Unraveling Post-Conflict Economic Recovery: Identifying Key Drivers of Above-Average Growth - A Cross-Country Analysis

Ammar Al-Hammadi

A Thesis in the Department of Economics

Presented in Partial Fulfillment of the Requirements
for the Degree of Master of Arts (Economics) at
Concordia University
Montréal, Québec, Canada

August 2023

CONCORDIA UNIVERSITY

School of Graduate Studies

This is to certify that the Thesis prepared

By: Ammar Al-Hammadi

Entitled: Unraveling Post-Conflict Economic Recovery:

Identifying Key Drivers of Above-Average Growth - A Cross-Country Analysis

and submitted in partial fulfillment of the requirements for the degree of

Master of Arts (Economics)

complies with the regulations of the University and meets the accepted standards with respect to

originality and quality.

Signed by the final Examining Committee:

_____Examiner

Dr. Jan Victor Dee

_____Supervisor

Dr. Tatyana Koreshkova

Approved by: _____

Dr. Christian Sigouin

Graduate Program Director

Date: _____ 2023   _____

Dr. Pascale Sicotte, Dean

Faculty of Arts and Science

Abstract

Unraveling Post-Conflict Economic Recovery: Identifying Key Drivers of
Above-Average Growth - A Cross-Country Analysis

Ammar Al-Hammadi

This paper examines the factors influencing economic recovery in post-conflict settings, with a primary emphasis on understanding the elements that contribute to heterogeneity in growth in post-conflict countries and identifying the specific variables associated with achieving above-average growth rates. Utilizing panel data encompassing economic, social, and political variables, as well as conflict-related data from 41 countries between 1970 and 2018, the study finds that terms of trade, foreign direct investment (FDI), capital formation, and education play a crucial role in influencing economic growth. These variables have a statistically significant impact on achieving above-average growth rates in the aftermath of conflicts. However, the paper finds that constraints on executives, serving as a proxy for institutions, turned out to be insignificant in relation to post-conflict economic performance. Regarding the timing of recovery, the paper identifies an initial 7-year post-conflict transition period marked by a notable catch-up effect. These findings contribute valuable insights to the existing literature on post-conflict economic growth, enriching our understanding of the dynamics of recovery in these challenging contexts and offering potential implications for policies and interventions aimed at fostering sustainable progress and resilience.

Contents

List of Figures

List of Tables

1 Introduction

It is an irrefutable fact that civil conflicts have devastating consequences on societies, resulting in loss of life, forced displacement, and the destruction of critical infrastructures. The economic and social costs of these conflicts are profound and long-lasting. Gates et al. (2012) conducted a study on the impact of armed conflicts on the United Nations' Millennium Development Goals (MDGs), revealing that conflicts significantly hinder the achievement of key developmental targets, such as poverty reduction, education, health, and environmental sustainability. Affected countries face challenges like widespread undernourishment, limited access to education, elevated poverty rates, and inadequate healthcare. Le, Bui, and Uddin (2022) further explore the consequences of conflict by examining its short- and long-term effects on development using global panel data from 109 countries between 1996 and 2019. Their findings demonstrate that conflict intensity significantly and negatively affects long-term economic growth, life expectancy, and educational attainment. Particularly, low-income countries bear more pronounced negative consequences.

Studies investigating the impact of civil wars on economic activities suggest that civil conflict exerts a more substantial effect on private investment, approximately three to four times larger than its impact on public investment (Imai and Weinstein 2000). Collier (1999) identifies several channels through which civil conflicts affect the economy and hinder growth, including the destruction of resources and infrastructure, disruption of economic activities, diversion of public expenditure, dis-saving leading to reduced capital stock and accumulation, and portfolio substitution where capital, both human and physical, moves out of the country. The adverse effects stemming from civil wars underscore the far-reaching consequences they have on a nation's economic well-being, living standards, and the overall quality of life for its people. This highlights the critical need for a comprehensive understanding of post-conflict dynamics and recovery strategies to mitigate disruptions and foster sustainable economic growth.

Poverty and low standards of living emerge as prominent factors associated with internal civil conflicts, as low income per capita and slow economic growth increase the likelihood of conflict occurrence (Blattman and Miguel 2010, Collier and Dollar 2002). The latter half of the twentieth century witnessed a steady rise in the number of countries experiencing internal conflicts, particularly in Sub-Saharan Africa, where nearly one-third faced ongoing conflicts in the mid-1990s

(Fearon and Laitin 2003, Blattman and Miguel 2010). Addressing poverty and promoting economic growth are crucial measures to mitigate conflict risk and promote stability. Consequently, rapid recovery and development efforts become essential in reducing the risk of conflict relapse. Strengthening state institutions and improving living standards can play a pivotal role in building resilience and dissuading people from engaging in rebellions (Walter 2004).

Moreover, the aftermath of a conflict presents an opportunity for recovery and rebuilding, where societies can harness the "peace dividend" to set the country on a path towards sustainable economic progress and stability. While various policies, including foreign aid and institutions have been proposed to augment growth and expedite recovery, the specific factors driving economic growth in post-conflict settings remain subjects of ongoing debate. Therefore, the primary objective of this study is to conduct an in-depth investigation into the key determinants influencing economic growth in post-conflict situations. By specifically exploring factors such as foreign aid, terms of trade, foreign direct investment (FDI), capital formation, education, financial development, capital formation, unemployment, constraints on executives, and natural resources rents, we aim to gain a more precise understanding of the elements that contribute to variations in economic performance after conflicts and the specific variables linked to achieving higher-than-average growth rates.

The rest of this paper is organized as follows: Section 2 provides an overview of the relevant literature, Section 3 presents the data, Section 4 explains the empirical methodology used, Section 5 reports the main empirical results and provides a policy discussion in light of the findings, and Section 6 concludes the paper.

2 Literature review

In the wake of conflicts, post-conflict countries confront formidable challenges, as they must rebuild physical, human, and social capital amidst weakened state capacity, economic distortions, widespread poverty, population displacement, and high unemployment rates. These conditions heighten the risk of relapse into violence, complicating efforts to achieve lasting settlements. Nevertheless, this post-conflict period also presents economic opportunities, characterized by the potential for high returns on investment in infrastructure, growth in commodity exports, and favorable political contexts that may foster growth-enhancing reforms. Despite these prospects, post-conflict

2

economic performance shows notable variations across countries, with some experiencing robust growth while others facing stagnation or decline.

The literature on the determinants of conflict risk and post-conflict recovery provides valuable insights into the complex dynamics of countries facing social upheaval. Collier and Hoeffler (2002) contribute to this understanding by revealing a negative correlation between a country's income per capita, its growth rate, and the likelihood of falling into conflict. Moreover, they highlight that increased dependence on primary commodity exports significantly raises the risk of conflict. While aid and policy have no direct impact on conflict risk, they can indirectly reduce it by promoting economic growth and higher income levels. Using fractional differentiation to analyze shock recovery in developed and developing countries, Gil-Alana and Singh (2016) find developing countries tend to experience faster recovery from shocks, reflecting their resilience in bouncing back after crises. Furthermore, they uncover an intriguing relationship between the duration of civil wars and post-conflict recovery, suggesting that longer conflicts are associated with faster recoveries and less extensive integration.

The dynamics of post-conflict economic growth are complex and multifaceted, shaped by various policies and macroeconomic considerations. As evident from the literature, specific factors play a crucial role in determining the trajectory of countries' recovery after conflicts. Staines (2004) highlights a shift in the economic features of conflicts that emerged after the 1990s compared to earlier conflicts. Post-1990 conflicts tend to be shorter in duration, associated with deeper economic downturns, and result in slightly higher growth rates in the initial post-conflict years. He argues that Macroeconomic policies have played a crucial role in recent conflicts by cushioning the decline in output growth and facilitating initial recovery. Notably, inflation tends to decrease, and fiscal balances improve through increased revenues to accommodate higher expenditures, potentially supporting growth. David, Bastos, and Mills (2011) suggest that changes in the terms of trade play a more influential role in driving economic growth following civil wars. An increase in the terms of trade is associated with a substantial rise in the marginal probability of positive economic performance, indicating its critical importance in the recovery process.

Collier (1995) identifies two main effects of civil war on income: a direct reduction caused by resource diversion and military disruptions, and an indirect reduction resulting from the decline in the capital stock. In the aftermath of short civil wars, economies tend to rebound quickly,

leading to a significant "peace dividend." However, in prolonged civil wars, the decline in the capital stock persists, and private agents adjust their activities to minimize direct disruption costs. Consequently, the immediate benefits of peace become smaller, and recovery relies heavily on the reconstruction of the capital stock. Nevertheless, there exists potential for a delayed peace dividend through the reversal of portfolio shifts and the restoration of social capital.

The role foreign aid plays in growth within the framework of post-conflict is controversial as it could be challenging to determine the precise and definitive effect foreign aid has on growth in post-conflict settings. Some argue that it is a necessary ingredient for economic growth and stability; especially when a country's resources are limited as a result of a conflict, while others maintain that it could be more of a Band-Aid solution to complex problems, and potentially hinder development. Staines (2004) observes that while donors typically reduce aid during conflicts, they increase aid significantly in the post-conflict period, potentially contributing to alleviating severe economic contractions. Additionally, Gates et al. (2012) argue that post-conflict countries may experience a catch-up effect with accelerated economic growth, potentially attributable to international assistance. On the other hand, David, Bastos, and Mills (2011) find limited evidence of foreign aid significantly influencing economic growth in post-conflict contexts.

Using a dynamic optimization model, Demekas, McHugh, and Kosma (2002) challenge the traditional analytical tools developed for analyzing and examining the impact of conventional aid in development; arguing that these tools are inadequate within the post-conflict aid framework. They suggest that when examining the impact of aid on different economic variables in post-conflict settings, aid disbursements should be broken down into two categories: humanitarian and reconstruction, since they have different effects on investment, welfare and economic development. Reconstruction aid, for example, encourages long-term savings and growth, while humanitarian aid improves welfare and addresses the short-term needs of the recipient country but it restrains economic development. Their model predicts that the marginal productivity of reconstruction aid reduces the long-run capital stock. While reconstruction aid tends to have an ambiguous effect on labour supply, it was found to have a robust and significant effect on both savings and productivity of capital.

There is limited analysis on measuring the effectiveness of aid in poverty reduction within the framework of post-conflict. Collier and Hoeffler (2004) extend the analysis of "poverty-efficient"

that Collier and Dollar (2002) established into the post-conflict context. Examining a comprehensive data set of conflicts that occurred in 17 countries from the 1960s to 2000, they find that aid is more than twice productive in post-conflict settings and significantly more effective in augmenting growth compared to normal situations. Even though in the first three years of the post-conflict period, the absorptive capacity of aid is half compared to the rest of the first decade, historical data suggests that aid pours in during the early years after a conflict ends, and steadily decreases afterwards while it should have been rising.

In a non-conflict context, Glaeser et al. (2004) examine the causal relationship between institutions and economic growth. They emphasize the primary influence of human and social capital on economic growth, with institutions playing a secondary role. The study highlights the significance of focusing on concrete laws and rules rather than vague assessments of institutional outcomes. Additionally, they challenge the conventional notion that constraints on government are essential for property security and economic development. On the other hand, and expanding on the link between institutions and growth performance in the aftermath of civil conflict, David, Bastos, and Mills (2011) analyze data from 30 sub-Saharan African countries using panel data techniques. The study identifies institutional quality as a key explanatory variable for differences in growth performance across post-conflict episodes. Countries with limited executive discretion are more likely to experience positive growth during the post-conflict period, underscoring the critical role of effective governance and institutional stability in fostering economic recovery.

In line with this focus on institutions, Henisz (2000) establishes a clear connection between a measure of political constraints and cross-country growth rates. The study highlights the importance of credible commitment to private property rights for sustained economic growth. It identifies two channels through which political institutions impact the economy: increased uncertainty resulting from policy changes and the reallocation of resources towards political activities.

It has been argued that foreign direct investment (FDI) brings a range of advantages beyond resource utilization, including the introduction of innovative processes, learning opportunities, workforce training, and spillover effects. Alfaro et al. 2004 conducted a study using cross-country data to explore the relationship between FDI, financial markets, and economic growth. Their findings suggest that the impact of FDI alone on economic growth is uncertain. However, countries with well-developed financial markets experience significant benefits from FDI. These results re-

main robust even when considering different measures of financial market development, accounting for other factors influencing economic growth, and addressing concerns related to endogeneity.

The link between natural resources and economic growth has been explored in the literature. Excessive reliance on natural resources can have detrimental effects on long-term economic growth, affecting saving, investment, consumption, and overall output per capita. Gylfason and Zoega (2006) examine the link between natural resources and economic growth, particularly through the pathways of saving and investment. Their empirical findings reveal that a higher proportion of natural capital in a nation's wealth leads to lower accumulation of physical, human, and social capital. Moreover, the study identifies a negative correlation between economic growth and natural resource dependence while highlighting positive associations with education and investment. Furthermore, Gylfason (2006) emphasizes the necessity of successful economic diversification to reduce reliance on natural resources. He highlights the adverse effects of natural resource dependence, including reduced trade openness, limited educational opportunities, weakened institutions, corruption, inequality, and political oppression. Moreover, the empirical evidence from the cross-country study reveals a negative relationship between natural resource intensity and financial depth, indicating that countries with high natural resource dependence tend to have underdeveloped monetary and financial institutions.

As indicated above, the exploration of factors influencing economic growth performance in post-conflict scenarios remains relatively limited in the existing literature. Specifically, little is known about the factors responsible for the variation in post-conflict economic performance and the specific variables associated with achieving above-average growth rates. In this study, we aim to bridge this gap and contribute to the field by examining these crucial aspects using a dataset spanning from 1970 to 2018. By extending the temporal scope, we seek to provide a comprehensive and updated understanding of the dynamics at play during post-conflict economic recoveries and shed light on the factors contributing to above-average growth in such settings.

3   Empirical Methodology

To analyze the factors contributing to heterogeneity in economic growth performance across countries in post-conflict settings, the paper employs a comprehensive empirical framework, methodology, and specifications. The first step involves examining the variables associated with average

growth rates, followed by investigating the factors that explain supra-normal growth rates.

Average Growth Rates:

In order to evaluate economic growth performance, average GDP per capita growth rate is a commonly used measure of economic growth performance. However, this measure could be misleading in the context of post-conflict countries, as GDP is often volatile before, during and immediately after these periods of turmoil, as depicted in Figure 1 and Figure 2. These figures illustrate significant fluctuations in GDP growth rates in the selected countries, which is a common trend observed before conflicts, during their occurrence, and in the immediate aftermath. To address this issue, a smoothed average approach is adopted in this study. Specifically, for any given year in each country, the smoothed average is computed over a five-year period, including the given year, two years prior, and two years following it. For instance, to calculate the average GDP per capita growth rate for the year 2000, the growth rates of 2000, 1999, 1998, 2001, and 2002 are averaged together. This approach captures the underlying trends and smooths out short-term fluctuations, enabling a more precise evaluation of economic growth over time.

The empirical specifications presented in this section can be summarized by equation (1).

$$G_{it} = \delta_i + \beta X_{it} + \epsilon_{it}, \tag{1}$$

where:

- G_{it} represents the dependent variable, the smoothed average of GDP growth rate, which serves as an indicator of economic performance.

- X_{it} denotes a vector of growth explanatory variables.

- ϵ_{it} is a random error term.

- The subscript i refers to the country.

- The subscript t refers to time (measured in years).

The first model uses ordinary least squares (OLS) regression, as denoted by equation (1), to estimate the impact of the growth explanatory variables on the smoothed average of GDP growth rate. The coefficient δ_i captures the fixed effect of the panel unit, while the coefficient β captures

7

the impact of the growth explanatory variables on the smoothed average of GDP growth rate. The error term ϵ_{it} accounts for the random variation in the data that cannot be explained by the model. The results of this regression is reported in Table 1.

It is crucial to recognize that certain variables used in the models may be correlated with the error term, potentially introducing bias and inconsistency in the estimated coefficients. Specifically, the terms of trade variable, the capital formation to GDP ratio, the foreign direct investment (FDI), and the foreign aid are potential sources of endogeneity. To mitigate the potential bias arising from endogeneity, the paper consider several specifications that include lagged values of the regressors in the different models, following David, Bastos, and Mills (2011). By incorporating lagged values, the paper effectively uses past information as a proxy for the true values of these variables in the current period. This approach helps to mitigate the correlation between the regressors and the error term, ultimately enhancing the accuracy of our coefficient estimates.

Timing Recovery:

Indeed, it's important to acknowledge that our present analysis encompasses all post-conflict years, a time-frame that naturally includes a wide array of conditions. It could be argued that this might not precisely map the trajectory of recovery. However, it remains crucial to retain a clear focus on the primary objective of this study: understanding the factors that underlie variations in economic growth performance across post-conflict societies, especially over the long term. The inclusion of all years following conflict cessation in the post-conflict period is crucial in this pursuit.

With this objective in mind, our aim is to delve into the intricate dynamics of post-conflict recovery, delving into the transitional phase that bridges the gap between conflict and a state of peace. Our intent is to assess whether the chosen variables effectively explain growth rates during this transitional period. To explore this further, we take an additional step by investigating the timing of recovery. In doing so, we introduce an arbitrarily defined transition period spanning seven years, characterized by either the absence of conflicts or the absence of significant armed activities. This allows us to examine the impact of these early years after conflicts end on economic growth.

At the core of our analysis lies the integration of nine dummy variables into our existing OLS regression model. This augmentation enriches our analytical framework, allowing us to explore the

distinct phases an economy experiences during the intricate transition from conflict to recovery. These nine dummy variables are constructed based on the time elapsed since the conclusion of conflict or the identification of minor-intensity armed activities. The specifics of these dummies are as follow: The 'post-conflict year 1' dummy captures whether the growth episode occurs within the first year after the conflict's end. Similarly, the 'post-conflict year 2' dummy encompasses the second year following the conflict's end, and so forth for subsequent years up to 'post-conflict year 7'. The 'First 7 years post-conflict' dummy collectively reflects growth episodes within the initial seven years since the conflict's end. On the other hand, the '8+ years post-conflict' dummy pertains to growth episodes occurring from the eighth year onward. Importantly, these variables interconnect and influence one another's values. To navigate this interdependence adeptly, we individually incorporate these variables into our regression models, adhering to the methodology laid out by Collier and Hoeffler (2004). The results of this regression analysis are meticulously laid out in Table 2.

Supra-Normal Growth Rates:

To further investigate the factors associated with heterogeneity in economic growth performance across countries in post-conflict context, the paper proceeds to estimate panel Logit models. The models provide a statistical framework for analyzing discrete indicators of favorable economic performance, specifically above-average growth. The model is conditioned on a comprehensive set of explanatory variables, including: initial GDP per capita, logarithm of population, executive constraints as a measure of institutions, education, unemployment, natural resource rents, financial development, terms of trade, capital formation, FDI, and foreign aid. Table 4 provides detailed information on the construction of these variables and their respective data sources.

The panel Logit regressions adopt the general form presented by Equation 2, following the established methodology by Cox (1958).

$$Pr(Y_{it}) = \frac{e^{\beta X_{it}+\epsilon_{it}}}{1 + e^{\beta X_{it}+\epsilon_{it}}}, \tag{2}$$

where the subscript i represents the country, and t denotes the year. The equation captures the probability of economic performance being above average, and the regressions aim to estimate this probability by conditioning it on the selected explanatory variables denoted as X. In these models, the dependent variable Y_{it} indicates whether the real GDP per capita growth rate (g_{it}) in

a specific post-conflict year exceeds the previously calculated smoothed average GDP per capita, such that $Y_{it} = 1$ if $g_{it} > G_{it}$, and 0 otherwise. This approach captures the concept of growth catch-up, commonly observed in post-conflict periods, referred to as the "peace dividend." The peace dividend signifies the positive economic outcomes that result from reduced conflict and the restoration of peace and stability. It is well-documented in the literature that post-conflict societies often experience accelerated economic growth, surpassing average or median growth rates over an extended period. By employing the Logit models described in equation 2, the paper aims to identify the factors driving growth rates that exceed typical expectations. This analysis sheds light on the dynamics and potential benefits of post-conflict recovery.

The outcomes of these panel Logit models are presented in Table 3. The analysis, to be discussed in a subsequent section, sheds light on the determinants contributing to the occurrence of supra-normal growth rates in post-conflict years. The significance of the coefficient estimates for the explanatory variables helps us understand the impact of factors such as institutional measures, FDI, aid, financial development, and other variables on the likelihood of observing positive above-average growth rates.

Alternative Approach:

To validate and enhance the findings obtained from the analysis presented in Table 3 and explore alternative indicators of economic performance, the paper takes a step further by employing two additional Logit models using equation (2), following David, Bastos, and Mills (2011). These models offer an opportunity to explore alternative indicators of economic performance in the post-conflict context. Departing from the previous approach of using the smoothed average GDP per capita growth rate, the focus shifts towards capturing above-average and above-median growth rates.

In the first model, the objective is to capture above-average growth during post-conflict periods by considering the mean GDP per capita growth rate over the entire sample period for each country. The panel Logit models in this case incorporate a dependent variable, denoted as Y_{it} which indicates whether the real per capita GDP growth rate in a specific year t surpasses the mean GDP per capita growth rate from 1970 to 2018 for the respective country. If the real GDP growth rate g_{it} is greater than the mean growth rate $\bar{g}_i$, the indicator Y_{it} takes a value of 1, signifying above-average growth; otherwise, it takes a value of 0. The estimation results for these models can be found in

Table 6, providing insights into the determinants of above-average growth rates in the post-conflict period.

In the second model, the focus shifts to capturing above-median growth during post-conflict episodes. Here, the panel Logit models incorporate a dependent variable, denoted as Y_{it}, which indicates whether the real per capita GDP growth rate in a specific year t surpasses the median GDP per capita growth rate from 1970 to 2018 for the respective country. If the growth rate g_{it} exceeds the median growth rate g_i^{med}, the indicator Y_{it} takes a value of 1, indicating above-median growth; otherwise, it takes a value of 0. The estimation results for these models are presented in Table 7, shedding light on the factors associated with above-median growth rates in the aftermath of conflicts.

It's noteworthy that the outcomes derived from the mean above-average and above-median growth models largely coincide with the results attained through the smoothed average GDP per capita growth rate technique, albeit with certain disparities. The application of the smoothed average method indicates that education and capital formation lack significant effects. In contrast, employing the above-average and above-median growth rates highlights their significance as explanatory factors for growth. This discrepancy could be attributed to the smoothed average method's ability to mitigate the impact of year-to-year fluctuations, thus offering a comprehensive perspective on economic performance. This method accentuates factors that might influence growth rates, potentially unveiling connections that might not be as evident in calculations based on means and medians. Conversely, the utilization of mean and median GDP per capita growth rates for the entire sample period offers a snapshot of overarching growth trends and their associated variables. This convergence of results across different indicators reinforces the robustness and consistency of the findings. By employing multiple indicators and approaches, the paper provides a comprehensive analysis of economic growth performance in post-conflict settings, offering a nuanced understanding of the determinants and dynamics of economic recovery.

4 Data

For the empirical analysis, this paper relies on a rich dataset encompassing annual data from 1970 to 2018. This dataset comprises a wide range of economic, social, and political variables, along with conflict-related data, making it a valuable resource for our investigation. The data is sourced

from multiple reputable databases, and detailed information about the variables' definitions and sources can be found in Table 4. Additionally, a summary of statistics for the variables is presented in Table 5. With access to this comprehensive dataset, our study aims to gain a deeper insight into the factors influencing economic growth performance in post-conflict contexts and explore the dynamics of recovery in these settings.

In this empirical exploration, the primary focus is to uncover the behavioral patterns of variables in countries that have undergone post-conflict situations, with a particular emphasis on those affected by internal (or civil) conflicts. To acquire relevant information on these conflicts, the paper rely on the UCDP/PRIO armed conflict database (Version 22.1), an exhaustive compilation crafted by the Uppsala Conflict Data Program (UCDP) at Uppsala University and the International Peace Research Institute in Oslo (PRIO). The UCDP/PRIO Armed Conflict Dataset offers a clear classification of conflicts, defining them as "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." Notably, this dataset distinguishes between two levels of conflict intensity: minor armed conflicts with 25 to 999 battle-related deaths in a given year, and wars with at least 1,000 battle-related deaths occurring in a given year. It encompasses both interstate and intrastate conflicts, including civil wars and other types, providing a comprehensive understanding of the conflict landscape.

To ensure the analysis remains focused on conflicts with significant repercussions for economic performance, the paper restrict the sample to countries that have witnessed civil conflicts only with more than 1,000 battle-related deaths per year. Consequently, the sample includes both intrastate conflicts involving a government and one or more rebel groups, and internationalized intrastate conflicts where foreign governments had troops fighting with either side. On the other hand, conflicts with minor intensity, i.e., between 25 and 999 battle-related deaths in a given year, as well as other types of conflicts in the dataset, are excluded from the analysis.

The accurate definition of the post-conflict period holds utmost significance in the empirical analysis. As such, the paper define the "post-conflict period" as the time-frame commencing from the year when significant armed activities or major battles, defined as less than 1,000 battle-related deaths per year, come to a halt. This implies either the absence of conflicts or the presence of only minor armed conflicts, as delineated by the UCDP/PRIO armed conflict database mentioned

earlier. To precisely determine this period, the paper carefully assess the duration from the year following the conclusion of armed conflict or when there is a notable reduction in battle intensity. This approach enables us to pinpoint the span of stability that occur after the conclusion of a conflict. By focusing on this specific time-frame, the objective is to gain valuable insights into the timing of recovery and the capture of the peace dividend. Additionally, the paper seeks to examine the transitional phase that economies undergo, shedding light on the dynamics of economic growth performance during the period of relative peace and recovery following turbulent conflict years.

The panel consists exclusively of countries that have undergone civil conflicts, allowing for a more focused analysis of the factors impacting economic growth after internal conflicts. Through a carefully executed selection process, our dataset is composed of 41 countries, encompassing a total of 1641 post-conflict episodes. However, to ensure the accuracy and reliability of our analysis, we had to consider data availability and missing variables for certain countries, which ultimately led to a reduced number of observations, resulting in 777 post-conflict episodes. To provide a visual representation of the chosen countries and their respective conflicts duration, Figure 3 presents a comprehensive summary, depicting the timeline for each country's post-conflict period and the duration they endured before attaining a state of relative peace and recovery.

By employing these specific criteria for the dataset, the analysis can concentrate on conflicts that hold particular relevance in understanding the intricate dynamics of economic growth performance in post-conflict contexts. This approach aims to shed light on the factors that play a pivotal role in explaining economic recovery and what could lead to heterogeneity in economic growth performance across countries after periods of turmoil and conflict. As a result, our panel dataset aims to provide a comprehensive representation of the economic dynamics and challenges faced by these countries during their transition to a state of relative peace and recovery.

5   Empirical Results and Discussion

In this section, the paper present a comprehensive overview of the empirical estimations and provide a brief analysis to gain insights into two crucial aspects. Firstly, we seek to understand the factors that can explain average growth in post-conflict countries. Secondly, we aim to identify the key determinants that contribute to the disparities in growth performance across countries after experiencing social conflicts, shedding light on what could explain above-average economic

performance and the dynamics of recovery in such contexts. These results are obtained from the estimations of two equations, employing a dynamic panel data approach. Specifically, we use Ordinary Least Squares (OLS) models to analyze the determinants of Average Growth Rates and Logit models to explore the determinants of Supra-Normal Growth Rates. This comprehensive approach allows to effectively capture the intricate interactions between variables, providing us with a deeper and more profound understanding of the complex processes at play during post-conflict recovery.

The results of the (OLS) regression in Table 1 provide valuable insights into the statistical relationships between the selected variables and the 5-year smoothed average growth rate. However, interpreting these findings in economic terms requires cautious consideration. To gain a deeper understanding of their practical significance, we contextualize the results by comparing the signs and magnitudes of the coefficients to existing economic literature and theories, taking broader economic contexts into account.

Among the key findings, we observe a consistent and statistically significant negative relationship between initial GDP and average growth rates across all specifications, with a 99% Confidence Interval (CI). This implies that countries with lower initial GDP levels tend to experience faster average growth rates compared to those with higher initial GDP. This negative relationship aligns with economic growth theory, indicating that countries with lower initial GDP have a greater potential for catching-up effects and benefit from higher marginal returns on capital (Mankiw, Phelps, and Romer 1995). It is essential to note that while the results are statistically significant, the economic magnitude of the relationship is relatively small. Nevertheless, these findings reinforce the pivotal role of initial GDP in shaping economic growth trajectories in post-conflict countries.

Furthermore, the results reveal a robust and statistically significant positive association between education and economic growth. Specifically, an increase in schooling by 18% to 25% leads to, on average, a 1% increase in growth across most specifications. This compelling finding underscores the crucial role of education as a driving force behind higher average growth rates in post-conflict scenarios. The implications of this relationship are profound, as it emphasizes the significance of investing in human capital development as a strategic pathway towards achieving sustainable economic recovery.

Table 1: OLS Regression: Explanatory Variables of Average GDP growth in Post-Conflict Episodes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
					Dependent variable: GDP Average Growth rate				
Initial GDP	−0.0002***	−0.0002***	−0.0003***	−0.0003***	−0.0003***	−0.0002***	−0.0002***	−0.0002***	−0.0002***
	(0.0001)	(0.0001)	(0.00005)	(0.00005)	(0.00005)	(0.0001)	(0.0001)	(0.0001)	(0.00005)
Log (Population)	0.049	0.247*	0.002	0.003	−0.012	0.048	0.058	−0.054	−0.045
	(0.129)	(0.127)	(0.121)	(0.121)	(0.121)	(0.129)	(0.128)	(0.129)	(0.127)
Constraints on Executives	−0.550	−0.755	−0.600	−0.582	−0.536	−0.571	−0.401	−0.074	−0.317
	(0.534)	(0.514)	(0.455)	(0.455)	(0.456)	(0.538)	(0.535)	(0.536)	(0.528)
Education	0.022***	0.025***	0.019***	0.019***	0.018***	0.022***	0.022***	0.018**	0.013*
	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)	(0.007)
Unemployment	0.003	−0.004	−0.061***	−0.066***	−0.067***	0.003	0.005	−0.007	0.016
	(0.027)	(0.026)	(0.023)	(0.024)	(0.024)	(0.027)	(0.027)	(0.026)	(0.026)
Natural Resources	0.029**	0.032**	0.019*	0.012	0.011	0.028**	0.030**	0.037***	0.020
	(0.013)	(0.012)	(0.011)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Financial Development	5.367***	4.306***	3.229**	3.356**	3.419**	5.365***	5.160***	5.406***	4.823***
	(1.578)	(1.537)	(1.402)	(1.405)	(1.404)	(1.579)	(1.567)	(1.551)	(1.526)
FDI		0.069***	0.068***	0.068***	0.058***				
		(0.021)	(0.019)	(0.019)	(0.020)				
Foreign Aid			−0.096***	−0.093***	−0.092***				
			(0.015)	(0.015)	(0.015)				
Terms of Trade				−0.018	−0.023				
				(0.014)	(0.014)				
Capital Formation					2.261*				
					(1.323)				
FDI (t-1)						0.009	0.004	0.010	−0.010
						(0.025)	(0.025)	(0.025)	(0.025)
Foreign Aid (t-1)							0.044***	0.046***	0.051***
							(0.012)	(0.012)	(0.012)
Terms of Trade (t-1)								0.050***	0.045***
								(0.012)	(0.012)
Capital Formation (t-1)									7.529***
									(1.367)
Constant	−0.553	−4.295*	2.016	3.887	4.257	−0.572	−1.015	−3.687	−3.962*
	(2.354)	(2.330)	(2.261)	(2.681)	(2.686)	(2.356)	(2.340)	(2.403)	(2.358)
Observations	777	765	736	736	736	777	777	777	777
Residual Std. Error	3.438 (df = 769)	3.294 (df = 756)	2.878 (df = 726)	2.877 (df = 725)	2.873 (df = 724)	3.439 (df = 768)	3.412 (df = 767)	3.376 (df = 766)	3.313 (df = 765)
F Statistic	5.725*** (df = 7; 769)	7.133*** (df = 8; 756)	12.574*** (df = 9; 726)	11.495*** (df = 10; 725)	10.744*** (df = 11; 724)	5.020*** (df = 8; 768)	6.044*** (df = 9; 767)	7.292*** (df = 10; 766)	9.641*** (df = 11; 765)

Note: The table shows OLS regressions for the across-section of countries. Dependent variable: GDP Average, is calculated as a smoothed 5-years average GDP growth rate. See Table 4 for definitions of the variables. Data on civil conflicts uses the UCDP/PRIO armed conflict database (Version 22.1). Sample period: 1970–2018. Robust Standard errors are in parenthesis. Significance levels: $^*p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Moreover, the data indicates a significant and negative correlation between unemployment and average growth rates, particularly when considering the impact of foreign aid, terms of trade, and capital formation variables. This suggests that lower unemployment rates are associated with more favorable economic growth outcomes, specifically when accounting for these influential factors. Understanding this negative relationship is critical, as unemployment can result in reduced productivity and the underutilization of human capital. When individuals remain unemployed, their skills and potential contributions to the economy remain untapped, hindering overall economic performance.

The literature presents a mixed body of evidence concerning the role of natural resources in economic growth. It is argued that in some cases, a negative relationship is observed, where natural resources can fuel conflict and corruption or affect growth through lower accumulation of physical, human, and social capital, impeding growth prospects (Gylfason and Zoega 2006). Interestingly, our analysis of natural resource rents reveals a distinct perspective. We find a positive and statistically significant association, especially when considering the impact of foreign direct investments (FDI) and foreign aid. This positive relationship persists even when lagged variables of FDI, foreign aid, and terms of trade are included. These results suggest that countries endowed with higher natural resource rents tend to experience above-average growth rates, particularly in light of foreign investments and aid over time. Contrary to the conventional negative view, our findings suggest that judiciously managed natural resources can be leveraged to drive economic growth during the post-conflict period.

The positive and statistically significant relationship observed between financial development and average growth rates across all specifications highlights the crucial role of a well-developed financial sector in driving economic recovery during the post-conflict period. Financial development, encompassing progress in financial institutions and markets in terms of depth, access, and efficiency, plays a crucial role in fostering economic growth. It's not a secret that a well-developed financial system enables more efficient capital allocation, which, in turn, leads to increased productivity and economic expansion. By facilitating access to credit and efficiently mobilizing savings, a strong financial sector empowers businesses and individuals to invest in productive ventures, thus contributing to overall economic growth.

While foreign direct investment (FDI) consistently emerges as a positive and statistically sig-

nificant factor across all specifications, indicating its instrumental role in driving stronger average growth rates during the post-conflict period, foreign aid presents a contrasting pattern. It displays a negative and statistically significant relationship at a 99% CI in all specifications, suggesting that higher levels of foreign aid are associated with lower average growth rates during the post-conflict phase. This seemingly counter-intuitive finding could potentially be attributed to the complex dynamics between foreign aid and the severity of conflicts. Countries ravaged by more intense conflicts, characterized by higher casualties and substantial capital destruction, might attract greater foreign aid in the immediate aftermath as part of the international community's response to the crisis. This influx of aid, while crucial for immediate relief and recovery efforts, could lead to a negative correlation with GDP growth due to the challenges of effective utilization and potential distortions. However, a noteworthy finding arises when considering the lagged foreign aid variable, revealing a positive and statistically significant relationship at a 99% CI in all specifications. This suggests that past foreign aid positively influences average growth rates in subsequent years. These findings highlight the nuanced nature of foreign aid's impact on post-conflict economic recovery. While the immediate effects of foreign aid could exhibit a negative relationship due to potential endogeneity and allocation issues, the long-term benefits become more pronounced when accounting for the cumulative impact of foreign aid assistance over time.

The results regarding terms of trade are intriguing; the variable itself appears to be insignificant, but when we consider the lagged terms of trade, a positive and statistically significant relationship emerges at a 99% CI. This suggests that favorable terms of trade, particularly when sustained over time, contribute to higher average growth rates during the post-conflict period. This finding underscores the importance of trade dynamics in driving economic recovery in these contexts.

Moving on to capital formation, we observe a positive and statistically significant association at a 90% CI. Moreover, when examining the impact of lagged capital formation, we find a stronger relationship with a coefficient nearly three times higher, and also statistically significant at a 99% CI. These results indicate that both current and past levels of capital formation significantly impact average growth rates during the post-conflict phase, emphasizing the critical role of investment in physical capital for post-conflict economic recovery.

Table 2: OLS Regression: Timing Recovery

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
					Dependent variable: GDP Average Growth rate				
Initial GDP	−0.0003***	−0.0003***	−0.0003***	−0.0003***	−0.0003***	−0.0003***	−0.0003***	−0.0002***	−0.0003***
	(0.00005)	(0.00005)	(0.00005)	(0.00005)	(0.00005)	(0.00005)	(0.00005)	(0.00005)	(0.00005)
Log (Population)	−0.013	−0.016	−0.020	−0.021	−0.014	−0.009	−0.013	−0.054	−0.013
	(0.122)	(0.122)	(0.121)	(0.121)	(0.121)	(0.121)	(0.121)	(0.121)	(0.123)
Constraints on Executives	−0.536	−0.527	−0.513	−0.514	−0.508	−0.539	−0.534	−0.442	−0.538
	(0.456)	(0.456)	(0.455)	(0.455)	(0.455)	(0.456)	(0.456)	(0.453)	(0.457)
Education	0.018***	0.019***	0.018***	0.018***	0.018***	0.018***	0.018***	0.018***	0.019***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Unemployment	−0.067***	−0.068***	−0.068***	−0.067***	−0.067***	−0.067***	−0.067***	−0.074***	−0.067***
	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.023)	(0.025)
Natural Resources	0.011	0.011	0.012	0.011	0.011	0.010	0.011	0.013	0.011
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.012)	(0.013)
Financial Development	3.424**	3.440**	3.363**	3.385**	3.304**	3.376**	3.410**	3.419**	3.438**
	(1.408)	(1.405)	(1.402)	(1.401)	(1.404)	(1.404)	(1.405)	(1.394)	(1.436)
FDI	0.058***	0.058***	0.058***	0.059***	0.059***	0.059***	0.058***	0.061***	0.058***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.019)	(0.020)
Foreign Aid	−0.092***	−0.092***	−0.095***	−0.095***	−0.095***	−0.092***	−0.092***	−0.103***	−0.092***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Terms of Trade	−0.023	−0.023	−0.024*	−0.025*	−0.023	−0.024*	−0.024*	−0.028**	−0.023
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Capital Formation	2.262*	2.288*	2.407*	2.395*	2.341*	2.323*	2.288*	2.784**	2.275*
	(1.324)	(1.325)	(1.323)	(1.321)	(1.322)	(1.324)	(1.324)	(1.322)	(1.341)
Post-conflict year 1	0.028								
	(0.491)								
Post-conflict year 2		0.241							
		(0.526)							
Post-conflict year 3			1.085*						
			(0.592)						
Post-conflict year 4				1.254**					
				(0.601)					
Post-conflict year 5					1.068*				
					(0.629)				
Post-conflict year 6						0.679			
						(0.599)			
Post-conflict year 7							0.375		
							(0.611)		
First 7 years post-conflict								0.868***	
								(0.255)	
8+ years post-conflict									−0.015
									(0.235)
Constant	4.260	4.320	4.407	4.537*	4.335	4.284	4.322	5.141*	4.281
	(2.688)	(2.691)	(2.683)	(2.683)	(2.683)	(2.685)	(2.689)	(2.679)	(2.713)
Observations	736	736	736	736	736	736	736	736	736
Residual Std. Error (df = 723)	2.875	2.875	2.868	2.866	2.869	2.872	2.874	2.852	2.875
F Statistic (df = 12; 723)	9.835***	9.855***	10.161***	10.257***	10.114***	9.959***	9.871***	10.955***	9.835***

Note: The table shows OLS regressions for the across-section of countries. Dependent variable: GDP Average, is calculated as a smoothed 5-years average GDP growth rate. Post-conflict year 1-7, First 7 years post-conflict and 8+ years post-conflict are time dummies. Data on civil conflicts uses the UCDP/PRIO armed conflict database (Version 22.1). Sample period: 1970–2018 .Robust Standard errors are in parenthesis. Significance levels: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Finally, the variable "Constraints on Executives," serving as a proxy for institutions, displayed a negative but insignificant relationship in all specifications. This suggests that the level of institutional constraints on executive power does not have a significant impact on average growth rates during the post-conflict period in the countries analyzed. In other words, while institutions play a vital role in shaping a country's economic development, the specific measure used in this analysis, "Constraints on Executives," did not demonstrate a statistically significant relationship with average growth rates in the aftermath of conflicts. It is essential to note that the insignificance of this variable in the regressions may not necessarily imply the absence of institutional influence on post-conflict economic performance. Other institutional factors not included in the analysis or interactions between variables might have a more pronounced effect on average growth rates.

Examining the timing of post-conflict recovery and the subsequent transition period holds key insights into the process of rebuilding economies. This investigation enables us to discern how the variables under examination contribute to growth rates during these pivotal transition years, providing a deeper understanding of the mechanisms that influence economic recovery following a conflict. To further investigate this matter, we replicate column (5) from Table 1 and introduce nine dummy variables to analyze the time-profile of the recovery period. The outcomes of this regression analysis are presented in Table 2. It's important to approach the interpretation of results with a particular consideration as the coefficient of a given dummy in a specific year captures not only the effect of that particular dummy but also the influence of the preceding years for which the coefficients are likely to be non-zero, as emphasized by Collier and Hoeffler (2004).

The time dummies corresponding to post-conflict years 1 and 2 yield coefficients that lack statistical significance. In contrast, year 3 and year 5 exhibit significance at the ten percent level, while year 4's significance is at the five percent level. In the third year post-conflict, the economy experiences, on average, a growth rate of 1.08%, which rises to 1.25% in the fourth year before slightly declining to 1.07% in the fifth year. Year 6 and year 7, however, yield insignificant results. To further examine this trend, we opt for two dummy variables instead of the year-specific dummies. The first dummy captures growth episodes within the initial 7 years post-conflict, while the second focuses on the period after the eighth year. Notably, the 'First 7 years post-conflict' dummy emerges as remarkably statistically significant at the one percent level. Its coefficient implies that, on average, the economy grows by 0.87% during this initial 7-year post-conflict phase. Worth noting is that, in the model featuring the 'First 7 years' dummy, the variable "Capital Formation"

attains statistical significance at the five percent level, underscoring its pivotal role in post-conflict economic recovery and reconstruction.

This recovery pattern isn't inherently unexpected. In the initial aftermath of conflict, numerous uncertainties are likely to prevail, and fundamental governmental functions may still need re-establishment. If peace endures, a catch-up phase follows, yet this momentum gradually subsides, causing the economy to return to its long-term growth trajectory. This sequence of recovery dynamics is anticipated due to the complex factors influencing post-conflict economic restoration.

Table 3 presents the results of the Logit models, offering valuable insights into the disparities in growth performance across countries after experiencing internal conflicts. These models shed light on the factors that could explain above-average economic performance and the dynamics of recovery in such contexts. By exploring the determinants of above-average growth rates, the Logit models contribute to a deeper understanding of the factors that lead to more robust economic recoveries in post-conflict countries.

The results of the models suggest that natural resources rents and terms of trade have a statistically significant impact on above-average post-conflict growth in almost all specifications, including models with contemporaneous and lagged variables. Additionally, foreign aid exhibits a statistically significant and negative effect in two specifications, at the ten percent and five percent levels. Furthermore, financial development shows a statistically significant effect at the five percent level in the specification where FDI is included and when some lagged variables are included as well.

These findings suggest that countries with abundant natural resources and favorable terms of trade are more likely to experience above-average growth after a conflict. This is likely because these countries have access to resources that can be utilized to finance reconstruction and productive investments. On the other hand, financial development emerges as a key factor in promoting robust economic growth in post-conflict countries. This is likely because financial development facilitates the mobilization of domestic savings and their allocation into productive investments, contributing to long-term economic growth and stability as explained earlier.

Table 3: Logit Regression: Determinants of Above-Average GDP Growth in Post-Conflict Episodes

	Dependent variable:Above Average GDP Growth								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Initial GDP	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
Log (Population)	−0.031*	−0.029	−0.035*	−0.035*	−0.034	−0.031*	−0.032*	−0.038**	−0.038**
	(0.019)	(0.019)	(0.021)	(0.021)	(0.021)	(0.019)	(0.019)	(0.019)	(0.019)
Constraints on Executives	−0.063	−0.074	−0.062	−0.071	−0.075	−0.069	−0.080	−0.063	−0.067
	(0.077)	(0.078)	(0.078)	(0.078)	(0.078)	(0.078)	(0.078)	(0.079)	(0.079)
Education	0.002	0.002	0.001	0.002*	0.002*	0.002	0.002	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Unemployment	−0.002	−0.002	−0.001	0.001	0.001	−0.002	−0.002	−0.002	−0.002
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Natural Resources	0.003*	0.003*	0.004**	0.008***	0.008***	0.003*	0.003	0.003*	0.003
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Financial Development	0.375	0.383*	0.313	0.254	0.248	0.374	0.387*	0.399*	0.392*
	(0.228)	(0.232)	(0.242)	(0.240)	(0.240)	(0.228)	(0.228)	(0.228)	(0.229)
FDI		0.003	0.003	0.003	0.003				
		(0.003)	(0.003)	(0.003)	(0.003)				
Foreign Aid			−0.003	−0.005*	−0.005**				
			(0.003)	(0.003)	(0.003)				
Terms of Trade				0.008***	0.009***				
				(0.002)	(0.002)				
Capital Formation					−0.204				
					(0.226)				
FDI (t-1)						0.003	0.003	0.003	0.003
						(0.004)	(0.004)	(0.004)	(0.004)
Foreign Aid (t-1)							−0.003	−0.003	−0.003
							(0.002)	(0.002)	(0.002)
Terms of Trade (t-1)								0.003	0.002
								(0.002)	(0.002)
Capital Formation (t-1)									0.101
									(0.205)
Constant	0.789**	0.752**	0.870**	0.004	−0.029	0.784**	0.812**	0.676*	0.673*
	(0.340)	(0.351)	(0.389)	(0.458)	(0.460)	(0.340)	(0.340)	(0.353)	(0.353)
Observations	777	765	736	736	736	777	777	777	777
Residual Std. Error	0.497 (df = 769)	0.496 (df = 756)	0.496 (df = 726)	0.492 (df = 725)	0.492 (df = 724)	0.497 (df = 768)	0.496 (df = 767)	0.496 (df = 766)	0.496 (df = 765)
F Statistic	2.509** (df = 7; 769)	2.420** (df = 8; 756)	2.386** (df = 9; 726)	3.415*** (df = 10; 725)	3.178*** (df = 11; 724)	2.257** (df = 8; 768)	2.286** (df = 9; 767)	2.266** (df = 10; 766)	2.080** (df = 11; 765)

Note:The table reports Logit regressions for the across-section of countries. Dependent variable: Above Average GDP Growth, takes the value of one if real GDP growth rate at a given year exceeds the 5-year smoothed average GDP growth rate, and it takes zero otherwise. See Table 4 for definitions of the variables. Data on civil conflicts uses the UCDP/PRIO armed conflict database (Version 22.1). Sample period: 1970–2018 .Robust Standard errors are in parenthesis. Significance levels: *p < 0.1; **p < 0.05; ***p < 0.01.

The analysis explored alternative approaches to calculating the dependent variable and the results are presented in Table 6 and Table 7 in the appendix. Two alternative indicators of economic performance were considered: the average growth rate over the entire sample period for each country (instead of the 5-year average) in the first alternative, and the median growth rate over the entire sample period for each country in the second alternative. These approaches aimed to validate the robustness of the previous findings and serve as sensitivity tests.

The findings from Table 6 align with those from Table 3 to some extent. Terms of trade continues to exhibit a statistically significant impact on above-average post-conflict growth at the five percent level, and lagged terms of trade remains significant at the ten percent level. Similarly, foreign aid shows a statistically significant and negative effect at the ten percent and five percent levels. However, differences emerge when compared to Table 3. FDI, which did not show statistical significance in all specifications before, now exhibits a statistically significant impact on above-average post-conflict growth at the ten percent level in three specifications in Table 6 and at the five level in Table 7.

In this alternative analysis, the role of capital formation also stands out. Lagged Capital Formation shows a statistically significant impact at the 99% CI with a relatively high magnitude in both analysis, indicating its significance in driving above-average growth rates during the post-conflict period. Additionally, the relationship between initial GDP and post-conflict growth remains consistently negative and significant across all specifications, albeit with varying levels of confidence. Education also appears as a significant factor, with a statistically significant impact at the one percent level in all specifications in both analysis, reaffirming its critical role in fostering economic recovery and growth in conflict-affected countries.

These findings suggest that the determinants of above-average post-conflict growth are complex and can vary depending on the specific indicator of performance used. However, the results of Tables 2, 5, and 6 consistently point to certain factors, such as terms of trade, FDI, lagged capital formation, and education, being associated with above-average growth in post-conflict settings. This consistency reinforces the importance of these factors in driving economic recovery and development in the aftermath of civil conflicts.

6 Conclusion

Civil conflicts have devastating consequences on societies, inflicting loss of life, displacements, and infrastructural destruction, leading to significant economic and social costs. The existing literature strongly supports the notion that conflicts impede the achievement of developmental goals, resulting in challenges such as undernourishment, limited access to education, elevated poverty rates, and inadequate healthcare, especially in low-income nations. In light of these implications, fostering economic growth becomes paramount to mitigating conflict risks and promoting stability.

This paper undertakes a rigorous investigation of the determinants of economic growth performance in post-conflict contexts, with a particular focus on understanding the factors contributing to variations in economic recovery and identifying specific variables linked to achieving above-average growth rates. Through the utilization of panel data spanning 41 countries from 1970 to 2018, our empirical study uncovers several key determinants associated with above-average growth rates in the aftermath of civil conflicts. Notably, terms of trade, foreign direct investment (FDI), capital formation, and education consistently emerge as critical drivers of economic recovery and development in post-conflict settings. However, we find that constraints on executives, serving as a proxy for institutions, turned out to be insignificant. These findings demonstrate the robustness of our analysis, as alternative models also reinforce the significance of these factors in capturing post-conflict economic performance.

Based on the findings of this study, specific policy recommendations can be formulated to foster sustainable economic growth and recovery in post-conflict nations. Policymakers should recognize the potential for commodity export booms in post-conflict environments and leverage favorable terms of trade. To capitalize on positive movements in the terms of trade, countries should implement structural reforms that promote export diversification and increase competitiveness in the international market. By enhancing productive structures and resource utilization, countries can better seize opportunities presented by favorable terms of trade.

Additionally, attracting and retaining foreign direct investment (FDI) should be a priority, and investment agencies can be established to offer fiscal and financial incentives. Creating an attractive investment climate through improved regulatory environments and reduced business costs will encourage FDI inflows. Policymakers must also emphasize the broader benefits of FDI,

including knowledge transfer, labor force training, and spillover effects, contributing to growth and development.

While constraints on executives were found to be insignificant in our study, institutions remain crucial for post-conflict economic recovery. Post-conflict environments offer a unique opportunity for rapid institutional change, and policymakers should capitalize on this moment to strengthen institutional quality. Addressing capacity constraints and fostering improvements in institutional frameworks will expedite progress towards sustainable growth and development. Policymakers should prioritize efforts to enhance governance structures, establish the rule of law, and promote transparency and accountability. A stable and predictable institutional framework will provide the necessary stability for sustainable economic development in the long term.

In summary, the findings offer valuable and actionable insights for policymakers in post-conflict nations. It is essential to consider the context-specific factors that can significantly impact economic growth in these settings. By implementing targeted policies to leverage favorable terms of trade, attract foreign direct investment, and foster rapid institutional improvements, countries can significantly enhance their prospects for sustainable progress and resilience in the aftermath of civil conflicts. These recommendations complement existing literature, providing nuanced policy directions that aim to promote inclusive and resilient growth in these challenging contexts.

While this study provides insights into post-conflict economic growth dynamics, it is essential to acknowledge certain limitations. Future research could explore how institutional factors interact with the identified determinants to strengthen the recovery process using different dataset and/or techniques. Additionally, conducting qualitative studies on individual post-conflict countries could offer context-specific policy recommendations for sustainable development. Addressing these limitations and conducting further research will contribute to more effective policies and interventions promoting lasting peace and prosperity in post-conflict nations.

References

Alfaro, Laura, Areendam Chanda, Sebnem Kalemli-Ozcan, and Selin Sayek. 2004. "FDI and economic growth: the role of local financial markets." *Journal of international economics* 64 (1): 89–112.

Blattman, Christopher, and Edward Miguel. 2010. "Civil war." *Journal of Economic literature* 48 (1): 3–57.

Collier, Paul. 1995. "Civil war and the economies of the peace dividend."

————. 1999. "On the economic consequences of civil war." *Oxford economic papers* 51 (1): 168–183.

Collier, Paul, and David Dollar. 2002. "Aid allocation and poverty reduction." *European economic review* 46 (8): 1475–1500.

Collier, Paul, and Anke Hoeffler. 2002. "Aid, policy and peace: Reducing the risks of civil conflict." *Defence and Peace Economics* 13 (6): 435–450.

————. 2004. "Aid, policy and growth in post-conflict societies." *European economic review* 48 (5): 1125–1145.

Cox, David R. 1958. "The regression analysis of binary sequences." *Journal of the Royal Statistical Society: Series B (Methodological)* 20 (2): 215–232.

David, Antonio, Fabiano Rodrigues Bastos, and Marshall Mills. 2011. "Post-Conflict Recovery: Institutions, Aid, or Luck?" *IMF Working Papers,* nos. 11-149.

Demekas, Dimitri G, Jimmy McHugh, and Theodora Kosma. 2002. "The Economics of Post Conflict Aid." *IMF Working Papers* 2002 (198).

Fearon, James D, and David D Laitin. 2003. "Ethnicity, insurgency, and civil war." *American political science review* 97 (1): 75–90.

Gates, Scott, Håvard Hegre, Håvard Mokleiv Nygård, and Håvard Strand. 2012. "Development consequences of armed conflict." *World Development* 40 (9): 1713–1722.

Gil-Alana, Luis A, and Prakarsh Singh. 2016. "Growth recovery after civil conflict: a fractional integration approach." *Defence and Peace Economics* 27 (4): 453–479.

Glaeser, Edward L, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer. 2004. "Do institutions cause growth?" *Journal of economic Growth* 9:271–303.

Gylfason, Thorvaldur. 2006. "Natural resources and economic growth: From dependence to diversification." *Economic liberalization and integration policy: Options for Eastern Europe and Russia,* 201–231.

Gylfason, Thorvaldur, and Gylfi Zoega. 2006. "Natural resources and economic growth: The role of investment." *World Economy* 29 (8): 1091–1115.

Henisz, Witold J. 2000. "The institutional environment for economic growth." *Economics & Politics* 12 (1): 1–31.

Imai, Kosuke, and Jeremy M Weinstein. 2000. "Measuring the economic impact of civil war." *CID Working Paper Series.*

Le, Thai-Ha, Manh-Tien Bui, and Gazi Salah Uddin. 2022. "Economic and social impacts of conflict: A cross-country analysis." *Economic Modelling* 115:105980.

Mankiw, N Gregory, Edmund S Phelps, and Paul M Romer. 1995. "The growth of nations." *Brookings papers on economic activity* 1995 (1): 275–326.

Staines, Andrew. 2004. "Economic Performance Over the Conflict Cycle." *IMF Working Papers* 2004 (095).

Walter, Barbara F. 2004. "Does conflict beget conflict? Explaining recurring civil war." *Journal of peace research* 41 (3): 371–388.

7 Appendix
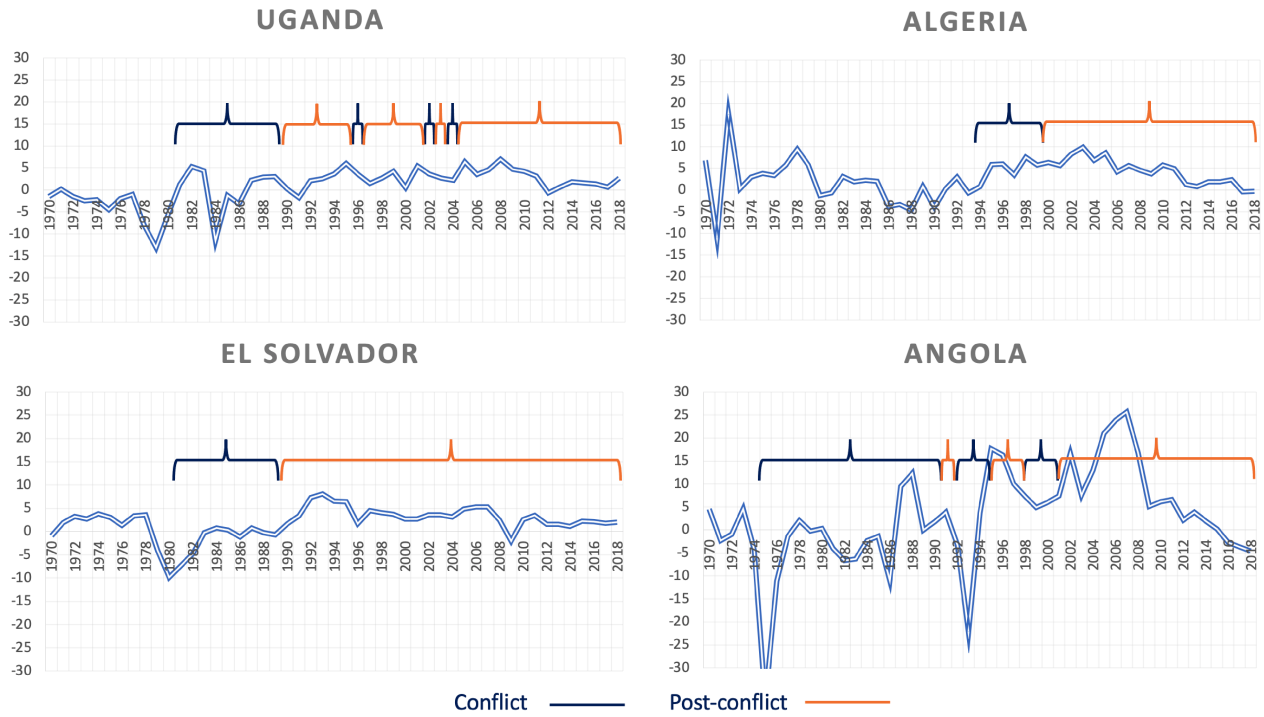
Figure 1: Selected countries with sustained high growth rates in the post-conflict period
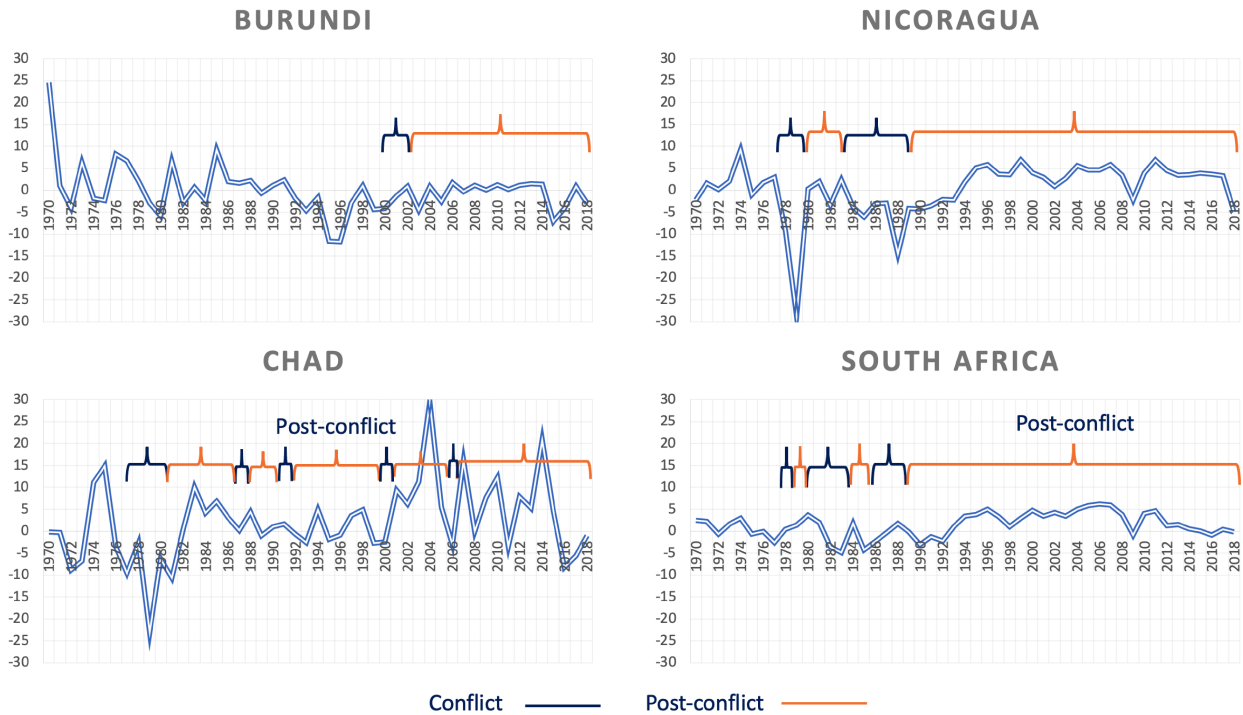
Figure 2: Selected countries with moderate or negative growth rates during the post-conflict period

These figures present the real GDP per capita growth rates, measured in purchasing power parity (PPP) terms, for a selection of post-conflict countries. It showcases countries with sustained high growth rates as well as those with moderate or negative growth rates during the post-conflict period. The data source for this analysis is the Maddison Project Database (2020), and the UCDP/PRIO armed conflict database (Version 22.1).
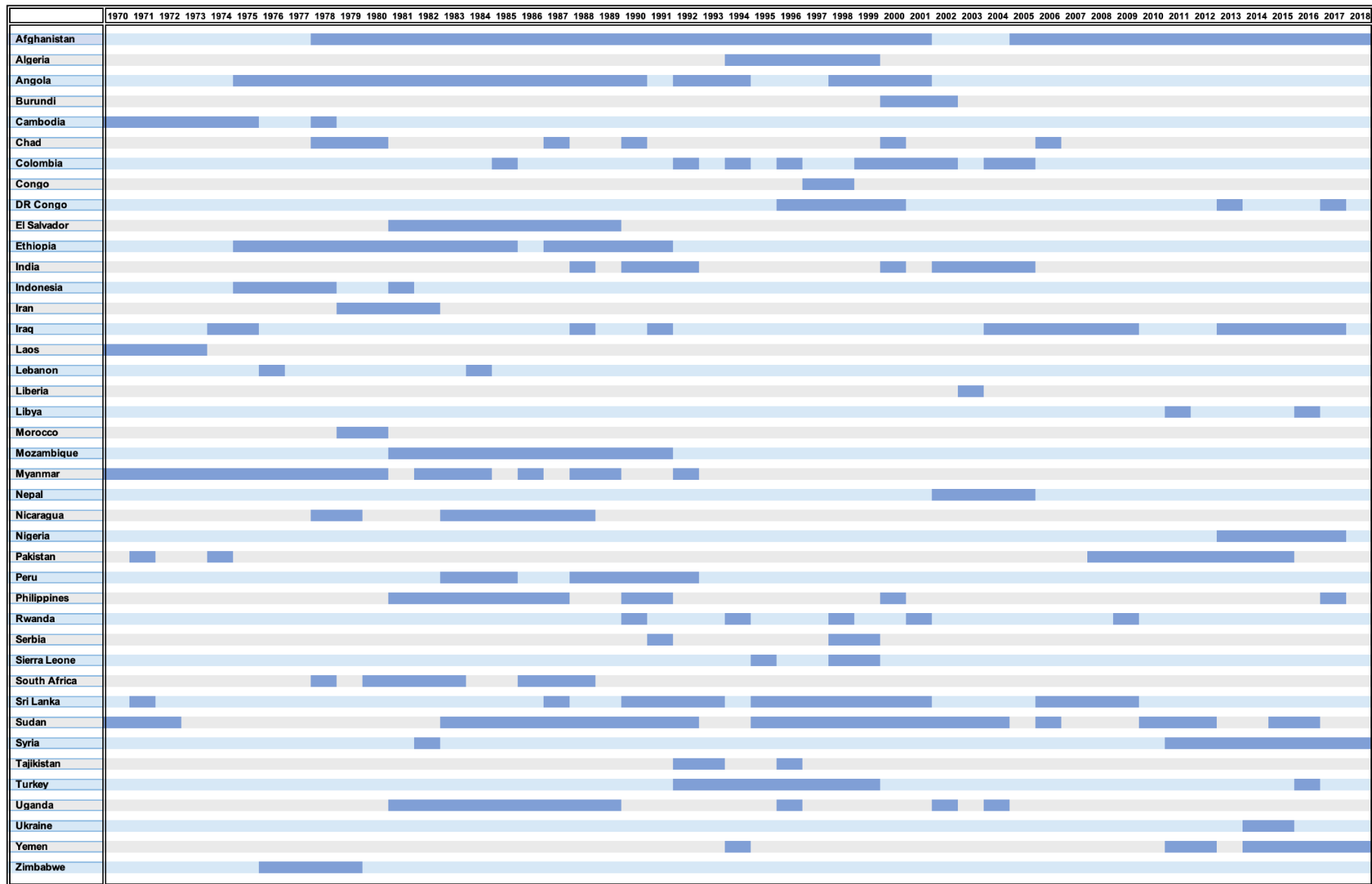
Figure 3: Conflicts Duration

Data from the UCDP/PRIO armed conflict database (Version 22.1). The analysis is limited to i) Conflicts with major intensity level i.e. 1000 battle-related deaths or more in a given year, ii) Intrastate conflicts, where a government is one side, and one or more rebel groups is the other side, and iii) Internationalized intrastate conflicts, similar to intrastate conflicts added to it the involvement of foreign governments with troops fighting with either side.

Table 4: Variable Definitions

Variable	Description/Notes	Source
Growth Rate	Real GDP per capita growth rate expressed in PPP terms.	Maddison Project Database 2020
Education	School enrollment, primary gross enrollment ratio as a percentage.	World Development Indicators
Unemployment	Unemployment, total (% of total labor force).	International Labour Organization
Log (Population)	Natural logarithm of the population.	World Bank
Constraints on Executives	Judicial constraints on the executive index.	Worldwide Governance Indicators
Natural Resources Rents	Total natural resources rents as a percentage of GDP.	World Bank
Financial Development	An index summarizing the development of financial institutions and financial markets in terms of their depth, access, and efficiency.	International Monetary Fund
FDI	Foreign direct investment, net inflows as a percentage of GDP.	World Development Indicators
Foreign Aid	Net Official Development Assistance (ODA) received as a percentage of Gross National Income (GNI).	World Development Indicators
Terms of Trade	Commodity terms-of-trade index: Individual Commodities Weighted by Ratio of Net Exports to GDP.	International Monetary Fund
Capital Formation	Share of gross capital formation at current PPPs.	World Development Indicators

Table 5: Summary Statistics

Variable	Min	Max	Std.Dev	Mean	Observations
Log (Population)	14.06	20.98	1.26	16.88	1573
Constraints on Executives	0.02	0.89	0.25	0.38	1544
Education	15.03	149.96	24.25	96.28	1251
Unemployment	0.14	24.22	5.53	7.54	1045
Natural Resources	0.00	67.44	12.58	11.17	1445
Financial Development	0.00	0.64	0.12	0.16	1233
FDI	-10.72	103.34	6.36	2.61	1416
Foreign Aid	-0.27	94.95	9.78	6.13	1324
Terms of Trade	36.90	119.87	13.21	96.43	1544
Capital Formation	-0.10	0.84	0.10	0.17	1514

Table 6: Logistic Regression: Determinants of Above-Average GDP Growth in Post-Conflict Episodes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
					Dependent variable: Above-Average Growth				
Initial GDP	−0.00002**	−0.00001**	−0.00001*	−0.00001*	−0.00001*	−0.00002**	−0.00002**	−0.00002**	−0.00002**
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
Log (Population)	−0.011	−0.00003	−0.006	−0.007	−0.007	−0.011	−0.011	−0.018	−0.018
	(0.018)	(0.018)	(0.020)	(0.020)	(0.020)	(0.018)	(0.018)	(0.018)	(0.018)
Constraints on Executives	−0.005	−0.022	−0.026	−0.031	−0.029	−0.004	−0.013	0.008	−0.011
	(0.073)	(0.073)	(0.074)	(0.074)	(0.074)	(0.074)	(0.074)	(0.075)	(0.075)
Education	0.005***	0.005***	0.005***	0.005***	0.005***	0.005***	0.005***	0.005***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Unemployment	0.002	0.001	−0.0002	0.001	0.001	0.002	0.002	0.001	0.003
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Natural Resources	0.001	0.001	−0.00003	0.002	0.002	0.001	0.001	0.001	−0.0003
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Financial Development	0.092	0.046	−0.101	−0.135	−0.133	0.092	0.103	0.119	0.074
	(0.217)	(0.220)	(0.228)	(0.228)	(0.228)	(0.217)	(0.217)	(0.216)	(0.216)
FDI		0.006*	0.005*	0.005*	0.005				
		(0.003)	(0.003)	(0.003)	(0.003)				
Foreign Aid			−0.004*	−0.005**	−0.005**				
			(0.002)	(0.002)	(0.002)				
Terms of Trade				0.005**	0.005**				
				(0.002)	(0.002)				
Capital Formation					0.076				
					(0.215)				
FDI (t-1)						−0.001	−0.0002	0.0001	−0.001
						(0.003)	(0.003)	(0.003)	(0.004)
Foreign Aid (t-1)							−0.002	−0.002	−0.002
							(0.002)	(0.002)	(0.002)
Terms of Trade (t-1)								0.003*	0.003*
								(0.002)	(0.002)
Capital Formation (t-1)									0.579***
									(0.193)
Constant	0.340	0.136	0.356	−0.152	−0.140	0.341	0.364	0.194	0.173
	(0.323)	(0.333)	(0.367)	(0.434)	(0.436)	(0.323)	(0.324)	(0.335)	(0.334)
Observations	777	765	736	736	736	777	777	777	777
Residual Std. Error	0.472 (df = 769)	0.470 (df = 756)	0.467 (df = 726)	0.466 (df = 725)	0.466 (df = 724)	0.472 (df = 768)	0.472 (df = 767)	0.471 (df = 766)	0.469 (df = 765)
F Statistic	4.708*** (df = 7; 769)	4.688*** (df = 8; 756)	4.286*** (df = 9; 726)	4.350*** (df = 10; 725)	3.961*** (df = 11; 724)	4.117*** (df = 8; 768)	3.882*** (df = 9; 767)	3.866*** (df = 10; 766)	4.368*** (df = 11; 765)

Note: The table reports Logit regressions for the across-section of countries. Dependent variable: Above Average Growth, takes the value of one if real GDP growth rate at a given year exceeds the mean GDP per capita growth rate over the entire sample period for each country, and it takes zero otherwise. See Table 4 for definitions of the variables. Data on civil conflicts uses the UCDP/PRIO armed conflict database (Version 22.1). Sample period: 1970–2018 . Robust Standard errors are in parenthesis. Significance levels: $^*p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table 7: Logistic Regression: Determinants of Above-Median GDP Growth in Post-Conflict Episodes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
			Dependent variable:Above-Median Growth						
Initial GDP	−0.00001	−0.00001	−0.00001	−0.00001	−0.00001	−0.00001	−0.00001	−0.00001	−0.00001
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
Log (Population)	−0.012	0.001	−0.008	−0.009	−0.010	−0.013	−0.013	−0.021	−0.020
	(0.018)	(0.019)	(0.020)	(0.020)	(0.020)	(0.018)	(0.018)	(0.019)	(0.018)
Constraints on Executives	−0.013	−0.031	−0.030	−0.036	−0.033	−0.019	−0.022	0.002	−0.019
	(0.075)	(0.075)	(0.076)	(0.076)	(0.076)	(0.076)	(0.076)	(0.077)	(0.077)
Education	0.005***	0.005***	0.005***	0.005***	0.005***	0.005***	0.005***	0.005***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Unemployment	−0.003	−0.003	−0.005	−0.003	−0.003	−0.003	−0.003	−0.004	−0.002
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Natural Resources	0.001	0.001	0.001	0.004*	0.003*	0.001	0.001	0.002	0.0002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Financial Development	0.014	−0.034	−0.129	−0.171	−0.168	0.013	0.016	0.034	−0.018
	(0.223)	(0.225)	(0.234)	(0.234)	(0.234)	(0.223)	(0.223)	(0.223)	(0.222)
FDI		0.007**	0.007**	0.007**	0.006*				
		(0.003)	(0.003)	(0.003)	(0.003)				
Foreign Aid			−0.005*	−0.006**	−0.006**				
			(0.003)	(0.003)	(0.003)				
Terms of Trade				0.006***	0.006**				
				(0.002)	(0.002)				
Capital Formation					0.132				
					(0.221)				
FDI (t-1)						0.003	0.003	0.003	0.002
						(0.004)	(0.004)	(0.004)	(0.004)
Foreign Aid (t-1)							−0.001	−0.0005	−0.0001
							(0.002)	(0.002)	(0.002)
Terms of Trade (t-1)								0.004**	0.003*
								(0.002)	(0.002)
Capital Formation (t-1)									0.667***
									(0.199)
Constant	0.330	0.081	0.331	−0.293	−0.271	0.324	0.331	0.136	0.112
	(0.332)	(0.342)	(0.378)	(0.446)	(0.448)	(0.332)	(0.333)	(0.345)	(0.343)
Observations	777	765	736	736	736	777	777	777	777
R^2	0.037	0.047	0.053	0.062	0.062	0.038	0.038	0.044	0.058
Adjusted R^2	0.029	0.037	0.041	0.049	0.048	0.028	0.027	0.031	0.044
Residual Std. Error	0.485 (df = 769)	0.483 (df = 756)	0.481 (df = 726)	0.479 (df = 725)	0.479 (df = 724)	0.485 (df = 768)	0.486 (df = 767)	0.484 (df = 766)	0.481 (df = 765)
F Statistic	4.256*** (df = 7; 769)	4.697*** (df = 8; 756)	4.493*** (df = 9; 726)	4.752*** (df = 10; 725)	4.349*** (df = 11; 724)	3.799*** (df = 8; 768)	3.389*** (df = 9; 767)	3.510*** (df = 10; 766)	4.261*** (df = 11; 765)

Note:The table reports Logit regressions for the across-section of countries. Dependent variable: Above Median Growth, takes the value of one if real GDP growth rate at a given year exceeds the median GDP per capita growth rate over the entire sample period for each country, and it takes zero otherwise. See Table 4 for definitions of the variables. Data on civil conflicts uses the UCDP/PRIO armed conflict database (Version 22.1). Sample period: 1970–2018 .Robust Standard errors are in parenthesis. Significance levels: $^*p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.