Conflict and the identification of the Least Developed Countries: Theoretical and statistical considerations

Ana Luiza Cortez and Namsuk Kim*

Background

This paper reviews conflict as one of potential factors that could be incorporated in the identification of least developed countries (LDCs). It is not clear whether conflict can be considered as a structurally predetermined handicap as those identified in LDC criteria. More importantly, even if countries may be caught in a conflict trap, adding conflict indicators to the LDC criteria does not provide additional insights to enhance our understanding of the category . And adding conflict indicators is unlikely to introduce changes in country classification. Many of the factors associated with conflict are already incorporated in the indicators used to identify LDCs, and, therefore, the inclusion of an explicit conflict indicator – to capture the risk of falling into conflict given conflict in the past – in the LDC criteria would not affect the composition list of LDCs.

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Ana Luiza Cortez and Namsuk Kim

I.   Introduction

The category of least developed countries (LDCs) was created to attract special support measures for the most disadvantaged economies. According to the United Nations Committee for Development Policy (CDP)[2], a subsidiary body of the Economic and Social Council, LDCs are recognized as low-income developing countries which face severe structural handicaps to sustainable development (United Nations 2011).

The CDP views the identification of LDCs as a dynamic and open process, requiring occasional refinements of the indicators that compose the criteria in the light of socio-economic developments, advances in the theoretical and empirical research and ongoing improvements in the availability of reliable and internationally comparable data. The three criteria for the identification of LDCs are: (i) Gross National Income (GNI) per capita, (ii) Human Asset Index (HAI); and (iii) Economic Vulnerability Index (EVI). The HAI and EVI are composite indices of various indicators to measure the long-term structural weaknesses of the economies (United Nations 2008a).

There seems to be a strong association between armed conflicts, poverty and underdevelopment. Countries have become profoundly poorer as a result of conflicts, their economic activities severely stunted by persistent insecurity (United Nations 2005:10). Hence, conflicts are recognized as one of the major problems affecting the well-being of populations, endangering development and poverty alleviation. Low-income countries affected by conflicts might have less resilience to deal with external shocks as they may have fewer resources and policy instruments to mitigate the adverse impact of these shocks.

A conflict country in this paper refers to a country that is currently experiencing, or has recently experienced armed intra-state conflicts (post-conflict). To identify countries that are currently experiencing conflict, we use the list of countries which receive UN's peacebuilding support as of 2010. Post-conflict countries are understood as countries with armed intra-state conflicts that ended, or significantly diminished after the end of the Cold War (UNDP 2008:7).[3] Applying those definitions a total of 34 countries are thus identified as conflict countries, 23 of which are LDCs (see table 1)

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1   A preliminary version of this paper was presented at the expert group meeting on the Committee for Development Policy on climate change, conflict and other issues related to the review of the criteria for the identification of LDCs, held in New York, 2-3 February 2011. Comments by Frances Stewart, Hans Opschoor, Philippe Hein, Olav Bejrkholt, and Rob Vos are greatly appreciated. This paper, however, does not necessarily reflect their views.

2   The CDP is responsible for undertaking a review of the list of the LDCs, on the basis of which it advises the Council regarding countries which should be added to the list and those that could be graduated from it. For more information on the CDP and the LDCs, see http://www.un.org/en/development/desa/policy/cdp/index.shtml

3   A country currently in conflict is a recipient country of UN Peacebuilding and Recovery Facility and Immediate Response Facility as of November 2010 (http://www.unpbf.org/index.shtml). On post conflict countries see Sambanis (2004) and Doyle and Sambanis (2006) for more information on the definition of post-conflict countries.

Table 1:   List of LDCs and conflict countries

	LDCs (48 countries)		
		Conflict countries (34 countries)	
	Group 1: Non-conflict LDC	Group 2: Conflict LDC	Group 3: Conflict non-LDC
	BANGLADESH	AFGHANISTAN	CONGO
	BENIN	ANGOLA	COTE D'IVOIRE
	BHUTAN	BURUNDI	EL SALVADOR
	BURKINA FASO	CAMBODIA	GUATEMALA
	DJIBOUTI	CENTRAL AFRICAN REPUBLIC	INDONESIA
	EQUATORIAL GUINEA	CHAD	KENYA
	GAMBIA	COMOROS	LEBANON
	KIRIBATI	CONGO, DEM. REP.	NAMIBIA
	LAOS	ERITREA	NICARAGUA
	LESOTHO	ETHIOPIA	PAPUA NEW GUINEA
	MADAGASCAR	GUINEA	SRI LANKA
	MALAWI	GUINEA-BISSAU	
	MALI	HAITI	
	MAURITANIA	LIBERIA	
	MYANMAR	MOZAMBIQUE	
	NIGER	NEPAL	
	SAMOA	RWANDA	
	SAO TOME AND PRINCIPE	SIERRA LEONE	
	SENEGAL	SOLOMON ISLANDS	
	TOGO	SOMALIA	
	TUVALU	SUDAN	
	UNITED REPUBLIC OF TANZANIA	TIMOR-LESTE	
	VANUATU	UGANDA	
	YEMEN		
	ZAMBIA		
Number of countries	25	23	11
Average Gross National Income (GNI) per capita (U.S. dollars)	1138.4	450.4	1916.1
Average Human Asset Index (HAI)	54.6	35.4	69.5
Average Economic Vulnerability Index (EVI)	49.6	50.9	34.4

Source: calculated from United Nations (2009) and UNDP (2008:7)

Note: Azerbaijan, Bosnia and Herzegovina, Croatia, Georgia, Kosovo, and Tajikistan are excluded from the list of conflict countries due to the lack of data. GNI, HAI, and EVI are un-weighted averages based on the 2009 triennial review of the list of LDCs.

The three criteria used for the identification of LDCs reflect, to some extent, the consequences of armed conflicts. Non-conflict LDCs have on average higher GNI and HAI scores than conflict LDCs. But higher income and HAI outcomes -as well as lower vulnerability- do not necessarily imply the absence of conflict (see column 3).

There seems to be correlation between the emergence and recurrence of conflict and having the LDC status. In the last two decades the average number of civil conflicts per country has become significantly higher in LDCs than in other developing countries (see the Annex for a comprehensive list of armed conflicts from 1946 to 2008). Yet, conflict-related indicators are not explicitly included in the present LDC identification criteria. Thus, a pertinent question is whether conflict could be an additional factor leading to LDC conditions or, conversely, whether LDC features favor the emergence of conflict. In other words, is conflict a structural impediment to development? And if so, how can it be best captured in the LDC criteria?

This paper reviews conflict as one potential factor to be taken into consideration in the identification of LDCs. This paper is structured as follows: section 2 reviews the literature on the root causes of armed conflict, and whether armed conflict itself could be a structural impediment to development. Section 3 examines the correlation between conflict indicators and existing LDC indicators, and tests whether there will be additional countries which become eligible for LDC inclusion when conflict indicators are added in the criteria. Section 4 concludes.

2.   Armed conflict: an outcome of problems or a problem itself?

Conflict has major consequences for all aspects of human life. For countries at a lower developmental stage, such as the LDCs, conflict could be a major handicap particularly when it leads to a persistent conflict trap. Major episodes of armed conflict that are listed in the Annex suggest that a significant number of countries experience repeated violence.

Conflict impacts

Armed conflicts have severe consequences for poverty and development, which could lead to conflict recurrence (Sambanis 2004). Civil wars have therefore been called "development in reverse" as they divert resources from productive economic activities and from public expenditures for social goods that advance development (Collier and others 2003:13). They incur direct human costs, and longer-term development costs through loss of household assets, destruction of infrastructure essential for both human well-being and for successful agriculture and trade, as well as loss of confidence in institutions, leading to lawlessness and capital flight (Stewart and others 2001). From 1990 to 2006, more than 3 million people died in armed conflicts in developing countries (Marshall 2006).

The death toll from armed conflicts was significantly higher for conflicts in LDCs in the 1990s[4]. Battle-related deaths in civil conflict were on average 1.5 per 1,000 people in LDCs in the 1990s while the figure was just 0.2 for non-LDCs (Guillaumont 2008: 223). Additionally, the number of non-combat deaths has been increasing and the total war-related deaths far exceed battle deaths: the total war deaths were estimated as 1.2 million in Ethiopia during 1976-1991, while only 2 per cent of them occurred in the battlefields (Lacina and Gleditsch 2004). In Sudan, 2 million people died in war during 1983-2002, but

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[4]   Civil conflicts in Iraq might be one of the large scale conflicts in non-LDCs, but the death toll estimates are not reliable for many of the years. See PRIO Battle Deaths Dataset 1946-2008
[http://www.prio.no/CSCW/Datasets/Armed-Conflict/Battle-Deaths/].

the percentage of battle deaths was only 3 per cent of that total (UNDP 2008:24). There is ample evidence of the negative impact of conflict on economic growth. Rodrik (1999) argues that the domestic conflict is one of the key factors to understand why growth rates are not sustained, and conflicts were the major factor which caused many countries to experience a growth collapse from the mid-1970s. Cerra and Saxena (2008) show that recessions associated with civil wars are, on average, 10 percentage points deeper and last ten more months longer than a typical recession. Chen and others (2008) examine 41 countries (of which 16 are LDCs) involved in internal wars over the period 1960–2003, and conclude that the cost of war is reflected in the substantial drop in per capita income suffered by conflict countries during war. Moreover, the loss of GDP per capita is significant even if the war is brief and this loss increases gradually with the war's duration. Figure 1 describes the changes in GDP per capita in post-conflict countries. It shows that longer conflicts tend to take a slightly greater toll on growth.

Figure 1: Changes in GDP per capita in selected conflict countries between start and end years of civil wars
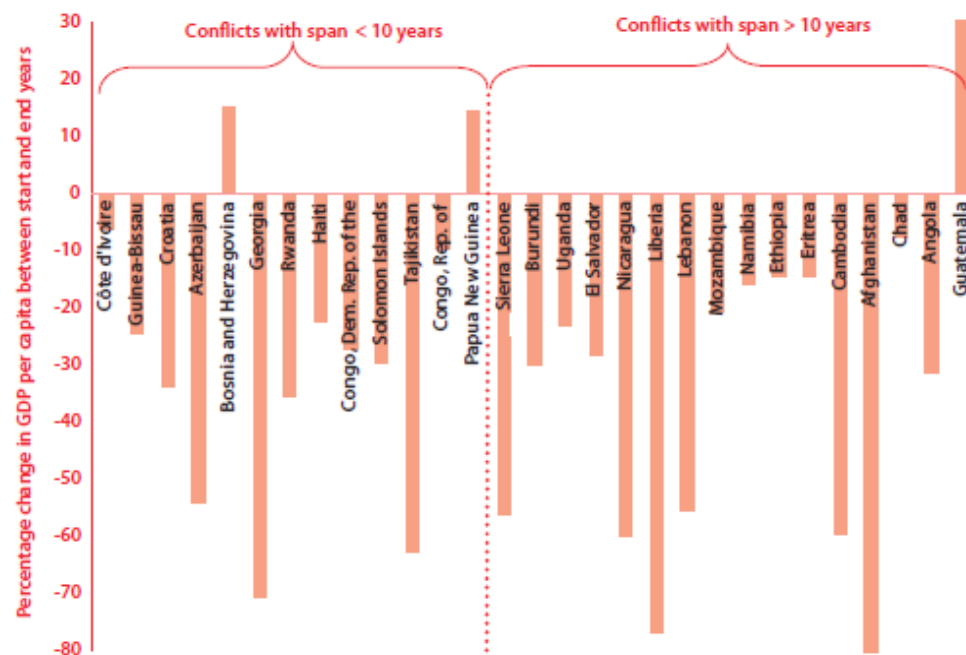
Source: UNDP (2008:38)
Note: Countries are ranked from left to right; countries with the shortest conflicts are on the left and those with the longest on the right. The conflict considered are those during which economic activity is expected to have been most affected on a continuous basis.

There is no doubt that violent conflict is one of the most extreme obstacles to freedoms and advancing rights, and forms a major threat to all aspects of human development (UNDP 2005:151). Justino and Verwimp (2008) find that the civil war and genocide in Rwanda during the period 1990-2000 had major negative impacts in all provinces: richer provinces in the east and in the north of the country experienced lower, even negative, economic growth, becoming as poor as the western and southern provinces. Nearly all human development indicators, including those used in the identification of the LDCs, deteriorate during wars, and improve during post-war periods only slowly. This not withstanding, the human development impact of conflict is significant also in the long-run. Alderman and others (2006) find that the civil war in Zimbabwe (1973-1979) had a permanent effect of malnutrition on children, resulting in lower labor productivity. Bundervoet and others (2008) also show that young children in Burundi affected by civil wars display worse health-scores than non-affected children. Shemyakina (2010) finds that in Tajikistan from 1992 to 1998, exposure to the conflict had a significant negative effect on the enrollment of girls of ages 12-15.

However, there are marked differences across countries in terms of the economic and social costs of war (Stewart and others 2001). In some cases, conflict does not lead to a decline in indicators at the national level. For example, oil production in the Sudan and Chad boosted overall economic growth rates even when armed conflicts produced huge casualties and displaced large segments of the population. Positive outcomes at the national level in the presence of conflicts mask the negative consequences of conflicts, such as widening inequality and human suffering. For instance, from 1990 to 2004, while the national human development index (HDI) for Uganda improved from 0.41 to 0.5, the poverty rate was twice as high, and under-five mortality remained three to four times higher than non-conflict areas (Fukuda-Parr and others 2008).

What causes conflict?

There is no simple answer to this question. In fact, a great number of channels and mechanisms through which potential social, political and economic triggers can lead to conflict have been studied. Gardner (2005) summarizes four key variables which have been frequently mentioned in the literature: insecurity, inequality, private incentives and perceptions.

Insecurity is a key variable in the presence of a security dilemma. The security dilemma refers to situations when conflict is a result of security-seeking behavior. The inability of the state to protect all groups within its borders spurs various groups to elevate the provision of security to a primary concern, and attempts to increase security by one group may decrease the perceived security of another group, often resulting in conflicts (Walter 1999; Snyder and Jervis 1999).

Inequality can be another key variable for conflicts, especially, horizontal inequality which is defined as differentials or deprivation across recognizable groups in society. This type of inequality can be measured across multiple dimensions including political participation, economic endowment, human assets, and social status. Although the existence of horizontal inequality does not always cause armed conflict, group inequalities underpin grievances that are important to mobilization for conflict (Stewart 2005). This factor is discussed in detail in the next section.

The political and economic incentives for potential leaders and potential followers can also be relevant to understanding conflict. Leaders may be motivated by political goals or economic gains. Those in power are likely to initiate conflict when they feel threatened, and those not in power use conflict to gain power. Followers can also have private incentives. Stewart (2005) describes how ethnicity and ideology are used by leaders pursuing political goals. Collier (2006) models the greed factor of both leaders and followers, showing that when the incentives for group leaders to fight over control of the state are high and the costs of recruiting followers are low, then the probability of conflict increases.

Lastly, perceptions are a major factor in understanding conflict. The group identity and the degree of group cohesion are crucial to facilitate mobilization of rebel groups. Ethnic cleavages, divergence in religion, group inequalities and grievances can be created and magnified by perceptions through histories, fears and myths. Perceptions are used instrumentally to create or exacerbate other causes of conflict (Lake and Rothchild 1998).

As for the direct conditions for the outbreak of armed conflicts, a recent strand of literature suggests that economic conditions are important determinants of the outbreak and recurrence of conflict. In particular, civil wars often start following growth collapses (Collier and others 2009). Sharp economic slowdowns and low levels of income per capita appear to increase the likelihood of conflicts. One of the most robust

findings in the literature is that negative economic conditions (low income, slow growth, and especially severe economic downturns) are correlated with the outbreak of conflict, with some evidence strongly suggesting that the causal direction runs from economic conditions to conflict (Collier and Hoeffler 2004). Low human development also seems to be related to the likelihood of conflict. Half of the countries experiencing conflicts since 1989 are in the bottom quartile of the UNDP's HDI ranking. With one third of the remaining countries in the next quartile, over 80 per cent of the countries that have experienced civil conflicts are in the bottom half of the HDI distribution (Panic 2005:3).

Understanding the role of inequality in conflict

It is interesting to note that vertical inequality, that is to say inequality among individuals, does not seem to be a relevant factor for conflict. Collier and Hoeffler (2004) and Fearon and Laitin (2003) find no statistical effect of vertical inequality, measured by the Gini coefficient, on the likelihood of civil war. Cramer (2003) suggests that economic inequality is important for explaining civil conflict, but that the links are only indirect. Østby (2008a) discusses that measures of vertical inequality neglect the group aspect of inequality, and results from panel, and cross-sectional analyses of 36 countries between 1986 and 2004 show that vertical inequality is not significant for conflict outbreak.

Horizontal inequality seems to have much stronger relationship with the risk of armed conflict. Stewart (2008) defines horizontal inequalities as inequalities between culturally defined groups or groups with shared identities. These identities are commonly defined by religion and ethnicity, but other factors can also bind groups of people. The identity basis of conflicts has become more explicit since the end of the Cold War. Marshall (2006) classifies conflicts into three groups, inter-state, revolutionary, and ethnic warfares, and suggests that the proportion of ethnic conflicts increased from 15 per cent in 1953 to nearly 60 per cent by 2005.

When sharp horizontal inequalities exist, violent political mobilization might become feasible. Significant and consistent horizontal inequalities in political and economic aspects are very likely to trigger violent political mobilization. For instance, Stewart (2002) argues that consistent and acute horizontal inequalities in political and economic spheres provoked rebellions in South Africa. Langer (2008) also shows simultaneous presence of severe horizontal inequalities in political, socio-economic and cultural status provoked violent conflicts in Côte d'Ivoire. Studies using a large sample of countries, such as Østby and others (2009) and Cederman and others (2010), also reach the conclusion that severe horizontal inequalities across groups are likely drivers of conflict behavior.

The identification and measurement of horizontal inequalities that may lead to violent conflict are not easy tasks (Mancini and others 2008). According to Montalvo and Reynal-Querol (2005), who examine 138 countries for the period 1960-1999, ethnic polarization is a significant explanatory variable for the incidence of civil wars. However, Østby (2008a) suggests that social polarization (measured by education years using Esteban and Ray (1994)'s formula) and horizontal social inequality are positively related to conflict outbreak, while purely ethnic polarization or combined ethnic/socio-economic polarization are not.

However, the existence of any of the conflict enabling factors, such as horizontal inequality or low income, does not automatically result in actual armed conflict. For example, there are complex mechanisms at play between the existence of horizontal inequalities and violent mobilization. Horizontal inequalities should exist at a significant and persistent level, grievances and salience of group identity should be formed by the sharp horizontal inequalities, then violent conflict can occur between mobilized groups under some

political and economic conditions (Stewart 2008). Some countries with high horizontal inequalities, such as Bolivia and Ghana, successfully manage their inequalities in a peaceful manner by inclusive policies. The Ghanaian Government employed consistent policies over the years to diffuse the north-south division. The Government has included different ethno regional groups in various policy making processes, undertook economic redistribution towards the deprived northern regions, and promoted norms and practices of cultural equality and inclusiveness in order to achieve national unity (Langer 2009; 2008). Bolivia had a similar strategy to include representatives of deprived groups in government since early 1990s (Caumartin and others 2008). These comparative studies suggest that political arrangements for including disadvantaged groups are likely to diminish the likelihood of conflict (Stewart and others 2008).

Conflict as a cause of conflict

Countries such as Burundi, Indonesia, Iran, Iraq, Rwanda, and Sri Lanka have all experienced recurring civil wars over time. At the same time, single episodes of civil war like those in Greece and Costa Rica are not uncommon (see Annex). Empirically, 36 per cent of civil wars that started during the period 1945-1996 were followed by an additional war (Walter 2004:371).

One of the most reliable predictors of whether or not a country will experience a new civil war is past occurence of wars (Collier and others 2004; Auvinen and Nafziger 1999). One estimate suggests that a typical country reaching the end of a civil war faces as high as 44 per cent risk of returning to conflict within five years (Collier and others 2003:83). But others estimate lower (although still significant) risks of recurrence of around 20 per cent (see Suhrke and Samset 2007). Conflict traps emerge in multiple ways: as conflict causes both human and financial capital flight, the shortened investment horizons result in reduced incomes and lack of employment. They in turn raise the risk of conflict (United Nations 2008b:124).

Figure 2 illustrates a conflict trap, based on predicted risk of war for a typical country in each country group estimated from 156 countries between 1960 and 1999. The analysis considers countries as post-conflict states at any given time if those countries are within 10 years after a war ended. Non-conflict countries (at peace) are those that have not experienced civil wars in the last 10 years of the period of analysis. "Successful developers" are defined as middle- and low-income countries with reasonably good economic policies as identified by the Country Policy and Institutional Assessment (CPIA) scores, while "marginalized countries" are low-income countries with low CPIA scores (Collier and others 2003: 101). The analysis indicates that each year 0.7 marginalized countries at peace will go from a state of established peace to war, whereas the same development will take place in only 0.3 successful developers at peace, indicating the greater risk of conflict occurence among low income countries with low CPIA scores. During the period of analysis, each year saw two countries move from active conflict to post-conflict status, (wars ended in two countries), while one post-conflict country fell back to active conflict status (war broke out anew in one country). The probability of high income countries going from peace to active war was found to be negligible at only 0.05 countries per year. Altogether, each year two countries went to active war, one being new conflict, and the other recurrent. Marginalized countries are at greater risk (0.7 countries per year) than successful developers (0.3 countries) to go into new war. Collier and others (2003:110) simulate the model based on past growth rates of each country group, past distribution changes across country groups, and the past likelihood of conflicts for each county group. The result suggests that the outbreak of war becomes increasingly concentrated in the marginalized and post-conflict countries, with their share of global conflict projected to rise from 82 per cent in 2000 to 94 per cent by 2050.

Figure 2: Conflict trap 2000, annual flows into and out of conflict
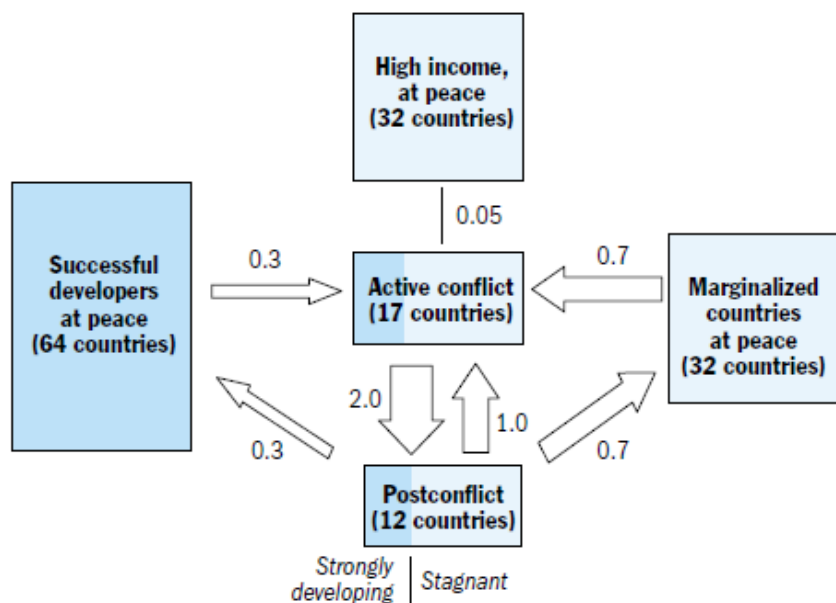
Source: Collier and others (2003:109).

Note: Numbers next to the arrows indicate the number of countries per year that move between the different states of conflict in the self-sustaining state. Numbers in boxes indicate the self-sustaining number of countries in each conflict state. The probability of transition and self-sustaining state is estimated based on Collier and Hoeffler model (2002).

Why do some countries experience recurring conflicts, while others don't?

Explanations for repeated wars tend to focus on three factors: (i) reasons why the original war began, (ii) how the original war was fought, and (iii) how the original war ended. Earlier wars set the stage for conflicts that occur in later years because the original grievances were not resolved, because violence exacerbated group divisions, or because war ended in unstable compromise settlements (Doyle and Sambanis 2000). Easy recruitment of rebel forces is another important factor to determine whether war would recur (Walter 2004). Civil war might be unlikely to resurface unless a number of conflict-enabling factors remain unsolved by appropriate policy measures after the original war ends.

Conflict and the identification of LDCs

Vulnerability according to LDC criteria has a structural character and is defined as the relative risk posed to a country's development by exogenous shocks (United Nations 2008a:48). Is conflict a structural impediment to development? A structural impediment is a feature that a country inherits from the past and cannot be readily changed. This acts as a serious obstacle to development. It is certainly true that conflicts can act as an impediment to growth. It could consequently also be argued that having had conflict in the recent past may represent an impediment to development because recurrence of conflict is likely, and is also something that cannot be easily changed.

Is conflict structural?

It is not clear, however, whether conflict is a structural and/or an exogenous risk which affects LDCs. In the past, the CDP has not considered politically generated shocks a source of structural vulnerability; conflicts are assumed to be less exogenous and their likelihood is less easy to assess (Guillaumont 2009:175). Although domestic conflicts may have external triggers, it is often the case that such conflicts are rooted in internal causes, against which, in principle, action might be taken. In this regard, it has been argued that

while domestic conflict can accentuate and perpetuate underdevelopment, it is not an exogenous, unforeseen event that is beyond a country's control.

The CDP understands economic vulnerability as resulting from the outcome of the interaction of exposure (determined by structural factors), size and frequency of shocks (exogenous events such as those caused by natural and environmental hazards and those caused by trade and exchange) and resilience (capacity to react to shocks, admittedly a combination of structural factors and the quality of policy and institutions). The first two components are reflected in the economic vulnerability index (EVI), while resilience is indirectly captured by the other two criteria, namely, the gross national income (GNI) per capita and the human asset index (HAI) as well as by EVI to a certain extent [5]. However, it could be argued that some aspects of vulnerability, as defined by the Committee, may be less structural than claimed. In principle, structural economic vulnerability could be circumvented as well, at least over the medium to long term, e.g. by diversification out of primary products, in much the same way as, in principle, the risk of conflict recurrence can be avoided.

Guillaumont (2009:222) argues that conflict should not be included in the LDC criteria because (i) it is less structural and less exogenous to current policy than other components of the EVI; (ii) it is, to a significant degree, an outcome of structural economic vulnerability; and (iii) conflict is both a cause and a consequence of the structural instabilities already reflected in the EVI. In practical terms, it might be also difficult to assess the underlying structural factors of conflict, and to generate measurable indicators for a wide range of developing countries, in particular the least developed among them.

In sum, evidence suggests that conflict has devastating repercussions including increasing the risk of the recurrence of conflict in the future and therefore the economic vulnerability of countries. While the causes of conflict are not as clear as its consequences, there are a number of key factors which are frequently studied in the literature. Some of the causes stem from long term factors (often associated with colonialism, which contributed to, for example, many of the horizontal inequalities that are in evidence today). Other triggers of conflict are related to repeated policy failures, and therefore, conflict might not be considered independently of recent public policies.

As shown above, it is not clear whether conflict can be considered as a structural handicap as those identified in LDC criteria. However, it could be argued that conflict in the past might be regarded as a predetermined factor, increasing the probability of falling back in conflict. If this is the case, how should conflict be incorporated in the LDC criteria? Is the risk to fall into conflict already captured by the existing indicators included in the LDC criteria? Alternatively, should a new conflict indicator need to be introduced? These issues will be examined in the subsequent sessions.

3.   Conflict and LDC criteria

This section reviews empirical evidence in the literature on the correlation between conflict and various economic and social indicators. It then examines the relationship between conflicts and the present main indicators included in the LDC criteria, and provides results of simulation with conflict indicators added in the LDC criteria.

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5   For details see *Handbook on the Least Developed Country Category: Inclusion, Graduation and Special Support Measures* (United Nations sales, Publication No. E.07.II.A.9)

As mentioned above, three criteria are used to classify countries as LDCs: GNI per capita, HAI and EVI. The HAI is a combination of four indicators related both to the level of health and nutrition and to the level of education: (i) the percentage of population that is undernourished; (ii) the rate of mortality for children aged five years and under; (iii) the gross secondary school enrolment ratio; (iv) the adult literacy rate. All four indicators carry equal weight in the calculation. The EVI is composed of six indicators to capture the relative risk posed to a country's development by exogenous shocks. Figure 3 shows the composition of the EVI.

Figure 3:   Composition of the Economic Vulnerability Index (EVI)

Source: United Nations (2011)

Note: Numbers in parentheses indicate the weights of a particular component or index in EVI.
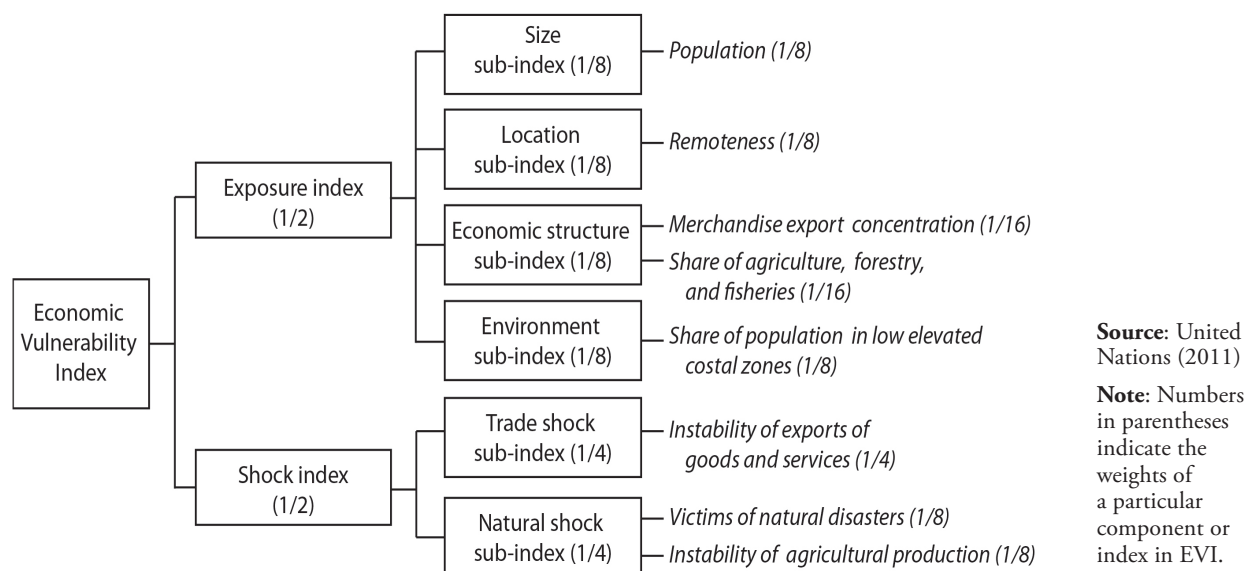
Future outbreak of armed conflict could be strongly associated with the income level of a country. Figure 4 suggests that the GDP per capita is negatively correlated with the probability of observing a new conflict, which is estimated by Collier-Hoeffler (2002) model.[6] While this is a simple projection based on the correlation between income and conflict (not necessarily implying a causal relationship), it suggests that being a poor country is statistically correlated with most forms of violence, except terrorism. Based on this model, a typical LDC—because of its low level of GNI per capita— is likely to have about 3.5 times higher probability of observing a new violent conflict than an average developing country.[7] It is important to note that regression models designed to find the relationship between conflicts and economic indicators are subject to misspecifications, omitted variables and endogeneity problems, and, therefore, the results should be carefully interpreted.

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6   The model estimates the probability of observing a new conflict based on the GDP per capita and other control variable for 161 countries in the period of 1960-1999.

7   Calculated from World Bank (2010) and Humphreys (2003).

Figure 4:   GDP per capita and the probability of observing a new violent conflict
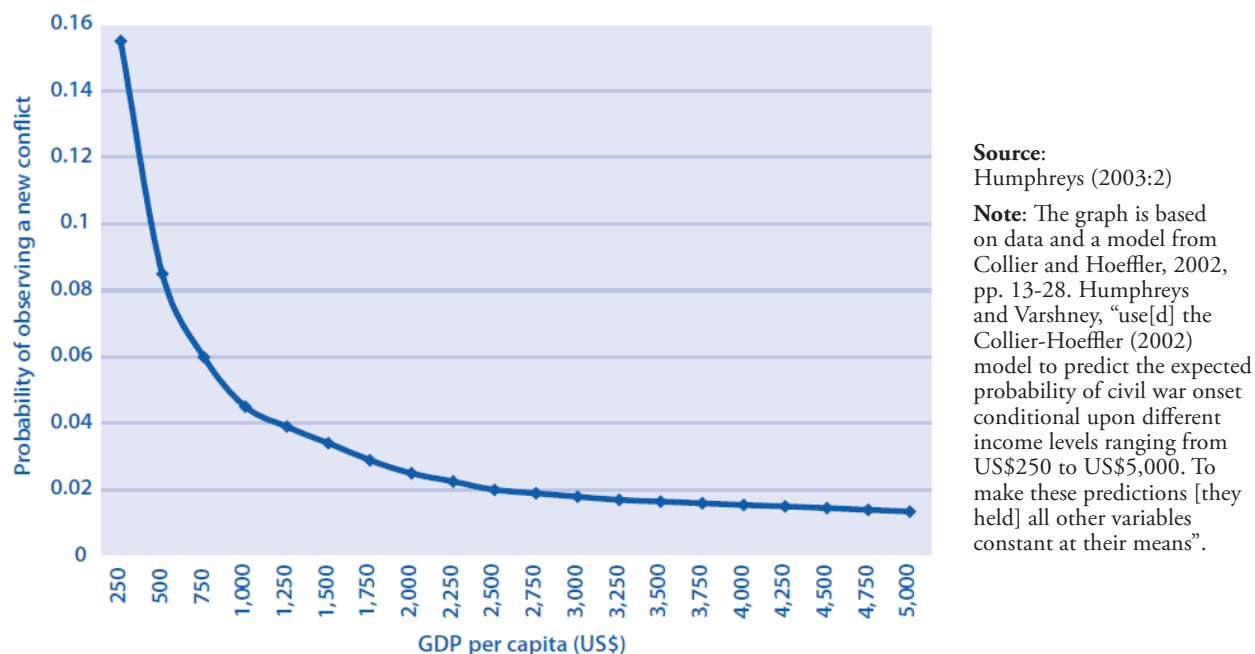
There is also evidence that the probability of armed conflict onset is higher in countries with low socio-economic outcomes than in countries with higher outcomes. Figure 5 presents selected socio economic indicators of conflict countries expressed as a share of corresponding values in non-conflict countries (Pinstrup-Andersen and Shimokawa, 2008).[8] The indicators are five-year averages before armed conflicts occurred, in order to control for the effects of ongoing or previous conflict on socio-economic factors. The headcount poverty index in conflict countries (prior to the outbreak of the conflict) was 31 per cent higher, the poverty gap index was 57 per cent higher, child mortality rates were 102 per cent higher, child malnutrition rates were 50 per cent higher, and under-nutrition rates were 45 per cent higher in conflict-onset countries than non-conflict countries. GDP per capita, annual GDP growth rate, and the proportion of the population having access to safe water source are 43–62 per cent lower in conflict countries, compared to those in non-conflict countries.

The present LDC criteria may already include some of the socio economic indicators that are usually correlated with conflict. Table 2 shows the average of each component of indicators used in LDC criteria, for seven country groups: (i) all developing countries, (ii) non-LDCs, (iii) low and lower middle income countries, (iv) low income countries, and (v) LDCs total, (vi) conflict LDCs, and (vii) non-conflict LDCs. The composition of EVI presented in table 2 was applied in the 2009 triennial review of the LDC category and is different from the one presented in figure 3[9]. A simple way to examine whether the conflict is associated with these indicators would be to compare the sample averages of these indicators separately for conflict and non-conflict countries using all developing or underdeveloped countries data. However, such exercise might not reveal the differences between conflict and non-conflict countries because differences in other socio-economic characteristics that are likely to be associated with the conflict indicator might bias the result. As

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8   Developed countries are included in the non-conflict countries, but they are excluded in the analysis in some cases where the indicators are not available, such as poverty related indicators.

9   For almost all LDC indicators, differences between conflict and non-conflict countries become larger and statistically more significant when we examine all developing countries, than when we focus on LDCs only.

the LDCs are countries that share common structural problems and some socio-economic characteristics, comparing the indicators for conflict and non-conflict countries only within the LDCs might therefore be more informative since it would help control for other socio-economic differences across countries. Therefore, the last column in table 2 reports the difference in sample means for two groups within the LDCs (conflict LDCs versus non-conflict LDCs), and the two-tailed t-test results.[10]

Figure 5:   Selected socio-economic indicators in conflict countries (non-conflict countries = 1.0) 1980-2005
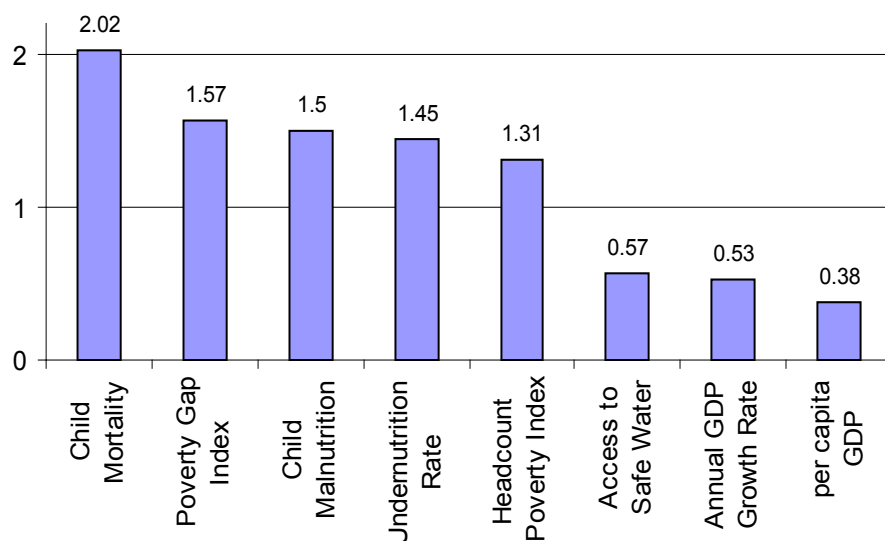
Source: Pinstrup-Andersen and Shimokawa (2008: Figure 1).

Note: calculated from five year averages before the first conflict outbreak. Number of total sample countries is 146.

The EVI seems to reflect some of the variation between conflict LDCs and non-conflict LDCs, but the statistical relationship is not strong. The EVI is higher for LDCs (50.6) than non LDCs (37.6). As the sample average for conflict LDCs (50.9) is almost the same as that of non-conflict LDCs (50.4), the difference presented in the last column (0.5) is statistically zero and the sample means are statistically the same.

There is variation across components within EVI in terms of the correlation with conflict countries. The EVI consists of two main components: (1) Exposure Index and (2) Shock Index. Although the Exposure Index is significantly higher for LDCs than non-LDCs, there is not a large difference between conflict LDCs and non-conflict LDCs. The sample means (46.3 and 52.4) are statistically the same. It might be because two of the three sub-components of the Exposure Index, which contributes 75 per cent of the indicator, are not likely to be affected by conflict. Population size (which accounts for 50 per cent of the Exposure Index) is slightly larger in conflict LDCs, and the Remoteness indicator (which accounts for 25 per cent of the Exposure Index) is lower in conflict LDCs, but they are not statistically different from the averages in non-conflict LDCs.

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10   We assign 100 instead of 1 to be consistent with other components of EVI, such as population, remoteness index, etc.

Table 2: LDC indicators for conflict and non-conflict countries (2009 review)

Indicators (actual values)	(i) All developing	(ii) non-LDCs	(iii) Low and lower-middle income	(iv) Low income	LDCs			
					(v) LDC Total	(vii) Conflict LDCs	(viii) non-conflict LDCs	Diff [1]
EVI	42.5	37.6	44.6	48.0	50.6	50.9	50.4	0.5
Exposure index	43.3	39.6	43.3	44.3	49.5	46.3	52.4	-6.1
Population (million)	41.7	56.8	54.3	21.2	16.8	18.0	15.7	2.3
Remoteness	50.8	47.7	53.4	56.1	56.0	53.6	58.2	-4.6
Structural index	35.3	25.7	41.5	53.1	51.3	57.0	46.2	10.8**
Export concentration	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.0
Shares of agriculture, forestry and fisheries in GDP	18.4	10.9	25.3	36.8	30.8	38.1	24.4	13.6***
Shock index	41.7	35.6	45.9	51.6	51.7	55.5	48.3	7.1*
Natural Shock index	40.3	36.9	42.7	45.8	45.8	42.3	48.9	-6.6
Percentage of homeless	1.6	1.2	2.0	1.8	2.3	1.1	3.3	-2.2**
Agricultural instability	6.6	6.6	6.2	6.7	6.6	6.0	7.1	-1.1
Export instability	16.8	14.0	18.7	21.4	21.4	25.0	18.3	6.7***
HAI	68.8	82.7	57.8	40.9	45.8	35.4	55.1	-19.6***
Prevalence of undernourishment in total population (%)	17.8	10.6	23.3	33.8	29.6	39.4	21.0	18.4***
Under 5 mortality (per 1000)	81.1	45.1	108.5	151.6	140.6	165.5	118.6	46.9***
Adult literacy rate	76.9	86.8	69.0	56.4	60.4	53.9	66.2	-12.3**
Gross secondary enrolment ratio	60.8	76.8	47.5	30.7	34.3	26.2	41.4	-15.2***
GNI per capita (USD)	4253.3	6313.5	1070.1	380.4	847.6	450.4	1198.9	-748.5**

Source: calculated from United Nations (2009).
Note: [1] The column reports the difference in sample means between conflict and non conflict countries in the LDCs category
* denotes that the null hypothesis of Diff being equal to zero can rejected at 10 per cent of confidence level by two tailed t-test, ** denotes 5 per cent and *** denotes 1 per cent.

However, the Structural Index which is a component of the Exposure Index is statistically higher for conflict LDCs than non-conflict LDCs (57 and 46.2, respectively). The Structural Index is the average of two sub-components, (1) the Export Concentration and (2) the Share of Agriculture, Forestry and Fisheries. The difference in the Structural Index seems to be driven by the substantially high share of agriculture, forestry and fisheries in conflict LDCs (38.1 per cent) compared with non-conflict LDCs (24.4 per cent).

The Shock Index consists of two subcomponents: (1) Natural Shock Index, and (2) Export Instability. It is higher for conflict LDCs (55.5) than non-conflict LDCs (48.3). This difference seems to be driven by the larger instability of exports in conflict LDCs (25) than in non-conflict LDCs (18.3). This paper examines only the correlation, not intending to establish any causal relationship. Guillaumont and others (2007:340) suggest that the instability in export earnings and related relative price instability are likely to lead to political instability and conflict. Reverse causation is also probable.

Unlike the EVI, the HAI and all of its sub-components are very strongly correlated with conflict. The HAI is lower for conflict LDCs (35.4) than for non-conflict LDCs (55.1), and we can reject the null hypothesis that the difference (-19.6) is statistically equal to zero at 1 per cent of confidence level. Likewise, the prevalence of undernourishment and under 5 mortality rate are much higher for conflict LDCs, while literacy rate and secondary enrolment ratio are much lower for conflict LDCs.

The results of the above exercises suggest that the indicators in LDC criteria reflect in part the economic and social characteristics associated with observed violent conflict. All components of HAI, a few components on economic structure of EVI and the level of GNI per capita are strongly correlated with conflict. Thus, some of the conflict-related factors seem to be reflected already in the main indicators in the present LDC criteria.

Conflict indicators in the EVI

There might be cases where giving some weight to conflict in the EVI would suggest a possible reclassification of LDC and non-LDC countries. We simulate these cases by adding some conflict indicators explicitly in the EVI (values of 2009 review). The result suggests that Côte d'Ivoire could be eligible for LDC inclusion but only if the weight assigned to conflict in EVI is very high, which is not compatible with the concept of LDC.

The UCDP/PRIO Armed Conflict Dataset is the main data source used in the simulations. Included in the analysis are interstate conflicts, internal armed conflicts and internationalized internal conflicts. All are restricted to war episodes (at least 1,000 battle deaths a year), as the objective of this exercise is to focus on major events leading to development disruption. Colonial conflicts did not occur in the period of analysis, and therefore were excluded. To be consistent with the current literature, analysis is restricted to the period 1990-2008.

Simulations are carried on the basis of alternative concepts of conflict indicators. The EVI includes two components: an exposure component (exposure index) and a shock component (shock index). As discussed above, past conflicts could be related to both components. Countries which experienced conflicts in the past might be exposed to another conflict in the future (exposure component). Outcomes of past conflicts also represent the realized adverse impacts of external shocks (shock component). To be compatible with the current methodology to measure the EVI, conflict indicators could be included in the exposure component, and in the shock component, as follows:

    a.   **Two alternative concepts of exposure to conflict:**

Conflict in the past ($x1$): According to the literature, conflict exposure is higher in countries which had conflict in the past. But the empirical relationship between past conflict and the risk of future conflict is highly non-linear, and sensitive to the definition of the "past" and the methodology to estimate the risk of future conflict. For the simulation, a simple binary indicator was used and it is equal to 100 if a country had a conflict within a given period and 0 otherwise.[11] That given period was taken to be the average number of years that countries in the dataset took to fall back into conflict during the period of analysis (1990-2008). The dataset suggests that the average period between conflict and conflict recurrence is 6 years. Therefore, $x1$ is equal to 100 if the country had a conflict in 2003-2008.

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    11   We assign 100 instead of 1 to be consistent with other components of EVI, such as population, remoteness index, etc.

Frequency index (x2): We use a frequency index, i.e., the weighted average number of conflict years divided by the total number of years in 1990-2008. We assume that the more frequently the country has conflict, the higher the exposure to future conflict. Recent conflicts are assigned larger weights than older conflicts as the risk of recurrence seems to larger in the period following a cease fire. Thus, conflict in year T is weighted by $(T-1990+1)/(1+2+\ldots+19)$. For example, the frequency index for a country which had one year of conflict in 1990 would be 0.5 per cent (=1/190), while the frequency index for a country which had one year of conflict in 2008 would be 10 per cent (=19/190). The frequency index would be 100 percent $(=1+2+\ldots+19)/190)$ for countries which are always in conflict.

b. **Two alternative concepts of conflict shock:**

Battle deaths (y1): We use the cumulative battle deaths (soldiers and civilians killed in combat) from 1990 to 2008, as percentage of population in 2008. The data source is the Battle Deaths Data by UCDP/PRIO (version 3.0). The dataset was complemented with the UCDP Non-State Conflict Dataset (version 2.3) to account for the non-state communal conflicts –not included in UCDP/PRIO– if they pass the 1,000 battle deaths threshold.[12] The data suggest that y1 is very small for many countries. It is equal to zero for 76 out of 130 countries (58 per cent), and less than one per cent for 97% of the countries. There are three outliers, Afghanistan (2 per cent), Cambodia (2.5 per cent) and Lebanon (3.5 per cent).[13] Using the same methodology applied to the calculation of EVI, an upper bound of 1 per cent was used.[14] All values (included bounded values) were normalized (Min-Max procedure) to be consistent with other elements in the EVI.

Since battle deaths have become less significant in recent years, war deaths, which account for all people killed in battle as well as all those whose deaths were the result of the changed social conditions caused by the war, might better reflect the devastating results of conflicts than battle deaths.[15] War deaths are not, however, included in this simulation due to the ambiguity in the data and estimation methodology.[16]

Refugees (y2): We use the average number of refugees in 1990-2008 as percentage of population in 2008.[17] The data is obtained from the UNHCR statistical online database. The data suggest that y2 is also very small for many countries: less than one percent for 116 out of 130 countries. There are three outliers,

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12 Today's wars tend to be geographically concentrated, with serious political violence rarely affecting more than a small fraction of a nation's territory (Human Security Report Project 2010). The UCDP Non-State Conflict Dataset covers the period 2002-2007 only.

13 Some countries with large scale interstate wars, for instance, Iran and Iraq, are not included in these outliers either because there is no best estimate of fatality, or because the estimates are not presented by nationality of those who were killed in the battles.

14 The selection of upper bound value is arbitrary. However, the overall result is not sensitive to the value of the upper bound.

15 The mean and median of combat fatalities per year in internal or internationalized internal conflict have fallen dramatically since the end of the Cold War (Lacina and Gleditscho (2005:156). And many case studies suggest that the battle deaths account for a small fraction of the total war deaths (Lacina and Gleditsch 2005; UNDP 2008).

16 Measuring war related deaths involves comparing the number of deaths that occurred due to a conflict against the counterfactual scenario of peace, which is subject to various theoretical and methodological assumptions. See Li and Wen (2005) and Human Security Report Project (2010) for detail.

17 Internally Displaced Persons (IDPs) might be another indicator for the conflict shock, but the availability and coverage of the data are limited. UNHCR only started collecting the IDP statistics systematically since 1993. The IDP data only includes conflict-generated IDPs to whom the UNHCR extends protection and/or assistance. As such, UNHCR's IDP statistics are not necessarily representative of the entire IDP population in a given country but are exclusively limited to the ones who are protected and/or assisted by the UNHCR.

Afghanistan (11 per cent), Bhutan (15 per cent), and Liberia (11 per cent). An upper bound of 10 per cent was used, and all values were normalized (Min-Max procedure) to be consistent with other elements in the EVI.

Table 3 summarizes the composition of a new EVI for the simulation purpose. We include the Conflict exposure index in the Exposure index with a weight of w1, and the Conflict shock index in the Shock index with a weight of w2. We calculate the new EVI values with the additional conflict indicators and weights, in order to test if the simulation would suggest a possible reclassification of non-LDCs. The relative weights of present components are not affected by this simulation, for example, smallness having double the weight of location and structural indices.

Table 3:   **EVI with conflict indicators: composition and weights**

Exposure Index (50%)	Conflict exposure index (w1 %)	Conflict in the past • A binary variable: Equal to 100 if the country had conflict in 2003-2008; 0 otherwise	(x1)
		Or	
		Frequency index • Weighted average of conflict years from 1990 to 2008: Conflict in year T is weighted by (T-1990+1)/190	(x2)
	Smallness ((100-w1)/2 %)	Population	(a)
	Location index ((100-w1)/4 %)	Remoteness	(b)
	Structural index ((100-w1)/4 %)	Merchandise export concentration (50%)	(c)
		Share of agriculture, forestry and fisheries (50%)	(d)
Shock Index (50%)	Conflict shock index (w2 %)	Battle deaths • Number of battle deaths in 1990-2008 as percentage of population	(y1)
		Or	
		Refugees • Average number of refugees in 1990-2008 as percentage of population	(y2)
	Natural shock index ((100-w2)/2 %)	Homelessness due to natural disasters (50%)	(e)
		Instability of agricultural production (50%)	(f)
	Trade shock index ((100-w2)/2 %)	Instability of exports of goods and services	(g)

The simulation results suggest that there is no additional country which is eligible for LDC inclusion, unless the weight of the conflict indicators in EVI is very large. The simulation uses the same reference group of countries, and also the same values of indicators as used in the 2009 review. Therefore, the simulation results show the counterfactual identification of LDCs if conflict indicators were included in the EVI in the 2009 review, holding the two other indicators of inclusion criteria, GNI per capita and HAI, unchanged.

Table 4 summarizes the simulation results. The first two columns present the conflict indicator and weights of the indicator. Weights of x1 and x2 are in the Exposure index, while weights of y1 and y2 are in the Shock index. The third column provides the simulated EVI thresholds. As in the triennial reviews, the threshold is determined as the first quartile of low-income countries under review plus existing LDCs that are no longer low-income countries.[18] The fourth column shows the countries which previously did not meet the inclusion threshold for EVI but now meet the threshold when a conflict indicator is included. The last column presents the countries which were previously not eligible for inclusion but would have been, had the conflict indicator been added to EVI.

Inclusion of the indicator of past conflict (x1) in the EVI suggests that Côte d'Ivoire might be eligible for LDC inclusion when the weight of x1 is larger than 30 per cent in the Exposure index. As we increase the weight of x1 from zero to 90 per cent in the Exposure Index, there are some countries which meet the EVI inclusion threshold. However, it is important to note that for many of these countries, the EVI values are above the threshold not necessarily because they experienced conflicts in the past. As explained above, the threshold is set relatively – the first quartile of low-income countries under review plus existing LDCs that are no longer low-income countries. In the simulation, many non-conflict countries meet the adjusted EVI inclusion criteria because the EVI threshold decreases as we increase the weight of the conflict indicator. Since a country should satisfy the inclusion threshold of all three criteria (income, HAI and EVI) to be eligible for LDC status, there is no country, except for Côte d'Ivoire, that could be reclassified as LDC.

When we use the frequency index (x2) which assigns linearly increasing weights of conflicts in recent years, there is no country that could be reclassified as LDC, regardless of the weight assigned to x2. It is important to note that the average value of x1 is much larger than x2 both for LDCs and non-LDCs: the average value of x1 is 33 for LDCs and 19 for non-LDCs, while for x2 the average is 8 for LDCs and 5 for non-LDCs. It is because x1 assigns a large weight for recent conflicts relative to old conflicts – 100 for the conflicts in recent years (2003-2008) and zero for the conflicts in earlier years (1990-2002) –, while x2 assigns linearly increasing weights on recent conflicts. The difference in weights of recent conflicts seems to explain the different results in the LDC inclusion eligibility of x1 and x2.[19]

There is no country that could be reclassified as LDC when we include the indicator of battle deaths in the period 1990-2008 as percentage of population (y1) in the EVI, regardless of the weight assigned to y1.

Likewise, there is no non-LDC country that could be reclassified as LDC when we include the average number of refugees in 1990-2008 as percentage of population (y2) in the EVI, regardless of the weight assigned to y2. When we use the average number of refugees in recent years (2006-2009) as the conflict shock index, Côte d'Ivoire might be eligible for LDC inclusion, but only with a very large weight of the conflict shock index — larger than 50 per cent in the Shock Index.

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18   We use the same list of 60 countries in the 2009 review to determine the threshold. See page 22 in the United Nations (2009, "Report on the eleventh session (9-13 March 2009)," Economic and Social Council Official Records, 2009, Supplement No.13.)

19   If x1 is scaled between zero and one like a typical binary variable, there is no non-LDC country which would be eligible for LDC inclusion, regardless of the weight assigned to the indicator.

Table 4:   LDC inclusion eligibility with conflict indicators in the EVI

Conflict Indicator	Weight in Exposure (or Shock) index (%)	EVI inclusion threshold	Countries that meet the inclusion threshold for EVI only after the addition of a conflict indicator*	Non-LDCs that would be eligible for LDC inclusion**
None		42.4		
Past conflict (x1)	10	41.2	None	None
	20	40.0	Algeria	None
	30	39.8	Algeria, Côte d'Ivoire, Peru, Sri Lanka	Côte d'Ivoire
	40	38.0	Algeria, Colombia, Cote d'Ivoire, Indonesia, Pakistan, Peru, Philippines, Sri Lanka	Côte d'Ivoire
	50	36.2	Algeria, Colombia, Côte d'Ivoire, India, Indonesia, Pakistan, Peru, Philippines, Sri Lanka, Thailand, Turkey	Côte d'Ivoire
	60	34.1	Algeria, Colombia, Côte d'Ivoire, India, Indonesia, Israel, Pakistan, Peru, Philippines, Sri Lanka, Thailand, Turkey	Côte d'Ivoire
	70	30.9	Algeria, Colombia, Côte d'Ivoire, India, Indonesia, Israel, Pakistan, Peru, Philippines, Sri Lanka, Thailand, Turkey	Côte d'Ivoire
	80	27.8	Algeria, Colombia, Côte d'Ivoire, Dominican Republic, India, Indonesia, Israel, Pakistan, Peru, Philippines, Sri Lanka, Thailand, Turkey	Côte d'Ivoire
	90	25.1	Algeria, Colombia, Côte d'Ivoire, Dominican Republic, India, Indonesia, Israel, Pakistan, Peru, Philippines, Sri Lanka, Thailand, Turkey	Côte d'Ivoire
Frequency index (x2)	10	40.4	None	None
	20	38.3	None	None
	30	36.1	Algeria, Dominican Republic, Sri Lanka	None
	40	33.8	Algeria, Colombia, Dominican Republic, India, Sri Lanka	None
	50	31.7	Algeria, Colombia, Dominican Republic, India, Sri Lanka	None
	60	29.8	Algeria, Colombia, Dominican Republic, India, Sri Lanka	None
	70	28.0	Algeria, Colombia, Dominican Republic, India, Sri Lanka	None
	80	25.4	Algeria, Colombia, Dominican Republic, India, Pakistan, Sri Lanka	None
	90	23.1	Algeria, Colombia, Dominican Republic, India, Lebanon, Pakistan, Sri Lanka, Turkey	None
Battle deaths (y1)	10	40.5	None	None
	20	38.5	Lebanon	None
	30	36.4	El Salvador, Lebanon	None
	40	33.8	El Salvador, Gabon, Lebanon, Namibia	None
	50	31.1	Bahrain, El Salvador, Gabon, Lebanon, Namibia, Sri Lanka, Trinidad and Tobago	None

Table 4 (continued)				
Battle deaths (y1)	60	28.0	Bahrain, El Salvador, Gabon, Guatemala, Jamaica, Lebanon, Namibia, Oman, Sri Lanka, Trinidad and Tobago	None
	70	25.9	Bahrain, El Salvador, Gabon, Guatemala, Jamaica, Lebanon, Namibia, Oman, Panama, Sri Lanka, Trinidad and Tobago	None
	80	23.7	Bahrain, Costa Rica, El Salvador, Gabon, Guatemala, Israel, Jamaica, Lebanon, Namibia, Oman, Panama, Sri Lanka, Trinidad and Tobago	None
	90	21.8	Bahrain, Costa Rica, El Salvador, Gabon, Guatemala, Israel, Jamaica, Lebanon, Namibia, Oman, Panama, Sri Lanka, Trinidad and Tobago	None
Refugees (y2)	10	40.6	None	None
	20	38.8	None	None
	30	36.5	None	None
	40	33.8	Bahrain, Gabon, Namibia	None
	50	31.1	Bahrain, Gabon, Namibia, Trinidad and Tobago	None
	60	27.9	Bahrain, Gabon, Jamaica, Namibia, Oman, Trinidad and Tobago	None
	70	24.6	Bahrain, Costa Rica, Ecuador, Gabon, Honduras, Jamaica, Namibia, Oman, Panama, Singapore, Trinidad and Tobago, United Arab Emirates	None
	80	22.2	Bahrain, Chile, Costa Rica, Ecuador, El Salvador, Gabon, Honduras, Jamaica, Namibia, Oman, Panama, Singapore, Trinidad and Tobago, United Arab Emirates	None
	90	20.1	Bahrain, Chile, Costa Rica, Ecuador, El Salvador, Gabon, Honduras, Jamaica, Namibia, Oman, Panama, Singapore, Trinidad and Tobago, United Arab Emirates	None

Source: Authors' calucations
Note: * Countries that are currently in the LDC category are excluded.
** Nigeria, Pakistan, Papua New Guinea, and Zimbabwe are excluded. Nigeria and Pakistan are middle income countries and do not meet the population threshold (75 million). Papua New Guinea and Zimbabwe are eligible even without conflict indicators in the EVI, but they declined to join the LDCs.

LDCs might have more difficulty in meeting the graduation criteria if conflict indicators are added in the EVI. The first row of table 5 shows that eight countries meet the EVI graduation threshold in the 2009 review (the values of EVI are below the threshold). As we increase the weight assigned to conflict indicators, the values of EVI for some conflict-affected LDCs will move or remain above the EVI graduation threshold, leaving fewer countries as potential candidates for LDC graduation. On the other hand, more non-conflict LDCs might meet the EVI graduation threshold because their EVI decreases as we increase the weight of the conflict indicator. At the same time, the EVI graduation threshold which is established at 10 per cent below the inclusion threshold decreases as the weight of the conflict indicator increases. As the threshold decreases, fewer countries will meet the EVI graduation threshold. The interaction of these effects might be complex, but the simulation results presented in table 5 show that adding conflict indicator decreases the number of countries which meet the EVI graduation threshold in many cases.

Table 5:   EVI graduation eligibility of LDCs with conflict indicators in the EVI

Conflict Indicator	Weight in Exposure (or Shock) index (%)	EVI graduation threshold	LDCs that would meet the EVI graduation threshold
None		38.2	Bangladesh, Ethiopia, Guinea, Madagascar, Myanmar, Nepal, Senegal, Tanzania
Past conflict (x1)	10	37.1	Bangladesh, Ethiopia, Guinea, Madagascar, Myanmar, Nepal, Senegal, Tanzania
	20	36.0	Bangladesh, Guinea, Madagascar, Senegal, Tanzania
	30	35.8	Bangladesh, Guinea, Madagascar, Senegal, Tanzania
	40	34.2	Bangladesh, Benin, Guinea, Madagascar, Senegal, Tanzania
	50	32.6	Bangladesh, Benin, Guinea, Madagascar, Senegal, Togo, Tanzania
	60	30.7	Bangladesh, Benin, Burkina Faso, Guinea, Madagascar, Senegal, Togo, Tanzania
	70	27.8	Bangladesh, Benin, Guinea, Madagascar, Senegal, Togo, Tanzania
	80	25.0	Bangladesh, Benin, Guinea, Lesotho, Madagascar, Sao Tome and Principe, Tanzania
	90	22.6	Bangladesh, Benin, Guinea, Lesotho, Madagascar, Sao Tome and Principe, Tanzania
Frequency index (x2)	10	36.4	Bangladesh, Ethiopia, Guinea, Madagascar, Myanmar, Nepal, Senegal, Tanzania
	20	34.5	Bangladesh, Ethiopia, Guinea, Madagascar, Nepal, Tanzania
	30	32.5	Bangladesh, Ethiopia, Guinea, Madagascar, Tanzania
	40	30.4	Bangladesh, Ethiopia, Guinea, Madagascar, Tanzania
	50	28.5	Bangladesh, Ethiopia, Guinea, Madagascar, Tanzania
	60	26.8	Bangladesh, Ethiopia, Guinea, Madagascar, Tanzania
	70	25.2	Bangladesh, Central African Republic, Ethiopia, Guinea, Madagascar, Mali, Tanzania
	80	22.9	Bangladesh, Central African Republic, Ethiopia, Guinea, Mali, Tanzania
	90	20.8	Bangladesh, Central African Republic, Ethiopia, Guinea, Mali, Sao Tome and Principe, Tanzania
Battle deaths (y1)	10	36.5	Bangladesh, Ethiopia, Guinea, Madagascar, Myanmar, Nepal, Senegal, Tanzania
	20	34.7	Bangladesh, Ethiopia, Guinea, Madagascar, Myanmar, Nepal, Senegal, Tanzania
	30	32.8	Bangladesh, Ethiopia, Guinea, Madagascar, Myanmar, Nepal, Senegal, Tanzania
	40	30.4	Bangladesh, Ethiopia, Guinea, Madagascar, Nepal, Senegal, Tanzania
	50	28.0	Bangladesh, Guinea, Madagascar, Nepal, Senegal, Tanzania
	60	25.2	Bangladesh, Guinea, Nepal, Senegal, Tanzania
	70	23.3	Bangladesh, Guinea, Nepal, Senegal, Tanzania
	80	21.3	Bangladesh, Nepal, Senegal, Tanzania
	90	19.6	Bangladesh, Nepal, Senegal, Tanzania

Table 5 (continued)			
	10	36.5	Bangladesh, Ethiopia, Guinea, Madagascar, Myanmar, Nepal, Senegal, Tanzania
	20	34.9	Bangladesh, Ethiopia, Guinea, Madagascar, Myanmar, Nepal, Senegal, Tanzania
	30	32.9	Bangladesh, Ethiopia, Guinea, Madagascar, Myanmar, Nepal, Senegal, Tanzania
	40	30.4	Bangladesh, Ethiopia, Guinea, Madagascar, Myanmar, Nepal, Senegal, Tanzania
Refugees (y2)	50	28.0	Bangladesh, Ethiopia, Guinea, Madagascar, Myanmar, Nepal, Senegal, Tanzania
	60	25.1	Bangladesh, Ethiopia, Guinea, Myanmar, Nepal, Senegal, Tanzania
	70	22.1	Bangladesh, Ethiopia, Nepal, Tanzania
	80	20.0	Bangladesh, Ethiopia, Nepal, Tanzania
	90	18.1	Bangladesh, Ethiopia, Nepal

Source: Authors' calculations

It is important to note that the simulation results are consistent with findings in the literature on the conflicts and its impact on economic volatility. The export concentration is already included in the EVI to reflect the country's exposure to shocks (see figure 3). When the country's export is point-sourced, that is to say, when the economy relies on an intensive exploitation of a few key resources, such as oil or diamonds, located in specific geographical areas, some theories on the cause of conflicts, such as the "greed hypothesis", would predict that the country is more likely to experience a conflict between parties over the control of the main source of income(United Nations 2008b: 125). In this case, the impacts of conflicts are in part already reflected in the current EVI (as suggested in table 2), and adding conflict explicitly into the EVI would not result in surprising changes in the list of countries which are eligible for LDC inclusion.

In sum, the simulation results suggest that in general there is no additional country which meets the LDC inclusion criteria when conflict indicator is added in the EVI while income and HAI values remain unchanged. Côte d'Ivoire might be the only non-LDC country to be eligible for LDC inclusion, but only if the value assigned to conflict indicator and the corresponding weight of the indicator is very large. Simulation results also suggest that adding conflict indicator in the EVI decreases the number of countries which meet the EVI graduation threshold in many cases.

4.   Conclusion

Armed conflict is a devastating event, caused by various factors commonly faced by developing countries, and the recurrence of conflict has been frequently observed. In this regard, conflict might be considered as a potential factor to be included in the classification of countries as LDCs.

Consensus on the cause of conflict is difficult to reach, but insecurity, inequality, private incentives and perceptions, among others, are studied in the literature as key variables to provide basis for violent conflict. Evidence suggests that sharp decline in economic growth and/or acute horizontal inequalities in political, economic, social and cultural aspects might trigger violent group mobilization. However, the causes and mechanisms of conflict outbreaks are complex, and the actual violent conflict might be prevented by coordinated policy measures. Therefore, we cannot unambiguously argue that conflict can be considered as a structurally predetermined handicap as those identified in LDC criteria.

In any case, many of the components of the LDC identification criteria are correlated with indicators usually associated with conflict situations. Particularly, GNI per capita, all components of HAI, and a few components of EVI are strongly correlated with conflict. The findings suggest that conflict is included in the current LDC criteria in indirect ways. Were conflicts to be explicitly included in the LDC criteria and assigned reasonable weights, there would be no changes in the list of countries eligible for inclusion of LDC category. In all, conflict risk is irrelevant for the classification of countries as LDCs.

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Annex I. Episodes of Internal Armed Conflict, 1946-2008

Location	Begin[a]	End[b]	Type[c]	A primary party to the conflict against the government
Afghanistan	1978	2008	3	Hizb-i Demokratik-i Khalq-i Afghanistan
Algeria	1991	2008	3	Takfir wa'l Hijra
Angola	1975	2002	4	National Liberation Front of Angola, National Union for the Total Independence of Angola
Angola	1991	2007	3	Front for the Liberation of the Enclave of Cabinda
Argentina	1955	1977	3	Military faction (forces of Eduardo A. Lonardi Doucet)
Azerbaijan	1992	2005	4	Republic of Nagorno-Karabakh
Azerbaijan	1993	1995	3	Military faction (Forces of Suret Husseinov)
Bangladesh	1975	1992	3	Jana Samhati Samiti/Shanti Bahini
Bolivia	1946	1967	3	Popular Revolutionary Movement
Bosnia and Herzegovina	1992	1995	4	Serbian irregulars, Serbian Republic of Bosnia and Herzegovina
Bosnia and Herzegovina	1993	1995	3	Autonomous Province of Western Bosnia
Bosnia and Herzegovina	1993	1994	4	Croatian irregulars, Croatian Republic of Bosnia and Herzegovina
Burkina Faso	1987	1987	3	Popular Front
Burundi	1965	2008	3	Military faction (forces loyal to Gervais Nyangoma)
Cambodia	1967	1998	3	Khmer Rouge
Cameroon	1960	1984	4	Union of the Peoples of Cameroon
Central African Republic	1996	2006	4	Military faction (forces of Cyriac Souke)
Chad	1966	2008	3	Frolinat
Chile	1973	1973	3	Military faction (forces of Augusto Pinochet, Toribio Merino and Leigh Guzman)
China	1946	1949	3	People's Liberation Army
China	1947	1947	3	Taiwanese insurgents
China	1950	1959	3	Tibet
Colombia	1964	2008	3	The Revolutionary Armed Forces of Colombia
Comoros	1989	1989	3	Presidential guard
Comoros	1997	1997	3	MPA/Republic of Anjouan
Congo	1993	2002	3	Cobras, Ninjas
Costa Rica	1948	1948	3	National Liberation Army
Cote D'Ivoire	2002	2004	3	Mouvement pour la Justice et la Paix, Patriotic Movement of Ivory Coast, Mouvement Patriotique du Grand Ouest
Croatia	1992	1995	4	Serbian irregulars, Serbian Republic of Krajina
Cuba	1953	1961	3	26th of July Movement
Democratic Republic of Congo (Zaire)	1960	1962	3	State of Katanga
Democratic Republic of Congo (Zaire)	1960	1962	3	Independent Mining State of South Kasai
Democratic Republic of Congo (Zaire)	1964	2008	3	Conseil national de libération
Democratic Republic of Congo (Zaire)	2007	2008	3	Bundu Dia Kongo
Djibouti	1991	1999	3	Front for the Restoration of Unity and Democracy

Dominican Republic	1965	1965	3	Military faction
Egypt	1993	1998	3	al-Gama'a al-Islamiyya
El Salvador	1972	1991	3	Military faction (forces of Benjamin Mejia)
Equatorial Guinea	1979	1979	3	Military faction (forces of Teodoro Obiang Nguema Mbasogo)
Eritrea	1997	2003	3	Eritrean Islamic Jihad Movement
Ethiopia	1960	1991	3	Military faction (forces of Mengistu Neway)
Ethiopia	1964	1991	3	Eritrean Liberation Front
Ethiopia	1975	1996	3	Afar Liberation Front
Ethiopia	1976	2008	4	Western Somali Liberation Front
Ethiopia	1977	2008	3	Oromo Liberation Front
Ethiopia	1995	1999	3	al-Itahad al-Islami
France	1961	1962	3	Organisation de l'armée secrète
Gabon	1964	1964	4	Military faction (forces loyal to Léon M'Ba)
Gambia	1981	1981	4	National Revolutionary Council
Georgia	1991	1993	3	Anti-government alliance
Georgia	1992	1993	3	Republic of Abkhazia
Georgia	1992	2008	3	Republic of South Ossetia
Ghana	1966	1983	3	National Liberation Council
Greece	1946	1949	3	Democratic Army of Greece
Guatemala	1949	1995	3	Military faction
Guinea	2000	2001	3	Movement of Democratic Forces of Guinea
Guinea-Bissau	1998	1999	4	Military Junta for the Consolidation of Democracy, Peace and Justice
Haiti	1989	2004	3	Military faction (forces of Himmler Rebu and Guy Francois)
Hyderabad	1947	1948	3	The Communist Party of India
India	1948	2008	3	The Communist Party of India
India	1956	2007	3	Naga National Council
India	1966	1968	3	Mizo National Front
India	1978	2006	3	Tripura National Volunteers
India	1982	2008	3	People's Liberation Army
India	1983	1993	3	Sikh insurgents
India	1989	2004	3	All Bodo Students' Union
India	1989	2008	3	Kashmir Insurgents
India	1990	2008	3	United Liberation Front of Asom
India	2008	2008	3	Dima Halim Daoga
India	2008	2008	3	People's United Liberation Front
Indonesia	1950	1950	3	Republic of South Moluccas
Indonesia	1953	1961	3	Darul Islam
Indonesia	1965	1978	3	Free Papua Movement
Indonesia	1975	1998	3	Fretilin
Indonesia	1990	2005	3	Free Aceh Movement
Iran	1946	1996	4	Democratic Party of Iranian Kurdistan
Iran	1946	1946	4	Republic of Azerbaijan
Iran	1979	1980	3	Arab Political and Cultural Organisation

Iran	1979	2008	3	Mujahedeen-e Khalq
Iraq	1958	2008	3	Military Faction (Free Officers Movement)
Iraq	1961	1996	3	Kurdistan Democratic Party
Israel	1949	2008	3	Palestinian insurgents
Israel	1990	2006	3	Hezbollah
Kenya	1982	1982	3	Military faction (forces of Hezekiah Ochuka)
Laos	1959	1990	3	Pathet Lao
Lebanon	1958	1990	3	Independent Nasserite Movement /Mourabitoun militia
Lesotho	1998	1998	4	Military faction
Liberia	1980	2003	3	Military faction (forces of Samuel Doe)
Macedonia	2001	2001	3	National Liberation Army
Madagascar	1971	1971	3	Monima
Malaysia	1958	1981	4	Communist Party of Malaya
Malaysia	1963	1966	3	Clandestine Communist Organisation
Mali	1990	2008	3	Azawad People's Movement
Mauritania	1975	1978	3	Popular Front for the Liberation of Saguia el-Hamra and Río de Oro
Mexico	1994	1996	3	Zapatista National Liberation Army
Moldova	1992	1992	3	Dniestr Republic
Morocco	1971	1971	3	Military faction (forces of Mohamed Madbouh)
Morocco	1975	1989	3	Popular Front for the Liberation of Saguia el-Hamra and Río de Oro
Mozambique	1977	1992	3	National Resistance Movement of Mozambique
Myanmar	1948	1994	3	Military faction
Myanmar	1948	1994	3	Arakan Insurgents
Myanmar	1949	1996	3	Mon Freedom League – Mon United Front
Myanmar	1949	2008	3	Karen National Union
Myanmar	1949	1992	3	Pawngyawng National Defense Force
Myanmar	1957	2005	3	Karenni National Progressive Party
Myanmar	1959	2008	3	Shan State Army
Myanmar	1997	1997	3	United Wa State Army
Nepal	1960	2006	3	Nepali Congress
Nicaragua	1978	1989	3	Sandinista National Liberation Front
Niger	1991	2008	3	Front of Air and Azawad
Niger	1994	1994	3	Coordination of the Armed Resistance
Niger	1996	1997	3	Democratic Front for Renewal
Nigeria	1966	1966	3	Military faction (forces of Patrick Nzeogwu)
Nigeria	1967	1970	3	Republic of Biafra
Nigeria	2004	2004	3	Ahlul Sunnah Jamaa
Nigeria	2004	2004	3	Niger Delta People's Volunteer Force
North Yemen	1948	1982	3	Opposition coalition
Oman	1957	1957	4	State of Oman/Free Oman
Oman	1972	1975	4	Popular Front for the Liberation of Oman
Pakistan	1971	1971	3	Mukti Bahini
Pakistan	1974	2008	3	Baluchi insurgents

Pakistan	1990	2008	3	Muttahida Qaumi Movement
Panama	1989	1989	3	Military faction (forces of Moisés Giroldi)
Papua New Guinea	1989	1996	3	Bougainville Revolutionary Army
Paraguay	1947	1989	3	Opposition coalition (Febreristas, Liberals and Communists)
Peru	1965	2008	3	National Liberation Army
Philippines	1946	2008	3	Hukbalahap
Philippines	1970	2008	3	Mindanao Independence Movement
Rumania	1989	1989	3	National Salvation Front
Russia (Soviet Union)	1946	1948	3	Forest Brothers
Russia (Soviet Union)	1946	1950	3	Ukrainian Insurgent Army
Russia (Soviet Union)	1946	1946	3	Latvian National Partisan Association
Russia (Soviet Union)	1946	1948	3	Bendras demokratinio pasipriešinimo sąjūdis
Russia (Soviet Union)	1990	1991	3	Republic of Armenia
Russia (Soviet Union)	1990	1990	3	Azerbaijani Popular Front
Russia (Soviet Union)	1993	1993	3	Parliamentary forces
Russia (Soviet Union)	1994	2007	3	Chechen Republic of Ichkeria
Russia (Soviet Union)	1999	1999	3	Wahhabi movement of the Buinaksk district
Russia (Soviet Union)	2007	2008	3	Forces of the Caucasus Emirate
Rwanda	1990	2002	4	Rwandan Patriotic Front
Saudi Arabia	1979	1979	3	the Salafi groups which practices hisba
Senegal	1990	2003	3	Movement of Democratic Forces in the Casamance
Sierra Leone	1991	2000	3	Revolutionary United Front
Somalia	1978	2008	3	Military faction (forces of Abdulaahi Yusuf)
South Africa	1966	1988	3	South West Africa People's Organization
South Africa	1981	1988	3	African National Congress
South Vietnam	1955	1964	3	National Front for the Liberation of South
South Yemen	1986	1986	3	Yemenite Socialist Party - Abdul Fattah Ismail faction
Spain	1980	1992	3	Basque Homeland and Freedom
Sri Lanka (Ceylon)	1971	1990	3	Janatha Vimukthi Peramuna
Sri Lanka (Ceylon)	1984	2008	3	Liberation Tigers of Tamil Eelam
Sudan	1963	1972	3	Anya Nya
Sudan	1971	2008	3	Sudanese Communist Party
Surinam	1986	1988	3	Surinamese Liberation Army Jungle Commando
Syria	1966	1982	3	Military faction (forces loyal to Nureddin Atassi and Youssef Zeayen)
Tajikistan	1992	1998	3	United Tajik Opposition
Thailand	1951	1982	3	Military faction (Navy)
Thailand	2003	2008	3	Patani insurgents
Togo	1986	1991	3	Togolese Movement for Democracy
Trinidad and Tobago	1990	1990	3	Jamaat al-Muslimeen
Tunisia	1980	1980	3	Résistance Armée Tunisienne
Turkey/Ottoman Empire	1984	2008	3	The Kurdistan Workers' Party
Turkey/Ottoman Empire	1991	2005	3	Devrimci Sol
Uganda	1971	2007	3	Military faction (forces of Idi Amin)

United Kingdom	1971	1998	3	Provisional Irish Republican Army
United States of America	2001	2008	4	al-Qaida
Uruguay	1972	1972	3	National Liberation Movement
Uzbekistan	1999	2004	3	Islamic Movement of Uzbekistan
Venezuela	1962	1992	3	Military faction (navy)
Yemen	1994	1994	3	Democratic Republic of Yemen
Yugoslavia (Serbia)	1991	1991	3	Republic of Slovenia
Yugoslavia (Serbia)	1991	1991	3	Croatian irregulars, Republic of Croatia
Yugoslavia (Serbia)	1998	1999	3	Kosovo Liberation Army
Zimbabwe (Rhodesia)	1973	1979	3	Zimbabwe African National Union

Source: generated from the UCDP/PRIO Armed Conflict Dataset version 4-2009, accessed in December 2010. [http://www.prio.no/CSCW/Datasets/Armed-Conflict/UCDP-PRIO/Armed-Conflicts-Version-X-2009/]

Note: In this dataset, conflict is defined as "a contested incompatibility that concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths." For a more in-depth definition and description of the dataset, see UCDP/PRIO Armed Conflict Dataset Codebook version 4-2009. [http://www.prio.no/misc/Download.aspx?file=%2fprojects%2fdataset-website-workspace%2fArmed%2520Conflicts%2520v52009%2fCodebook_UCDP_PRIO%2520Armed%2520Conflict%2520Dataset%2520v4_2009.pdf]

[a] The year of the first (at least 25) battle-related death recorded in the conflict.

[b] The most recent year in which conflict was active.

[c] Type 3 is the internal armed conflict which occurs between the government of a state and one or more internal opposition group(s) without intervention from other states. Type 4 is the internationalized internal armed conflict which occurs between the government of a state and one of more internal opposition group(s) with intervention from other states (secondary parties) on one or both sides. Type 1 (colonial/territorial conflict) and Type 2 (interstate conflict) conflicts in the dataset are excluded here.