. As indicated above, many low-income countries endowed with natural resources have been found to exhibit weaker institutions and governance, lower tax effort, and higher military spending. To control for these direct and indirect effects on resilience, we interact the variables of interest with a dummy variable taking the value of 1 if natural resource rents exceed 10 percent.

C.   Choice of Control Variables

In the estimation we also control for other factors, most of which have been found to be linked to fragility, while trying to remain parsimonious:

- *Lagged dependent variable*, as one would expect high persistence in resilience, as in fragility.

- *Growth of real GDP per capita*, as a control for economic performance. Fast-growing countries are, ceteris paribus, more likely to become more resilient.

- *High inflation*, another indicator of economic performance and state capacity. Gollwitzer and Quintyn (2010) note that an important step for countries with weak institutional environments, fiscal dominance and high inflation is the creation of an independent central bank able to credibly anchor inflation. We expect high inflation to be negatively associated with resilience. High inflation is captured here by a dummy variable taking the value of 1 if inflation exceeds 20 percent, zero otherwise.

- *Degree of exchange rate flexibility*. This indicator captures another aspect of policy space, besides fiscal space, and should be positively associated with resilience, as found in IMF (2014b).

- *Terms of trade*. Terms of trade are important, exogenous, determinants of countries' fortunes, and have been found to be significantly associated with favorable growth performances in post-conflict countries (David et al., 2011). They are thus also expected to be positively associated with resilience. As above, we control for interactions between terms of trade and resource-rich countries (possible Dutch Disease effects), that could lead resource-rich countries experiencing a commodity boom to experience macroeconomic instability, and thus become less resilient.

- *Constraints on the executive* capture the official discretionary leeway that the executive branch has in changing and implementing new policies (POLITY dataset). This is closest to the concept of rule of law for elites or the first doorstep on the transition from a weak

and fragile state to an open access, developed society (North, Wallis and Weingast, 2009). Therefore, more constraints on the executive should be positively associated with the odds of becoming resilient. David et al. (2011) find that the greater the degree of constraints on the executive, the higher the probability of a positive growth performance post-conflict. This is consistent with literature findings that countries with weak constraints on the power of governments and the political elite are more likely to pursue economic policies that are conducive to lower growth and higher output volatility (Acemoglu et al.,2003) This variable is a good proxy for the quality of property rights institutions (Acemoglu and Johnson, 2005), because it directly corresponds to rules constraining state action, and is not a clear equilibrium outcome variable determined by actions from political elites and citizens such as the Heritage Foundation's private property protection index (David et al., 2011).

- *Private investment,* measured as a share of GDP, is an outcome variable that can be understood as a proxy for the capacity of the state to support the development of private markets, or Besley and Persson's (2014) "legal capacity". Higher private investment is expected to be positively associated with building resilience.

D. Estimation Methodology

System GMM Estimation

As mentioned earlier, the factors associated with building resilience are closely interrelated. In addition, many of the explanatory variables may not be fully orthogonal to the indicator chosen to measure resilience, as the CPIA assessment is constructed based on some of the right hand side variables. The correlation between the error term and the non-orthogonal variables should not be too serious however, because the CPIA ratings reflect the subjective judgment of staff in the World Bank's country teams rather than specific data or indicators..

In this section, we address the endogeneity issue by using the System-GMM estimator (Arellano and Bover, 1995; Blundell and Bond, 1998). This estimator is derived from the estimation of a system of two simultaneous equations, one in levels and the other in orthogonal deviations. [18] The system-GMM estimator performs better with highly persistent data and permits to obtain more precise estimates by using the variation over time of the dependent variables and underlying determinants. We use annual data instead of multi-year averages as, for low-income countries in general and fragile countries in particular, volatility is a characterizing feature, with structural breaks caused by conflict or episodes of extreme fragility. Because each country's path is unique in this respect, averages over different spells of collapse or recovery are not comparable across countries and would lead to misleading results (Cevik and Rahmati, 2013). For the panel, the CPIA ratings for the full sample of 44

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[18] Because of missing values in our data, orthogonal deviations instead of differences were used to maximize the sample size (Roodman, 2006). Furthermore, the first-difference GMM estimator suffers from small sample bias when the time series in short and exhibits high persistence over time, which makes the lagged levels weak instruments for subsequent first differences (Arellano and Bover, 1995; Blundell and Bond, 1998).

SSA countries are used to implement System-GMM (for large "N", small "t"). Given the upward and downward bias of a pooled OLS and a least-squares dummy variables with fixed effects (LSDV), respectively, the lagged dependent variable coefficient estimated by a System-GMM should lie in between these two (Roodman, 2006), as is the case in our sample.[19]

The control variables areas specified in section IV.C. above, albeit with a few exceptions. In order to avoid losing too many degrees of freedom, we do not include year dummies and instead use categories of exchange rate regimes and the growth of real GDP per capita in Organisation for Economic Co-operation and Development (OECD) countries to control for time fixed effects.[20] In all specifications, the number of instrumental variables is (weakly) smaller than the number of countries (to avoid instrument proliferation, the number of lags for the GMM instruments is restricted to two, see Roodman, 2009). The AR(2) test, Sargan test, and Hansen test of overidentifying restrictions are all insignificant, indicating that the instruments are appropriate.

The estimates for the two-step System-GMM with Windmeijer SE correction are shown in Table 3. Looking first at the effect of control variables (Table 3, column 1), we find that domestic economic and institutional variables, as well as external factors, are important in explaining a country's improvement in CPIA rating. CPIA ratings are highly persistent, a reflection of the difficulties associated with building resilience, and high inflation has a negative impact on CPIA ratings. Real per capita GDP growth, constraints on the executive, terms of trade, constraints on the executive and real GDP per capita in OECD countries have a positive impact on CPIA ratings. However, the impact of a country's own real per capita GDP growth is not robust in all specifications (Table 3, columns 5-7), probably reflecting interactions between real GDP per capita growth and education and health spending.

Higher development aid, lower inequality and lower infant mortality (Table 3, columns 1-3) help improve CPIA ratings. Regarding fiscal variables, the estimates support the hypothesis that tax revenue as a share of GDP is positively related to higher CPIA scores, while resource-rich countries show a lower tax effort. Current expenditure as a share of GDP is negatively related to the CPIA rating; health and education spending per capita and as a share of total expenditure are positively and significantly related to CPIA ratings.

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[19] Estimates are available on demand.

[20] Exchange regimes are classified as: 1-Pegged, 2-Managed, or 3-Floating. The real growth of GDP in Organisation for Economic Co-operation and Development countries is meant to capture common fixed effects, given the low degree of intraregional integration in sub-Saharan Africa. The exchange rate regime captures common fixed effects stemming from the mechanism of adjustment to external conditions.

VARIABLES	1	2	3	4	5	6	7
Table 3. System-GMM Estimation (1990-2013)							
CPIA (t-1)	0.716***	0.673***	0.751***	0.641***	0.543***	0.515***	0.493***
	(0.059)	(0.060)	(0.053)	(0.069)	(0.124)	(0.079)	(0.068)
Inflation	-0.075	-0.043	-0.094*	-0.192**	-0.239	-0.003	-0.124
	(0.065)	(0.089)	(0.052)	(0.077)	(0.182)	(0.083)	(0.118)
Real GDP per capita growth	0.005	-0.007	0.001	0.007	-0.038***	-0.024**	-0.011***
	(0.009)	(0.007)	(0.007)	(0.009)	(0.013)	(0.009)	(0.004)
Terms of Trade	0.001	0.001	0.001***	0.000	0.003***	0.002***	0.003***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
Executive Constraints	0.005	0.012	0.014	0.003	0.018	0.030**	0.010
	(0.013)	(0.012)	(0.015)	(0.016)	(0.018)	(0.012)	(0.019)
Real GDP per capita growth, OECD	0.002	0.007*	0.006*	0.001	0.009	0.035***	0.030***
	(0.005)	(0.003)	(0.003)	(0.005)	(0.009)	(0.006)	(0.009)
Exchange Rate Regime	0.282**	0.240**	0.144**	0.200*	-0.112	-0.078	0.031
	(0.117)	(0.104)	(0.066)	(0.113)	(0.080)	(0.110)	(0.087)
(Development Aid/GDP)	0.012**	0.011***	-0.001				
	(0.005)	(0.003)	(0.003)				
Inequality Index	-0.015*						
	(0.008)						
Infant Mortality		-0.003**					
		(0.001)					
(Tax Revenue/GDP)			0.029***				
			(0.010)				
(Current Expenditure/GDP)			-0.013**				
			(0.006)				
(Tax Revenue/GDP)*RR			-0.039***				
			(0.008)				
(Military Exp./Total Exp.)				-0.003			-0.002
				(0.004)			(0.003)
Military Exp. per capita						0.000	
						(0.000)	
(Education Exp./Total Exp.)					0.013		0.039***
					(0.012)		(0.009)
(Total Health Exp./Total Exp.)[1]					0.003		0.002
					(0.006)		(0.006)
Education Exp. per capita						0.002***	
						(0.001)	
Total Health Exp. per capita[1]						0.001***	
						(0.000)	
Constant	0.653	0.521	0.252	0.727	1.270***	1.308**	0.592
	(0.488)	(0.345)	(0.376)	(0.466)	(0.466)	(0.497)	(0.417)
Observations	503	702	532	484	375	351	322
Number of country_code	39	40	39	38	36	34	34
AB test for AR(2)	0.461	0.439	0.169	0.100	0.946	0.696	0.722
Number of IVs	18	18	22	16	18	20	20
Sargan test	0.132	0.255	0.122	0.370	0.408	0.440	0.135
Hansen test	0.260	0.286	0.243	0.313	0.628	0.436	0.507

Source: Authors' calculations. The dependent variable is the CPIA rating (World Bank). (***) indicates statistical significance at t the 1 percent level, (**) at the 5 percent level, and (*) at the 10 percent level.
[1] Data from World Health Organization.

Figure 1 shows the contribution of fiscal variables evaluated at their mean, one and two standard deviations, to the change in CPIA scores, in the full sample of 44 sub-Saharan African countries. A one standard deviation increase in the share of education expenditure in total spending, the ratio of tax revenue to GDP or aid to GDP would contribute to a 0.25, 0.2 and 0.1 point increase in the CPIA. Increasing health or education spending per capital could contribute to increasing the CPIA by 0.06-0.09 points. At the same time, a reduction in

inequality or in current expenditure as a share of GDP would contribute to a 0.1-0.08 point increase in the CPIA.

Figure 1. Fiscal Variables' Contribution to Changes in CPIA Ratings
(Based on GMM Estimation Results)

Sources: World Economic Outlook; AFR Departmental Database; World Development Indicators; Authors' calculations.
The bars show the marginal contribution to increasing/decreasing the CPIA score of each variable of interest evaluated at its mean, mean +1 standard deviation, and mean + 2 standard deviations.

To summarize, the results of GMM estimation support most of our initial hypotheses: fiscal space (higher development aid, tax revenue, lower recurrent spending) and the composition of spending matter for improving CPIA scores, with resource-rich countries showing less tax effort, consistently with the finding in Crivelli and Gupta (2014). Lower income inequality is significantly associated with higher CPIA scores. However, given limited degrees of freedom and the fact that GMM estimation doesn't allow for inclusion of indicator variables as explanatory variables, we have yet to show the impact of budget institutions and of finer components of tax and expenditure on resilience. In addition, estimating progress along the continuum of CPIA scores doesn't allow us to identify the factors associated with exiting fragility. Although this is not a precise threshold, resilient and fragile countries differ significantly along a number of different dimensions, as shown in the stylized facts section.

Simple Logit Model

In this section we use the sample of 26 countries that were deemed fragile in the 1990s described in section III.A above to study in more detail the factors associated with building resilience, including budget institutions. A logit model with random effects is used to identify significant factors and their marginal contributions to the probability of becoming resilient.[21] Resiliency is proxied by a time-varying indicator variable that takes a value of 1 when the CPIA score is above 3.2 and there are no significant conflicts, and zero otherwise.[22] We first

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[21] We use xtlogit with random-effects instead of fixed-effects to avoid dropping countries that are fragile throughout the sample period. We use year dummies to control for common time effects.

[22] A conflict is significant if there are more than 1000 deaths. This is different from the stylized facts section, where we classified countries as resilient or fragile based on the combination of CPIA rating and existence or not of conflict in 2011-13 only.

test our hypotheses on the associations between fiscal institutions, the composition of spending, and tax revenue, on resilience. As several of our explanatory variables are potentially endogenous to our measure of resilience, which could lead to biased and inconsistent coefficient estimates, we use lagged values of the regressors (David et al., 2011, Taydas and Peksen, 2012, Singh et al., 2014). This attenuates the endogeneity and reverse-causality bias, although it is quite possible that issues of reverse causality appear before t-1 as well. Estimation results are presented in Tables 4 and 5, respectively. Table 4 shows the estimation with proxies for fiscal institutions and fiscal space as independent variables, starting from the set of controls and adding our main measures of fiscal institutions (budget institutions, and government effectiveness and regulatory quality, followed by broad indicators of fiscal space. In Table 5 we explore in more detail the association between resiliency and the composition of tax revenue and expenditure, measured both as a share of GDP or per capita. We also look at the share of tax revenue and various taxes in total revenue and the share of recurrent and (domestically-financed) capital spending in total spending.

The control variables in the baseline specification (Table 4, column 1) mostly have the expected sign, though not all are significant. The variables that are significantly and positively associated with resilience include lagged resilience (indicating persistence) and the terms of trade. The interaction of terms of trade and the dummy variable for resource-rich countries is negative and significant, suggesting that the positive impact of terms of trade shocks on resilience is much weaker in resource-rich countries. Private investment is also positive and significant, and robustly so across all specifications in Table 4, an indication that higher private investment is positively associated with exiting fragility, even after accounting for other factors including macroeconomic and political stability and various measures of the quality of fiscal institutions and fiscal space. In some specifications, constraints on the executive, and the degree of exchange rate flexibility are also positively and significantly associated with resilience.

Columns 2 and 3 look at the impact of income inequality and infant mortality, respectively, on the odds of becoming resilient. The inequality coefficient has the wrong sign but is not significant in this specification, but infant mortality is negatively and significantly associated with the odds of building resilience, reflecting the low capacity or effectiveness of the state in delivering basic social services.

The fiscal variables of interest are significantly associated with resilience. In particular, the proxies for quality of fiscal institutions are all positively associated with the probability of becoming resilient, while interactions with the resource-rich indicator variable are negative and significant (Table 4, columns 5 and 6). This suggests that good quality of budget institutions and government capacity are positively associated with resilience, but the impact is weaker in resource-rich countries. The exception is regulatory quality, which has a strong and positive association with the probability of becoming resilient in resource-rich countries.

Table 4. Panel Random Effects Logit regression: Fiscal Institutions, Fiscal Space and Resilience (1990-2013)

VARIABLES	1	2	3	4	5	6	7	8
Resilience (t-1)	2.951***	3.106***	2.641***	2.940***	3.492***	2.766***	2.232***	1.605*
	(0.434)	(0.590)	(0.467)	(0.488)	(0.526)	(1.037)	(0.594)	(0.849)
Real GDP per capita growth	0.029	0.003	0.031	0.023	0.014	-0.030	0.004	0.073
	(0.027)	(0.031)	(0.029)	(0.030)	(0.027)	(0.055)	(0.033)	(0.055)
High Inflation	-0.799	-0.606	-0.551	-1.073	-0.144	-0.942	-1.544	-1.099
	(0.586)	(0.731)	(0.620)	(0.689)	(0.698)	(1.081)	(1.116)	(1.466)
Terms of Trade	0.010*	0.011	0.010	0.012*	0.002	0.019	0.005	0.011
	(0.006)	(0.008)	(0.006)	(0.007)	(0.006)	(0.018)	(0.008)	(0.011)
Terms of Trade*RR	-0.012**	-0.009	-0.008	-0.009	0.008	-0.006	-0.000	-0.031
	(0.006)	(0.007)	(0.008)	(0.007)	(0.010)	(0.020)	(0.015)	(0.025)
Executive Constraints	0.109	0.264*	0.068	0.198	0.244*	0.273	0.176	0.262
	(0.113)	(0.143)	(0.124)	(0.148)	(0.126)	(0.195)	(0.180)	(0.224)
Exchange Rate Regime	0.565	1.231**	0.859	0.613	0.488	0.458	1.311*	1.670*
	(0.493)	(0.595)	(0.559)	(0.554)	(0.528)	(0.714)	(0.695)	(0.908)
(Private Investment/GDP)	0.048*	0.080**	0.052**	0.070**	0.046*	0.063	0.093**	0.103**
	(0.025)	(0.038)	(0.026)	(0.031)	(0.026)	(0.045)	(0.038)	(0.043)
Inequality Index		0.009						
		(0.048)						
Infant Mortality			-0.048**					
			(0.021)					
High Fiscal Deficit				-0.557				
				(0.558)				
Budget Institutions					5.031**			
					(2.503)			
Budget Institutions*RR					-4.451**			
					(2.228)			
Regulatory Quality						2.439		
						(2.111)		
Government Effectiveness						4.086***		
						(1.583)		
Regulatory Quality*RR						4.697**		
						(2.333)		
Government Effectiveness*RR						-4.198**		
						(2.012)		
(Development Aid/GDP)							-0.009	-0.036
							(0.031)	(0.039)
(Tax Revenue/GDP)							0.357**	0.521**
							(0.157)	(0.229)
(Current Expenditure/GDP)[1]							-0.185*	-0.359**
							(0.104)	(0.170)
(Dom. Fin. Capital Exp./GDP)							0.098*	0.052
							(0.056)	(0.070)
(Tax Revenue/GDP)*RR							-0.231	-0.026
							(0.153)	(0.235)
Medium-term IMF Supported Program								1.692
								(1.080)
Constant	0.622	0.557	1.243**	0.655	-0.216	-1.432	1.253*	1.291*
	(0.552)	(0.793)	(0.591)	(0.610)	(0.836)	(5.026)	(0.643)	(0.720)
Observations	447	304	447	376	368	287	343	268
Number of country_code	23	23	23	23	19	22	23	22

Source: Authors' calculations. The dependent variable is an indicator of resilience, which is approximated by a time-varying indicator that takes a value of 1 when the CPIA score is above 3.2 and there are no significant conflict, and 0 otherwise. A conflict is significant if there are more than 1,000 deaths. RR: Resource-rich countries. Standard errors in parentheses. (***) indicates statistical significance at the 1 percent level, (**) at the 5 percent level, and (*) at the 10 percent level.

[1] Current expenditure excluding interest payments.

Turning to the fiscal space indicators measured as shares of GDP, all the coefficients have the expected sign, excepted for the one on foreign aid, which comes with a negative sign (though the effect is not significant). High fiscal deficits are negatively associated with building resilience, but the effect is not significant (Table 4, column 4). Looking in more details at the composition of fiscal space, we find that tax revenue is significantly and positively associated with the odds of becoming resilient, as is, on the spending side, domestically-financed investment (Table 4, columns 7 and 8). On the other hand, current spending as a share of GDP is negatively and significantly associated with becoming resilient (Table 4, columns 7 and 8). A possible rationale for the latter result is that higher levels of current spending may be more often associated with an oversized civil service or higher military spending and thus a rigid fiscal structure, lowering fiscal space and reducing the scope for social and infrastructure spending. This interpretation is supported by the analysis of the composition of tax and expenditure in Table 5. The interaction between tax revenue and the resource-rich dummy is negative, although not significant in this specification; this result is consistent with the findings in Crivelli and Gupta (2014) that, other things equal, the domestic tax effort is lower in resource-rich countries. Lastly, the presence of a multiyear agreement with the IMF (such as an Extended Credit Facility) is positively (but not significatively in this specification) associated with resilience, signaling a government commitment to a program rooted in economic stability and reforms.

To shed further light on the possible drivers of the relationship between fiscal space indicators and resilience, we also present results of logit regressions estimating the impact of the composition of public expenditure and tax revenue (Table 5). The main results from this analysis are that higher tax revenue and lower military expenditures are strongly and positively associated with the probability of becoming resilient. This holds whether these variables are measured as a share of GDP per capita, or as a share of total revenue or expenditure (Table 5, columns 1 to 4). That is not only the overall level of tax revenue or military expenditures, but also their respective shares in total revenue and total expenditure, respectively, matters. The result on military spending seems even stronger in resource-rich countries (Table 5, column 3), in contrast to the Singh, Bodea, and Higashijima (2014) study that suggested that military spending may contribute to stability in this group of countries. Health and education spending are mostly positively associated with resilience, though the coefficients on these variables are not significant (Table 5, columns 2 and 4). Consistently with the results presented in Table 4, overall current spending (excluding interest payments) as a share of total spending is negatively associated with increased odds of becoming resilient, while the share of domestically-financed investment is positively associated with resilience (Table 5, columns 5 and 6).

On the revenue side, tax revenue as a share of total revenue is positively associated with resilience with some evidence of a lower tax effort in resource-rich countries. Looking at the composition of tax receipts (Table 5, column 6) the results show that only taxes on income,

profits, and capital gains have a positive and significant impact. Surprisingly, taxes on goods and services and trade taxes seem to have a negative impact on building resilience.[23]

Table 5. Panel Random Effects Logit Regression: Composition of Spending and Taxation and Resilience (1990-2013)

VARIABLES	1	2	3	4	5	6	7
(Tax Revenue/GDP)	0.602***	0.144					
	(0.227)	(0.226)					
(Tax Revenue/GDP)*RR	-0.559**	-0.359					
	(0.238)	(0.294)					
Education Exp. per capita		0.010					
		(0.014)					
Education Exp. per capita*RR		-0.003					
		(0.025)					
Total Health Exp. per capita[1]		0.038					
		(0.095)					
Total Health Exp. per capita*RR[1]		0.040					
		(0.094)					
Military Exp. per capita	-0.458**						
	(0.188)						
Military Exp. per capita*RR	0.141						
	(0.218)						
(Tax Revenue/Domestic Rev.)			0.006	0.094*	0.047*		
			(0.031)	(0.052)	(0.025)		
(Military Exp./Total Exp.)			-0.300**				
			(0.119)				
(Tax Revenue/Dom Rev.)*RR			0.001	-0.060	-0.001		
			(0.033)	(0.051)	(0.023)		
(Military Exp./Total Exp.)*RR			-0.539*				
			(0.323)				
(Education Exp./Total Exp.)				0.000			
				(0.110)			
(Education Exp./Total Exp.)*RR				0.387			
				(0.279)			
(Total Health Exp./Total Exp.)[1]				-0.007			
				(0.070)			
(Total Health Exp./Total Exp.)*RR[1]				-0.006			
				(0.084)			
(Dom. Fin. Capital Exp./Total Exp.)					0.023**	0.015	0.015
					(0.011)	(0.011)	(0.012)
(Current Exp./Total Exp.)[2]					-0.037	-0.068*	-0.082**
					(0.032)	(0.038)	(0.040)
(Taxes on G and S/Dom. Rev.)						-0.005	-0.007*
						(0.003)	(0.004)
(Taxes on Profits/Dom. Rev.)						0.008**	0.016**
						(0.004)	(0.007)
(Taxes on Int'l Trade/Dom. Rev.)						-0.005*	-0.008**
						(0.003)	(0.004)
(Taxes on G and S/Dom. Rev.)*RR							0.001
							(0.006)
(Taxes on Profits/Dom. Rev.)*RR							-0.012
							(0.009)
(Taxes on Int'l Trade/Dom. Rev.)*RR							0.008
							(0.006)
Constant	1.765**	1.446**	1.759**	1.199	1.081	1.517**	1.474**
	(0.786)	(0.730)	(0.811)	(0.897)	(0.661)	(0.598)	(0.579)
Observations	282	215	278	211	343	323	323
Number of country_code	21	19	22	19	23	23	23

Source: Authors' calculations. The dependent variable is an indicator of resilience, which is approximated by a time-varying indicator that takes a value of 1 when the CPIA score is above 3.2 and there are no significant conflict, and 0 otherwise. A conflict is significant if there are more than 1,000 deaths. Control variables (not shown) include: resilient (lagged), growth real GDP per capita, inflation, terms of trade, terms of trade interacting with resource rich, executive constraints, exchange rate regime, and private investment (percent of GDP). Standard errors in parentheses. (***) indicates statistical significance at the 1 percent level, (**) at the 5 percent level, and (*) at the 10 percent level.

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[23] The evidence on the impact of these taxes can be interpreted as representing the successful taxation of rents in monopolistic sectors like telecommunications or banking. There is also the possibility of reverse causality, as resilient countries are likely to have stronger tax administration and higher growth, hence derive higher income from these taxes. It is harder to explain the negative coefficient on taxes on goods and services, as these are normally least distortionary and have been associated in the literature with higher GDP growth.

For easier interpretation of the findings, Figure 2 displays the predicted probability of being resilient evaluated at different values (mean, one and two standard deviations), using the estimated coefficients of the fiscal variables that have been found to be significant in the logit regressions, holding the other variables constant at their mean. These estimates highlight a nontrivial contribution of fiscal institutions and fiscal space indicators to the probability of becoming resilient.

A one standard deviation increase in the share of taxes on income, profits and capital gains, regulatory quality, or the share of tax revenue in total revenue would increase the probability of a country becoming resilient by about 70 to 40 percent. A one standard deviation in crease in the quality of budget institutions, domestically-financed capital spending (as a share of GDP or as a share of total spending) would increase the probability of resilience by about17-20 percent. At the same time, a one standard deviation increase in current spending either as a share of GDP or of total spending would reduce the probability of being by about 12-13 percent, while an increase of one standard deviation in military expenditure would reduce the probability of becoming resilient by 2-3 percentage points.

Figure 2. Fiscal Variables' Contribution to the Predicted Probability of Becoming Resilient
(Based on Random Effects Logit Coefficients)
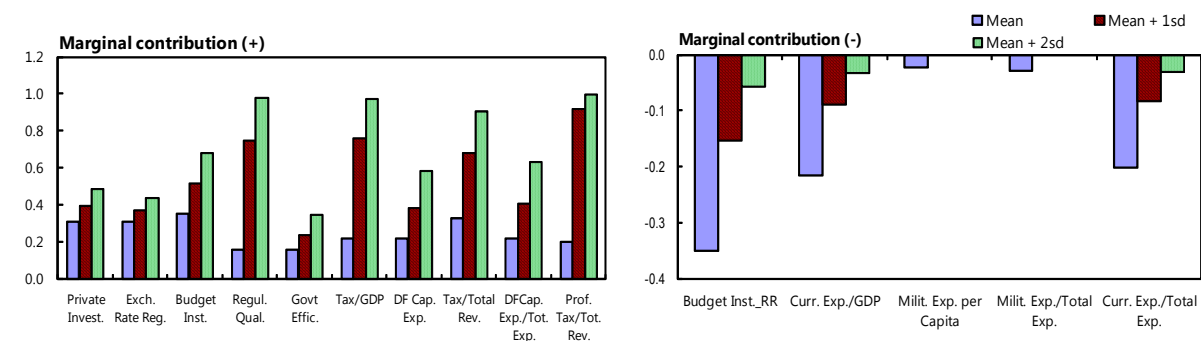
Sources: World Economic Outlook; AFR Departmental Database; ICRG Database; World developpment Indicators; Authors' calculations.
The bars represent the marginal contribution of each variable (evaluated at its mean, mean + 1 standard deviation, mean + 2 standard deviations, whith other dependent variables remaining at their mean) to the probability of becoming resilient, using estimated coefficients from Table 3 and Table 4.

Overall the logit estimation results are consistent with the GMM findings, but speak more directly about the relation between fiscal space and spending composition and the probability of becoming resilient. They also shed additional light on the association between the quality of budget institutions and various types of taxes and expenditures, and resiliency.

Robustness of the results

We conduct several robustness tests in order to check the validity of the empirical findings, focusing on the logit estimation. Because both the dependent variable and some of the control variables are highly persistent, we ran the log it regressions using two-year lagged dependent variables. Results (shown in Appendix Tables 4 and 5) are fully consistent with those presented in tables 4 and 5. We also checked the robustness of the results to a different, more demanding definition of resilience, whereby a country is deemed resilient in a

particular year if the CPIA is larger than 3.2 and there is no major conflict each year for three consecutive years, on a rolling basis, instead of only in the current year. Results, shown in Appendix Tables 6 and 7 are also qualitatively the same as in Tables 4 and 5. Inequality now has the correct sign, the index of the quality of budget institutions remains strongly positive overall and negative for resource-rich countries, and the presence of an IMF-supported structural adjustment facility is now significantly related to the odds of becoming resilient. Previous results on the strength of tax revenue (as a share of GDP or of total revenue, and domestically-financed investment in affecting the probability of becoming resilient still hold, while military expenditure and recurrent spending are still negatively associated with the odds of becoming resilient. We also checked for multicollinearity by exploring bi-variate correlations among explanatory variables. The full correlation matrix indicates that, although the regressors are often significantly correlated, the coefficients remain mostly low, with only a few bilateral correlation coefficients above 0.5. In the empirical estimation, these variables were never entered simultaneously (results available on demand). Overall, the main empirical results are robust to the estimation method, sample and definition of the dependent variable.

While beyond the scope of this paper, the impact of the quality of the health, education and investment spending on building resilience could usefully be further investigated. Subject to data availability, studies focusing more narrowly on the impact of foreign aid on fragility and resilience could also assess the impact of various types of external assistance (e.g. project versus budget support, or technical assistance). Furthermore, while this paper investigates separately the effects of fiscal institutions as well as fiscal space and its composition, on building resilience, there are clearly direct interactions between the quality of fiscal institutions and fiscal outcomes which would be worth exploring further, as discussed in Section II of this paper. Finally, this paper focuses on the role of fiscal institutions and policies on exiting fragility but doesn't fully answer the question of whether fiscal institutions have earlier or greater returns than other types of institutions. Indeed, the take-aways from the related study by IMF (2015) are that although fiscal institutions and fiscal space play an important role, so do other types of policy space, such as the ability to deliver low inflation and to adjust to external shocks.

V. LESSONS FROM RESILIENT COUNTRIES ON THE SEQUENCING OF REFORMS

In this section, we use a more qualitative approach to identify the sequencing of reforms in a group of seven countries that have made some progress in overcoming fragility since the 1990s, namely Cameroon, Ethiopia, Mozambique, Niger, Nigeria, Rwanda and Uganda (see section III.A. above and Table 1). We align the seven countries at the year in which their Country Policy and Institutional Assessment (CPIA) was the lowest since 1985 (t0, see Box 1) and track them until they reach a

Figure 3. Overall CPI Index
Index (1-6)

Sources: The World Bank Group; authors' calculations.

"resilient" state (when the CPIA score has been above 3.2 for over three consecutive years and the country has not experienced a major conflict). We focus on the timing and extent of
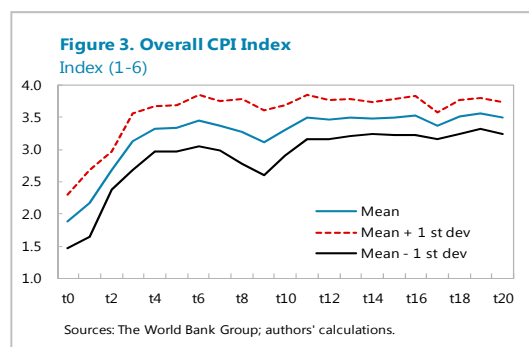
progress in indicators of fiscal institutions and fiscal space, as well as selected other economic and sociopolitical variables.[24]

Box 1. Identifying the Most Fragile Period

Cameroon (1993). During the mid-1980s, Cameroon's economy suffered a period of steady decline, marked by lower terms of trade, oil output, and an appreciation of the real effective exchange rate. Faced with a deepening economic crisis, the government cut wage and nonwage spending in 1993 (IMF 1993a). In the wake of the presidential election and the economic decline, sociopolitical tensions rose in 1993, marking this year as the most fragile period for Cameroon.

Ethiopia (1991). In the late 1980s, Ethiopia faced major economic hardship due to deterioration in the terms of trade, a drought, and rising political and security tensions. Industrial production declined sharply due to a foreign exchange shortage and the stagnation in agriculture (IMF 1991). Violence and political tensions were elevated with a long-fought civil war between Ethiopia and Eritrea (1974–91), while the collapse of the Soviet Union resulted in the halting of its aid in 1990. In 1991, Eritrea gained independence from Ethiopia and the government of President Mengistu collapsed. The economic decline, violence, and political tensions in 1991 marked the most fragile year for Ethiopia.

Mozambique (1985). In 1975, a civil war erupted in Mozambique, leading to a 16-year-long civil war. The centrally planned economic system characterized by price and production controls led to a pronounced economic deterioration and severe economic instability starting in the 1980s. The peak of the economic decline was in the mid-1980s, when output contracted by 25 percent and the country experienced hyperinflation (IMF 2003). 1985 was the most fragile year.

Niger (1993). After the end of a uranium boom in the 1980s, Niger faced macroeconomic imbalances due to the deterioration in the terms of trade, frequent droughts, and inefficient economic management. In 1990, political turmoil and social disturbances intensified, and a transitional government was formed in 1991 pending legislative and presidential elections. However, sporadic fighting of the guerrilla groups continued, and the economy declined further until 1993 (the most fragile year).

Nigeria (1994). Nigeria experienced considerable political turmoil in 1993/94. The presidential elections were annulled and an Interim National Government was formed to prepare for new presidential elections in early 1994. There was widespread civil unrest and the military took power. The new military government dismissed all elected officials and dissolved the state and national legislatures. Prior to the unrest, economic conditions deteriorated rapidly amidst accelerating inflation, lower economic growth, and high current account deficits. Nigeria's fragility peaked around 1994.

Rwanda (1994). After years of ethnic conflict and violence, civil war broke out in 1994 and ended with a genocide of up to 1 million people. Due to the armed conflict, most institutions were closed and the administrative system collapsed. Output fell by one-half and exports declined by 60 percent (IMF, 1999). 1994 marked the most fragile year for Rwanda.

Uganda (1985). Uganda experienced recurrent civil wars and external conflicts since the 1970s. While the civilian government was restored in 1981, an open civil war took place during 1983–85. Shortages of consumer goods and expansionary financial polices led to hyperinflation. Peace and security were restored in late 1986, but living standards had fallen sharply. The last year of the civil war, 1985, marks the highest level of fragility in Uganda.

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[24] An important caveat in this analysis is the time coverage of CPIA scores. If the first year for which there is available CPIA data represents the lowest CPIA score that year will be considered as t0. For instance, in the case of Mozambique, the earliest available CPIA score is the lowest as well, which may underestimate the length of the "fragility" period. For all other countries, the "fragility" period falls in between the earliest and the latest available data.

Based on this methodology we find that, on average, it took ten years for these countries to overcome fragility —ranging from 6 years in Ethiopia and Mozambique to 14 and 15 years in Niger and Nigeria, respectively. The overall CPIA scores show a rapid improvement in the first 5 years, moving from an average of 1.9 to an average of about 3.4 (Figure 3). After reaching this level, the pace of improvement slowed on average.

A number of studies, using different approaches, confirm that it takes many years to escape fragility. The World Development Report (World Bank 2011b), for example, estimates that moving from the level of institutional capacity of a country like Haiti to that of Ghana could take between 15 and 30 years. Cilliers and Sisk (2013) estimate that of 26 sub-Saharan African countries identified as fragile, 12 could be expected to be on a path to greater resilience by 2039, 4 more by or before 2050, leaving 10 still in a fragile situation by 2050.[25]

Macroeconomic and political stability

In all seven countries the areas that improved the most in the five years after the conflict were the political and macroeconomic situation (Figure 4). This is consistent with IMF (2014b), which notes the importance of an inclusive political settlement that guarantees stability, and the return to macroeconomic stability in the early post-conflict years for improvements in other areas and building resilience.

All resilient countries also made considerable progress in political stability and the rule of law. The political risk index improved fastest over the 10 years following the conflict, with slower progress thereafter, whereas the improvement in the rule of law was consistent throughout the two decades following the conflict. In the seven countries, on average, real GDP growth improved by 14 percent in the first five years, or 94 percent of the total improvement over the 20 years following the conflict. Inflation declined by 21 percent in the same period, or about 80 percent of the total long-run stabilization (Appendix Table 8).

Institutions and fiscal space

The progress in several institutional measures, such as regulatory quality, and government effectiveness indicates that strong institutions play a crucial role in building resilience. All resilient countries have made considerable progress in this area, particularly between years 5-10 after the conflict.

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[25] Other studies found similarly long periods. Chauvet and Collier (2008) find that the probability of a fragile state starting a sustained turnaround in any given year is just 1.7 percent (implying that it would take on average 59 years before a country could cease to be fragile); this probability increases to 5 percent in a post-conflict environment.

Figure 4. Macroeconomic and Political Stability Indicators

GDP per Capita Growth (percent)

Inflation (Percent)

Legend:
- Mean
- Mean + 1 st dev
- Mean - 1 st dev

Political Risk (Index)

Rule of Law (Index)

Legend:
- Mean
- Mean + 1 st dev
- Mean - 1 st dev

Note: The charts represent the average across the seven countries.
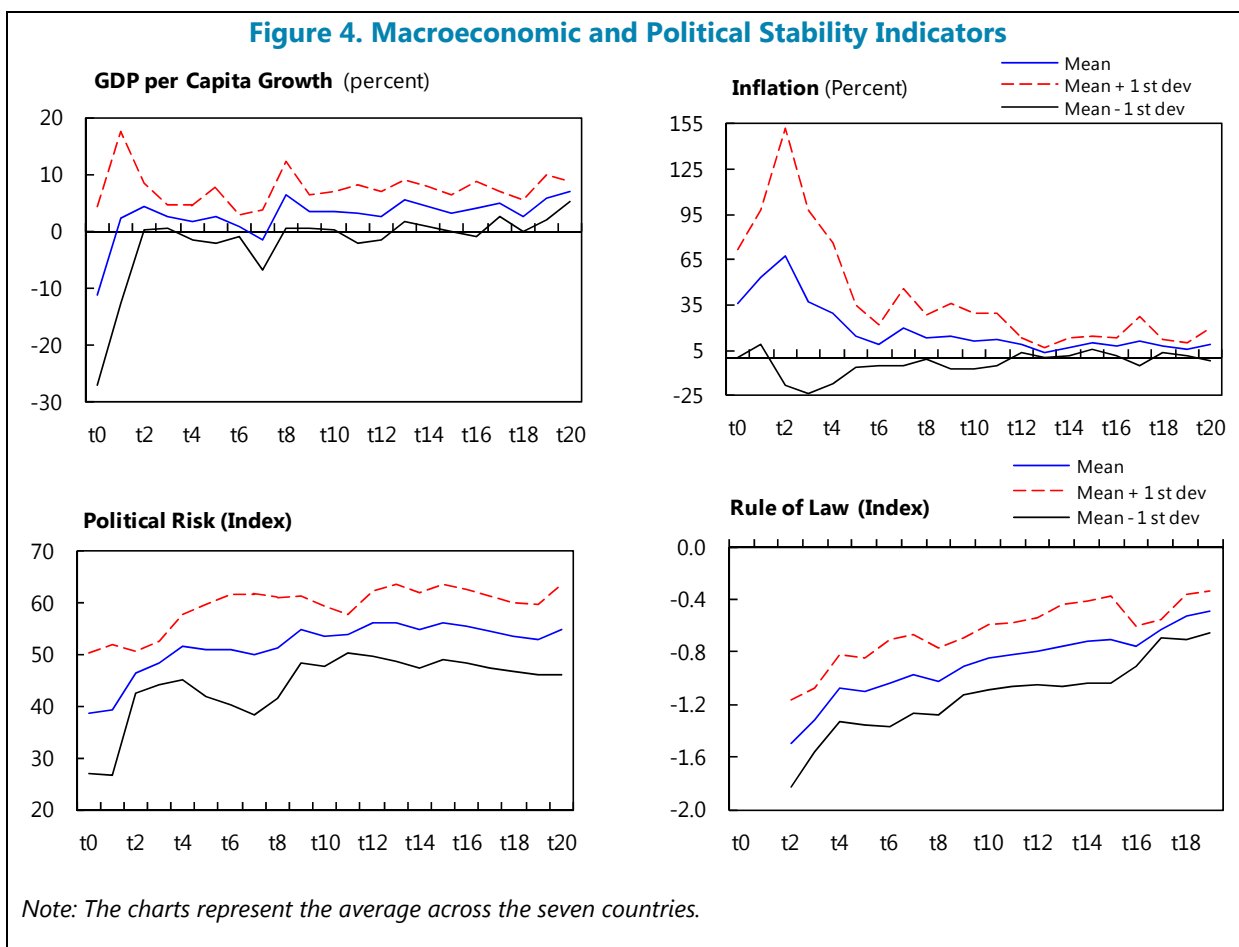
Sources: International Country Risk Guide; Penn World Tables, University of Pennsylvania; World Economic Outlook; World Development Indicators; authors' calculations.

A crucial factor that helped these countries build resilience is the creation of fiscal space for investment and social spending in conjunction with buffers of government savings and external reserves. The countries managed to contain non-priority spending, reduce debt service payments, and mobilize domestic revenue. The share of current spending in total spending declined rapidly in the initial years and hovered at about 55 percent thereafter. This, in turn, allowed for higher levels of public investment. Debt relief through the Heavily Indebted Poor Countries and the Multilateral Debt Relief Initiatives also enabled these countries to reduce debt levels and debt service outlays. Debt levels declined from an average of about 120 percent of GDP in the earlier years to about 40 percent of GDP by t_{13}.

In addition to lower current spending and debt, the seven countries were also successful in mobilizing fiscal revenue (Figure 5). Tax revenues increased progressively from an average of 5 percent of GDP (at t_0) to an average of 13 percent of GDP (at t_{20}), confirming the important role of revenue mobilization (the chart does not show the tax revenues of Nigeria and Cameroon, two countries rich in natural resources where much of the increase in revenues were in the form of oil receipts). More remains to be done, however, as tax

revenues remain below the average of 20 percent of GDP for non-fragile sub-Saharan African countries.

Figure 5. Fiscal Space Indicators

Note: The charts represent the average across the seven countries.
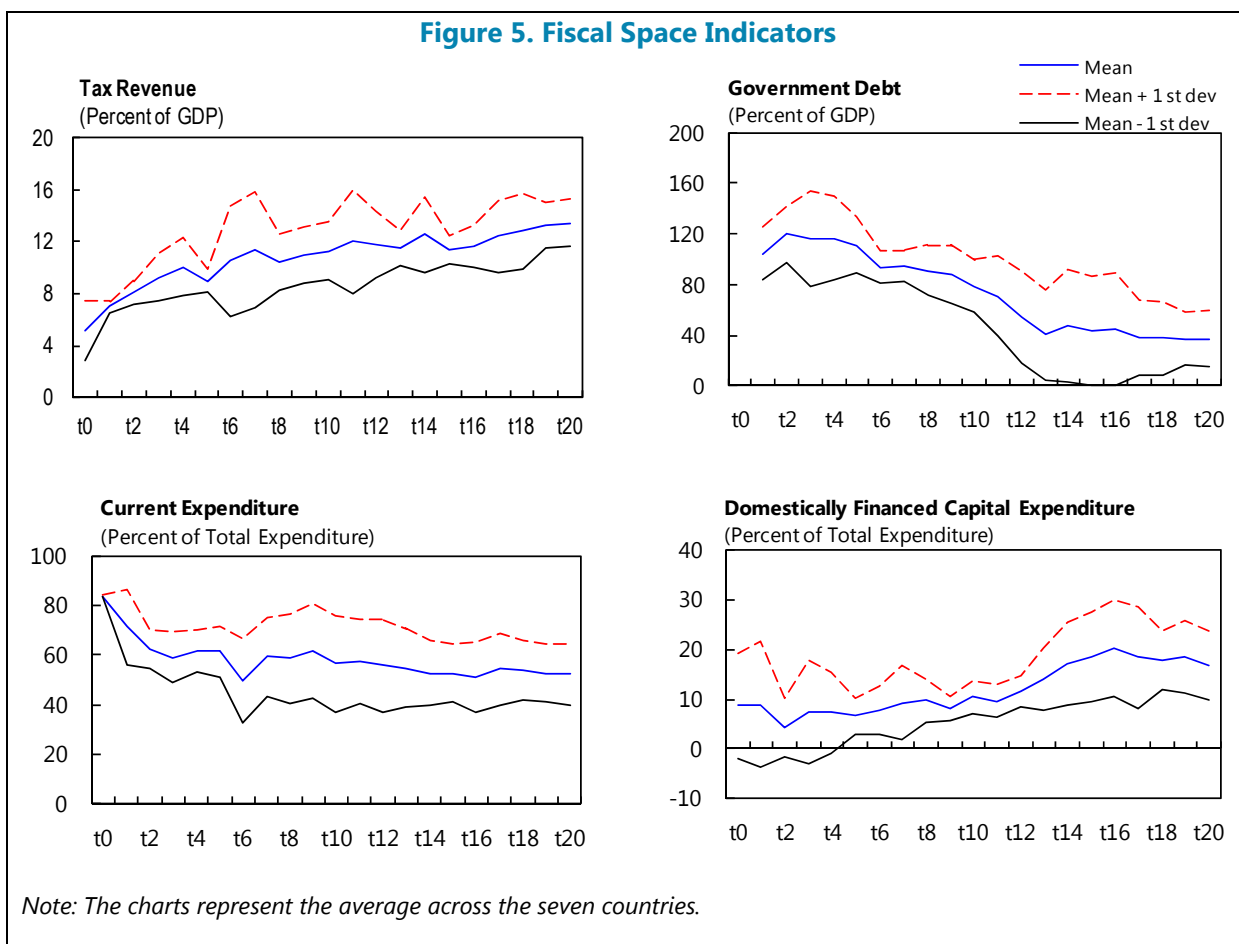
Sources: World Economic Outlook; AFR department database, IMF; authors' calculations.

In the early years, countries mobilized revenues through improved collection of taxes on goods and services—reflecting a combination of tax rate adjustments and administrative improvements (Table 6). In subsequent years, additional forms of taxation contributed more, particularly income taxes as economies recovered, while the importance of revenue from international trade taxes declined as a result of trade liberalization.

On the expenditure side, the data show a focus on capital spending in the early years. Political instability and conflict have negative effects on investment and capital stocks, implying a need to rebuild infrastructure as well as a high return to capital expenditures in post-conflict years. In many cases, donors helped to finance investment in light of limited domestic resources, although the emphasis was on project financing in light of lack of confidence in national budgetary systems. The subsequent mobilization of domestic revenue contributed to generate fiscal space and allowed to sustain increases in domestically financed capital expenditure over time. And while most countries did not lower military spending in the first five years after the most fragile period, they did so shortly after and shifted resources into health and education spending.

Table 6. Evolution of Fiscal Indicators (average)				
	Δ1:Change t0-t5	Δ2:Change t0-t10	Δ3:Change t0-t15	Δ4:Change t0-t20
Revenue Variables	*(% of domestic revenue unless noted otherwise)*			
Tax Revenue	3.2	2.1	2.2	4.3
Resource Revenue	2.7	6.6	5.7	n.a.
Taxes on International Trade	0.7	2.3	-0.3	-0.9
Taxes on Goods and Services	6.4	7.6	8.4	10.7
Income Tax	-5.6	5.1	8.7	18.2
Expenditure Variables	*(% of total expenditure unless noted otherwise)*			
Current Expenditure	-1.6	-1.8	-1.5	-1.2
Capital Expenditure	16.8	5.1	7.9	5.2
Domestically Financed Capital Ex	0.3	-0.2	7.8	6.0
Health Expenditure	-1.8	-0.2	1.0	3.2
Education Expenditure	-2.7	-0.9	1.4	1.8
Military Expenditure	0.0	-4.3	-6.3	-9.5
Expenditure Variables	Level in t0	Level in t5	Level in t10	Level in t15
	$US per capita			
Current Expenditure	56.9	40.0	38.7	65.6
Capital Expenditure	12.1	16.4	17.0	35.7
Domestically Financed Capital Ex	6.0	3.3	6.7	20.5
Health Expenditure	18.5	10.7	15.1	24.7
Education Expenditure	67.2	30.3	37.2	64.6
Military Expenditure	17.3	10.8	12.1	19.0

Sources: AFR department database, IMF; World Economic Outlook, IMF; Fiscal Affairs Department, IMF; World Development Indicators; authors'calculations.

Note: This table indicates the average pace of change in several institutional and political measures. For each country, we look at the change in the variable between the last year and the first year of each sub-period, e.g. $\Delta_1 = X_{t5} - X_{t0}$, and present the average across the seven countries.

Sequencing of fiscal reforms

Gupta et al. (2007) examine the challenges and experiences of post-conflict countries in rebuilding fiscal institutions. Their findings point to a three-step process that facilitates the strengthening of fiscal institutions over time: (1) creating a sound legal framework for fiscal management, (2) establishing a central fiscal authority that acts as a coordinating body for foreign assistance, and (3) designing appropriate tax policies while simultaneously introducing simple tax administration and expenditure management arrangements. It is noted, however, that the sequencing may vary from country to country depending on country-specific factors, notably their stage of development. In some countries, the process of strengthening fiscal institutions has been supported by substantial technical assistance.

The importance of tailoring reforms to the specifics of each country can be seen by contrasting the experiences of Rwanda and Mozambique. Prior to the onset of conflict, Rwanda had a higher annual per capita GDP than Mozambique (US$259 versus US$145) and stronger fiscal institutions. For this reason, Mozambique followed more closely the above steps. The authorities established a legal and regulatory framework over a period of four years (introduction of value-added tax, public financial management law, fiscal incentive code, income and corporate tax law) and then established a semiautonomous revenue authority. To overcome capacity constraints, the country successfully outsourced its customs administration to a private company. In contrast, before the conflict, Rwanda already had the basic legal framework and institutions. After the conflict, the government chose to

focus first on fiscal decentralization, which supported an inclusive peace and reconciliation process through the devolution of resources to local governments (Figure 6).

Figure 6. Fiscal Reforms' Sequencing in Mozambique and Rwanda

Source: authors' calculations.
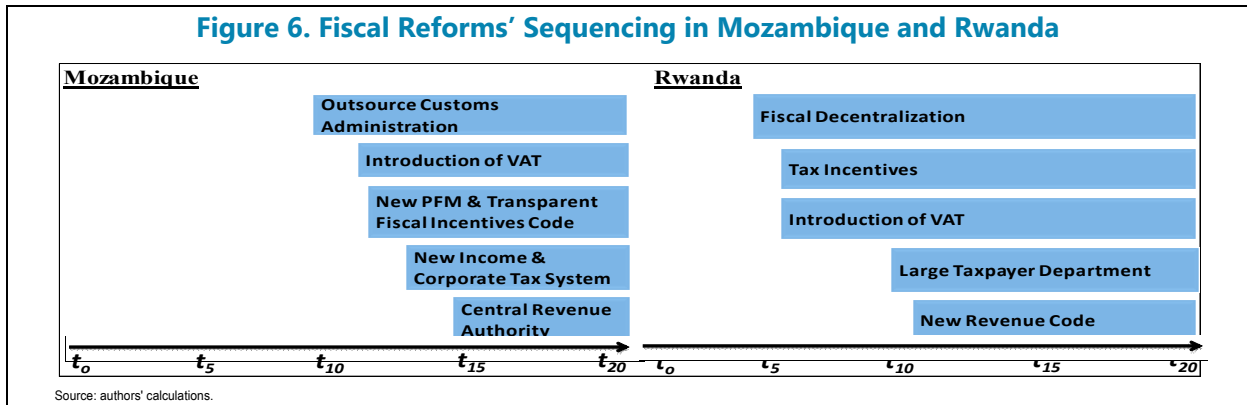
VI. CONCLUSIONS AND POLICY RECOMMENDATIONS

Fragile countries face multidimensional challenges associated with building resilience. Notwithstanding the inherent difficulties, some countries have managed to move away from fragility. Those newly resilient countries have usually created more inclusive political environments, implemented better and more consistent economic policies and built stronger economic institutions. At the center of this process and critical to a successful transition rests the development of sufficient and sustainable fiscal space, itself enabled by the development of strong fiscal institutions.

In this paper, we find that fiscal institutions and fiscal space, namely the capacity to raise tax revenue and contain current spending, as well as rein in military spending and, to some extent, boosting social expenditure, are significantly and fairly robustly associated with building resilience. Stronger fiscal institutions proxied either by an index of the quality of budget institutions or measures of government effectiveness and regulatory quality are positively and significantly associated with building resilience. In the case of resource-rich countries, those that do well are those that are able to develop strong institutions to manage the fiscal space from the resource wealth. Results are also consistent with literature findings that countries with better fiscal institutions have more favorable fiscal outcomes, in terms of greater fiscal space. In this regard, countries' ability to collect tax revenue appears to play an important role, as well as the capacity of the government to contain recurrent expenditure and boost domestically-financed capital spending.

The analysis also provides insights into the association between the composition of tax and expenditure and resilience. A higher share of taxes on income and profits tends to be associated with building resilience. Health and education expenditure, both in absolute terms and as a share of total expenditure, appear positively related to building resilience, and military expenditure negatively so, in line with findings of the literature on conflict. These results are robust to the estimation method (logit versus system GMM), sample composition (26 countries fragile in the 1990s and all sub-Saharan countries except South Sudan), and

definition of dependent variable (dichotomous measure of resilience based on one year where CPIA>3.2 and absence of conflict versu three consecutive years with CPIA>3.2 and absence of conflict, and continuous CPIA variable).

A closer look at the experience of seven sub-Saharan countries that managed to build resilience since the 1990s highlights the importance and potentially high returns of an early focus on building sound fiscal institutions that lead to stronger revenue-raising capacity and to the ability to carve out space for growth-enhancing investments in human and physical capital. Progress was faster in the initial years, supported by consensus to take necessary reforms to improve outcomes and the tapping of capacity that survived the crisis. Capital spending and military spending were high in the initial period, followed by a shift in the composition of spending toward health and education. In this process improving fiscal space and building stronger economic institutions was critical.

The international community can play an important role in fragile helping countries develop strong fiscal institutions through knowledge transfer and capacity building. Fiscal space can be expanded by the delivery of aid and debt relief. However, most of all, the analysis in this paper highlights the importance of home-grown leadership of the reform process, including efforts to enhance budget institutions, strengthen tax collection and allocate public spending to priority investment, including in health and education.

References

Acemoglu, Daron, Simon Johnson, and Jared Diamond, 2004, "Institutions as the Fundamental Cause of Long-Run Growth," *NBER Working Paper No. 10481* (Cambridge, MA: National Bureau of Economic Research).

Acemoglu, Daron, and James A. Robinson, 2000, "Why Did the West Extend Franchise? Democracy, Inequality and Growth in Historical Perspective," Quarterly Journal of Economics*,* Vol. 115, No. 4, pp. 1167–199.

Acosta-Ormaechea S., and J. Yoo, 2012, "Tax Composition and Economic Growth," IMF Working Paper 12/257 (Washington, D.C. : International Monetary Fund).

Andrimihaja, Noro Aina, Matthias Cinyabuguma, and Shantayanan Devarajan, 2011, "Avoiding the Fragility Trap in Africa," Policy Research Working Paper No. 5884 (Washington, D.C: The World Bank).

Arellano, Manuel, and Olympia Bover, 1995, "Another Look at the Instrumental Variable Estimation of Error-components Models," *Journal of Econometrics*, Vol. 68, No. 1, pp 29–51.

Arnold, Jens M., Bert Brys, Christopher Heady, Asa Johansson, Cyrille Schwellnus, and Laura Vartia, 2011, "Tax Policy for Economic Recovery and Growth," *Economic Journal*, Vol. 111, pp. 59–80.

Azam, Jean-Paul, and Alice Mesnard, 2003, "Civil War and the Social Contract," *Public Choice* Vol. 115, No. 3-4, pp. 455–75.

Azam, Jean-Paul, 2001, "The Redistributive State and Conflicts in Africa," *Journal of Peace Research,* Vol. 38, No. 4, pp. 429–44.

Berg, Andrew, Jonathan Ostry, and Charalambos Tsangarides, 2014, "Redistribution, Inequality and Growth"*,* IMF Staff Discussion Note 14/02 (Washington, D.C.: International Monetary Fund).

Bertocchi, Graziella, and Davide Guerzoni, 2010, "The Fragile Definition of State Fragility," IZA Discussion Paper No. 4817 (Modena: University of Modena).

Besley, Timothy, and Torsten Persson, 2014, "The Causes and Consequences of Development Clusters: State Capacity, Peace, and Income," *Annual Review of Economics*, Vol. 6, pp. 927–49.

_____, 2011, *Pillars of Prosperity, The Political Economics of Development Clusters* (Princeton: Princeton University Press).

_____, 2010, "State Capacity, Conflict, and Development," *Econometrica,* Vol. 78, No. 1, pp. 1–34.

_____, 2009, "The Origins of State Capacity: Property Rights, Taxation and Politics," *American Economic Review*, Vol. 99, No.4, pp. 1218–44.

Besley, Timothy, Ethan Ilzetzki, and Torsten Persson, 2013, "Weak States and Steady States: The Dynamics of Fiscal Capacity," *American Economic Journal*, Vol. 5, No.4, pp. 205–35.

Blundell, Richard, and Stephen Bond, 1998, "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models." *Journal of Econometrics,* Vol. 87, No. 1, pp. 115–143.

Bueno De Mesquita, Bruce, Alastair Smith, Randolph M. Siverson, and James D. Morrow, 2002, *The Logic of Political Survival* (Cambridge, MA: MIT Press).

Burgoon, Brian, 2006, "On Welfare and Terror: Social Welfare Policies and Political-Economic Roots of Terrorism," *Journal of Conflict Resolution,* Vol. 15, No. 2, pp.176–203.

Cevik, Serhan, and Mohammad Rahmati, 2013, "Breaking the Curse of Sisyphus: An Empirical Analysis of Post-Conflict Economic Transitions", IMF Working Paper 12/03 (Washington, D.C. : International Monetary Fund).

Chauvet, Lisa and Paul Collier, 2009, "Elections and Economic Policy in Developing Countries," *Economic Policy*, Vol. 24, No. 59, pp. 509–50.

Chauvet, Lisa, and Paul Collier, 2005, "Policy Turnarounds in Fragile States," CSAE

Working Paper (Oxford: Center for the Study of African Economies).

Chu, Ke-Young, Hamid Davoodi, and Sanjeev Gupta, 2000, "Income Distribution and Tax and Government Social Spending Policies in Developing Countries," IMF Working Paper 00/62 (Washington, D.C. : International Monetary Fund).

Cilliers, Jackie, and Timothy D. Sisk, 2013, "Assessing Long-Term State Fragility in Africa: Prospects for 26 'More Fragile' Countries," *ISS Monograph No. 188* (Pretoria: Institute for Security Studies).

Collier, Paul, and A. Hoeffler, 2004, "Grief and Grievance in Civil War", *Oxford Economic Papers*, Vol. 56, pp. 563–595.

Collier, Paul, and Anke Hoeffler, 2007, "Military Spending and the Risks of Coups d'Etat," CSAE Working Paper (Oxford: Center for the Study of African Economies).

Crivelli, Ernesto, and Sanjeev Gupta, 2014, "Resource Blessing, Revenue Curse? Domestic Revenue Effort in Resource-Rich Countries," *European Journal of Political Economy,* Vol.35, pp.88–101.

Dabla-Norris, Richard Allen Era, Luis-Felipe Zanna, Tej Prakash, Eteri Kvintradze, Victor Lledo, Irene Yackovlev, and Sophia Gollwitzer, 2010, "Budget Institutions and Fiscal Performance in Low-Income Countries," IMF Working Paper 10/80 (Washington, D.C. : International Monetary Fund).

David, Antonio C., Fabiano Rodriguez Bastos, and Marshall Mills, 2011, "Post-Conflict Recovery: Institutions, Aid, or Luck?" IMF Working Paper 11/149 (Washington, D.C. : International Monetary Fund).

Fritz, Verena, Edward Hedger, and Ana Paula Fialho Lopes, 2011, "Strengthening Public Financial Management in Post-Conflict Countries," *Economic Premise*, Poverty Reduction and Economic Management Network, Number 54 (Washington, D.C. : The World Bank).

Gollwitzer, Sophia, 2011, "Budget Institutions and Fiscal Performance in Africa," *Journal of African Economies,* Vol. 20, No. 1, pp. 111-152.

Gollwitzer Franke, Sophia, and Marc Quintyn, 2012, "Institutional Transformations, Polity and Economic Outcomes: Testing the North-Wallis-Weingast Doorsteps Framework," IMF Working Paper 12/87 (Washington, D.C. : International Monetary Fund).

Gollwitzer, Sophia, and Marc Quintyn, 2010, "The Effectiveness of Macroeconomic Commitment in Weak(er) Institutional Environments," IMF Working Paper 10/193 (Washington, D.C.: International Monetary Fund).

Gupta, Sanjeev, Emanuele Baldacci, Benedict J. Clements, and Erwin Tiongson, 2003, "What Sustains Fiscal Consolidations in Emerging Market Countries?" IMF Working Paper 03/224, (Washington, D.C. : International Monetary Fund).

Gupta, Sanjeev, Marijn Verhoeven, and Erwin Tiongson, 2001, "Public Spending on Health Care and the Poor," IMF Working Paper, (Washington, D.C. : International Monetary Fund).

Gupta, Sanjeev, and Sami Ylaoutinen, 2014, "Budget Institutions in Low-Income Countries: Lessons from G-20," IMF Working Paper 14/164, (Washington, D.C. : International Monetary Fund).

Gupta, Sanjeev, Shamsuddin Tareq, Benedict Clements, Alex Segura-Ubiergo, and Rina Bhattacharya, June 2007, "Postconflict Countries: Strategy for Rebuilding Fiscal Institutions," (United Nations University: World Institute for Development Economics Research).

Hegre, Havard, Tanja Ellingsen, Scott Gates, and Nils Petters Gleditsch, 2001, "Towards a Democratic Civil Peace? Democracy, Political Change, and Civil War, 1816–1992," *American Political Science Review,* Vol. 95, Nr. 1, pp. 16–33.

Heller, P. S., 2005. "Understanding Fiscal Space." IMF Policy Discussion Paper 05/4 (Washington, D.C., International Monetary Fund).

International Monetary Fund, 2015, *Building Resilience in Sub-Saharan Africa's Fragile States*, African Department Paper 15/05, (Washington, D.C.: International Monetary Fund).

_____ 2014a, "Fiscal Policy and Income Inequality," IMF Policy Paper (Washington, D.C. : International Monetary Fund).

_____, 2014b, "Building Resilience in Fragile States in Sub-Saharan Africa," *Sub-Saharan Africa Regional Economic Outlook,* Chapter 2, (Washington, D.C. : International Monetary Fund).

_____, 2014c, "Is It Time for an Infrastructure Push? The Macroeconomic Effects of Public Investment," *World Economic Outlook,* Chapter 3 (Washington, D.C. : International Monetary Fund).

_____, 2011, *Regional Economic Outlook: Sub-Saharan Africa,* (Washington, D.C. : International Monetary Fund)

_____, 2003. *"Republic of Mozambique—Ex-post Assessment of Mozambique's Performance Under Fund-Supported Programs", IMF Country Report 04/53* (Washington, D.C. : International Monetary Fund).

_____, 2000. *"Rwanda—Recent Economic Developments" IMF Country Report 00/04* (Washington, D.C. : International Monetary Fund).

International Monetary Fund, 1988. *"Rwanda—Recent Economic Developments"* (Washington, D. C. : International Monetary Fund.

Miguel, Edward, Shanker Satyanath, and Ernest Sergenti, 2004, "Economic Shocks and Civil Conflict: An Instrumental Variables Approach," *Journal of Political Economy*, Vol. 112, No. 4, pp. 725–53.

Monchuk, Victoria, 2014, "Reducing Poverty and Investing in People, the New Role of Safety Nets in Africa", (Washington D.C.: The World Bank Group)

Murdoch, James C.; and Todd Sandler, 2002, "Economic Growth, Civil Wars, and Spatial Spillovers," *Journal of Conflict Resolution* Vol. 46, No. 1, pp. 91–110.

North, Douglass, John Joseph Wallis, and Barry R. Weingast, 2009, *Violence and Social Orders* (Cambridge: Cambridge University Press).

OECD, 2013"Fragile States 2013: Resource Flows and Trends in a Shifting World" (Paris: Organisation for Economic Co-operation and Development).

Pattillo, Catherine, Sanjev Gupta, and Kevin Carey, 2005, "Sustaining Growth Accelerations and Pro-Poor Growth in Africa," IMF Working Paper 05/195 (Washington, D.C.: International Monetary Fund).

Pritchett, Lant; and Frauke de Veijer, 2011, "Fragile States: Stuck in a Capability Trap?" World Bank Development Report 2011, Background Paper, (Washington, D.C.: The World Bank Group).

Rodrik, Dani, 2000. "Institutions for High-quality Growth: What They Are and How to Acquire Them." *Studies in Comparative International Development,* Vol. 35, No. 3, pp. 3-31.

Roodman, David, 2009, "Practitioner's Corner: A Note on the Theme of Too Many Instruments," *Oxford Bulletin of Economics and Statistics*, Vol. 71, No. 1, pp. 135–58.

_____, 2006, "How to Do xtabond2: An Introduction to 'Difference' and 'System' GMM in Stata," CGD Working Paper No. 103, (Washington, D.C. : Center for Global Development).

Sachs, Jeffrey D. and Andrew M. Warner, 2001, "The Curse of Natural Resources," European Economic Review, Vol. 45, No. 4-6, pp. 827-838.

Siebrits, Krige, and Estian Calitz, 2007, "The Legacy and Challenge of Fiscal Policy in Sub-Saharan Africa," *South African Journal of Economics,* Vol. 75, No. 2, pp. 221-235.

Singh, Raju Jan, Cristina Bodea, and Masaaki Higashijima, 2014, "Oil and Civil Conflict: Can Public Spending Have a Mitigation Effect?" *Policy Research Working Paper WPS7100*, (Washington, D.C. : The World Bank Group).

Skinner, Jonathan. 1987, "Taxation and Output Growth: Evidence from African Countries," *NBER Working Paper No. 2335* (Cambridge, MA: National Bureau of Economic Research).

Solt, Frederik, The Standardized World Income Inequality Database (SWIID), version 5.0, October 2014.

Taydas, Zeynep, and Dursun Peksen, 2012, "Can States Buy Peace? Social Welfare Spending and Civil Conflicts," *Journal of Peace Research*, Vol. 49, No. 2, pp. 273-287.

Thyne, Clayton, 2006, "ABC's, 123's and the Golden Rule: The Pacifying Effect of Education on Civil War, 1980-1999," *International Studies Quarterly*, Vol. 50, No.4, pp. 733-754.

Wantchekon, Leonard; and Zvika Neeman, 2002, "A Theory of Post Civil War Democratization," *Journal of Theoretical Politics* Vol. 14, No. 4, pp. 439–64.

World Bank (Independent Evaluation Group), 2009, "The World Bank's Country Policy and Institutional Assessment: An Evaluation," (Washington, D.C. : The World Bank Group).

Appendix

Appendix Table 1. Variables and Data Sources		
Variable Name (expected sign)	*Definition*	*Data Source*
Dependent Variables		
CPIA	Rating of a country's policy framework and institutions	World Bank, Country Policy and Institutional Assessment
Resilience	Dummy for resilient countries: 1 if CPIA > 3.2 and there are no significant conflicts, 0 otherwise.	World Bank, Country Policy and Institutional Assessment
Explanatory Variables		
Resource Rich	Dummy variable: 1 if resource rents exceed 10 percent of GDP and 0 otherwise.	IMF, Regional Economic Outlook
Conflict	Dummy variable: 1 if conflict is significant and 0 otherwise. A conflict is significant if there are more than 1,000 deaths	Uppsala Political Conflict Database
Growth Real GDP per Capita (+)	Growth of Real GDP per capita; constant million 2005 US$	World Penn Tables
Growth Real GDP per capita, OECD (+)	Growth of Real GDP per capita for OECD countries.	IMF, World Economic Outlook database
High Inflation (-)	Dummy variable: 1 if inflation > 20 percent and 0 otherwise	IMF, World Economic Outlook database
Terms of Trade (+)	Net barter terms of trade index for goods and services (2000=100)	World Bank, World Development Indicators
Infant Mortality (-)	Mortality rate, infant (per 1,000 live births)	World Bank, World Development Indicators
Executive Constraints (+)	Institutionalized constraints on the decision-making powers of chief executives: scale of one to seven	Polity IV Project; Marshall, Gurr, Jaggers 2017
Exchange Rate Regime (+)	Dummy: 1 if hard peg, 2 if soft peg, and 3 if floating	IMF, Monetary and Capital Markets Department and AREEAR database
Private Investment (+)	Private gross fixed capital formation; percent of GDP	IMF, World Economic Outlook database
Inequality Index (-)	Comparable Gini indices of gross and net income inequality for 174 countries.	Frederick Solt (University of Iowa)
Budget Institutions (+)	Budget institutions index	Gollwitzer 2010
High Overall Fiscal Deficit	Dummy variable: 1 if overall deficit excluding grants > median value.	IMF, World Economic Outlook database
Regulatory Quality (+)	Regulatory quality index; higher values correspond to better outcomes (index)	World Bank Governance Indicators
Government Effectiveness (+)	Government effectiveness; higher index values correspond to better outcomes (index)	World Bank Governance Indicators
Development Aid (+)	Total official development assistance, net; percent of GDP	United States Conference on Trade and Development
External Debt (-)	External Debt in percent of GDP	IMF, African Department database
Tax Revenue (+)	Tax revenue; in percent of GDP or domestic revenue	IMF, African Department database
Current Expenditure (-)	Current expenditure excluding interest payments; in percent of GDP or total expenditure	IMF, African Department database
Domestically-Financed Capital Expenditure (+)	Domestically-financed capital expenditure; in percent of GDP or total expenditure	IMF, African Department database
Structural Adjustment Facility (+)	Structural adjustment facility, IMF program	IMF, Strategy, Policy, and Review Department
Military Expenditure (-)	Military expenditure; per capita, percent of GDP, or percent of total expenditure	World Bank, World Development Indicators
Education Expenditure (+)	Education expenditure; per capita, percent of GDP, or percent of total expenditure	IMF, Fiscal Affairs Department
Health Expenditure (from WHO) (+)	Total health expenditure in percent of GDP or total expenditure, or per capita at average exchange rate	World Health Organization
Taxes on Goods and Services (+)	Taxes on goods and services; percent of GDP or domestic revenue	IMF, African Department database
Taxes on Income, Profits, and Capital Gains (+)	Taxes on income, profits, and capital gains; percent of GDP or domestic revenue	IMF, African Department database
Taxes on International Trade (+)	Taxes on international trade; percent of GDP or domestic revenue	IMF, African Department database

Appendix Table 2. Comparing Sample Means between 1990-2000 and 2001-13

Variables	SSA		Fragile		Fragile Res. Rich		Fragile Res. Poor		Resilient	
	1990-2000	2001-13	1990-2000	2001-13	1990-2000	2001-13	1990-2000	2001-13	1990-2000	2001-13
CPIA	3.28	3.18	3.07	2.84	2.79	2.88	3.29	2.81	3.20	3.44
Conflict	0.23	0.17	0.27	0.21	0.43	0.27	0.13	0.17	0.51	0.43
Real GDP per Capita	0.38	2.70	-1.40	1.73	-2.37	2.74	-0.62	0.93	0.78	4.13
High Inflation	0.27	0.07	0.36	0.11	0.44	0.14	0.31	0.08	0.29	0.03
Terms of Trade	104.16	111.52	103.92	106.25	88.57	129.44	112.69	89.38	108.73	127.35
Infant Mortality	90.11	72.01	103.66	85.31	117.68	95.85	92.18	76.69	111.75	77.90
Executive Constraints	3.27	4.18	2.75	3.63	1.98	3.10	3.38	4.06	3.22	4.10
Exchange Rate Regime	2.35	2.38	2.29	2.31	2.41	2.42	2.21	2.24	2.56	2.48
Private Investment	14.88	14.87	11.27	11.80	13.74	11.80	9.30	11.81	9.65	14.14
Inequality Index	46.87	44.74	46.58	43.95	46.24	44.89	46.77	43.37	41.25	41.82
Budget Institutions	0.51	0.51	0.47	0.47	0.48	0.48	0.47	0.47	0.54	0.54
(Fiscal Balance/GDP)	-13.06	-5.79	-9.63	-7.59	-4.78	-2.37	-11.76	-11.64	-7.90	-6.35
Regulatory Quality	-0.64	-0.66	-0.99	-1.06	-1.16	-1.05	-0.86	-1.07	-0.72	-0.62
Government Effectiveness	-0.78	-0.82	-0.96	-1.06	-0.99	-1.01	-0.94	-1.11	-0.87	-0.67
(Development Aid/GDP)	13.17	11.45	15.31	15.85	12.66	16.48	17.27	15.38	15.53	12.97
(Ext. Debt/GDP)	87.94	55.28	111.97	75.69	117.81	69.07	107.85	79.90	93.54	43.85
(Tax Revenue/GDP)	14.51	16.23	12.02	13.52	13.81	14.81	11.10	12.52	9.31	12.83
(Tax Revenue/Dom. Rev.)	62.95	66.83	61.89	62.06	63.65	66.10	60.84	58.92	54.03	60.67
(Current Exp./GDP)[1]	14.28	15.63	15.34	15.36	10.87	14.61	18.83	15.92	10.68	11.52
(Current Exp./Total Exp.)[1]	55.47	60.64	56.55	61.59	55.83	62.97	57.15	60.43	52.77	57.72
(Dom. Fin. Capital Exp./GDP)	9.92	3.99	2.50	2.87	1.50	4.04	2.95	1.98	1.84	3.75
(Dom. Fin. Capital Exp. /Total Exp.)	12.95	16.13	9.08	11.85	6.77	15.79	10.29	8.50	10.89	19.88
Struct. Adjustment Facility	0.43	0.53	0.41	0.51	0.35	0.55	0.46	0.48	0.62	0.73
(Military Exp./GDP)	2.89	1.96	4.50	2.68	4.05	2.27	4.81	3.15	2.39	1.60
(Military Exp./Total Exp.)	13.23	8.00	14.99	10.71	16.23	10.08	14.29	11.43	10.54	8.24
Military Exp. per capita	2.36	2.51	1.92	2.40	1.93	2.88	1.91	1.85	2.39	0.90
(Education Exp./Total Exp.)	5.92	15.65	12.10	14.23	11.59	11.97	12.35	15.44	11.05	14.95
Education Exp. per capita	92.20	4.69	4.53	4.58	4.56	4.61	4.52	4.56	4.25	4.80
(Total Health Exp./Total Exp.)[2]	30.69	27.22	38.28	31.07	56.44	37.76	24.16	25.13	30.24	35.04
(Total Health Exp. Per capita)[2]	5.32	6.02	5.81	6.38	6.45	6.87	5.33	5.99	5.00	6.53
(Tax on GS/Dom. Rev.)	22.04	23.12	21.74	19.39	24.14	16.02	20.13	22.01	23.50	25.32
(Tax on Profits/Dom. Rev.)	16.82	23.97	16.87	22.87	18.41	29.49	15.96	17.87	12.73	20.67
(Tax on Int'l Trade/Dom. Rev.)	21.09	16.25	22.12	17.24	14.62	17.33	26.19	17.17	16.21	12.60

Sources: See Table 1. Number of countries in each group: SSA (44), Fragile (26), Fragile Resource Rich (8), Fragile Resource Poor (11), and Resilient (7).
[1] Current expenditure excluding interest payments.
[2] Data from World Health Organization.

Appendix Table 3. Difference between Sample Averages: Resilient vs. Fragile and Resource Rich vs. Resource Poor

Variable	Resilient	Fragile	Significance Level	Fragile		Significance Level
				Resource Rich	Resource Poor	
CPIA	3.332	2.942	***	2.835	3.021	***
Conflict	0.464	0.238		0.344	0.152	***
Growth Real GDP per capita	2.453	0.167		0.183	0.154	
High Inflation	0.149	0.217	*	0.266	0.180	**
Terms of Trade	118.163	105.147		111.624	100.937	***
Infant Mortality	94.824	94.483	***	106.767	84.433	***
Executive Constraints	3.677	3.213	***	2.570	3.740	***
Exchange Rate Regime	2.519	2.303		2.416	2.222	***
(Private Investment/GDP)	12.081	11.572	***	12.674	10.760	**
Inequality Index	41.543	45.217	***	45.515	45.045	
Budget Institutions	0.535	0.472	***	0.476	0.468	
(Fiscal Balance/GDP)	-6.906	-8.244	***	-2.963	-11.684	***
Fiscal Rule	0.490	0.552		0.528	0.567	
Regulatory Quality	-0.644	-1.047	***	-1.070	-1.027	
Government Effectiveness	-0.709	-1.043		-1.002	-1.075	*
(Development Aid/GDP)	14.247	15.580	***	14.571	16.321	
(Debt/GDP)	66.625	91.757		91.405	91.991	
(Tax Revenue/GDP)	11.735	13.040	***	14.542	12.019	***
(Tax Rev./Dom. Rev.)	58.823	62.008	***	65.498	59.493	**
(Current Exp./GDP)	12.523	17.755		17.376	18.040	
(Current Exp./Total Exp.)	64.809	68.723	***	73.024	65.350	***
(Dom. Fin. Capital Exp./GDP)	3.032	2.733		3.285	2.384	**
(Dom Fin. Capital Exp./Total Exp.)	16.520	10.847	**	13.103	9.232	***
Struct. Adjustment Facility	0.679	0.467	***	0.458	0.473	
FAD Technical Assistance	270.593	204.988		242.726	173.859	**
(Military Exp./GDP)	2.001	3.544	*	2.998	4.030	
(Military Exp./Total Exp.)	9.388	12.531		12.131	12.871	
Military Exp. per capita (log)	1.640	2.175	***	2.513	1.885	***
(Education Exp./GDP)	2.593	3.100	***	2.771	3.260	**
(Education Exp./Total Exp.)	13.040	13.095	***	11.773	13.770	*
Education Exp. per capita (log)	4.527	4.550		4.579	4.535	
(Health Exp./GDP)	1.092	1.882	***	1.158	2.396	***
(Health Exp./Total Exp.)	5.722	7.851	***	5.817	9.448	***
Health Exp. per capita (log)	4.516	4.498		4.484	4.508	
(Tax on GS/GDP)[2]	5.017	3.827	***	3.156	4.305	***
(Tax on GS/Dom. Rev.)	24.816	19.981	***	17.927	21.516	***
(Tax on Profits/GDP)[1]	3.770	4.948	***	6.943	3.602	***
(Tax on Profits/Dom. Rev.)	18.468	21.188	***	26.702	17.297	***
(Tax on Int'l Trade/GDP)	2.533	3.356	***	2.767	3.773	***
(Tax on Int'l Trade/Dom. Rev.)	13.602	18.572	***	16.690	19.871	**
(Exp. on GS/GDP)[2]	4.623	5.396	**	5.996	5.019	*
(Exp. on GS/Total Exp.)	23.412	20.668	***	24.054	18.254	***
(Exp. on Wages/GDP)	4.752	5.961		5.767	6.165	
(Exp. on Wages/Total Exp.)	23.707	26.676		25.819	27.678	*
(Capital Exp./Total Exp.)	35.191	31.277	***	26.976	34.650	***

(***) indicates the statistical significance at the 1 percent level, (**) at the 5 percent level, and (*) at the 10 percent level.

[1] Taxes on income, profits, and capital gains.

2 Expenditure and taxes on goods and services

Appendix Table 4. Panel Random Effects Logit Regression: Fiscal Institutions, Fiscal Space, and Resilience, Taking 2 Lags of Explanatory Variables (1990-2013)

VARIABLES	1	2	3	4	5	6	7	8
Resilience (t-2)	1.492***	1.813***	1.255***	1.182**	1.909***	0.262	1.028*	1.610**
	(0.421)	(0.546)	(0.451)	(0.500)	(0.469)	(0.963)	(0.613)	(0.750)
Growth Real GDP per capita	0.025	0.015	0.024	0.025	0.008	0.114	0.019	0.083*
	(0.026)	(0.032)	(0.026)	(0.031)	(0.027)	(0.076)	(0.032)	(0.044)
High Inflation	0.415	0.169	0.573	-0.208	0.758	0.104	0.262	1.015
	(0.533)	(0.667)	(0.544)	(0.663)	(0.682)	(1.596)	(0.934)	(1.095)
Terms of Trade	0.012**	0.010	0.012**	0.019**	0.009	-0.023	0.014	0.008
	(0.006)	(0.007)	(0.006)	(0.007)	(0.006)	(0.022)	(0.009)	(0.009)
Terms of Trade*RR	-0.009	-0.008	-0.006	-0.008	0.003	0.065*	0.005	-0.045*
	(0.007)	(0.008)	(0.007)	(0.008)	(0.010)	(0.038)	(0.015)	(0.025)
Executive Constraints	0.333***	0.465***	0.315***	0.552***	0.378***	0.770**	0.688***	0.543**
	(0.115)	(0.149)	(0.118)	(0.170)	(0.122)	(0.370)	(0.217)	(0.222)
Exchange Rate Regime	0.342	0.755	0.462	0.561	0.243	1.979	1.126*	1.343*
	(0.487)	(0.571)	(0.507)	(0.572)	(0.527)	(1.231)	(0.650)	(0.735)
(Private Investment/GDP)	0.057**	0.091**	0.057**	0.106***	0.048*	0.189**	0.098***	0.103**
	(0.024)	(0.037)	(0.025)	(0.034)	(0.026)	(0.084)	(0.036)	(0.040)
Inequality Index		0.016						
		(0.048)						
Infant Mortality			-0.029*					
			(0.017)					
High Fiscal Deficit				-0.722				
				(0.556)				
Budget Institutions					7.198**			
					(3.249)			
Budget Institutions*RR					-3.675			
					(2.475)			
Regulatory Quality						4.489**		
						(2.275)		
Government Effectiveness						3.396		
						(2.152)		
Regulatory Quality*RR						11.685**		
						(4.831)		
Government Effectiveness*RR						-1.907		
						(3.093)		
(Development Aid/GDP)							0.013	0.017
							(0.034)	(0.039)
(Tax Revenue/GDP)							0.273*	0.219
							(0.142)	(0.163)
(Current Expenditure/GDP)[1]							-0.117	-0.230*
							(0.092)	(0.118)
(Dom. Fin. Capital Exp./GDP)							0.012	-0.012
							(0.052)	(0.069)
(Tax Revenue/GDP)*RR							-0.213	0.205
							(0.145)	(0.215)
Medium-term IMF Supported Program								1.090
								(0.921)
Constant	1.150**	1.177*	1.393***	1.493***	0.599	1.580*	1.514***	1.082*
	(0.481)	(0.627)	(0.506)	(0.501)	(0.591)	(0.933)	(0.550)	(0.656)
Observations	446	304	446	376	367	288	343	268
Number of countries	23	23	23	23	19	22	23	22

Source: Authors' calculations. The dependent variable is an indicator of resilience, which is approximated by a time-varying indicator that takes a value of 1 when the CPIA score is above 3.2 and there are no significant conflict, and 0 otherwise. A conflict is significant if there are more than 1,000 deaths. RR: Resource-rich countries. Standard errors in parentheses. (***) indicates the statistical significance at the 1 percent level, (**) at the 5 percent level, and (*) at the 10 percent level.

[1] Current expenditure excluding interest payments.

Appendix Table 5. Panel Random Effects Logit Regression: Composition of Spending and Taxation and Resilience, Taking 2 Lags of Explanatory Variables (1990-2013)

VARIABLES	1	2	3	4	5	6
(Tax Revenue/GDP)	0.340**	0.090				
	(0.158)	(0.328)				
(Tax Revenue/GDP)*RR	-0.260	-0.355				
	(0.169)	(0.374)				
Education Exp. per capita		0.023				
		(0.021)				
Education Exp. per capita*RR		-0.099**				
		(0.047)				
Total Health Exp. per capita[1]		-0.113				
		(0.112)				
Total Health Exp. per capita*RR[1]		0.198*				
		(0.111)				
Military Exp. per capita	-0.181					
	(0.124)					
Military Exp. per capita*RR	-0.122					
	(0.214)					
(Tax Revenue/Domestic Rev.)			0.030	0.217**	0.058**	
			(0.026)	(0.106)	(0.027)	
(Military Exp./Total Exp.)			-0.095			
			(0.065)			
(Tax Revenue/Dom Rev.)*RR			0.015	-0.145	-0.006	
			(0.029)	(0.094)	(0.025)	
(Military Exp./Total Exp.)*RR			-0.335			
			(0.219)			
(Education Exp./Total Exp.)				0.423		
				(0.272)		
(Education Exp./Total Exp.)*RR				-0.562		
				(0.557)		
(Total Health Exp./Total Exp.)[1]				-0.236*		
				(0.138)		
(Total Health Exp./Total Exp.)*RR[1]				0.410*		
				(0.213)		
(Dom. Fin. Capital Exp./Total Exp.)					0.003	-0.005
					(0.012)	(0.012)
(Current Exp./Total Exp.)2					-0.033	-0.060*
					(0.029)	(0.036)
(Taxes on G and S/Dom. Rev.)						-0.005
						(0.004)
(Taxes on Profits/Dom. Rev.)						0.017**
						(0.008)
(Taxes on Int'l Trade/Dom. Rev.)						-0.007*
						(0.004)
(Taxes on G and S/Dom. Rev.)*RR						0.001
						(0.007)
(Taxes on Profits/Dom. Rev.)*RR						-0.012
						(0.010)
(Taxes on Int'l Trade/Dom. Rev.)*RR						0.005
						(0.006)
Constant	1.693***	3.185***	1.450**	3.842***	1.605***	2.134***
	(0.634)	(0.766)	(0.592)	(0.975)	(0.556)	(0.572)
Observations	282	215	278	211	343	323
Number of countries	21	19	22	19	23	23

Source: Authors' calculations. The dependent variable is an indicator of resilience, which is approximated by a time-varying indicator that takes a value of 1 when the CPIA score is above 3.2 and there are no significant conflict, and 0 otherwise. A conflict is significant if there are more than 1,000 deaths. Control variables (not shown) include: resilient (lagged), growth real GDP per capita, inflation, terms of trade, terms of trade interacting with resource rich, executive constraints, exchange rate regime, and private investment (percent of GDP). Standard errors in parentheses. (***) indicates statistical significance at the 1 percent level, (**) at the 5 percent level, and (*) at the 10 percent level.

[1] Data from World Health Organization.

[2] Current expenditure minus interest payments.

Appendix Table 6. Panel Random Effects Logit Regression: Fiscal Institutions, Fiscal Space, and Resilience, Alternative Definition of Dependent Variable (1990-2013)

VARIABLES	1	2	3	4	5	6	7	8
Resilience (t-1)	3.914***	4.871***	4.372***	4.819***	5.217***	6.929***	4.807***	4.978***
	(0.496)	(0.705)	(0.544)	(0.630)	(0.578)	(1.584)	(0.810)	(0.764)
Growth Real GDP per capita	0.030	0.033	0.072**	0.058	0.041	-0.056	0.049	0.134**
	(0.029)	(0.042)	(0.036)	(0.039)	(0.034)	(0.082)	(0.044)	(0.056)
High Inflation	0.072	0.231	0.508	-0.392	0.681	-0.111	-0.494	0.489
	(0.603)	(0.765)	(0.667)	(0.710)	(0.670)	(1.464)	(1.173)	(1.283)
Terms of Trade	0.009	0.007	0.005	0.006	-0.002	-0.011	0.000	0.001
	(0.006)	(0.007)	(0.006)	(0.006)	(0.006)	(0.018)	(0.008)	(0.008)
Terms of Trade*RR	-0.014**	-0.006	-0.009	-0.010*	0.008	0.028	-0.005	-0.020
	(0.006)	(0.006)	(0.006)	(0.005)	(0.009)	(0.023)	(0.013)	(0.018)
Executive Constraints	0.159	0.295**	0.123	0.207	0.241*	0.617**	0.229	0.300
	(0.127)	(0.150)	(0.141)	(0.155)	(0.132)	(0.282)	(0.172)	(0.192)
Exchange Rate Regime	0.423	0.898	0.662	0.336	0.343	0.214	0.540	0.261
	(0.518)	(0.640)	(0.582)	(0.488)	(0.468)	(0.870)	(0.621)	(0.621)
(Private Investment/GDP)	0.039	0.031	0.024	0.036	0.015	0.043	0.023	0.014
	(0.026)	(0.039)	(0.027)	(0.029)	(0.026)	(0.057)	(0.041)	(0.035)
Inequality Index		-0.026						
		(0.046)						
Infant Mortality			-0.039*					
			(0.023)					
High Fiscal Deficit				-0.128				
				(0.541)				
Budget Institutions					3.675**			
					(1.846)			
Budget Institutions*RR					-3.618*			
					(2.030)			
Regulatory Quality						2.347		
						(1.681)		
Government Effectiveness						2.944		
						(2.106)		
Regulatory Quality*RR						5.091		
						(3.242)		
Government Effectiveness*RR						-2.166		
						(2.424)		
(Development Aid/GDP)							0.017	-0.022
							(0.028)	(0.033)
(Tax Revenue/GDP)							0.255**	0.326**
							(0.128)	(0.148)
(Current Expenditure/GDP)[1]							-0.206*	-0.213*
							(0.109)	(0.118)
(Dom. Fin. Capital Exp./GDP)							0.103**	0.104*
							(0.051)	(0.056)
(Tax Revenue/GDP)*RR							-0.110	0.010
							(0.120)	(0.171)
Medium-term IMF Supported Program								2.193**
								(1.087)
Constant	0.413	-0.539	0.544	-0.971	-13.025	-13.066	-1.100	-10.234
	(0.662)	(1.933)	(0.895)	(1.759)	(42.184)	(40.476)	(2.944)	(46.659)
Observations	447	304	447	376	368	287	343	268
Number of countries	23	23	23	23	19	22	23	22

Source: Authors' calculations. The dependent variable is an indicator of resilience, which is approximated by a time-varying indicator that takes a value of 1 when the CPIA score is above 3.2 in the current and past two years and there have been no significant conflicts in each of these years, and 0 otherwise. A conflict is significant if there are more than 1,000 deaths. RR: Resource-rich countries. Standard errors in parentheses. (***) indicates the statistical significance at the 1 percent level, (**) at the 5 percent level, and (*) at the 10 percent level.

[1] Current expenditure excluding interest payments.

Appendix Table 7. Panel Random Effects Logit Regression: Composition of Spending and Taxation and Resilience, Alternative Definition of Dependent Variable (1990-2013)

VARIABLES	1	2	3	4	5	6
(Tax Revenue/GDP)	0.272**	0.085				
	(0.124)	(0.200)				
(Tax Revenue/GDP)*RR	-0.194	-0.257				
	(0.128)	(0.295)				
Education Exp. per capita		-0.011				
		(0.015)				
Education Exp. per capita*RR		-0.006				
		(0.023)				
Total Health Exp. per capita[1]		-0.002				
		(0.078)				
Total Health Exp. per capita*RR[1]		0.048				
		(0.086)				
Military Exp. per capita	-0.270**					
	(0.119)					
Military Exp. per capita*RR	0.113					
	(0.145)					
(Tax Revenue/Domestic Rev.)			0.007	0.156**	0.055**	
			(0.029)	(0.064)	(0.028)	
(Military Exp./Total Exp.)			-0.228			
			(0.171)			
(Tax Revenue/Dom Rev.)*RR			0.003	-0.094	0.009	
			(0.028)	(0.064)	(0.022)	
(Military Exp./Total Exp.)*RR			-0.362			
			(0.349)			
(Development Aid/GDP)						
(Education Exp./Total Exp.)				-0.167		
				(0.116)		
(Education Exp./Total Exp.)*RR				0.651		
				(0.429)		
(Total Health Exp./Total Exp.)[1]				-0.005		
				(0.061)		
(Total Health Exp./Total Exp.)*RR[1]				-0.027		
				(0.092)		
(Dom. Fin. Capital Exp./Total Exp.)					0.032***	0.026**
					(0.012)	(0.011)
(Current Exp./Total Exp.)[2]					-0.001	-0.018
					(0.025)	(0.030)
(Taxes on G and S/Dom. Rev.)						-0.004
						(0.003)
(Taxes on Profits/Dom. Rev.)						0.005
						(0.006)
(Taxes on Int'l Trade/Dom. Rev.)						-0.003
						(0.003)
(Taxes on G and S/Dom. Rev.)*RR						-0.001
						(0.006)
(Taxes on Profits/Dom. Rev.)*RR						0.000
						(0.008)
(Taxes on Int'l Trade/Dom. Rev.)*RR						0.001
						(0.004)
Constant	-1.095	-11.774	0.195	-13.155	-0.852	-0.257
	(2.169)	(1,099.116)	(2.695)	(41.451)	(1.596)	(1.330)
Observations	282	215	278	211	343	323
Number of countries	21	19	22	19	23	23

Source: Authors' calculations. The dependent variable is an indicator of resilience, which is approximated by a time-varying indicator that takes a value of 1 when the CPIA score is above 3.2 in the current and past two years and there have been no significant conflicts in each of these years, and 0 otherwise. A conflict is significant if there are more than 1,000 deaths. Control variables (not shown) include: resilient (lagged), growth real GDP per capita, inflation, terms of trade, terms of trade interacting with resource rich, executive constraints, exchange rate regime, and private investment (percent of GDP).Standard errors in parentheses. (***) indicates the statistical significance at the 1 percent level, (**) at the 5 percent level, and (*) at the 10 percent level.

[1] Data from World Health Organization.

[2] Current expenditure minus interest payments.

Appendix Table 8. Resilient Countries: Changes in Selected Variables

Macroeconomic Variables	Δ1: Change t0-t5	Δ2: Change t0-t10	Δ3: Change t0-t15	Δ4: Change t0-t20
	(% of GDP unless noted otherwise)			
Real GDP Growth (%)	14	15	14	15
Real GDP Per Capita (USD, 2005)	73	202	354	435
Inflation (%)	-21.4	-25.4	-26.2	-26.9
Trade Openness	9.0	13.1	17.2	18.4
Terms of Trade (Index, 2010=100)	-36.0	-19.8	-7.5	-105.6
Development Aid	0.4	3.6	-2.3	8.2
Debt	2.6	-19.8	-53.7	-59.5
Public Investment	2.8	3.3	4.3	6.3
Private Investment	4.2	4.3	8.2	5.6

CPIA Variables [1]	Δ1: Change t0-t5	Δ2: Change t0-t10	Δ3: Change t0-t15	Δ4: Change t0-t20
Overall CPIA	1.48	1.42	1.62	1.68
Macroeconomic CPIA	1.23	0.75	1.01	1.13
Structural CPIA	0.76	0.38	0.46	0.49
Social Inclusion CPIA	0.27	0.39	0.43	0.50
Public Sector CPIA	-0.11	0.28	0.23	0.23

[1] The index ranges from 0 to 6, where higher index values correspond to better outcomes.

Social Variables	Δ1: Change t0-t5	Δ2: Change t0-t10	Δ3: Change t0-t15	Δ4: Change t0-t20
Infant Mortality (per 1,000 live births)	-12	-29	-45	-55
Infant Mortality under 5 (per 1,000 live l	-31	-65	-96	-115
Primary School Enrollment (% gross)	-3.1	11.8	28.6	36.7
Primary Education (pupils, growth)	6.5	4.5	3.2	1.0

Sources: World Economic Outlook (IMF), Penn Tables, World Development Indicators (WB), Governance Indicators (WB), and UNCTADstat.