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The Geography of Displacement, Refugees' Camps and Social Conflicts

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Abstract

The aim of this paper is twofold. Firstly, the authors analyze the geographical dimension of refugee camps in Africa by shedding light on the heterogeneous location patterns of hosting camps across countries as well as the economic settings in which refugee camps are situated, which allows us to identify the main determinants of such patterns. Second, the authors investigate the effects of hosting refugees in camps on the occurrence of protests and social conflicts, by using geo-referenced panel data from a large sample of African countries between 2000 and 2014. The main analysis is performed by using 50x50 km cells as units of analysis, GDELT and GED data on the frequency of protests, armed conflicts and other organized violence events and data from UNHCR Camp Mapping Database. By using a counterfactual empirical strategy, the authors find that refugee camps significantly increase the occurrence of protests only in the first two years while no significant effect is detected in the subsequent years. The authors do not find evidence of any effect of camps location on the frequency of violence events resulting in casualties. Moreover, by performing a highly detailed analysis with GHSL data the authors find that the presence of camps on average positively affects economic growth.

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The Geography of Displacement, Refugees' Camps and Social Conflicts

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1. Introduction

Millions of displaced people are provided with assistance and support in camps scattered around the World, most of them managed by the United Nation High Commission for Refugees (UNHCR) and the respective host governments and largely located in low-income countries. In fact, camps host a sizable share of refugees: approximately 22% in 2014 (UNHCR, 2021). Camps constitute effective tools as they allow to reach economies of scale and scope in the support of people who leave conflict zones and address multiple needs ranging from basic food assistance to health and educational services. On the other hand, life in a camp is often characterized by the compression of refugees' rights and freedoms that can constrain in an undesirable way refugees' socio-economic behaviors and their impact on hosting communities. In the light of the potential trade-offs associated with this important form of organized assistance to displaced populations, camps are generally foreseen as temporary locations when other options are impracticable, ineffective or simply not available (UNHCR 2014). Yet it is not uncommon that their existence spans for several years and, sometimes, even decades.

This paper aims to shed light on the geography of refugee camps in the African continent, which hosts most of them (about one third of all refugees). The geographical dimension of refugees' settlements – both self-settlements and enclosed camps – has been neglected or largely taken as exogenous in most of existing studies. Beside the well-known fact that camps are largely located in countries bordering conflict zones, very little systematic analysis on their locational features (and the associated consequences) has been conducted so far. On the other hand, the geographical dimension of resettlement in a third country is important for the well-being of refugees but also for shaping their interactions with host communities.

The present paper tries to fill this gap in literature by contributing in two distinct ways. Firstly, we analyze the geography of refugees' camps in Africa and, in particular, we shed light on the heterogeneous location patterns of hosting camps across countries and on the main determinants of these patterns. Second, we investigate the effects of hosting refugees' camps on the occurrence of protests and violent social conflicts[2].

More precisely, in the first part of the study we analyze some important features of the geography of refugees' camps in Africa. We use a two-steps approach. In the first, we start by looking at a macro-

[2] In our empirical analysis we employ broad and comprehensive measures of the occurrence of protests and conflicts as the presence of refugees might have complex direct and indirect effects on social, economic, political relationships in interested areas. The focus on specific types of events – for instance those that explicitly target refugees' communities – might miss important parts of the potential tensions generated by the presence of camps.

geographical scale by investigating the determinants of camps location in sub-national administrative areas of 39 African countries using Fisk (2014b) Geo-Refugee Dataset. More precisely we estimate the factors that are associated with a higher probability of hosting camps in regions across Africa. In addition to proximity to neighboring countries which experience conflicts, we find that larger regions experiencing a growth of population and per-capita income are more likely to host a refugees' camp. Proximity to the capital as well as political marginality are negatively associated with the location of camps. Interestingly, camps are more likely to be settled when neighboring countries experience minor conflicts rather than major ones (more than 1000 deaths in a year). On the contrary, the share of refugees in camps over the total hosted increases with the number of major conflicts in border areas.

In the second step, we zoom at a finer geographical scale by using geo-referenced data on refugee' camps (UNHCR Camp Mapping Database). By comparing the dynamics of built-up settlements – our proxy of economic activity – within 10 km from the camps with the dynamics observed in counterfactual areas – defined as regions with a similar set of geographical features – we find that territories hosting refugee' camps grow on average more than other areas with similar ex-ante characteristics.

In the second part of the study the attention is switched to the impact of the presence of refugee' camps on protests, violent conflict and economic growth (proxied with built-up area) in host communities.

This is a fundamental question for policymakers and for organizations providing protection and support to refugees as a growing concern is placed on the potential tension with locals spurred by the presence of camps. We employ a comprehensive measure of protests that includes small-scale communal violence and tensions as well as more dramatic tensions that generates casualties. We also provide evidence, as in other studies (Fisk 2019; Zhou and Shaver 2021), on organized violence events that result in at least 1 death.

Using a counterfactual approach, we find that the location of camps increases the occurrence of protests, but the effect is short-lived (on average in the 2 years following the establishment of a camp). In the subsequent periods we do not find a significant impact of camps on social unrests neither we find evidence of impact on the occurrence of organized violence events. The result might be due to the fact that while the initial population shock generates immediate social tensions, the public expenditure shocks and the positive contribution of refugees in local goods and factor markets might take more time to fully materialize. Thus, over time the easing of tensions might be related to the increased socio-economic contacts and the diffusion of benefits stemming from the presence of a 'camp-economy' to larger shares of the host country population.

To support the hypothesis that economic growth in the areas hosting camps might be one of the factors behind the short-time effects on protests, we investigate – using an even more granular spatial approach (250x250mt gridded cells as units of analysis) – if the establishment of 86 camps in the period 2000-2014 has affected growth of host-localities. We use the increase in built-up areas as a proxy of economic growth[3] and show that on average areas hosting camps (all cells within 10km) have experienced a higher growth compared to counterfactual areas (defined as all cells within 100km from the centroid of the camp with similar distance from the border and similar infrastructure endowment compared to camps' hosting areas). Interestingly, while the growth effect of camps is on average positive, we observe a high degree of heterogeneity across the considered areas. A preliminary inspection of the least-performing areas reveals that these are generally highly marginal areas with a scattered local population.

Our work contributes to a recent and growing body of literature which looks at refugees-host communities' interactions and focuses on the impact of forced displacement on host-country socio-economic well-being. The recent work by Verme and Schuettler (2021) provides a comprehensive review of existing studies in economics which investigate the effects of a local population shock associated with forced displacement on a set of four main outcomes: employment, wages, prices of goods and services and housing and household well-being. This survey reveals that previous studies by economists have largely concentrated on labor-market effects, very often based on case studies focusing on single events or single locations. In most studies the geography of refugees has largely been considered as exogenous[4]. Our study, taking a multi-country approach, explicitly considers the high heterogeneity of camps locational settings and their implications for host communities.

The present paper is also related to those contributions - mostly in political science and in migration and refugee' studies - that have focused on the role of forced displacement as a determinant of conflicts in host countries (Fisk 2014a; Fisk 2018; Duncan 2005; Jacobsen 1997; Zhou and Shaver 2021). These contributions have emphasized several channels through which refugees - both in self-settlements and in camps - might generate tensions in the host-communities: competition over scarce resources, environmental pressures, labor-market competition, trust and security issues. More recently, several papers have shown that 'refugees' shocks' – such as the emergence of a camp – might benefit local communities by expanding aggregate demand and (in some contexts) the supply of productive factors. In turn, this might generate additional employment opportunities and income for host communities and reduce the chances of conflicts. As the effects of the population shock are

[3] The measure of built-up area in a cell is generated using satellite data and in the context of poor and marginal areas is a better proxy for growth compared to nightlight intensity which is often used in the literature.

[4] One exception is Camarena (2019) which draws on East African refugee crises to develop a model of refugee policy selection during a strategic civil war. The author argues that the location of refugee' camps might be related to the strategic role of supporting rebels groups.

likely to be unevenly distributed in the host-communities with winners as well as losers, the probability of refugee' induced conflicts might be highly context-specific. The geographical dimension of refugees-host communities interactions might represent an important mediating factor. The paper is organized as follows. In *Section 2* we describe the context of the study. Here, we provide a brief description of the area covered and the importance in terms of displaced population and of the refugees' camps included in the analysis. *Section 3* provides a selective review of the relevant literature and presents the main theoretical underpinning and hypothesis of the paper. The methodology is described in *Section 4*. *Section 5* contains a presentation and a discussion of the main results of the paper. The last section (*Section 6*) concludes and offers some final policy considerations.

2. Context

The focus of this paper is on the geography of refugees' camps in Africa, a continent that hosted more than 6,8 million of refugees and individuals in refugee-like situations in 2019, approximately 33,3% of the total (UNHCR 2020). The importance of Africa does not rest exclusively on the quantitative dimension of the phenomenon but also on the fact that the cross-border displacement taking place in Africa largely involves countries with limited resources, and thus it has the potential to exacerbate, more than elsewhere, the socio-economic fragility of the interested populations.

A large share of refugees, and more generally displaced individuals, in Africa are hosted in camps. UNHCR defines refugee camps as those temporary facilities built to provide immediate protection and assistance to people who have been forced to flee their homes due to war, persecution or violence. Although camps are not established to provide permanent solutions, they offer a safe haven for refugees and meet their most basic needs - such as food, water, shelter, medical treatment and other basic services - during emergencies. In situations of long-term displacement, the services provided in camps are expanded to include educational and livelihood opportunities as well as materials to build more permanent homes to help people rebuild their lives. These services are also offered to host communities.[5] Camps are a fundamental means for providing humanitarian support in response to forced displacement and allow to exploit economies of scale and scope in the delivery of assistance to affected individuals. On the other hand, camps might exacerbate the marginalization of the hosted population and make their (re-)integration more difficult as socio-economic life in a camp might compress individual rights and choices, and indirectly, refugees'

[5] https://www.unrefugees.org/refugee-facts/camps/

potential contribution to the host-localities (Betts 2021). Camps might also increase the potential conflicts with the host communities by making the distinction 'them' *versus* 'us' more visible and salient.

Although refugees' camps are perceived by UNHCR as 'exceptional and only temporary measures', the reality suggests that camps are often the rule rather than the exception and that it is not infrequent to have camps in operation for many years or – even – decades.

The existing economic literature on forced displacement, while exploring different aspects on the relationship between camps and host communities, has devoted scant attention to the geography of camps. Only a few studies explicitly consider the influence of locational features on the 'camp economy' employing a case study approach (Alloush et al. 2017). A closer look at the location of refugee' camps reveals a high degree of heterogeneity with respect to some fundamental elements – such as their urban/rural setting, closeness to populated areas, importance of agriculture etc. - that might affect interactions within the camps and between the camps and the external environment.

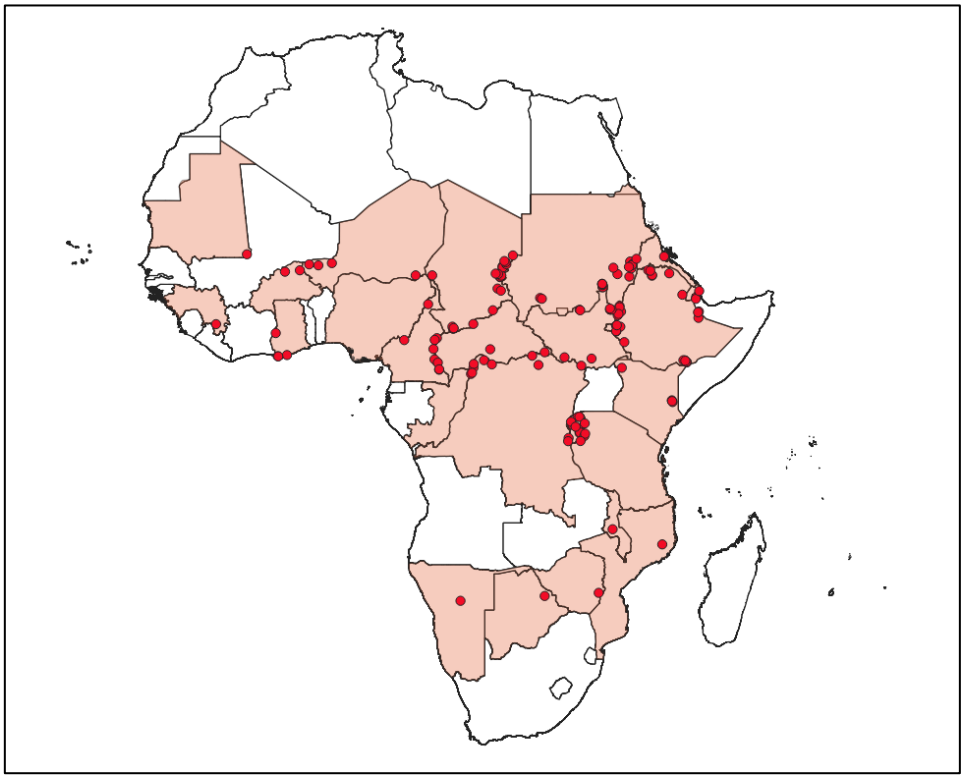
In the context of this study, we mainly focus on the 140 refugees' camps listed in the UNHCR Camp Mapping database[6]. As reported in *Figure 1*, such refugee' camps are located in 22 different countries, mainly concentrated at short distance from the border. Most of such camps are located in Ethiopia (26 camps close to the borders with Sudan, South Sudan, Eritrea and Somalia), Sudan (22 camps at the border with South Sudan and Eritrea) and Republic of Chad (22 camps, mainly at the border with Sudan but close to the Central African Republic). Several camps are also hosted in South Sudan and in Cameroon (both countries hosting 9 refugees camps).

Focusing on the 137 camps for which it has been possible to collect information about location and population, it is possible to obtain insightful evidence on their characteristics. Although more than half of the camps have been set up after 2010 (54 percent), confirming the tendency to adopt such solution for relatively short time periods, there is evidence of refugee' camps set up more than 30 years ago (10 percent of camps already existed in 1991) with three camps established in the 80s, four in the 70s and one camp - Wad Sharife camp in Sudan – set up in 1968.

The average number of refugees in the analyzed camps is slightly higher than 24,000, with the smallest camp hosting 585 refugees (Mboti in the Bas-Uele region of the Central African Republic) and the biggest one hosting about 158,000 people (Kakuma, in the Rift Valley region of Kenya).

[6] Part of the analysis is based on Fisk (2014) Geo-refugee database which contains information on a larger number of refugees camps (some of them not currently operational).

Figure 1: Location of refugees camps in Africa



Source: authors' elaboration based on UNHCR data (retrieved in April 2021)

Refugee' camps are mainly located in peripheral regions, as confirmed by their distance[7] from country borders and capital cities. The average distance from the border is 50 kilometers. About 93 percent of camps are located within 100 kilometers from the border and only a few exceptions (Fau 5 in Sudan, Osire in Namibia and Maratane in Mozambique) are located more than 200 kilometers from the border. The average distance from the capital is about 500 kilometers. Gorom, in South Sudan, is the refugee camp located closest to the capital while the farthest are Mboti, Mulongwe and Lusenda in the Democratic Republic of the Congo.

Concerning the context in which the camps are located, by analyzing satellite data it has been possible to detect the characteristics of camps' neighborhood. Most of refugee' camps are close to local communities (85 percent of the total), close to crop fields areas (78 percent), in rural context (75 percent) and within 15 kilometers from rivers or lakes (75 percent). Almost a half of the camps are close to Savana and in desertic areas, 14 percent in the context of forest and only a small part is located in urban (1.5 percent) or mountain (3 percent) areas.

[7] Computed as Euclidean distance.

3. Theoretical Motivation

A growing number of studies has investigated the economic, social and environmental repercussion of the presence of refugees' or IDP camps on the host communities (see for instance Maystadt et al. 2020; Hagenlocher et al. 2012; Alix-Garcia et al. 2013; Verme and Schuettler 2021). As discussed in the recent survey by Verme and Schuettler (2021), forced displacement generates two main shocks in host localities: i) a *population shock* due to the sudden inflow of people in the area; ii) a *public expenditure shock*, associated with the direct humanitarian assistance to displaced individuals and the increase in demand for goods and services by aid workers and donor organizations. In turn, these shocks affect local aggregate demand and supply of final goods, services and production factors. The short to medium term directions of the shifts in prices and quantities are clearly context-specific depending – among other things – on the size and characteristics of the involved populations (both refugees and host-communities), the pre-existing socio-economic landscape and resource scarcity/abundance, the assistance provided by national and international organizations (for instance in-kind *versus* cash transfers as in Alloush et al. 2017)[8], the flexibility of factors and goods markets (Ruiz and Vargas-Silva 2016). Another fundamental context-specific factor that shapes market and non-market interactions of refugees with the local population is the overall policy and legal context, in particular the constraints imposed by authorities to refugees' participation in the labor market (Fajth et al. 2019).

Several studies suggest that the overall effect of the combination of these two shocks on host communities tends to be positive. In one of the few existing studies on the growth-effect of hosting refugees, Alix-Garcia et al. (2018) shows that the refugees' inflows in the area of Kakuma in Kenya expanded economic activities and the average consumption within 10km from the centroid of the camp. The authors use night-time light intensity as a proxy for economic growth complemented by household-level survey data. The positive result found in their study is explained by the expansion of labor market opportunities but also by changes in agricultural and livestock prices, favorable to local producers. The study of Alix-Garcia et al. (2018) considers a highly specific context as it is based on a single location and shows average growth effects which might mask inevitable heterogeneity within the host-community. The meta-analysis of Verme and Schuettler (2021) seems to confirm the largely positive net effects of hosting refugees on household well-being – the most

[8] The demand of goods and services by refugees and by the staff of NGO, Governmental or international organizations involved in the operations might have a substantial effect on aggregate demand in host localities. As the model of refugees' assistance is progressively switching from in-kind aid to cash-transfers that boost trade opportunities between refuges and locals the final effect is likely to be sizable (Alloush et al. 2017).

general measure of economic impact on host communities – as most of the surveyed studies finds evidence of net positive effects.

Loschmann et al. (2019) investigate the impact of refugee' camps hosting displaced Congolese people in local communities in Rwanda. Also in this work – which employs survey data – the focus is on labor market activity and economic welfare. The authors identify the exposure to the camps comparing individuals and households at various distances from them (within 10km *versus* above 20km). According to this study, the presence of camps induces a shift of locals from employment in subsistence farming and/or livestock production to wage employment; local females are also found to be more likely to be self-employed in business (both as primary and secondary occupations). A positive effect is also found on household asset ownership for those individuals living within 10km from the camps. Although these results bear some general implications on the effects of refugee' camps, it should be noted that the long-term presence of Congolese refugees and the rather liberal approach of the Rwandan Government on the labor market participation of refugees are important contextual elements to consider.

The presence of refugees is likely to be associated to complex redistributive effects. While some individuals are winners (for instance producers in rural areas and asset owners in rural and urban areas), others might lose because of direct competition in the labor market or due to generalized increases in local prices. The presence of refugees might also have negative consequences on some *strata* of the local population due to pressure over the use of scarce resources or environmental degradation that might lead to welfare loss and/or 'flight' of local population.[9]

One of the main concerns of authorities in host localities is that the high concentration and visibility of refugees in camps might lead to conflicts with local communities. Conflicts might be ignited by social and economic interactions between refugees and locals[10] and this is the reason why in some circumstances governments are worried that open refugees' policies might harm social cohesion and lead to backlash against the politicians who facilitated them. Nevertheless, there is evidence showing that restrictive policies such as limits on refugees' movement and the right to work does not yield more tolerance of immigrants (Aksoy and Glinn, 2021) also because social cohesion

[9] Some studies have focused on the effects of the presence of camps on land-use and environmental degradation which, according to anecdotal evidence, might be another source of conflicts between refugees and host-communities. For instance, Maystadt et al. (2020), using data on continental Africa, find evidence of a contribution of refugees to increases in vegetation conditions but also on increased deforestation due to agricultural expansion. Alix-Garcia & al. (2013) finds some evidence of a negative environmental impact near IDP camps in Darfour.

[10] One source of conflicts that has been largely investigated in refugees-related studies is the potential resentment of local population in poor areas that might see those living in camps as privileged in terms of goods and services provision (Aukot 2003; Betts 2009). Evidence on this 'resentment channel' is mixed. For instance, the study by Fajth et al (2019) on Congolese refugees in Rwanda suggests, based on qualitative analysis, that as support to refugees increases their socio-economic interactions with local communities (through trade and exchanges) are boosted. In turn, the increased density of interactions improves trust between refugees and host communities.

between refugees and host communities is only partly explained by inter-group interaction (mostly in urban contexts) and refugee-host interaction/perception is likely to be shaped by a complex combination of intra-group attitude formation at the neighborhood level (Betts *et al*, 2021).

The study of refugees-induced conflicts is not new, but the existing literature has mostly focused on specific types of conflicts (such as armed conflicts or events associated with a relatively large number of deaths) and generally the geography of forced-displacement has either been ignored or considered as exogenously given (Maystadt et al 2020; Fisk 2019). Zhou *et al* (2021) analyze the relationship between refugee camps settlements and – potential – tensions using very detailed data (parish level), although focusing on a single country. The authors empirically test whether proximity to refugees affects access to aid and public service delivery in Uganda, and – if so – whether this affects potential tensions between refugees and host communities. Adopting Diff-in-Diff estimates, Zhou *et al* (2021) show that proximity to refugee settlements in Uganda has positive externalities on host communities while host attitudes towards migrants or migration policy are not affected.

Fisk (2019), Bertinelli *et al* (2021) and Zhou and Shaver (2021) are among the few multi-country studies focusing on the effects of camp settlements on conflicts. Fisk (2019) employs sub-national data for 39 Sub-Saharan Countries in the period 2000-2010 and shows that the number of non-state conflicts[11] significantly increases in regions in which refugees' camps are settled. The effects seem to be mediated by covariates such as political marginality of hosting areas and ethnic ties between refugees and locals. Bertinelli *et al* (2021) assess the impact of refugees on the likelihood of conflict by analyzing changes in diversity in the refugee-hosting areas across 23 countries in sub-Saharan Africa between 2005 and 2016. The work shows that refugees' presence *per se* does not have any significant correlation with the occurrence of conflict but their impact on the ethnic composition does. In particular, refugee flows increasing their index of ethnic polarization exacerbate the risk of conflict while, on the opposite, refugee flows causing an increase in the ethnic fractionalization are associated to a decrease in the likelihood of conflicts. Working on global data for the period 1990-218, Zhou and Shaver (2021) find no evidence that hosting refugees increases the likelihood of new conflict, neither the duration of existing conflicts, nor the number of violent events or casualties. These authors use as unit of observation sub-national administrative units. One important limit of this approach is that it is difficult to correctly identify refugee camps-host communities interactions

[11] In Fisk (2019) conflicts data are taken from the Uppsala Conflict Data Program's Geo-Referenced Event Dataset (UCDP GED, version 17.1). This implies that the definition of conflicts is rather restrictive including non-state conflicts resulting in at least 25 battle-related deaths in a year (see Sundberg, Eck and Kreutz 2012). Several social conflicts that might arise due to tensions between refugees and host communities might not be included. In addition, as most camps are located in administrative units neighboring conflict zones there is a high risk that the true drivers of the increase in these types of armed conflicts are highly correlated with the establishment of camps.

as these units are often very large geographical areas (on average equal to the size of a country such as The Netherlands in Zhou and Shaver 2021).[12]

Clearly, geography matters in mediating both the economic and the social consequences of the establishment of camps and the potential for conflicts. A first obvious role of geography is the ***distance-decay intensity of refugees-local population interactions***. Several studies adopt a '10km rule' in order to define a counterfactual scenario and distinguish local communities affected by the presence of camps (the 'treated') from those not affected (the 'untreated'). This rule-of-thumb is supported by survey data which shows that, in particular in the context of developing countries, interactions between refugees' camps and local communities become rare at distances above this threshold (Alloush et al. 2017; Fajth et al. 2019).

Our hypothesis is that the marginality/remoteness of areas hosting camps also matters in shaping socio-economic interactions and, in turn, potential conflicts. The effects of remoteness and economic marginality are likely to be ambiguous. In fact, on one side the location of a camp in a marginal and underdeveloped context implies a lower capacity to absorb the population shock, as more competition over scarce economic and environmental resources might lead to more conflicts. On the other side, the shock might generate an unexpected inflow of external resources (through the initial public expenditure shock) and thus represent a boon for the host community. Thus, it is important to condition the study on refugees-camps induced conflicts on the spatial dimension of these forms of organized support to displaced people.

The location of refugee' camps – and more generally the geography of forced displacement – in a given country is likely to be shaped by a set of push and pull factors that have been emphasized in studies on the determinants of refugees' flows (Dreher et al 2019; Hatton 2016). These factors include the distance from conflict-affected areas, the magnitude of conflicts, ethno-linguistic and cultural proximity between sending-host areas, socio-economic resources (including aid from humanitarian assistance and international organizations) and their distribution. Whether the location of camps is in remote marginalized areas or in better connected ones can depend also on institutional characteristics of host countries (*e.g.*, democratic or autocratic Governments or the distribution of power between central and local Governments). The theoretical mechanisms explaining refugee' camps location might be diverse and complex, and the relative importance of different factors is ultimately an empirical question.

[12] In some recent empirical studies on the determinants of conflicts, like the current study, geographical grid squares are used as basic unit of analysis (cells). On one hand, the more granular geographical scale of gridded cells allows for a better identification of proximity relations (between refugee' camps and local population in this study) compared to larger and more heterogeneous administrative units. On the other hand, the use of administrative units allows the researcher to include in the analysis a richer set of control variables that might be relevant for better understanding the phenomena under investigation.

We also argue that the timing of the effects associated with the establishment of a camp matters as the population shock and the public expenditure shocks might produce asynchronous socio-economic effects that might also have heterogeneous impacts on the occurrence of conflicts.

4. Research design

The geography of refugees' camps in Africa

In the first part of our analysis the main goal is to shed light on the geography and main location features of refugee' camps in Africa. We employ a step-by-step approach, starting from a macro-level geographical scale (sub-national administrative units) and then zooming at a finer geographical level, *i.e.*, the surrounding areas where refugee' camps are located within sub-national administrative units. The research questions that we ask in the first step of analysis are related to the characteristics of the regions in which refugee' camps are located; in particular, using an extended version of the data employed in Fisk (2018), we investigate the locational drivers of the emergence of refugee' camps in 39 African Countries[13] in the period 2000-2010. We estimate a linear probability model where the dependent variable is a dummy equal to 1 when at least one camp is located on a sub-national region and 0 otherwise.

Building our analysis on the work by Fisk (2018), we use administrative sub-national units of observation which on one side are less likely to suffer from the issue of spatial aggregation and on the other allow us to use a richer set of control variables (regional characteristics). Among the potential determinants of refugee' camps location we consider the lagged values of population and income per capita, which should be expected to act as pull factors. Moreover, we control also for the total land area of the region in square kilometers, the distance from the capital city as well as two sets of dummy variables signaling i) the presence of democracy in the region and ii) the adjacency of the sub-national administrative unit to the border. All such four control variables are expected to be positively correlated with the presence of refugee camps. Another control variable included in the analysis is a dummy variable signaling the existence of a conflict in neighboring countries, that is expected to positively influence the probability, for a region, to host refugee' camps. However, despite the advantages of using regional level data, such unit of observation does

[13] The Countries considered are: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Congo (Republic of), Cote d'Ivoire, Democratic Republic of Congo, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Malawi, Mali, Mauritania, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Somalia, Sudan, Tanzania, Togo, Uganda, Zambia, Zimbabwe.

not shed light on the granular geography of territories and, in virtue of the high heterogeneity of camps location in Africa, this might not effectively capture the dynamics of refugee' camp location. For this reason, in the second step of the analysis we employ information at a finer geographical scale, as the main goal is to better understand the specific geographical context in which camps are settled in hosting areas. We focus on all the 140 camps that are reported in the UNHCR Camp Mapping database. Using publicly available satellite imagery as well as UNHCR reports and other available sources, we collect general information on the camps (year of establishment, number of refugees hosted, main nationality of refugees, distance from borders, proximity to a local community, distance to urban areas) as well as the surrounding areas using a radius from the centroid of the camps of 10-to-100 km (features analyzed: rural/urban areas, transport infrastructures, population, built-up area). This information allows us to assess the degree of remoteness as well as socio-economic marginality of camps in the host-country context across Africa.

The impact of refugee' camps on host communities: expansion of economic activities and social conflicts

Using the geo-localization of the camps and information of the year of establishment we investigate two important channels through which refugees affects and interact with host communities: i) the expansion of economic activities; ii) the social conflicts and protests.

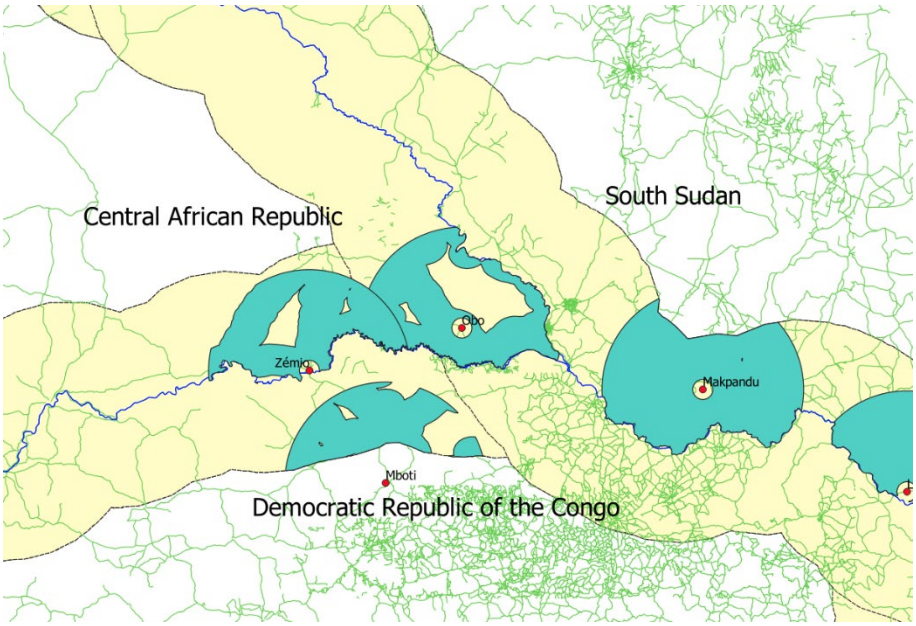
Several studies have investigated the socio-economic impact of refugees (self-settled as well as camps) on host communities, as discussed in the previous section. Contrarily to most studies – which focus on case studies based on one or few camps in a single country – we look at all existing refugee' camps within Africa. As a proxy for economic growth, we employ the change in built-up areas (GHSL Data Package by Corbane et al., 2018).[14] We argue that in the context of developing countries – and considering the remoteness and marginality of the areas where generally refugee camps are located – this variable better identifies the expansion of economic activities (and, indirectly, of well-being) compared to nighttime light intensity (Alix-Garcia et al 2018; Rozo and Sviatschi 2021).[15] To identify the effect of camps, we compare (as in other studies) the change in built-up areas over time at different distances from them. The unit of observation are 250m-by-

[14] More precisely, we employ geo-referenced data on the built-up density on a 250m resolution (Global Human Settlement Layer, JRC, European Commission). These data are available at different point in time from the 1975 to 2014 (1975, 1990, 2000, 2014). For the purpose of our analysis, we will focus on the period 2000-2014.

[15] The recent methodological report on remote sensing by Ehrlich, D., Schiavina, M., Pesaresi, M., Kemper, T. (2018) shows the limits of nightlight intensity in identifying and mapping deprived communities in Africa. The authors suggest a novel index for detecting the spatial pattern of inequalities which exploits geo-localized information on built-up areas (the one used in our analysis) as well as population and night-light intensity.

250m gridded-cells within an area with a radius of 10km from the centroid of the camps. In order to compare areas that have a-priori a similar probability of hosting a camp, we also refine the analysis by including only cells above 10 km and within the 100km radius that have both a distance from highways and primary roads lower than 16.8 km and a distance from the border lower than 97.48 km.[16] Distance from camps identifies host-communities intensity of exposure to refugees camps ('treatment') in areas that are reasonably ex-ante rather homogeneous from a socio-economic perspective. We recognize the special relevance of the comparison of areas within a 10km radius with those above this distance, as existing evidence based on micro-level data shows that interactions of refugees in camps with host communities are rare above this cut-off distance (Alloudsh *et al* 2017; Alix-Garcia et al 2018; Ruiz and Vargas-Silva 2016).

Figure 2: Areas hosting refugee camps and counterfactual areas: an illustrative example



Source: authors' elaboration based on UNHCR data

Figure 2 shows in detail how the units of observation are identified. The figure reports the location of 4 refugees camps (Zémio, Obo, Makpandu and Mboti) between the Central African Republic, South Sudan and the Democratic Republic of the Congo. Red dots are the centroids of camps, and the small circles close to them are the 10 km radius areas which represent the units of observation. The blue lines represent the borders between the three countries while the yellow area represents the buffer of 97.48 km from the border. In green we reported the main roads serving the area while the

[16] The cut-off thresholds of distance from road infrastructures and from the border for the comparison area are computed as the mean plus one standard deviation of the distance of refugee camps from main roads and from borders. Robustness tests have been conducted using alternative cut-off thresholds and deliver qualitatively similar results.

area in turquoise is the intersection result between the buffer area of 100 km from the camps, the buffer from the border and the buffer of 16.8 km from the road network (excluding the 10 km radius circle close to the refugee camps). We identified, thus, such territories as those with an ex-ante similar probability of hosting a camp (counterfactual units) and we compare (in the next section) their built-up dynamics with that recorded in 10 km-circles areas hosting camps (treated units).

The second outcome variable that we relate to the presence of refugee camps is the number of conflicts and protests. This analysis employs geocoded information on protests obtained from Google Global Database for Events, Language and Tone-GDELT database (see Leetaru and Schrodt 2013) and those on organized violence events from the UCDP Georeferenced Event Dataset (Version 21.1; Sundberg and Melander 2013). These georeferenced datasets are matched with the UNHCR data on the geographical location of refugee camps described above. Our unit of analysis are 0.45 x 0.45° of latitude and longitude subnational cells (equivalent to 50 x 50 km areas at the equator) covering 54 African countries for a final sample of 13.100 cells.[17]

From GDELT – which can be considered as the most comprehensive database on the global occurrence of protests which includes data from 1979 (see details in Iacoella et al. 2021) – we consider the sum of daily events occurring in a cell each year (from 2000 till 2014). As the original data are collected from multiple sources[18], in order to avoid to over-estimate the occurrence of protest as in Iacoella et al. (2021) we impose the limit of one event per day per single cell. The final sample includes more than 175 thousand events for the considered area in 2000-2014.

Following Iacoella et al. (2021) we estimate the following baseline model:

$$Y_{cit} = \beta_1 RefCamp_{cit} + \beta_2 X_{cit} + \delta_c + \theta_{it} + \epsilon_{cit} \quad (1)$$

where Y_{cit} represents the (log of) number of yearly protests or organized violence conflicts occurring in cell *c* in country *i* at time *t*. Our main covariate of interest is $RefCamp_{cit}$ which is a dummy equal to 1 if the cell hosts a refugee camp at time t and 0 otherwise. The main hypothesis we want to test is whether the presence of a refugee camp in a cell impacts on the number of protests or violence events. In alternative specifications we introduce interaction terms to test whether some of the geographical characteristics of camps - such as their size, remoteness and socio-economic marginality – matter in shaping the links between refugees' presence and protests

[17] We thank Iacoella, Martorano, Metzger and Sanfilippo for sharing the data employed in their recent analysis on the impact of Chinese investments on protests in Africa (for details see Iacoella et al. 2021).

[18] Note that, in order to be registered in GDELT, an event must be reported in digitalized news (from newspapers, news agencies, digital media, web-based news aggregators) implying that although a very large portions of events are likely to be registered this source cannot be considered as fully representative of all kinds of protests occurring in the world. To our knowledge, all other database collecting information on conflicts suffer from a similar bias.

in the host community. We include a vector of time-varying cell-level controls, X_{cit}. More specifically, we include a measure of ethnic fragmentation borrowed from Iacoella et al. (2021) which employ an Herfindahl Index on the inverse of the number of ethnic groups in a cell using the Ethnic Power Relations (EPR) dataset (Vogt et al. 2015). This Ethnic Fragmentation Index ranges from 0 (high fragmentation) to 1 (only one ethnic group).

In order to control for the intensity of potential interactions with the host country population we include the (estimated) *population size* per cell calculated from NASA SEDAC Population Count Dataset v4.

As a large body of evidence shows the important role of climatic shocks and weather conditions in shaping the availability of resources and, potentially, the conflicts over their distribution (see among others Maystadt et al. 2020; Madestam et al. 2013), we include *average yearly rainfall* and a measure of *evapotranspiration* which is a proxy of the risk of drought.

As a proxy of economic activities, we include as in other studies a variable measuring night-time light data. Following Eberhard-Ruiz and Moradi (2019) and Iacoella et al. (2021) we use the cell average non-stable night-time light data which is a more appropriate measure of economic activities in rural settings in developing countries.

Finally, we include country-by-time fixed effects (θ_{it}) and cell fixed effects (δ_c)which are meant to control for unobserved heterogeneity at the national as well as cell levels.

Additional details as well as summary statistics on the variable employed in the analysis are reported in *Appendix 1*.

5. Results

The geography of refugee camps in Africa

Which regions are more likely to host a refugee camp? What are the characteristics of sub-national areas that are more likely to be associated with the establishment of a camp? We start our analysis by looking first at aggregated spatial units, *i.e.*, first-level administrative units in 39 African countries between 2000-2010. As discussed in the previous section, we estimate a linear probability model that has the main advantage of interpreting the estimated coefficient as percentage change in the probability of hosting camps associated with a change in the covariate of interest.[19] The main results of the analysis are reported in *Table 1*. In columns (1) to (6) the dependent variable is a

[19] In this step of the analysis, we are mainly interested in understanding the regional characteristics that are associated with the establishment of camps rather than in precisely measuring the probability of the events. We performed also random effects probit analysis which delivers qualitatively similar results and is available upon request.

dummy equal to 1 when a refugee camp is established in the region while in column (7) we employ as a dependent variable the share of refugees hosted in a camp over total refugees in the region, restricting the sample to those regions hosting refugees in the considered decade.

Our results show that both population and income per capita – measured in the year before to avoid the inclusion of new refugees flows in the measurement of the variable – are positively associated with the probability of hosting camps. A per cent increase in population is associated with +1.8-2.3% increase in the likelihood of setting up a camp depending on the model specification. The association of the dependent variable with income per capita is higher, +3.3-4.1%. These findings seem to contradict, at least at a high level of geographical aggregation, the fact that refugee camps are hosted in relatively poor and sparsely populated areas. We find (column 7) weak evidence that income per capita is negatively associated with the proportion of refugees hosted in camps compared to self-settlements. This latter result is in line with the observation that self-settlements are mostly closely located to relatively larger urban areas in the host country. The size of the administrative unit is negatively associated with the hosting of camps while it is not statistically associated with the share of refugees living in organized structures.

Table 1 – Which regions host refugee camps?

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variables:	Presence of refugee camp(s) (dummy)						Camps / Selfsettled (share)
Population (ln; lag 1)	0.020**	0.019**	0.020**	0.023***	0.018**	0.018**	-0.220
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.134)
Income per capita (ln; lag 1)	0.035***	0.035***	0.036***	0.041***	0.033***	0.034***	-0.211*
	(0.013)	(0.012)	(0.012)	(0.013)	(0.012)	(0.012)	(0.128)
Unit_size	-0.022**	-0.022***	-0.022***	-0.024***	-0.021**	-0.021**	-0.134
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.144)
Democracy	0.022	0.023	0.025	0.030	0.025	0.028	-0.364***
	(0.032)	(0.032)	(0.032)	(0.031)	(0.032)	(0.031)	(0.118)
Politically marginalized	-0.021*	-0.022*	-0.023*	-0.024*	-0.022*	-0.022*	0.080
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.137)
Distance from capital	0.012***	0.011**	0.011**	0.009**	0.011**	0.009**	0.336***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.124)
Border region	0.032	0.027	0.023	0.006	0.023	0.008	0.309
	(0.023)	(0.023)	(0.023)	(0.025)	(0.023)	(0.025)	(0.465)
Conflicts in neighboring countries (nr.; t)		0.014*	0.010	0.002			
		(0.008)	(0.007)	(0.008)			
Conflicts in neighboring countries (nr.; t1)			0.016*				
			(0.009)				
Conflicts in neighboring countries (nr.; t1_t4)				0.015**			
				(0.006)			
Minor conflicts in neighboring countries (nr.; t)					0.011*	0.013*	0.064
					(0.007)	(0.008)	(0.052)
Major conflicts in neighboring countries (nr.; t)					-0.022	-0.018	-0.019
					(0.026)	(0.025)	(0.097)
Minor conflicts in neighboring countries (nr.; t1)					0.020**		
					(0.010)		
Major conflicts in neighboring countries (nr.; t1)					-0.000		
					(0.016)		
Minor conflicts in neighboring countries (nr.; t1_t4)						0.016**	0.021
						(0.007)	(0.023)
Major conflicts in neighboring countries (nr.; t1_t4)						0.004	0.127***
						(0.009)	(0.032)
Constant	-0.369***	-0.365***	-0.371***	-0.435***	-0.342***	-0.347***	3.208*
	(0.136)	(0.135)	(0.133)	(0.135)	(0.131)	(0.130)	(1.823)
Observations	4,250	4,250	4,250	4,250	4,250	4,250	1,124
Country FE	YES	YES	YES	YES	YES	YES	NO
Number of admin units	435	435	435	435	435	435	164

*Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Columns 1-6: estimated as a linear probability model; Column 7: estimated as a fractional logit model conditional on an administrative unit hosting refugees.*

Interestingly, we find that in regions belonging to a democratic country the share of refugees hosted in camps is significantly lower compared to less democratic countries. In other words, decentralized forms of assistance to refugees seem to be more likely in countries with relatively better institutional settings. We also test if regions that host politically irrelevant or marginal populations are more likely to host camps in their territory. The finding suggests that this is not the case as we even find a weakly negative association between being a politically marginal region and hosting camps; the latter result is entirely explained by politically marginal regions in democratic country while we do not find any effect of this covariate in undemocratic countries.[20]

The more distant a region is from the capital city the higher the probability that refugee camps will be established and that a large share of refugees will be hosted in them. This result is quite intuitive as most camps are located in border regions (a variable that is generally highly correlated with distance from the capital city).

In order to capture 'push' factors that determine the establishment of camps, we introduce controls for armed conflicts in countries that neighbor the administrative units included in our sample. We start in column (1) with the number of conflicts in the same year and find a positive but weak association with the dependent variable. As displacement of population affected by armed conflicts might take some time, we consider also events happening in neighboring countries in the previous year (column 3) as well as in the previous 4 years (column 3). The results show that past conflicts in neighboring countries take time before translating in the emergence of camps.

Interestingly, when considering the intensity of conflicts – we differentiate between minor conflicts (with less than 1000 deaths per year) and major ones (with more than 1000 deaths per year) – we do not find that major conflicts are more likely to translate into the establishment of refugees camps, but when refugees' flows do occur most of the displaced people reside in camps rather that self-settlement.[21]

This initial, explorative analysis suggests that some characteristics of the regions matter in explaining the determinants of camps. Geography seems to play a double role: distance from the capital but, more importantly, also distance from countries experiencing conflicts.

Equally interesting – and less investigated to our knowledge – are the characteristics of camps location at a more granular level. By using data at 250 meters resolution from the Global Human Settlement Layer (GHSL) we are able to detect the built-up density presence in the territories

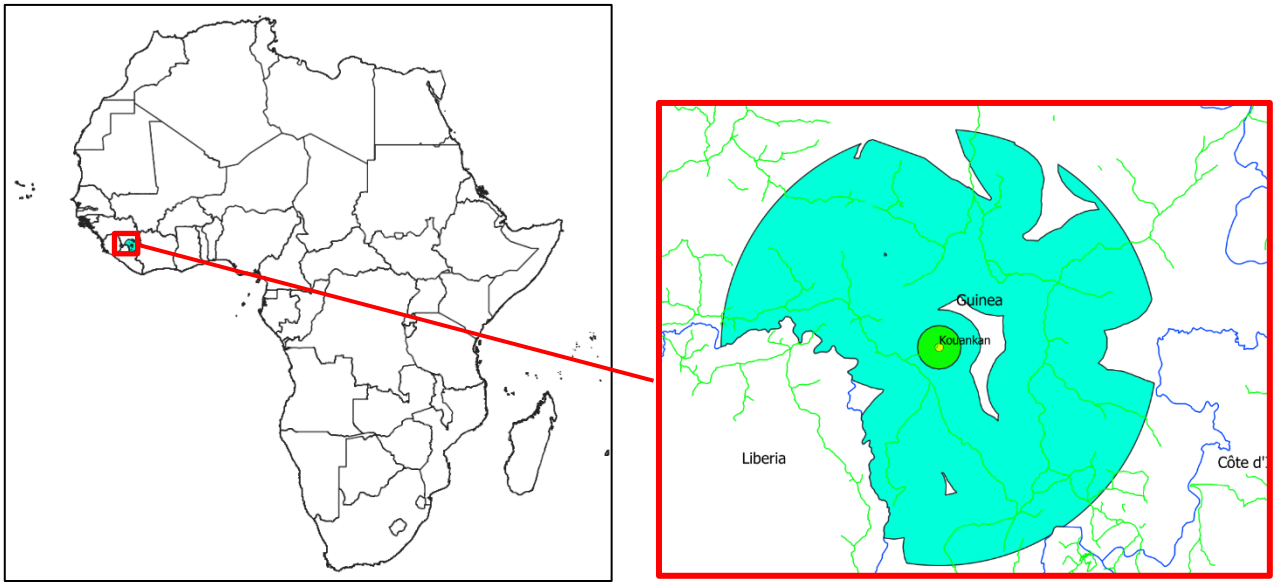
[20] An interaction effects between democracy and politically marginal areas - introduced in additional analysis not reported here – is negative and highly significant.

[21] This might be due to both a higher preference of host governments to control the inflows for security reasons but also to a higher need to face sudden and large inflows of people who have been severely displaced by high-intensity conflicts in their home countries.

hosting refugees and in the surrounding areas. *Figures 3-4* provide an illustrative example of our methodological approach showing different geo-spatial layers considered in the analysis of built-up areas in Kouankan refugees' camp in Guinea.

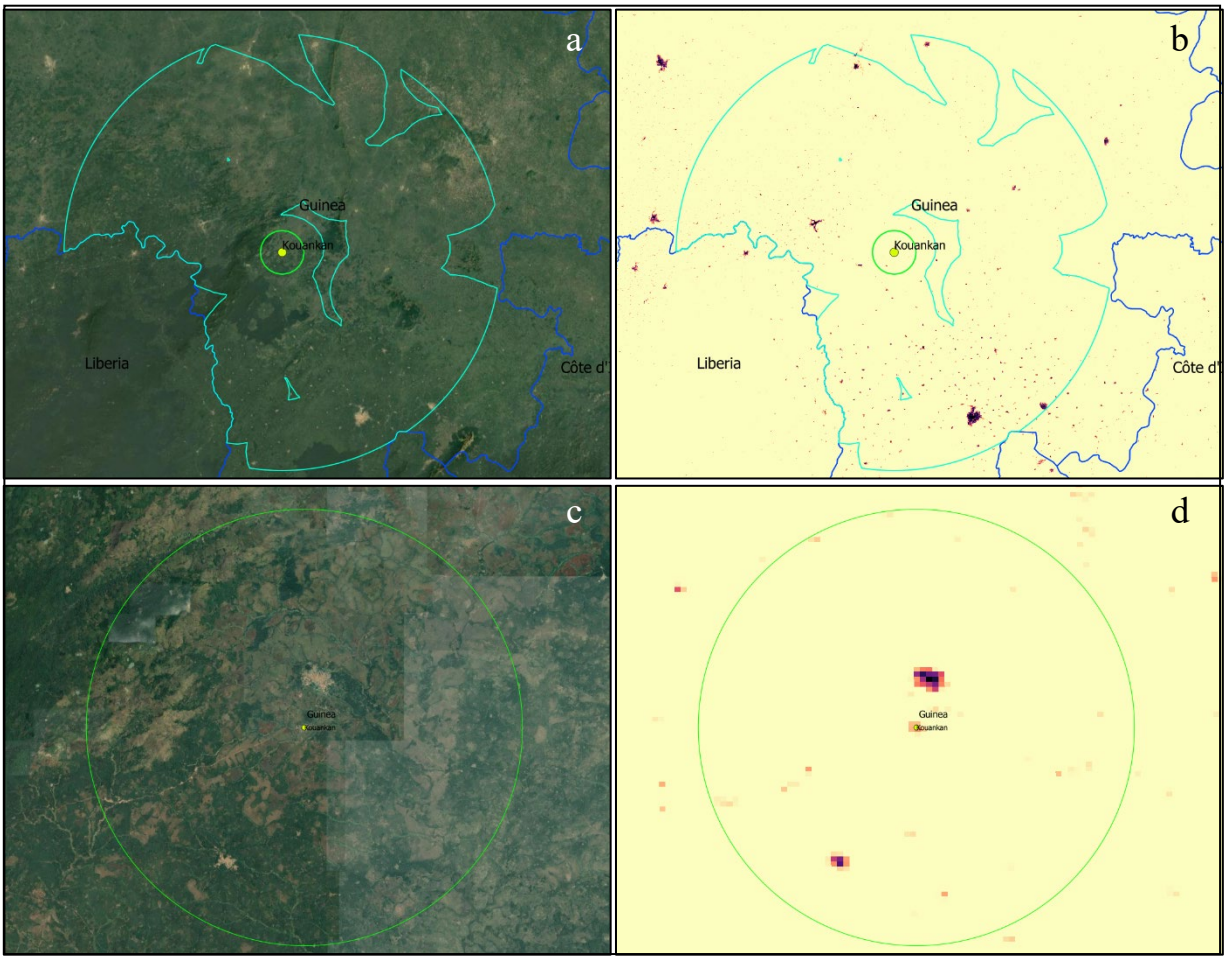
Figure 3 shows the location of the camp, situated in the western Africa, as well as the detail of the neighborhood taken into consideration for the granular analysis. The yellow dot represents the centroid of the camp, the green circle delimits the 10 km buffer surrounding the camp – and represents the treated area – while the turquoise area identifies the counterfactual area, *i.e.*, the area that, according to statistics collected for all Sub-Saharan refugee camps, are territories that could be ideally matched with those hosting actual camps. The turquoise area is identified as the intersection between four different selection processes. It considers all territories i) within the 100 km buffer from the camp centroid, ii) beyond the 10 km buffer from the camp centroid, iii) within the buffer from country border, iv) within the buffer from all main roads (highways and primary roads). The buffers from country border and from main roads are measured as one standard deviation beyond the full sample averages.

Figure 3: Camp location and counterfactual area: an illustrative example (Kounkan camp in Guinea).



Source: authors' elaboration based on UNHCR data

Figure 4: Focus and layer description of satellite data on Kouankan camp.



Source: authors' elaboration based on Google Satellite data and GHSL data (2014).

Figure 4 provides further detail on the territories in which Kouankan camp is located. *Panel a* reports the Google Satellite image of the whole area while *panel b* reports, for the same area, the classified raster image provided by GHSL. In the latter, every pixel carries information on the built-up index (ranging from 0 to 100, where 0 indicates absence of human settlements and 100 a zone with a high built-up density) with colors becoming darker for higher level of such index. *Panels c* and *d* further zoom on the area, focusing on the 10 km buffer of the camp for both data sources. Focusing on *panel d*, it is possible to detect, close to the camp, the city of Kouankan (about 49,000 inhabitants in 2014) – in the prefecture of Macenta – which represents a cluster of highly dense settlements. South-west to the camp, we see also a cluster of built-up pixels corresponding to the town of Boussédou (about 10,000 inhabitants in 2014). Besides such centers, both *panel b* and *panel d*, show the presence of distributed built-up area with colors ranging in the orange-red-violet-black *spectrum*. The aim of our analysis, in such context, is to detect the change in the built-up density between 2000 and 2014. We focus only on the neighborhood of those camps in our database

that were settled in the period under scrutiny (86 refugees centers out of the 140 representing the full sample).

Since our 'treated' observations and 'counterfactual' ones differ in size, we take into consideration relative indexes of built-up. The built-up index from GHSL is computed *per* single pixel (250 x 250 mt) and, in our analysis, we compute synthetic geographical measures. We analyze the *average built-up index* as well as the share of *non-zero built-up share* for both 10 km buffers and counterfactual (up to 100 km) buffers. The first measure is a simple mean between the values of each pixel comprises in each area while the second one is the share – for each area considered – between the number of pixels with a positive built-up density and the total number of pixels. These two measures allow us to measure the intensive (more intense building in a cell/pixel) and extensive margin (more cells/pixels with buildings) of built-up dynamics.

Table 2 shows the descriptive statistics for the 86 refugees camps under scrutiny. Looking at the mean values, it seems that both the indexes show that treated areas – those located within 10 km from the camps' centroids – had higher growth in terms of both built-up intensity (*average built-up index*) and built-up extension (*built-up share*) with respect to counterfactual areas.

The *average built-up index* has increased, in the period 2000-2014, by 0.027 points for treated areas and by 0.021 points for counterfactual while the *built-up share* has increased for treated areas by 0.21 per cent and for counterfactual areas by 0.15 per cent. Low values in the statistics reported in *Table 2* reflect the absence of dynamics in the built-up settlements in camps' areas.[22]

Table 2: Descriptive statistics of built-up indexes dynamics (difference in 2000-2014 period).

Variable	Obs	Mean	Std. Dev.	Min	Max
Δ *average built-up index* in treated areas (a)	86	0.027	0.060	0.000	0.462
Δ *average built-up index* in counterfactual areas (b)	86	0.021	0.052	0.000	0.288
Δ *built-up share* in treated areas (c)	86	0.210	0.369	0.000	1.965
Δ *built-up share* in counterfactual areas (d)	86	0.149	0.342	0.000	2.260

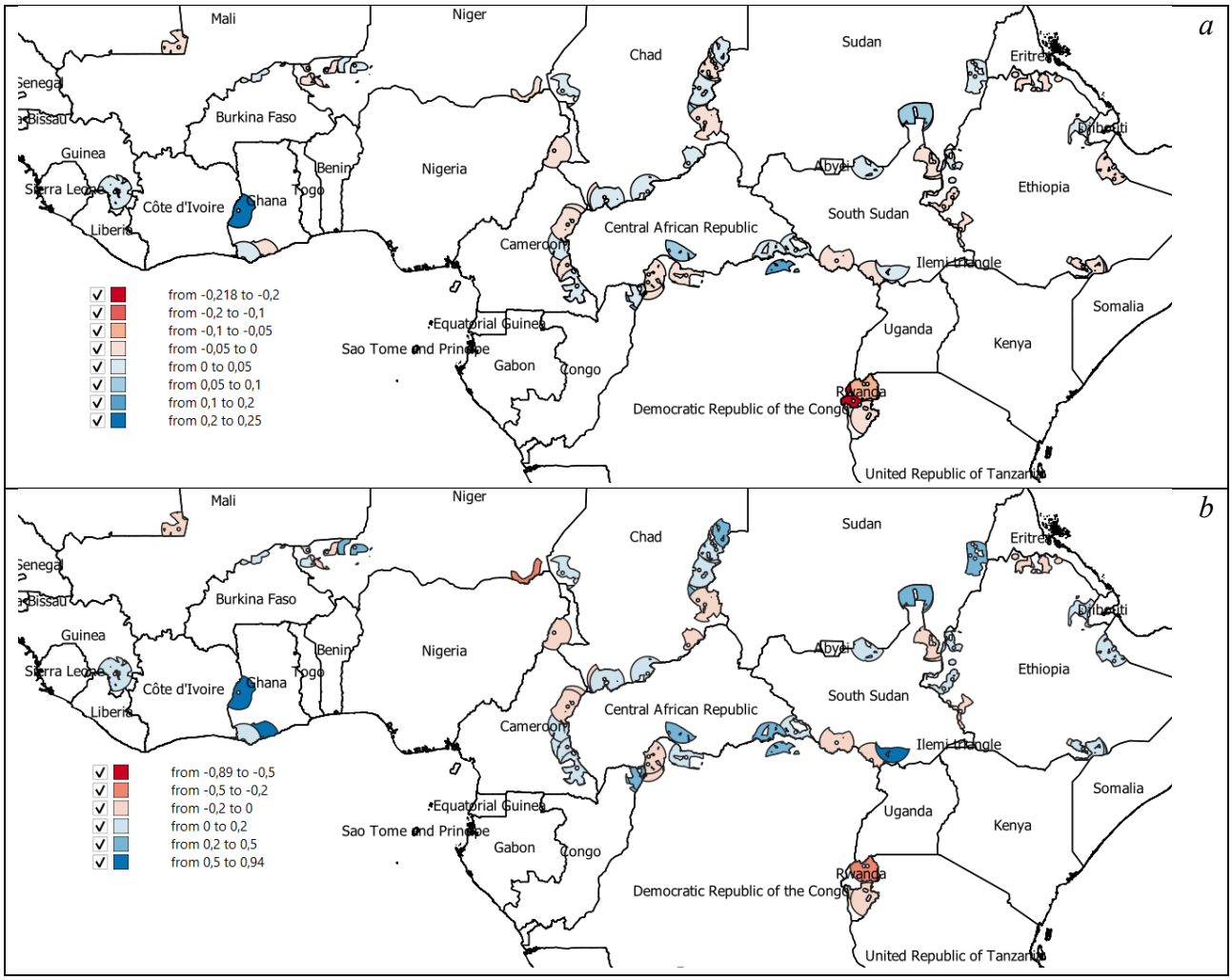
Source: authors' elaboration based on GHSL data.

Comparing the *delta average built-up index* (alternatively, *built-up share*) for treated areas with the *delta average built-up index* (*built-up share*) for counterfactual areas it is possible to measure the extent to which areas close to the camps – eventually – grew more than surrounding areas.

[22] Among the 86 analyzed camps, there is a single case – Goudoubo in Burkina Faso – for which data did not show any built-up detection in both areas.

Moreover, such focus allows us to shed light on the heterogeneity of camps' contexts. *Figure 5, panel a*, reports the difference *a – b* (dynamics comparison of *average built-up index*) while *Figure 5, panel b*, reports the difference c – *d* (dynamics comparison of *built-up share*). Positive values show that built-ups close to the camps have grown more than built-ups far from them.

Figure 5: Difference in built-up index growth between 10 km radius areas and counterfactual.

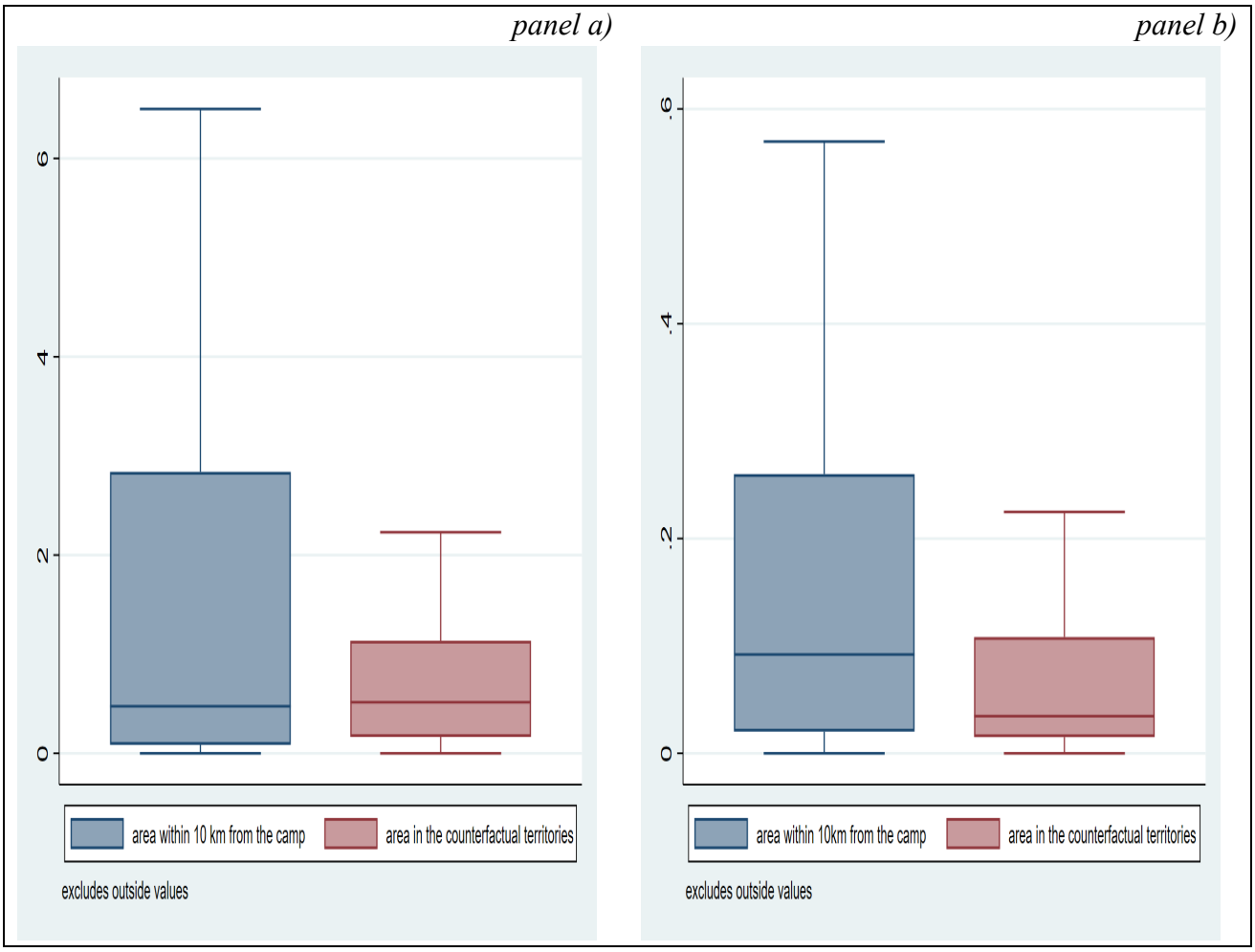


Source: authors' elaboration based on GHSL data. The values of the dynamics' comparison are represented by coloring the shape of the counterfactual areas.

Regarding the dynamics of the *average built-up index*, our measure of the intensive margin of settlement, *Figure 5*, *panel a*, shows that the cluster of refugees' camps in Rwanda and Burundi had a negative impact on the neighbor context since the settlements at short distances have not been as dynamic as the settlement in the counterfactual areas. Such evidence might be linked to the relatively small size of these two countries for which the counterfactual area includes the entire countries' territories. This evidence is confirmed also by looking at the dynamics of the extensive margin of built-ups (*share*, in *panel b*). For the other countries it is not straightforward to identify a

general pattern, confirming the crucial role played by camps' location and neighbor in the local dynamics. Ethiopian camps show a negative impact on neighborhood when looking at the intensive margin, turning to positive when considering the extensive margin of settlements. Most of refugees' camps in South Sudan have negative values but some exceptions (such as Gorom camp at the border with Uganda) occur. In Ghana areas next to camps observed a strong growth of built-up areas and similar results are found also for Sudan and Chad.

Figure 6: Built-up indexes' dynamics.



Source: authors' elaboration based on GHSL data. Panel a) reports the values for Δ average built-up index (intensive margin); panel b) reports the values for Δ built-up share (extensive margin).

Results from *Figure 6* help to compare the dynamics of the two indexes employed in this micro-level analysis, showing that treated and counterfactual areas have similar average built-up values – although a clearly different overall distribution – while their built-up share (extensive margin of spatial growth) seems to be significantly different from each other.

To check the robustness of the comparison between the distribution of treated units' dynamics and the distribution of counterfactual territories dynamics, we perform Student t-test of equality of means. The null hypotheses that we test are:

1) mean of Δ *average built-up index* in treated areas ≤ mean of Δ *average built-up index* in counterfactual areas.

2) mean of Δ *built-up share* in treated areas ≤ mean of Δ *built-up share* in counterfactual areas.

In this way, if the treated areas have shown a higher degree of dynamics with respect to counterfactual buffers, the test refuses the null hypothesis by accepting the alternative that the built-up indexes neighboring the camps have higher values with respect to farther territories.

The two tests confirm that treated areas' human settlements have grown more than counterfactual areas' ones. However, while such evidence is strongly significative for the *built-up share*, our measure of extensive margin of settlements growth (p-value 0.066), when turning to the *average built-up index*, our measure of intensive margin of settlements growth, the test shows weak evidence (p-value 0.1033). Such results are in line with the idea that the presence of refugees' camps might positively affect the neighbor areas' economy, although a year-by-year analysis – not available when analyzing built-up dynamics – would provide further evidence of the role of refugees in peripheral local economies.

The impact of refugee' camps on host communities: expansion of economic activities and social conflicts

Do protests and conflicts occur more frequently in areas where refugee camps are located? While anecdotal evidence and some academic research based on specific settings suggests a positive answer to this question, to our knowledge no systematic and comprehensive analysis of the issue has been carried out so far. Two important exceptions are the recent works by Fisk (2019) on 39 African countries and by Zhou and Shaver (2021) for the entire globe. Both studies have the merit of investigating the effects of refugees' location on armed and civic conflicts looking at a large pool of regions. While Fisk (2019) finds evidence of a positive association between the setting up of a refugees' camp and non-state conflicts the work by Zhou and Shaver (2021) finds no evidence of an increased likelihood of new conflicts, the extension of old conflicts or of increases in the number of deaths. An important limit of both studies relates to the fact that we cannot exclude that the rise in violence might be due to other factors that might affect both the number of conflicts (the dependent variable) as well as the likelihood that a refugees' camp will emerge (the main covariate). In fact, the increase in violence might be due to the increase in the number of refugees in general (not necessarily those hosted in camps) or because of violence spillovers from the conflicts in

neighboring countries that led to the displacement of people in the first instance. Using large geographical areas – as both studies do - might also make the identification of the true effects of refugee camps on neighboring areas less precise.

In order to overcome these limits, we adopt a different methodology – as described in more details in the previous section – and a more granular geographical scale (50 x 50km gridded geographical cells).

The main idea is to compare geographical cells that host a camp (treated) with other cells that have *a priori* a similar probability of hosting a camp, a highly similar socio-economic context and are equally exposed to shocks in neighboring countries (counterfactual). The matching approach employed minimizes the risk to wrongly attribute the change in the number of protests to the presence of refugee camps.

The first step of the analysis is presented in *Table 3*, which reports the estimates of a panel difference-in-difference model which implements the counterfactual comparison just described above. In Columns (1) to (5) the dependent variable is the (log of) the number of daily protests in a year in a cell. The effect of hosting a refugee camp is found to be weakly associated to the dependent variable only when we do not include other cell-specific characteristics (column 1). When controlling for economic growth (proxied by night-time average light intensity), ethnic fragmentation, population as well as climatic variables such as rainfall and evotraspiration (a proxy for the risk of drought) the effects of refugee camps is not statistically significant. In Columns (3) and (4) we interact the presence of refugee camps with some spatial features of their localization, respectively their location in rural areas and the proximity to local communities. The findings suggests that also in rural areas and in locations where there is a strong proximity with local populations the impact on protests continues to be statistically not significant. The main results are confirmed when we use the number of refugees in the camp (intensity) instead of the dummy variable (column 5).

Interestingly, we find evidence that conditional on protests occurring in a given year, the presence of a refugee camps increases the number of protests observed in a cell (intensive margin of protests). Finally, we employ two alternative measures of violence. In column (7) we report estimates where the dependent variable is the number (in log) of organized violent events defined as "*incidents where armed force was used by an organised actor against another organized actor, or against civilians, resulting in at least 1 direct death at a specific location and a specific date*" (UCDP Georeferenced Events Dataset; v. 21.1). These events can be considered as a subset of

conflicts that results in particularly violent outcomes causing casualties.[23] The results, reported in column (7) confirm that the presence of refugee camps does not significantly affects the average number of violent events in interested areas compared to counterfactual ones. Finally, we employ as an alternative dependent variable, the number of protests and riot events happened in Africa that have been recorded in the Armed Conflict Location and Event Data Project (ACLED). The results, reported in column (8), confirms the lack of evidence on a significant effect of refugee camps on protests.

Table 3 – Refugees camps and the occurrence of protests.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. variable:	Protests (nr; ln)	Protests (nr; ln)	Protests (nr; ln)	Protests (nr; ln)	Protests (nr; ln)	Protest (intensive margin)	Organized Violence (nr; UCDP GED data)	Conflicts (nr; ACLED data)
Refugees' camp in the cell (dummy)	0.816*	0.507	0.332	0.303		0.735**	-0.268	-0.009
	(0.472)	(0.399)	(0.341)	(0.332)		(0.325)	(0.295)	(0.039)
Refugees in camps (nr: log)					0.057			
					(0.041)			
Nightlight intensity		0.838***	0.838***	0.838***	0.835***	0.772***	0.029	0.141***
		(0.103)	(0.103)	(0.103)	(0.103)	(0.117)	(0.116)	(0.022)
Ethnic fragmentation index (lower score = higher fragmentation)		0.341	0.336	0.341	0.345	-0.165	-1.040***.	-0.065
		(0.348)	(0.346)	(0.348)	(0.347)	(0.436)	(0.246)	(0.045)
Population count interpolation (log)		1.000***	0.998***	0.999***	1.000***	0.086	0.474***	0.075***
		(0.108)	(0.108)	(0.108)	(0.108)	(0.173)	(0.079)	(0.022)
Rainfall (log)		-0.474***	-0.474***	-0.476***	-0.472***	0.136	0.071	-0.073***
		(0.157)	(0.157)	(0.157)	(0.156)	(0.315)	(0.124)	(0.021)
Evapotraspiration (log)		0.283**	0.281**	0.282**	0.285**	0.032	0.310**	0.074**
		(0.117)	(0.118)	(0.117)	(0.116)	(0.160)	(0.135)	(0.037)
Refugees' camps * rural area			0.190					
			(0.497)					
Refugees' camps * close-distance local community		0.215						
				(0.516)				
Constant	-2.48***	-18.81***	-18.77***	-18.78***	-18.84***	-4.109	-12.23***	-1.709***
	(0.176)	(2.092)	(2.108)	(2.101)	(2.087)	(3.481)	(1.701)	(0.508)
Observations	11,685	9,754	9,754	9,754	9,754	1,152	9,754	9,754
R-squared	0.431	0.602	0.602	0.602	0.602	0.628	0.427	0.409

[23] We thank an anonymous referee for suggesting the use of this alternative dataset. Additional analysis, available upon request, has been carried out by considering separately the occurrence – and the number of related deaths – of State-based and non-State-based armed conflicts as well as one-sided violence (Högbladh Stina, 2021, "UCDP GED Codebook version 21.1", Department of Peace and Conflict Research, Uppsala University). The results are qualitatively similar as we do not find any evidence of an increase in the likelihood of these violent events when refugees' camps are established.

Controls	N	Y	Y	Y	Y	Y	Y	Y
Country-Year FE	Y	Y	Y	Y	Y	Y	Y	Y

Note: In columns (1)-(6) the dependent variable is the (natural log of) number of protests. In column (6) the analysis is restricted to cells with at least one protest day per year (intensive margin). In Columns (7) and (8) we use as alternative dependent variables respectively the number of organized violent events (UCDP GED v.21.1 dataset) and armed conflicts (ACLED database). Robust standard errors clustered at cell-level in parentheses *** p<0.01, ** p<0.05, * p<0.1 (regressions are weighted by population in the cell / country by time fixed effects are included in all specifications)

The findings above are based on a comparison – between the units hosting camps and their counterfactual areas – of the change in average protests and conflicts in pre-establishment period and the post-establishment period. From a theoretical perspective the establishment of a refugees' camp might affects social tension in hosting areas that vary over time. In fact, in the initial period of settlement the host community will observe a 'population shock' which is generally very large both in absolute terms (number of hosted refugees) and relative to the local area population. This shock might give rise to social tensions as the increased heterogeneity of the population might generate mistrust (Putnam 2007). But as the existing evidence suggests, over time – as refugees start so have social and economic interactions with locals and the public expenditure shocks associated to the establishment of camps delivers its effects – tensions might be softened as more and more locals benefits from the 'camp economy' and more intense contacts reduce the initial mistrust (intergroup contact theory).

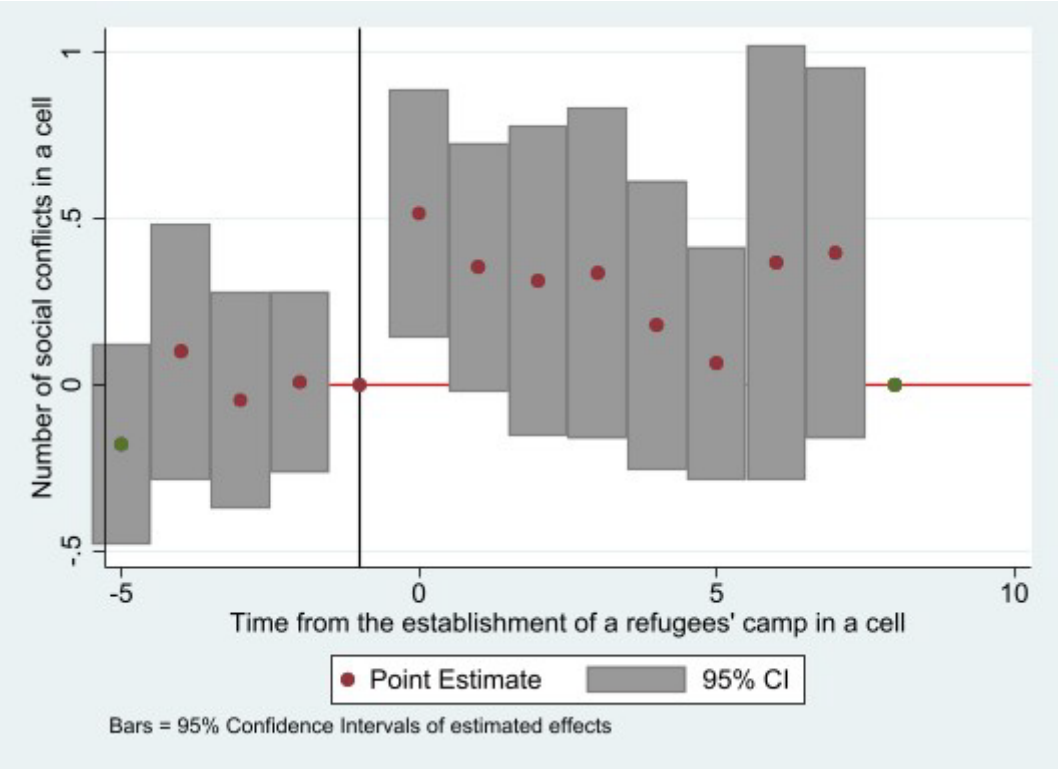
In the final step of the analysis we test this hypothesis and conduct a panel event analysis which has the advantage of allowing us to analyze the temporal nature of the effects of the setting up of refugees camps on the number of protests and not only the average (post-treatment) one reported in *Table 3*.[24]

The results of the event-study are summarized in *Figure 7* and highlights the importance of considering the dynamics of the effects of the presence of camps on social conflicts with the host population. In fact, we find evidence of a significant increase in the number of protests in the 2-years from the establishment of the camp. After this time lag the effects is still positive but not statistically different from zero suggesting that the increase in conflicts is transitory. On the contrary we do not find evidence of increase in the number of organized violence events which result in casualties as measured in the UCDP GED dataset (*Appendix 3*). The results might be due to the fact that while the initial population shock generates immediate social tensions, the public expenditure shocks and the positive contribution of refugees in local goods and factor markets generally will take more time to fully materialize. Thus, over time the easing of tensions might be

[24] Panel event studies analysis – also known as staggered adoption designs – have several other advantages such as the possibility to test the parallel trends assumption in the pre-treatment period (in our study the period before the set up of the camps). These models are widely applied in empirical analyses in a wide range of contexts and the methodological approaches are rapidly evolving (Goodman-Bacon (2018) and Clarke and Tapia (2020)).

due to sensitization actions by the UNHCR, Governments and other actors but also be related to the increased socio-economic contacts between refugees and locals and the progressive diffusion of the benefits of the 'camp-economy' to a larger share of the host country population.

Figure 7 – Establishment of a refugee' camp and number of protests[25]



Source: authors' elaboration based on estimates.

6. Policy pimplications and conclusions

While refugee camps are not the only means for providing effective protection and assistance to displaced population they are and most likely will continue to represent a fundamental mean for achieving these goals. Refugee camps are particularly important in the context of developing

[25] *Figure J* reports the results from a panel event study model which corresponds to a difference-in-difference estimation that includes a series of lag and leads and allows to investigate the dynamics of the effect. The model includes the same covariates reported in Table 2 (cells fixed effects, country-year fixed effects, nightlight intensity, ethnic fragmentation, population, rainfall and evapotranspiration). The parallel trend assumption in the period before the establishment of the refugees' camp is supported. See Goodman-Bacon (2018) and Clarke and Tapia (2020) for details on the adopted estimation methodology. See also *Appendix 3* for a similar analysis conducted using the number of organized violence events as dependent variable.

countries where settlements emerge in marginal areas bordering countries in conflicts. In such context camps ensure the necessary economies of scale and scope in delivering assistance to vulnerable individuals. One concern that has often emerged in policy circles as well as in academic debates is the fear that the establishment of camps might negatively impact the host populations through different channels (competition in the labor market, security, environmental degradation, redistributive effects, etc.) and thus generate conflicts. Another concern is due to the fact that while camps allow to reap economies of scale in the delivery of assistance[26] the limitations imposed to refugee' rights and freedoms might limit their interactions with the host community and have adverse socio-economic effects. These concerns often translate into ex-ante hostility to the establishment of camps and complicates the politics of refugee rights in hosting countries (Betts 2021). While anecdotal evidence and some studies on refugees-induced conflicts seems to support the concern related to the emergence of conflicts (Fisk 2019; Duncan 2005; Jacobsen 1997) other recent studies do not find any evidence of increased violence and tensions (Zhou and Shaver 2021). While the effects of camps on conflicts is still an open issue the existing evidence is more unanimous in suggesting that the effects of camps on economic development of host communities is overall positive, although the distribution of gains and losses might be highly heterogeneous (Alix-Garcia et al 2018; Alloush et al 2017; Verme and Schuettler 2021).

The starting point of this paper is that wellbeing of refugees as well as that of host-communities strongly depends on the specific economic and geographical context in which the 'refugee-camp shock' takes place. In fact, we argue that the location of camps is a fundamental element in shaping the socio-economic effects of forced displacement, including the likelihood of conflicts. To our knowledge most existing studies drive evidence from specific case studies and the few multi-country studies ignore the geographical dimension of host population-refugees' interactions.

In this paper we firstly shed some light on the heterogeneous geography of camps in Africa, the continent hosting the largest number of refugees in the World. Secondly, we show - using a geo-referenced counterfactual analysis that allows to zoom at a more granular locational scale - that the establishment of camps increases the likelihood of protests only in the aftermath of its creation; on average in the subsequent two years. After a relatively short period of time, we observe no differences in the occurrence of protests between areas receiving refugees camps ('treated cells') and those areas not receiving camps but with highly similar socio-economic features and a similar ex-ante probability of hosting camps (untreated cells). When we focus on the most severe conflicts,

[26] As individuals hosted in refugees' camps are registered and live side-by-side to the personnel of humanitarian organization assisting them, their needs can be more easily identified and, in turn, support can be delivered in a more tailored way compared to other alternative hosting arrangements such as self-settlements in rural and urban areas.

i.e. organized violence events resulting in casualties, we do not find no evidence of significant increase in areas receiving refugee camps.

The findings of this paper might contribute to support the advocacy efforts of UNHCR and other organizations in shaping policies supporting displaced and stateless people, by reassuring government and non-government parties about the unjustified worries of generalized and high-scale social tensions generated by the establishment of camps. Our results also suggest that the initial years are crucial for stemming potential tensions. Recognizing the existence of a higher potential for conflicts in the aftermath of the establishment of refugee camps is a first important step to the drafting of practical solutions that might further reduce such tensions. It is important to acknowledge that our overall positive finding does not rule out the possibility of specific cases of social conflicts and tensions induced by the establishment of a camp, for instance if substantial changes in the ethnic composition of the population occur.

Although a detailed understanding of the mechanism is beyond the scope of this paper, we speculate that one possible explanation rests on the asynchronous effects of the two main shocks associated with the establishment of a refugee camp. The sudden population shock might drive an initially negative reaction in the host-country population through channels that have largely been investigated in the literature such as mistrust (Putnam 2007; Gesthuizen et al 2009), security threat (Feldmeyer et al 2019), increase in diversity (Hooghe et al 2008). The effects of the public expenditure shock and a more active participation of the 'newly added' population are likely to take more time. As a consequence, the dynamic evolution of the effects of hosting-camps on conflicts might be highly relevant. Practical interventions might be focused on activities and initiatives aimed at building social bridges between refugee and, at the same time, remove the obstacles that delay or dampens the positive economic effects generated by the establishment of refugee camps. The study provides support for those policies and initiatives that speed up the process of integration of refugees in the host localities; the intensity and density of interactions are unlikely to generate strong social tensions as refugees – if allowed to participate in local markets – might greatly contribute to the expansion of economic opportunities also for the local population.

Our results on the effects of newly established camps on economic growth – measured by the change in the share of built-up areas within 10km from the centroid of refugee camps – show that on average refugee camps have positive local effects. We also provide evidence of heterogeneous effects with some hosting areas – mostly in highly marginal settings – experiencing a lower growth compared to their counterfactual. A better understanding of these heterogeneous patters is beyond the scope of this contribution, but it is likely to provide interesting insights into which contextual

factors matters in reducing conflicts and finding the right balance between the rights of refugees and those of hosting societies.

Although our analysis as the merit of looking at a relatively large sample of countries and camps and at a more granular geographical level, a more detailed investigation – for instance matching geo-referenced characteristics of places with individual and household level data – is needed to fully understand the mechanisms that hamper (or boost) conflicts and social unrests. One possible extension would be that of considering other important forcedly displaced populations such as IDPs or self-settled refugees. Finally, further refinements of the analysis could be done by looking at specific types of protests and conflicts in host localities. These extensions of the current analysis are promising avenues for further research.

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Appendix 1
Table A1.1: Variables employed in Table 1

Variable name	Description	Mean / SD	Source
Refugees' camp	Dummy variable equal to 1 if the sub-national administrative unit hosts a refugee camp at time t and 0 otherwise	0.039 / .1937	Fisk (2019) based on UNHCR data
Camps / Selfsettled (share)	Share of refugees living in camps at the subnational level at time t	0.435 / 0.459	//
Population (ln; lag 1)	(log of) Population of the sub-national administrative unit in the year before (t1).	13.243 / 1.328	Gridded Population of the World Dataset (v3)
Income per capita (ln; lag 1)	(log of) Income per capita of the sub-national administrative unit in the year before (t1).	6.525 / 1.244	Fisk (2019)
Unit_size	(log of) Size in square km of the sub-national administrative unit.	9.527 / 1.720	Fisk (2019)
Democracy	Dummy variable equal to 1 if the sub-national administrative unit is located in a country with a Polity 2 Index equal or above 5 and zero otherwise at time t.	0.257 / 0.437	Marshall (2019)
Politically marginalized	Dummy variable equal to 1 if the sub-national administrative unit is home to one or more groups that are either politically: powerless, discriminated, irrelevant. Variable constructed using the Ethnic Power Relation dataset (EPR) and Geo-references Ethnic Power Relation dataset (Geo-EPR)	0.517 / 0.500.	Fisk (2019)
Distance from capital	(log of) Distance in km of the capital of the administrative unit from the national capital.	5.500 / 1.736	Fisk (2019)
Border region	Dummy variable equal to 1 if the sub-national administrative unit shares an international border and 0 otherwise.	0.619 / 0.486	Our computation.
Conflicts in neighboring countries (nr.; t)	Number of non-state conflicts in neighboring countries of a border region in year t (events with >=25 battle-related deaths). Uppsala Conflict Data Programme (UCDP-PRIO v201)	0.293 / 0.616	Our computation
Conflicts in neighboring countries (nr.; t1)	Number of non-state conflicts in neighboring countries of a border region in year t – 1 (events with >=25 battle-related deaths).	0.300 / 0.631	//
Conflicts in neighboring countries (nr.; t1_t4)	Cumulated number of non-state conflicts in neighboring countries of a border region in between year t – 1 and t – 4 (events with >=25 battle-related deaths).	1.434 / 2.781	//
Minor conflicts in neighboring countries (nr.; t)	Number of non-state conflicts in neighboring countries of a border region in year t (events with *less than* 1000 battle-related deaths).	0.242 / 0.570	//
Major conflicts in neighboring countries (nr.; t)	Number of non-state conflicts in neighboring countries of a border region in year t (events with *more than* 1000 battle-related deaths).	0.051 / 0.225	//
Minor conflicts in neighboring countries (nr.; t1)	Number of non-state conflicts in neighboring countries of a border region in year t – 1 (events *with less than* 1000 battle-related deaths).	0.241 / 0.571	//
Major conflicts in neighboring countries (nr.; t1)	Number of non-state conflicts in neighboring countries of a border region in year t – 1 (events *with more than* 1000 battle-related deaths).	0.062 / 0.247	//
Minor conflicts in neighboring countries (nr.; t1_t4)	Cumulated number of non-state conflicts in neighboring countries of a border region between year t – 1 and year t – 4 (events with *less than* 1000 battle-related deaths).	0.878 / 1.852	//
Major conflicts in neighboring countries (nr.; t1_t4)	Cumulated number of non-state conflicts in neighboring countries of a border region between year t – 1 and year t – 4 (events with *more than* 1000 battle-related deaths).	0.303 / 0.892	//

Appendix 2

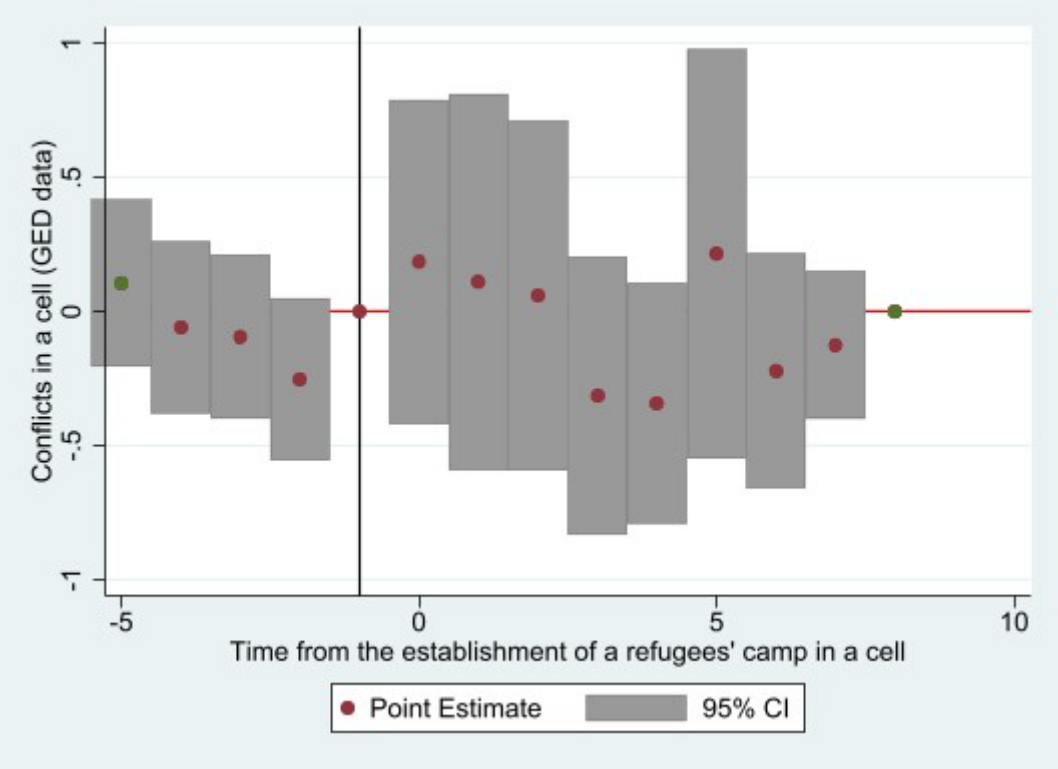
Table A2.1: Refugees' camps and protests. Variables' description and summary statistics (Table 3)

Unit of analysis = 50x50 km gridded cells. Number of cells: i) main analysis nr. 11715 (restricted sample); ii) only countries with at least one refugee camp in the time interval 2000-2014, nr. 109785; iii) all continental Africa, nr. 195945.

Variable name	Description	Mean / SD	Source
Number of protests (GDELT) (ln)	Number of daily protests occurring in cell i in year t.	-4.049 / 1.686	Google's Global Database for Events, Language and Tone (GDELT), version 1.0
Number of organized violence events (ln)	Number of incidents where armed force was used by an organized actor against another organized actor, or against civilians, resulting in at least 1 direct death at a specific location and a specific date occurring in cell i in year t.	-4.487 / 0.795	UCDP Georeferenced Event Dataset v.21.1 (see Sundberg, R., and E. Melander 2013)
Refugees' camp in the cell (dummy)	Dummy variable equal to 1 if the cell hosts a refugee camp at time t and 0 otherwise	0.47 /0.21	UNHCR Camp mapping data
Refugees in camps (nr: log)	Number of refugee camp at time t in the cell.	0.87 / 0.464	//
Nightlight intensity	Average, non-stable nigh-time light intensity discounted by frequency of observation at the cell level	3.576 / 0.893	Iacoella et al (2021) based on US National Oceanic and Atmospheric Administration (NOAA) data
Ethnic fragmentation index (lower score = higher fragmentation)	Inverse of the Herfindahl-Index of the number of ethnic groups per cell. The index ranges from 0 (= only one ethnic group) to 1 (= high fragmentation).	0.725 / 0.285	Iacoella et al (2021) based on Ethnic Power Relations (EPR) dataset (Vogt et al 2015)
Population count interpolation (log)	Estimated population count per cell.	10.74 / 1.242	NASA Socioeconomical Data and Applications Center (SEDAC) Population Count Dataset (v4)
Rainfall (log)	Average yearly rainfall in mm (computed averaging monthly data)	4.154 / 0.732	NASA CHIRPD v2.0 database
Evapotraspiration (log)	Variable used as a proxy for the risk of drought computed as the sum of evaporation and plant transpiration from land	8.94 / 0.905	Iacoella et al (2021) based on NASA Goddard Space Flight Center's MOD16 terrestrial ecosystem evotranspiration dataset.
Rural area	Dummy variable equal to 1 if the refugee camp is located in a rural area and 0 otherwise (no camps or camps not in rural areas).	0.580 / 0.494	Our computation based on geo-referenced data of camps in UNHCR.
Close-distance local community	Dummy variable equal to 1 if the refugee camp is located within 3 km from a local village/city and 0 otherwise (no camps or camp location in an uninhabited or sparsely populated area).	0.768 / 0.422	Our computation based on geo-referenced data of camps in UNHCR.

Appendix 3

Figure A3.1: Refugees' camps and violent conflicts. Robustness estimates using UCDP Georeferenced Event Dataset



Source: authors' elaborations based on estimates considering GED data