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**Spillover Effects of Conflict on the Economic
Growth of Neighboring Countries**

*A study of the consequences of conflict reaching beyond the host countries of conflict in Asia,
Africa and Latin America between 1990-2019*

Author:

Tove Björling

Supervisor:

Pontus Hansson

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Department of Economics

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Abstract

In this article, the effects of conflict on the economic growth of neighboring countries (referred to as economic spillover effects of conflict) are studied for Asia, Africa and Latin America during 1990-2019. Compared to previous studies on the subject, this study accounts for the changing conflict climate over the years by starting the sample period 30 years later than other authors. The overall result is that the effects seem to be region-specific.

Furthermore, the effects appear to be dependent on conflict type and neighbor countries' distance away from conflict. Most effects were negative, while the effect on non-contiguous neighbor countries to conflict (secondary neighbors) was sometimes positive. Moreover, the economic spillover effects of conflict tend to reach further in Asia and Africa than in Latin America.

Keywords: *Economic Growth, Conflict Economics, Conflict Spillover, New Wars, Contemporary Conflict, Economic Aid, Interstate Conflict, Civil War, Intense Conflict, Macro Economics*

Definitions

Some key concepts in this article can be somewhat confusing since their names are similar. Since they are lengthy to explain at each mentioning, I will clarify here what is meant by them in this article. While I do also explain most concepts when first mentioned in the text, this section is meant to act as an aid if the reader becomes uncertain of their meaning at any time in the text.

- *Conflict spillover* – Regards the occurrence of a conflict in one country contributing to the eruption of a conflict in another country. Is often referred to as conflict contagion in the conflict literature.
- *Economic spillover effects / spillover effects of conflict on economic growth* – Refers to spillover effects of conflict that specifically affect the economic growth of another country.
- *Host country (of conflict)* – A country in which a conflict is present.
- *Primary neighbors* – Refers to countries who share a border with a particular country. In other words, countries who are directly contiguous with another country.
- *Secondary Neighbors* – Countries who are not directly contiguous with but is within a certain distance to a particular country. Numerous distance thresholds are used in this article. Therefore, which countries are defined as secondary neighbors to a country in this article depends on which of these are used in each particular case.

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1. Introduction

War has been a natural part of society for a long time. Before the emergence of nation states, a diversity of actors was involved in wars. As states grew stronger, they became the main actors and as technology developed, warfare moved towards the extremes. Following the emergence of nuclear weapons there was hope of an end of the war era, since it was deemed that no state interest could legitimize the potential destruction of a nuclear war. However, while interstate conflicts have decreased since nuclear weapons entered the scene, the number of civil conflicts has increased (Kaldor 2012, p. 18-30). Based on this, although in different shapes, war seems to be here to stay. It is therefore important to understand the consequences which a conflict brings.

In the latter part of the 1800th century, the importance of peace and conflict studies started to become acknowledged. As a result, the literature concerning conflicts has increased tremendously since. The concept of conflict spillover, referring to when a conflict in one state contributes to the eruption of conflict in another state, has been studied by numerous researchers. Today, there is a wide-spread consensus of an empirically robust phenomenon called “the neighborhood effect of civil conflict” – that a civil war in one state significantly increases the risk of another civil conflict erupting in other states located in the same neighborhood (Forsberg, 2009). A study by Hegre and Sambanis (2006) even show that the most reliable factor for predicting the eruption of a new civil conflict is the presence of a nearby conflict. The neighborhood effect demonstrates the importance of not limiting studies to countries in conflict (host countries of conflict), but also its surroundings, to understand the full consequences of conflict. In this article, a conflict’s consequences on neighborhood countries are studied from an economic perspective.

While conflict spillover is well-studied, the economic spillover effects of conflict on neighboring countries, defined in this article as the impact a conflict in one country has on the economic growth of neighbor countries, is not as well-documented. Until the beginning of the twenty-first century, research regarding economic spillover effects of conflict was extremely scarce. Fortunately, numerous contributions to the subject have been made over the last twenty years (Murdoch and Sandler 2002a, 2002b, 2004; de Groot 2010; Dunne and Tian 2015, 2019). This article will build upon these contributions. Since there is a possibility that economic spillover effects of conflict are different on directly contiguous neighbors to

conflict (primary neighbors) and those close but not directly contiguous (secondary neighbors), the effects on these two groups of neighbors are separated.

As important as not limiting conflict studies to host countries of conflict, I believe it is to consider the constantly changing conflict climate. Previous authors have focused on economic spillover-effects over a long period of time, from 1960 and forward. However, there is a visible shift of the distribution of different types of war (PRIO, 2019) as well as claims of a changed character of conflict (Kaldor 2002). These changes are taken into account in this article by limiting the period of study to thirty years: from 1990 to 2019. Apart from using new data, this approach is what mainly separates my study from previous research.

1.1 Research question

The aim of this study is to contribute to the literature concerning consequences of conflict reaching beyond the host countries of conflict. Specifically, how the economic growth of neighboring countries to conflict is affected. As mentioned, the literature concerning economic spillover-effects of conflict on neighboring countries has increased significantly during the past twenty years. However, there are still knowledge gaps to be filled.

While de Groot (2010) and Dunne and Tian (2015, 2019) have studied economic spillover-effects in the African region, no one has, to my knowledge, compared the effects in Africa, Asia and Latin America in the same study since Murdoch and Sandler (2002b). Since Murdoch and Sandler used data from 1960-1990, I believe a new such study including new data is of use. Furthermore, I believe that it is meaningful to start the sample period later than 1960, since conflicts and consequently spillover-effects of conflict on economic growth may have changed considerably since then. Therefore, the period studied in this article starts in 1990 instead of 1960, which is motivated further under 2.3 The changing conflict climate. Since both Murdoch and Sandler (2002b) and de Groot (2010) found that the effects are stronger in the short run, mentioned more under “previously conducted research” this is what is studied in this article.

In conclusion, I aim to reduce the information gap concerning economic spillover-effects of conflict in Asia, Africa and Latin America using new data and accounting for the contemporary conflict climate by starting the sample period later than in previous studies on the topic. Hence, the period studied is between 1990 and 2019.

The main question this article aims to answer is:

How have conflicts between 1990 and 2019 affected the economic growth of neighboring countries to conflict in Asia, Africa and Latin America?

Furthermore, differences in effects depending on region, type of conflict and distance from conflict will be studied to answer the follow-up question:

Are there differences in the economic spillover effects in different regions, of different types of conflicts or depending on how far away from conflict the neighbors are geographically?

A pooled sample of data for all three regions will also be used to answer the questions in a general manner.

1.2 Method of approach

Regression analyses are made to answer the research question. The regressions of this study are based on the Solow growth model including human capital (Solow 1956; Mankiw et al. 1992). The model is augmented to include variables reflecting information about conflict and spatial relations between countries – which I call conflict and contiguity variables. The model is the same model first constructed by Murdoch and Sandler (2002b) and later used by de Groot (2020) and Dunne and Tian (2015, 2019). The method and structure of this article largely resembles previous research on the subject but is using new data and studies another later time-period overall.

The conflict and contiguity variables are the ones in focus of this essay. The conflict variables give information about whether there is any conflict in a country, or if it is a civil or an intense conflict. The contiguity variables are divided into variables reflecting primary neighbors (directly contiguous to a country) and secondary neighbors (countries within a certain distance to another country but not directly contiguous) respectively. Several alternative versions of the conflict, primary and secondary neighbor variables. However, only one version of each is used for each regression. Different combinations of the variables are tested to study which ones, if any, yield significant results.

1.3 Disposition

To provide some background on the topic previously conducted research is first presented. The presented research concerns economic spillover effects of conflict and the theoretical transmission mechanisms that can potentially cause an effect. Furthermore, research of the conflict climate is presented to provide a view of how it has changed over time. Research concerning the changing conflict climate also acts as an argument for the choice of period to study. Presentation of previous research is followed by a method section where the model used and its variables are presented and explained. Thereafter, the data sources used to collect data for the study are presented. The data source section is followed by a presentation of the results in tables which are commented. Lastly, the result is concluded.

2. Previously Conducted Research

In this section, an overview of previously conducted research and results considered relevant to this study is presented.

2.1 Economic spillover effects of conflict

Below, previous studies of economic spillover effects of conflict on neighbor countries to conflict are presented. All studies mentioned under 2.1 largely use the same model and method to measure the effects. Namely, they use the Solow growth model (Solow 1956) with human capital (Mankiw et al. 1992) as a base model together with conflict and contiguity variables and conduct regression analyses to measure the economic spillover effects on neighbors. This is done in this study as well. The major differences of the studies will be mentioned below.

To my knowledge, Murdoch and Sandler (2002a, 2002b, 2004) were the first ones to study the economic spillover effects of conflict on neighbor countries to conflict. In three separate articles, they studied spillover effects of civil conflicts specifically in one country on the economic growth of nearby countries. The article most relevant to this study is Murdoch and Sandler (2002b), where they divide their sample based on three different regions: Africa, Asia, and Latin America. They do this to investigate if there are any differences in spillover effects in the regions during the period 1960-1995. The study showed a negative economic spillover effect of civil conflict on neighboring countries to conflict for all regions.

Furthermore, it suggested that economic spillover effects of conflict are regional-specific – generally larger in Asia and Latin America than in Africa. While not conclusive, their results also suggests that the economic spillover effects reach further in Asia (around 500 km) than in Africa (around 100 km) and Latin America (primary neighbors). They studied the effects from both a long-run and short-run perspective, where short-run regressions showed much stronger results studying the long-term effects.

Murdoch and Sandler were followed by de Groot (2010). His article also concerns economic spillover-effects of conflict. He studied the period 1960-2000. He studied not only the effect of civil conflict but also studied that of any conflict at all and of intense conflict specifically. Like Murdoch and Sandler's found general negative effect on neighboring countries to civil conflict, he found that the economic growth of primary neighbors to conflict are negatively affected. However, his study yielded an interesting result concerning the effect on secondary neighbors. In contrast to Murdoch and Sandler's (2002b) negative effect on neighboring countries in general, de Groot's separation of neighbors into two groups yielded a positive effect on secondary neighbors. In other words, his result suggested that secondary neighbors to conflict benefit from conflict. Relatively similar to Murdoch and Sandler (2002b), de Groot found indications of that economic spillover effects reach around 250 km away from conflict in Africa. As Murdoch and Sandler (2002b), de Groot compares results from short-run and long-run regressions and found that the spillover effects of conflict are stronger in the short than long run.

After de Groot (2010), came Dunne and Tian (2015, 2019). Their studies are, like de Groot's, limited to Africa. Their hypothesis was that closeness between countries depend on additional aspects than geographical and that these additional aspects could have a part in explaining spillover effects. Hence, they account for additional variables in their studies.

In Dunne and Tian (2015), they account for economic and political factors reflecting the grade of democracy and trade respectively. They tested if political similarities and more economical integration in terms of bilateral trade between countries affect spillover effects of conflict. They studied the period 1960-2010. In the baseline case, not including trade and democracy variables, they (like Murdoch & Sandler and de Groot) found that primary neighbors to countries in conflict are negatively affected. Furthermore, they found no significant effect on secondary neighbors, a result contradicting de Groot's finding of a positive effect and

consistent with the result of a negative effect by Murdoch and Sandler (2002b). Including trade and democracy variables yielded the same general results but the negative spillover effects on primary neighbors decreased in size when allowing for political and economic dissimilarities. Based on their result, the more similar countries are politically or economically, the larger the economic spillover effect of conflict is. This indicates that trade and democracy influence how different countries are affected by nearby conflict. In turn, that and that results may be exaggerated if not including such information.

By the same principle, they take state fragility into account in Dunne and Tian (2019). In the article, their hypothesis was that the economic growth of fragile countries is harder hit by a nearby civil conflict than other countries. The period studied is 1960-2014. Their results suggest that the hypothesis is true – showing disproportionately more negative economic spillover-effects of conflict on fragile states compared to that on non-fragile states, by the presence of domestic civil conflict as well as a civil conflict in a nearby country.

2.2 Transmission channels

Beyond the empirical results from previous studies presented in the literature overview, there are several reasons why a conflict in one country could affect the economic growth of nearby countries. While transmission mechanisms are not studied in this article, they are highly relevant to understand economic spillover effects of conflict. de Groot (2010) divides the channels of which conflict in one country can affect the economy of the host country and its neighboring countries into four groups. These are: *capital*, *labor*, *conflict spillover* and *trade*. This article will follow the same categorization.

Before getting to the theoretical categorization, a study by Carmignani and Kler (2018) is worth mentioning. This, because they specifically investigated the transmission mechanisms of economic spillover effects of civil conflict on neighbor countries, in addition to the mere existence and size of such an occurrence. They found that domestic institutions in countries geographically close to civil conflict are more likely to deteriorate. The economic integration of a neighbor country is also more likely to decrease, as compared to countries to which a nearby conflict is not present. Moreover, they found that civil conflict in a neighborhood significantly increases the risk of a conflict erupting in a primary neighbor in the short run.

2.2.1 Capital

The first theoretical channel, capital, could potentially affect economic growth in mainly three ways: through physical capital stock destruction, transfer of investments to less growth-inducing sectors, as well as a decrease in investments.

To start with, host and primary neighbor countries are likely to be affected by capital stock destruction or collateral damage resulting from battles. Collateral damage is presumably less likely to affect secondary neighbors as they are generally further away from the conflict geographically, but not impossible (de Groot 2010).

Secondly, countries in conflict tend to increase investments in certain sectors, such as the defense sector (Ghobarah, Huth and Russett, 2003). Since an increased investment in the defense sector could lead to a decreased investment in another sector, investment may be moved from areas where it is more effective in terms of creating economic growth. This too is likely to happen in primary neighbors since there may be an increased need of protecting borders due to the nearby conflict. It is not unlikely to be the case in secondary neighbors, but probably in a smaller scale (de Groot 2010).

Thirdly, the uncertainty and perceived risk that a conflict inflicts is likely to affect investments in the host country of conflict and the region where it is located. The risk is for instance due to violence as well as a weakened state and social institutions (Collier, 199). As de Groot mentions, there are few industries benefiting from conflict, which sends a negative signal to investors (de Groot 2010; Guidolin and La Ferrara 2007). As a result, investors may choose to invest in more stable countries or regions. Host countries are most likely to be affected by this, but primary neighbors are likely negatively affected by this as well. It could potentially also affect secondary neighbors negatively if the region is perceived as riskful. On the other hand, as de Groot (2010) suggests, primary and secondary neighbors could potentially benefit from a nearby conflict if investors choose to move investments from the host country of conflict to theirs. This could be the case if investors regard neighboring countries as less uncertain than the host country. The thought behind this is that it depends on why the investor invests in the host country (or region) in the first place. If the goal is to invest specifically in the host country, they will most likely not move their investments to its neighbors in the event of a conflict. However, if the goal is to invest in the region where the host country is situated, investors may choose to invest in primary or secondary neighbor

countries instead, since they are in the same region but further away from conflict and hence risk (de Groot, 2010).

2.2.2 Labor

The second theoretical channel is labor. First, labor could be negatively affected by the destruction of human capital. For example, due to war-related deaths as well as injuries resulting of battle (Collier, 1999).

Secondly, by the same principle as capital, a part of the labor force is likely to be transferred to industries such as the defense sector in the host country and its primary neighbors. This could move labor away from other areas that contribute more to domestic economic growth and therefore affect it negatively.

Lastly, neighboring countries to conflict could bear a potential economic burden following an influx of refugees, resulting from people fleeing conflict. Primary neighbors are more likely to be affected by this, since it is common for refugees to end up in primary neighbor countries to a host country of conflict (de Groot, 2010). However, the influx of refugees into primary neighbor countries often differ in size since the flow of refugees tends to be disproportionately larger to some countries. Consequently, it is common for some primary neighbors to bear the largest burden of refugees, but not all (Forsberg 2009). While the flow of refugees is generally the largest on primary neighbors and therefore the potential economic burden, de Groot (2010) suggests that secondary neighbor could potentially benefit from refugees entering their country since those who choose or manage to get to a secondary neighbor is likely to have a higher human capital.

2.2.3 Conflict spillover

The third theoretical channel that could affect the economic growth of neighbor countries to conflict is through spillover of conflict itself. As mentioned in the introduction, there is an evident neighborhood effect of civil conflict (Halvard and Gleditsch, 2008; Buhaug and Gleditsch, 200) referring to the spread of civil conflict to nearby countries. Since the economy of host countries of conflict is often negatively affected by the conflict, conflict spillover is one way a conflict in one country can affect the economic growth of neighbors. It then becomes relevant to ask how a country is affected by a conflict present in the home country.

This has been studied by Collier (1999) who studied the relationship between civil conflict and economic growth of the host countries. His result was that civil conflict affects host countries negatively in the short term. Furthermore, Koubi (2005) takes account to both civil and interstate wars between 1960-1989. He found that the economic growth of countries involved in conflict is negatively affected by the conflict during the conflict and when it ends. However, he found that the correlation between long-term growth after the conflict and economic growth is positive. More positive the more intense or long the conflict is. This is actually in accordance with general economic theory of conditional convergence – that countries further from their steady state tend to grow faster than those closer to it (Barro and Sala-i-Martin, 1992). In this case, the argument would be that countries in conflict have moved away from their steady state as a result of the negative economic consequences following the conflict, and therefore grow faster when the conflict is over.

2.2.4 Trade

The fourth theoretical channel is trade. Qureshi (2013) has studied the effect on the trade of primary neighbor countries to a country in conflict. She found that transportation costs tend to rise in primary neighbor countries to conflict as a result of blocked routes as well as increased border security, thereby disrupting trade. Her results showed a negative effect on trade that coincided with the time of eruption and that last around 3-5 years after the end of a conflict.

Sundström (2014) conducted a very similar study while also taking secondary neighbors into account. He too found that a conflict affects the trade of primary neighbors negatively. The more intense a conflict - the stronger the measured effect. In contrast to the instant effect on trade following a conflict found by Qureshi (2013), Sundström's findings show that the effect is lagged until the year after a conflict eruption. Sundström found no significant effect on the trade of secondary neighbors. This does not necessarily have to contradict de Groot's (2010) finding of a positive economic spillover effect of conflict on secondary neighbors, since trade is not the only transmission channel possible. Nevertheless, it indicates that if there is such an effect suggested by de Groot, it is not transmitted through trade. Furthermore, while Sundström's sample is worldwide, de Groot's is limited to Africa which makes comparison somewhat problematic, since there may be differences in regions.

The result of the two studies could indicate that the economic growth of primary neighbors is negatively affected while that of secondary neighbors is not. However, one could assume that

the disruption of trade following a conflict is also dependent on the initial economic integration between countries. For example, if two neighbor countries do not trade with each other before a conflict, the effect is likely smaller if one of them enters a conflict compared to if their bilateral trade is initially more extensive.

To summarize the transmission mechanism section, the four channels give reason to believe that primary neighbor countries to conflict are most likely to be affected negatively economically. Furthermore, that secondary neighbors are also likely to be affected negatively but not as much. While most theoretical channels involve a negative effect, there is also basis for arguments that the economic growth of neighbor countries could potentially be affected positively by conflict nearby.

2.3 The changing conflict climate

I am approaching the subject of economic spillover effects of conflict with a presumption of a changed conflict climate. This has implications for the choice of time-period to study.

Previously mentioned authors have seemingly sought to include as large a time span as possible, including data from 1960 onwards. This is understandable considering that, in general, including more data gives more statistically reliable results. However, if economic spillover effects of conflict have changed over time, including data from time periods before the change could potentially hide information about contemporary spillover effects. The presumption is mainly based on two aspects that indicate that a change in the conflict landscape has occurred.

2.3.1 Conflict distribution

To start with, the distribution of different types of conflict has changed over the years (PRIO, 2019). Between 1946-2018 there was a clear trend, though not continuous over the whole period, of an increase of civil conflicts parallel to a decline in the number of interstate conflicts. The number of civil conflicts rose to over 30 from around 15 while interstate conflicts decreased from around 8 to less than 3. Furthermore, internationalized civil conflicts, which refer to the involvement of external parties in civil conflicts, have increased greatly from below 20 to over 50. Moreover, apart from some peaks during the period, there has been a down-going trend in the number of battle-related deaths (PRIO, 2019). Presumably, the economic spillover effects of conflict have followed the changes of the conflict landscape, which I believe motivates starting the sample period of this study later than 1960.

2.3.2 New wars

Secondly, several authors claim that a fundamental transformation of war has taken place, from “old” to “new” wars (Kaldor, 2012; Münkler, 2005). One of them is Mary Kaldor, who argues that a new type of violence closely connected to globalization evolved in the later part of the twentieth century, around the end of the Cold War in the 1990s. She calls these types of conflicts “new wars”, though referred to as a myriad of different names by other authors.

The context in which new wars arise is when a state, particularly its monopoly of violence, is weakened and violence is increasingly privatized. Furthermore, new wars are often associated with identity politics, the presence of global actors and transnational criminality. Moreover, new wars often do not have a clear ending but is more of a lasting social condition (Kaldor 2012, p. 113).

It is not claimed that all wars since the Cold War are “new” but refers to a specific type of violence that has emerged and increased in scale. There is a controversy among authors within the conflict literature of whether new wars are in fact new or not. However, Kaldor emphasizes that the main point of coining the concept of new wars is not that all aspects of them are entirely new, but to acknowledge an important shift in the evolution of wars (Kaldor 2012, p. 1-7). Likewise, the point of this article is not to immerse in the discussions on specifications, but rather to acknowledge and take the changed conflict landscape into consideration. On the basis of this argument, I believe the approach of assuming a shift in conflict characteristics is relevant regardless of which side of the controversy you stand on. The notion of new wars in this article can simply be regarded as an illustration of what some contemporary conflicts tend to resemble, but not necessarily have to. Furthermore, it serves as further motivation for starting the data collection later than 1960. More specifically, starting the data sample in 1990 - when “new wars” started to appear.

On the basis of a presumably changed conflict landscape and character of conflict due to the two mentioned aspects above, it is reasonable to presume that a shift in spillover effects on economic growth may have followed. Therefore, if results are to implicate where aid is needed the most in the contemporary conflict landscape, I believe it is beneficial to start data collection around the time of the alleged change. Based on this reasoning and claim of a change, data collection in this article starts in 1990 instead of 1960. Of course, spillover

effects may have changed even from 1990 until today, but I still believe it better accounts for the contemporary conflict climate than investigating a period starting in 1960. A positive consequence of starting the data collection later is that data is available for more countries and periods, enabling inclusion of more countries than otherwise.

3. Model and Method

In this section, the model used in regressions and its variables are specified.

3.1 Base model

The growth model used as a base to create the final model (Equation 5) is the Solow model (Solow 1956) with human capital (Mankiw et al. 1992) as shown in Equation 1.

$$gr_{it} = \beta_0 + \beta_1 \ln(y_{1it}) + \beta_2 \ln(inv_{it}) + \beta_3 \ln(sch_{it}) + \beta_4 \ln(n_{it} + g_{it} + \delta_{it}) \quad (1)$$

where i and t denotes a country and a five-year period, respectively. Observations are made from 1990-2019 and are divided into five-year periods to measure short-run effects. This results in a total of six five-year periods: 1990-1994, 1995-1999, 2000-2004, 2005-2009, 2010-2014 and 2015-2019. The variable gr denotes economic growth. It is measured as $\ln(y_5) - \ln(y_1)$, where $\ln(y_5)$ is the natural logarithm of GDP per capita at the last year of observation for a period t and $\ln(y_1)$ is the natural logarithm of GDP per capita at the first year of the same period. β_0 is a constant.

The variable y_1 denotes initial income, defined as income at the first year of a five-year period t . Investment, inv , is measured as the average of a country's annual investment share in a period t . The variable sch represents human capital, measured as the percentage of population over 25 who has reached secondary school (but not per definition necessarily finished it). It is measured as the average percentage per five-year period t . The variable n denotes working population growth and is calculated as $(\ln(pop_5) - \ln(pop_1))/5$. In other words, the annual average of working population growth for a period t , where pop_5 is the working population at the last year of a period and pop_1 is the observation on the first year. Lastly, the variable g denotes technological development and δ capital depreciation. The value used for g and δ is a summated theoretical value based on studies by (Mankiw, Romer and Weil 1992)

3.2 The extended model

Attempting to catch economic spillover effects of conflict, variables reflecting conflict information as well as spatial relationships between countries are added to Equation 1 to create an extended version of the model. These are referred to as conflict and contiguity variables. In the regressions, different combinations of the conflict and contiguity variables, explained below, are tested in the extended model to find which ones yield significant results. This extended model is the one used in regressions and is specified below in Equation 2.

$$gr_{it} = \beta_0 + \beta_1 \ln(y_{0it}) + \beta_2 \ln(inv_{it}) + \beta_3 \ln(sch_{it}) + \beta_4 \ln(n_{it} + g_{it} + \delta_{it}) + \beta_5 conf_{i,t} + \beta_6 v_{pri,i,t} + \beta_7 v_{sec,i,t} + \varepsilon_{i,t} \quad (2)^1$$

Where i and t denotes a country and a five-year period respectively. Furthermore, $conf_{i,t}$ refers to conflicts in a country i . Variables $v_{pri,i,t}$ and $v_{sec,i,t}$ are joint measures of conflict variables and contiguity variables and will be explained below in Equation 3, 4 and 5. In short, they concern conflicts in primary and secondary neighbors to a country i and takes into account how close the neighbors are. $\varepsilon_{i,t}$ is a country-specific error term

3.2.1 Conflict variables

Three versions of conflict variables will be used. All three versions are referred to $conf$ as a collection name. In other words, $conf$ is not a variable itself and is therefore not used in regressions. It always refers to one of the three versions.

The first $conf$ variable is a conflict dummy, which I will call *any conflict*. It takes a value of 1 if there is any conflict at all in a country i at some time during a period t and 0 if not. The definition of a conflict used in this article is the definition of state-based armed conflict used by Uppsala Conflict Data Program (UCDP). Their definition is “a contested incompatibility that concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths in a calendar year”.

¹ The model is in practice identical to that used by Murdoch and Sandler (2002b) and de Groot (2010). I have simply chosen to write it in a slightly different way. While they have included matrices directly in the model, I have chosen to do the matrix multiplication in a previous step (construction of the variable v) to avoid this.

The second *conf* variable is a civil conflict dummy, referred to as *civil*, where 1 means that a civil conflict is present in a country i during a period t and 0 that it is not. The definition of a civil war used is partly based on UCDP's definition of an internal armed conflict, as a conflict that "occurs between the government of a state and one or more internal opposition group(s) without intervention from other states". However, in contrast to their definition, intervention from other states (internationalized internal conflict) is also allowed in this article.

The third and last *conf* variable used is an *intense* dummy which is used to indicate if there is an intense conflict present. UCDP's definition of intense conflict is used: a conflict with more than 999 battle related deaths in a given calendar year (UCDP, 2020). Hence, if the number of battle related deaths in a conflict supersede 999, the dummy takes the value of 1 and 0 if not.

3.2.2 Contiguity variables

To reflect spatial relationships between countries, three types of spatial weights matrices are constructed and used to create three contiguity variables. All contiguity variables and the matrices used to construct them are based on the work of previous authors (Murdoch and Sandler 2002a, 2002b, 2004; de Groot 2010; Dunne and Tian 2015, 2019). The use of spatial weights matrices as a method is in turn based on the work by Anselin (1988). In all matrices, each row regards a specific country and the columns regards the country's neighbors.

One shortcoming of the contiguity variables is that they only reflect geographical contiguity. Thus, they do not provide a full picture of all possible contiguity relationships between pairs of countries. As mentioned, some studies show that relationships beyond geographical contiguity are explanatory for both economic spillover effects of conflicts. For example, Dunne and Tian found that both economic and political factors and state fragility have explanatory power when it comes to which countries tend to be affected the most by economic spillover effects of conflict. Despite the shortcoming, there are strong indications from previous studies that the geographical dimension is important (Murdoch and Sandler 2002b; de Groot 2010). Nevertheless, it is important to keep in mind that the geographical aspect is one of several potential aspects.

3.2.2.1 Primary neighbors

The first spatial weights matrices reflect primary neighbors. That is, as mentioned, directly contiguous neighbors to conflict. The variables are used to measure how economic spillover

effects of conflict affect the closest countries to conflict. Two versions are tested in regressions to see which of them yield the most significant result in the regressions, of which only one is presented in the result.

The first is called W_{dum} and is a neighbor dummy matrix to catch primary neighbors, indicating whether two countries share a border or not. In this matrix, 1 reflects that two countries share a border and 0 that they do not. The second matrix, called W_{bor} , regards the shared border length of primary neighbors in extent to the mere sharing of borders. In this matrix, the elements reflect the shared border length in km of each primary neighbor to a country i . The thought behind the border matrix is that countries may be affected more by a conflict in a neighbor country with whom it shares a longer border compared to one it shares a shorter border with.

3.2.2.2 Secondary neighbors

Lastly, a third type of matrix called W_{MDcut} makes use of minimal distance data. It is used to catch secondary and not only primary neighbors to also measure if and how economic spillover effects affect countries who are close but not directly contiguous to conflict. The concept of minimum-distance data was introduced by Gleditsch and Ward (2001), who defined minimum-distance as “the shortest distance between the two closest physical locations for every pair of independent polities”. Murdoch and Sandler (2002a, b, 2004) made use of this data by constructing a dummy approach matrix, of whether a country was within a certain distance of another country or not.

The matrix was later developed by de Groot (2010) who criticized the dummy approach for not accounting for the degree of proximity among countries within a chosen distance. To create a continuous minimum-distance matrix he constructed W_{MDcut} , the type of matrix used in this article.² It catches neighbor countries within certain distance thresholds, where the distances are referred to as *cut*. The word “cut” is substituted by the different distance thresholds. The first cut used in this article is 100 km, increased by steps of 100 km up to 900 km. This results in nine different W_{MDcut} matrices. The elements of the W_{MDcut} -matrices are calculated as shown in Equation 3, as the cut distance subtracted by the minimum-distance

² Note: de Groot (2010) calls it minimal-distance. However, in the source he has used as well as the other literature I have read dated both before and after de Groot, it is called minimum-distance. For consistency with most literature, I will call it minimum-distance too.

between pairs of countries if they are within the cut range. This gives countries who are the closest the largest value, thereby accounting for the degree of proximity between countries within a particular distance.

$$\Delta_{ij}^3 = [cut - (mindist_{ij} | mindist_{ij} < cut)] \quad (3)$$

The thought behind the minimum-distance matrix is that countries beyond primary neighbors may be affected by conflict, but still accounts for that economic spillover effects from conflict to neighbor countries could be larger the closer the neighbors are. Since primary neighbors are also within each distance threshold with a minimum-distance of 0 km, they too are reflected in this matrix. However, since the main difference from the matrices reflecting only primary neighbors is that secondary neighbors are also considered, they are generally referred to as reflecting secondary neighbors.

3.2.2.3 Row normalization

All spatial weights matrices are row normalized by dividing each element, referred to from now on as Δ , in the matrix by the total value of the row they are in, as shown in equation 4. This is done to create scalable weights e_{ij} that are comparable for all countries. By row normalizing, the total sum per row adds up to 1. For example, in the neighbor dummy matrix, if there are 5 primary neighbors to a country i the row normalized weight e_{ij} per neighbor is $\frac{1}{5}$.

$$where e_{ij} = \frac{\Delta_{ij}}{\sum_i \Delta_{ij}} \quad (4)$$

Each row normalized weight e_{ij} per neighbor country is then multiplied by one of the *conf* variables for each neighbor country j in question. The sum of this value for all neighbor countries to the country i creates the final variable v_{it} , which is the variable used in the extended model. The calculation of v_{it} is specified below in equation 5.

³ de Groot uses the denotation δ , but I have chosen to use capital delta, Δ , for clarity since δ is already used as a denotation for depreciation.

$$v_{it} = \sum_{j=1}^{j=N} e_{ij} * conf_{jt} \quad (5)$$

Where j denotes a neighbor country and $conf_{jt}$ is a collection name for the variables *any conflict*, *civil* or *intense*, reflecting if there is a conflict present in the specific neighbor country or which type it is. If e is calculated using the W_{dum} or W_{bor} matrices, v is called a primary neighbor variable. Meanwhile, if W_{MDcut} matrices are used to calculate e , v is instead called a secondary neighbor variable. They are denoted as v_{pri} and v_{sec} respectively. In turn, depending on if the primary neighbor variable is based on W_{dum} or W_{bor} it is denoted as $v_{pri.dum}$ or $v_{pri-bor}$. Lastly, depending on the distance thresholds used for the secondary neighbor variable, it is denoted as v_{sec100} , v_{sec200} , v_{sec300} etcetera.

In summary, the variable v_{it} reflects all conflicts close to a country i , where what is regarded as “close” is dependent on which contiguity variable is used. Since all matrix weights, e_{ij} , are row standardized and all conflict variables $conf$ are either 1 or 0, each country can get a maximum v_{pri} - and v_{sec} -value of 1 respectively.

3.2.3 Summary of the use of the Extended model

To summarize this section, the extended model is used in regressions to measure economic spillover effects of conflict. In the regressions one of the $conf$ variables – *any conflict*, *civil* or *intense* – is used to measure the effect on host countries of conflict. Moreover, the primary neighbor variables ($v_{pri.dum}$ OR $v_{pri-bor}$) and secondary neighbor variables (v_{sec100} , v_{sec200} , v_{sec300} , v_{sec400} , v_{sec500} , v_{sec600} , v_{sec700} , v_{sec800} , v_{sec900} .) neighbor variables are used to measure economic spillover effects of conflict on primary and secondary neighbors. Since there are three conflict variables, two primary neighbor variables as well as nine secondary neighbor variables, 54 regressions are conducted per region - a total of 216 regressions including the pooled sample regression.

4. Data Sources

Data used to calculate growth in GDP per capita (gr), initial GDP per capita (y_1), working population (n) and investment rate (inv) is collected from Penn World Tables 10.0 (Feenstra, Inklaar and Timmer, 2015). The variables used are $rgdpe$ (for gr and y_1), $cash_i$ (for inv) and emp (for n). The sum of variables ($g + \delta$) is assumed to be 0.05 for all countries and periods

based on research by Mankiw, Romer and Weil (1992), who showed that the assumption has very little effect on end results in growth regressions. The data source used for information on education attainment (*sch*) is the Human Development Reports (2020), which combines data from UNESCO Institute for Statistics and Barro and Lee (2013) to form a more complete dataset.

All conflict information (*conf* variables: *any conflict*, *civil* and *intense*) is retrieved from version 20.1 of the UCDP/PRIO Armed Conflict Database (Pettersson and Öberg (2020); Gleditsch et. al. (2002); Pettersson (2020)). Countries who are allies or second parties to a conflict are not coded as in conflict in this article, simply the primary parties. There is one shortcoming of the UCDP/PRIO data concerning new wars. Since new wars often do not have a clear ending but is more of a social condition (Kaldor 2012, p. 113), they are not very well-captured in the conflict data. This is something Kaldor (2012) herself criticizes in the preface of her book. However, as mentioned in the introduction, this is not a clear-cut investigation of new wars at all but rather of the conflict landscape since 1990 as a whole. Therefore, this is a limitation of data but does not result in making the study irrelevant. However, in future research it could be interesting to isolate wars that fit into the categorization of “new wars “ to study the economic spillover effects of conflict related to them specifically.

To create the matrices W_{dum} and W_{bor} , information is collected manually from the CIA World Factbook provided by the Central Intelligence Agency (2021). Version 0.97 (mat2002) of Gleditsch and Ward’s (2001) minimum-distance matrix is used to construct the minimum-distance cut matrices W_{MDcut} . The data collected for all matrices is processed in numerous, relatively time-demanding steps to create the final matrices as well the contiguity variables which are based on the matrices.

4.1 Exceptions

For some countries and specific cases, exceptions are made concerning data. These are listed below.

To start with, in the W_{MDcut} -matrices for Asia, Yugoslavia is included as a secondary neighbor in the period 1990-2004. This is because Yugoslavia collapsed in 2003 and is close enough to be included as a secondary neighbor to Turkey. For remaining periods, weights are given per country Yugoslavia was divided into after the collapse, if they are close enough to be a

secondary neighbor to a country in the sample. This type of exception is not done with more countries. For example, the Soviet Union is not taken into consideration. The reasoning behind this is that Yugoslavia was present the majority of a period involved in the sample whereas the Soviet Union was not (fell 1991). I am aware that there might be more examples of border changes during the sample period but have chosen not to immerse myself in this. This is partly due to time restriction but mainly because I do not believe it has a remarkable effect on results to consider or not. Nevertheless, it is a reduction of information about reality and could therefore affect the results of the study slightly.

Moreover, a country's primary and secondary neighbors (as mentioned under Data Sources) are based on CIA's data in the W_{dum} - and W_{bor} -matrices, and according to Gleditsch and Ward's (2001) data in the W_{MDcut} -matrices. However, there are some exceptions to this. Since South Sudan and Palestine are included in CIA's data but not in Gleditsch and Ward's W_{MDcut} matrices, these entities are not included in any of the matrices for consistency. This resulted in that conflicts in South Sudan are not included in the data at all. Conflicts in Palestine, however, are still included in the dataset but through Israel since it is coded as an Israeli civil conflict in the UCDP/PRIO Armed Conflict Dataset. This too is a small reduction of information that may affect results.

Lastly, countries lacking data for any variable or period have in general been removed from the sample. However, an exception is made concerning education data. As a rule, countries are included unless they lack data about education for more than two of the periods studied. Education data for the missing periods in these cases is approximated based on what is regarded as reasonable given the data for available years. Note that the removed countries are still reflected through the spatial weights matrices and conflict variables if they are a primary or secondary neighbor to countries included in the sample. In other words, the removed countries' spillover effect on other countries is still recorded while the opposite is not. Removing countries therefore does not affect the study in any other way than simply reducing the sample to fewer observations. Complete lists of which countries per region are included in regressions are provided in Appendix I.

5. Results

A total of 216 regressions were conducted to study economic spillover effects of conflict in Asia, Africa and Latin America using the extended model in Equation 2. In the regressions, different combinations of conflict and contiguity variables were tested to study which ones yielded significant results. The variables in focus are the contiguity variables (primary neighbor variables and secondary neighbor variables) since these are the ones created to measure economic spillover effects of conflict – the subject of this article.

First, a summary of significant results is presented in Table 1 to provide a picture of the overall results. To start with, results from the pooled sample regressions are presented to study general economic spillover effects of conflict in the world. The results from the regressions are then presented in tables for each region. In turn, the tables (and the pooled sample) are divided per conflict type – resulting in three tables per region and the pooled sample. Results are also commented for each region and conflict type. Moreover, base variables are commented shortly to acknowledge consistency or deviation from what could be expected from general economic theory.

The variable coefficients from results are presented in the table rows while the columns of the tables refer to the distances used in the secondary neighbor variables to visualize potential differences in results based on how far away neighbors are. Because of this, row 8 (v_{sec}) of tables 2-13 should be read together with the distance on the same column headline to understand which version is used. Due to the extensive number of regressions, of which only a few yielded significant results for the variables in focus of this essay, coefficients with a significance of under 5% are presented in pale grey. The purpose of this is to facilitate interpretation of the results by the reader.

5.1 Initial comments

For all regressions, using the dummy variable $v_{pri-dum}$ for primary neighbors yielded more significant results than using the one based on shared border length $v_{pri-bor}$ - all else equal. This indicates that two countries sharing borders is more explanatory of economic spillover effects of conflict than their shared border length. Because this holds for all regressions, only regressions using the $v_{pri-dum}$ variable are presented and analyzed in the result section. This reduces the number of regressions from 216 to 108 regressions.

5.2 Presentation of results

Table 1 An overall summary of the signs of significant coefficients from regressions per region and conflict type

	Pooled	Asia	Africa	Latin America
Any Conflict				
any conflict	-	Neg (100-900 km)	-	-
V _{pri-dum}	-	-	Neg (500-900 km)	-
V _{sec}	-	-	Pos (500-900 km)	-
Civil Conflict				
civil	-	Neg (200-900 km)	-	-
V _{pri-dum}	-	-	Neg (400-900 km)	-
V _{sec}	Neg (100 km)	Neg (100 km)	Pos (400-900 km)	-
Intense Conflict				
intense	Neg (100-900 km)	Neg (100-900 km)	-	-
V _{pri-dum}	-	-	-	Pos (100 km)
V _{sec}	Neg (500-900 km)	Neg (400-900 km)	-	Neg (100 km)

Significant levels: “-“= $p>0.05$ while all other results has a $p=<0.05$. The parentheses show which distance thresholds used for the secondary neighbor variables that yielded significant results. Neg = negative coefficient/effect, pos=positive coefficient/effect

Pooled

Table 2 Regression results for Pooled "any conflict"

	100 km	200 km	300 km	400 km	500 km	600 km	700 km	800 km	900 km
c	2.841***	2.833***	2.831 ***	2.827 ***	2.823 ***	2.181 ***	2.805 ***	2.794 ***	2.787 ***
ln(inv)	0.196***	0.196***	0.196 ***	0.193 ***	0.196 ***	0.195 ***	0.194 ***	0.194 ***	0.194 ***
ln(sch)	0.060(0.18)	0.057(0.18)	0.057 (0.18)	0.056 (0.19)	0.055 (0.19)	0.055 (0.20)	0.054 (0.20)	0.054 (0.21)	0.052 (0.23)
ln(y0)	-0.123***	-0.122 ***	-0.122 ***	-0.122 ***	-0.122 ***	-0.122 ***	-0.122 ***	-0.121 ***	-0.120 ***
ln(n+g+ δ)	0.44***	0.442 ***	0.441 ***	0.440 ***	0.440 ***	0.440 ***	0.439 ***	0.438 ***	0.437 ***
any conflict	-0.027(0.46)	-0.028(0.45)	-0.027 (0.45)	-0.028 (0.45)	-0.028 (0.45)	-0.028 (0.45)	-0.028 (0.45)	-0.028 (0.45)	-0.028 (0.45)
V _{pri-dum}	-0.176(0.23)	-0.125(0.40)	-0.102 (0.45)	-0.123 (0.32)	-0.126 (0.28)	-0.126 (0.25)	-0.128 (0.22)	-0.134 (0.18)	-0.133 (0.16)
V _{sec}	0.165(0.24)	-0.125(0.44)	0.102 (0.51)	0.142 (0.34)	0.158 (0.29)	0.170 (0.25)	0.185 (0.21)	0.208 (0.15)	0.212 (0.13)
Durbin-Watson	1.7931	1.7934	1.7925	1.7939	1.7943	1.7943	1.7945	1.7962	1.7983
R ²	0.3533	0.3522	0.3520	0.3526	0.3530	0.3532	0.3536	0.3542	0.3548

Significant levels: ***= $p<0.01$, **= $p<0.05$ and *= $p<0.1$

Table 3 Regression results for Pooled "civil"

	100 km	200 km	300 km	400 km	500 km	600 km	700 km	800 km	900 km
c	2.908 ***	2.814 ***	2.810 ***	2.810 ***	2.807 ***	2.801 ***	2.795 ***	2.787 ***	2.782 ***
ln(inv)	0.190 ***	0.196 ***	0.197 ***	0.197 ***	0.197 ***	0.196 ***	0.195 ***	0.195 ***	0.196 ***
ln(sch)	0.056 (0.18)	0.059 (0.16)	0.058 (0.17)	0.058 (0.17)	0.058 (0.17)	0.058 (0.17)	0.058 (0.17)	0.057 (0.17)	0.057 (0.17)
ln(y0)	-0.130 ***	-0.122 ***	-0.122 ***	-0.123 ***	-0.123 ***	-0.123 ***	-0.123 ***	-0.122 ***	-0.122 ***
ln(n+g+ δ)	0.440 ***	0.439 ***	0.437 ***	0.437 ***	0.437 ***	0.437 ***	0.436 ***	0.435 ***	0.435 ***
civil	-0.015 (0.68)	-0.032 (0.40)	-0.032 (0.39)	-0.031 (0.41)	-0.031 (0.41)	-0.030 (0.41)	-0.302 (0.42)	-0.030 (0.42)	-0.030 (0.42)
$v_{pri-dum}$	0.170*	-0.220 (0.14)	-0.193 (0.17)	-0.175 (0.17)	-0.155 (0.19)	-0.142 (0.20)	-0.149 (0.19)	-0.144 (0.16)	-0.142 (0.15)
v_{sec}	-0.263**	0.222 (0.15)	0.214 (0.18)	0.212 (0.17)	-0.155 (0.196)	0.1925 (0.21)	0.199 (0.19)	0.220 (0.14)	0.228 (0.12)
Durbin-Watson	1.8186	1.8033	1.8012	1.8002	1.7987	1.7971	1.7960	1.7969	1.7978
R ²	0.3628	0.3540	0.3537	0.3538	0.3535	0.3534	0.3536	0.3542	0.3545

Significant levels: ***= $p < 0.01$, **= $p < 0.05$ and *= $p < 0.1$

Table 4 Regression results for Pooled "intense"

	100 km	200 km	300 km	400 km	500 km	600 km	700 km	800 km	900 km
c	2.94 ***	2.937***	2.943***	2.956***	2.979***	2.981***	2.998***	3.015***	3.033***
ln(inv)	0.172***	0.172***	0.171***	0.169***	0.169***	0.165***	0.164***	0.164***	0.163***
ln(sch)	0.039 (0.35)	0.037 (0.37)	0.035 (0.39)	0.035 (0.39)	0.035 (0.39)	0.040 (0.33)	0.040 (0.33)	0.039 (0.34)	0.037 (0.36)
ln(y0)	-0.126 ***	-0.125 ***	-0.125 ***	-0.127 ***	-0.128 ***	-0.131 ***	-0.132 ***	-0.134 ***	-0.135 ***
ln(n+g+ δ)	0.449***	0.448***	0.449***	0.450***	0.451***	0.449***	0.450***	0.450***	0.449***
intense	-0.170 ***	-0.168 ***	-0.165 ***	-0.162 ***	-0.158 ***	-0.163 ***	-0.162 ***	-0.161 ***	-0.161 ***
$v_{pri-dum}$	0.113 (0.46)	0.085 (0.55)	0.093 (0.51)	0.108 (0.42)	0.122 (0.34)	0.051 (0.64)	0.054 (0.61)	0.059 (0.57)	0.068 (0.51)
v_{sec}	-0.242 (0.12)	0.219 (0.14)	-0.239 (0.10)	-0.275*	-0.312**	-0.228*	-0.248**	-0.275**	-0.309**
Durbin-Watson	1.7875	1.7882	1.7876	1.7854	1.7834	1.7784	1.7770	1.7757	1.7740
R ²	0.3748	0.3745	0.3750	0.3762	0.3776	0.3766	0.3775	0.3784	0.3795

Significant levels: ***= $p < 0.01$, **= $p < 0.05$ and *= $p < 0.1$

Base variables (Pooled)

As seen in Tables 2-4, all base variables (first 4 rows of each table) were significant in the pooled regressions, except for human capital ln(sch). They were all of the expected sign except for ln(n+g+ δ). Its sign is normally negative in economic growth theory but is positive in all pooled regressions of this article.

Any Conflict (Pooled)

Seen in Table 2, using the *any conflict* variable for the pooled sample of countries yielded no significance neither for host countries nor the primary and secondary neighbor variables. This

suggests that there are no general global patterns concerning the economic effects on either host countries of an unspecified conflict or its primary or secondary neighbors.

Civil

No significance was observed on the *civil* variable in the pooled sample regressions shown in Table 3. This suggests that there are no general effects on host countries of civil conflict globally. Likewise, no results were significant for primary neighbors either. However, it was very close to significant (significance of 0.058) at 100 km with a positive coefficient of 0.17, indicating that there could be a general effect on primary neighbors. The secondary neighbor variable was significant when using the 100 km variable, with a coefficient of (-0.26). This indicates that the economies of secondary neighbors within a 100 km distance to civil conflict are generally negatively affected.

Intense (Pooled)

Shown in Table 4, the variable *intense* was significant for all regressions of the pooled sample, with a coefficient of around (-0.15). While there is no general global effect on host countries induced by the other conflict types (*any* or *civil conflict*)— there are general negative effects on the economic growth of host countries due to intense conflict. No significance for primary neighbors to conflict were found. For the secondary neighbors, coefficients were significant and negative using the 500-900 km secondary neighbor variables. This suggests that the effects of an intense conflict are felt quite far away from the host country.

Asia

Table 5 Regression results for Asia "any conflict"

	100 km	200 km	300 km	400 km	500 km	600 km	700 km	800 km	900 km
c	2.049***	2.035***	2.029***	2.030***	2.030***	2.028***	2.025***	2.021***	2.020***
ln(inv)	0.080 (0.23)	0.079 (0.24)	0.078 (0.240)	0.079 (0.24)	0.079 (0.24)	0.079 (0.24)	0.078 (0.24)	0.079 (0.24)	0.080 (0.23)
ln(sch)	0.173**	0.172**	0.172**	0.172**	0.172**	0.172**	0.172**	0.172**	0.172**
ln(y0)	-0.134 ***	-0.133 ***	-0.133 ***	-0.133 ***	-0.133 ***	-0.133 ***	-0.133 ***	-0.133 ***	-0.133 ***
ln(n+g+δ)	0.282***	0.28***	0.280***	0.280***	0.280***	0.280***	0.279***	0.280***	0.279***
Any conflict	-0.147**	-0.148**	-0.148**	-0.148**	-0.148**	-0.148**	-0.148**	-0.148**	-0.148**
<i>v</i> _{pri-dum}	-0.050 (0.81)	-0.083 (0.73)	-0.058 (0.82)	-0.009 (0.97)	0.016 (0.95)	0.031 (0.89)	0.028 (0.9)	0.018 (0.9)	0.018 (0.93)
<i>v</i> _{sec}	0.136 (0.43)	0.185 (0.45)	0.162 (0.57)	0.108 (0.71)	0.079 (0.79)	0.061 (0.84)	0.071 (0.80)	0.081 (0.760)	0.096 (0.73)
Durbin-Watson	1.560	1.562	1.558	1.557	1.557	1.557	1.557	1.559	1.560
R ²	0.283	0.283	0.282	0.281	0.281	0.281	0.281	0.281	0.281

Significant levels: ***= $p < 0.01$, **= $p < 0.05$ and *= $p < 0.1$

Table 6 Regression results for Asia "civil"

	100 km	200 km	300 km	400 km	500 km	600 km	700 km	800 km	900 km
c	2.25***	2.056***	2.046***	2.043***	2.041***	2.040***	2.042***	2.042***	2.043***
ln(inv)	0.055 (0.38)	0.084 (0.19)	0.083 (0.20)	0.082 (0.20)	0.082 (0.21)	0.081 (0.21)	0.081 (0.21)	0.082 (0.21)	0.083 (0.20)
ln(sch)	0.145**	0.175**	0.174**	0.173**	0.173**	0.172**	0.172**	0.172**	0.172**
ln(y0)	-0.145 ***	-0.137 ***	-0.137 ***	-0.136 ***	-0.136 ***	-0.136 ***	-0.136 ***	-0.136 ***	-0.136 ***
ln(n+g+δ)	0.273***	0.278 ***	0.276 ***	0.276 ***	0.275 ***	0.275 ***	0.275 ***	0.275 ***	0.275 ***
civil	-0.124 (0.06)	-0.152**	-0.153**	-0.1536 **	-0.154**	-0.154**	-0.154**	-0.154**	-0.154**
<i>v_{pri-dum}</i>	0.099 (0.50)	-0.159 (0.50)	-0.146 (0.60)	-0.089 (0.70)	-0.055 (0.80)	-0.021 (0.90)	-0.009 (0.97)	-0.007 (0.97)	-0.002 (0.99)
<i>v_{sec}</i>	-0.391 ***	0.273 (0.30)	0.268 (0.30)	0.210 (0.50)	0.176 (0.50)	0.134 (0.60)	0.123 (0.70)	0.126 (0.70)	0.124 (0.60)
Durbin-Watson	1.560	1.567	1.561	1.560	1.560	1.559	1.559	1.559	1.560
R ²	0.287	0.288	0.286	0.285	0.284	0.284	0.284	0.284	0.284

Significant levels: ***= $p < 0.01$, **= $p < 0.05$ and *= $p < 0.1$

Table 7 Regression results for Asia "intense"

	100 km	200 km	300 km	400 km	500 km	600 km	700 km	800 km	900 km
c	2.289***	2.297***	2.305***	2.329***	2.364***	2.357***	2.373***	2.392***	2.414***
ln(inv)	0.042 (0.50)	0.042 (0.50)	0.0404 (0.51)	0.0391 (0.52)	0.040 (0.52)	0.024 (0.70)	0.023 (0.71)	0.021 (0.73)	0.018 (0.76)
ln(sch)	0.090 (0.19)	0.085 (0.22)	0.080 (0.25)	0.077 (0.26)	0.076 (0.27)	0.095 (0.17)	0.095 (0.17)	0.092 (0.18)	0.087 (0.20)
ln(y0)	-0.131 ***	-0.130 ***	-0.129 ***	-0.131 ***	-0.132 ***	-0.141 ***	-0.142 ***	-0.143 ***	-0.143 ***
ln(n+g+δ)	0.276***	0.275***	0.275***	0.275***	0.276***	0.272***	0.273***	0.272***	0.271***
intense	-0.230 ***	-0.228 ***	-0.224 ***	-0.219 ***	-0.213 ***	-0.221 ***	-0.220 ***	-0.220 ***	-0.220 ***
<i>v_{pri-dum}</i>	-0.136 (0.40)	-0.143 (0.40)	-0.141 (0.40)	-0.130 (0.40)	-0.125 (0.40)	-0.194 (0.20)	-0.197 (0.20)	-0.193 (0.20)	-0.185 (0.20)
<i>v_{sec}</i>	-0.276 (0.10)	-0.294 (0.10)	-0.314 (0.06)	-0.352 (0.04)	-0.387**	-0.293**	-0.306**	-0.334**	-0.375 ***
Durbin-Watson	1.571	1.575	1.571	1.567	1.563	1.551	1.550	1.549	1.550
R ²	0.353	0.355	0.356	0.359	0.362	0.361	0.363	0.365	0.368

Significant levels: ***= $p < 0.01$, **= $p < 0.05$ and *= $p < 0.1$

Base variables (Asia)

Regressions for Asia as presented in Tables 5-7 yielded the least significant results for the base variables (first 4 rows of each table) out of all three regions studied. The *inv* variable was not significant for any of the Asia regressions. Moreover, the *sch* variable was not significant when using the *intense* variable seen in Table 7. The significant variables were all of the same sign as expected from other studies, except for $\ln(n+g+\delta)$ which was positive here instead of negative.

Any Conflict (Asia)

The results for any conflict in Asia are shown in Table 5. The regressions yielded significant negative coefficients for the *any conflict* variable, suggesting that countries in Asia are negatively affected by any conflict present in the home country. The negative coefficient was around (-0.15). No results were significant for primary or secondary neighbors, meaning that there is no general effect visible on either primary or secondary neighbors by any conflict present in the near surroundings

Civil (Asia)

Shown in Table 6, testing for effects of a civil conflict in Asia, the variable *civil* yielded significant results using the 200-900 km variables for secondary neighbors with a negative coefficient around (-0.15). This indicates that a country in Asia is generally affected negatively by hosting a civil conflict. No results were significant regarding the economic spillover effect of conflict on primary neighbors to conflict. However, the results showed a significant negative effect on secondary neighbors to conflict using the 100 km variable. The coefficient was around (-0.39). This indicates that secondary neighbors within a 100 km distance to conflict are negatively affected, while there is no visible effect on other neighboring countries.

Intense (Asia)

Testing for intense conflict effects in Asia, the *intense* variable itself yielded significant results for all regressions as shown in Table 7. The negative coefficient was slightly higher than for the *any conflict* and *civil* variables, with a coefficient around (-0.22). This suggests that countries in Asia are generally negatively affected by an intense conflict in the home country - even more so than by any conflict in general or a civil conflict. The primary neighbor variable yielded no significant results for intense conflicts in Asia. However, the secondary neighbor variables yielded significant results using the 400 to 900 km distance thresholds. The effect was negative with coefficients ranging from (-0.29) to (-0.38). This suggests that the economic spillover effects of an intense conflict in Asia reaches quite far away from the host country of conflict. Furthermore, that primary neighbors are not necessarily more affected than secondary. While the negative impact differs slightly using the 400-900 km variables, there is no clear trend of the effect being weaker or stronger towards any end of the specified spectrum. Instead, the sizes of the coefficients are distributed arbitrarily. This could indicate that the most important factor concerning economic spillover

effects of an intense conflict in Asia is that the conflict is within a 400 to 900 distance away from a neighbor, rather than any particular distance within that interval.

Africa

Table 8 Regression results for Africa "any conflict"

	100 km	200 km	300 km	400 km	500 km	600 km	700 km	800 km	900 km
c	3.705***	3.700***	3.708***	3.736***	3.768***	3.77***	3.762***	3.756***	3.750***
ln(inv)	0.196***	0.196***	0.197***	0.200***	0.200***	0.198***	0.195***	0.193***	0.191***
ln(sch)	0.146***	0.145***	0.143***	0.129**	0.122**	0.118**	0.115**	0.112**	0.108**
ln(y0)	-0.230 ***	-0.230 ***	-0.230 ***	-0.232 ***	-0.235 ***	-0.237 ***	-0.236 ***	-0.236 ***	-0.236 ***
ln(n+g+δ)	0.486***	0.485 ***	0.486 ***	0.482 ***	0.483 ***	0.484 ***	0.484 ***	0.485***	0.484 ***
any conflict	0.021 (0.64)	0.020 (0.65)	0.021 (0.64)	0.0229 (0.60)	0.026 (0.56)	0.028 (0.52)	0.03 (0.49)	0.032 (0.46)	0.034 (0.44)
v _{pri-dum}	-0.109 (0.67)	-0.133 (0.52)	-0.124 (0.48)	-0.258* (0.48)	-0.303** (0.48)	-0.313** (0.48)	-0.310 **	-0.309 ***	-0.306 ***
v _{sec}	0.048 (0.85)	0.077 (0.72)	0.076 (0.71)	0.284 (0.15)	0.383** (0.15)	0.437** (0.15)	0.464** (0.15)	0.495*** (0.15)	0.517*** (0.15)
Durbin- Watson	2.226	2.223	2.223	2.231	2.238	2.243	2.243	2.244	2.251
R ²	0.448	0.449	0.449	0.455	0.461	0.465	0.468	0.471	0.473

Significant levels: ***= $p < 0.01$, **= $p < 0.05$ and *= $p < 0.1$

Table 9 Regression results for Africa "civil"

	100 km	200 km	300 km	400 km	500 km	600 km	700 km	800 km	900 km
c	3.696***	3.699***	3.739***	3.817***	3.856***	3.864***	3.855***	3.857***	3.859***
ln(inv)	0.199***	0.198***	0.202***	0.207***	0.205***	0.202***	0.199***	0.196***	0.194***
ln(sch)	0.141***	0.143***	0.139**	0.131**	0.132**	0.132**	0.131**	0.129**	0.128**
ln(y0)	-0.228 ***	-0.229 ***	-0.233 ***	-0.239 ***	-0.244 ***	-0.246 ***	-0.246 ***	-0.248 ***	-0.249 ***
ln(n+g+δ)	0.485***	0.485***	0.485***	0.491***	0.495***	0.497***	0.497***	0.497***	0.497***
civil	0.012***	0.010 (0.83)	0.011 (0.81)	0.016 (0.72)	0.018 (0.69)	0.020 (0.66)	0.021 (0.64)	0.023 (0.62)	0.025 (0.59)
v _{pri-dum}	-0.392 (0.19)	-0.296 (0.18)	-0.292 (0.13)	-0.364** (0.13)	-0.353** (0.13)	-0.340** (0.13)	-0.327** (0.13)	-0.327 ***	-0.326 ***
v _{sec}	0.348 (0.26)	0.262 (0.26)	0.295 (0.20)	0.441** (0.20)	0.466** (0.20)	0.487** (0.20)	0.501** (0.20)	0.533*** (0.20)	0.560*** (0.20)
Durbin- Watson	2.232	2.236	2.234	2.237	2.233	2.223	2.219	2.216	2.218
R ²	0.452	0.452	0.453	0.460	0.463	0.465	0.467	0.470	0.472

Significant levels: ***= $p < 0.01$, **= $p < 0.05$ and *= $p < 0.1$

Table 10 Regression results for Africa "intense"

	100 km	200 km	300 km	400 km	500 km	600 km	700 km	800 km	900 km
c	3.714***	3.711***	3.718***	3.721***	3.726***	3.741***	3.766***	3.795***	3.827***
ln(inv)	0.199***	0.199***	0.199***	0.199***	0.198***	0.196***	0.193***	0.192***	0.190***
ln(sch)	0.152***	0.152***	0.152***	0.152***	0.153***	0.154***	0.154***	0.154***	0.154***
ln(y0)	-0.240***	-0.240***	-0.240***	-0.240***	-0.241***	-0.242***	-0.244***	-0.246***	-0.249***
ln(n+g+δ)	0.463***	0.463***	0.463***	0.464***	0.465***	0.468***	0.471***	0.473***	0.474***
intense	-	-0.072	-0.073	-0.073	-0.071	-0.066	-0.061	-0.058	-0.056
	0.070(0.29)	(0.28)	(0.28)	(0.28)	(0.29)	(0.33)	(0.36)	(0.39)	(0.40)
$V_{pri-dum}$	-0.063	-0.056	-0.020	-0.0062	0.036	0.110	0.177	0.228	0.264
	(0.89)	(0.89)	(0.96)	(0.98)	(0.90)	(0.67)	(0.46)	(0.32)	(0.22)
V_{sec}	0.119	0.114	0.076	0.066	0.014	-0.092	-0.201	-0.295	-0.375
	(0.80)	(0.80)	(0.85)	(0.86)	(0.97)	(0.78)	(0.54)	(0.36)	(0.24)
Durbin-Watson	2.207	2.205	2.204	2.204	2.204	2.201	2.197	2.190	2.182
R ²	0.450	0.450	0.450	0.450	0.449	0.450	0.451	0.452	0.454

Significant levels: ***= $p < 0.01$, **= $p < 0.05$ and *= $p < 0.1$

Base variables (Africa)

All coefficients for base variables (first 4 rows of each table) in regressions conducted for Africa, presented in Tables 8-10, were significant. Again, all were of the expected sign apart from $\ln(n+g+\delta)$ which was positive instead of negative.

Any Conflict (Africa)

In Africa, no significant coefficients were found for the *any conflict* variable, shown in Table 8. However, for primary and secondary neighbors the coefficients were statistically significant when using the 500-900 km variables for secondary neighbors. Interestingly, the sign of the coefficients of the effect on primary and secondary neighbors are opposite. While it is negative for primary neighbors of around (-0.30) it is positive for secondary neighbors, ranging from 0.38 to 0.52. This suggests that primary neighbors to any conflict in Africa are negatively affected while secondary neighbors are positively affected by a nearby conflict.

Civil (Africa)

Seen in Table 9, there was no significant effect found on the host country of a civil conflict in Africa, using the *civil* variable. The coefficients for primary and secondary neighbors were significant when using secondary neighbor variables from 400-900 km. As for *any conflict*, the effect was negative on primary neighbors and positive effect for secondary neighbors. The coefficients for primary and secondary neighbors are slightly higher for civil conflict than for any conflict, around (-0.34) for primary and from 0.44-0.56 for secondary neighbors. This

indicates that the economic spillover effects of civil conflicts in Africa are larger in the event of a civil than any conflict.

Intense (Africa)

None of the coefficients for intense conflict or for primary or secondary neighbor variables were significant when using the *intense* variable - testing for the effect of intense conflicts in Africa. The result is presented in Table 10.

Latin America

Table 11 Regression results for Latin America "any conflict"

	100 km	200 km	300 km	400 km	500 km	600 km	700 km	800 km	900 km
c	3.552***	3.526***	3.543***	3.558***	3.567***	3.574***	3.574***	3.569***	3.570***
ln(inv)	0.296**	0.295**	0.**	0.295**	0.294**	0.293**	0.294**	0.294**	0.294**
ln(sch)	-0.370***	-0.387***	-0.394***	-0.396***	-0.396***	-0.396***	-0.394***	-0.392***	-0.391***
ln(y0)	0.121 (0.12)	0.124 (0.11)	0.124 (0.11)	0.124 (0.11)	0.123 (0.11)	0.123 (0.12)	0.122 (0.11)	0.122 (0.12)	0.122 (0.12)
ln(n+g+δ)	1.063***	1.045***	1.039***	1.040***	1.041***	1.042***	1.042***	1.043***	1.044***
Any conflict	-0.120 (0.17)	-0.115 (0.19)	-0.111 (0.21)	-0.110 (0.21)	-0.110 (0.21)	-0.110 (0.21)	-0.111 (0.21)	-0.112 (0.21)	-0.112 (0.20)
<i>v_{pri-dum}</i>	-0.701 (0.26)	-0.18 (0.71)	0.006 (0.98)	0.007 (0.97)	0.006 (0.98)	-0.001 (0.99)	-0.01720 (0.93)	-0.033 (0.87)	-0.038 (0.84)
<i>v_{sec}</i>	0.669 (0.31)	0.050 (0.88)	-0.104 (0.72)	-0.117 (0.67)	-0.122 (0.66)	-0.121 (0.67)	-0.100 (0.74)	-0.077 (0.80)	-0.070 (0.82)
Durbin-Watson	1.806	1.824	1.810	1.810	1.812	1.814	1.820	1.816	1.817
R ²	0.586	0.582	0.583	0.583	0.583	0.583	0.583	0.582	0.582

Significant levels: ***= $p < 0.01$, **= $p < 0.05$ and *= $p < 0.1$

Table 12 Regression results for Latin America "civil"

	100 km	200 km	300 km	400 km	500 km	600 km	700 km	800 km	900 km
c	3.497***	3.470***	3.487***	3.503***	3.512***	3.522***	3.526***	3.525***	3.532***
ln(inv)	0.301**	0.300**	0.302**	0.300**	0.300**	0.299**	0.299**	0.2998**	0.299**
ln(sch)	-0.367***	-0.385***	-0.393***	-0.395***	-0.395***	-0.395***	-0.393***	-0.392***	-0.391***
ln(y0)	0.123 (0.11)	0.127* (0.11)	0.128* (0.11)	0.127* (0.11)	0.127 (0.10)	0.126 (0.10)	0.125 (0.11)	0.125 (0.11)	0.124 (0.11)
ln(n+g+δ)	1.057***	1.037***	1.031***	1.032***	1.033***	1.034***	1.034***	1.035***	1.036***
civil	-0.106 (0.26)	-0.102 (0.28)	-0.099 (0.29)	-0.099 (0.29)	-0.099 (0.29)	-0.099 (0.29)	-0.099 (0.29)	-0.100 (0.29)	-0.099 (0.29)
<i>v_{pri-dum}</i>	-0.695 (0.27)	-0.110 (0.73)	0.014 (0.96)	0.016 (0.94)	0.016 (0.94)	0.012 (0.96)	-0.003 (0.99)	-0.015 (0.94)	-0.017 (0.93)
<i>v_{sec}</i>	0.670 (0.31)	0.047 (0.88)	-0.110 (0.71)	-0.125 (0.65)	-0.132 (0.65)	-0.136 (0.64)	-0.119 (0.69)	-0.104 (0.73)	-0.105 (0.74)
Durbin-Watson	1.804	1.821	1.806	1.806	1.809	1.811	1.812	1.813	1.813
R ²	0.584	0.580	0.580	0.581	0.581	0.581	0.580	0.580	0.580

Significant levels: ***= $p < 0.01$, **= $p < 0.05$ and *= $p < 0.1$

Table 13 Regression results for Latin America "intense"

	100 km	200 km	300 km	400 km	500 km	600 km	700 km	800 km	900 km
c	3.158***	3.232***	3.248***	3.293***	3.315***	3.34***	3.352***	3.342***	3.33***
ln(inv)	0.292**	0.326**	0.326**	0.323**	0.322**	0.324**	0.327**	0.327**	0.327**
ln(sch)	-0.242**	-0.336***	-0.337***	-0.335***	-0.333***	-0.334***	-0.336***	-0.339***	-0.339***
ln(y0)	0.084 (0.29)	0.130 (0.10)	0.128 (0.11)	0.124 (0.12)	0.122 (0.12)	0.1206 (0.13)	0.120 (0.13)	0.122 (0.13)	0.123 (0.13)
ln(n+g+δ) intense	0.957*** -0.130 (0.38)	1.019*** -0.137 (0.37)	1.017*** -0.136 (0.37)	1.021*** -0.139 (0.36)	1.023*** -0.140 (0.35)	1.024*** -0.139 (0.35)	1.022*** -0.140 (0.35)	1.021*** -0.139 (0.36)	1.021*** -0.139 (0.36)
v _{pri-dum}	7.949**	0.275 (0.68)	0.640 (0.35)	-0.677 (0.26)	0.694 (0.22)	0.610 (0.26)	0.492 (0.32)	0.369 (0.41)	0.288 (0.49)
v _{sec}	-7.983**	-0.165 (0.80)	-0.570 (0.42)	-0.630 (0.32)	-0.663 (0.28)	-0.609 (0.32)	-0.497 (0.41)	-0.368 (0.53)	-0.268 (0.64)
Durbin-Watson	1.984	1.858	1.875	1.884	1.890	1.885	1.879	1.869	1.863
R ²	0.600	0.579	0.581	0.583	0.583	0.583	0.581	0.580	0.580

Significant levels: ***= $p < 0.01$, **= $p < 0.05$ and *= $p < 0.1$

Base variables (Latin America)

The coefficients of base variables (first 4 rows of each table) were significant in all regressions conducted for Latin America, presented in Tables 11-13, except for y_0 . Of those significant, all were of the expected sign except for $\ln(n+g+\delta)$ which was positive instead of negative and $\ln(\text{sch})$ which was negative instead of positive.

Any Conflict (Latin America)

As seen in Table 11, using the variable *any conflict* yielded no significant results in Latin America regressions. Neither did the primary or secondary neighbor variables.

Civil (Latin America)

As for *any conflict*, the regressions using the *civil* variable were not significant for the variables in focus. The results are seen in Table 12.

Intense (Latin America)

As seen in Table 13, using the *intense* variable yielded no significance for the variable itself - suggesting that an intense conflict in Latin America has no visible effect on the economy of the host country. However, results were significant for both primary and secondary neighbors using the 100 km variable. This indicates that an intense conflict in Latin America causes a greater effect on primary and secondary neighbors in close proximity (within 100 km) to a host country of conflict than on the host country itself. The effects on both primary and

secondary neighbors are very strong and approximately of the same size but with different signs on the coefficient - around 7.94 for primary and (-7.98) for secondary.

R-squared

When it comes to how well the model explains the variance of the dependent variable economic growth (*gr*) - regressions yielded values of R-squared (R^2 , seen in row 10 of each table) higher than 0.5 for only one region. This region was Latin America, where the value of R-squared ranged between 0.58 and 0.6. In Asia, the value ranged between 0.28-0.37 and in Africa it was around 0.45. Furthermore, R-squared values in the regressions using the pooled sample ranged from 0.35 to 0.37. The low values of R-squared for Asia, Africa and the pooled sample indicates that there are factors affecting economic growth excluded from the model. This is not necessarily a problem, but signals that the coefficients of the model are likely measured with a high degree of imprecision. What could be worth noting is that the values of R-squared in this article are generally higher than in previous similar studies of economic spillover effects of conflict in the short run (Murdoch and Sandler 2002b; de Groot, 2010; Dunne and Tian, 2015, 2019).

Autocorrelation

A Durbin Watson Test was also conducted – testing for autocorrelation of the residuals in lag 1. The results are visible in row 9 of all tables. The values of the test for all regressions ranged from 1.5 to 2.2. Since all values are relatively close to 2, the test indicates that there is no autocorrelation lag 1 among residuals in any of the regressions conducted (University of Notre Dame 2021).

6. Discussion

In summary, results regarding economic spillover effects of conflict differed greatly depending on which of the three regions (Asia, Africa, or Latin America) was studied. It differed both in the number of significant results as well as in sign and size of the coefficients. The large differences indicate that economic spillover effects of conflict are region-specific, consistent with the indications in Murdoch and Sandler's (2002b). Based on this, it could be argued that it is important to take into consideration in which region a conflict is present when examining economic spillover effects of conflict. Below, results from the pooled sample and

per region are discussed briefly before discussing other potential patterns (or absence thereof). The discussion ends with some comments applying to all results.

The pooled sample did not yield many significant results of the variables measuring economic spillover effects. The only general global effect seems to be negative on secondary neighbors to civil and intense conflict. There could also be a positive effect of civil conflict on primary neighbors, but it is slightly below the significance threshold chosen for this article (5%). The fact that fewer results were significant in the pooled sample than the separate regressions per region (apart from in Latin America) signals that general economic spillover effects are not present on a global level. At least not in the three regions as a group. One reason for this could be that the effects are different in different regions and therefore cancel each other out. The absence of visible general global economic spillover effects amplifies the previously mentioned indication that the effects are region-specific. In the next three paragraphs, the results for each region are discussed.

Results for Asia suggest that the economic growth of host countries of conflict is affected negatively by all types of conflicts studied. The measured negative effect tends to be of a different size depending on what type of conflict is present. The presence of any conflict or a civil conflict is smaller than that of an intense conflict. In other words, intense conflicts seem to have the most devastating effect on host countries. In contrast, there was no general effect on primary neighbors to any type of conflict studied in Asia. However, the result suggests a negative effect on secondary neighbors to civil conflict within 100km and intense conflict reaching further within 400-900 km (both larger than on host countries). Based on this, secondary neighbors seem to be more negatively affected by civil or intense conflict than the host countries.

In Africa, the result suggests that conflicts do not have a significant effect on the economic growth on the host countries. In contrast, there seems to be a general effect on the primary and secondary neighbor countries to conflict. This is strange. Especially since previous studies have shown a negative effect on host countries of conflict in Africa (Murdoch and Sandler 2002b; de Groot 2010; Dunne and Tian 2015, 2017). Economic spillover effects on both primary neighbors are visible for any conflict and civil conflict, but not intense. The measured effect was negative on primary and positive on secondary neighbors with the positive effect on secondary being stronger than the negative effect on primary. The result of primary

neighbors to conflict in Africa seemingly negatively affected economically by a conflict in the neighborhood while secondary neighbors benefit is consistent with that of de Groot (2010). However, the positive effect on secondary neighbors contradicts the result of Murdoch and Sandler (2002b) and Dunne and Tian (2015). At first glance, the result concerning secondary neighbors seems quite odd, considering the often-devastating consequences a conflict brings to a society. However, as mentioned in the background under the capital and labor channels, there could be a logical explanation behind the positive effect. Moreover, the spillover effects in Africa seem to reach quite far (at least 900 km). This somewhat contradicts the results of Murdoch and Sandler (2002b) and de Groot (2010) where the dispersion is less far-reaching.

Results for Latin America regarding economic spillover effects were only significant for intense conflict for primary and secondary neighbors within 100 km, indicating that the economic spillover effects in Latin America do not reach very far, as found by Murdoch and Sandler (2002b). It is strange that the effect is extremely strong (the coefficient is around 7.9) on both primary and secondary neighbors but with opposite signs. First of all, it is difficult to think of an explanation for the effects being so many times larger than other spillover effects found in the study. Secondly, it is difficult to see why a conflict would benefit primary neighbors extremely and be extremely devastating for secondary neighbors. Conclusions regarding the extreme result should probably be taken cautiously. Nevertheless, the result suggests that more aid should be directed towards the closest neighbors to conflict in Latin America rather than those further away in the event of an intense conflict. The lack of significant results for Latin America compared to Asia and Africa suggests that general economic spillover effects are more strongly present in the other two regions. It could also be explained by the fact that the number of countries included in the Latin America sample is considerably smaller (24 countries), compared to the two other regions (39 and 40 countries respectively). It could also be that countries in Latin America are affected differently so that the effects cancel each other out.

The base variables are less in focus in this study but is still of great importance for the overall credibility of the results. For all regressions, most base variables were generally significant and of the expected sign based on general economic theory/research, apart from a relatively small number of exceptions. However, for all regressions $\ln(n+g+\delta)$ was positive instead of negative, which is somewhat strange and bit alarming for the rest of the result.

The differences, in results compared to previous similar studies (Murdoch and Sandler 2002b; de Groot 2010; Dunne and Tian 2015, 2019), might be a consequence of studying a later time period than them. After all, compared to their studies, a period of at least 30 years (1960-1990) is excluded from this study. However, they all yielded negative values of $\ln(n+g+\delta)$, which is more probable, while the values were positive in this study. The reasons for these differences are unclear and would need further investigation.

Lastly, based on previous research (Dunne and Tian 2015, 2019), one can assume that the overall results of economic spillover effects may be underestimated for fragile states and to countries with political similarities and higher economic integration to the host countries of conflict. At least in Africa, since this is the region they studied. However, their results are not directly comparable to this study, since the periods studied in their articles differ from that in this article. Still, it is important to keep this possibility in mind.

7. Conclusion

In this study the economic spillover effects of conflict on neighbor countries (primary and secondary neighbors) in Asia, Africa and Latin America are studied for the period 1990-2019. Since the same type of study has been conducted before but for other periods, the results of this study have been compared with previous results to see if the same results hold also for this study.

The results from the pooled sample indicate that there are few general economic spillover effects of conflict globally (at least not for countries in the three regions studied). The exception is for intense conflicts, where economic spillover effects appear to be negative on secondary neighbors within 100 km to civil conflict and within 500-900 km from intense conflict.

From a regional comparison perspective, the results of this study suggest that economic spillover effects of conflict on primary and secondary neighbors differ considerably depending on which region a country is located in. The effects differ both in size and sign of coefficients. The result amplifies the conclusion drawn by Murdoch and Sandler (2002b) - that economic spillover effects of conflict seem to be region-specific. The effects also seem to

be dependent on which type of conflict is present and how close the neighbor countries are. The main results per region are presented in more detail below.

In Asia, there seem to be no general spillover effect on primary neighbors to conflict. However, there is a negative effect on secondary neighbors within 100 km to civil conflict and at least 500-900 km to intense conflict. In contrast, primary neighbors in Africa appear to be negatively affected by any or civil conflict while secondary neighbors within 400-900 km and 500-900 km seem to benefit any or civil conflict respectively. The result regarding secondary neighbors is especially interesting since it supports previous result of de Groot (2010). However, it contradicts results of Murdoch and Sandler (2002b) as well as Dunne and Tian (2015, 2019). In Latin America, economic spillover effects seem to be present only for intense conflict on primary and secondary neighbors within 100 km. Primary neighbors appear to be positively affected while secondary neighbors are negatively affected.

To conclude, the results suggest that general economic spillover effects of conflict are present and that they are dependent on region, conflict type and distance. The main conclusions to be drawn about a neighbor's distance from conflict is that economic spillover effects of Asian and African conflicts seem to reach further than those in Latin America. Other than that, there are few clear patterns to be made out. The fact that economic spillover effects are found at all signifies the importance of not only considering the economy of host countries in the aftermath of conflict but also of the neighboring countries. However, as mentioned, the effect of conflict may not necessarily be negative. Furthermore, while regional results could give a hint of economic spillover effects per region, conflict type and distance from conflict, the lack of overall patterns signals that it is important to look at each specific case individually.

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Appendix

Appendix I

List of countries included in data samples per region.

Africa (39)

Algeria	Central African Republic	Gabon
Benin	Congo Brazzaville	Gambia
Botswana	Congo Kinshasa	Ghana
Burundi	Côte d'Ivoire	Kenya
Cameroon	Egypt	Lesotho

Liberia	Namibia	Swaziland
Libya	Niger	Tanzania
Malawi	Rwanda	Togo
Mali	Senegal	Tunisia
Mauritania	Sierra Leone	Uganda
Mauritius Morocco	South Africa	Zambia
Mozambique	Sudan	Zimbabwe

Asia (40)

Armenia	Jordan	Qatar
Azerbaijan	Japan	Republic of Korea
Bahrain	Kuwait	Russia
Bangladesh	Kyrgyzstan	Saudi Arabia
Brunei	Kazakhstan	Singapore
Cambodia	Laos	Sri Lanka
China	Malaysia	Syria
Vietnam	Maldives	Tajikistan
India	Mongolia	Thailand
Indonesia	Myanmar	Turkey
Iran	Nepal	United Arab Emirates
Iraq	Pakistan	
Israel	Philippines	
Yemen		

Latin America (24)

Argentina	Dominican Republic	Mexico
Bahamas	Ecuador	Nicaragua
Belize	El Salvador	Panama
Bolivia	Guatemala	Paraguay
Brazil	Guyana	Peru
Chile	Haiti	Uruguay
Columbia	Honduras	Venezuela
Costa Rica	Jamaica	

