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Abstract: The incidence of civil war in Sub-Saharan Africa since the turn of the century is less than half of what it was on average in the last quarter of the 20th century. This paper shows that the aid boom triggered by 9/11 played a key role in achieving purposefully this result using panel data for 46 African countries over four decades. The duly instrumented estimated linear probability model predicts that the observed fall in the probability of a civil war occurring in a typical Sub-Saharan African country/year could have been achieved by increasing foreign aid by 25% on average, had the higher incidence of natural disasters and the commodity price shocks of the 2000s not stacked the odds against peace. However, the small rise in minor conflicts mitigates this achievement to some extent.

Key Words: Foreign Aid – Africa – Civil Wars. **JEL Numbers:** F35 – N47 – P45.

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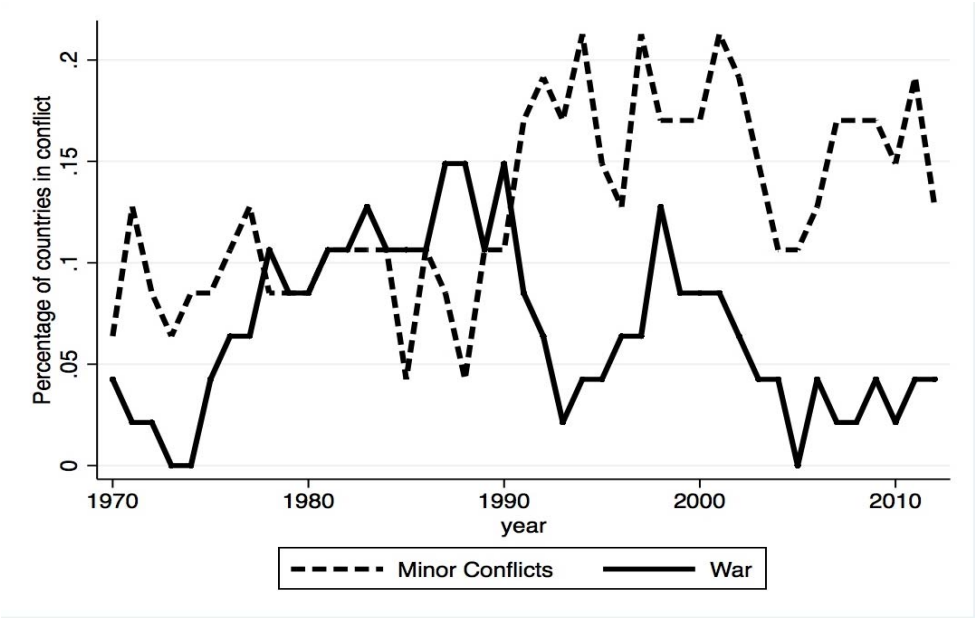
1. Introduction

The 21st century marks a striking contrast for Sub-Saharan African countries relative to the last quarter of the previous one. A kind of African renaissance occurred with remarkable economic performances occurring in a sizable number of countries. Radelet (2010) coined the expression "Emerging Africa" to refer to 17 countries that achieved sizable growth performances in terms of GDP per capita since 1996 and he documents a list of factors that might explain this welcome recovery. The African countries made obviously significant progress on a broad range of fronts, thus raising hopes of a sustained economic growth over many years to come. In a recent publication, a team of IMF economists uses the expression "Sub-Saharan African Frontier Markets" to refer to those countries that made the most progress in financial markets development (IMF, 2013).

This African renaissance is clearly linked to the spectacular improvement in governance in many Sub-Saharan African countries since the fall of apartheid in South Africa and the election of Nelson Mandela at the presidency. Nevertheless, Sub-Saharan Africa is still associated in many people's minds with civil war and other forms of armed violence. The last 25 years of the 20th century saw a massive increase in the incidence of civil wars in that part of the world, as shown by chart 1. The continuous line describes the number of countries suffering from major civil wars, whether internationalized or not, where more than 1000 battle-related deaths occurred each year. The broken line refers to minor conflicts where the number of fatalities was above 25 per year and less than 1000. Eyeballing the data suggests that civil strife started in the wake of the commodity boom of the 1970s and continued unabated for many years until the end of the century. More than 7% of the countries were at war on average during that period, when counting only the major wars. The curves suggest as well that the 1990s witnessed some reduction in conflict lethality with a temporary fall in the number of countries affected by a major conflict, more of less compensated by an increase in

the number of minor conflicts. The end of the century saw the number of major conflicts soar again to its previous level, without any significant fall in the number of minor ones[1].

Chart 1: Percentage of Countries in Internal or Internationalized Conflicts



Data Source: PRIO-Uppsala

The number of major conflicts fell spectacularly since the turn of the century to an average number less than half the one prevailing during the previous quarter of a century, as shown in table 1. Explaining this spectacular turn around is the main focus of the present paper. However, this major achievement is partly tarnished by the rise in minor conflicts.

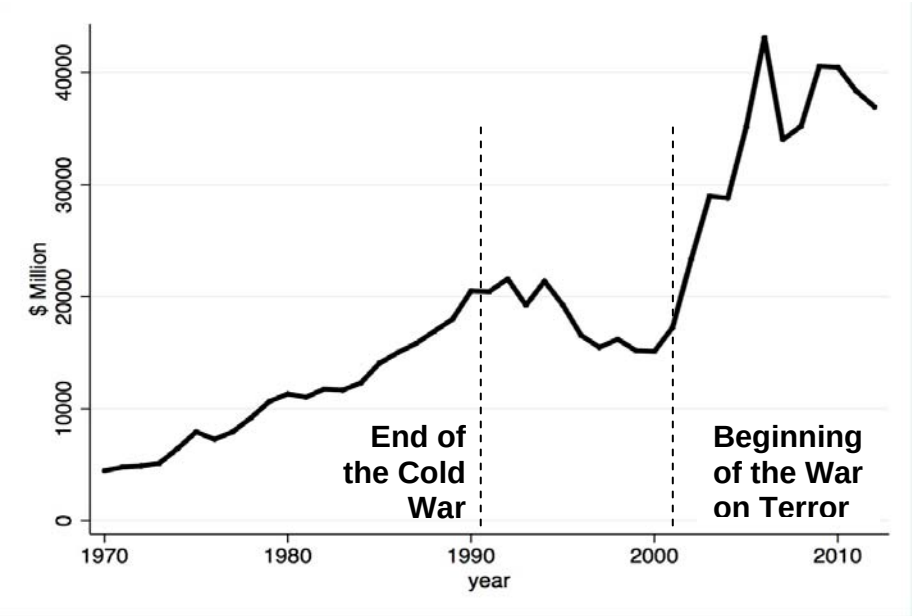
Table 1: Mean Conflict Frequencies per Period

	1970-2000	**2001-2012**
Mean Civil Wars	0.07	0.029
Mean Civil Wars & Minors	0.163	0.182

Data Source: PRIO-Uppsala

[1] Bates (2008b) presents a rich descriptive material on civil wars in "late-century" Africa (1970-1995), pointing out in particular that some countries were at war over the whole period while others did not suffer from any episode of civil war. His empirical analysis uses the existence of private militias as the dependent variable.

Chart 2: The 21st Century Aid Boom



Note: Deflated by the Manufactures Unit Value Index of G15 exports to low- and middle-income countries in US $.

The econometric analysis presented below supports the view that the aid boom that occurred in the wake of 9/11 and the beginning of the war on terror was a major determinant of this fall in the incidence of civil war in Sub-Saharan Africa. Chart 2 depicts this aid boom, which is analyzed further below. The aid series is the standard ODA (Official Development Assistance) one produced by the OECD. It is deflated by a price index that reflects the international purchasing power of this aid money for a representative African economy, namely the manufactures unit value (MUV) index of the exports to low- and lower-middle income countries by the top 15 industrialized countries. The key points to bear in mind are that this index takes due account of the prices of the Chinese and Indian exports that have drastically increased their market shares over the last few decades, thus increasing massively the purchasing power of African commodity exports and aid flows on the world market, and that it is independent of any African-country-specific shocks. The curve clearly shows that

three different episodes can be contrasted over these forty years or so. The Cold War saw a steady increase in foreign aid, which grew fourfold over a couple of decades. This growth ended abruptly in 1991, as the end of the Cold War entailed a gradual decline of foreign aid to Africa, which fell by about 25% in real terms during the subsequent decade. The 9/11 shock interrupted this downward slide and the beginning of the War on Terror opened a new era marked by a massive aid boom, as the aid flow to Africa increased by about 170% in real terms over less than a decade and seems to be bound to remain high in the near future[2].

This spectacular achievement of foreign aid to Africa stands in sharp contrast to the so-called "aid-ineffectiveness" literature that started with Boone (1996) and Burnside and Dollar (2000) and reached a broad audience through Easterly (2006) and Moyo (2009). This literature claims that foreign aid failed to reach its objectives of fighting poverty and boosting economic growth in recipient countries and was thus ineffective[3]. However, revealed preference theory suggests another interpretation of foreign aid pointing to a potential hidden agenda behind the much advertized philanthropic objectives. More than six decades of aid disbursement by rich countries suggest that they were getting something in return. Frey (1984) and Alesina and Dollar (2000) suggest that foreign aid seems to pay for political alignment of recipient governments, while Svensson (2001) shows that foreign aid does not seem to reward democracy, Burnside and Dollar (2000) find no evidence that it is given to foster sound macroeconomic policies and Alesina and Weder (2002) show that corruption does not deter donors. Other researchers have been luckier and found positive results in the quest for the donors' hidden motivations. Azam and Berlinschi (2010) have found that rich donors, mainly OECD members, are actively using foreign aid to reduce immigration from

[2] Fleck and Kilby (2010) show that total U.S. bilateral aid experienced a boom starting with the war on terror and they bring out a distinctive change in its determinants, becoming less dependent on "need". Boutton and Carter (2014) also found that US foreign aid has changed since 9/11, becoming more effective against terrorism.

[3] This "aid-ineffectiveness" diagnosis has been recently challenged quite successfully by Arndt et al. (2014) using an instrumental variable approach. They find that aid positively affects economic growth and some other relevant outcomes.

low- and lower-middle income countries. This is revealed by the fact that the amount of foreign aid disbursed is endogenous in an equation explaining the number of immigrants in the donors' countries. Azam and Delacroix (2006) and Azam and Thelen (2008, 2010) have shown that foreign aid is effective for reducing the number of transnational terrorist events originating in recipient countries, and that donors are actively using it for that purpose[4]. Here again, endogeneity of foreign aid plays a key part in the interpretation of the findings[5]. Boutton and Carter (2014) show that US foreign aid is quite successfully focused on countries whose terrorists directly threaten the US but not on protecting its allies.

The present paper describes another attempt at discovering what foreign aid is good for by looking at its impact on the incidence of civil war in Sub-Saharan Africa, an issue first addressed empirically by de Ree and Ellisen (2009)[6]. From a theoretical perspective, Azam and Saadi-Sedik (2004) present a game-theoretic model where a foreign power has to choose between offering foreign aid and threatening sanctions to convince an oppressor to refrain from inflicting violence on some group in his country. The threat of sanctions is modeled as a self-enforcing contract which determines the limit beyond which it can't be credible. Aid will be used to buy compliance when the threat of sanctions is made ineffective by too high a cost of imposing them when challenged to do so. The basic framework is an incentive model where the foreign power offers to the recipient government a contract that promises to pay some (aid) money in exchange for the latter's effort at reducing violence. Azam and Delacroix

[4] Bandyopadhyay et al. (2011a, 2011b), Campos and Gassebner (2009), Dreher and Fuchs (2011) and Young and Findley (2011) provide theoretical and empirical caveats and qualifications to this finding.

[5] This brief review makes no mention of the huge literature evaluating the impact of aid-financed projects at the micro-level. Among others, Casey et al. (2012) provide a micro-level analysis of a community-driven development project at the village level aimed at evaluating both its institutional and its welfare impacts and reach a fairly mixed conclusion. Fearon et al. (2009) present a field experiment related to a similar project in post-conflict Liberia. The theoretical framework sketched below has a more macroeconomic focus where aid is regarded as an incentive offered to the recipient government to reduce the risk of civil war, without looking precisely at the tools used for that purpose.

[6] Our empirical approach below aims improves on de Ree and Ellisen by (i) using country-specific instruments rather than continent-wide instruments for foreign aid (de Ree-Ellisen use donors' GDP as instruments), (ii) by instrumenting also domestic GDP p.c. in the conflict-incidence equation and (iii) by using an extended sample covering almost four decades.

(2006) and Azam and Thelen (2008, 2010) use a similar framework where the donors use aid money to incite recipient governments to protect the former's economic and political interests within their sphere of influence by countering terrorism. Here, we extend this line of inquiry by testing the impact of foreign aid on the incidence of civil war in Sub-Saharan Africa. Azam and Mesnard (2003) and Azam (2006) have analyzed the government's choice between war and peace in a similar kind of incentive model with special reference to Africa. In these models where the government cannot use a perfectly credible commitment strategy, civil war erupts when the potential rebels can expect to get a higher payoff by rebelling than what the government is prepared to promise under the credibility constraint or to invest in deterrence. A similar conceptual framework is used by Bates (2008a, 2008b) to analyze how "things fell apart" in late-century Africa, while Besley and Persson (2009, 2011) extend this framework to investigate the determinants of the choice between peace, repression and civil war from both a theoretical and an econometric point of view. Bates (2008b) presents empirical tests of some of its main predictions, emphasizing the role of political institutions and of the rulers' ethno-regional origins. None of these studies have tested the impact of foreign aid. The two levels of contracting briefly sketched above can be combined à la Azam-Thelen to produce a model where the foreign power is delegating to the recipient government the task of dealing with the potential rebels in return for a transfer. The key implication of such a framework is that the foreign power can tilt the balance in favor of peace by making it cheaper for some recipient governments to go for peace rather than war. Some implicit or explicit contract can be offered to put the latter in a position to credibly promise to transfer more resources to the potential rebels or to invest in more deterrence than they would without aid.

The next section presents the empirical analysis using panel-data techniques with an unbalanced sample of 46 African countries over about four decades. Controlling for both time-invariant country effects and continent-wide time dummies, it shows that foreign aid is a

significant inhibitor of civil war in Africa and that donors are using it for that purpose. However, the persistence of the total number of conflicts, including minor ones, leans in favor of a qualified answer to the question raised in the title of this paper. The aid boom did in fact reduce the lethality of African conflicts by cutting drastically the number of major conflicts but it did not affect significantly the overall number of conflicts. The subsequent section tries to unbundle the continent-wide effects by looking at the impact of various key time-series variables like commodity prices and natural disasters that affect the continent as a whole. This brings out some additional policy-relevant insights regarding the control of armed conflict. Section 4 briefly concludes.

2. Estimating the Foreign-Aid/Civil-War Trade-Off.

This section tests the core hypothesis that the aid boom of the 21st century played a key part in abating civil war in Africa in the 2000s using an unbalanced panel of 46 countries over about four decades, starting mostly in 1970. South Sudan and Somalia are not included because of missing data especially regarding the level of gross national product. The series of Angola, Cabo Verde, Comoros, Equatorial Guinea, Eritrea, Ethiopia, Guinea, Mauritius, Mozambique, Namibia, São Tomé and Principe, South Africa, Tanzania and Uganda do not start in 1970. However, our results are robust if we exclude South Africa and to several other restrictions, e.g., if we only use countries for which more than two thirds of the years are available, i.e., excluding Eritrea, Guinea, São Tomé and Principe and Tanzania.

The war data come from the UCDP/PRIO Armed Conflict dataset (Gleditsch et al. 2002). They include the number of civil wars with at least 1,000 casualties and of minor armed conflicts with more than 25 deaths (and less than 1000) in a year over the 1970-2012 period. The aid flows are represented by the classic ODA (Official Development Assistance) from the World Bank's African Development Indicators (ADI). This captures the actual disbursements of the aid money, which is often released by tranches in the wake of

commitments. As mentioned above, the aid series is deflated by the MUV index of the top 15 industrialized countries' exports from the World Bank Commodity Price Data (The Pink Sheet). Additional variables like GDP p.c. (also deflated by MUV) and population size (both from ADI) are used to disentangle the effects of foreign aid from those of low income per capita and population size that are known to be correlated with it.

The Pacifying Impact of Aid in Africa

Table 2: Internal and Internationalized Conflicts

	Civil Wars		**Civil Wars & Minors**	
	(1)	**(2)**	**(3)**	**(4)**
Log GDP p.c.	-0.0831***	0.0965	-0.1026***	-0.2692***
	(0.01)	(0.07)	(0.02)	(0.09)
Log Pop.	-0.2568***	-0.2400***	-0.2915***	-0.3150***
	(0.06)	(0.07)	(0.08)	(0.09)
Log ODA p.c.	-0.0475***	-0.1481***	-0.0408***	0.0065
	(0.01)	(0.04)	(0.01)	(0.06)
Res. Log GDP p.c.		-0.1890***		0.1779*
		(0.07)		(0.09)
Res. Log ODA p.c.		0.1035**		-0.0476
		(0.04)		(0.06)
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Nb. of Obs.	1761	1761	1761	1761
Joint Res. T.	-	9.03***	-	3.72
F stat	2.19***	2.22***	2.34***	2.28***

Note: Columns (1) and (3): Fixed Effects linear probability estimation using robust standard errors (in parenthesis). Columns (2) and (4): Hausman test for endogeneity using the residuals from the first-stage equation at table 3, robust standard errors. Stars refer to the standard convention: {***, **, *} mark the significance levels {1%, 5%, 10%}.

Table 2 presents various findings regarding the determinants of the probability of conflict in a country-year. The model used is a linear probability model[7] including fixed

[7] We have also experimented with a Logit model, yielding qualitatively the same conclusions. The latter has two drawbacks relative to the linear probability model: (i) when applied in a panel data analysis, it excludes from the sample all the countries that did not incur any civil war or minor conflict over the period, entailing a risk of a selection bias, requiring a two-stage approach on top of the two-stage approach required for controlling endogeneity, and (ii) its coefficients cannot be interpreted immediately and need to be translated into comparable coefficients to the ones from table 1 using fairly conventional scalars (see, e.g., Hsiao, 1986).

effects that control for time-invariant country characteristics and time dummy variables that control for continent-wide shocks[8]. Columns (1) and (3) do not control for endogeneity and robust standard errors are presented in parenthesis. Column (1) restricts the analysis to civil wars entailing at least 1000 battle-related deaths per year while column (3) adds the minor conflicts that produce at least 25 battle-related deaths per year. These regressions are highly significant and the three continuous variables included are all significant at the 1% threshold.

The estimate of the impact of ODA p.c. on the probability of a civil war in a given country-year in column (1) means that a doubling of per capita ODA would reduce the probability of a civil war affecting the recipient country in any given year by 4.75 percentage points (%). This is slightly higher than the fall in the mean frequency of civil war shown at table 1. To evaluate correctly the meaning of this number, one must bear in mind that the average such probability for the whole sample is 5.7%. Hence, foreign aid is found here to be highly effective at abating civil war. The other two continuous variables, i.e., GDP p.c. and population seem to be even more powerful inhibitors of civil war. However, a doubling of these variables is not the relevant thought experiment to use in these cases. Hence, a 1% increase in population is here predicted to reduce the risk of civil war by 2.57%, assuming that GDP and ODA increase in the same proportion, which is not an insignificant impact either. As far as GDP p.c. is concerned, the estimated impact would be 0.83% for a 10% increase. Hence, given the relevant ranges of variation of these variables, ODA p.c. comes up as a key policy variable for the sake of preventing civil wars.

Given such a significant policy trade-off, however, one might argue that the international community is probably exploiting it in fact already to determine its allocation of foreign aid across countries and across time with a view to control civil violence in recipient countries. This would happen if the rational policy-makers were at least as clever as the

[8] Section 3 below presents an attempt at unbundling these continent-wide effects.

econometricians and wanted to reduce the potential collateral damage of civil wars to their political and economic interests in Africa. This would require a different identification strategy than at columns (1) and (3) if they benefitted from some information on the risk of civil war in the different sample countries that is not available to the researcher. Then, some endogeneity bias might result if the donors rationally used such information for making their aid-allocation decision. Besides, some less strategic motivations might also be present and require similar econometric precaution, e.g., if donors cannot deliver normally foreign aid to a country when the latter is at war, entailing a reverse-causation problem. Moreover, columns (1) and (3) do not control either for the likely endogeneity of GDP p.c.. There is a fair presumption that reverse causation is at work as the occurrence of violent conflict is bound to disrupt economic activity and to reduce GDP in the country where it takes place. It is also likely that some unobserved time-variant country-specific shocks have a simultaneous impact on output and on the probability of violent conflict. Hence, GDP p.c. must probably be treated as endogenous as well.

Columns (2) and (4) present the Hausman test for endogeneity showing that this is a significant issue here for both variables (Hausman, 1978)[9]. The residuals from the reduced-form equations explaining foreign aid per capita and GDP per capita presented in table 3 at columns (5) and (6) capture in a synthetic fashion the impact of unobserved variables on donors' behavior and on GDP p.c. and they are orthogonal to the included exogenous variables and the instruments, by construction. They are especially significant in column (2), relative to civil wars, while they are less so at column (4), when minor conflicts are included. The coefficient of ODA p.c. is higher in absolute value in column (2) when the residuals from the first-stage equation are included than otherwise, suggesting that these aid shocks reveal some relevant information that is unavailable to the econometrician and that affects positively

[9] Hausman (1978) showed that including the reduced-form residuals as we do here yields consistent estimates both under H_0 (exogeneity) and under H_1 (endogeneity). Then, this procedure yields the same estimates as 2SLS when the regressors in question are endogenous.

and simultaneously the amount of aid delivered and the probability of civil war. The sum of the two coefficients for ODA p.c. and its residuals is almost equal to the estimates of the impact of ODA p.c. at columns (1). This suggests that these residuals perform like a control function and correct an endogeneity bias present in column (1)[10]. This seems to reveal that donors respond to some information that signals an increased risk of civil war (and that is unobserved by the researcher) by stepping up their delivery of foreign aid to the affected country. After controlling for foreign aid's endogenous response, column (2) shows that foreign aid is strongly effective for reducing the risk of civil war, with an impact that is somewhat underestimated in column (1)[11]. This estimate shows that the reduction in the risk of civil war found at table 1 could in fact be achieved by an average increase in foreign aid by about 25% since the turn of the century relative to the previous period, *ceteris paribus*. Comparing the estimates found at columns (1) and (2) for the impact of ODA seems to suggest that the latter is overestimated at column (2). However, the next section provides empirical arguments to the contrary by showing that foreign aid was effective at abating civil war in Africa despite two massive exogenous shocks that stacked the odds against peace. By contrast, GDP p.c. looses its significance at column (2), and the estimated coefficient changes its sign, while its residuals are strongly significant. This clearly shows that the negative impact of GDP p.c. found at column (1) is probably only capturing in fact reverse causation rather than any meaningful behavioral impact.

The aid endogeneity finding tells us something about the type of information that donors use to make their allocation decisions across recipient countries. The signal that they get about the increased risk of civil war in a given country/year is an early-warning device

[10] Table A6 presents the same results estimated more conventionally by 2SLS. For a linear model, the two approaches are indistinguishable, but 2SLS makes it easier for Stata to compute the various tests of instruments validity presented there.

[11] Table A2 in the appendix shows that the level of foreign aid received by each country's neighbors has no significant impact on its risk of conflict, despite the cross-border effects estimated by Bates (2008b). The example of the Democratic Republic of Congo comes to mind to illustrate these effects (Turner, 2007). This finding suggests that aid-recipient governments do not (or cannot) control significantly the cross-border activity of guerrillas based on their own territory.

that gives them a first-mover advantage for controlling civil strife. The coefficient of the ODA residuals in column (2) tells us how much higher would be the risk of civil war in a given country/year had the aid flow not increased in response to the early-warning signal that the donors received when the risk arose. This might arguably be viewed as a tribute to the intelligence-gathering performed by the donors to inform their aid allocation.

Reduced-Form Determinants of Foreign Aid and GDP p.c.

Table 3: First Stage Equations for log ODA pc and log GDP p.c.

	Log ODA p.c. **(5)**	**Log GDP p.c.** **(6)**
Log Pop.	0.1080	0.0428
	(0.24)	(0.14)
Trend * French	-0.0265***	0.0002
Colonies	(0.01)	(0.00)
Trend * UK	-0.0081	0.0135***
Colonies	(0.01)	(0.00)
War on terror	0.6931***	- 0.1444*
	(0.15)	(0.07)
Cold War	-0.4604	1.3367**
	(0.29)	(0.35)
Nb. Of Natural	0.0407***	-0.0199***
Disasters	(0.01)	(0.01)
Country FE	yes	yes
Year FE	yes	yes
Nb. Obs.	1761	1761
F stat	7.5168***	62.6406***

Note: OLS with robust standard errors. STATA automatically removes two time dummies to avoid the collinearity problem with the two war dummies.

Table 3 presents the reduced-form equations estimated to produce the residuals used in the Hausman endogeneity test in Table 2's columns (2) and (4). Although these first-stage estimates are mongrel parameters that cannot be understood as causal, they suggest that the allocation of foreign aid across country/years mainly responds to two key stimuli:

(i) Donors are providing some implicit insurance against natural disasters, here measured by the number of such disasters according to the international Disaster Database

(EM-DAT). This includes natural disasters categorized as geophysical (e.g. earthquake), meteorological (storm), hydrological (flood), climatological (e.g. drought and wildfire) and biological (epidemic) events. Foreign aid responds positively to the occurrence of such shocks. Table A3 in the appendix shows that such natural disasters do not affect the risk of civil war directly and thus satisfy the exclusion restriction for instrumental variables. Not surprisingly, this variable has a significant negative impact on GDP p.c.[12]. We may conclude that donors have some genuine humanitarian motivations beside the political objectives that we emphasize here because natural disasters do trigger a positive response of aid without impacting directly the probability of conflict at the country level. Section 3 below provides some qualification to this statement.

(ii) Donors are also evidently using foreign aid strategically to prevent African economies from being drafted into major world-wide conflicts and to purchase their alignment. The war on terror revived the flow of foreign aid to Africa, which had lapsed by about 25% in the wake of the end of the Cold War, as seen at chart 2. At the same time, GDP suffers a negative impact, may be via a "Dutch Disease" effect, but this is only significant at the 10% level. The Cold War dummy has a surprising but insignificant negative impact on foreign aid. This must be interpreted in conjunction with the two trend variables, which capture the evolution of foreign aid to the French and British former colonies, with a negative sign, although it is only significant for French colonies. Hence, the share of traditional donors is probably declining over time while non-traditional ones, like China and the U.S., have become sizable players in the recent years, whereas they were mostly absent until the turn of the century[13]. Still, former British colonies get (insignificantly) less aid over time but tend also to grow faster, while such a correlation is not present for former French colonies.

[12] Miguel et al. (2004) is the classic reference on the use of climatic variables, rainfall in particular, as instruments for estimating the impact of GDP on the risk of conflict.

[13] Fleck and Kilby (2010) and Boutton and Carter (2014) provide some clues about the changing role of US aid across these two periods. Dreher and Fuchs (2012) provide a thorough analysis of China's foreign aid, showing that it does not deserve the label 'Rogue Aid'.

Appendix tables A4 and A5 show that these variables pass the exclusion test and are thus appropriate instruments. The Cold War dummy has a significant positive impact on GDP relative to the interim decade between the two wars. The next section offers a potential explanation for this by showing that some of the commodities exported by Sub-Saharan Africa faced especially low prices on the world market during that interim decade.

The Persistence of Minor Conflicts

Columns (3) and (4) add minor conflicts to civil wars, thus increasing sizably the number of conflicts to be explained as seen at table 1. In column (3), foreign aid seems slightly less powerful for abating minor conflicts than at column (1), while GDP p.c. and population are more powerful instead. However, aid looses entirely its significance when endogeneity is controlled for at column (4). Moreover, the residuals of the reduced-form ODA p.c. equation are not significant either in this case. This suggests that donors do not respond in the same fashion when minor conflicts are involved as they do for civil wars, as neither ODA p.c. nor its residuals are significant at column (4), either because it is more difficult to collect useful intelligence about them or because there is nothing much at stake for donors in this type of conflict. When minor conflicts are added, at column (4), the negative impact of GDP p.c. remains significant (unlike at column (2)) when controlling for endogeneity and it becomes stronger than at column (3). Its residuals are significant at the 10% threshold, with a positive sign. This suggests that there are unobserved shocks that affect positively both GDP p.c. and the risk of minor conflict, while the basic impact of GDP p.c. is negative. In other words, while economic development seems to reduce the risk of minor conflicts in the long run, short run unexpected booms might instead spread havoc.

There are thus significant differences between the equations explaining the determinants of civil wars, understood here as major conflicts, and minor conflicts. This comes out here despite the fact that the former are included in the dependent variable used

when minor conflicts are also included at columns (3) and (4), suggesting that these differences are strongly meaningful. This provides some support for the view expressed by Collier (2000) and Bueno de Mesquita (2013) that the escalation phenomenon, whereby a minor conflict can evolve into a major one, deserves to be analyzed in its own right. However, our findings support the view that the amount of foreign aid received by the government is a key determinant that can prevent this escalation, while their analyses focus entirely on the rebel side. Further research is certainly needed to clarify the relative roles of rebels and government in the escalation process[14].

3. Unbundling Continent-Wide Effects

In tables 2 and 3, continent-wide effects are controlled for using time-dummy variables. This is the appropriate method to use in panel data analysis as it controls both for observable and unobservable variables that affect simultaneously all the sample countries. However, researchers and policy makers may be also interested in unbundling these effects, with a view to identify the key continent-wide shocks that affect significantly the incidence of civil war in Sub-Saharan Africa. In particular, Besley and Persson (2009) have found significant impacts of export and import prices while Fearon (2005) and Humphreys (2005) emphasize fuel exports. Similarly, Bates (2008b) finds some impact of the price and production of oil. As discussed among others by Azam (2006), wide swings in commodity prices are liable to change drastically the relative affluence of different ethno-regional groups in African countries and can upset the established political equilibrium. This concern is especially relevant since the turn of the century, as the war on terror in the wake of 9/11 and the ensuing monetary policy pursued by the FED have triggered a commodity boom of the same order of magnitude as the historical oil shock of the 1970s. We now test whether these

[14] Kalyvas and Balcells (2010) provide an analysis of some qualitative changes that affected the pattern of internal conflicts in the world when the cold war ended. They emphasize the interactions between governments and rebels that entailed a reduction in the size of the forces involved in many countries. Their period of analysis ends in 2004, before the aid boom entailed by the war on terror became obvious.

commodity-price shocks explain a significant share of the impact of the continent-wide shocks captured by the time dummies at table 2. The latter's coefficients measure how much higher (or lower) was the probability of conflict in an average African economy due to the combination of continent-wide shocks that occurred each year. The commodity prices and the composite indexes that we use come from the World Bank Commodity Price Data (The Pink Sheet) as does the MUV index used for deflating them[15].

Beside commodity prices, we also test the impacts of two other variables, namely natural disasters and the international-relations regime. Hsiang et al. (2013) have performed a meta-analysis of 60 primary studies of the links between climate variables and conflict outcomes. These primary studies are taken from a wide range of fields and cover a very deep historical time span. They conclude that a one-standard deviation increase in temperature or towards more extreme rainfalls entails a 14% median increase in the incidence of conflict between groups. In order to capture this kind of effects, we use again the EM-DAT natural disaster index presented above, but aggregated at the sub-continent-wide level this time. However, this kind of disasters is bound to affect commodity prices, especially in the agricultural sector.

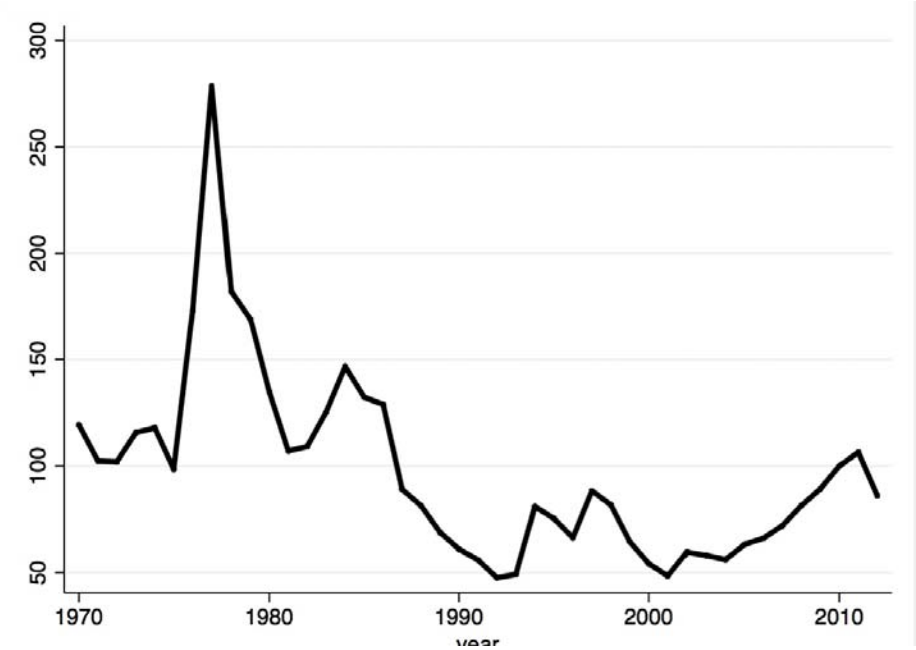
Chart 3 represents the time series of a World Bank index for tropical beverages, where the impacts of climatic shocks can be read off by eyeballing the curve. The main peaks clearly are associated with major El Niño or La Niña events. The 1972-73 and 1982-83 El Niño droughts evidently triggered a sizable price hike while the widely forecasted and announced El Niño event of 1997-98 had a more moderate impact[16]. The largest price hike was due to the 1976 frost of the Brazilian coffee crop, due to a La Niña cold episode. A more modest cold

[15] Unlike Bates (2008b), Fearon (2005) and Humphreys (2005) we do not use commodity outputs besides their prices implicitly captured by the time dummies in our second-stage equations at table 2 because (i) they are most probably endogenous, and (ii) their impacts are probably well captured by GDP p.c. and country fixed effects in Sub-Saharan Africa. Modeling commodity supply functions is a cottage industry of its own and trying to do this here would take us too far afield.

[16] Fagan (2009) presents a clear introduction to basic climatology and describes the El Niño events of the 1970s and 1980s.

episode occurred in 2011, with some impact on beverage prices. Still, macroeconomic shocks in industrialized countries are also affecting these prices. Lastly, we also control for the stance of global international relations by including dummies for the cold war and for the war on terror, as we did above.

Chart 3: Beverage Prices and El Niño Events



Note: Deflated by the Manufactures Unit Value Index of G15 exports to low- and middle-income countries in US $.

Unexpected Price Effects

We experimented first with a number of individual commodity prices producing fairly disappointing results. Although these exercises always yield highly significant equations, from a statistical point of view, the estimated coefficients turned out not to be robust in general, depending crucially on the list of the included prices. This is due to the fact that some commodity prices are strongly collinear, while agricultural commodities are also strongly correlated with the aggregate number of natural disasters. Table 4 illustrates the problem using a parsimonious specification regressing the coefficients of the time dummies from table 2 on different combinations of the log of three commodity prices (gold, crude oil and cotton)

and the aggregate number of natural disasters. The first set of five columns uses these time effects from the Civil Wars equation (2) and the second set uses the data when including the Minors as in (4). The first column of each set includes jointly the three commodity prices and Natural Disasters as regressors. The next two columns [(8) – (9)] and [(13) – (14)] alternate by eliminating either the price of gold or that of crude oil, while the subsequent two columns [(10) – (11) and (15) – (16)] eliminate in turn the price of cotton or the aggregate number of natural disasters. The findings are typical of a multicollinearity problem as neither the prices of gold and oil nor the price of cotton and the aggregate number of natural disasters are ever jointly significant. In the (13) – (14) pair, neither the price of gold nor that of oil is ever significant. The table appended at the foot of table 4 presents the results of using the Davidson-MacKinnon (1981) J-test for selecting among non-nested hypotheses to each pair of collinear variables. On purely statistical grounds, these tests lean in favor of choosing the price of gold and the price of cotton for the case of civil wars, while none of the three prices examined here survives and natural disasters come out as the main determinants when minor conflicts are included However, there is no strong analytical reasons to make such choices and a broader perspective seems advisable. These findings suggest on the one hand that it is the general movement of extractive-commodity prices that matters for the incidence of African civil wars rather than the price of oil per se, which has often been found significant in previous empirical studies, as mentioned above; on the other hand, they suggest that the impacts of natural disasters are largely transmitted to agricultural prices, while the latter also reflect the state of the world market and the policies pursued by rich countries.

Table 4: Time Effects and Commodity Prices

	Time Effects from Civil Wars – Equation (2)					Time Effects from Civil Wars & Minors – Equation (4)				
	(7)	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**
Log Gold Price	0.157***	0.126***		0.152***	0.179***	-0.023	-0.043		-0.062	-0.027
	(0.04)	(0.02)		(0.04)	(0.05)	(0.05)	(0.03)		(0.06)	(0.05)
Log Crude Oil Price	-0.028		0.070***	-0.019	-0.058	-0.019		-0.033	0.048	-0.013
	(0.03)		(0.02)	(0.03)	(0.04)	(0.03)		(0.02)	(0.04)	(0.04)
Log Cotton Price	-0.232***	-0.239***	-0.249***	-0.253***		0.040	0.035	0.042	-0.124***	
	(0.04)	(0.04)	(0.05)	(0.03)		(0.04)	(0.04)	(0.04)	(0.04)	
Nb. Natural disasters	0. 0.0003	0.0002	-0.000		0.002***	0.002***	0.002***	0.003***		0.002***
	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)		(0.00)
Intercept	-0.409**	-0.303**	0.251***	-0.377**	-0.707***	0.019	0.089	-0.077	0.274	0.070
	(0.17)	(0.15)	(0.09)	(0.17)	(0.18)	(0.22)	(0.17)	(0.07)	(0.29)	(0.22)
Nb. Obs.	42	42	42	42	42	42	42	42	42	42
R2	0.758	0.753	0.674	0.755	0.587	0.646	0.641	0.642	0.294	0.635
F stat	28.56***	36.09***	28.97***	34.84***	23.40***	28.67***	35.75***	39.51***	6.79***	40.44***

Note : OLS with robust standard errors (* p < 0.1 ,** p < 0.05,*** p < 0.01)

Davidson MacKinnon J-test :

Test H0	J-test	Conclusion
H0: (8) vs. H1: (9)	-0.87	Equation (8) is preferred to (9)
H0: (9) vs. H1: (8)	4.16***	
H0: (10) vs. H1: (11)	0.83	Equation (10) is preferred to (11)
H0: (11) vs. H1: (10)	5.33***	
H0: (13) vs. H1: (14)	0.54	Neither of equations (13) nor (14) is preferred
H0: (14) vs. H1: (13)	0.46	
H0: (15) vs. H1: (16)	6.55***	Equation (16) is preferred to (15)
H0: (16) vs. H1: (15)	-1.10	

Chart 4: The Real Prices of Oil and Gold

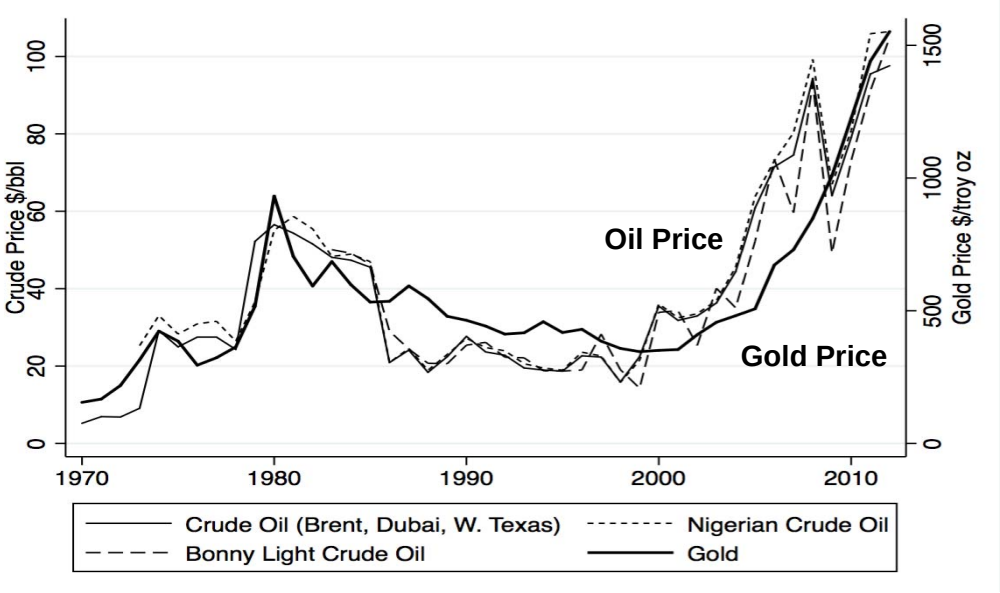
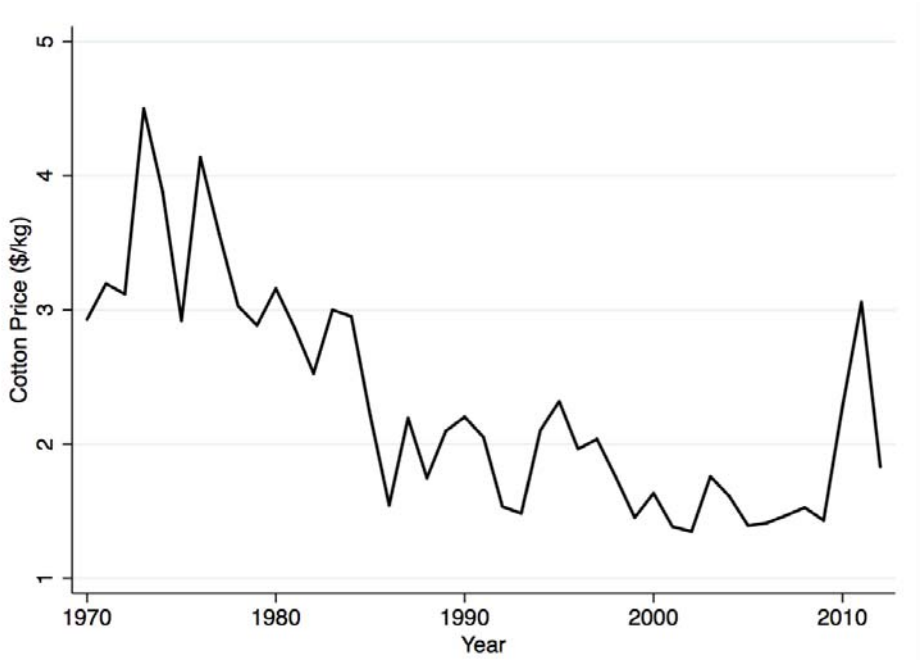


Chart 4 helps us to draw the implications of this finding. It depicts the time series of different kinds of crude oil prices (left scale), including an index of Nigerian oil and the price of Bonny light, the typical crude oil found in the Gulf of Guinea, all deflated by the same MUV index. All these series have basically the same time profile with a long period of stagnant low prices during the 1986-99 period bracketed by two massive booms of roughly the same magnitude in percentage terms. The time profile of the price of gold (right scale) has a very similar timing, although the two booms seem to have a shorter duration. Comparing these profiles to the civil war data depicted at chart 1 immediately shows that the gold/oil price swings raised a special challenge since the turn of the century. The first oil shock saw a massive and long-lasting increase in the number of civil wars, while the second one occurred when the civil war series had a quantum fall. Therefore, the findings of table 4 suggest that foreign aid's achievement at pacifying Sub-Saharan Africa was even more spectacular than acknowledged above, as it had to face the war-promoting impact of the second extractive

commodity price boom. This finding is corroborated below using composite price indexes instead of individual prices.

Chart 5: Real Price of Cotton

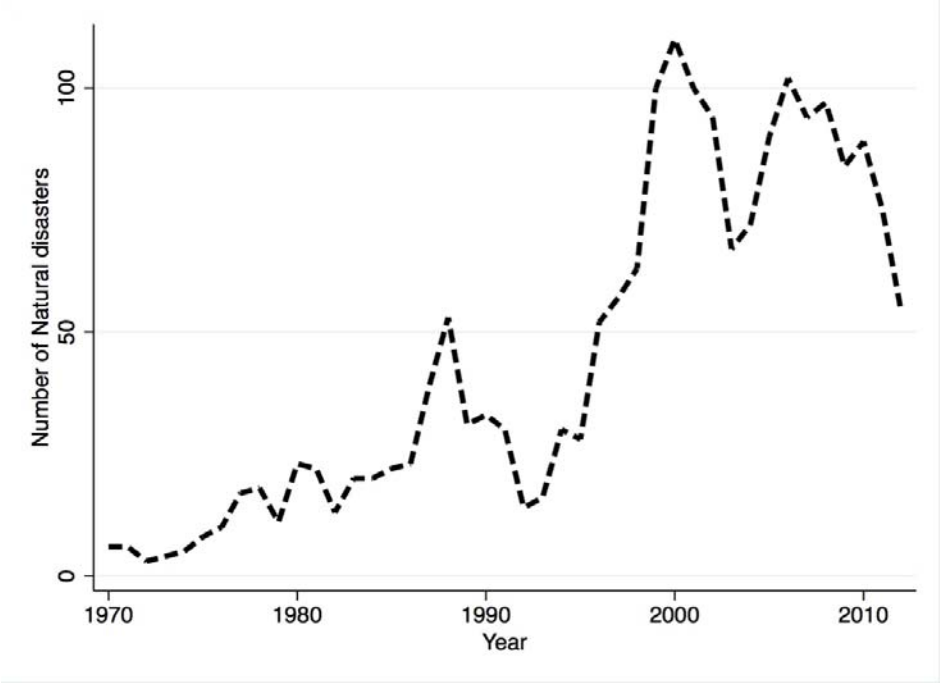


The price of cotton is a very robust determinant of the incidence of civil wars in Sub-Saharan Africa and it seems to play a key part at the sub-continent-wide level. Cotton is widely grown in most countries of West Africa, in Chad and Sudan, and in several countries in Southern and East Africa. The estimates show that an increase in the price of cotton reduces significantly the probability of civil wars, with or without the addition of minor conflicts at column (15). Chart 5 shows that the real price of cotton was particularly low from the mid-1980s to the late 2000s. The world market for cotton is well known for its distortions as the US government has traditionally been subsidizing its own producers over most of the sample period, with a sizable downward impact on the market price for poor countries' producers[17]. Among others, Bourdet (2004) provides a rich analysis of the market

[17] The WTO's Dispute Settlement Body ordered the U.S. government to eliminate its cotton production subsidies in 2005. The latter lost its appeal in 2009, but the battle goes on. In 2010, the U.S. government offered the Brazilian Cotton Institute $147.3 million a year as temporary bilateral agreement to give the U.S. some time

environment of some African cotton-exporting countries and its distortions. In addition, China has also paid its producers a subsidy aimed at compensating them partly for the US policy. This suggests that the US government has a powerful lever for enhancing the chances of peace in Africa by changing its price-subsidy policy for cotton. Still, climatic shocks also seem to affect the price of cotton as discussed about tropical beverage prices at chart 3.

Chart 6: Aggregate Number of Natural Disasters in Sub-Saharan Africa



Source: EM-DAT.

In addition to the commodity prices, table 4 brings out the war-promoting impact of Natural Disasters not for major conflicts, but when the Minors are included. However, table 4 shows that the price of cotton and the total number of natural disasters are quite (negatively) correlated, as can be checked visually by comparing charts 5 and 6, so that Natural Disasters becomes significant even for Civil Wars if the price of cotton is excluded. This negative correlation does not seem to follow from a simple market mechanism and might reflect instead the pricing behavior of the state-owned companies that market cotton in many African

to adjust its policy. Brazil is now threatening some forms of retaliatory measures against U.S. cotton subsidies. Meanwhile, nothing was offered to African producers (Langevin, 2014).

countries. Still, the price of cotton seems to be a more robust determinant than natural disasters at the continent-wide level as far as Civil Wars is concerned. Although the coefficient of Natural Disasters is fairly small in every column of table 4, falling below 0.03 percentage points, it is far from negligible because of the number of disasters involved. Chart 6 shows the time profile of the number of such natural disasters in Sub-Saharan Africa that peaks at 110 in 2000. Therefore, the accumulation of natural disasters happening in a given year can increase sizably the risk of Civil Wars & Minors even with the small coefficient estimated at table 4, *ceteris paribus*. However, we know from table 3 that foreign aid does respond to natural disasters and from table 2 that this can prevent a sizable increase in the risk of civil war. Notice however by comparing chart 2 and chart 4 that the massive increase in the number of natural disasters starting in the second half of the 1990s took place in the context of a fall in foreign aid to Africa while the aid boom only started in 2001 with the launch of the war on terror. At the same time, the real price of cotton was falling to the all time low of the 2000s as shown by chart 5. This might explain why chart 1 displays a big spike in the civil war series in the last few years of the 20th century. This fairly mixed impact of natural disasters at the continent-wide level seems to concur with the fact that we could not find any significant country-specific impacts of domestic natural disasters on the risk of war at table A3.

Using Composite Price Indexes

In order to circumvent the uncertainty mentioned above about the use of individual commodity prices, we also performed a similar exercise using composite indexes. The results are presented in table 5 for Civil Wars and Civil Wars & Minors and they seem to corroborate the findings of table 4 to a large extent, while they yield some additional insight.

Table 5: Time Effects and Composite Price Indexes

	Time Effects from Civil Wars – Equation (2)			Time Effects from Civil Wars & Minors – Equation (4)		
	(17)	**(18)**	**(19)**	**(20)**	**(21)**	**(22)**
Log Energy Price	-0.0087	0.0036	0.0124	-0.0213	0.0511	-0.0278
	(0.03)	(0.03)	(0.04)	(0.04)	(0.05)	(0.04)
Log Precious Metal Price	0.1765***	0.1621***	0.2028***	-0.0238	-0.1085*	-0.0319
	(0.04)	(0.04)	(0.05)	(0.05)	(0.06)	(0.06)
Log Fertil. Price	0.0319	0.0447	-0.1189***	-0.0153	0.0597	0.0310
	(0.04)	(0.04)	(0.04)	(0.03)	(0.05)	(0.03)
Log Metals & Min. Price	-0.0060	0.0212	-0.1387**	-0.0382	0.1223**	0.0026
	(0.05)	(0.04)	(0.05)	(0.05)	(0.06)	(0.05)
Log Agricultural Price	-0.4457***	-0.5046***		0.1371	-0.2095***	
	(0.08)	(0.06)		(0.08)	(0.08)	
Nb. Natural disasters	0.0005		0.0022***	0.0028***		0.0023***
	(0.00)		(0.00)	(0.00)		(0.00)
Intercept	1.5245***	1.6521***	0.4474***	-0.3891	0.3606	-0.0579
	(0.22)	(0.20)	(0.13)	(0.25)	(0.28)	(0.13)
Nb. Obs.	42	42	42	42	42	42
R2	0.856	0.851	0.724	0.671	0.304	0.644
F stat	37.11***	44.24***	36.37***	19.94***	5.97***	23.71***

Note: OLS with robust standard errors (* $p < 0.1$,** $p < 0.05$,*** $p < 0.01$)

Test H0	J-test	Conclusion
H0: (18) vs. H1: (19)	1.15	Equation (18) is preferred to (19)
H0: (19) vs. H1: (18)	5.50***	
H0: (21) vs. H1: (22)	6.63***	Equation (22) is preferred to (21)
H0: (22) vs. H1: (21)	-1.64	

The price indexes in this data set are presented with three different levels of aggregation. The second and third levels are derived by disaggregating the composite price indexes of the higher level into a small number of indexes, creating a kind of Russian doll hierarchy. In table 5, we use some indexes from these different levels of aggregation. We have selected these various price indexes after a gradual testing process. For example, at the same level as the Energy Price and Precious Metal Price used in table 5, there is an index of Non-Energy Price. The latter is decomposed at the next level of disaggregation into three sub-indexes, namely Fertilizers Price, Metals & Mineral Prices and Agricultural Prices. We use these five composite price indexes in table 5 together with the aggregate number of natural disasters. Then, the findings are presented in two sets of three columns, for Civil Wars and Civil Wars & Minors, respectively. Collinearity problems also arise with these series and we handle them like in table 4 by performing Davidson-MacKinnon J-test in order to find the most robust specification. However, we restrict here the test to the Agricultural Price/Natural Disasters pair. Most findings are very close to those found at table 4. For example, the Energy Price index is never significant in table 5, confirming the insignificance of the price of oil found at table 4. The price of precious metals has a significant positive impact in the first set of columns, and not in the second (except at column (21) at the 10% level), confirming the result found at table 4 for the price of gold. We find at table 5 for Agricultural Price a result similar to that found for the price of cotton in table 4. The latter index is also quite collinear with the number of natural disasters. In this case, a market-mechanism interpretation of the negative correlation between these two variables is more appealing as many of the goods whose prices are included in the index have a sizable domestic market while natural disasters are bound to reduce domestic demand. Like at table 4, the J-test selects the specification with the agricultural price index against the one with Natural Disasters for Civil Wars, and the

other way around when Minors are included. In both cases Fertilizers Price and Metal & Mineral Price are insignificant in the J-test-preferred equation.

These findings roughly confirm that the risk of civil war increases when gold and precious metals prices rise while higher agricultural prices tend to reduce it. The latter suggests that food aid may have a detrimental impact on peace via its depressing impact on staple crop prices, beside the cotton-price subsidy problem discussed above. The number of Natural Disasters at the continent-wide level has roughly the same impact in table 5 as in table 4, with positive coefficients of the same order of magnitude as in table 4, which are only significant in column (19) for Civil Wars when agricultural prices are excluded and in columns (20) and (22) when minor conflicts are included.

4. Conclusion.

The empirical analysis reported in this paper supports the view that the aid boom that started in the wake of 9/11 and the launch of the war on terror played a key part in abating civil wars in Sub-Saharan Africa. This occurred despite the increased tensions raised by two major exogenous price shocks that stacked the odds against peace at the continent-wide level since the turn of the century. The oil shock of the 2000s was in fact a broad-based extractive commodity boom that exerted a detrimental influence raising the risk of civil war in Africa. At nearly the same time, the price of cotton and the composite agricultural price index were going through a trough that was also threatening peace. The econometric analysis performed to reach this conclusion involves three intermingled steps from which a “rectangular causality flow” can be derived. Three major exogenous variables, namely the occurrence of natural disasters, the launch of the war on terror and the evolutions of some commodity prices are imposing shocks on three interdependent endogenous variables, namely foreign aid, GDP p.c. and the risk of civil war. Donors are pursuing their own objective of controlling violence in Sub-Saharan Africa, with a view to avoid ripple effects on their own economic or political

interests, what became more pressing since the launch of the war on terror. To achieve this objective, they mainly offer foreign aid to African governments as a reward for avoiding the outburst of civil conflict within their sphere of influence. In addition to humanitarian motives, donors know that natural disasters are probably a major cause of violent conflict through their impacts on agricultural prices and their aid-allocation behavior reflects this connection. They step up aid-disbursement when such disasters occur. In addition, donors use some information that is not available to the econometrician. Our two-stage panel-data analysis has been able to capture this information in a synthetic fashion, by using the residuals of a reduced-form equation explaining aid disbursements. These residuals are affecting simultaneously their aid allocation behavior and the probability of war for each recipient country/year. This aid strategy turned out to be highly effective since the turn of the century, as the incidence of civil war in Sub-Saharan Africa is nowadays on average less than half of what it was in the last quarter of the 20th century. Unfortunately for African people, the aid boom only started with the launch of the war on terror, while the need for it arose already in the 1990s from a humanitarian point of view when the incidence of natural disasters began to rise significantly. Some commodity prices are creating additional shocks to this system. In particular, the unbundling of time effects performed above points out that high prices for cotton and for agricultural products are also pacifying factors on which rich countries exert a measure of control by subsidizing their own producers and through food aid. Moreover, the aid boom does not seem to have affected as successfully the risk of minor conflicts as the fall in the number of major conflicts has been compensated by a rise in the number of minor conflicts. Still, this can be regarded as a beneficial move as the latter are less lethal by definition. Hence, rather than concluding that the aid boom has pacified Sub-Saharan Africa, a more accurate claim could be that it has contributed to contain civil violence despite adverse

commodity price developments and a sizable increase in the number of natural disasters affecting Sub-Saharan Africa.

This begs the question of the likely evolution of the aid flow to Sub-Saharan Africa, especially since Osama Ben Laden's death on May 2, 2011. Is this event likely to put an end to the war on terror? Such an event would entail a growing threat looming over peace in Africa, as our first-stage equation for aid per capita shows that the war on terror was the key trigger that revived the aid flow to Africa since the turn of the century. However, Atwan (2012) evaluates what the next generation of Al-Qaeda and affiliate organizations is up to and concludes that violent Jihadists are not about to disappear and should keep the West weary for many years to come. This prediction seems to be supported by the current events in Syria and Iraq, where the ISIS is trying to carve a new state for the Sunni Muslims under Islamic rule. Among other places, Eastern Libya is also vindicating this prediction. This renewed instability should keep the flow of foreign aid to Sub-Saharan Africa steady for some years, as Western powers will certainly strive to avoid leaving new stateless areas where Al-Qaeda and its affiliates could flourish and recruit disgruntled fighters.

Appendix

Table A1: Summary Statistics

	N	Nb. of Countries	Minimum	Maximum	Mean	Standard Deviation
Civil Wars	1761	46	0	1	0.057	0.232
Civil Wars & Minors	1761	46	0	1	0.169	0.375
log GDP p.c.	1761	46	3.91	9.61	6.454	1.017
log ODA p.c.	1761	46	-4.2	6.81	3.865	1.004
log Pop.	1761	46	10.89	18.94	15.373	1.501
Nb. Of Natural Disasters	1761	46	0	12	1.006	1.487

Table A2: Test of Cross-Border Spillovers

	Civil Wars		Civil Wars & Minors	
	(A2.1)	**(A2.2)**	**(A2.3)**	**(A2.4)**
Log GDP p.c.	-0.0826***	0.2081**	-0.0885***	-0.2706**
	(0.01)	(0.09)	(0.02)	(0.12)
Log Pop.	-0.2789***	-0.5037***	-0.4122***	-0.2889**
	(0.08)	(0.10)	(0.11)	(0.14)
Log ODA p.c.	-0.0486**	-0.1530***	-0.0439***	-0.0010
	(0.01)	(0.04)	(0.01)	(0.06)
Log ODA p.c.	0.0052	-0.0094	-0.0031	0.0037
Neighbors	(0.01)	(0.01)	(0.01)	(0.01)
Res. Log GDP		-0.3020***		0.1910
p.c.		(0.09)		(0.13)
Res. Log ODA		0.1064**		-0.0428
p.c.		(0.04)		(0.06)
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Nb. of Obs.	1662	1662	1662	1662
Joint Res. Test	-	10.88***	-	2.33
F stat	2.16***	2.20***	2.34***	2.28***

Note : The columns present the findings of the same kind of estimation as in table 2, just adding the logarithm of the average level of foreign aid per capita in neighboring countries (deflated by the MUV index) in those estimations and in the reduced-form equation. Cape Verde, Seychelles and Lesotho are excluded from the sample. For the other islands of the sample the closest countries are used as neighbors. Stars refer to the standard convention: {***, **, *} mark the significance levels {1%, 5%, 10%}.

Table A3: Natural Disasters Exclusion Tests

	Civil Wars		Civil Wars & Minors	
	(A3.1)	**(A3.2)**	**(A3.3)**	**(A3.4)**
Log GDP p.c.	-0.0847***	0.0863	-0.1024***	-0.2921***
	(0.01)	(0.07)	(0.02)	(0.10)
Log Pop.	-0.2368***	-0.2359***	-0.2941***	-0.3057***
	(0.06)	(0.07)	(0.09)	(0.09)
Log ODA	-0.0463***	-0.1400***	-0.0410***	0.0248
p.c.	(0.01)	(0.04)	(0.01)	(0.07)
Nb. Natural	-0.0088*	-0.0020	0.0012	-0.0046
Disasters	(0.01)	(0.01)	(0.01)	(0.01)
Res. Log		-0.1789**		0.2008**
GDP p.c.		(0.08)		(0.10)
Res. Log ODA		0.0954**		-0.0659
p.c.		(0.05)		(0.07)
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Nb. Of Obs.	1761	1761	1761	1761
Joint Res. Test	-	6.36**	-	3.94
F stat	2.19***	2.18***	2.29***	2.24***

Table A4: Trend*French Colonies Exclusion Test

	Civil Wars		Civil Wars & Minors	
	(A4.1)	**(A4.2)**	**(A4.3)**	**(A4.4)**
Log GDP p.c.	-0.0810***	0.0435	-0.1014***	-0.3888*
	(0.02)	(0.16)	(0.02)	(0.23)
Log Pop.	-0.2667***	-0.2263***	-0.2971***	-0.2841***
	(0.07)	(0.07)	(0.09)	(0.10)
Log ODA p.c.	-0.0464***	-0.2113	-0.0402***	-0.1362
	(0.01)	(0.18)	(0.01)	(0.25)
Trend * Fr. Colonies	0.0006	-0.0019	0.0003	-0.0043
	(0.00)	(0.01)	(0.00)	(0.01)
Res. Log GDP p.c.		-0.1361		0.2975
		(0.16)		(0.23)
Res. Log ODA p.c.		0.1666		0.0951
		(0.18)		(0.25)
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Nb. of Obs.	1761	1761	1761	1761
Joint Res. T.	-	9.19***	-	3.49
F stat	2.15***	2.18***	2.29***	2.24***

Table A5: Trend*UK Colonies Exclusion Test

	Civil Wars		Civil Wars & Minors	
	(A5.1)	**(A5.2)**	**(A5.3)**	**(A5.4)**
Log GDP p.c.	-0.0906***	0.1906	-0.0914***	-0.0563
	(0.02)	(0.25)	(0.02)	(0.37)
Log Pop.	-0.2386***	-0.2404***	-0.3183***	-0.3159***
	(0.07)	(0.07)	(0.09)	(0.09)
Log ODA p.c.	-0.0490***	-0.1394***	-0.0386***	0.0262
	(0.01)	(0.04)	(0.01)	(0.07)
Trend * UK Colonies	0.0014	-0.0014	-0.0021*	-0.0032
	(0.00)	(0.00)	(0.00)	(0.01)
Res. Log GDP p.c.		-0.2832		-0.0350
		(0.26)		(0.37)
Res. Log ODA p.c.		0.0947**		-0.0673
		(0.05)		(0.07)
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Nb. of Obs.	1761	1761	1761	1761
Joint Res.Test	-	7.16**	-	0.94
F stat	2.17***	2.18***	2.32***	2.24***

Table A6: Conventional 2SLS with Tests of Instruments Validity:

	Civil Wars (1)	Civil Wars & Minors (2)
Log GDP p.c.	0.0964	-0.2692***
	(0.07)	(0.09)
Log Pop.	-0.2399***	-0.3150***
	(0.07)	(0.09)
Log ODA p.c.	-0.1481***	0.0064
	(0.04)	(0.06)
Country FE	Yes	Yes
Year FE	Yes	Yes
Nb. of Obs.	1761	1761
Under-Identification Test (Kleibergen-Paap rank LM statistics	45.40***	45.40***
Weak Idenitification Test (Kleibergen-Paap rank Wald F Stat)	15.22	15.22
Endogeneity test	8.63**	3.60
Sargan Test (overidentification test of all instruments)	0.12	0.33
Angrist-Pischke first-stage F test	44.40***	27.06***
Root MSE	0.2057	0.28
F Stat.	1.55***	1.97***

Note: 2SLS estimations using robust standard errors (in parenthesis) and tests from the xtivreg2 procedure of Stata. Stars refer to the standard convention: {***, **, *} mark the significance levels {1%, 5%, 10%}. See Angrist and Prischke (2009) and Baum, Schaffer and Stillman (2007) for the following tests:

Under-identification test (Kleibergen-Paap rank LM statistic): the test is equivalent to the Cragg and Donald test but more appropriate with robust covariance estimator. We reject the null and thus the matrix is full rank and we have identification.

Weak identification test (Kleibergen-Paap rank Wald F Stat): the test is equivalent to the test of Stock and Yogo but more appropriate with robust covariance estimator. The null hypothesis tested is that the estimator is weakly identified in the sense that it is subject to bias. The statistic is equal to 15.22, a F value above 10 indicates that the null can be rejected and thus there is no weak-instrument problem in estimation (1) and (2).

Endogeneity test: the null hypothesis tested is that the specified endogenous regressors can actually be treated as exogenous. We reject the null in (1) but not in (2).

Sargan test: test of over-identifying restrictions also known as the Hansen J statistic. The null hypothesis tested is that the full set of orthogonality conditions are valid. We do not reject the null for both equations.

Angrist-Pischke first-stage F test: tests of under- and weak identification when there is more than one endogenous regressor (Angrist and Pischke, 2009)). In contrast to the Kleibergen-Paap statistics, which test the identification of the equation as a whole, the AP first-stage F statistics are tests of whether one of the endogenous regressors is under- or weakly identified. In both estimations we reject the null.

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