OPPORTUNISTIC BEHAVIOUR OF FOREIGN FISHERS DURING CIVIL CONFLICTS AND CIVIL WARS IN COASTAL AFRICAN COUNTRIES

By

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Abstract

The negative economic consequences of civil wars and civil conflicts on countries wherein violence and instability become endemic are clear. Also, different researches mention the impacts of conflicts' spread onto the geographically surrounding countries. This research investigates the sector-specific impacts that conflicts have on fisheries in neighbor countries. The study uses the reported maritime fish catch to investigate the possible effect of conflicts on fisheries as a result of population displacement, counter-insurgency policies, and foreign fishermen encroachment in marine territories. The analysis of data for 29 coastal African countries between 1970 and 2004 suggests a strong positive impact of the onset of civil conflict on the fish catch growth in neighbor countries. The research also finds a positive, but smaller, significant relationship between civil conflicts and fisheries in the bordering countries. Interestingly, the magnitude of these effects on fishing growth are largely higher than the impact of the GDP growth. The results also show that the termination of civil conflicts does not have a significant impact on the growth of fisheries. This research enriches the literature on the economic effects of civil conflicts as it attracts the attention of international fisheries and peace organizations to protect the coastal fisheries of these conflict afflicted regions given the regional social, political, and economic impacts of maritime resources.

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Contents

Introduction

The development in reverse is a term used by the World Bank to describe the negative impacts of civil wars and armed conflicts, within countries, on local development activities (Collier & Hoeffler, 2004). Civil conflicts and civil wars also have negative economic effects on all countries in the region (Murdoch & Sandler, 2004). One of the sectors afflicted by civil wars are fisheries, which are critical to economic growth and food security for countries worldwide (Pomeroy et al., 2007). Civil wars and civil conflict occur when the level of grievance is high enough for people to be willing to engage in a violent protest and armed conflict to get their rights (Collier & Hoeffler, 2004). Since civil wars and political uprisings always have an impact on a country's aggregate output, they must also have an impact on different industries (industry-specific impacts), which ultimately affects the country's food security, economic growth, and lifestyle quality (Hendrix & Glaser, 2011). The rapid growth rates of populations, scarce resources and civil wars and conflicts are determinant factors of food security. In this context, the industry-specific impact of civil conflicts on fisheries is of special attention as fisheries, nutritionally, provide 15% of the amount of protein intake per person for around 2.9 billion people around the world (Hendrix & Glaser, 2011).

In 2012, a total of 58.3 million people around the world were employed in global fisheries, 37% of which were employed full-time, and 84% of them resided in Asia (FAO, 2014). Despite these figures, Sugunan et al. (2007) argue that there has been little importance given to the fisheries industry and fishing harvest when exploring ways to create food security and permanent income. Rather, these industries' economic value has been highly underappreciated by reports and research (Sugunan et al. 2007). Global fisheries and annual fishing harvest play an

important role in food security, and livelihood (Pauly et al., 2005; Hendrix & Glaser, 2011). Fishing is divided into two main forms: i) inland ii) and maritime fishing. Although maritime fishing accounts for 92.7% of the global fishing harvest, Hendrix and Glaser (2011) argue that civil wars pose a significant negative impact on the fishing harvest of any afflicted country. During the Sri Lankan civil war between the Tamil Eelam and Liberation Tigers, the annual fishing harvest of the country decreased by 27%. The country was only able to re-attain its pre-war harvest levels approximately a decade after the end of the civil war. Three years after the start of Lebanon's civil war, the country's fishing harvest fell by 50% (FAO, 2014; Hendrix & Glaser, 2011).

Hendrix and Glazer (2011) found that civil wars, worldwide, caused a decrease in the fishing harvest of any country. There are many reasons for this including port blockages, population displacements, curfews, fishing done by foreign distant fishing fleets, while local fishers not having access to these kinds of fleets (Kaczynski & Fluharty, 2002; Acquay, 1992). Therefore, third-party opportunistic encroachment, labour displacement, participation of fishermen in the war, economic downturn, and population migration to safer zones are all possible reasons for the decrease in a country's fishing harvest (Kaczynski & Fluharty, 2002; Acquay, 1992; Hendrix & Glaser, 2011). The foreign fishermen's encroachment applies only to marine fishing while other factors apply to the different possible inland fishing and inland aquaculture (Kaczynski & Fluharty, 2002). It is a possible reason for an eventual increase in maritime fishing growth in neighbor countries.

As the fishing harvest is a key component in the world's food security, it is also common that overfishing as well as illegal and unreported fishing under the third party access to the Exclusive Access Zone agreements (EAZ) for up to 200 nautical mile represent a real threat to

any country's food security (Acquay, 1992; Agnew et al., 2009). In 2009, the annual level of illegal and unreported fishing ranged from 11 million to 26 million tonnes whose value is estimated between $10 billion and $23.5 billion. Developing countries face higher risks of illegal and unreported fishing because of the lack of appropriate fishing managements and the fishing under EAZ agreements signed by these countries and developed countries.

Illegal and unreported fishing activities are 40% higher in countries in West Africa compared to other countries globally (Agnew et al., 2009). According to Acquay (1992), the lack of distant fishing fleets in African countries and the abundance of artisanal and traditional fishing among local fishers is the motive behind the EZA fishing agreements which lead to the unreported fishing. Agnew et al. (2009) find that the levels of total illegal and unreported fishing has decreased over time from approximately 21% between 1980 and 1994 to 20% between 1995 and 1999, and finally more recently to 9% between 2000 and 2003.

Since civil wars cause large population displacement, labour displacement, increased foreign fishers encroachments, and illegal and unreported fishing (Watson & Pauly, 2001), Hendrix and Glazer (2011) find that there is a strong, statistically robust, and negative relationship between the onset of civil conflicts and civil wars and the growth of maritime fishing harvest. Murdoch and Sandler (2004) also find that civil wars cause a decrease in the steady state and the income per capita in all countries in the region of the afflicted country. This paper intends to estimate the effect of onset, incidence, and termination of civil conflicts, and civil wars in African coastal countries on the growth of marine fishing in their neighbor countries.

The conflicts' data used in this research is published by Strand (2006). The data is transformed and periodically updated by the UCDP/PRIO Armed Conflict Dataset (UCDP-

PRIO, 2015). The Data on fishing are from the FAO Fisheries and Aquaculture Statistics Collection Global Production Tables. We use this data set for 29 African coastal countries extracted for the periods between 1970 and 2004 to build new data. For instance, we use the data from Morocco and Tunisia to build the new variables for Algeria. The data includes variables used to account for the onset (start), incidence, termination, intensity, and distance of civil conflicts and civil wars from the shores. . The data also includes levels of maritime fish catch, the growth of maritime fish catch, GDP growth, and GDP per capita and population.

We use different regressions to investigate conflict related variable: the impact of onset, incidence, and termination of civil conflicts and civil wars on fishing. We begin by using three benchmark regressions to investigate the impact of every conflict related variable separately in one regression along with the economic variables. We then use other regressions to replicate the regressions made by Hendrix and Glaser (2011) in order to investigate the impact of the onset, incidence, and termination of civil conflicts on fishing in neighbor countries when they are included in the same regression.

The research attains interesting findings. We find that the onset of civil conflict has the strongest impact on fishing in the neighbor countries. We also find that the continuity of conflicts has a positive, but lower, significant effect of fishing in bordering countries. This research finds that conflicts termination has no significant impact on fishing which may be a result of the time countries take to regain control. The results also demonstrate that the onset, incidence, and termination of civil wars do not play an impact on fishing in neighbor countries.

This paper consists of five remaining sections. First, it presents a comprehensive review of the literature to summarize the impact of civil wars and civil conflicts on food security, overfishing, illegal and unreported fishing, as well as literature on civil wars and conflicts. The

second section presents the methodology and the theoretical models used to test the impact of civil wars and civil conflicts in a given country on the growth of maritime fish catch in the neighbor countries. The third section presents the methodology and the theoretical model used to investigate these relations. This is then followed by the results and discussion of the results in comparison to the existing literature. Finally, the paper concludes with a summary of the paper's findings, research limitations and a list of future recommendations.

Literature Review

Conflicts and Natural Resource

In 2012, the total global production of fish harvest was 158 million tonnes of which 104.4 million tonnes were total marine catch, 11.6 million tonnes from inland capture and 41.9 million tonnes from inland aquaculture (FAO, 2014). The inland aquaculture has the highest annual growth between 2008 and 2012 compared to maritime capture, maritime aquaculture, and inland aquaculture (FAO, 2014). Bostock et al. (2010) show that aquaculture has the highest growth rate compared to any other food producing sector. The high seas fishing increased from less than 2 million tonnes a year in 1950 to 10 million tonnes in 2009. The deep-water fishing catch in 2009 reached 4 million tonnes. However, a fishing ceiling must be imposed to protect the ecosystem and fish stock from depletion. The total annual global fish catch should be restricted to less than 100 million tonnes (Garcia & Rosenberg, 2010). Welcomme et al. (2010) suggest that the annual ceiling level for inland fishing is highly uncertain with a higher possibility for growth in this area.

The fact that the annual marine fishing ceiling has been reached and overpassed has clear consequences on the current situation of maritime resources (Garcia & Rosenberg, 2010). In

2008, 52% of the targeted fishing sources were fully utilized, 20% were moderately exploited, 19% were overused, 8% were exhausted, and 1% was recovering from depletion (FAO, 2008). Worm et al. (2009) find that these figures also apply to the Canadian and U.S.A marine resources although recent studies show that the fishing pressures on maritime resources in the U.S.A and Canada is decreasing due to the increasing vigilance for sustainable fishing management. On the other hand, 80% of targeted maritime resources in Europe have been exhausted or overexploited (Garcia & Rosenberg, 2010).

Illegal and unreported fishing activities are a key global issue begging control of the overfishing and depletion of maritime fish resources. However, the adaptable, dynamic and highly clandestine nature of high seas' unreported and illegal fishing activities makes it difficult to estimate true figures and enforce subsequent control of the volume of these practices (FAO, 2014). Agnew et al. (2009) estimate that the annual global illegal and unreported fishing activities are to be between 11 and 26 million tonnes ($10 to $20 billion annually). Garcia and Rosenberg (2010) show that the level of illegal and unreported fishing activities in high seas is decreasing because of the availability of information, the increasing concern of the population, and the strengthening of governmental measures against local and foreign fishers' encroachment.

Conflicts and Economic Aspects

Civil wars in Africa have the same incidence probability compared to other developing countries. Civil wars in the African continent are related to the world's economic trends, behaviour, and patterns (Collier & Hoeffler, 2002). Collier and Hoeffler (2002) suggest that civil war uprisings and rebellion survival depend on the binding financial constraint. So, the ability of rebels to finance their activities, payroll, and armament is the determinant of the continuity and

expansion of the conflict. The second determinant of the size and scale of civil wars is the military abilities and skills of its members (the size of the rebel forces is its survival constraint). The third determinant is the history of conflicts between communities which feeds the hatred (Collier & Hoeffler, 2002).

Civil wars are the consequence and a cause of low economic development (Collier & Hoeffler, 2002; Collier & Hoeffler, 2004; Fearon & Laitin, 2003). According to Fearon and Laitin (2003), during the period from 1945 to 1999, around 3.3 million battle-deaths occurred during 25 interstate conflicts and wars killed at least 1000 people in each battle. The average duration of civil wars between 1945 and 1999 was 3 months, and around 16.2 million people were killed during these wars (Fearon & Laitin, 2003). On the other side, civil wars and conflicts occurred in 73 countries (members of the United Nations), and the median length of these civil wars was 6 years. Civil wars and conflicts caused more refugees than the death toll, and refugees caused by the 25 interstate wars between 1945 and 1999 (Fearon & Laitin, 2003; Collier, 1999). The authors find that civil wars and conflicts have the more devastating impact on national economies than do interstate wars.

Hendrix and Glaser (2011) suggest that civil wars and conflicts destroy the human and physical capital in the afflicted country and its neighbouring countries. Civil wars occur more in poor than in rich and developing countries more than developed countries (Hendrix & Glaser, 2011). The economic cost of civil wars scourge has a higher impact than debt crisis and the Asian financial crisis (Figure 1 Appendix). Political shocks and civil wars have a large negative impact on economies due to population displacements, economic activities disruption, and labour displacement (Cerra & Saxena, 2008). The immediate cost of civil wars and conflicts on

economic activities is estimated at 6% of the national GDP. The local fishers displaced by the ongoing violence in their areas, move to the neighboring countries and start using long-distance fishing fleets to access their areas from the sea (Thorpe et al., 2009). Also, the growth of the marine catch in neighbor countries can increase because the local fishers may decide that it's an opportunity for them when neighboring states face violence to encroach in their maritime territories and fish. The civil wars uprising and political shocks cause, on average, a 16 per cent decline in output in developing countries, and 20 per cent decline in output in poorer countries. The decline in output from civil war is consistent with no perceptible rebound (Cerra & Saxena, 2008). Civil wars and political shocks also have an impact on specific industries such as fishing, tourism, and finance (Hendrix & Glaser, 2011; Cerra & Saxena, 2008; Schneider & Troeger, 2006).

Civil wars and interstate wars have a negative impact on financial markets (Schneider & Troeger, 2006). The uprising interstate wars and civil wars have a direct positive effect on interactions and exchanges at stock markets due the cheerfulness of investors in financial markets boosted by the increase in armament spending. At the beginning of Iraq's invasion of Kuwait, Dow Jones index declined by 6.31%. Afterwards, it gained 17% during the first four weeks following the intervention of the U.S.A army to free Kuwait. However, the index became very volatile when the military intervention faced strong resistance (Schneider & Troeger, 2006).

Countries relying on tourism because they represent a nice touristic destinations are vulnerable to political instability and violence. For countries with good touristic attraction such as beaches, nice weather, and archeology, any violence uprising will make tourists easily change to another safer destination (Neumayer, 2004).

Interstate wars, civil wars, and civil conflicts have a strong negative economic impact for a short period after the end of the conflict. However, on the long run interstate and civil wars and conflicts do not have a strong impact due to the fast post-war growth (Bellows & Miguel, 2009; Boskin & Lau, 1990). Koubi (2005) demonstrates the length of the civil war and its intensity (number of battle death) have a positive impact on the economy after the end of the war (Phoenix Effect). Bellows and Miguel (2009) find that people whose families were directly affected by the long-lasting severe civil war in Sierra Leone were more likely to vote, be active politically and socially, and work to rebuild the national economy. The authors find that this is proof that the duration and the intensity of the civil war have a positive impact, on the long run, on economic growth during the post-war era. However, the phoenix effect is not valid when using a broader number of countries in the study (Cerra & Saxena, 2008). Cerra and Saxena (2008) argue that the rapid economic growth is mainly due to the international aid. When the authors introduce inflows of international aid, the impact of the duration and intensity of civil wars disappears.

Conflicts and Fisheries

Le Manach et al. (2012) argue that during civil wars, conflicts, and political turmoil, the level of unreported and illegal fishing activities increases because of the absence of government control. The authors find that foreign encroachment and overfishing through the exclusive access zones by foreign fishers and companies are a major cause of fish stocks depletion in countries such as Madagascar. Due to the political instability in Madagascar, the government continues to face difficulties controlling the fishing levels and enforcing its exclusive access zones agreements (Le Manach et al., 2012). Moreover, the tension and disagreements between local fishers in Madagascar (small-scale fishers), and foreign fishers with exclusive access agreements

(shrimp fleets) is increasing while the government lacks measures and power to control their activities, which increases the illegal and unreported fishing (Le Manach et al., 2012). Although, the real trends and level of clandestine fishing are highly uncertain, FAO estimates that between 1990 and 2000 the illegal and unreported fishing was at 9.5 million tonnes (FAO, 2014). Davies et al. (2009) suggest that illegal and unreported fishing harvest represents 10% of the total reported marine fish catch.

Moreover, competition between countries over the exploitation of fisheries maritime resources causes interstates wars and conflicts instead of being a consequence (Mitchell & Prins, 1999). Between 1946 and 1992, most of militarized conflicts between democratic regimes were about fishing, maritime territories, and maritime resources. The length of democratic countries interstate-militarized conflicts are shorter in time due to the ability of these countries to reach to agreements. However, most of the fisheries and maritime territories disputes remain unsolved (Mitchell & Prins, 1999). Typical fishery and maritime territory and resources exploitation disputes between democracies are the results of a menace to use the force by one state's agent against private fishing vessels that belonging to other democratic countries (Hendrix & Glaser, 2011).

Hendrix and Glazer (2011) find that the uprising of civil conflict (25 or more battle death per year) has a significant negative impact of the growth of the total catch, inland catch, and maritime catch. The results show that civil conflicts have a higher impact on the growth of inland fish catch compared to total marine fish catch growth. The authors also find that the same pattern applies to the impact of civil wars (1000 or more battle death per year). Interstate and civil wars are also a cause for illegal and unreported fishing because of the lack of data, which causes over

licencing (Jacquet et al., 2010). Moreover, the uprising of political instability and civil wars may result in a decrease in the fish catch because of refugees from war zones, curfews, and labour displacement such as fishers who join the war (Dudley et al., 2002).

During the World War I, there was a significant drop in the fish catch in the North Atlantic area. The level of fishing harvest increased after the end of the war (Hendrix & Glaser, 2011). Murphy (2007) suggests that the impact of civil wars and conflicts on the maritime fish catch is not significant because rebels do not have maritime fleets and arms, which spares the fishing territories from the conflict. On the other side, the focus on the civil war at the expense of the protection of territories encourages other activities that have a negative impact on local fishing such as piracy, as well as illegal and unreported fishing (Davies et al. 2009; Le Manach et al. 2012; Hendrix & Glaser, 2011). Since Hendrix and Glaser (2011) find that civil wars and conflicts have a negative impact on the total fishing harvest because of the crowding out effect it has on the time, and human and physical capitals invested in the fishing industry, this research hypothesizes that these conflicts in adjacent countries may have a positive impact on the growth of maritime fishing harvest in the coastal neighbor countries.

Data Description:

The paper uses the data set from Strand (2006) and it is transformed and updated by the UCDP/PRIO Armed Conflict Dataset (UCDP-PRIO, 2015). This data is used to construct a new data set for the neighbor countries. We use the onset variables from Strand (2006) to build new variables for the two neighbor countries. For instance, Tunisia and Morocco's data were used to construct the data for Algeria. Moreover, Hendrix and Glaser (2011) used two types of conflicts:

i) the civil conflicts, and ii) the civil wars. Civil conflicts are defined as conflicts whereby the tension between fighting parties results in 25 or more battle-deaths, annually. On the other hand, civil wars are defined as conflicts whereby fighting parties have 1000 or more battle-deaths per year. In this paper, we choose to use the same thresholds and definitions for civil conflict and civil wars in the bordering countries

We focuses only on the data collected between 1970 and 2004 and nothing prior since it was determined that a lot of data had been missing between 1952 and 1970 for most of the African countries as a result of colonization. The data collected 2004 onwards was not considered given the recent stability of the countries of interest during this time. The research initially chose 38 African countries (See Table 2 Appendix). However, Cape Verde, Comoros, Madagascar, Mauritius, São Tomé and Príncipe, and Seychelles were dropped from the study given they were islands and did not geographically border with any neighbouring countries. The Democratic Republic of Congo and Tanzania were omitted because of the lack of available data. Gambia was omitted since it was geographically surrounded by Senegal from both sides. The total number of countries that were finally included in this study were 29 coastal African countries.

The fish catch data is taken from the FAO Fisheries and Aquaculture Statistics Collection Global Production Tables. Due to bureaucracy, corruption, and the lack of competence and means to collect the data, the FAO acknowledges the difficulty to claim accurate numbers for developing countries. Therefore, the FAO relies on the expertise of its members to draw approximate estimates of the current fish catch levels and fish stocks (FAO, 2008). The data biases increase for countries with higher fish stock and fishing harvest (Hendrix & Glaser, 2011).

Despite this, the FAO Fisheries and Aquaculture Statistics Collection Global Production Tables remain the most standardized and reliable source for fisheries data.

Another problem with this data is that it is very hard to collect data and report accurate statistics during civil conflicts and civil wars for many obvious reasons; The politico-military propaganda during conflicts tend to inflate or minimize numbers, depending on the end. For instance, if the country wants to get international support, it tends to inflate the material damages, numbers of refugees, injuries, and deaths. Contrarily, if the country wants to minimize the impact of the war to show that everything is under control, it tends to minimize the magnitude of impacts. As a solution, Hendrix and Glaser (2011) take the average between the highest and lowest estimates. Also, the propaganda tends to affect the geographic variables because every disputing party announces the acquisition of new territories which make it harder to collect the data on the geography.

The variable measuring the onset of civil conflict ($Lconfonset_{i,t}$) is a dummy variable that takes the value of 1 if one of the two bordering countries to country "i" had a civil conflict onset at the same year "t", and 0 otherwise. The descriptive statistics show that on average, 4% of African coastal countries have a reported civil conflict onset at any given year.

The civil conflict's incidence variable ($Lconfinci_{i,t}$) takes the value of 1 for every year the civil conflict in a bordering country carries on, and 0 otherwise. This variable is used to measure the effect of the continuity of the civil conflict, isolated from the outbreak of the conflict, in a given country on the maritime fish catch growth in its neighbor. Table 1 (Appendix) shows that on average 20% of countries studied have a civil conflict carrying on at any given year.

The civil conflict termination at year "t" is a dummy variable that takes the value of 1 if a civil conflict in one of the two bordering countries ends at a given year"t", and 0 otherwise. The descriptive statistics show that on average, 4% of countries have conflicts ending annually.

The civil wars incidence in neighbor countries ($Lwarinci_{i,t}$), is a dummy variable that takes the value 1 if a country has an onset of civil war in its neighbor countries, and 0 otherwise. On average, only 1% of the countries studied have onsets of civil wars at any given year. The civil war incidence ($Lwarinci_{i,t}$) is also a dummy variable that takes the value of 1 if there is a war carrying on in the neighbor country. Results show that 15% of the 29% countries at any given year have a civil war continuing. This means that it's rare for civil wars to outbreak (1%), but when they do outbreak (onset), they last for a long time (15%). The termination of civil wars ($Lcwarterm_{i,t}$) is another dummy variable representing the end of the civil war. It takes the value 1 if there is a civil war ending at a given year, and 0 otherwise. Table 1 (appendix) shows that at any given year, on average, 1% of African coastal countries have a civil war ending.

The lagged variable of log fish ($lncatch_{i,t-1}$) is used to measure the impact of the level of fishing in the previous period on the growth of the current period. Descriptive statistics show that the average annual fish catch is 113,271 tons, and the annual maritime fish catch growth is 4.2%. The descriptive statistics also show that the minimum of fishing was 0 ton in 1980 in Algeria, and the maximum is 1,544,122 in Somalia. These results are probably due to poor data. Moreover, the paper also includes the lagged variable of log GDP per capita ($lngdpc_{i,t-1}$), the previous year's log GDP growth ($gdpg_{i,t-1}$), and the lag of the log population ($lnpop_{i,t-1}$). We use the first difference of log population ($fdpop_{i,t}$) to account for the impact of population. Table 1 (Appendix) shows that average annual GDP in the 29 African coastal countries is $2.5

billion and the average population growth is 2.2%. We also use the first difference of log GDP ($fdgdp_{i,t}$) to account for the effect of the GDP on fishing. The average annual GDP growth is 0.3%. The average population in the countries studied is 14.32 million.

The intensity of civil conflict is measured by the log of the proportion of population displaced inside and outside of the country as a result of the conflict. Also, Buhaug and Gates (2002) argue that the distance between the shores and the area of the conflict also determines the impact on maritime fishing. Therefore, we use the log of the shortest distance between the area of the conflict in the bordering country and its shores to determine the impact of geography. The data for these variables is also from Strand (2006) on the PRIO website. We use similar variables with the same description for civil wars with a 1000 or more annual battle-deaths, threshold.

Methodology

The model investigate the effects of civil conflicts on fishing growth in neighbor countries. The model deals with observations collected from Strand (2006). Different OLS regressions are used to investigate the impact of different variables associated with civil conflicts and on the growth of maritime fish catch of the neighbor countries. We hypothesis that the onset of civil conflicts and civil wars have a positive effect on fishing in neighboring states.

Dependent Variable:

To measure the impact of civil wars and civil conflicts in the African coastal countries on the growth of the maritime harvest of their bordering countries, we use the log first difference of maritime catch (gfh_{it}) as the dependent variable, presented in the following equation:

$$gfh_{it} = \ln(tmfc_{i,t}) - \ln(tmfc_{i,t-1})$$

The variable (gfh_{it}) represents the change in the total amount of fish catch between year "t" and "$t-1$" in a country "i".

$tmfc_{i,t}$: Total maritime fish catch in country "i" at year "t"

$tmfc_{i,t}$: Total maritime fish catch in country "i" at year "$t-1$"

Independent Variables

The independent variables are used to investigate the impact of civil wars and civil conflicts on maritime fish catch in neighboring countries. The following sections present the model's theoretical framework:

War and Conflict Onset, Incidence, and Termination Variables

The impact of civil wars and civil conflicts may not immediately appear for different reasons. Firstly, most African coastal countries are poor and are forced to allocate their resources and armed forces in control the violence, which leave their maritime territories unprotected. Secondly, these countries have low levels of control over their maritime territories. The triggering incidents of civil conflicts mostly take place years before the onset of hostilities which make foreign fishermen ready to take advantage of the opportunity created by the conflict. Consequently, we include civil conflict onset in neighboring countries. However, we find that the conflict onset at year "t" is highly correlated with the conflict incidence variable of the same year. Instead, we use the conflict onset's first lag ($Lcconfonset_{i,t-1}$) and second lag ($Lcconfonset_{i,t-2}$) in the regression to account for the impact of the onset of civil conflict on fishing in neighboring areas. The civil conflict incidence in bordering countries ($Lconfinci_{i,t}$) is

used to measure the effect of the continuity of the civil conflict in a given country on the maritime fish catch growth in its neighbor countries. Hendrix and Glaser (2011) also study the impact of the civil conflict termination and its lags on the growth of marine fishing in countries where the civil conflicts take place. Instead, we explore the impact of the civil conflict's termination year ($Lconfterm_{i,t}$). We also use the first ($Lconfterm_{i,t-1}$), and second year lags ($Lconfterm_{i,t-2}$) since civil conflict termination impact may not show immediately (Murdoch & Sandler, 2004).

The impact of civil wars on fish catch are also studied. The civil wars incidence in neighbor countries ($lwarinci_{i,t}$), the first year lag of civil war onset ($Lcwaronset_{i,t-1}$) in a given country"i", and its second year lag ($lcwaronset_{i,t-2}$) are used to inspect the effect of civil war onset and continuity on the maritime fish catch in the bordering countries. The civil war termination ($Lcwarterm_{i,t}$), its first year lag ($Lcwarterm_{i,t-1}$) and second year lag ($Lcwarterm_{i,t-2}$) are also utilized to explore the impact of the end of the civil war. All the variables of civil wars have the same description of civil conflicts except that the threshold is 1000 annual battle-deaths.

Variables Measuring the Impact of the War intensity of Fish Catch Growth

We also investigates the impact of civil conflicts and civil wars' intensity on the fish catch growth in the neighboring countries. The civil conflict intensity variable ($Lconfpd_{i,t}$) is the log of the proportion of the population that is forced to flee their homes because of the violence and refuge to safer areas inside or outside their countries. The geography (area of the conflict) has an impact on fishing in countries where the civil war and civil conflict take place (Hendrix and Glaser, 2011). As such, we use the log of the shortest distance between the coasts

and the area of the civil conflict ($Lcondsh_{i,t}$) to measure the impact of civil wars and conflicts on the maritime fish catch growth in the neighbor countries. The log of the proportion of population displaced inside and outside of their countries as a result of civil wars ($Lcwardp_{i,t}$) and the log of the shortest distance between the area of the civil war and the shore ($Lcwardp_{i,t}$) are used to investigate the impact of civil wars on fish catch growth in the neighbor countries.

Economic Variables

The study uses different economic variables to investigate the impact of civil wars in neighbor countries. The lag of log fish ($lncatch_{i,t-1}$) is used to measure the impact of the level of fishing in the previous period on the growth of the current period because countries with bigger fisheries and fish catch are assumed to have a lower growth rate (Hendrix & Glaser, 2011; Pauly et al., 2002). The paper also includes the lag of log GDP per capita ($lngdpc_{i,t-1}$), the previous year's log GDP growth ($gdpg_{i,t-1}$), and the lag of the log population ($lnpop_{i,t-1}$). Previous research finds that a negative relationship associates the growth of fish catch with the population and the GDP per capita (Jennings et al., 2001). However, Hendrix and Glaser (2011) find that these variables have a positive impact on the growth of total and inland catch while they have a negative impact on the growth of marine fish catch.

The regressions used in this research are divided into: i) Benchmark Regressions and ii) Other Regressions.

Benchmark Regressions

We use the first regression to accounts for the effect of the outbreak of civil conflicts ($Lconfonset_{i,t}$),

$gfh_{it} = constant + \beta_1 Lncatch_{i,t-1} + \beta_2 Lconfonset_{i,t} + \beta_3 lnpop_{t-1} + \beta_4 lgdpg_{t-1} + +\beta_5 lngdpc_{t-1} + \varepsilon_i$	Regression 1

The second benchmark regression investigates the impact of the incidence of the conflict ($Lconfinci_{i,t}$) at year "t.This regression also includes the different economic variables.

$gfh_{it} = constant + \beta_1 Lncatch_{i,t-1} + \beta_2 Lconfinci_{i,t} + \beta_3 lnpop_{t-1} + \beta_4 lgdpg_{t-1} + +\beta_5 lngdpc_{t-1} + \varepsilon_i$	Regression 2

The third benchmark regression includes the termination of conflict ($Lconfterm_{i,t}$) at year "t" to investigate its impact on the fish growth.

$gfh_{it} = constant + \beta_1 Lncatch_{i,t-1} + \beta_2 Lconfterm_{i,t} + \beta_3 lnpop_{t-1} + \beta_4 lgdpg_{t-1} + \beta_5 lngdpc_{t-1} + \varepsilon_i$	Regression 3

Since previous research suggest that the impact of the onset and termination of civil conflict may not appear immediately, as Hendrix and Glaser (2011) and Murdoch and Sandler's (2004) papers do, we decided to try different sets of regressions with first year and second year's lags, however, with all the results coming out as non-significant.

Since the GDP and the Population are known in the literature to be unit root processes, this may render our results misleading. As such, we decided to use the first difference of the GDP and the population in the same regressions to make sure the results were similar:

$$fdpop_{i,t} = \ln(pop_{i,t}) - \ln(pop_{i,t-1})$$

The variable ($\mathrm{fdpop_{i,t}}$) represents the change in the population of a given country "i" between year "t" and "$t-1$".

$pop_{i,t}$: Total population in country "i" at year "t"

$pop_{i,t}$: Total maritime fish catch in country "i" at year "$t-1$"

$$fdgdp_{i,t} = \ln(gdp_{i,t}) - \ln(gdp_{i,t-1})$$

The variable ($\mathrm{fdgdp_{i,t}}$) represents the change in the GDP of a given country "i" between year "t" and "$t-1$".

$gdp_{i,t}$: Total population in country "i" at year "t"

$gdp_{i,t}$: Total maritime fish catch in country "i" at year "$t-1$"

We ran the three first regressions a second time. In these regressions we replaced the log of population at year "$t-1$" ($lnpop_{t-1}$) by the first difference of population ($fdpop_{i,t}$). We also replace the log GDP at year "$t-1$" ($lngdpc_{t-1}$) by the first difference of GDP ($fdgdp_{i,t}$). To avoid the multi-collinearity, we dropped the GDP growth at "$t-1$" ($lgdpg_{t-1}$) from these regressions.

Other Regressions

In this section, we replicate the work of Hendrix and Glazer (2011) on the neighbor countries instead of those countries afflicted by civil conflict and civil wars. For the fourth regression, we inspect the impact of civil conflicts on the fish catch growth in the neighbor countries. The equation then measures the impact of the onset lagged variable, continuity, and the termination of the civil conflicts on the growth of maritime fish catch in a given country.

$$gfh_{it} = constant + \beta_1 Lncatch_{i,t-1} + \beta_2 Lconfonset_{i,t-1} + \beta_3 Lconfonset_{i,t-2} + \beta_4 Lconfinci_{i,t} + \beta_5 Lconfterm_{i,t} + \beta_6 Lconfterm_{i,t-1} + \beta_7 Lconfterm_{i,t-2} + \beta_8 lnpop_{t-1} + \beta_9 lgdpg_{t-1} + +\beta_{10} lngdpc_{t-1} + \varepsilon_i$$	Regression 7

In the fifth regression, we explore the impact of civil conflicts' incidence, onset, and termination on the growth of the maritime fish catch in the neighbor countries after introducing the variables of population displacement and distance from the shore.

$$gfh_{it} = constant + \beta_1 Lncatch_{i,t-1} + \beta_2 Lconfonset_{i,t-1} + \beta_3 Lconfonset_{i,t-2} + \beta_4 Lconfinci_{i,t} + \beta_5 Lconfterm_{i,t} + \beta_6 Lconfterm_{i,t-1} + \beta_7 Lconfterm_{i,t-2} + \beta_8 lnpop_{t-1} + \beta_9 lgdpg_{t-1} + +\beta_{10} lngdpc_{t-1} + \beta_{11} Lconfdp_{i,t} + \beta_{12} Lconfdsh_{i,t} + \varepsilon_i$$	Regression 8

The sixth regression inspects the impact of civil wars on the fish catch growth in the neighbor countries. The equation measures the impact of the start, continuity, and termination of civil wars on the growth of maritime fish catch in a given country.

$$gfh_{it} = constant + \beta_1 Lncatch_{i,t-1} + \beta_2 Lcwaronset_{i,t-1} + \beta_3 Lcwaronset_{i,t-2} + +\beta_4 Lwarinci_{i,t} + \beta_5 Lcwarterm_{i,t} + \beta_6 Lcwarterm_{i,t-1} + \beta_7 Lcwarterm_{i,t-2} + \beta_8 lnpop_{t-1} + \beta_9 lgdpg_{t-1} + \beta_{10} lngdpc_{t-1} + \varepsilon_i$$	Regression 9

In the seventh regression, we investigate the impact of civils wars' onset, incidence, and termination on the growth of the maritime fish catch in the neighbor countries after introducing the variables of population displacement and distance from the shore.

$gfh_{it} = constant + \beta_1 Lncatch_{i,t-1} + \beta_2 Lcwaronset_{i,t-1} + \beta_3 Lcwaronset_{i,t-2} + +\beta_4 Lwarinci_{i,t} + \beta_5 Lcwarterm_{i,t} + \beta_6 Lcwarterm_{i,t-1} + \beta_7 Lcwarterm_{i,t-2} + \beta_8 lnpop_{t-1} + \beta_9 lgdpg_{t-1} + \beta_{10} lngdpc_{t-1} + \beta_{11} Lwardp_{i,t} + \beta_{12} Lwardsh_{i,t} + \varepsilon_i$	Regression 10

Results

Table 1 shows the findings of the three benchmark regressions used to estimate the impact of civil conflicts onset, incidence, and termination on the fish catch (each separately).

Table 1: Regressions Presenting the Isolated Impacts of Onset, Incidence, and Termination of Civil Conflicts (25+ Battle Death) on the Fishing Growth in Bordering Countries between 1970 and 2004

Variables	*Growth of Marine Catch*		
	Regression 1	Regression 2	Regression 3
Constant	-0.013	0.038	0.023
log $catch_{i,t-1}$	-0.011**	-0.012**	-0.011**
$Lconfonset_{i,t}$	0.056**		
$Lconfinci_{i,t}$		0.034**	
$Lconfterm_{i,t}$			0.0231
$lpop_{i,t-1}$	0.01	0.009	0.009

$\text{lgdpg}_{i,t-1}$	0.0013*	0.0012*	0.0012*
$\text{lrgdpc}_{i,t-1}$	0.005	0.002	0.004
R^2	0.015	0.0144	0.009

**p<0.1, **, P<0.05*

The results of the first regression show that the onset of conflict had a positive and significant impact at a level of 5% on the growth of maritime fishing in the neighbor countries ($\beta_2 = 5.6\%$). Using the average annual growth of fish catch in those countries of interest at 4.2%, we find that when the neighbor country has an onset of civil conflict at a given year *"t"*, the annual growth of fish catch is 10.2%.

The effect of civil conflicts on fish catch is not isolated to the outbreak of civil conflicts. The continuity of civil conflicts may also have other effects on fishing through the conflict expansion onto to other territories, the increase in the number of refugees, and counter-insurgency policies. The results in regression 2 show the impact of civil conflicts on the fish catch growth to be smaller ($\beta_2 = 3.4\%$). Therefore, assuming the growth during peace periods is equal to the average 4.2%, then the growth rate at years where neighbor countries have civil conflicts incidence is 7.8%. Interestingly, the impact of civil conflicts is lower than the impact of their onset. A possible explanation is that some measures and hostilities against foreign fishermen start after the first year of the conflict. Furthermore, the results in regression 3 show that the conflict termination in a country does not have a significant impact on the growth of fish catch in their bordering countries. This result is possibly since countries overcoming civil conflicts take time to regain control over their fisheries.

Moreover, the impact of the previous year's fish catch growth has a negative impact on the growth of fish catch ($\beta_1 = -1.1\%$). The results of the three regressions are very similar. Therefore, if the annual fish growth is 4.2%, we find that the growth rate of fish catch will decrease from 4.2 to 3.1%. Moreover, the impact of GDP growth also has positive, but modest, significant effects on fish catch growth at a level of 10% ($\beta_4 = 0.1\%$). So, assuming that the growth of fish catch is equal to its average (4.2%), then the fish catch growth rate is equal to 4.3%.

Table 2 shows the results of the fourth, fifth, and sixth regressions. These regressions are used to explore the reliability of the results through the use of the first differences of GDP and population to avoid the impact of unit root processes, which may lead to misleading results.

Table 2: Regressions Presenting the Isolated Impacts of Onset, Incidence, and Termination of Civil Conflicts (25+ Battle Death) on the Fishing Growth in Bordering Countries between 1970 and 2004 Using the Population and GDP First Differences

Variables	*Growth of Marine Catch*		
	Regression 3	Regression 4	Regression 5
Constant	0.11**	0.116**	0.114**
$\log \text{catch}_{i,t-1}$	-0.008*	-0.010**	-0.008*
$\text{Lconfonset}_{i,t}$	0.05**		
$\text{Lconfinci}_{i,t}$		0.035**	
$\text{Lconfterm}_{i,t}$			0.019
$\text{fdpop}_{i,t}$	0.205	0.232	0.199

$fdgdp_{i,t}$	-0.036	-0.038	-0.038
R^2	0.0103	0.0112	0.009

**p<0.1, **, P<0.05*

The findings of regression 4 show that the onset of civil conflicts had a positive and significant impact at a level of 5% on the growth of maritime fishing in the neighbor countries ($\beta_2 = 5\%$). Using the average annual growth of fish catch in those countries of interest at 4.2%, we find that when the neighbor country has an onset of civil conflict at a given year *"t"*, the annual growth of fish catch is 9.4%. The findings in regression 5 show the impact of civil conflicts on the fish catch growth to be smaller ($\beta_2 = 3.5\%$). Thus, assuming the growth during periods of peace is equal to the average of 4.2%, then the growth rate during the years where neighbor countries have civil conflicts incidence is 8.03%. Furthermore, the results in regression 6 show that the conflict termination results are not significant, which are similar to the results in regression 3. Furthermore, the effect of the previous year's fish catch growth has very similar results to those of the first three regressions. The impact of GDP growth and population growth are not significant in the three regressions.

Table 3 displays the results of the seventh and eighth regressions. The fourth regression investigates the impact of different civil conflict's variables on the growth of fish catch in the bordering countries. The fifth regression includes the conflict intensity and its distance from shores.

Table 3: Regressions Presenting the Impact of Civil Conflicts (25+ Battle Death) on the Fishing Growth in Bordering Countries between 1970 and 2004

VARIABLES	**GROWTH OF MARINE CATCH**	
	Regression 7	Regression 8

CONSTANT	.035	.037
$\text{lcatch}_{\text{I,T}-1}$	-.0125**	-.013**
$\text{Lconfonset}_{\text{i,t}-1}$	.013	.008
$\boldsymbol{Lconfonset_{i,t-2}}$	-.002	-.008
$\boldsymbol{Lconfinci_{i,t}}$	.0330**	.041**
$\boldsymbol{Lconfterm_{i,t}}$	.025	.035
$\boldsymbol{Lconfterm_{i,t-1}}$	.008	.014
$\boldsymbol{Lconfterm_{i,t-2}}$	-.037	-.035
$\boldsymbol{lpop_{i,t-1}}$	.009	.010
$\boldsymbol{lgdpg_{i,t-1}}$	.001*	.0013*
$\boldsymbol{lrgdpc_{i,t-1}}$	.003	.003
$\boldsymbol{Lconfdp_{i,t}}$		.002
$\boldsymbol{Lconfdsh_{i,t}}$		-.001
R^2	0.0176	0.0189

**p<0.1, **, P<0.05*

The results of the seventh regression show that the conflict incidence has a positive and significant impact (at 5% level) on the growth of maritime fishing in the neighbor countries ($\beta_5 = 3.3\%$). Therefore, if the growth in peaceful periods is equal to the average growth rate (4.2%), the results mean that during the years where there is civil conflict carrying on in a country, the maritime fish catch annual growth is 7.6%. When we include the civil conflict intensity, and distance from the shores in regression 8, the growth of fish catch becomes 8.5% at 5% level ($\beta_5 = 4.1\%$). The impact of real GDP growth and the first marine fish catch found in regression 4 and 5 are very similar to the results of regression 1 and 2 ($\beta_1 = -1.25\%$,$\beta_9 = 0.01\%$). It is remarkable that the civil conflict incidence in a neighbor country has a much higher impact on the growth of maritime fish catch than the growth of that country's GDP per capita.

The outbreak of civil conflicts are anticipated by a high tensions' period between the disputing parties, which has an impact on the fish catch growth within the same country (Hendrix & Glaser, 2011). We also find that the outbreak of civil conflicts has immediate positive impacts on fishing in neighbor countries. The tensions make foreign fishers wait for the onset of the civil conflicts to take advantage of the situation. When we isolate the impact of civil conflicts from their outbreak, we find that the incidence of civil conflict has a significant impact on fishing in bordering countries. However, results of the two regressions show that the period prior to the outbreak of conflicts has no impact on the growth of the maritime fish catch in the neighbor countries. Also, the findings show that the conflict termination and the period prior to the end of the conflict do not have a significant impact on the growth of maritime fish catch in the bordering countries. The non-significant impact of the war termination might be because it takes more time for countries exiting from civil conflicts to establish a good marine control, and it takes longer time for refugees to build trust and return to their zones and normal life.

Table 4 includes two regressions that are used to estimate the impact of civil wars with an annual 1000 battle death threshold.

Table 4: Regressions Presenting the Impact of Civil Wars (1000+ Battle Death) on the Fishing Growth in Bordering Countries between 1970 and 2004

VARIABLES	**GROWTH OF MARINE CATCH**	
	Regression 9	Regression 10
CONSTANT	.042	.045
$\text{lcatch}_{i,t-1}$	-.0127**	-.012**
$\boldsymbol{Lcwaronset_{i,t-1}}$	-.011	-.021
$\boldsymbol{Lcwaronset_{i,t-2}}$	-.021	.019

$\boldsymbol{Lwarinci_{i,t}}$	.026	.025
$\boldsymbol{Lcwarterm_{i,t}}$	- .022	.022
$\boldsymbol{Lcwarterm_{i,t-1}}$	.020	.020
$\boldsymbol{Lcwarterm_{i,t-2}}$	-.042	-.044
$\boldsymbol{lpop_{i,t-1}}$	.009	.008
$\boldsymbol{lgdpg_{i,t-1}}$	.001*	.001*
$\boldsymbol{Lrgdpc_{i,t-1}}$	.003	.003
$\boldsymbol{Lcwardp_{i,t}}$		.0011
$\boldsymbol{Lcwardsh_{i,t}}$		-.002
R^2	0.0130	0.0134

**p<0.1, **p<0.05*

In the last two regressions, all the civil war related variables including the variables presenting the impact of the period preceding the onset of civil wars, the civil war's incidence, and termination variables do not have a significant impact on the growth of the marine fish catch in the coastal neighbor countries. Also, the civil war intensity variable (population displaced inside and outside the country) and the distance between the closest point of the civil war and the shores do not have an impact on the fishing growth in the coastal neighboring countries. Moreover, to investigate the impact of the civil wars' onset, incidence, and termination on fishing, we tried the same benchmark regressions used for the civil conflict but the results also showed no significant impact on the fish catch growth.

There are different possible explanation why civil wars' onset, incidence, and termination do not have an effect on the growth of fishing in coastal bordering countries. The first possible

explanation is the lack of data because in poor countries and during intense civil wars it is very hard to acquire data. The second explanation is that local fishers get involved into the war. Third, in the case of civil wars bordering countries are involved by supporting one of the parties, which makes the war more intense and foreign fishers are worried to navigate through the coasts of the neighbor country as hostility increases. Another possible reason is the difficulty people face to refuge to other countries.

Discussion

The onset of civil conflicts and wars demonstrate a clear hindrance to the growth of fisheries in the countries where these conflicts take place (Hendrix & Glaser, 2011). However, the negative impact in the country in civil conflict turns to a positive impact in the neighboring countries. Our findings report that the onset of civil conflicts in a given country has a positive impact on marine fishing in neighbor countries. The results of our research report that the onset of the civil conflict in a given country causes maritime fishing in the neighboring countries to have an average annual fish catch growth of approximately 10.2%. Civil conflicts may have a negative impact on the overall economic situation in the region (Murdoch & Sandler, 2004) but it may also have a positive impact on other sectors (Hegre & Sambanis, 2006). Therefore, the onset of civil conflicts have an impact on fishing in neighbor countries because foreign investments anticipate the start of the conflict and settle in neighbor countries (Murdoch & Sandler, 2002). The impact may also be due to the intensity of the situations preceding conflicts which make foreign fishermen prepared to encroach in the marine territories once hostilities begin.

Moreover, the continuity of the conflict has an effect on fishing. However, the effect of the continuity of conflicts is lower than the impact of the onset of the conflict. The incidence of civil conflicts in a given country causes maritime fishing in the bordering countries to have an average annual fish catch growth of 7.8%. The time it takes for civil conflicts to affect the economies of countries within geographic proximity depends on the distance of a given conflict from the border, and the conflict's territory spillover (Murdoch & Sandler, 2004). The incidence of the conflict has persistent effects on fishing neighbor countries. Different possible explanations may justify these results. Firstly, different counter-insurgency policies such as fishing restrictions and the deliberate damaging of fishing fleets in order to deplete the financial resources of rebellions are made after the start of civil conflicts (Murphy, 2007). Therefore, the economic, military, and political events which follow the onset of conflicts may be the cause of the persistent, but lower, impact of the effect of civil conflict incidence on fishing in neighbor countries (Hendrix & Glaser, 2011; Murdoch & Sandler, 2002). The impact of conflicts' persistence is that fisheries exiting from civil war-torn countries take an average of 8.5 years to fully recover and regain control over their fisheries (Hendrix & Glaser, 2011).

The results also show that the termination of civil conflicts does not have a significant impact on maritime fishing in bordering countries. The non-significant impact of the end of civil conflicts on fishing in its neighbor countries may be because a conflict's termination has a long-term (not immediate) impact on countries in civil conflict (Hendrix & Glaser, 2011), and on its neighbors (Murdoch & Sandler, 2004). Therefore, the termination effects of a conflict may not appear within two years. This is because it is usually very hard to re-establish peace and gain the trust of the people who were initially forced to flee their homes taking refuge in other countries

throughout the duration of that conflict period. Ghobarah et al. (2003) find that civil wars, on the long run, kill and maim almost the same number of people as it does when the hostilities are onset.

The absence of an effect of civil wars on fishing in the neighbor countries may be due to different factors. First, unlike civil conflicts, neighbor countries are either directly or indirectly involved in civil wars usually by supporting one of the fighting parties. This involvement in turn exacerbates the resulting hostilities and discourages foreign fishermen from navigating through the shores of those countries afflicted by civil wars. Second, civil wars put doubt on the future stability of all the countries within the geographic region. The intensity of civil wars increase the likelihood for neighbor countries to, in themselves, also experience conflicts and wars (Salehyan & Gleditsch, 2006). This factor forces a reduction in total foreign direct investments in those neighboring countries subsequently negatively affecting their economies (Murdoch & Sandler, 2004; Le Manach et al., 2012).

The economic variables also have an impact on the fishing growth. The results report that the GDP growth has a positive, yet modest, significant impact on the fish catch of the country. Intense civil wars (with magnitudes of upwards of 25,000 or more annual deaths) demonstrate negative effects on the steady state as well as the income per capita within the afflicted country along with its neighbor countries (Murdoch & Sandler, 2004). The modest impact of GDP growth may be due to the low economic growth and the decrease in the steady state. The low investment in fishing due to the increase in government spending on armaments and security is another possible explanation for the low impact of GDP on fishing (Salehyan & Gleditsch, 2006). In addition to the decrease in spending on investments, civil wars in merely some parts of

any country may be a sufficient impetus to completely divert foreign direct investments from the whole country (Murdoch& Sandler, 2002). Also, the findings show that the growth of fish catch in a given year causes a decrease in the growth of fish catch in the following year. Pauly et al. (2002) find that mature fisheries grow less rapidly than newly exploited fisheries. Overfishing causes fish stock to decrease and consequently reduces the fishing growth in following years (Garcia & Rosenberg, 2010).

Conclusion

The calamities, losses, and pains of civil conflict in afflicted countries are beneficial for fishermen in the neighbor countries. Since fisheries represent an important source of income for more than 58 million people globally serving as an important source of food security, the impact of civil conflict onset and continuity on fish catch growth in bordering countries must attract the attention of policy makers both nationally and internationally. The lack of protection of maritime territories during civil conflicts allow for overfishing as well as illegal and unreported fishing activities.

As such, civil conflicts may not only give a chance for illegal fishing by foreigners but they may even be responsible for the overfishing that have consequently resulted in the depletion of many fish species. Civil conflict is a phenomenon that is mainly observed in developing and poor countries where populations that rely heavily on fish as are food source. Consequently, these populations are more likely to reap the direct negative ramifications of civil conflicts given the decrease in available fish harvest (Hendrix & Glaser, 2011). Thus, the opportunistic tendencies of foreign fishers during civil conflicts may be the cause of other civil conflicts.

This paper presents the following recommendation with favourable policy implications. The first recommendation is that maritime territories be protected by third parties in order to prevent overfishing and illegal fishing activities by foreign fishermen which may be the cause of both future conflicts and fish depletion. The FAO and/or third parties are best fit for this role. In 2006, after 33 days of fierce war between Hezbollah and Israel, and after the Security Council issued the 1701 resolution, Germany and Denmark sent 11 ships to protect the Lebanese waters against arm smuggling which served as an opportunity for Lebanese fishermen to return to their activities (Hendrix & Glaser, 2011; Makdisi, 2011). A second possible solution is for local governments to keep marine forces out of the conflict or to put the reestablishment of marine control of water territories as their top priority after the conflict termination.

Finally, this research contributes to the growing literature in the field of economic impacts caused by civil conflicts and civil wars. It also contributes by shedding light on the potential issue of ecosystem destruction as a result of unprotected water territories during civil conflicts. However, it is important to mention two noteworthy limitations to this research: i) firstly, that the missing data and the inaccuracies regarding fishing, population displacements, and the reported number of victims put some doubts on the accuracy of the results; secondly, developed countries were not included within this study when investigating the impact of civil wars on fishing especially since they also possess most of the long-distance fishing fleets in the world. While these limitations exist, the research findings nonetheless suggest that attention is necessary. We find that civil conflicts onset and continuity have a positive impact on maritime fishing growth in neighbor countries. This is interesting and warrants future research prompting

for the investigation of the impact of civil wars and conflicts on neighboring countries and in the study since developed countries may have stronger capacities to benefit from.

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Appendix

Table 1: Descriptive Statistics for Conflict, War, and Population variables

Variable	Mean	S. Dev	Min	Max

Conflict term at year t	0.04	0.19	0	1
Conflict Incidence	0.2	0.4	0	1
Conflict term at year t	0.04	0.19	0	1
War incidence at year t	0.15	0.36	0	1
War onset at year t	0.01	0.1	0	1
War term at year t	0.01	0.11	0	1
Annual Fish Growth	0.042	0.518	-4.73	11.60
Annual Fish catch (ton)	113,274	220,507	0	1,544,122
Annual GDP (million$)	2,504.405	3,670.515	0	20,206.72
Annual GDP Growth	0.003	0.116	-2.13	0.767
Annual Population (thousands)	14,321.71	21,493.83	179.9	136,217.3
Annual Population Growth	0.022	0.09	-3.10	0.14

Table 2: List of Countries and Neighbor Countries

Country Number	*Country*
1	*Algeria*
2	*Angola*
3	*Benin*

4	*Cameroon*
5	*Congo*
6	*Cote D'Ivoire*
7	*Djibouti*
8	*Egypt*
9	*Equatorial Guinea*
10	*Eritrea*
11	*Gabon*
12	*Ghana*
13	*Guinea*
14	*Guinea-Bissau*
15	*Kenya*
16	*Liberia*
17	*Libya*
18	*Mauritania*
19	*Morocco*
20	*Mozambique*
21	*Namibia*
22	*Nigeria*
23	*Senegal*
24	*Sierra Leone*
25	*Somalia*
26	*South Africa*
27	*Sudan*
28	*Togo*
29	*Tunisia*