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## **Civil Conflicts and Regional Economic Integration Outcomes in Africa**

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## **Abstract**

Civil conflicts are a major challenge to the economic development of a country and its neighbors. The present article analyzes the consequences of conflicts on regional economic integration outcomes among African nations. Our findings document that civil conflicts affect the economic fate of regional economic communities through their negative substantial impact on business cycle synchronicity. Yet, contrary to the findings of previous studies on the effects of conflict on bilateral trade flows, we show that experiencing conflict increases regional trade intensities. This only holds in the short run and is explained by a decrease in the conflict country's total trade and output, as well as by an increase in its intra-regional trade flows. By assessing the effect of conflict on regional economic integration processes, this paper highlights that intrastate political events are also a major regional constraint. We therefore find an additional reason to recommend that prevention and resolution of civil conflicts might be put on the top of the political agenda of African Regional Economic Communities.

**Keywords:** Civil conflict, Regional Economic Integration, Regional Trade, Business Cycle Synchronization, Africa.

**JEL Classification:** O11, F15, D74, O55.

## 1 Introduction

Regional economic integration (REI) is crucial for African states since they are characterized by relative small market sizes impeding their development process and integration to the global economy. The potential benefits of REI, such as the improvement of economic prospects and political stability, are expected to be substantial (*e.g.* Schiff and Winters 2003). However, as of their anticipated outcomes, the existing African Regional Economic Communities (RECs) have poorly performed since their establishment. Progresses in intra-regional trade and policy coordination appear to be low. Among the identified explanatory factors, the lack of political commitment and the importance of economic constraints have been stressed as the most hampering for countries to progress in REI (Geda and Kibret 2008). As a major challenge to economic development, civil conflict might also be a constraint to REI.

Africa is one of the continents that are the most affected by civil conflict, with more than 2/3 of its 53 countries having experienced conflict between 1980 and 2005. Like all wars, civil conflict has harmful consequences in the occurring countries. Human lives are lost and communities, infrastructures and institutions are destroyed. Further, in terms of economic prospects, it has devastating consequences (Collier et al. 2003). Although civil conflict is an intrastate dispute, it is also found to have an impact on the neighboring countries by affecting their economic prospects (*e.g.* Murdoch and Sandler 2002), and by geographically spreading to those countries (*e.g.* Hegre and Sambanis 2006). Civil conflict is thus a source of regional political and economic destabilization and, as such, it might be an obstacle to progress in REI in Africa. Understanding the effect of conflict on REI outcomes would highlight the role of intrastate political events, such as civil wars, as a critical constraint hampering the

performances of African RECs.

The present article aims at assessing the consequences of conflicts on regional economic integration outcomes among African countries. In particular, we are interested in analyzing what happens to a country participating in a given REC when civil conflict occurs. We therefore propose an empirical study of the regional costs of conflicts, in terms of their effects on integration outcomes in Africa between 1980 and 2005. The empirical approach we use in this paper is innovative for several reasons. First, we conduct the analysis at the multilateral level, which considers the degree of integration of a country with all the other countries belonging to the same REC. This allows us to account for the global effects of civil conflicts, rather than using the bilateral approach. Further, instead of *de jure* indicators of economic integration among nations such as the signature of agreements or treaties, we use *de facto* measures accounting for the various dimensions of integration which are the increase in regional trade and the greater economic interdependence between countries. In addition, we address the endogeneity of civil conflict relative to the REI measures by adopting an instrumental variable technique. This allows us to control for the unobserved heterogeneity affecting simultaneously integration effectiveness and civil conflict, and purge the reverse causality between REI and conflict. The conflict variable is instrumented by the number of assassination attempts on national leaders and by the number of refugees hosted in countries.

Our findings document that prevention and resolution of domestic violent conflicts should be put on the top of the political agenda of African RECs. We show that civil conflict reduces business cycle synchronicity and increases intra-regional trade intensities. We further find evidence that past conflicts affect negatively current intra-regional trade intensities. From

these results, we derive the following policy implication: it is highly advisable for members of the same REC to get involved in their peers' conflicts prevention and/or resolution, because of their regional economic effect. Consolidating peace and building strong state institutions are crucial to improve regional economic prospects and achieve a sustainable economic development.

The rest of the paper is structured as follows. Section 2 presents theoretical aspects of the effect of civil conflict on regional economic integration process in Africa. Section 3 describes the data and the research design. The results are discussed in section 4, and concluding remarks are provided in the final section.

## **2 Civil Conflict and Regional Economic Integration: Theoretical Aspects**

### **2.1 Regional Economic Integration in Africa**

According to Balassa (1961), REI can be defined as a process by which a group of countries agrees "to eliminate discrimination between the economic and noneconomic units that belong to the different national states". Various stages of REI can be distinguished, following Balassa (1961), from the establishment of a free trade area to a full economic union, according to the extent of cooperation: a free trade area, a customs union, a common market, a monetary union and a full economic union<sup>3</sup>. REI has become a concern for all countries throughout the world,

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<sup>3</sup> A free trade area is a group of countries which suppresses all restrictions on mutual trade, but each member retains its own tariff and quota system on trade with third countries. A free trade area becomes a customs union

in the current context of increased globalization. Indeed, as pointed out by Alesina and Spolaore (1997), “countries that are too small may not be viable in a world of trade restrictions”. Most African states are characterized by a low income and a small market size (UNECA 2004). For them, REI is thus crucial. Regional integration is first viewed as means to allow African states to offset the small size of their domestic markets and attain sustained economic growth, notably through scale and competition effects, new trade opportunities and increased investment (Schiff and Winters 2003). It is also perceived as a possible way to improve the credibility of members’ economic policies (Fernandez and Portes 1998) and as an important tool for diplomacy (Schiff and Winters 1998).

REI is not a straightforward process; it involves the decision to cooperate (*de jure* integration) and the effectiveness of the cooperation (*de facto* integration). Neither the signature of a treaty, nor the establishment of regional institutions in charge of the execution of policies allowing regional economic progress guarantee the effectiveness of REI. Countries must implement specific political and economic measures in order to achieve the gradual elimination of various forms of discrimination among them. The set of such measures comprises the continuing lowering of intra-regional boundaries and the shifting of authority over key areas of domestic regulation and policy to the supranational level (Lombaerde and Van Langenhove 2005). Without implementing those measures, countries would not achieve REI outcomes, in terms of increase in regional trade, in factor movement and business cycle

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when countries adopt a common system of tariffs and quotas with respect to trade with third countries. Further, a customs union becomes a common market with the removal of all restrictions on factor movement. The adoption of a common monetary policy and a common currency leads to a monetary union, and beyond the monetary union, countries that coordinate their economic policies form an economic union.

synchronicity. The increase in intra-regional trade would catch the progress and the reality in the removal of trade barriers through the free trade area and customs unions agreements signed by countries (*e.g.* Carrère 2004 and 2006). In the same manner, the extent of cross-border shareholdings and labor force regional movement indicates the extent of the elimination of restrictions on factors movement. Further, the synchronicity of business cycles indicates the economic interdependence between the countries within a given cluster, and is required for countries to better coordinate their macroeconomic policies and reap the benefits of adopting a common market, common policies and a common currency (*e.g.* Mundell 1961, Frankel and Rose 1998, Darvas *et al.*, 2005).

Since the independences, African leaders have strived to enhance the economic integration of the continent. Several regional groups were created. We find that the number of RECs has increased from 10 to 21 between 1980 and 2005 (2 customs unions, 6 economic integration agreements, 8 free trade agreements, 3 monetary zones and 2 monetary unions)<sup>4</sup>. The multiplication of RECs has been accompanied by an overlapping membership phenomenon. Out of the 53 African states, 46 are members of at least 2 RECs in 2004 (UNECA 2004). The average was only 1 in 1980. Overlapping membership hampers the progress of integration since countries participate in RECs which objectives and policies that are different, with however a global emphasis on trade and macroeconomic integration. Despite the African interest in REI, the progress toward integration with respect to the achievement of these goals is quite poor. For illustration, according to the World Trade Organization, intra-African exports represent only 9.5% of African total exports in 2007. Other blocs are performing better with 73.5% in Europe, 51.3% in North America, 49.7% in Asia, 24.4% in South and

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<sup>4</sup> The list of African RECs and their members is provided in Appendix 1.

Central America and 12.3% in Middle East. These poor performances hint poor effective implementation of regional agreements, suggesting that the issue of the difference between *de jure* integration and *de facto* integration is important in Africa.

## **2.2 Constraints to progress in Regional Economic Integration in Africa**

Besides the REI outcomes we mentioned above, which are the benefits expected from the integration process, each step of the economic integration process also comprises costs for the members of a REC (*e.g.* Venables 2000). Such costs consist for instance in the loss of sovereignty over domestic policies, the diversion of trade and the loss of fiscal revenues from regional trade. The distribution of costs and benefits determines national interest and incentives likely to lead countries to implement or not the regional agreements signed. The difficulty of bearing the costs associated with progress in terms of REI might explain the lack of political commitment of national leaders to put the regional agreements into action. Some requirements allow countries to offset the costs associated with a deeper degree of integration, at each step. For instance, the Mundell (1961) theory of Optimum Currency Areas (OCA) provides the criteria required for countries in a monetary union to offset the costs associated with being in such a union. These criteria are related to the necessary economic interdependence between the members of a same REC: symmetry in the shocks affecting the economies, full mobility of factors, diversification of production, similarity in inflation rates, flexibility of wages and prices, and capacity for risk-sharing within the REC. Thus, at each stage of REI, if the members do not sufficiently fulfill some specific criteria, the costs associated with the integration process might lead them to not make the efforts required for their progress in REI.

In Africa, as identified by Geda and Kibret (2008), the unwillingness of national leaders to effectively implement the agreements signed is a major political constraint to the performances of African RECs. At the same time, it appears that the criteria allowing the countries to offset the costs associated with the integration process are not fulfilled, which hampers the suitability of regional unions. This consists in the economic constraints to progress in REI. Among those constraints, the overall insufficient production specialization, divergent macroeconomic policies, poor infrastructure development and the continuity of strong economic ties with non-members seem to play an important role (*e.g.* Schiff and Winters 2003 and Geda and Kibret 2008).

Civil conflicts might be an additional constraint hampering the progress of African RECs. Indeed, Africa is one of the continents that are the most affected by civil conflict, with more than 2/3 of its 53 countries that experienced a civil conflict between 1980 and 2005. Only 17 states have avoided internal sizeable conflicts in the continent<sup>5</sup>, and on average, each year, civil conflict occurs in 11 African countries. Major challenge to the economic development, civil conflicts cause serious damages to national economic prospects. The most common feature that has been identified in the literature on the consequences of civil conflicts is the decline of economic capabilities that results from civil conflict. A country confronted to a civil conflict might experience serious losses in its accumulated physical and human capital, and in its overall trade flows (Bayer and Rupert 2004). The impossibility for this country to offer secured long term returns for investments further results in a low investment (Collier

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<sup>5</sup> According to the UCDP/PRIOD dataset, these countries are Benin, Botswana, Cape Verde, Equatorial Guinea, Gabon, Libya, Madagascar, Malawi, Mauritania, Mauritius, Namibia, Sao Tome and Principe, Seychelles, Swaziland, Tanzania, Zambia and Zimbabwe.

1999), which leads this country to a decline in GDP per capita and/or in growth rates. Not only do civil conflicts have an impact on economic capabilities when they occur, but also when there is a risk that they occur. Besley and Persson (2008) find that the risk of civil conflict results in a lower investment in state fiscal capacity, notably because of the diversion of fiscal resources in the increased military expenditures. Although intrastate events, it has been argued that civil conflicts have a strong negative impact on the neighboring countries (Collier et al. 2003). Murdoch and Sandler (2002) find that civil wars reduce short-run growth across an entire region of neighboring countries. De Groot (2009) moderates this finding by arguing that only contiguous (“primary”) neighboring countries actually suffer from the negative effects of proximate conflict, and also experience a decline in their economic capabilities. Non-contiguous (“secondary”) neighbors experience on the contrary a positive spillover effect. There is also some evidence that civil conflict may also have an impact on neighbors’ through geographical spillovers, which are considered as a strong determinant of civil conflict throughout the world<sup>6</sup>. By allowing for country specific heterogeneity, Bosker and de Ree (2009) show however that the probability of civil war onset following a neighboring conflict is increased only for Africa. In other words, the fate of African countries does not only depend on their own actions to prevent civil war, but also on what is happening in their neighboring states. Thus, following the literature on their consequences, civil conflicts appear to be likely to prevent countries from reaping REI benefits, notably in terms of increase in regional trade and scope for better policy coordination.

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<sup>6</sup> See among others Sambanis (2001), Hegre and Sambanis (2006), Salehyan and Gleditsch (2006), Gleditsch (2007) and Buhaug and Gleditsch (2008).

### **2.3 Civil conflicts and REI: the transmission channels**

As a result of its impaired economic situation and lower investment in state fiscal capacity, we can expect a country confronted to a civil conflict not to be able to overcome the economic and political constraints to REI. Indeed, it might not be possible for this country to face the potential losses due to the REI process, notably due to the likely asymmetry in the shocks affecting its economy and its regional peers' economies. Further, conflict might impede production diversification, infrastructure development within the occurring country, and make macroeconomic discipline impossible. Besides that, conflict might affect political commitment towards REI, by changing the priorities of the governments and leading countries to become withdrawn. It is also likely that conflict countries might, for instance, be more sensitive to incentives to go back on signed agreements, given the time inconsistency problems of economic policy-making.

As of intra-regional trade, the effect of civil conflicts is likely to be ambiguous. Indeed, besides the negative effect on overall trade due to the decline in economic capabilities and to infrastructure destruction, civil conflict might increase a country's reliance on its regional peers. As Mansfield and Bronson (1997) point out, countries with limited resources might trade more with their allies in times of conflict. Civil conflict might then contribute to somewhat reduce economic ties with non-members. For instance, some countries consider certain ethical aspects when trading with other countries and might be unwilling to maintain economic relations with countries confronted to a civil conflict. Yet, in Africa, intra-regional trade flows are weak compared to trade with non-members, mainly because of the non-complementarity in the countries' structure of trade. So, even if there is a relative increase in

intra-regional trade flows due to an increased reliance on the members of the same REC, it is likely that this increase will not be large, compared to overall trade flows. Further, according to Longo and Sekkat (2001), in Africa a supposedly large part of intra-regional trade is unrecorded. Yet, it is likely that the part of intra-regional trade that is unrecorded will increase as a result of conflict. For this reason we expect civil conflict to have an ambiguous effect on intra-regional trade.

In terms of business cycle synchronicity, which represents the scope for better policy coordination, civil conflicts are likely to have a negative effect. They might indeed lead to a greater economic divergence among the members of the same REC, first because they are a source of potential regional political destabilization, since they increase the neighbors' probability of falling in their turn into conflict. Secondly, conflicts are likely to reduce synchronicity by increasing the asymmetry of the shocks affecting the member states economies, notably depending on if they are "primary" or "secondary" neighbors to conflict countries. Yet, if in a given REC there is more than one civil conflict occurring, then the neighboring countries might be "primary" neighbors in some cases, and "secondary" neighbors in other cases. Then civil conflict could be a covariate shock affecting the economies in this REC. This might lead to a certain convergence within this REC, due to this covariate shock.

### 3 Data and Research Design

#### 3.1 Data

Our empirical analysis is based on a panel data set that we construct from different sources. It covers the 53 African countries and the 21 RECs from 1980 to 2005. In this data set, the observation unit is the existing couple country-REC<sup>7</sup>. According to the date of the establishment of RECs, we have a sample size of 3663 observations<sup>8</sup>.

As mentioned above, the integration process comprises the signature of treaties and the concrete measures taken to achieve free trade and common markets. Therefore, there is no guarantee that signature of a regional treaty would result in effective integration. On this aspect, one of the identified reasons of the poor performances of African RECs is the lack of political commitment in implementing the signed treaties. This leads us to rely on *de facto* measures of regional economic integration, to assess the effect of conflict on the effectiveness of REI, in terms of the expected outcomes of the implementation of regional agreements. In the present paper, we focus on trade relationships and the scope for coordination of policies, given the lack of reliable data on factor mobility for African countries. We use the intra-regional trade intensity and business cycles synchronicity variables as proxies of REI outcomes, as suggested in the literature (*e.g.* Frankel and Rose 1997, 1998).

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<sup>7</sup> For example, the couples Sénégal-WAEMU and Madagascar-SADC are taken as observation units in our data set.

<sup>8</sup> See the date of creation for African RECs in Appendix 1.

For business cycle synchronicity, we rely on data on real gross domestic product (GDP) that comes from the World Bank World Development Indicators (WDI) 2008. We take GDP as a proxy of real economic activity, for it is often referred to as one of the main summary indicators of economic activity, and because of its availability for African countries<sup>9</sup>. We construct the business cycle synchronicity variable as follows. First we take the natural logarithm of GDP, and then we filter the data from short-term fluctuations and long-term trend to use the de-trended<sup>10</sup> component of GDP growth rate. In a third step, we compute, for each pair of countries, a correlation coefficient of the business cycles of countries  $i$  and  $j$  within the same REC over a rolling 5-years sub-period<sup>11</sup>. Finally, we take the regional mean of these correlation coefficients for each country  $i$  as our measure of business cycle synchronicity. According to the date of the establishment of the RECs, we have between one and twenty-six observations on the business cycle synchronicity for a given couple country-region. The business cycle synchronicity variable, whose descriptive statistics are shown in Table 1, is continuous and comprised between -0.720 and 0.758.

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<sup>9</sup> Frankel and Rose (1997, 1998), Darvas *et al.* (2005) and Inklaar *et al.* (2008), use alternative proxies of real economic activity such as the industrial production or the employment rate, but these data is usually not available for African states.

<sup>10</sup> Following Frankel and Rose (1997, 1998), the cyclical component is computed with the Hodrick and Prescott filter. We use value of 6.25 for the smoothing parameter, as suggested by Ravn and Uhlig (2002) for annual data. As also pointed out by studies by Frankel and Rose (1997, 1998) and Calderon *et al.* (2007), we find in our robustness checks that using different filtering methods does not affect the results,.

<sup>11</sup> For each year  $t$ , we compute the correlation coefficients on the period  $\{t, t+4\}$ , except for the year 2005, for which we compute the correlation coefficient on the  $\{2005; 2007\}$  period because of data availability. We find similar results, available upon request, when we compute those coefficients over different rolling periods' duration.

The second dependent variable is intra-regional trade intensity. It is computed as the mean of bilateral trade intensities between country  $i$  and the other countries in the REC for each year.

Following Frankel and Rose (1997, 1998), we define two indicators of trade intensity (TI1

and TI2) as follows: 
$$TI1_{ijt} = \frac{M_{ijt} + X_{ijt}}{(X_{it} + M_{it}) + (X_{jt} + M_{jt})}$$
 and 
$$TI2_{ijt} = \frac{M_{ijt} + X_{ijt}}{Y_{it} + Y_{jt}}.$$

$X_{ijt}$  is the nominal bilateral trade exports FOB (Free On Board) of country  $i$  to country  $j$  and

$M_{ijt}$  is the nominal bilateral trade imports CIF (Cost-Insurance-Freight) of country  $i$  from

country  $j$ . Bilateral trade data come from the IMF database Direction of Trade. The official

trade data are obtained from the compilation of formal trade and do not include informal trade

which is certainly important among African states. Therefore, with the official data, the

estimate of the impact of civil conflict on intra-regional trade intensity may be

underestimated.  $X_{it}$  ( $M_{it}$ ) is the total nominal exports FOB (total nominal imports CIF) of

the country  $i$ .  $Y_{it}$  is the nominal GDP of the country  $i$ . Total exports, total imports and

nominal GDP are taken from World Development Indicators 2008.

We are interested in investigating the effect of conflict on REI. As our main variable of

interest we use a dummy for the years during which a country is in civil conflict. We use the

UCDP/PRIO Armed Conflict Dataset, version 4 (Gleditsch *et al.* 2002, PRIO 2009).

UCDP/PRIO defines a civil conflict 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”.

We control for the usual determinants of REI outcomes (Imbs 2004, Darvas *et al.* 2005 and

Inklaar *et al.* 2008): the production specialization and the similarity of fiscal policies. The

production specialization is computed as the regional mean of the specialization indicator defined by Imbs (2004)  $S_{ijt}$ . It is computed as the mean of the differences of economic

structures between countries  $i$  and  $j$  over the rolling period  $t$ :  $S_{ijt} = \frac{1}{T} \sum_t \sum_n |s_{nit} - s_{njt}|$ , where

$s_{ni}$  denotes the GDP share of a sector  $n$  in a country  $i$ .  $S_{ijt}$  reaches its maximal value when the two countries have no sector in common. The similarity of fiscal policies is proxied by the correlation of the share of government consumption in the GDP<sup>12</sup>. The data for both variables is drawn from the WDI 2008.

We also add variables that are included in gravity models. As suggested by Inklaar *et al.* (2008), these not only affect trade intensity, but there also related to variables affecting business cycle synchronicity. These variables are the following: per capita GDP, to control for the effect of economic development level; an institution variable, namely the Polity2 variable from the Polity IV dataset; and the number of mobile and fix phone lines per 1000 inhabitants, to control for the level of infrastructures. The data is drawn from the WDI 2008.

### 3.2 Econometric issues

The focus of the present paper is the analysis of the potential effects of civil conflicts on REI outcomes in Africa. For that purpose, we estimate the following regression:

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<sup>12</sup> The conventional deficit is usually acknowledged to be a better indicator of the fiscal policy of a government. We decided to use the share of government consumption because of the greater availability of these data. But when using the conventional deficit to construct the variable of similarity of fiscal policies as a robustness check, our results, which are available upon request, are similar, despite the loss of about one-third of the observations.

$$REI_{irt} = \alpha + \beta \cdot Conflict_t + \gamma \cdot X_{irt} + \eta_{irt} \quad (1)$$

$REI_{irt}$  is the regional integration indicator of a country  $i$  in a cluster  $r$  on year  $t$ ,  $Conflict_t$  is the conflict status of a country  $i$  on year  $t$ ,  $X_{irt}$  denotes the various control variables that could determine REI outcomes independently of civil conflict and  $\eta_{irt}$  is the classical error term.  $\alpha$ ,  $\beta$  and  $\gamma$  are the coefficients to be estimated.

A simple OLS regression of equation (1) might yield biased estimates. There is indeed a potential issue with the reverse causality between civil conflict and REI. On one hand, civil conflict might make more difficult the integration of a country, and on the other hand, countries might get into an integration process in order to secure the achievement of peace and political stability. There is also a potential bias coming from omitted variable. Indeed, there are unobserved factors related to countries' social, economic and political indicators, and/or to the incentives to implement the regional economic agreements. Those unobserved factors may affect both conflicts and the progress in REI. For instance, countries that are more likely to benefit from the distribution of gains and losses of REI might show a strong and sustained political commitment towards the integration process in order to capture the gains associated. In doing so, they experience an enhanced economic growth, which contributes to increase, for instance, the citizens' opportunity cost of joining a rebellion<sup>13</sup>. Then, the degree

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<sup>13</sup> Poverty has been identified as a cause of civil war by many studies in the literature. Yet, researchers differ in their interpretation of this empirical finding. According to Fearon and Laitin (2003), conflict in poor countries reflects their henceforth limited state capability to put down rebellions, whereas for Collier and Hoeffler (2004) it reflects lower opportunity costs of fighting in those countries. Whether one interpretation prevails on the other does not really matter when we consider the effect of REI on conflict. On one hand, by allowing them to conduct

of REI will be closely tied to the fact those countries are in peace, and this could result in an observed negative association between regional integration depth and conflict status which might in fact capture the result of countries' effective implementation of regional agreements.

To purge the simultaneity between REI and conflict, and the correlations between conflict and unobserved factors affecting the effective implementation of regional agreements, we adopt an instrumental variables estimator and use two instruments for conflict: a dummy for assassination attempts on the national leader and the number of refugees hosted by the country in each period.

Jones and Olken (2008) analyze the effects of assassinations attempts on national leaders on political institutions and civil conflicts. In their study, they emphasize the role of national leaders in the path of conflicts and provide evidence that assassinations attempts affect civil conflicts in a different way according to their intensity. While successful assassination attempts lead to an intensification of low intensity conflicts, they tend to hasten the termination of high intensity conflicts. We use the data collected by the authors from 1875 to 2004. They consider only the attempts in which a weapon was actually used. In Africa, there have been 13 assassination attempts among which 4 have been successful, between 1980 and 2004. This is the key to our identification assumption: if all assassinations had been successful, this variable could not be a good instrument, since Jones and Olken (2008) find that successful attempts lead to an institutional change likely to directly affect progress in

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better economic policies, REI would allow states to make the require investments to increase national capability and change the political opportunity that affects rebels' decision to fight. On the other hand, by enhancing economic growth, REI might contribute to increase the opportunity cost of fighting.

REI. We assume that assassination attempts do not have a direct effect on regional economic integration, but an indirect effect through conflict, GDP and institutional change, for which we control.

The second instrument we use for conflict is the number of refugees hosted by the country each year. We use data compiled by Marshall for the Center for Systemic Peace<sup>14</sup>. Assisting and protecting refugees is a great burden for host countries, as suggested by the UNHCR reports. Refugees' flows urge the necessity to provide more public services, increase the scarcity of resources and require the shifting of a share of public expenditures from national citizens to the refugee population. Refugees might also influence positively the country's economic growth, if they have a high level of human or physical capital, or due to the increase in aid flows a host country might expect, especially when the conflict they are fleeing receives large international media coverage. We thus assume that it does not have a direct impact on progress in REI, but only through its impact on national economy. On the other hand, refugees hosting might, as argued by Saleyhan and Gleditsch (2006), lead to the international spread of conflict. First, refugee camps are often located near conflict areas and targeted during attacks. Some of the refugees might also bring along with them arms, combatants, and ideologies which are conducive to violence and mobilize opposition directed at their country of origin, or even at the hosting country. Furthermore, Saleyhan and Gleditsch (2006) point out that there might be tensions between refugees and host communities, due to several factors, from misperceptions about the real impact of refugees on the local environment and economy to the induced demographic and ethnic balance change in the host society.

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<sup>14</sup> Data compiled from the World Refugee Survey of the United States Committee for Refugees and Immigrants (USCRI).

We finally include in all estimates year fixed effects in order to control for the occurrence of covariate shocks, and region fixed effects to control for regional specific characteristics that are constant over time, notably the type of regional integration arrangements<sup>15</sup> or the characteristics of the established regional institutions.

## **4 Empirical Results**

### **4.1 Descriptive analysis**

Descriptive statistics on the full sample over the 26 years of our analysis are provided in Table 1. The average country in our sample has low intra-regional trade flows and is relatively weakly synchronized with the countries in the REC it belongs to. In comparison, Tapsoba (2009) suggests that, from 1970 to 2003, the average business cycle synchronicity is nine times higher for the OECD members (0.4012) and 13 times higher for European Monetary Union members (0.5554) than for African countries. This is consistent with the poor performances of African RECs we mentioned above. If we differentiate the variables according to the conflict status, we find that an average conflict country is not clearly more or less integrated than a country at peace in terms of business cycle synchronicity. In terms of intra-regional trade however, conflict countries are not clearly different as of trade intensity relative to regional partners' total output, but they have greater trade intensity relative to regional partners' total trade.

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<sup>15</sup> In Africa, the RECs have not changed their type of arrangement in our period.

## 4.2 Effects of civil conflict on progress in regional economic integration

Table 1 shows that, on average, it is on average more likely for a conflict country to experience more assassination attempts on its leaders and host more refugees<sup>16</sup>. The first stage equations of the IV estimates are reported in Appendix 3. We find that experiencing an assassination attempt increases significantly the probability of conflict by between 20 and 31 percentage points depending on the specifications, whereas a 1% increase in the number of refugees hosted increases also significantly this probability by between 3 and 5 percentage points.

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<sup>16</sup> We also conducted a test of the significance of the difference in the means of assassination attempts on leaders and refugees hosted according to the conflict status, which is not presented here but available upon request, showing that this difference is statistically significant

**Table 1: Descriptive statistics of the main variables.**

	Mean	Std. Dev.	Minimum	Maximum	Observations
	[1]	[2]	[3]	[4]	[5]
<b>Conflict</b>	0.21103	0.40809	0	1	3663
<b>Trade intensity</b>					
TI1	0.00203	0.003313	0	0.03425	3452
<i>With Conflict</i>	0.00234	0.004212	0	0.03425	711
<i>No Conflict</i>	0.00195	0.003021	0	0.03425	2559
TI2	0.00117	0.001753	0	0.02141	3532
<i>With Conflict</i>	0.00114	0.002067	0	0.02141	730
<i>No Conflict</i>	0.00116	0.001646	0	0.02141	2592
<b>Synchronicity</b>					
Hodrick-Prescott ( $\lambda=6.25$ )	0.08053	0.19490	-0.72059	0.75819	3572
<i>With Conflict</i>	0.08044	0.20086	-0.56674	0.73156	753
<i>No Conflict</i>	0.08056	0.19331	-0.72059	0.75819	2819
<b>Instruments</b>					
Assassination attempts on leaders	0.00792	0.08864	0	1	3663
<i>With Conflict</i>	0.02458	0.15494	0	1	773
<i>No Conflict</i>	0.00346	0.05873	0	1	2890
Number of refugees hosted	68.2975	140.868	0	1527	3530
<i>With Conflict</i>	111.740	142.371	0	914	773
<i>No Conflict</i>	56.1170	138.037	0	1527	2757

Note: Std. Dev. stands for Standard deviation. TI1= Regional average of bilateral trade divided by the sum of the total trade of countries in the pairs. TI2= Regional average of bilateral trade divided by the sum of the output of countries in the pairs.  $\lambda$  is the smoothing parameter of the Hodrick-Prescott's filter.

In Table 2, we present the results of instrumental variables estimates. We find that civil conflict significantly affects REI process through its negative impact on regional synchronicity. Moreover, the effect is substantial, in quantitative terms. In column [3] of Table 2, we see that experiencing conflict reduces synchronicity by 0.126. If we compare a country at peace between 1980 and 2005 to a country having been in conflict on average for 40.64% of the period (conflict sample standard deviation), the difference in the corresponding

synchronicity measure would be  $-0.126 \times 0.4081 = -0.0514$ . This amounts to slightly less than a one-third decrease in business cycle synchronicity sample standard deviation (0.195). Further, comparing a country at peace between 1980 and 2005, such as Botswana, to a country which has been continuously in conflict over the period, like Sudan, yields a fall in synchronicity of 0.126, which is roughly equivalent to a two-third shortfall in the synchronicity sample standard deviation.

We find that civil conflict has a positive and significant impact on intra-regional regional trade intensities. If we compare a country at peace between 1980 and 2005 to a country having been in conflict on average for 40.64% of the period, the difference in the corresponding intra-regional trade intensity TI1 (TI2) would be  $0.00143 \times 0.4081$  ( $0.00093 \times 0.4081$ ) = 0.000583 (0.000379). This corresponds roughly to a one-fourth increase in both TI1 and TI2 sample standard deviations. This result might seem relatively striking, notably when considering the related literature. For instance, Bayer and Rupert (2004) find evidence that, between 1950 and 1992, civil wars have reduced total bilateral trade by about one-third. Besides that, given the identified impact of civil conflict on economic capabilities, we would expect a reduction in intra-regional trade intensity. Further, a major obstacle to the expansion of intra-REC trade in Africa is the similarity in the structure of trade among REC members and it is likely that conflict might hamper the diversification of the economic structure, not only for conflict countries, but also for their neighbors<sup>17</sup>. Yet, this result indicates that civil conflict increases the ratio of the country's intra-regional trade flows on all regional partners' total trade flows: this can be due to a decrease in the conflict country's total trade, as well as to an increase in its intra-regional trade flows.

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<sup>17</sup> See section 2.

<b>Table 2: IV estimates of the impact of civil conflict on trade intensity and synchronicity.</b>				
<b>Dependent variable</b>	<b>Trade intensity</b>		<b>Synchronicity</b>	
	<b>TI1</b>	<b>TI2</b>		
	[1]	[2]	[3]	[4]
<b>Conflict</b>	<b>0.00143***</b>	<b>0.00093***</b>	<b>-0.12641***</b>	<b>-0.13018***</b>
	(0.00051)	(0.00033)	(0.04760)	(0.04714)
TI1			0.26122	
			(2.45343)	
TI2				1.12234
				(4.13336)
Production specialization	-0.00096**	-0.00085***	-0.17958***	-0.17230***
	(0.00039)	(0.00026)	(0.03047)	(0.03033)
Governments similarity	0.00077***	0.00041***	-0.00258	-0.00303
	(0.00027)	(0.00014)	(0.02221)	(0.02222)
Polity2	0.00001	0.00001	-0.00304***	-0.00310***
	(0.00001)	(0.00001)	(0.00088)	(0.00088)
Log (Phone lines)	0.00034***	0.00021***	0.00997***	0.00963***
	(0.00003)	(0.00002)	(0.00284)	(0.00286)
Log (GDP per capita )	0.00007	0.00012**	-0.01725**	-0.01741**
	(0.00009)	(0.00006)	(0.00775)	(0.00770)
Partial R2 of excluded instruments	0.0317	0.0319	0.0326	0.0334
F test of excluded instruments	52.62***	52.92***	54.25***	56.07***
Hansen	1.257	0.117	0.598	0.578
Probability	0.262	0.732	0.439	0.447
Hausman test	12.74	14.77	5.738	6.289
Probability	0.0004	0.0001	0.0166	0.0121
Observations	2942	2946	2942	2946

Note: All estimates include an intercept, regional and year dummies. TI1= Regional average of bilateral trade divided by the sum of the total trade of countries in the pairs. TI2= Regional average of bilateral trade divided by the sum of the output of countries in the pairs. The variables Production specialization and Governments similarity measure respectively the similarity of productive structures and the similarity of Government consumption with the other partners in a given cluster. The conflict variables are instrumented with a dummy for an assassination attempt on the leaders and the logarithm of the number of refugees hosted. The null hypothesis of the Hausman test is the exogeneity of the covariate of interest. Robust standard errors in parentheses. \* Significant at 10 %, \*\* significant at 5 % and \*\*\* significant at 1 %.

As we argue above, civil conflict might lead to an increase in regional trade, for the country having to rely more on its regional peers. But, given the induced decline in its national economic capabilities and the spillover effects of conflict on its neighbors, likely to belong to the same REC(s), the effect that might be more important is the decrease in total trade.

Some of the control variables appear to be significantly associated to our measures of REI. Even if the corresponding coefficients are prone to an endogeneity bias, it is worthwhile briefly comment on them. The results indicate that the similarity in the production specialization of a country and its regional peers is negatively associated with REI. Similarly, infrastructure development (proxied by the number of mobile and fix phone lines per 1000 inhabitants) is positively correlated with REI. Furthermore, similarity in government consumption is positively correlated with our trade intensity measures, while institution level (Polity2) and GDP per capita growth are negatively correlated with the synchronicity variable.

### **4.3 Delayed impact of civil conflict on REI**

The effect of civil conflict may vary over time. Civil conflict damages determinants of economic prospects and induces lasting changes in the economic structure. We add the lagged conflict variable to our regressors to test the assumption that there is a delayed effect of conflict on REI. The results presented in Table 3 show that civil conflicts do have a lagged negative effect on intra-regional trade intensities. Having experienced conflict the previous year reduces the intra-regional trade intensities by about a one-third sample standard deviation, for both TI1 and TI2. This result is interesting if we put it in perspective with our above suggestion that conflict might have an ambiguous effect on intra-regional intensities due to the increased reliance of the conflict country on its regional peers. The lagged negative impact of civil conflict indicates this increased reliance would be a relatively short term effect. If the country has been in conflict the previous year, the induced changes in the economic structure lead to a decrease in intra-regional trade intensity likely to be due to the fact regional trade flows, and not only total trade flows or total output, are also decreasing.

The negative effect of lagged conflict on intra-regional trade intensity might also be explained by the fact the regional peers experience an increase in their trade or output with other intra-regional or extra-regional partners. In other terms, the regional peers would rely less on the conflict country. Yet, this lagged conflict-induced reduction in intra-regional trade intensity is not important enough to offset the current conflict-induced increase, the total effect of conflict remaining positive. For instance, having experienced conflict during both the previous and current years yields an increase in TII corresponding to about one-sixth sample standard error, which is nevertheless a smaller effect than the one we found in Table 2.

As of synchronicity, we find that if a country is in conflict the previous year, the difference in the corresponding synchronicity is equivalent to a one-fourth increase in the sample standard deviation. This result might be explained by civil conflicts negative effects on neighboring countries' economic prospects. A country confronted to civil conflict might show greater business cycle synchronicity with the countries belonging to the same regional community, but this might reflect the fact that the regional peers also experience an impaired economic situation as a result of this conflict. The total effect of conflict is nevertheless still negative and significant; being in conflict during both the current and the previous years leads to a decline in synchronicity roughly equivalent to a one-fourth decrease in the sample standard deviation. The magnitude of this effect is less important than the one we found in the previous section, which suggests that the longer a country is in conflict, the less negative effect this has on its synchronicity with its regional peers. This is in favor of the assumption that conflict leads to a greater asymmetry in the economic shocks affecting the occurring country and its regional peers, asymmetry most likely due to the fact the longer a country is in conflict the more important are the losses induced for its neighbors.

**Table 3: Dynamic impact of civil conflict on trade intensity and synchronicity (IV estimates).**

Dependent variable	Trade intensity		Synchronicity	
	TI1	TI2		
	[1]	[2]	[3]	[4]
<b>Conflict</b>	<b>0.00362***</b> (0.00119)	<b>0.00245***</b> (0.00076)	<b>-0.22487**</b> (0.10030)	<b>-0.23409**</b> (0.09981)
<b>Lagged conflict</b>	<b>-0.00239***</b> (0.00074)	<b>-0.00165***</b> (0.00047)	<b>0.11705*</b> (0.06181)	<b>0.12259**</b> (0.06149)
TI1			1.80334 (2.57269)	
TI2				4.16910 (4.19652)
Production specialization	-0.00114*** (0.00035)	-0.00100*** (0.00022)	-0.16175*** (0.03209)	-0.15314*** (0.03207)
Governments similarity	0.00082*** (0.00030)	0.00045*** (0.00015)	-0.00746 (0.02357)	-0.00801 (0.02359)
Polity2	0.00001 (0.00001)	0.00001 (0.00001)	-0.00273*** (0.00090)	-0.00280*** (0.00091)
Log (Phone lines)	0.00033*** (0.00003)	0.00020*** (0.00002)	0.00963*** (0.00312)	0.00920*** (0.00314)
Log (GDP per capita)	0.00006 (0.00008)	0.00011** (0.00005)	-0.01458** (0.00714)	-0.01492** (0.00715)
Partial R2 of excluded instruments	0.0128	0.0128	0.0130	0.0132
F test of excluded instruments	19.08***	19.13***	19.09***	19.49***
Hansen J statistic	0.191	18.33	1.225	5.212
Probability	0.662	0.901	0.268	0.273
Hausman test	15.07	0.0156	4.687	1.203
Probability	0.0001	0.0000	0.0304	0.0224
Observations	2770	2774	2770	2774

Note: All estimates include an intercept, regional and year dummies. TI1= Regional average of bilateral trade divided by the sum of the total trade of countries in the pairs. TI2= Regional average of bilateral trade divided by the sum of the output of countries in the pairs. The variables Production specialization and Governments similarity measure respectively the similarity of productive structures and the similarity of Government consumption with the other partners in a given cluster. The conflict variables are instrumented with a dummy for an assassination attempt on the leaders and the logarithm of the number of refugees hosted. The null hypothesis of the Hausman test is the exogeneity of the covariate of interest. Robust standard errors in parentheses. \* Significant at 10 %, \*\* significant at 5 % and \*\*\* significant at 1 %.

## 4.4 Robustness checks

### 4.4.1 Calculation of the variables of interest

Our results might be driven by the choices we made for the business cycles synchronicity, intra-regional trade and conflict variables. We first focus on the conflict variable and use the logarithm of the number of battle-related deaths, to assess the effect of conflict intensity, and the logarithm of the number of years of conflict<sup>18</sup>, to assess its duration impact.

The results, presented in Table 4, are similar to the ones we have with the conflict dummy variable, in the sense that the coefficient for synchronicity is negative and significant, and the one for intra-regional trade-intensity is positive and statistically significant.

Dependent variable	TI1		TI2		Synchronicity	
	[1]	[2]	[3]	[4]	[3]	[4]
Log (Battle-related deaths)	0.00020*** (0.00007)	0.00013*** (0.00005)	-0.01634** (0.00662)	-0.01696*** (0.00658)		
Log (Conflict duration in years)	0.00053*** (0.00020)	0.00035*** (0.00013)	-0.04842*** (0.01786)	-0.04981*** (0.01766)		

All estimates include the following variables: similarity of productive structures and of government consumption with the regional peers, Polity2, Log (Phone lines), Log (GDPpc), intercept, regional and year dummies. Columns [3] and [4] respectively include TI1 and TI2 in the controls. TI1= Regional average of bilateral trade divided by the sum of the total trade of countries in the pairs. TI2= Regional average of bilateral trade divided by the sum of the output of countries in the pairs. The battle-deaths and conflict duration variables are instrumented with a dummy for assassination attempts on the leaders and the logarithm of the number of refugees hosted. Robust standard errors in parentheses. \* Significant at 10 %, \*\* significant at 5 % and \*\*\* significant at 1 %.

<sup>18</sup> We use here the major dates of conflict, according to the UCDP/PRIODATASET. Yet, our estimates with duration calculated with the minor dates are similar, and available upon request.

For the business cycle synchronicity variable, the results might be different according to the indicator of economic activity and to the filtering method used to compute the cyclical component of this economic activity. As indicator of economic activity, we could have chosen the consumer price index, which we did not because of the lesser availability of these data for African countries. Columns [1] and [2] of Table 5 show that our results do not significantly change when using alternative synchronicity variables. In column [3], we also have similar results when we use alternatives regional trade variables, except for TI3, the ratio of regional trade flows on total trade flows of the conflict country. To relate this with our discussion of the results shown in Table 2 for TI1, it suggests that the increase of intra-regional trade intensity relative to regional partners' total trade is more due to the decrease in regional partners' trade with the conflict country than to an increase of its reliance on its regional peers.

**Table 5: Robustness checks on the effect of conflict on REI using alternative intra-regional trade and synchronicity variables**

<b>Synchronicity variables</b>		
	<b>TI1</b>	<b>TI2</b>
	[1]	[2]
Prices synchronicity	-0.10948** (0.05259)	-0.10969** (0.05232)
Baxter-King Filter (2,8)	-0.14662*** (0.05076)	-0.14882*** (0.04946)
Fisher's z-transformation	-0.13086*** (0.04981)	-0.13473*** (0.04929)
<b>Trade variables</b>		
	[3]	
TI3	0.00073 (0.00222)	
TI4	0.00227* (0.00134)	
Log (Regional trade value)	1.61437*** (0.49268)	

Note: All estimates include the following variables: the similarity of productive structures and the similarity of Government consumption of the rest of partners in the given cluster, Polity2, Log (Phone lines), Log (GDPpc), intercept, regional and year dummies. The synchronicity of prices is computed from the logarithm of Consumer Prices Index. The Baxter-King filter assumes here that the length of business cycles is between 2 and 8 years. TI1 = Regional average of bilateral trade divided by the sum of the total trade of countries in the pairs. TI2 = Regional average of bilateral trade divided by the sum of the output of countries in the pairs. TI3 = Regional average of bilateral trade divided by the sum of the total trade of country *i*. TI4 = Regional average of bilateral trade divided by the sum of the output of country *i*. Log (Regional trade value) = Sum of exports and imports to and from country *i*. The conflict dummy variable is instrumented with a dummy for assassination attempts on the leaders and the logarithm of the number of refugees hosted. Robust standard errors in parentheses. \* Significant at 10 %, \*\* significant at 5 % and \*\*\* significant at 1 %.

#### 4.4.2 Selection Bias

Another issue that might modify our results is one of selection. In fact, there are two issues of selection. The observation unit in the dataset is the existing couple "country-REC". Since we do not account for the non-existing couples, or the countries that are not members of any REC<sup>19</sup>, we effectively study a selective sample of countries. This potentially induces a selection bias if the probability of becoming a member of a REC is related to the domestic political situation of a country. It may however be argued, that the bias is relatively small,

<sup>19</sup> By the beginning of the 1990's, all the 53 African countries are members of at least one REC.

given the circumstances of the construction of REC: geographical factors and cultural proximity usually play an important role in determining which countries join a REC (Frankel 1997, Baier and Bergstrand 2004). Another issue of selection arises from the fact that there is non-random missing synchronicity and intra-regional trade intensity data. This is arguably more important. Indeed, the probability of having missing synchronization and/or intra-regional trade data might be systematically higher for conflict countries, which are more likely to lack the capacity to collect reliable economic data. We can assume that a country lacking the capacities to collect reliable data might also lack the capacity to implement regional economic agreements. Then, by not accounting for the existence of these missing data among the existing couples country-REC, we might underestimate the effect of civil conflict on effective REI.

In order to simultaneously control for causes of selection as well as for the unobserved heterogeneity affecting both REC membership and agreements implementation, and for the simultaneity between civil conflict and REI, we adopt the method presented by Semykina and Wooldridge (2008). The method works as follows: in a first step, we estimate the probability of having non-missing synchronization or intra-regional trade data for an existing country-REC couple and derive from this stage the inverse Mills ratio. Then, we apply a pooled instrumental variable estimator to the structural equation and include the estimated inverse Mills ratio in the regressions. Following Thomas and Strauss (1997), we use the same set of instruments to identify both the selection and the REI equation. The results, presented in Appendix 4, allow us to reject selection for the trade intensity regressions, since the inverse Mills ratio turns out to be statistically indistinguishable from zero. Yet, when introducing the inverse Mills ratio in the estimates the coefficient for conflict is no longer statistically

indistinguishable from zero. For synchronicity, the estimated inverse Mills ratio is dropped due to collinearity, for it is constant over time, which means the process of selection is constant over time. Then, by including region fixed effects allowing us to control for regional specific characteristics that are constant over time, in a certain way we correct for the potential selection problem due to the nature of our data.

## **5 Concluding Remarks**

In this paper, we have examined the impact of civil conflicts on REI outcomes in Africa through their effects on business cycle synchronicity and intra-regional trade intensity. In the literature on REI, these variables represent the progress made in terms of REI and the scope for going deeper into the integration process: the co-movement of business cycles catches the ability of countries to coordinate their economic policies and intra-regional trade intensity shows the economic interdependence between countries through the depth of their trade relations. Our estimates provide evidence that conflict in a country tends to reduce its synchronicity with its regional peers, whereas it increases its intra-regional trade intensities. We also find that while current conflict increases intra-regional trade intensity, lagged conflict reduces it, and the opposite holds for business cycle synchronicity. More generally, this highlights that progress in regional integration is modified once civil conflict occurs in one state.

African countries have been involved in regional economic integration since the beginning of the twentieth century<sup>20</sup>. The efforts made have varied across the different countries, regions and time, but as of today, the performances of the various RECs appear relatively disappointing, especially compared to RECs in other developing regions. The recurrence of civil conflicts and other constraints related to political institutions raise the issue that the success of a REI process depends on if it is accompanied by a political integration process. The coordination of national economic policies particularly requires such a process. It is all the more essential for RECs' members to strengthen their political ties when one of them is confronted to a civil conflict, for this will contribute to increase private actors' confidence in the coherence of the initiative. Thus, by being committed to resolve a civil conflict occurring in a country, regional groups' members might also reap specific benefits, in terms of their own progress in REI. We then recommend that, especially in the African context, RECs get strongly involved in their peers' civil conflict prevention, containment and resolution.

Our study also adds to the evidence provided by the literature on the effects of civil conflicts, by showing the negative regional effects of conflicts and identifying an additional incentive for conflict prevention and resolution policies. More specifically, our point here is that apart from conflict spillover effects that have been identified by previous studies, there is a further incentive for members of the same REC to work for the prevention and/or the resolution of conflicts in their peers. If conflict in a country impedes its progress in REI, then it should be a primary concern for its regional peers since their own progress towards integration would also be affected. We then argue that bringing a sustain political stability in a regional community

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<sup>20</sup> The East African Community (EAC) was launched in 1917, and the South African Customs Union (SACU) in 1910.

should be considered as a regional public good and RECs' members should get involved in the prevention, containment and resolution of conflict occurring in their regional peers.

## References

Alesina, A. and Spolaore E. (1997): "On the Number and Size of Nations", *Quarterly Journal of Economics*, 112(4), 1027-1056.

Balassa, B. (1961): *The Theory of Economic Integration*, Homewood, IL: Richard Irwin.

Baxter, M. and King R. G. (1999): "Measuring Business Cycles: Approximate Band-Pass Filters For Economic Time Series", *Review of Economics and Statistics*, 81(4), 575–593.

Bayer, R. and Rupert M. (2004): "Effects of Civil Wars on International Trade, 1950-92", *Journal of Peace Research*, 41(6), 699-713.

Besley, T. and Persson T. (2008): "Wars and state capacity", *Journal of the European Economic Association* 6, 522-530.

Blattman, C. and Miguel E. (2008): "Civil War", *Journal of Economic Literature*, forthcoming.

Bosker, M. and de Ree J. (2009): "Localizing conflict spillovers: introducing regional heterogeneity in conflict studies", unpublished manuscript.

Calderon, C., Chong A. and E. Stein (2007): "Trade Intensity and Business Cycle Synchronization: Are Developing Countries Any Different?", *Journal of International Economics*, 71(1), 2–21.

Carrère, C. (2004): "African Regional Agreements: Impact on Trade with or without Currency Unions", *Journal of African Economies*, 13(2), 199-239.

Carrère, C. (2006): "Revisiting the Effects of Regional Trading Agreements on Trade Flows with Proper Specification of the Gravity Model", *European Economic Review*, 50(2), 223-247.

Collier, P. (1999): "On the Economic Consequences of Civil War." *Oxford Economic Papers*, 51, 168-183.

Collier P., Elliott V., Hegre H., Hoeffler A., Reynal-Querol M. and N. Sambanis (2003): *Breaking the Conflict Trap: Civil War and Development Policy*, Washington, DC-New York: World Bank and Oxford University Press.

Darvas, Z., Rose A. K. and G. Szapary (2005): "Fiscal Divergence and Business Cycle Synchronization: Irresponsibility Is Idiosyncratic", NBER Working Papers 11580, National Bureau of Economic Research.

De Groot, O. J. (2009): "Spill-Over Effects of Conflict on Growth in Neighboring Countries", *Defence and Peace Economics*, forthcoming.

De Lombaerde, P. and Van Langenhove L. (2006): "Indicators of Regional Integration: Conceptual and Methodological aspects", in Philippe De Lombaerde (ed.), *Assessment and Measurement of Regional Integration*, Routledge: London, 9-41.

Fernandez, R. and Portes J. ( 1998) : "Returns to Regionalism: An Analysis on Nontraditional Gains from Regional Trade Agreements." *World Bank Economic Review* 12(2), 197–220.

Frankel, J. (1997): *Regional Trading Blocs in the World Economic System*. Washington, D.C.: Institute for International Economics.

Frankel, J.A. and Rose A.K. (1997): "Is EMU more Justifiable ex post than ex ante?", *European Economic Review*, 41 (3–5), 753–760.

- Frankel, J.A. and Rose A.K. (1998): “The Endogeneity of the Optimum Currency Area Criteria”, *The Economic Journal*, 108(449), 1009–1025.
- Geda, A. and Kibret, H. (2008): “Regional Economic Integration in Africa: A Review of Problems and Prospects with a Case Study of Comesa”, *Journal of African Economies*, 17(3), 357-394.
- Gleditsch, N. P., Wallensteen P., Eriksson M., Sollenberg M. and H. Strand. (2002): “Armed Conflict 1946-2001: A New Dataset”, *Journal of Peace Research*, 39(5), 615-637.
- Grossman G. M. and Helpman E. (1995): “The Politics of Free-Trade Agreements”, *American Economic Review*, 85(4), 667-690.
- Hegre, H. and Sambanis N. (2006): “Sensitivity Analysis of Empirical Results on Civil War Onset”, *Journal of Conflict Resolution*, 50(4), 508-535.
- Hodrick, R.J. and Prescott E.C. (1997): “Postwar U.S. Business Cycles: An Empirical Investigation”, *Journal of Money, Credit and Banking*, 29(1), 1–16.
- Imbs, J. (2004): “Trade, Finance, Specialization, and Synchronization”, *Review of Economics and Statistics*, 86(3), 723–734.
- Inklaar, R., Jong-A-Pin R. and J. de Haan (2008): “Trade and Business Cycle Synchronization in OECD countries—A Re-examination”, *European Economic Review*, 52(4), 646–666.
- Jones, B. F. and Olken B. A. (2009): “Hit or Miss? The Effect of Assassinations on Institutions and War”, *American Economic Journal: Macroeconomics* 1(2), 55-87.
- Longo, R. and Sekkat, K. (2001): “Obstacles to Expanding Intra-African Trade”. OECD Development Centre Working Paper 169.

Mansfield, E. D. and Bronson R., (1997): "Alliances, Preferential Trading Arrangements, and International Trade", *American Political Science Review*, 91(1), 94-107.

Marshall, M. G. and Jagers K. (2004): *Polity IV Project*, Integrated Network for Societal Conflict Research Program and Center for International Development and Conflict Management, University of Maryland.

Murdoch, J.C. and Sandler, T. (2002): "Economic Growth, Civil Wars and Spatial Spillovers". *Journal of Conflict Resolution*, 46(1), 91-110.

Murdoch, J. C. and Sandler T. (2004): "Civil wars and economic growth: spatial dispersion," *American Journal of Political Science*, 48, 138–151.

PRIO, *Armed Conflict Dataset Version 4-2009*. Available at <http://new.prio.no/CSCW-Datasets/Data-on-Armed-Conflict/UppsalaPRIO-Armed-Conflicts-Dataset/>

Ravn, M.O. and Uhlig H. (2002): "On Adjusting the Hodrick–Prescott Filter for the Frequency of Observations", *The Review of Economics and Statistics*, 84(2), 371–375.

Salehyan, I. and Gleditsch K. S. (2006): "Refugees and the spread of civil war", *International Organization*, 60, 335–366.

Schiff, M. and Winters L. A. (1998). "Regional Integration as Diplomacy." *World Bank Economic Review* 12(2), 271–296.

Schiff, M. and Winters L. A. (2003) "*Regional Integration and development*", Washington, DC: World Bank.

Semykina, A. and Wooldridge J. M. (2008): "Estimating Panel Data Models in the Presence of

Endogeneity and Selection”, revise and resubmit at *Journal of Econometrics*.

Tapsoba, S. J. (2009): “Trade intensity and Business Cycle Synchronicity in Africa”, *Journal of African Economies*, 18(2), 287-318.

Thomas, D. and Strauss J. (1997): “Health and wages: Evidence on men and women in urban Brazil”, *Journal of Econometrics* 77, 159-185.

UNECA (2004): *Assessing Regional Integration in Africa 2002*, United Nations Economic Commission for Africa, Addis Ababa.

United States Committee for Refugees and Immigrants (USCRI), *World Refugee Survey* (Annual Series). Compiled by Monty G. Marshall, Center for Systemic Peace.

World Bank (2008): *World Development Indicators*. Retrieved August 2009, from <http://go.worldbank.org/B53SONGPA0>.

**Appendix 1: List of Regional Economic Communities and countries**

Clusters	Members	Type	Entry	Source
CFA Zone (ZF)	Cameroun (1961), Benin, Burkina Faso, Comoros, Congo, Côte d'Ivoire, Gabon, Equatorial Guinea (1985), Bissau Guinea (1997), Mali (1958-1962-1967), Madagascar (1973), Mauritania (1958-1973), Niger, Central African Republic, Senegal, Chad, Togo (1963)	MC	1958	Authors
Common Monetary Area (Zone Rand)	Botswana (1961-1975), Lesotho (1961), Namibia (1990), South Africa (1961), Swaziland (1961)	MC	1961	
Liptako-Gourma Authority	Burkina Faso, Mali, Niger	EIA	1970	
Intergovernmental Authority on Development (IGAD)	Djibouti, Ethiopia, Kenya, Somalia, Sudan, Uganda, Eritrea (1993-2007)	EIA	1986	
Community of Sahel-Saharan States (CEN-SAD)	Burkina Faso, Chad, Libya, Mali, Niger, Sudan, Central African Republic (1999), Eritrea (1999), Djibouti (2000), Gambia (2000), Senegal (2000), Egypt (2001), Morocco (2001), Nigeria (2001), Somalia (2001), Tunisia (2001), Benin (2002), Togo (2002), Côte d'Ivoire (2004), Guinea-Bissau (2004), Liberia (2004), Ghana (2005), Sierra Leone (2005), Comoros (2007), Guinea (2007), Kenya (2008), Mauritania (2008), Sao Tome and Principe (2008)	FTA	1998	
Nile Basin Initiative (NBI)	Burundi, Democratic Republic of Congo, Egypt, Ethiopia, Kenya, Rwanda, Sudan, Tanzania, Uganda	EIA	1999	
West African Monetary Zone (WAMZ)	Gambia, Ghana, Guinea, Nigeria, Sierra Leone	MC	2000	
Mano River Union (MRU)	Liberia, Sierra Leone, Guinea (1980)	EIA	1973	Frankel (1997)
Economic Community of the Great Lakes Countries (CEPGL)	Burundi, Democratic Republic of Congo, Rwanda	EIA	1976	
Economic Community of Central African States (ECCAS)	Angola, Burundi, Cameroon, Congo, Gabon, Equatorial Guinea, Rwanda (withdraw in 2007), Sao Tome and Principe, Democratic Republic of Congo, Chad	FTA	1983	
Indian Ocean Commission (IOC)	Comoros, Madagascar, Mauritius, Reunion, Mayotte, Seychelles	EIA	1984	
Arab Maghreb Union (AMU)	Algeria, Libya, Mauritania, Morocco, Tunisia	FTA	1989	
Cross Border Initiative (CBI)	Burundi, Comoros, Kenya, Madagascar, Malawi, Mauritius, Namibia, Rwanda, Seychelles, Swaziland, Tanzania, Uganda, Zambia, Zimbabwe	FTA	1993	
African Economic Community (AEC)	African States	FTA	1994	
Southern African Customs Union (SACU)	Botswana, Lesotho, Namibia, South, Africa, Swaziland	CU	1910	WTO

West African Economic and Monetary Union (UEMOA/WAEMU)	Benin, Burkina Faso, Côte d'Ivoire, Bissau Guinea (1997), Mali (1958-1962- 1984), Mauritania (1958-1973), Niger, Senegal, Togo (1963)	MU	1958	
East African Community (EAC)	Kenya, Tanzania, Uganda, Rwanda (2007), Burundi (2007)	MU (1960-1966), MC (1966-1977), CU (Since 1999)	1960	
Economic Community of West African States (ECOWAS)	Benin, Burkina Faso, Cape Verde (1976), Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania (1975-2000), Niger, Nigeria, Senegal, Sierra Leone, Togo	FTA	1975	
Southern African Development Community (SADC)	Angola, Botswana, Democratic Republic of Congo (1997), Lesotho, Madagascar, Malawi, Mauritius (1995), Mozambique, Namibia (1990), Seychelles (1997-2004, 2008), South Africa (1994), Swaziland, Tanzania, Zambia, Zimbabwe	FTA	1992	
Common Market for Eastern and Southern Africa (COMESA)	Burundi, Comoros, Democratic Republic of Congo, Djibouti, Egypt (1999), Eritrea (1994), Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Namibia (1994-2004), Rwanda, Seychelles (2001), Sudan, Swaziland, Uganda, Zambia, Zimbabwe, Libya (2006), Lesotho (1994-1997), Mozambique (1994-1997), Tanzania (1994-2000)	FTA	1994	
Commission de la Communauté Economique et Monétaire de l'Afrique Centrale (CEMAC)	Cameroun (1961), Congo (1958), Gabon (1958), Republic of Central Africa (1958), Chad (1958), Equatorial Guinea (1985)	MU	1958	
Note: PTA: Preferential Trade Agreement, FTA: Free Trade Area, CU: Customs Union, MU: Monetary Union, MC: Monetary Cooperation, EIA: Economic Integration Agreement, WTO: World Trade Organization.				

**Appendix 2: List of countries in civil conflicts as defined in the PRIO data set (1980-2005)**

<b>Country</b>	<b>Period</b>
Algeria	1991-2005
Angola	1980-2002, 2004
Burkina Faso	1987
Burundi	1991-1992, 1994-2005
Cameroon	1984
Central African Republic	1996-1997, 2001-2002
Chad	1980-1984, 1986-1987, 1989-1994, 1997-2002, 2005
Comoros	1989, 1997
Congo, Democratic Republic	1996-2001
Congo, Republic of	1993-1994, 1997-1999, 2002
Côte d'Ivoire	2002-2004
Djibouti	1991-1994, 1999
Egypt	1993-1998
Eritrea	1997, 1999, 2003
Ethiopia	1980-1992, 1994-1996, 1994-2005
Gambia	1981
Ghana	1981, 1983
Guinea	2000-2001
Guinea-Bissau	1998-1999
Kenya	1982
Lesotho	1998
Liberia	1980, 1989-1995, 2000-2003
Mali	1990, 1994
Morocco	1980-1989
Mozambique	1980-1992
Niger	1991-1992, 1994, 1996-1997
Nigeria	2004
Rwanda	1990-2002
Senegal	1990, 1992-1993, 1995, 1997-1998, 2000-2001, 2003
Sierra Leone	1991-2000
Somalia	1982-1984, 1986-1996, 2001-2002
South Africa	1980-1988
Sudan	1983-2005
Togo	1991
Tunisia	1980
Uganda	1980-2005

**Appendix 3: First stages of the IV estimates.**

Dependent variable	Conflict				
	[1]	[2]	[3]	[4]	[5]
<b>Assassination attempts on leaders</b>	<b>0.30816***</b> (0.08886)	<b>0.30626***</b> (0.08283)	<b>0.20842***</b> (0.06616)	<b>0.30841***</b> (0.07809)	<b>0.31347***</b> (0.07711)
<b>Log (number of refugees hosted)</b>	<b>0.04724***</b> (0.00361)	<b>0.03793***</b> (0.00402)	<b>-0.00178</b> (0.00534)	<b>0.03881***</b> (0.00414)	<b>0.03919***</b> (0.00413)
TI1				-10.11045** (4.02590)	
TI2					-24.90434*** (6.54383)
Production specialization		0.34799** (0.15957)	0.10403* (0.05820)	0.30216* (0.16443)	0.28517* (0.16596)
Governments similarity		-0.07372 (0.09348)	-0.03771 (0.02635)	0.04580 (0.09765)	0.05714 (0.09839)
Polity2		-0.00039 (0.00341)	0.00031 (0.00190)	-0.00440 (0.00378)	-0.00444 (0.00377)
Log (Phone lines)		-0.01939 (0.01643)	-0.03450** (0.01529)	-0.03586** (0.01700)	-0.03341** (0.01688)
Log (GDPpc)		-0.12986*** (0.02022)	-0.10997*** (0.02302)	-0.13137*** (0.02130)	-0.12979*** (0.02140)
Observations	3530	3209	3209	2942	2946
R-squared	0.163	0.210	0.540	0.232	0.234

Note: All estimates include an intercept, regional and period dummies. Column [3]: the estimate also includes country dummies. Robust standard errors in parentheses. \* Significant at 10 %, \*\* significant at 5 % and \*\*\* significant at 1 %.

#### Appendix 4: Correction of selection bias in the IV estimates (Method of Semykina and Wooldridge 2008)

Dependent variable	Trade intensity		Synchronicity	
	TI1	TI2	[3]	[4]
	[1]	[2]		
<b>Conflict</b>	<b>0.00166</b>	<b>0.00000</b>	<b>-0.12641***</b>	<b>-0.13018***</b>
	<b>(0.00107)</b>	<b>(0.00010)</b>	<b>(0.04760)</b>	<b>(0.04714)</b>
TI1			0.26122	
			(2.45343)	
TI2				1.12234
				(4.1334)
Production specialization	-0.00100***	-0.00091***	-0.17958***	-0.17230***
	(0.00038)	(0.00026)	(0.03047)	(0.03033)
Governments similarity	0.00077***	0.00037***	-0.00258	-0.00303
	(0.00028)	(0.00013)	(0.02221)	(0.02222)
Polity2	0.00001	-0.00000	-0.00304***	-0.00310***
	(0.00001)	(0.00000)	(0.00088)	(0.00088)
Log (Phone lines)	0.00034***	0.00018***	0.00997***	0.00963***
	(0.00005)	(0.00002)	(0.00284)	(0.00286)
Log (GDP)	0.00011	0.00004	-0.01725**	-0.01741**
	(0.00011)	(0.00003)	(0.00775)	(0.00770)
<b>Inverse Mills ratio</b>	<b>0.00003</b>	<b>-0.01142***</b>	<b>Dropped</b>	<b>Dropped</b>
	<b>(0.01295)</b>	<b>(0.00372)</b>		
Partial R2 of excluded instruments	0.0103	0.2798	0.0326	0.0332
F test of excluded instruments	18.60***	142.21***	54.25***	55.78***
Hansen J statistic	2.545	0.551	0.598	0.578
Probability	0.111	0.458	0.439	0.447
Hausman test	3.250	5.064	5.738	6.289
Probability	0.0714	0.0244	0.0166	0.0121
Observations	2942	2946	2942	2946

Note: All estimates include an intercept, regional and year dummies. TI1= Regional average of bilateral trade divided by the sum of the total trade of countries in the pairs. TI2= Regional average of bilateral trade divided by the sum of the output of countries in the pairs. The variables Production specialization and Governments similarity measure respectively the similarity of productive structures and the similarity of Government consumption with the other partners in a given cluster. The conflict variable is instrumented with a dummy for assassination attempts of leaders and the logarithm of the number of refugees hosted. The null hypothesis of the Hausman test is the exogeneity of the covariate of interest. The null hypothesis of the Hansen test is the validity of the instruments. Robust standard errors in parentheses. \* Significant at 10 %, \*\* significant at 5 % and \*\*\* significant at 1 %.